NUMBER: SB 500-76-001, Rev C

MODEL: ECLIPSE EA500

SUBJECT: Throttle Lever Test

Mandatory

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1. PLANNING INFORMATION

A. Effectivity

Aircraft Serial Numbers: 000001 through 000038 pre SB 500-99-001 and 000039 through 000262, 000266, and 000267, pre SB 500-76-002

Throttle Quadrant Assemblies with label “SB 500-76-001, Rev B complied with” do not require testing.

B. Reason

This Service Bulletin is to test Throttle Quadrant Levers for potentiometer variances under load.

Revision C of this Service Bulletin updates the effectivity.

Revision B of this Service Bulletin corrects test procedure.

C. Description

The intent of this test is to determine if installed Throttle Quadrant Assemblies (TQA) cause the throttle position signal to exceed its design range. There are two test procedures provided, one for on aircraft and one for off aircraft. Either test can be accomplished.

D. Relevant Publications

06-122204 – EA 500 AFM, current revision

06-121654 – EA 500 AFM, current revision

06-100106 – EA 500 AFM, current revision

E. Compliance

This Service Bulletin must be accomplished at the next maintenance visit (but no later than the 300 hour inspection) to the Service Center or Eclipse Authorized Service Center.

F. Approval

This Service Bulletin is based on engineering data that is FAA-approved, and the modification herein complies with the applicable regulations.

G. Labor Requirements

The following information is for planning purposes only.

(1) Estimated labor hours to perform:

(a) On Aircraft Test

Suggested number of personnel: 2

TQA test: 0.5 Hour

Engine run: 0.5 Hour

Total labor hours: 2.0

The above is an estimate based on properly equipped and experienced personnel complying with this Service Bulletin. Actual labor hours may vary depending on workforce experience, concurrent maintenance, discovery of other discrepancies, etc.

(b) Off Aircraft Test

Suggested number of personnel: 2

TQA Removal: 0.25 Hour

TQA Test: 1.0 Hour

TAQ Installation: 0.25 Hour

Adjustment/Tests: 2.5 Hours

Total labor hours: 8.0

The above is an estimate based on properly equipped and experienced personnel complying with this Service Bulletin. Actual labor hours may vary depending on workforce experience, concurrent maintenance, discovery of other discrepancies, etc.

(2) Qualification of personnel:

- A person properly authorized under 14 CFR 43 to perform aircraft maintenance.
- Engine run qualified.

H. References

Airplane Flight Manual (P/N 06-122204) Temporary Revision 5 and 6

Airplane Flight Manual (P/N 06-122204) Revision 1

Airplane Flight Manual (P/N 06-121654) Temporary Revision 7 and 8

Airplane Flight Manual (P/N 06-100106) Temporary Revision 13 and 14

Aircraft Maintenance Manual (AMM) P/N 06-117751

2. MATERIAL INFORMATION

A. Materials

Order Non-kitted Parts below if required.

(1) Non-Kitted Parts

Part Number	Description	Qty	Unit of Issue
76-122940-2001	TQA Stop	1	EA.

B. Consumables

The following consumables are required if TQA Stop is installed.

Material	Specification	Use
Double Sided Tape	3M VHB 4910 (.040 THK)	To install TQA Stop.
Aluminum Tape	3M 425	To install TQA Stop.

C. Tooling - On Aircraft Test

The following special tooling/support equipment is required to accomplish the on aircraft test.

Nomenclature	Specification	Use
Throttle Quadrant Assembly Test Plate Assembly	EAC P/N 86-122861-1001	To test Throttle Quadrant Assembly Levers
Cable Assembly with T-bar and Weight	EAC P/N 86-122860-1001	To test Throttle Quadrant Assembly Levers Information Only: 35.4 pound weight
Additional Weight	EAC P/N 86-122938-2001	To test Throttle Quadrant Assembly Levers Information Only: 8.4 pound weight

D. Tooling - Off Aircraft Test

The following special tooling/support equipment is required to accomplish the off aircraft test.

Nomenclature	Specification	Use
Throttle Quadrant Assembly Test Stand	EAC P/N 86-122859-1001	To hold Throttle Quadrant Assembly for testing
Cable Assembly with T-bar and Weight	EAC P/N 86-122860-1001	To test Throttle Quadrant Assembly Levers Information Only: 35.4 pound weight
J1 Test Harness	EAC P/N 86-122863-1001	To test Throttle Quadrant Assembly Levers
J2 Test Harness	EAC P/N 86-122864-1001	To test Throttle Quadrant Assembly Levers
Power Supply	DC capable of producing 10.00 +/- .005 VDC	To test Throttle Quadrant Assembly Levers
Multimeter	Calibrated Fluke 1507 or equivalent	To test Throttle Quadrant Assembly Levers
Clamps	C Clamp (X2)	To hold Test Stand to table
Additional Weight	EAC P/N 86-122938-2001	To test Throttle Quadrant Assembly Levers Information Only: 8.4 pound weight

3. ACCOMPLISHMENT INSTRUCTIONS

A. Test Procedure - On Aircraft

(1) Make the aircraft safe for maintenance. Refer to AMM 20-00-01 MAKE SAFE FOR MAINTENANCE.

(2) Turn on aircraft electrical power in the following configuration:

(a) Ground Power Unit connected (if available)

(b) BUS TIE switch - AUTO

(c) SYSTEM BATT switch - ON

(d) START BATT switch - ON

(3) Wait for two minutes to ensure complete system power-up and Data Storage Unit recording.

(4) Ensure there are no ENG CONTROL CAS messages.

(5) Install test fixture (P/N 86-122861-1001) onto top of TQA assembly and align locating pins with TQA mounting fastener holes.

NOTE: For on-aircraft test, the center console must be installed to support the weight of the test rig.

(6) Place throttle levers in the MAX position and position T-bar between levers as shown in Figure 1.

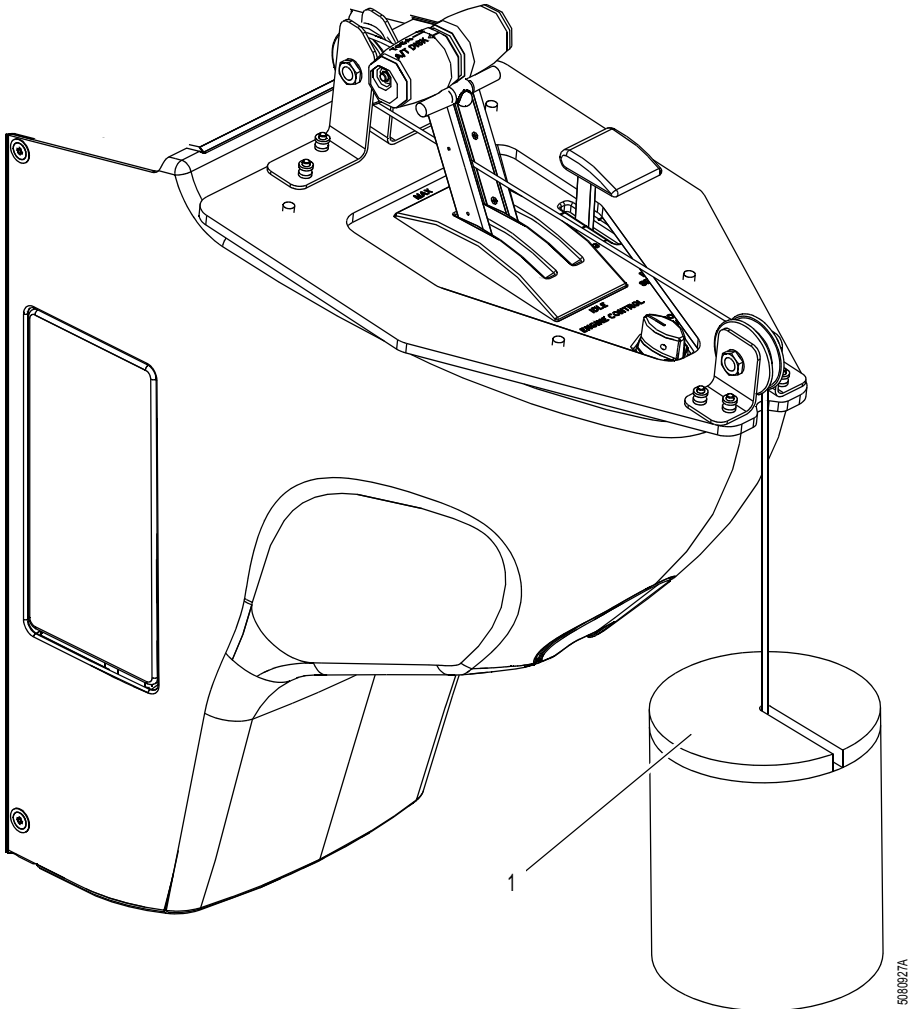

Figure 1. On Aircraft Test Set-Up

(7) Route cable with T-bar over forward pulley between the throttle levers and over the aft pulley. The cable end should be positioned pointing down between the pilot and co-pilot seats as shown in Figure 1.

(8) While holding test fixture in place, gently allow the weight to load the cable. Make sure that the T-bar remains in place against the throttle levers with the load equally distributed between the throttle levers and that the cable remains on the pulley. Do not allow the weight to “bounce” or fall. Weight must hang free and not touch the floor or center pedestal.

(9) Carefully slide the additional weight (1, Figure 1) on top of the large suspended weight. Make sure that the combination of weights do not bounce or fall.

(10) Check MFD. Note any CAS messages.

(11) If both "L ENG CONTROL FAIL" and "R ENG CONTROL FAIL" CAS Messages are not activated, carefully remove all equipment.

NOTE: A single "L ENG CONTROL FAIL" or "R ENG CONTROL FAIL" CAS Message or no CAS Message is a valid condition for this test.

(12) Prepare label with adhesive backing “Tested per SB 500-76-001, Rev B”.

(a) Loosen four captive mounting screws from TQA.

(b) Pull TQA up from the throttle pedestal support assembly without disconnecting the electrical connectors.

(c) Affix prepared label to TQA next to TQA identification plate.

(d) Slide TQA onto the throttle pedestal support assembly and align holes.

(e) Tighten four captive mounting screws until TQA is secure.

(13) If both “L ENG CONTROL FAIL” and “R ENG CONTROL FAIL” CAS Messages appear, carefully remove all test equipment and power down aircraft by setting the BUS TIE switch - OPEN, SYSTEM BATT switch - OFF and START BATT switch - OFF. Install TQA Stop, refer to step 3C, then continue with step 3A(14).

(14) Repeats steps 3A(2) through 3A(11) with the TQA Stop installed.

(a) If both “L ENG CONTROL FAIL” and “R ENG CONTROL FAIL” CAS Messages appear with the TQA Stop installed, remove and replace the TQA. Refer to AMM 25-10-01 THROTTLE QUADRANT REMOVAL and AMM 25-10-01 THROTTLE QUADRANT INSTALLATION. Make sure to do test of Throttle Quadrant - AMM 31-10-00 DISPLAYS AND CONTROL PANELS - ADJUSTMENT/TEST and Engine Run - AMM 71-00-00 POWERPLANT - ADJUSTMENT/TEST.

(15) Do engine run to test APR as follows:

(a) Ensure that aircraft wheels are chocked and parking brake is engaged.

(b) Perform normal engine start per the Aircraft Flight Manual (AFM).

(c) Advance left and right throttles to the MAX position. Refer to AFM, section 4.

(d) Ensure that both left and right N1 readings are at take-off values and that the “APR Armed “ indications are displayed on the MFD.

NOTE: If “APR Armed “indications are not displayed, replace TQA. Refer to AMM 25-10-01 THROTTLE QUADRANT REMOVAL and AMM 25-10-01 THROTTLE QUADRANT INSTALLATION. Make sure to do test of Throttle Quadrant - AMM 31-10-00 DISPLAYS AND CONTROL PANELS - ADJUSTMENT/TEST and Engine Run - AMM 71-00-00 POWERPLANT - ADJUSTMENT/TEST.

(e) Retract left and right throttles to the IDLE position.

(f) Perform engine shutdown per the AFM.

(16) Turn off aircraft electrical power in the following configuration:

(a) BUS TIE switch - OPEN

(b) SYSTEM BATT switch - OFF

(c) START BATT switch - OFF

(d) Ground Power Unit disconnected (if available)

(17) Prepare label with adhesive backing “Modified and Tested per SB 500-76-001, Rev B”.

(a) Loosen four captive mounting screws from TQA.

(b) Pull TQA up from the throttle pedestal support assembly without disconnecting the electrical connectors.

(c) Affix prepared label to TQA next to TQA identification plate.

(d) Slide TQA onto the throttle pedestal support assembly and align holes.

(e) Tighten four captive mounting screws until TQA is secure.

(18) If all other maintenance is complete, return the aircraft to service. Refer to AMM 20-00-02 RETURN TO SERVICE (AFTER MAINTENANCE).

B. Test Procedure - Off Aircraft

(1) Mount TQA onto Mounting Plate with the throttle levers in the MAX position.

(2) Clamp TQA and test plate assembly to a solid horizontal surface such as a table top so that the TQA is oriented vertically as shown in Figure 2.

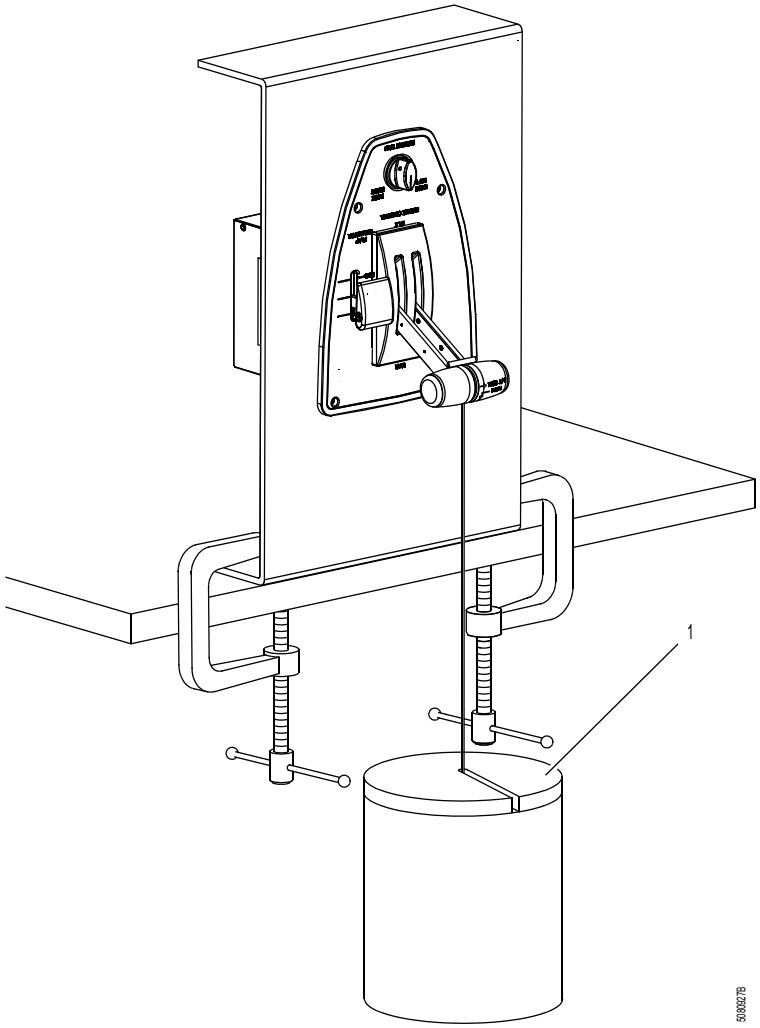

Figure 2. Off Aircraft Test Set-Up

(3) Connect test harness (P/N 86-122863-1001) to J1 connector on TQA.

(4) Connect test harness (P/N 86-122864-1001) to J2 connector on TQA.

(5) Connect Power Supply leads to test harness connected to J1 pin 1 (+) and pin 3 (-).

(6) Turn on Power Supply and set to 10.00 +/- .005 VDC.

(7) Connect multimeter leads to test harness connected to J1 pin 2 (+) and pin 3 (-).

(8) Attach cable by placing T-bar between each thrust lever resting against the knobs as shown in Figure 2.

CAUTION: Allow weight to bear on the throttle levers gently. Do not allow the weight to fall suddenly.

NOTE: Make sure weight is distributed evenly between the throttle levers.

(9) Carefully slide the additional weight (1, Figure 2) on top of the large suspended weight. Make sure that the combination of weights do not bounce or fall.

(10) Record voltage reading on multimeter.

(a) Note reading as Left Hand Channel A (LHA).

(11) Turn off power supply, disconnect power supply leads and multimeter test leads from test harness connected to J1.

(12) Connect Power Supply leads to test harness connected to J2, pins 4 (+) and 6 (-).

(13) Connect multimeter test leads test harness connected to J2, pins 5 (+) and 6 (-).

(14) Turn on Power Supply and set to 10.00 +/- .005 VDC.

(15) Record voltage reading on multimeter.

(a) Note reading as Left Hand Channel B (LHB).

(16) Turn off power supply, disconnect power supply leads and multimeter test leads from test harness connected to J2.

(17) Connect Power Supply to test harness connected to J2, pins 1 (+) and 3 (-).

(18) Turn on Power Supply and set to 10.00 +/- .005 VDC.

(19) Connect multimeter test leads to test harness connected to J2, pins 2 (+) and 3 (-).

(20) Record voltage reading on multimeter.

(a) Note reading as Right Hand Channel A (RHA).

(21) Turn off power supply, disconnect power supply leads and multimeter test leads from test harness connected to J2.

(22) Connect Power Supply leads to test harness connected to J1, pins 4 (+) and 6 (-).

(23) Turn on Power Supply and set to 10.00 +/- .005 VDC.

(24) Connect multimeter test leads to test harness connected to J1, pins 5 (+) and 6 (-).

(25) Record voltage reading on multimeter.

(a) Note reading as Right Hand Channel B (RHB).

(26) Remove cable with T-bar and weight from throttle levers.

(27) Turn off power supply, disconnect power supply leads and multimeter test leads from test harness connected to J1.

(28) Remove test harness from J1.

(29) Remove test harness from J2.

(30) Unclamp TQA and test plate assembly from horizontal surface and remove TQA from test plate.

(31) Pass/Fail Criteria

(a) **Pass**: Review all voltage readings noted for LHA, LHB, RHA, RHB. If any one reading is 9.33V maximum the test is passed.

Prepare label with adhesive backing “Tested per SB 500-76-001, Rev B” and affix to TQA next to TQA identification plate.

(b) **Fail**: If voltage reading on all channels (LHA, LHB, RHA, RHB) exceeds this 9.33V maximum, install TQA Stop (P/N 76-122940-2001). Refer to step 3C, then proceed to step 3B(31)(c).

(c) Repeat steps 3B(1) through 3B(26).

(d) **Pass with TQA Stop**: Review all voltage readings noted for LHA, LHB, RHA, RHB. If any one reading is 9.33V maximum the test is passed.

Do not affix label to the TQA.

1. Repeat steps 3B(5) through 3B(7) and move the left throttle to the MAX position under no load.
2. Repeat steps 3B(9) through 3B(13) and move the left throttle to the MAX position under no load.
3. Repeat steps 3B(14) through 3B(18) and move the right throttle to the MAX position under no load.
4. Repeat steps 3B(19) through 3B(23) and move the right throttle to the MAX position under no load.
5. Repeat steps 3B(24) and 3B(26) through (29).
6. Review all voltage readings and ensure that the voltage output from all four channels is 8.67 volts minimum to ensure take-off thrust and APR can be achieved with the TQA Stop installed.
7. Prepare label with adhesive backing “Modified and Tested per SB 500-76-001, Rev B” and affix to TQA next to TQA identification plate.

(e) **Fail with TQA Stop**: If voltage readings on all channels (LHA, LHB, RHA and RHB) exceeds the 9.33 volts maximum with the TQA Stop installed, return the TQA to Eclipse Aerospace.

C. TQA Stop Installation

(1) If needed, install TQA Stop (P/N 76-122940-2001) as follows. Refer to Figure 3.

(a) Position the left and right Throttle Levers to the IDLE position.

(b) Install 3M VHB 4910 Tape (.040 thick) (2, Figure 3, Sheet 1) under TQA Stop (P/N 76-122940-2001) (1, Figure 3, Sheet 1). Cut tape to size to fit under TQA Stop.

(c) Add 3M 425 Aluminum Tape (3, Figure 3, Sheet 1) to the Throttle Quadrant and under the 3M VHB 4910 Tape (2, Figure 3, Sheet 1). Cut to the same size as the 3M VHB 4910 Tape.

(d) Locate the TQA Stop (P/N 76-122940-2001) (1, Figure 3, Sheet 2) to ensure that the bent tabs are flush against the forward wall in the slots.

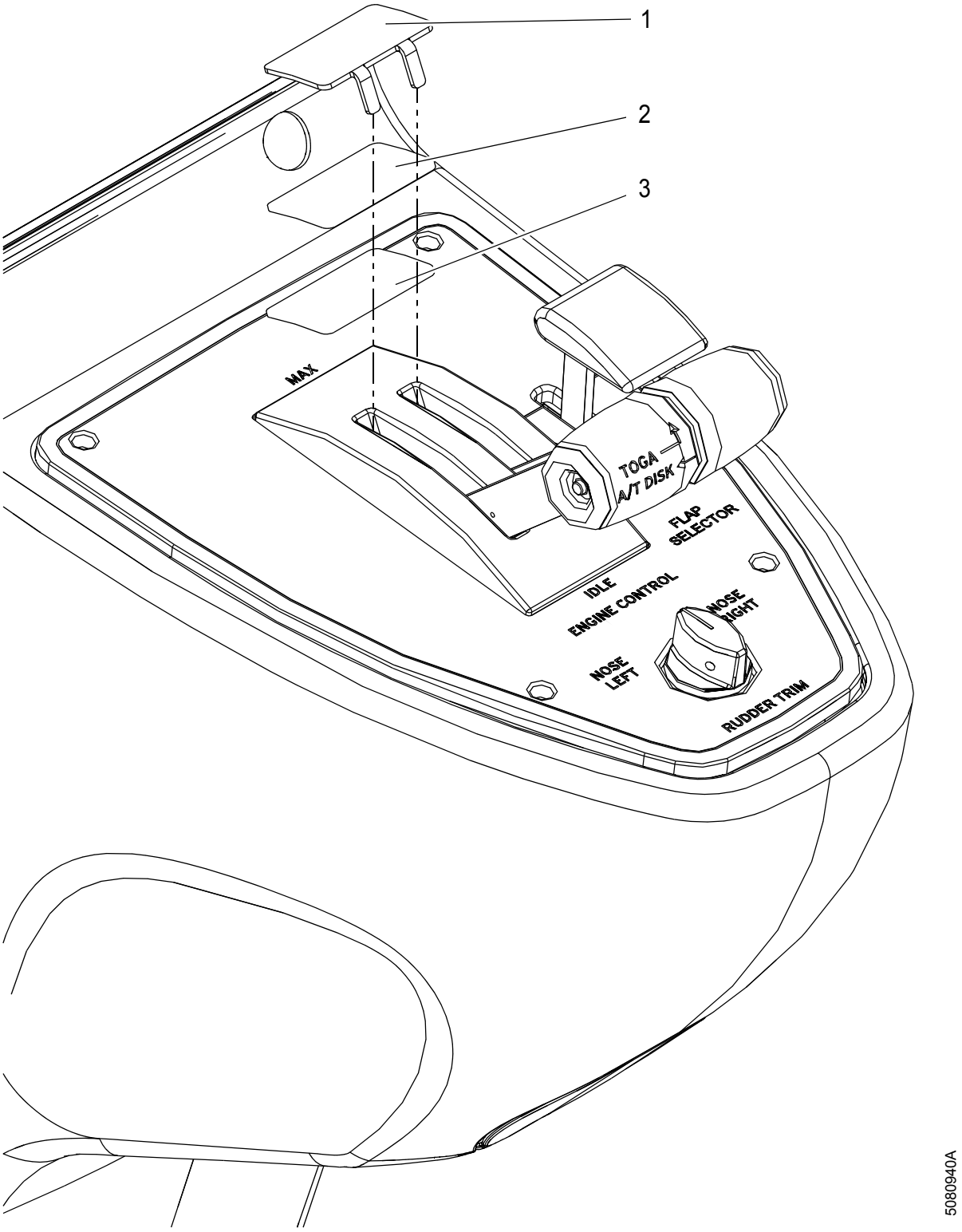

Figure 3. (Sheet 1 of 2) TQA Stop Installation

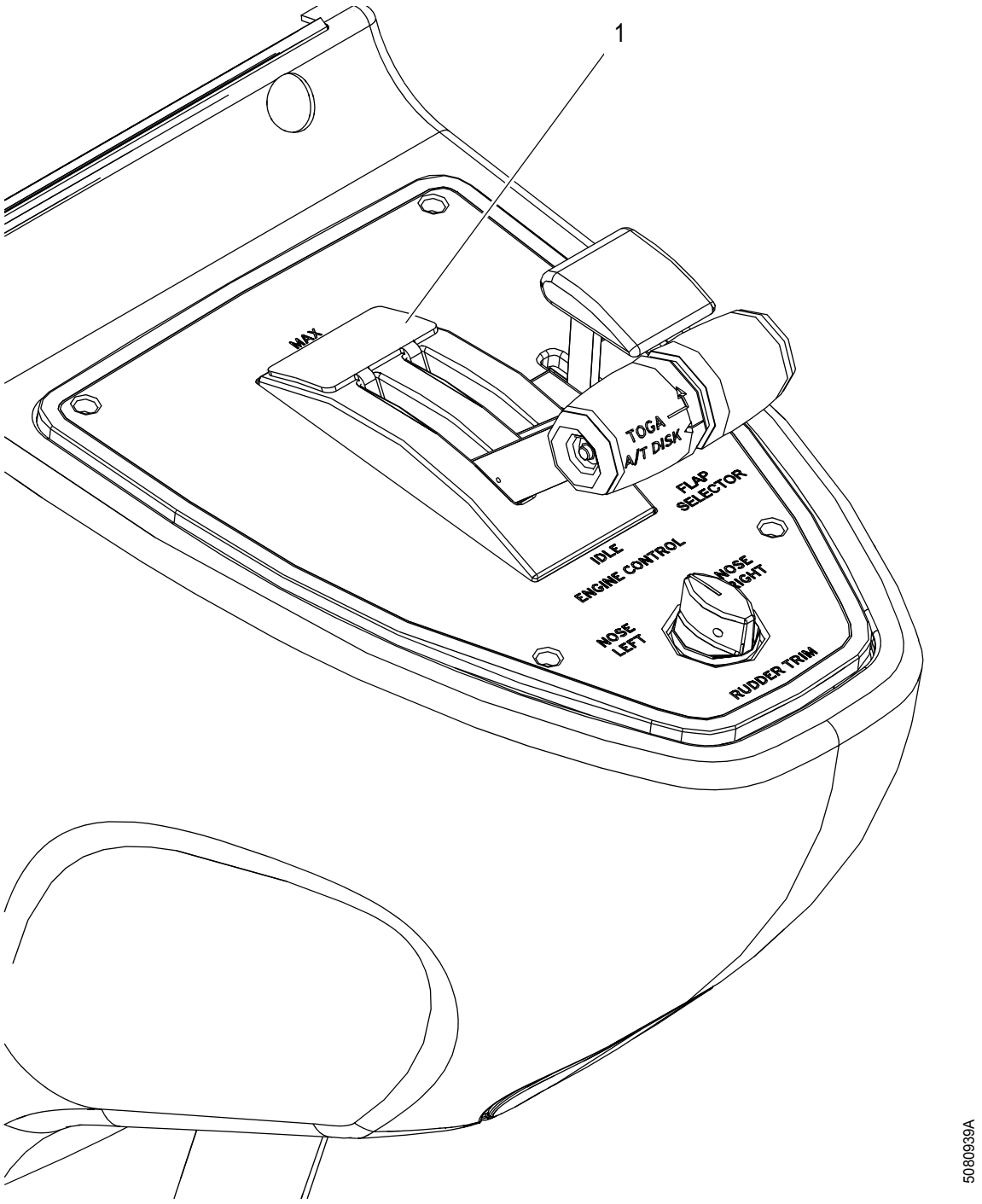

Figure 4. (Sheet 2 of 2) TQA Stop Installed

D. Limitations and Procedures

Insert into the emergency and normal procedures sections of the AFM Temporary Revisions No. 005 and 006 to AFM part number (P/N) 06-122204, Initial Issue, Temporary Revisions No. 007 and 008 to AFM P/N 06-121654, and Temporary Revisions No. 013 and 014 to AFM P/N 06-100106, as applicable.

No action required for AFM part number (P/N) 06-122204 Revision 1.

E. Parts Disposition

Return Throttle Quadrants that do not pass the test to Eclipse Aerospace Inc.

F. Cost

Parts and Labor will be supplied by Eclipse Aerospace Inc. at no charge to the aircraft owner. This Service Bulletin must be accomplished at an Eclipse Aerospace Service Center or Eclipse Aerospace designated facility.

4. RECORD OF COMPLIANCE

Upon completion of this Service Bulletin, make an appropriate maintenance-record entry specifying the Service Bulletin number.

5. NOTIFYING ECLIPSE AEROSPACE

On completing this Service Bulletin, the operator/maintainer shall complete the attached Compliance Record and send it to Eclipse Aerospace via regular mail, fax, or e-mail.

Mailing Address	Eclipse Aerospace Incorporated ATTN: Service Engineering 2503 Clark Carr Loop SE Albuquerque, NM 87106
Fax	1-505-241-8802
E-mail	sbcompliance@eclipse.aero

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MODIFICATION/SERVICE BULLETIN COMPLIANCE RECORD

MODEL _____ AIRPLANE S/N _____ REG. NO. _____ TOTAL TIME _____ (HOURS)

OWNER NAME: _____

ADDRESS: _____

_____

TELEPHONE NO. (___) _____ FAX NO. (___) _____

COMPLIANCE WITH SB 500-76-001, Rev C

Description of Work Performed

(Inspection | Modification | Repair | Option Installation | Defect or Damage Found, if applicable)

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DATE _____

WORK PERFORMED

BY _____ (PRINTED)

_____ (SIGNATURE)

COMPANY _____

ADDRESS _____

_____

TELEPHONE _____ FAX _____