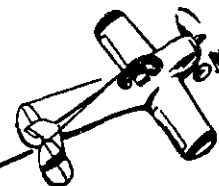


ERCOUPE
SERVICE
MEMORANDUM
No. **59**

Ercoupe **MEMORANDUM**

**SUBJECT: Rudder Pedals—Assembly and
Installation of**



In keeping with the many requests we have had for rudder pedal installations in the Ercoupe, we are now adding SK-21, rudder pedal kit, to our long list of optional equipment and accessories. This unit was designed and manufactured for simple installation and ease of operation, and is applicable to all post-war Ercoupes. It may be installed in pre-war Ercoupes with some small modifications, and local approval from the C.A.A.

The installation of the Trim-O-Matic will not allow rudder pedals to be installed, or vice-versa, as these units are attached in the same area of the front spar, and the operation of one would interfere with the other. With the installation of rudder pedals, it is necessary to remove the top arc of the foot brake pedal; this may be sawed off with a hacksaw when the floor board is removed. This will allow free operation of the rudder pedals without interference from the brake pad. We have found after several tests, that the hand brake with the system in good condition, is adequate in filling the braking needs of the Ercoupe, both statically and in coming to an abrupt stop. However, it is strongly recommended that the complete hydraulic brake system be given an overhauling to check for leakage in the master cylinder and friction in the control cable which is operated from the instrument panel.

Installation instructions.

1. Remove rug, toe board, control column plate, floor board, and seat cushion. Take out the bucket seat by removing four hold down screws and three pins from the hinge assemblies; save all hardware as most of it must be replaced.

2. Remove fibre guide 415-52056 (guide prevents pushrod 415-52036 from riding on the front spar). Drill out rivet above guide and leave the hole blank. The same rivet in the adjacent bay to the left, must be drilled out also, and left blank. This allows plates 415-52387L/R to lie flat on the rear of the front spar.

3. Prior to drilling any holes in the front spar, position plates 415-52387 L/R (with the letters "L" and "R" stamped on) facing rearward. Position reinforcement plates with the inboard edge against the center gusset and the top of the plate touching the bottom edge of the spar capstrip (see view AA of blueprint 415-52389). Drill a few pilot holes with a #30 drill (.128) and fasten plate temporarily to spar with Celeco buttons or nuts and bolts. Drill the remaining rivet holes. Do not drill the $\frac{3}{8}$ " holes, nor $\frac{3}{16}$ " dia. hole (lower inboard corner). Use countersunk rivets in holes cut for them in plates 415-52387 L/R (6 in left, 2 in right). Prior to riveting the round head rivets, check the position for the pulley brackets 415-52395 L/R. The line of the rivets nearest the centerline are used to attach this bracket. Note: When locating pulley bracket,

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the lower hole on the bracket should register with 3/16" hole in the lower inner corner of plate, the 3/8" holes should also register. Check View AA for clarification. Finish riveting plates and brackets in place. Drill #11 holes (.191) through the bottom spar using hole of pulley brackets for location, and insert the nut and bolt as called out on installation blueprint. Drill 3/8" dia. hole through spar using the holes in pulley brackets for location, and clean any burrs that might remain, using a round file. Install pulleys as shown in View AA, centering the pulleys with washers and spacers. The blueprint does not show extra washers which may be required to center pulleys over the center of the 3/8" holes.

4. Replace guide removed in step #2, using original screws and nuts. If necessary, trim the top of guide to allow it to fit under pulley bracket.

5. Refer to View EE in installation drawing for location of two 1/2" dia. holes to be cut in bottom member of seat back. Drill these holes as indicated and clean out burrs.

6. Install 415-52394 clip. Locate the center of extrusion 415-31235-1, as shown in View CC, and from it, measure downward 1 3/8" from bottom of extrusion and secure clip to firewall at this point with the proper hardware. Attach spring, 415-52393, and allow them to hang free. CAUTION: To avoid stretching, do not hook to rudder pedals (see paragraph #9).

7. Re-install floor board and replace toe board with a new one, 415-52390, which is furnished with rudder pedals and cables assembled on it; the old foot rest (453059 or toe board as it is called in these instructions) may be discarded. In the earlier models of Ercoupes washer head screws were used for securing the floor board and toe board; however, these must be retained or replaced with AN-3-6A bolts and AN-960-10 washers, which are easier than washer head screws to install.

8. Insert the turnbuckle terminal ends of rudder cables through 3/8" hole from the front of the main spar, and thread under the pulleys. It may be necessary to elongate these holes slightly with a file, to allow terminal ends to pass through. Install cotter key, AN 380-4-6, in pulley brackets, as shown in View AA.

9. Disconnect rudder cables from control mast, which is located below the baggage compartment. In order to remove these cables, it is necessary to remove the bolt which locks the rudder bellcrank arm to the aileron bellcrank arm. Remove and discard the bolts which secure the clevis ends of the rudder cables to the bellcrank, and also remove and discard clevis ends from turnbuckles. Neutralize the aileron and rudder pedal cables through holes in seat back, and connect them to rudder cables which cross, as previously, in middle of tail cone. Tighten cables and actuate rudder pedals and check rudder pedal cables for clearance.

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Cables should not touch structure. Disconnect rudder cables and install fairleads, 415-31126, as shown in View EE. Re-install rudder pedal cables. Check tension of each cable with respective pedal held firmly against toe board, using a tensiometer, to 30 lbs. - 70 lbs. Note: With above adjustment rudder travel should be limited by stops in stabilizer, not by pedals. Turnbuckle terminal of cables 415-52398 are threaded all the way up to provide sufficient adjustment. Turnbuckles must be safetied with a single wrap, using .040 stainless steel wire, refer to CAM 18 for further information.

10. Install fairlead blocks, 415-52397 as shown in View DD, using the measurement $4\frac{1}{4}$ and $8\frac{1}{2}$ inches from the center line of control mast with wheel full forward, (see notes 2 and 3 on blueprint). With wheel full forward, kick extreme rudders left and right to determine clearance between fairleads and turnbuckle ends of rudder cable. Now, pull control wheel full back and actuate rudders in the same manner and check fairleads. Do not allow the turnbuckle ends to ride into either fairlead.

11. To install the rug, place it in original position and snap it to the floor board, and lay over the foot pedals. Cut a $\frac{3}{4}$ " square out of the rug on each side, so that pedal bracket will fit into hole; cut from lower edge of this hole toward opening for control column, and fit rug around pedals. Cut 1" dia. holes in line with spring hole in plywood. Locate triangular hole for dog-leg in pedal shaft, by laying rug on top of shaft at this point. Cut hole in rug $\frac{1}{4}$ " less than matching hole in plywood. Save the piece cut out, to fasten under hole where brake pedal was.

12. With long nose pliers, pull springs 415-52939 up through toe board, and attach to rudder pedals. Actuate pedals to determine whether there is excessive friction. A few drops of light oil at the movable joints of the pedal assembly will assist in reducing friction. Also check for binding or interference.

13. Center the guard 415-52386 over rudder pedal cables, then move it rearward until it touches the front spar. Before securing the guard to floor board and foot rest with six PK screws, check rudder pedal cable for clearance inside guard.

14. Install scuff plates under rudder pedal shaft with notch around pedal bracket, and secure them to the floor board with PK screws.

15. Replace all parts removed from the airplane, (see paragraph #1).

16. The installation of the Rudder Pedal Kit increases the net weight 5.5 lbs. with an arm of 18" aft of datum line (firewall); therefore a new weight and balance must be made.