ELECTRIC ELEVATOR TRIM - ADJUSTMENT/TEST

1. Electric Trim Rigging (Airplanes with 400B and 400B IFCS Autopilots Types AF-550A and IF-550A Installed)

A. Adjust the Electric Trim (Refer to Figure 501).

(1) Set the control wheels in the neutral position of elevator.

(2) Use a control column neutral rigging tool attach the control wheels in the neutral position.

(3) Make sure the actuator motor is attached to the actuator mount with four bolts, washers and safety wire.

(4) Make sure the actuator mount is attached to the support with four bolts and washers.

(5) Make sure the support is attached to the brackets which attach to the pedestal using two each bolts and washers.

(6) Make sure that chain is correctly aligned on the actuator motor sprocket and sprocket.

(7) Make sure that chain is installed with a connecting link.

(8) Make sure the two chain guard posts are correctly installed and have safety wire attached to the actuator assembly.

(9) Make sure the electrical connector is attached.

(10) Adjust the tension of the chain assembly.

(a) Apply five pounds of scale tension to the chain the same distances from each of the sprockets.

(b) While you apply the five pounds of pressure, examine the chain to have a total horizontal travel of 0.40 inch.

(c) If the chain tension is too high or too low, loosen the bolts and adjust he two support brackets to allow 0.40 inch chain deflection.

(d) Tighten the bolts.

(e) Remove the scale from chain.

(11) If the chain has to be removed for replacement or maintenance, you must remove the two chain guard posts. When the chain guard posts are removed, do not lose the lock washers.

(12) To correctly adjust the electric trim system, you must make sure that you have a continuous 28.8 volts DC applied to the electronics side of the airplane's bus bar. This can be accomplished in one of the following methods.

(a) Use the standard airplane starting procedures for the engine and operate the engine at 52 degrees Ng to maintain the normal operating aircraft voltage (28.8 VDC).

(b) With the battery switch and avionics power switches set in the OFF position, connect a well regulated and filtered external power supply directly to the battery side of the battery contactor. Adjust the power supply for 28.8 volts DC and then turn to ON the battery switch and avionics power switches to supply power to the system.

(13) To remove the gyro roll and pitch signals generated by a non-erected gyro, the 400B autopilot has a GYRO switch located on the rear of the control head. Set the GYRO switch to the OUT position.

(14) If an outside vacuum source is used, it must be calibrated in inches of mercury and the suction range required to erect the gyro is 4.6 to 5.4 inches of mercury.

(15) If the airplane engine is operated to erect the gyro, the engine must operate at 65 degrees Ng to provide the amount of vacuum and maintain correct bus voltage.

(16) The 400B IFCS does not have a gyro out switch. You must hook up an outside vacuum source or operate the airplane engine to erect the gyros.

(17) Remove the neutral rigging tool.

(18) Set a piece of tape or a mark on the top of the airplane's ELEVATOR TRIM command wheel so that a full revolution of the ELEVATOR TRIM command wheel will be observed and timed with a stop watch.

(19) With 28.8 volts DC applied to the electronics bus, place AP/ON autopilot (ON/OFF) switch to the ON position. Allow the autopilot to sync out. (Autopilot PITCH wheel stops running.)

(20) Monitor and time one complete rotation of the airplane's ELEVATOR TRIM command wheel by placing pitch command wheel in the UP position. Make sure that you get a time of 30 +3 or -3 seconds for one complete rotation of the airplane's ELEVATOR TRIM command wheel.

(a) Remove the cover assembly and sidewall to get access to the computer amplifier.

(b) Remove the center plug button from the top of the computer amplifier to get access to the R46 on computer module A6.

(c) Engage the autopilot and apply a NOSE-DOWN pitch command via the PITCH wheel, sufficient to cause trim to run.

(d) Adjust the R46 (counter clockwise - slows trim) on computer module A6 to get a rotation of the airplane's ELEVATOR TRIM wheel. One rotation in 30 +3 or -3 seconds in the NOSE-DOWN direction and one rotation in 30 +3 or -3 seconds in the NOSE-UP position must be completed.

NOTE: With autopilot disengaged, the electric trim actuator operates on a bus voltage of 28.8 volts DC in both the NOSE-UP and NOSE-DOWN directions. The average time for ELEVATOR TRIM command wheel to make three complete rotations is 23.5 +2 or -2 seconds.

(e) Do a check of the system friction and voltage if time limit is exceeded.

(21) Reverse the procedure and make sure that you are getting a reading of 30 +3 or -3 seconds for one full rotation of the airplane's ELEVATOR TRIM command wheel in the NOSE-DOWN position. If the rate of the travel for one full rotation does not agree with the prior travel time limits, then use the following procedures to get the desired rate of pitch trim tab travel.

(a) Turn AP/ON autopilot (ON-OFF) switch, avionics power switches, and airplane battery switch to the OFF positions.

(b) Replace the access plates removed. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

(c) Remove the external power source if installed.

(d) Remove the outside vacuum source if installed or reset the GYRO switch to the IN position.

2. Electric Elevator Trim Clutch Torque System Check (Airplanes with 400B and 400B IFCS Autopilots Types AF-550A and IF-550A Installed)

A. Do a Check of the Trim Clutch Torque.

(1) Remove the left and right cover plates from the pedestal. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

(2) Remove the nut and washer. Remove the elevator trim wheel from the shaft.

(3) Loosen the bolts and move the supports up to relieve the tension on the chain.

(4) Remove the connecting link from the chain and detach the chain from the sprockets.

(5) Disconnect the plug from the connector.

(6) Remove the bolts and washers. Remove the electric trim actuator and actuator mount bracket from the support. Move the actuator and bracket from the airplane to a table.

(7) Remove the bolts and remove the electric trim actuator from the actuator mount bracket.

(8) Remove the front seal retainer and the front seal from the sprocket housing.

(9) Lock the shaft to prevent rotation and install 1 5/16 inch socket over sprocket housing. Attach a torque wrench to socket.

(10) Rotate the sprocket housing slowly clockwise or counter clockwise and check the torque value.

(11) The torque value must check 30 +5 or -5 inch-pounds.

(12) Adjust the electric trim clutch torque as follows:

(a) Loosen the lock screw.

(b) Turn the adjusting nut clockwise to increase the torque or counter-clockwise to reduce the torque.

NOTE: If a closer setting is required, the adjusting nut may be turned without loosening the locking screw.

1 When you adjust the clutch torque, rotate the adjusting nut clockwise until the torque shows 2.0 to 4.0 inch-pounds by the required setting.

2 Tighten the lock screw 40-45 inch-pounds.

(13) Install the front seal to the sprocket housing.

(14) Install the front seal retainer.

(15) Attach the electric trim actuator to the actuator mount bracket and install the bolts. Follow the torque sequence

diagram and torque the bolts to 15-20 inch-pounds.

(16) Attach the electric trim actuator and the actuator mount bracket to the support. Install the washers and bolts.

(17) Connect the plug to the connector.

(18) Attach the chain to the sprockets and install the connector link.

(19) Adjust the support to set the required tension of the chain and tighten the bolt.

(20) Attach the elevator trim wheel to the shaft and install the washer and nut.

(21) Attach the left and right cover plate to the control pedestal and install the screws.

3. Electric Trim Rigging (Airplanes with KAP-150 Autopilot and KFC-150, KFC-225 Flight Control System Installed)

A. Adjust the Electric Trim Rigging (Refer to Figure 502).

(1) Set the control wheels in the neutral position of the elevator.

(2) Lock the control wheels in the neutral position by using a control column neutral rigging tool.

(3) Adjust the pitch trim servo slip clutch values of the KM 277 Capstan. Refer to Slip Clutch Torque Adjustment.

(4) The KS 272A Trim Servo and KM 277 Servo Mount are installed with the electric pitch trim control in the KAP-150 Autopilot System and KFC-150, KFC-225 Flight Control System. The KS 272A and KM 277 units are installed inside the engine control pedestal just aft of FS 114.4.

(5) Access the pitch trim servo installation and remove the five bolts that attach the chain guard to the pedestal.

(6) Make sure the trim servo bracket is correctly installed inside the engine control pedestal. Inspect to make sure the trim servo bracket is attached at the forward end using two bolts and two washers. The two bolts fit the holes that exist in the engine control pedestal.

(7) Do a check to make sure the aft end of the trim servo bracket is correctly attached using two bolts and two washers. The two bolts fit the holes (existing slots) in the engine control pedestal. Make sure the trim servo bracket is adjusted to the top of the slots if adjustment is necessary.

(8) Make sure the two nut plates are correctly attached to the back of the KS 272A servo with four screws.

(9) Do a check to make sure the aft trim bracket is correctly attached to the trim servo bracket with one bolt, two washers and one nut.

(10) Do a check to make sure the forward trim bracket is correctly attached to the trim servo bracket with two bolts, four washers and two nuts.

(11) Make sure the KM 277 servo mount is correctly attached to the aft trim bracket with two bolts, two washers and two nuts.

(12) Make sure the KS 272A Pitch trim servo is correctly installed with two bolts.

(13) Do a check to make sure the pitch trim chain is routed under the KM 277 Capstan and over the pilot's trim wheel shaft sprocket. Make sure the two ends of the trim chain are properly connected using the connecting link.

(14) Adjust the tension of trim chain.

(a) Apply five pounds of scale tension to the trim chain as close to equal distance from the trim wheel sprocket and KM 277 Capstan.

(b) While applying five pounds of pressure, monitor the trim chain has a total horizontal travel of 0.25 inch maximum.

(c) If chain tension is too high or too low, loosen the two bolts and adjust the trim servo bracket, up or down as required to allow 0.25 inch chain deflection.

(d) Tighten the two bolts that attach the trim servo bracket.

(e) Remove the scale from trim chain.

(15) Remove the neutral rigging tool.

(16) Make sure the servo's electrical connector is attached.

(17) Install the chain guard with the five bolts.

Figure 501 : Sheet 1 : Electric Trim Rigging

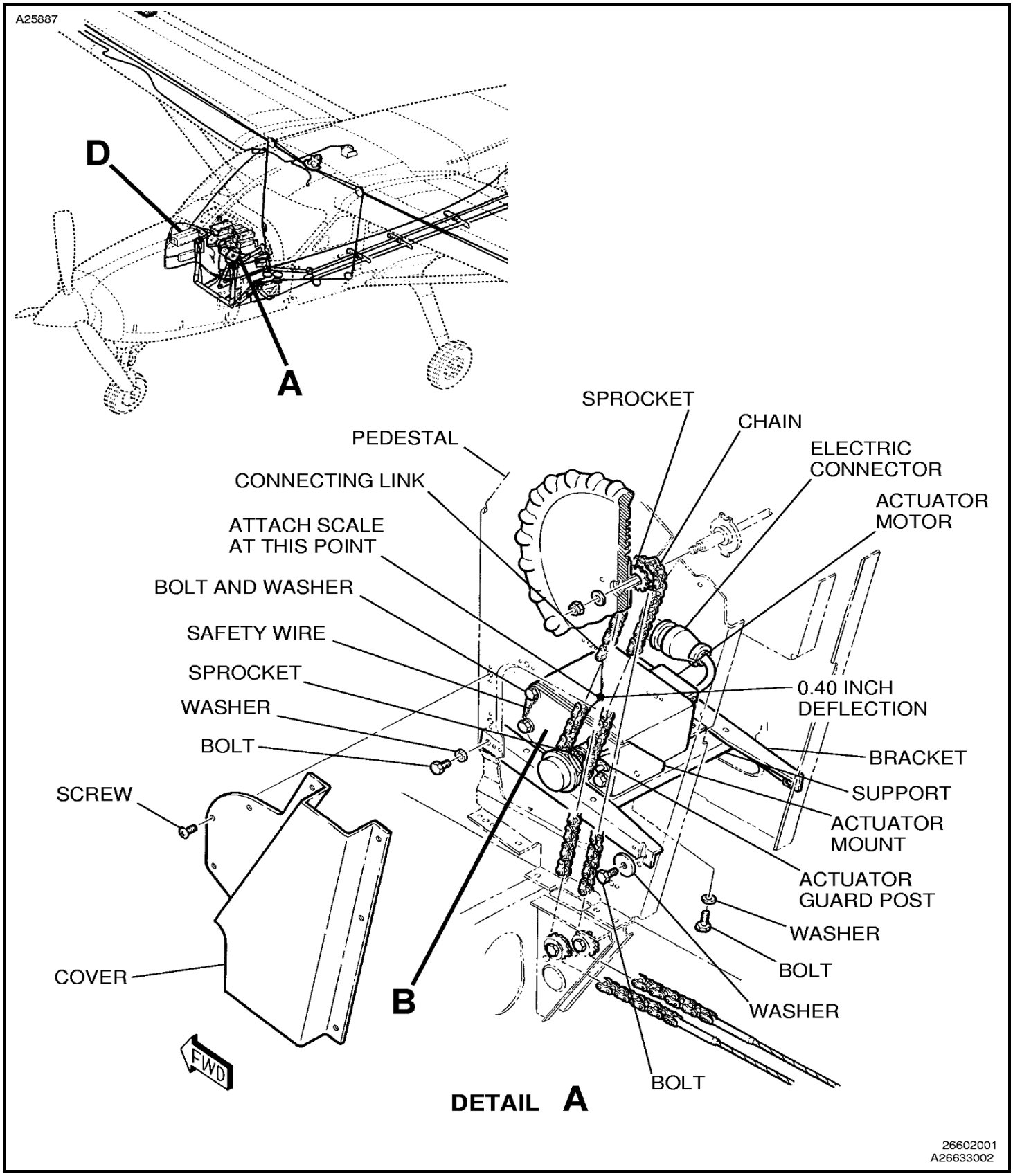

Figure 501 : Sheet 2 : Electric Trim Rigging

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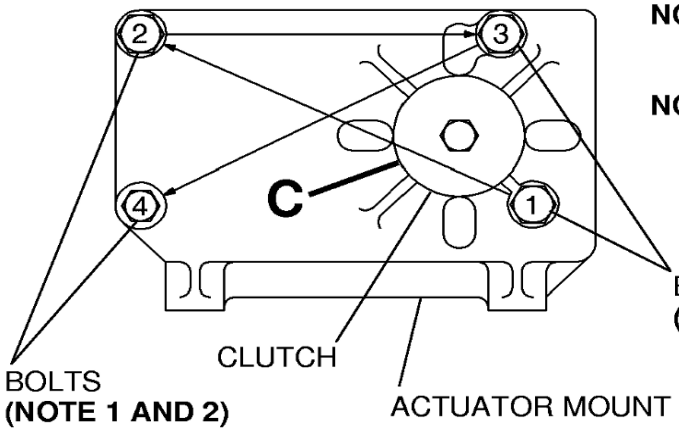
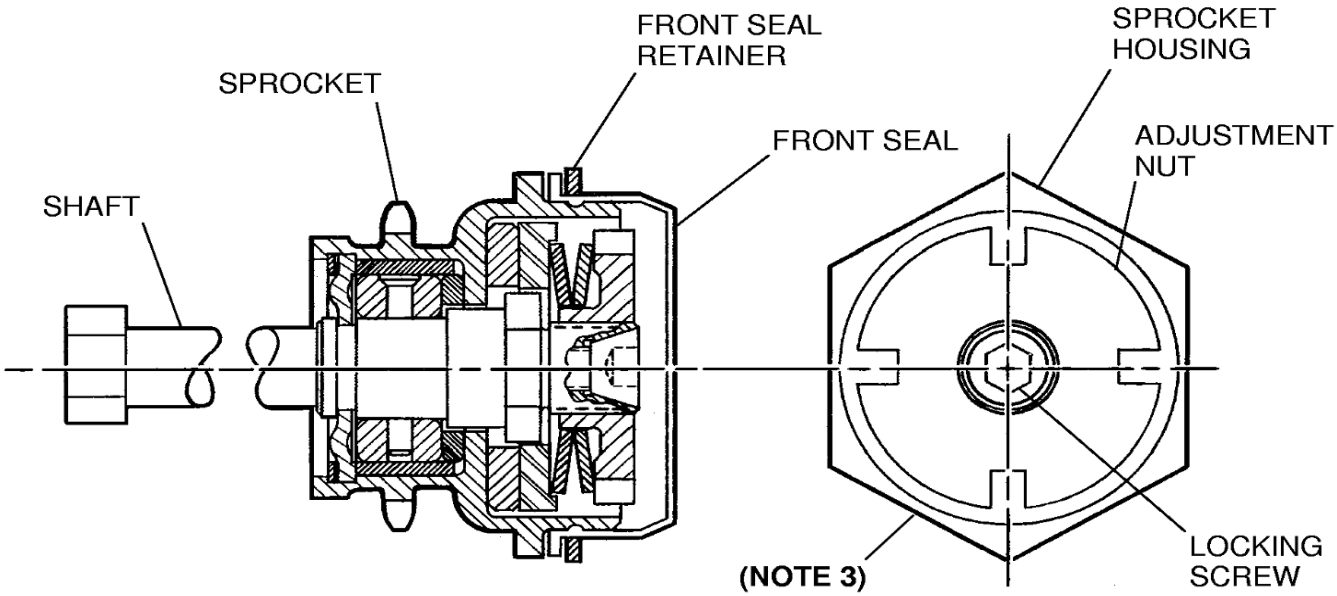


NOTE 1: TIGHTEN BOLTS EVENLY IN SEQUENCE TO 15 TO 30 INCH-POUNDS.

NOTE 2: MOUNTING BOLTS ARE THREADED THREADED INTO SELF-LOCKING INSERTS, THEREFORE, SAFETY WIRE IS OPTIONAL.

DETAIL B
TORQUE SEQUENCE DIAGRAM



NOTE 3: FOR CLARIFICATION, THIS VIEW SHOWN WITH FRONT SEAL AND SEAL RETAINER REMOVED.

DETAIL C

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Figure 501 : Sheet 3 : Electric Trim Rigging

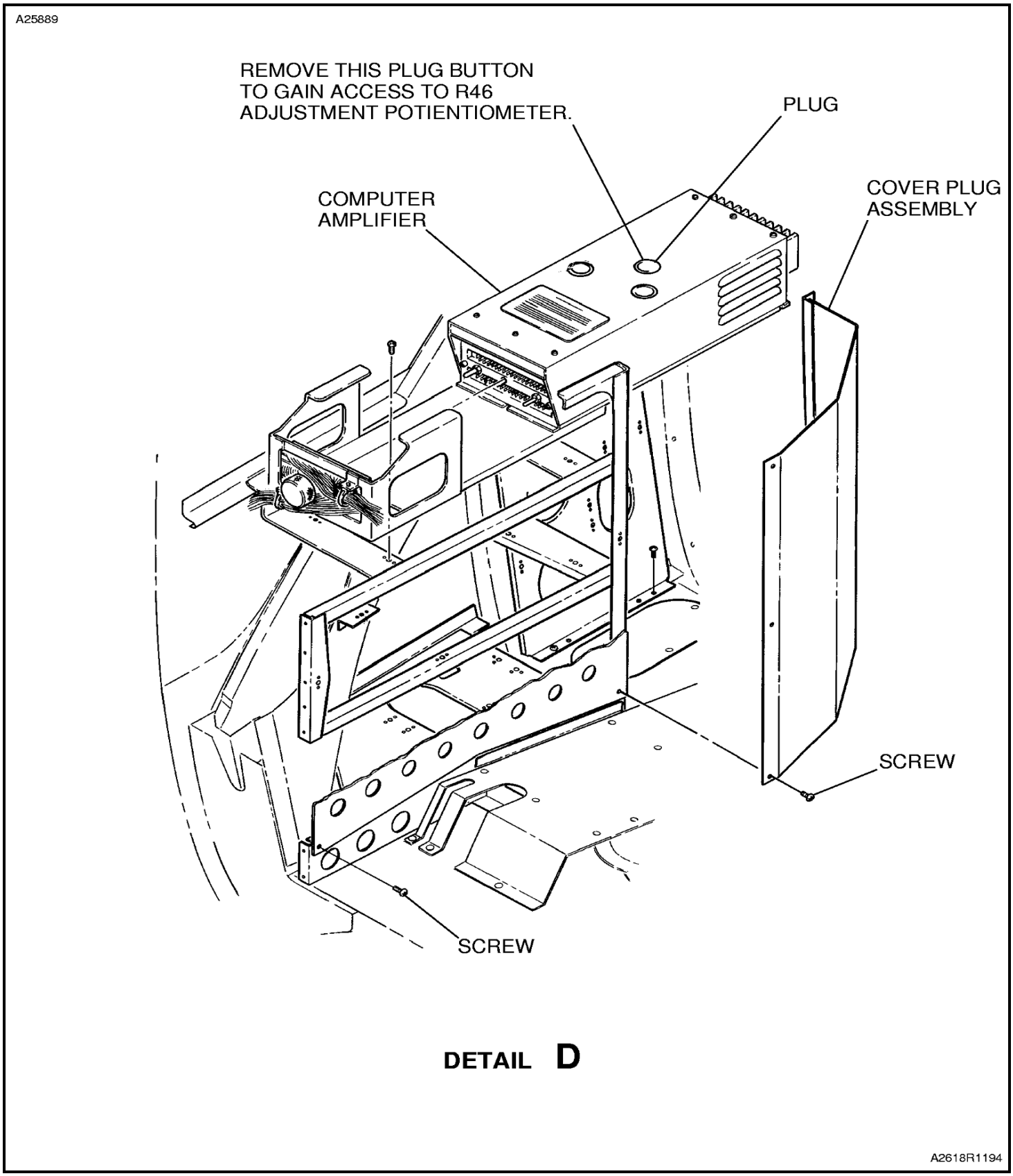

Figure 502 : Sheet 1 : Electric Trim Rigging