



SERVICE BULLETIN

ALERT

FLIGHT CONTROLS – INSTALLATION OF AN ALERTING PLACARD ABOUT MAXIMUM SPEED TO PITCH-TRIM AFTER TAKEOFF

1. EFFECTIVITY

Aircraft affected:

| MODEL | S/N |
|-----------------------------|---|
| EMB-145 () and EMB-135 () | 145004 thru 145103, 145105 thru 145121, 145123 thru 145139, 145141 thru 145153, 145155 thru 145189, 145191 thru 145256, 145258 thru 145262, 145264 thru 145349, 145351 thru 145362, 145364, 145366 thru 145369. |

In-production effectivity:

EMB-145() and EMB-135() aircraft S/N 145001 thru 145003, 145104, 145122, 145140, 145154, 145190, 145257, 145263, 145350, 145363, 145365, 145370 and on have an equivalent modification factory-incorporated.

2. REASON

Instances have been reported concerning the occurrence of temporary loss of pitch trim command after takeoff / during climb phase.

In order to alert the crew to the maximum speed for airplane retrimming at this flight phase a placard is being installed on the instrument panel.

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3. DESCRIPTION - TIME FOR ACCOMPLISHMENT

3.1 DESCRIPTION

This bulletin consists of the installation of a placard on the main instrument panel (2 positions) located in the cockpit.

Accomplishment instructions:

1. Make sure that the aircraft is safe for maintenance.
2. Install placards P/N 145-46718-001 (2 positions) on the main instrument panel by using adhesive tape P/N YR-9625. Refer to figure 1 or figure 2, according to the aircraft panel configuration, as well as to instructions in the applicable "Aircraft Maintenance Manual" – Chapter – 20-12-01 – Standard Practices – Airframe.
3. Restore the aircraft to normal.
4. Enter the accomplishment of this bulletin in the applicable document.

3.2 TIME FOR ACCOMPLISHMENT

Embraer strongly recommends that this bulletin be accomplished within the next 100 flight hours.

4. APPROVAL

The technical aspects of this bulletin are approved by CTA/IFI – Divisão de Homologação Aeronáutica.

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5. MATERIAL - COST AND AVAILABILITY

Placards P/N 145-46718-001 (2 positions) required for the accomplishment of this bulletin should be requested directly from Embraer, or EAC, or EAI at the addresses below. Adhesive tape P/N YR-9625 or similar should be procured from the operator's inventories or ordered as spare part.

Embraer – Empresa Brasileira de Aeronáutica S/A
Av. Brigadeiro Faria Lima, 2170
12.227-901 São José dos Campos – SP –Brazil.
Ph. (55) 12-345-1000
Fax (55) 12-345-2428

EAC
Embraer Aircraft Corporation
276 S.W. 34th Street
Ft. Lauderdale, Fl 33315 - USA.
Ph. (954)359-8225
Fax (954)359-4711.

EAI
Embraer Aviation International
Aéroport du Bourget
Zone Aviation d'Affaires
93350 Le Bourget - FRANCE
Ph. (33) 148-35-8555
Fax : (33)148-35-9514

6. REFERENCES

A.M.M. 145/() - "Aircraft Maintenance Manual" - Chapter 20-12 - Standard Practices
– Airframe.

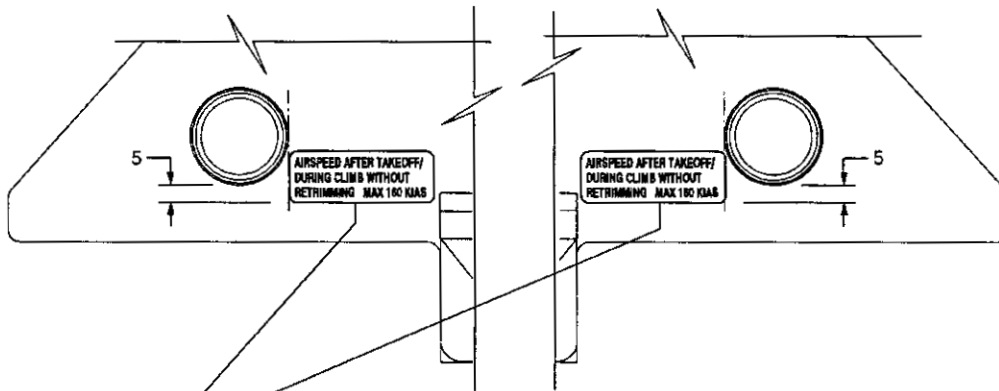
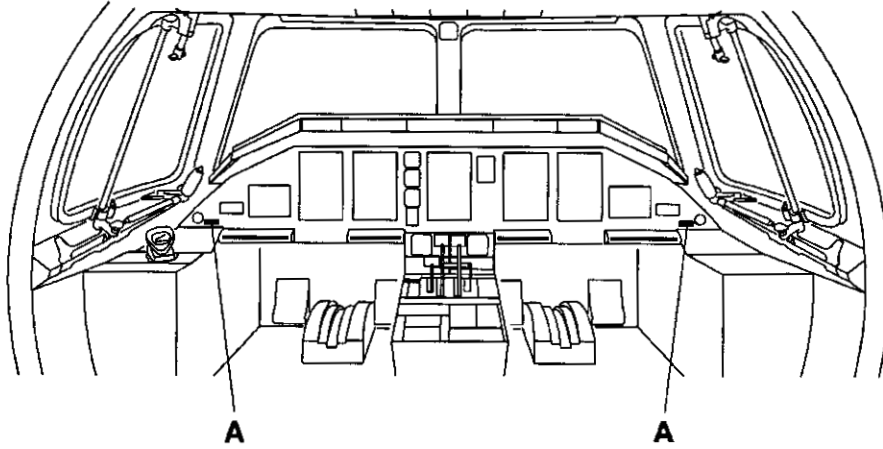
7. AFFECTED PUBLICATIONS

AFM 145/() – Airplane Flight Manual – Flight Controls.
I.P.C. 145/() - "Illustrated Parts Catalog" - Chapter 11-31-00 – Placards and Markings.



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DET. A

**AIRSPPEED AFTER TAKEOFF/
DURING CLIMB WITHOUT
RETRIMMING MAX 160 KIAS**

PLACARD
P/N 145-46718-001
(INSTALL)

-DIMENSIONS IN mm.

SB270256.MCE

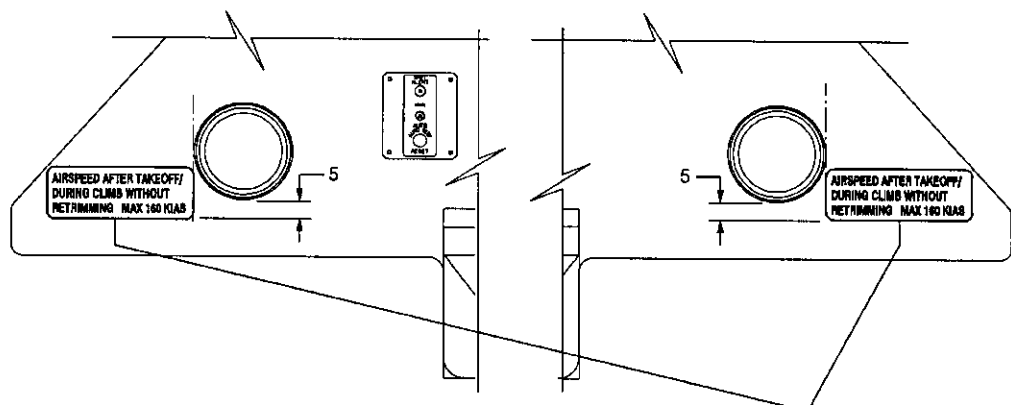
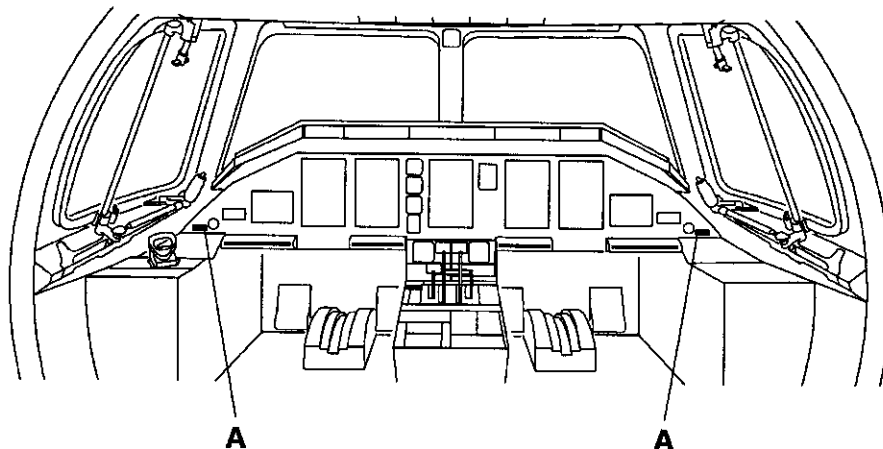
**FIGURE 1: INSTALLATION OF THE PLACARDS
(SHEET 01 OF 01)**





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DET. A

**AIRSPEED AFTER TAKEOFF/
DURING CLIMB WITHOUT
RETRIMMING MAX 160 KIAS**

PLACARD
P/N 145-46718-001
(INSTALL)

-DIMENSIONS IN mm.

SB270257.MCE

FIGURE 2: INSTALLATION OF THE PLACARDS
(SHEET 01 OF 01)



TRANSMITTAL LETTER

1. DESCRIPTION

This sheet transmits Revision 02 to Service Bulletin 145-27-0050.

NOTE: This is a partial reissue of the Bulletin.

2. ADDITIONAL ACTION

Aircraft that have complied with previous issue of this Bulletin do not need additional action.

3. RECORD OF REVISION

Basic issue: 03/Mar/1999.

Revision 01: 09/Apr/1999.

Revision 02: 25/Oct/2000.

4. HIGHLIGHTS

| SUBJECT/PAGE | DESCRIPTION OF CHANGE |
|-----------------------|---|
| 1.A. EFFECTIVITY / 01 | Changed Service Bulletin effectivity and In-production effectivity. |
| 1.B. REASON / 01 | Added reason of Revision 02. |
| 2. MATERIAL / 04 | Changed P/N of the Material Kit. |

**TRANSMITTAL LETTER****5. LIST OF EFFECTIVITY PAGES**

| Page | Date | Rev. | Page | Date | Rev. |
|------|-------------|------|------|-------------|------|
| 01 | 25/Oct/2000 | 02 | 08 | 09/Apr/1999 | 01 |
| 02 | 25/Oct/2000 | 02 | 09 | 09/Apr/1999 | 01 |
| 03 | 25/Oct/2000 | 02 | 10 | 09/Apr/1999 | 01 |
| 04 | 25/Oct/2000 | 02 | 11 | 09/Apr/1999 | 01 |
| 05 | 09/Apr/1999 | 01 | 12 | 09/Apr/1999 | 01 |
| 06 | 09/Apr/1999 | 01 | 13 | 09/Apr/1999 | 01 |
| 07 | 09/Apr/1999 | 01 | 14 | 09/Apr/1999 | 01 |



SERVICE BULLETIN

FLIGHT CONTROLS - MODIFICATION OF THE ELEVATOR FORWARD CONTROL SYSTEM TO COMPLY WITH 18-DEGREE FLAP IMPLEMENTATION

1. PLANNING INFORMATION

A. EFFECTIVITY

Aircraft affected:

| MODEL | S/N |
|-------------|---|
| EMB-145 () | 145004 thru 145094, 145096 thru 145098, 145100 thru 145103, 145105 thru 145111, 145113 thru 145118, 145120, 145121, and 145123 thru 145125. |

In-production effectivity:

EMB-145 () aircraft S/N 145001 thru 145003, 145095, 145099, 145104, 145112, 145119, 145122, 145126 and on have an equivalent modification factory-incorporated.

B. REASON

During the 18-degree Flap development for takeoff, it was observed that this flap configuration requires a greater effort for the pilot to level the aircraft.

So, in order to reduce this effort, the elevator forward torque tube is being modified.

REVISION 01: To clarify the Service Bulletin accomplishment, and to change Service Bulletin effectivity.

REVISION 02: To change the Service Bulletin effectivity.



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C. DESCRIPTION - TIME FOR ACCOMPLISHMENT

(1) DESCRIPTION

The modification described in this part consists of replacing the bellcrank of the LH and RH forward torque tubes of the elevator control system, the control column trim cover, the control column rigging fitting, and the gust lock rod, as well as changing the elevator primary and secondary stops.

For this, it will be necessary to remove the pilot seats, cockpit underfloor access hatch 123BL, cockpit floor panels 221EF and 222FF, the upper and rear fairings of the vertical stabilizer.

NOTE: This bulletin is to be accomplished in conjunction with SB 145-27-0043 - FLIGHT CONTROLS - REPLACEMENT OF THE ELEVATOR REAR SECTORS TO COMPLY WITH 18-DEGREE FLAP IMPLEMENTATION.

(2) TIME FOR ACCOMPLISHMENT

The modification described in this bulletin may be accomplished at any time, at the operator's discretion.

D. APPROVAL

The technical aspects of this bulletin are approved by: CTA/IFI - Divisão de Homologação Aeronáutica.

E. ESTIMATED MANPOWER

- Disassembly: 3.0 man-hours.
- Modification: 5.0 man-hours.
- Assemblage: 4.0 man-hours.
- Test: 2.0 man-hours.

NOTE: Without considering time for release and adjustment of the elevator control cables.



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F. TOOLING - COST AND AVAILABILITY

Not applicable.

G. WEIGHT AND BALANCE

- Change in basic weight: + 0.22 lb (+ 0,10 Kg).
- Change in basic moment: + 247.36 lb.in (+ 2,85 Kg.m).

H. REFERENCES

- A.M.M. 145/() - "Aircraft Maintenance Manual" - Chapters 06-30-00, 06-41-01 and 06-41-02 - Dimensions & Areas.
- A.M.M. 145/() - "Aircraft Maintenance Manual" - Chapters 25-11-01 and 25-27-02 - Equipment & Furnishings.
- A.M.M. 145/() - "Aircraft Maintenance Manual" - Chapters 27-31-00, 27-31-01 and 27-36-03 - Flight Controls.
- SB 145-27-0043 - "FLIGHT CONTROLS - REPLACEMENT OF THE ELEVATOR REAR SECTORS TO COMPLY WITH 18-DEGREE FLAP IMPLEMENTATION".

I. AFFECTED PUBLICATIONS

- A.M.M. 145/() - "Aircraft Maintenance Manual" - Chapter 27-31-00 - Flight Controls.
- I.P.C. 145/() - "Illustrated Parts Catalog" - Chapters 27-00-00, 27-31-00, 27-31-03, and 27-71-00 - Flight Controls.



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2. MATERIAL - COST AND AVAILABILITY

The material required for the accomplishment of this bulletin will be available from EMBRAER 21 weeks after receipt of orders, at the reference price of US\$ 2,298.97, subject to confirmation upon receipt of orders.

When ordering, specify S.B. 145-27-0050.

| NEW P/N | DESCRIPTION | OLD P/N | QTY | DISP |
|---------------|-----------------|--------------------|------|------|
| MS21042L3 | Nut | MS2104L3 | 02 | 7 |
| AN316-4R | Nut | NAS509-4 | 02 | 3 |
| MS14144L4 | Castle nut - A | MS14144L4 | 04 | 7 |
| MS24665-132 | Cotter pin | MS24665-132 | 02 | 7 |
| MS24665-134 | Cotter pin | MS24665-134 | 02 | 7 |
| MS20995C32 | Lockwire | MS20995C32 | A.R. | 6 |
| 145-37363-401 | Bellcrank | 145-28282-401 | 02 | 3 |
| 145-37513-001 | Support | 123-00113-001 | 02 | 3 |
| 145-22141-425 | Rod assy | 145-22141-403/-423 | 01 | 3 |
| NAS428H4A10 | Bolt | NAS428H4A12 | 02 | 3 |
| 120-44245-005 | Trim cover assy | 120-44245-001 | 02 | 3 |

QUANTITY: A. R. = As Required.

DISPOSITION: 3 = Replace part bearing OLD P/N with part bearing NEW P/N.
6 = Apply as required.
7 = Replace with part bearing the same P/N.



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3. ACCOMPLISHMENT INSTRUCTIONS

The steps below outline the general accomplishment instructions.

- A. Make sure that the aircraft is safe for maintenance.
- B. Remove cockpit underfloor access hatch 123BL. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 06-41-01 - Dimensions & Areas.
- C. Remove the pilot seats. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 25-11-01 (TASK 25-11-01-000-801-A) - Equipment & Furnishings.
- D. Remove floor panels 221EF and 222FF. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 06-41-02 - Dimensions & Areas.
- E. Remove upper and rear fairings 321 of the vertical stabilizer. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 06-30-00 - Dimensions & Areas.
- F. If it is necessary to release the control cables, do as follows:
 - (1) Remove the cover of the cargo compartment forward partition as per instructions in the applicable "Aircraft Maintenance Manual" - Chapter 25-27-02 (TASK 25-27-02-000-801-A) - Equipment & Furnishings.
 - (2) Remove floor panel 261BF. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 06-41-02 - Dimensions & Areas.
 - (3) Install the prop block in the LH and RH elevator torque tube tension regulators according to FIGURE 2.
 - (4) Release the tension of the control cables, with the turnbuckles, to allow the prop block installation. Refer to FIGURE 3.
- G. Install the rig pins to the elevator control system to lock it in the neutral position.
- H. Remove the stick shaker. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 27-36-03 (TASK 27-36-03-000-801-A) - Flight Controls.
- I. Replace the LH and RH control column trim covers from P/N 120-44245-001 to 120-44245-005, according to FIGURE 5.



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- J. Remove gust lock rod P/N 145-22141-403 or P/N 145-22141-423 from its bellcrank at the RH torque tube quadrant, by removing the cotterpin, nut, washers, bushing, bonding strap and bolt, according to FIGURE 6.
- K. Disconnect the end of the control column rods from the bellcrank at the LH and RH forward torque tube quadrants, by removing the cotter pin, nut, washers, bushing, bonding strap and bolt according to FIGURE 4.
- L. Replace bellcrank P/N 145-28282-401 from LH and RH forward torque tubes with bellcrank P/N 145-37363-401, according to FIGURE 4.
- M. Install rig pins on the LH and RH forward elevator torque tubes.
- N. Position the digital protractor GSE-070 on the pilot control column base, with its display on the right side (towards the cockpit right sidewall), and set it to zero.
- O. Move the protractor from pilot control column base to the pilot control column vertical surface. Keep the protractor display facing towards the cockpit right sidewall. Refer to FIGURE 7.
- P. Move the pilot control column nose down, until the protractor display shows 76.5 + 0.5 degrees.
- Q. Adjust the length of the control column rod in order to assemble it in this condition, and connect it to the control column.
- R. Repeat steps "M" to "P" for the copilot control column.
- S. Replace the rigging support from LH and RH control columns P/N 123-00113-001 with rigging support P/N 145-37513-001 according to FIGURE 5. Proceed as follows:
 - (a) Release and retain the bolts and washers which are attaching old rigging pin support;
 - (b) Remove and discard the old rigging pin support P/N 123-00113-001;
 - (c) Position new rigging pin support P/N 145-37513-001 on the control column using the bolts and washers. Do not tighten them yet;
 - (d) Adjust the vertical position of the support in order to install the rig pin;
 - (e) Tighten the bolts attaching new rigging pin support to the control column.

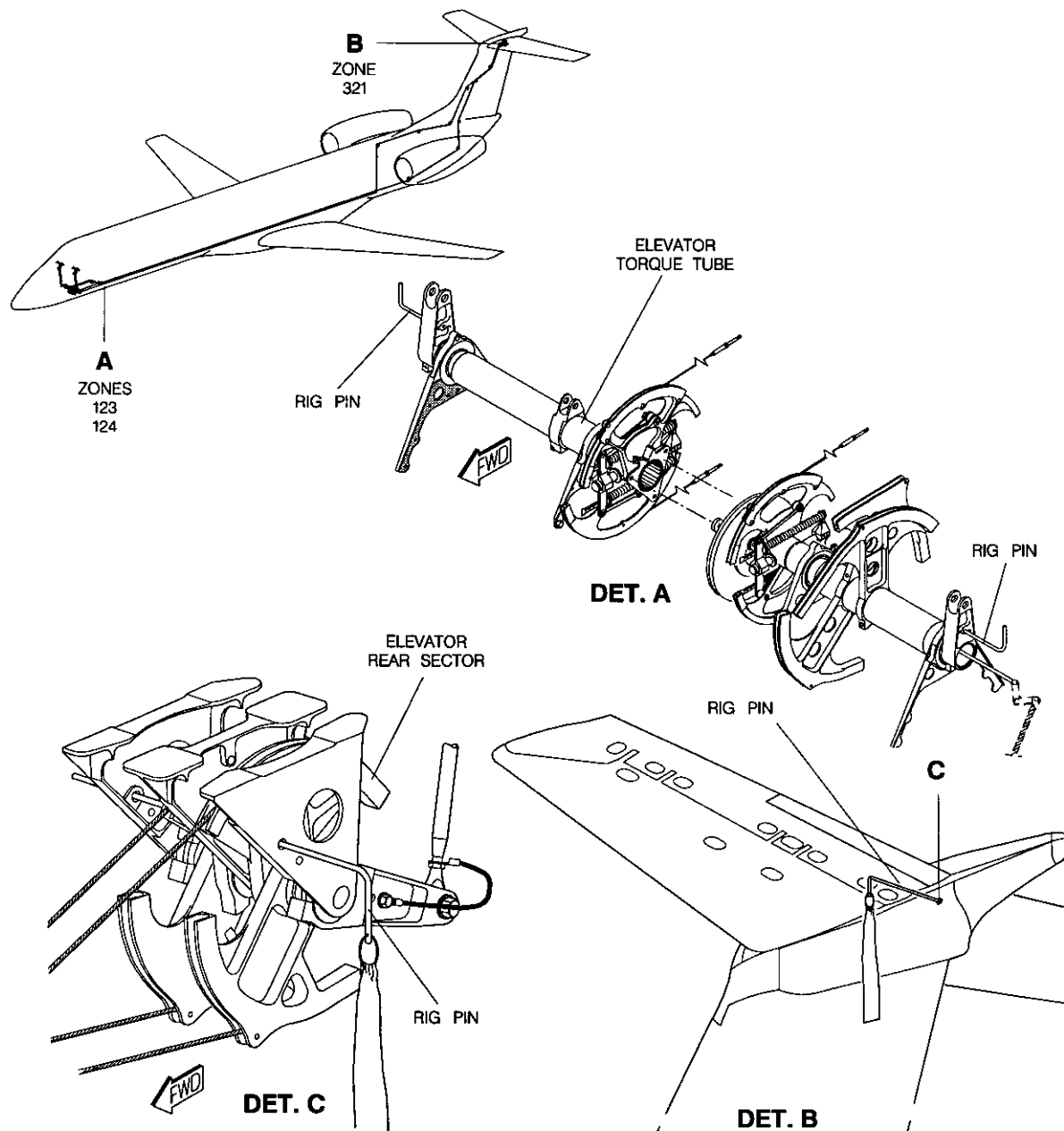


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- T. Replace the RH and LH nose-down backstops from the control column according to FIGURE 5.
- U. Adjust the elevator Primary and Secondary backstops. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 27-31-00 (TASK 27-31-00-700-802-A).- Flight Controls.
- V. Install new gust lock rod P/N 145-22141-425 to its bellcrank at the RH torque tube quadrant, installing the cotterpin, nut, washers, bushing, bonding strap, and bolt, according to FIGURE 6.
- W. Install the stick shaker. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 27-36-03 (TASK 27-36-03-400-801-A) - Flight Controls.
- X. If the prop blocks were installed at LH and RH elevator torque tube tension regulator, remove them. Refer to FIGURE 3.
- Y. If necessary, adjust the elevator control cables. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 27-31-01 (TASK 27-31-01-700-801-A) - Flight Controls.
- Z. Install floor panels 221EF and 222FF. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 06-41-02 - Dimensions & Areas.
- AA. Install the pilot seats. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 25-11-01 (TASK 25-11-01-000-801-A) - Equipment & Furnishings.
- BB. Install cockpit underfloor access hatch 123BL. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 06-41-01 - Dimensions & Areas.
- CC. If the floor panel 261BF was removed, install it. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 06-41-02 - Dimensions & Areas.
- DD. If the cover of the forward cargo compartment partition was removed, install it. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 25-27-02 (TASK 25-27-02-000-801-A) - Equipment & Furnishings.
- EE. Install upper and rear fairings 321 of the vertical stabilizer. Refer to the applicable "Aircraft Maintenance Manual" - Chapter 06-30-00 - Dimensions & Areas.
- FF. Restore the aircraft to normal.
- GG. Enter the accomplishment of this bulletin in the applicable documents.



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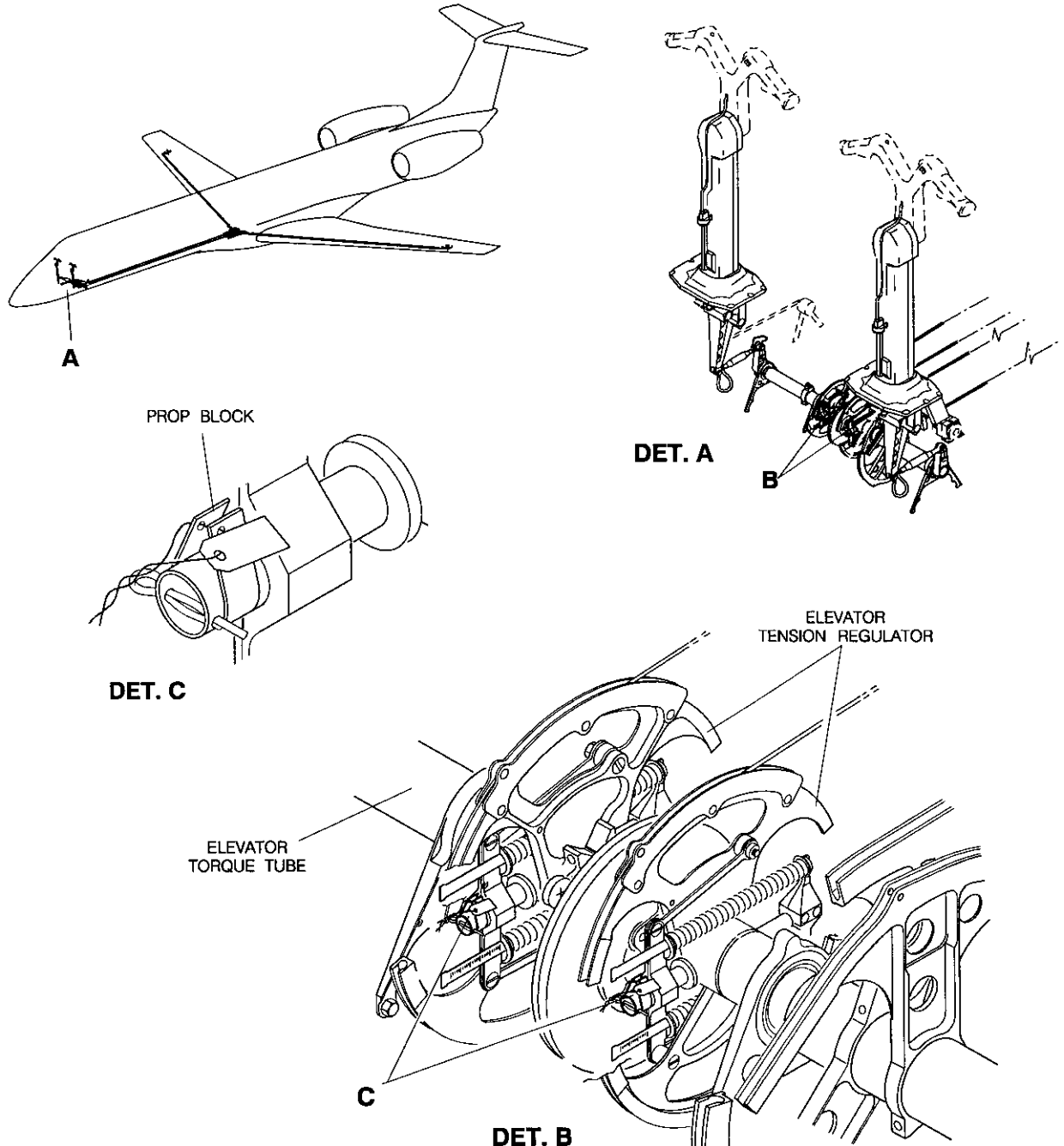


145BS27089.MCE A

FIGURE 1: RIG PIN LOCATIONS
(SHEET 1 OF 1)



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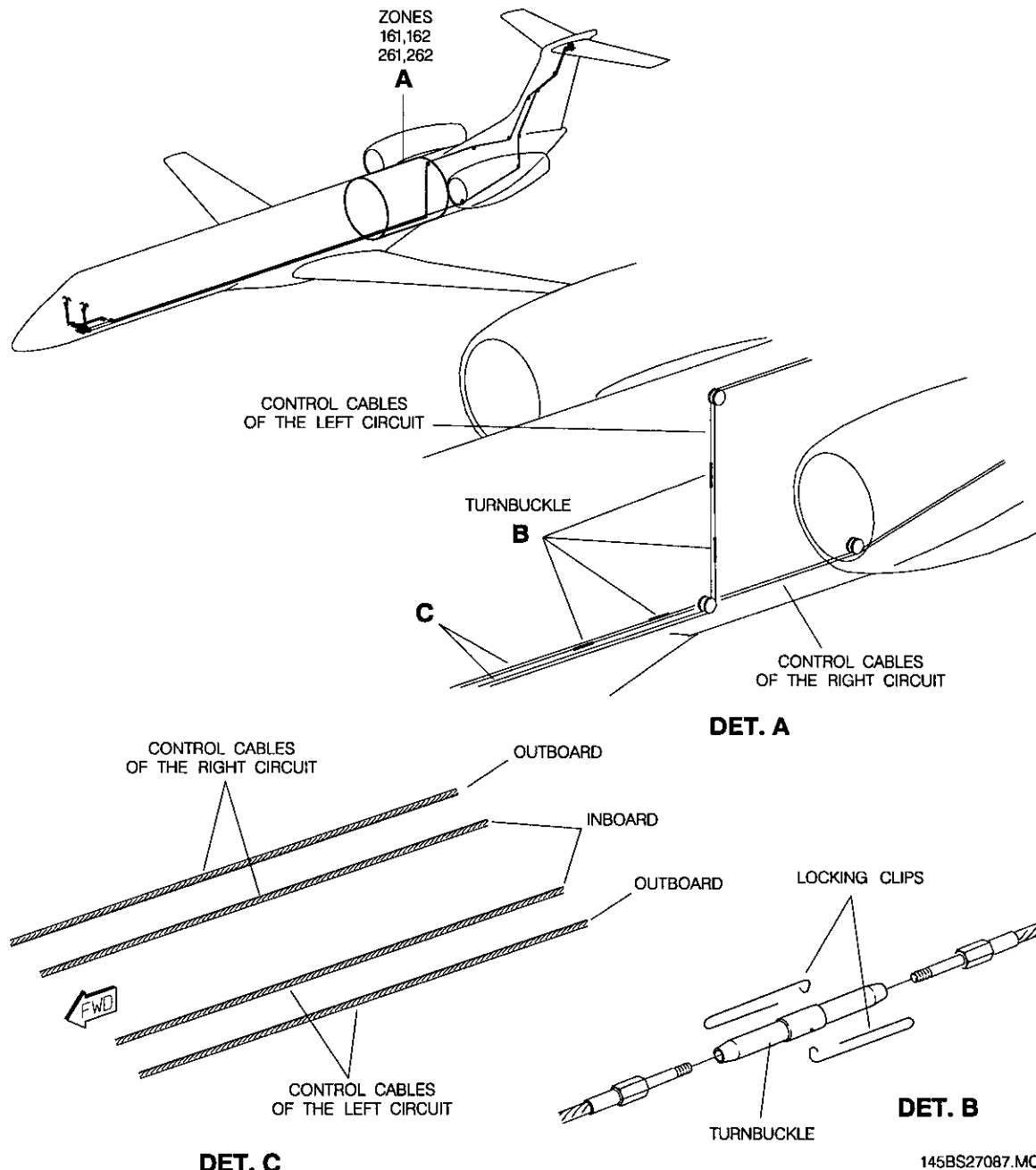


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FIGURE 2: PROP BLOCK INSTALLATION
(SHEET 1 OF 1)



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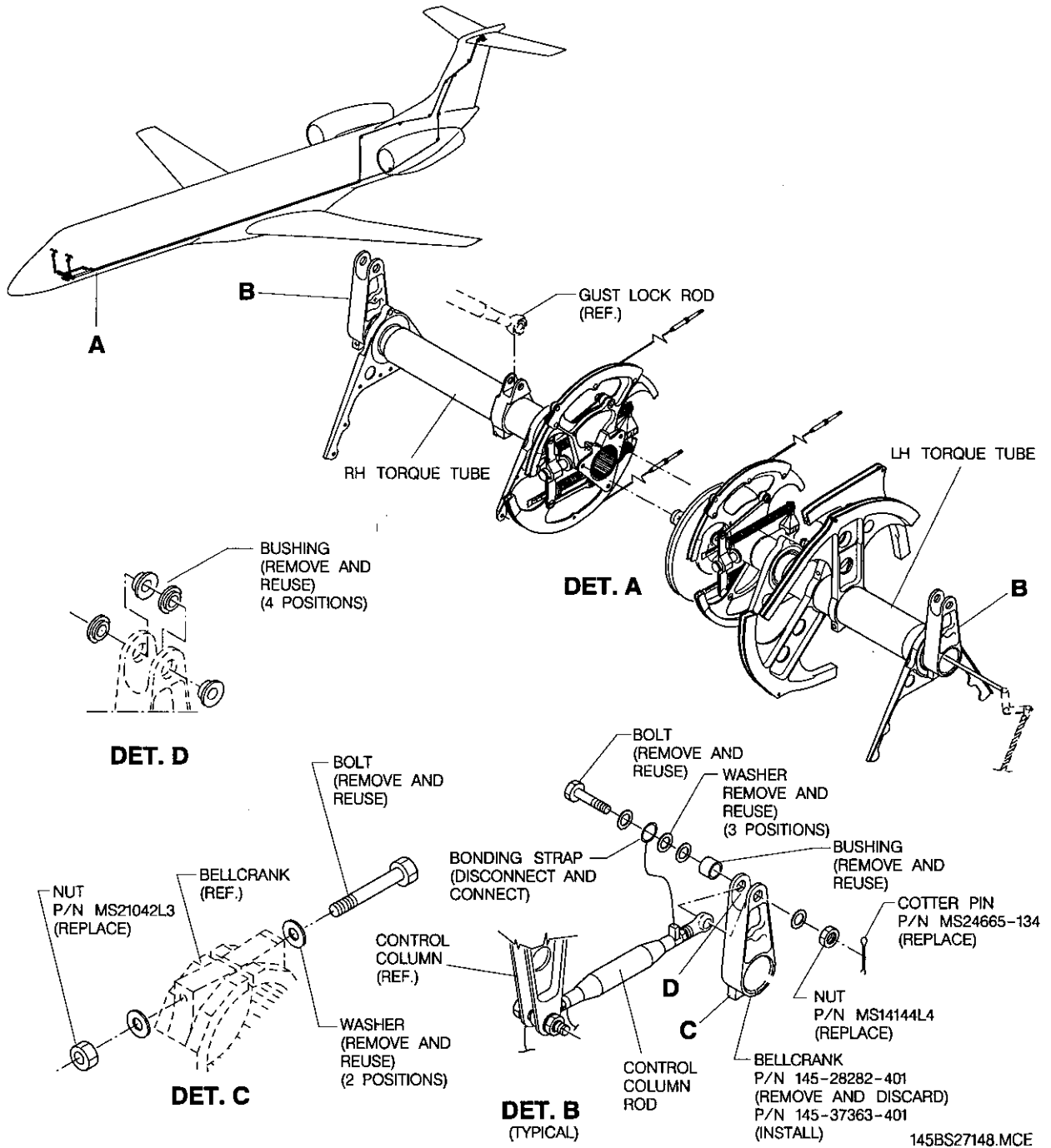


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**FIGURE 3: ELEVATOR CONTROL CABLES ADJUSTMENT
(SHEET 1 OF 1)**



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**FIGURE 4: REPLACEMENT OF THE BELLCRANKS
(SHEET 1 OF 1)**



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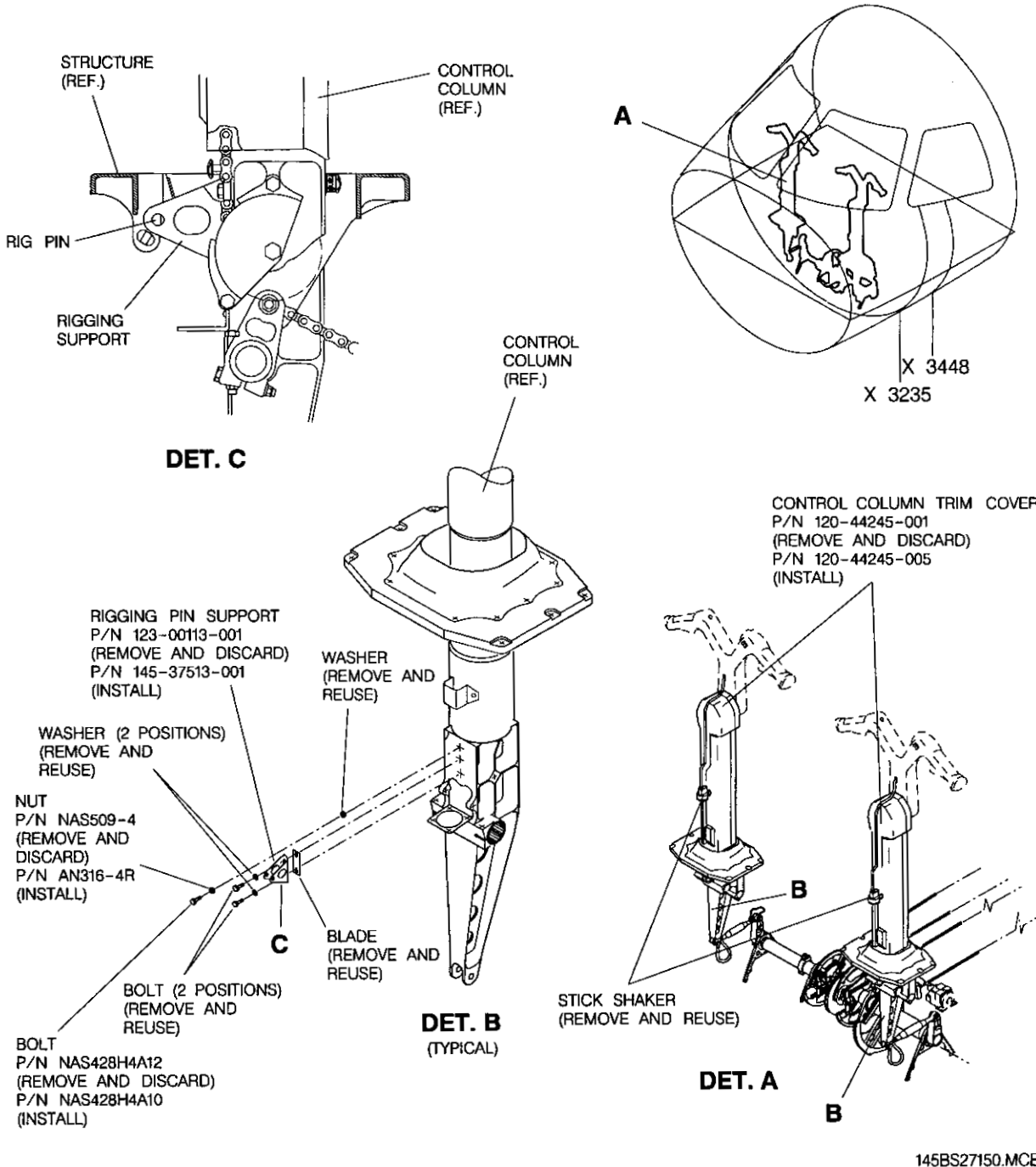
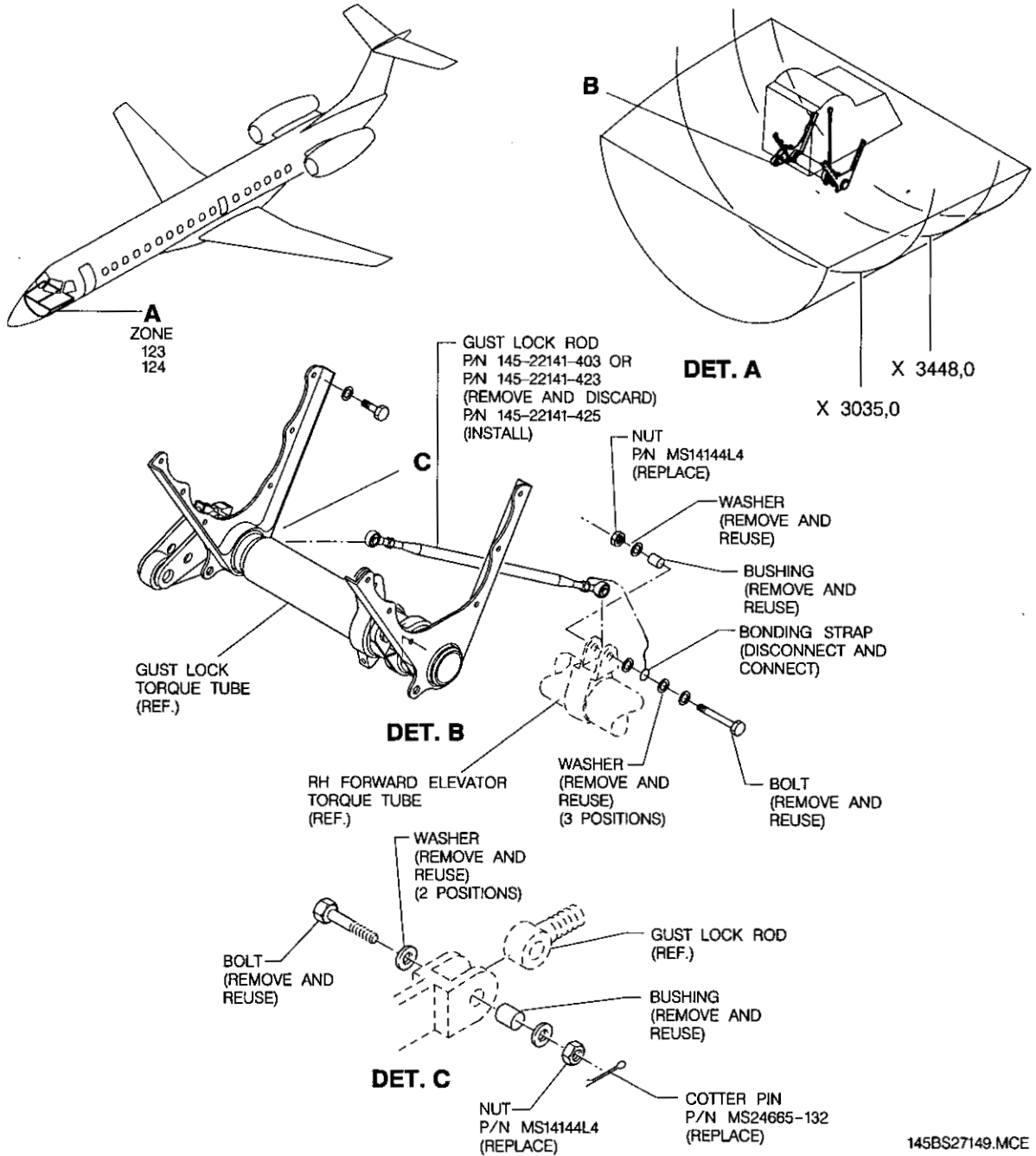


FIGURE 5: CONTROL COLUMN MODIFICATIONS
(SHEET 1 OF 1)



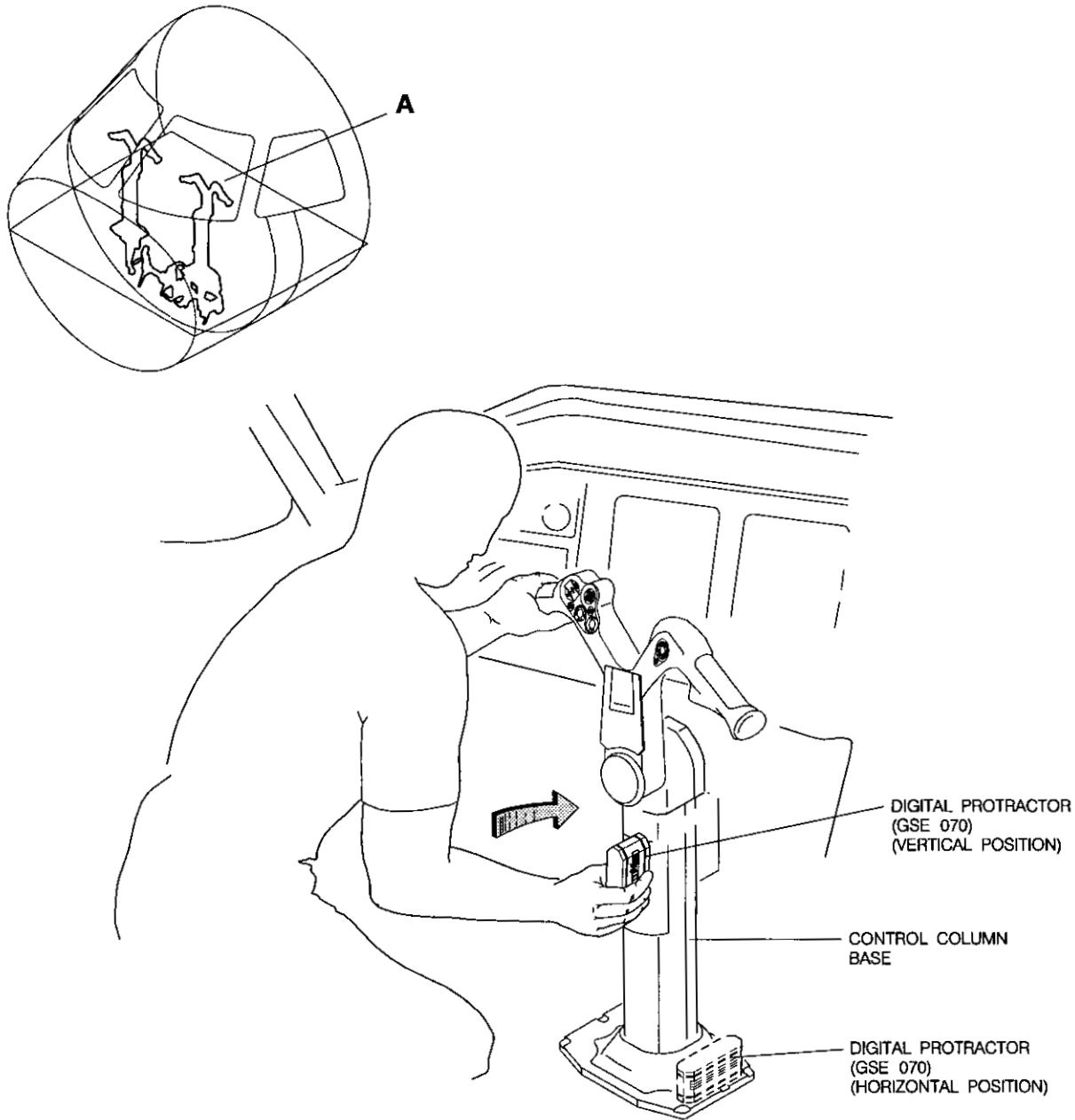
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**FIGURE 6: REPLACEMENT OF THE GUST LOCK ROD
(SHEET 1 OF 1)**



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DET. A

145BS27161.MCE

**FIGURE 7: POSITION OF THE DIGITAL PROTRACTOR
(SHEET 1 OF 1)**