

 **BOEING**
COMPONENT
MAINTENANCE MANUAL

TO: ALL HOLDERS OF RUDDER CONTROL POSITION TRANSMITTER ASSEMBLY COMPONENT
MAINTENANCE MANUAL 27-28-01

REVISION NO. 4 DATED JUL 01/92

HIGHLIGHTS

Pages which have been added or revised are outlined below together with the highlights of the revision. Remove and insert the affected pages as listed and enter Revision No. 1 dated Jul 10/83 on the Record of Revision Sheet.

CHAPTER/SECTION
AND PAGE NO.

DESCRIPTION OF CHANGE

27-28-01

HIGHLIGHTS

01.101

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Sep 01/97

RUDDER CONTROL POSITION TRANSMITTER ASSEMBLY

PART NUMBERS 251T3010-2,-4,-6 THRU -9

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

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TITLE PAGE

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REVISION RECORD

- Retain this record in front of manual. On receipt of revision, insert revised pages in the manual, and enter revision number, date inserted and initial.

REVISION NUMBER	REVISION DATE	DATE FILED	BY	REVISION NUMBER	REVISION DATE	DATE FILED	BY



TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR B11811 PRR B12085	APR 01/90 OCT 01/91

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TR & SB RECORD

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			602	BLANK	
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1	OCT 01/91	01.1	701	JUL 10/83	01.1
2	BLANK		702	JUL 10/83	01.1
REVISION RECORD			SPECIAL TOOLS		
1	JUL 10/83	01	901	JUL 10/83	01
2	BLANK		902	BLANK	
TR & SB RECORD			ILLUSTRATED PARTS LIST		
1	OCT 01/91	01.1	1001	JUL 10/83	01
2	BLANK		*1002	JUL 01/92	01.1
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* [1] Special instructions not required. Use standard industry practices and information contained in 20-30-03.

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INTRODUCTION

The instructions in this manual provide the information necessary to perform maintenance functions including test, fault isolation, and replacement of defective components.

This manual is divided into separate sections:

- | | |
|---|--------------------------------|
| 1. Title Page | 4. List of Effective Pages |
| 2. Record of Revisions | 5. Table of Contents |
| 3. Temporary Revisions &
Service Bulletin Record | 6. Introduction |
| | 7. Procedures and IPL Sections |

Refer to the Table of Contents for the page location of applicable sections. An asterisked flagnote *[] in place of the page number indicates that no special instructions are provided since the function can be performed using standard industry practices.

An explanation of the use of the Illustrated Parts List is provided in the introduction to that section.

All weights and measurements used in the manual are in English units unless otherwise stated. When metric equivalents are given they will be in parentheses following the English units.

Design changes, optional parts, configuration differences and Service Bulletin modifications create alternate part numbers. These are identified in the Illustrated Parts List (IPL) by adding an alphabetical character to the basic item number. The resulting item number is called an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless otherwise indicated.

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RUDDER CONTROL POSITION TRANSMITTER ASSEMBLY

DESCRIPTION AND OPERATION

1. The rudder control position transmitter assembly consists of a transmitter, an aluminum bracket assembly and a nylon crank.
2. The position transmitter assembly converts mechanical input of the rudder position to electrical output to the surface position indicator.
3. Leading Particulars (Approximate)
 - A. Height -- 5 inches
 - B. Width -- 2 inches
 - C. Length -- 5 inches

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DESCRIPTION & OPERATION

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DISASSEMBLY

NOTE: Disassemble this component only as necessary to complete fault isolation, determine the serviceability of parts, perform required repairs, and restore unit to serviceable condition.

1. Disassemble this component using standard industry practices.

NOTE: Refer to manufacturer's instructions for overhaul procedures for transmitter (50, IPL Fig. 1).

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DISASSEMBLY

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CHECK

1. Check all parts for obvious defects in accordance with standard industry practices.
2. Penetrant check per 20-20-02 -- Bracket (45A, IPL Fig. 1), Crank (30A, 30B, 30D).

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REPAIR – GENERAL1. Contents

- A. Repair, refinish and replacement procedures are included in separate repair sections as follows:

<u>P/N</u>	<u>NAME</u>	<u>REPAIR</u>
--	MISC PARTS REFINISH	1-1

2. Standard Practices

- A. Refer to the following standard practices as applicable, for details of procedures in individual repairs.

20-30-02	Stripping of Protective Finishes
20-30-03	General Cleaning Procedures
20-41-01	Decoding Table for Boeing Finish Codes
20-41-02	Application of Chemical and Solvent Resistant Finishes
20-43-01	Chromic Acid Anodizing

3. Materials

NOTE: Equivalent substitutes may be used.

- A. Primer -- BMS 10-11, Type 1 (Ref 20-60-02)

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REPAIR-GENERAL

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MISCELLANEOUS PARTS REFINISH – REPAIR 6-1

1. Repair of parts listed in Fig. 601 consists of restoration of the original finish.

IPL FIG. & ITEM	MATERIAL	FINISH
<u>Fig. 1</u>		
Bracket (45A)	Al alloy	Chromic acid anodize (F-17.02) all over. Apply 1 coat of primer, BMS 10-11, type 1 (F-20.02) all over except in 1.000 inch diameter bore.
Crank (30A,30B,30D)	Al alloy	Chromic acid anodize and apply one coat of primer, except omit primer on internal serrations (F-18.05).

Refinish Details
Figure 601

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REPAIR 1-1

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ASSEMBLY1. Material and Equipment

NOTE: Equivalent substitutes may be used.

- A. Sealant -- BMS 5-95 (Ref 20-60-04)
- B. Voltmeter -- Simpson Model 465
- C. Power Supply -- 26 VAC, 400 Hz crystal oscillator controlled.

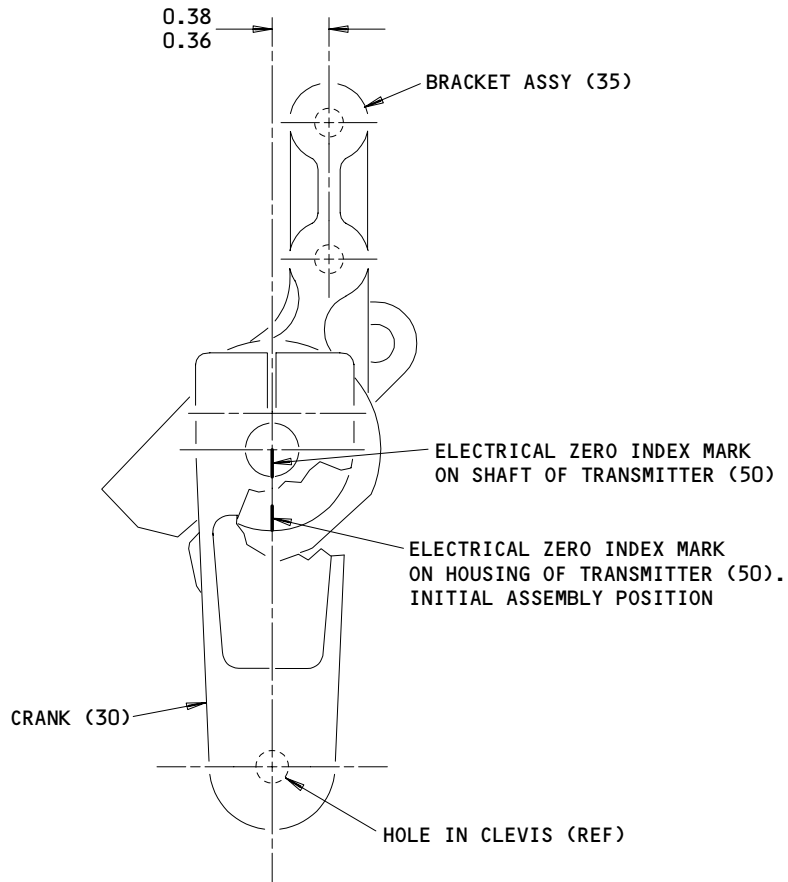
2. Assembly (IPL Fig. 1)

- A. Prepare faying surfaces between transmitter (50) and bracket assembly (35A) per 20-11-03.
- B. Insert transmitter (50) into bracket assembly (35A) until retaining screw will engage groove on transmitter (50). Install screws (5) and washers (10). Do not tighten screws.
- C. Rotate transmitter (50) housing until index mark is oriented to bracket as shown in Fig. 701.
- D. Install crank (30) on shaft of transmitter (50) with index mark on shaft of transmitter pointed towards holes in clevis of crank. Push crank down to line up bolt hole cutout. Install screw (15), washers (20) and nut (25).
- E. Rotate crank (30) to position shown in Fig. 701.
- F. Apply 26 VAC, 400 Hz to pin 1 and 2 of the connector in transmitter (50).
- G. Rotate transmitter (50) housing until voltage across pin 4 and 5 is less than 50 millivolts RMS. Tighten screws (5) to secure transmitter (50) to bracket assembly (35A).
- H. Fillet seal screws (5, 15) and nut (25) with sealant.

3. Use Standard industry practices and information contained in 20-44-02 to store this component.

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ALL DIMENSIONS ARE IN INCHES

Assembly Details
Figure 701

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ASSEMBLY
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SPECIAL TOOLS, FIXTURES AND EQUIPMENT

NOTE: Equivalent substitutes may be used.

1. Voltmeter -- Simpson Model 465
2. Power supply -- 26 VAC, 400 Hz crystal oscillator controlled

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SPECIAL TOOLS

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ILLUSTRATED PARTS LIST

1. This section lists and illustrates replaceable or repairable component parts. The Illustrated Parts Catalog contains a complete explanation of the Boeing part numbering system.
2. Indentures show parts relationships as follows:

Assembly

Detail Parts for Assembly

Subassembly

Attaching Parts for Subassembly

Detail Parts for Subassembly

Detail Installation Parts (Included only if installation parts may be returned to shop as part of assembly)

3. One use code letter (A, B, C, etc.) is assigned in the EFF CODE column for each variation of top assembly. All listed parts are used on all top assemblies except when limitations are shown by use code letter opposite individual part entries.
4. Letter suffixes (alpha-variants) are added to item numbers for optional parts, Service Bulletin modification parts, configuration differences (except left- and right-hand parts), product improvement parts, and parts added between two sequential item numbers. The alpha-variant is not shown on illustrations when appearance and location of all variants of the part are the same.
5. Service Bulletin modifications are shown by the notations PRE SB XXXX and POST SB XXXX.
 - A. When a new top assembly part number is assigned by Service Bulletin, the notations appear at the top assembly level only. The configuration differences at detail part level are then shown by use code letter.
 - B. When the top assembly part number is not changed by the Service Bulletin, the notations appear at the detail part level.

6. Parts Interchangeability

Optional
(OPT)

The parts are optional to and interchangeable with other parts having the same item number.

Supersedes, Superseded By
(SUPSDS, SUPSD BY)

The part supersedes and is not interchangeable with the original part.

Replaces, Replaced By
(REPLS, REPLD BY)

The part replaces and is interchangeable with, or is an alternate to, the original part.

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ILLUSTRATED PARTS LIST

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VENDORS

15653 KAYNAR MICRODOT AEROSPACE FASTENING SYSTEM
800 SOUTH COLLEGE BLVD PO BOX 3001
FULLERTON, CALIFORNIA 92634-3001

33463 NOVATRONICS OF CANADA LTD
677 ERIE STREET
STRATFORD, ONTARIO, CANADA N5A 6VA

51761 ASTRO INSTRUMENT CORP
450 GOLDSBY BLVD
DEERFIELD, FLORIDA 33442-3019

52828 REPUBLIC FASTENER MFG CORP
1300 RANCHO CONEJO BLVD
NEWBURY PARK, CALIFORNIA 91320-1405

71087 BOOTS ACFT NUT DIV TOWNSEND CO SEE TEXTRON INC CHERRY
FASTENER TOWNSEND DIV V11815

72962 ELASTIC STOP NUT A DIV OF HARTFORD INDUSTRIES INC
2330 VAUXHALL ROAD
UNION, NEW JERSEY 07083-5038

80539 SPS TECHNOLOGIES INC AEROSPACE PRODUCTS DIV
2701 SOUTH HARBOR BOULEVARD PO BOX 1259
SANTA ANA, CALIFORNIA 92702-1259

86197 CLIFTON PRECISION LITTON SYSTEM INC
MAPLE AT BROADWAY
CLIFTON HEIGHTS, PENNSYLVANIA 19018

92215 VOI-SHAN DIV OF VSI CORP SUB OF FAIRCHILD INDUSTRIAL INC
8463 HIGUERA STREET
CULVER CITY, CALIFORNIA 90230

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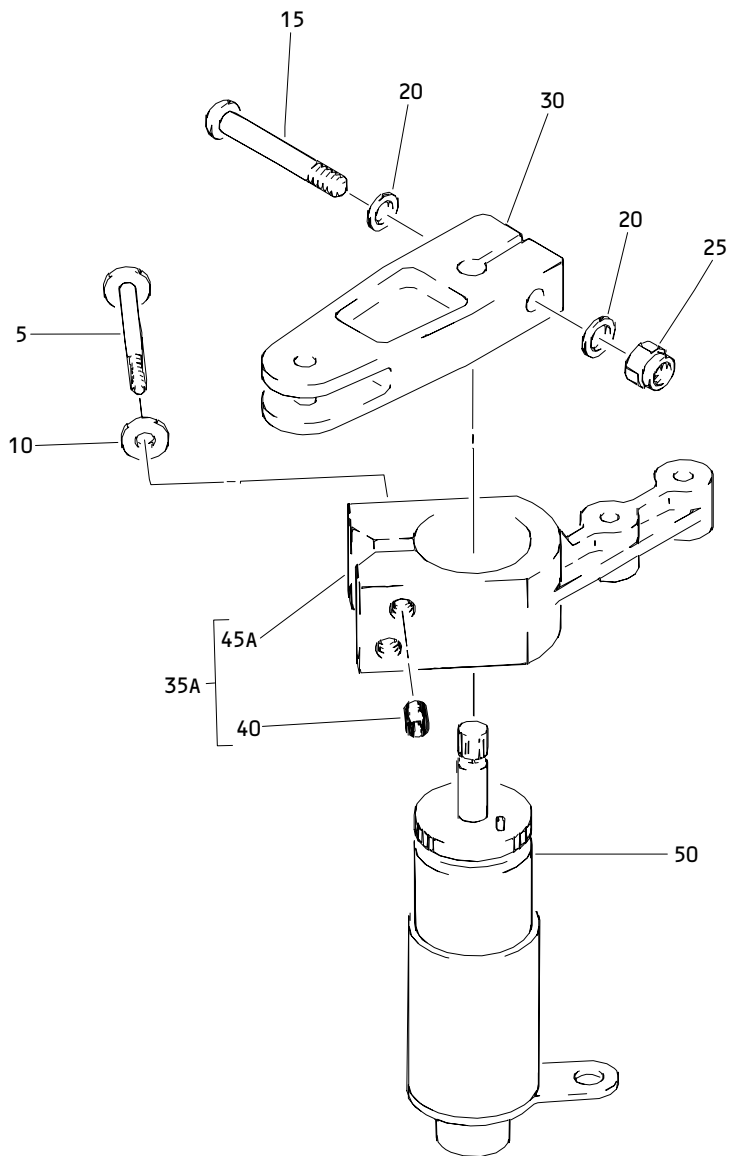
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PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
AN960PD10		1	20	2
BACN10JC3		1	25	1
BRH10A3		1	25	1
H10-3BAC		1	25	1
H505A		1	50G	1
H505B		1	50J	1
H509B		1	50K	1
MS21209F1-15		1	40	2
NAS620-10L		1	10	2
NAS623-3-13		1	15A	1
NAS623-3-14		1	5	2
		1	15E	1
NAS623-3-17		1	15	1
NS202101-02		1	25	1
RMLH9075-3W		1	25	1
S250N104-1		1	50G	1
S250N104-4		1	50J	1
S250N104-6		1	50K	1
T6S1032J		1	25	1
VN303A02		1	25	1
13TX0115A		1	50	1
13TX0615A		1	50C	1
251T3010-2		1	1	RF
251T3010-4		1	1A	RF
251T3010-6		1	1B	RF
251T3010-7		1	1C	RF
251T3010-8		1	1D	RF
251T3010-9		1	1E	RF
60B40042-3		1	50	1
60B40042-7		1	50C	1
		1	50R	1
65B80863-14		1	35A	1
65B80863-15		1	45A	1
69-15812-1		1	30	1
69-15812-2		1	30E	1
69-71007-3		1	30A	1
7977-18-01		1	50N	1
96-02		1	25	1

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Rudder Control Position Transmitter Assembly
Figure 1

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01- -1	251T3010-2		TRANSMITTER ASSY-RUD CONT POSITION	A	RF
-1A	251T3010-4		TRANSMITTER ASSY-RUD CONT POSITION	B	RF
R -1B	251T3010-6		TRANSMITTER ASSY-RUD CONT POSITION	C	RF
R -1C	251T3010-7		TRANSMITTER ASSY-RUD CONT POSITION	D	RF
R -1D	251T3010-8		TRANSMITTER ASSY-RUD CONT POSITION	E	RF
R -1E	251T3010-9		TRANSMITTER ASSY-RUD CONT POSITION	F	RF
5	NAS623-3-14		.SCREW		2
10	NAS620-10L		.WASHER		2
15	NAS623-3-17		.SCREW (USED WITH ITEM 30)	A,B	1
R -15A	NAS623-3-13		.SCREW (USED WITH ITEM 30A)	A,B	1
R -15B	NAS623-3-9		DELETED		
R -15C	NAS623-3-11		DELETED		
R -15D	NAS623-3-13		.SCREW	C,D	1
R -15E	NAS623-3-14		.SCREW (USED WITH ITEM 30D)	E	1
R -15F	NAS623-3-17		.SCREW (USED WITH ITEM 30C)	E	1
R -15G	NAS623-3-17		.SCREW	F	1
20	AN960PD10		.WASHER		2
R 25	H10-3BAC		.NUT- (V15653) (SPEC BACN10JC3) (OPT NS202101-02 (V80539)) (OPT RMLH9075-3W (V72962)) (OPT T6S1032J (V71087)) (OPT VN303A02 (V92215)) (OPT 96-02 (V80539)) (OPT BRH10A3 (V52828))		1
R 30	69-15812-1		.CRANK (OPT ITEM 30A)	A,B	1

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
R 01-30A	69-71007-3		.CRANK (OPT ITEM 30)	A,B	1
R -30B	69-71007-3		.CRANK	C,D	1
R -30C	69-15812-1		.CRANK (OPT ITEM 30D)	E	1
R -30D	69-71007-3		.CRANK (OPT ITEM 30C)	E	1
R -30E	69-15812-2		.CRANK	F	1
35	65B80863-2		DELETED		
R 35A	65B80863-14		.BRACKET ASSY		1
40	MS21209F1-15		..INSERT		2
45	65B80863-4		DELETED		
R 45A	65B80863-15		..BRACKET		1
R 50	13TX0115A		.TRANSMITTER- (V51761) (SPEC 60B40042-3) (OPT 7977-18-01 (V86197)) (OPT ITEM 50C)	A	1
-50A	60B40042-7		DELETED		
-50B	60B40042-7		DELETED		
R -50C	13TX0615A		.TRANSMITTER- (V51761) (SPEC 60B40042-7) (OPT ITEMS 50, 50P)	A	1
R -50D	13TX0615A		.TRANSMITTER- (V51761) (SPEC 60B40042-7) (OPT ITEM 50G)	B	1
-50E	7977-18-01		DELETED		
-50F	9000401-1		DELETED		
R -50G	H505A		.TRANSMITTER- (V33463) (SPEC S250N104-1) (OPT ITEM 50D)	B	1
R -50H	H505A		.TRANSMITTER- (V33463) (SPEC S250N104-1)	D	1
R -50J	H505B		.TRANSMITTER- (V33463) (SPEC S250N104-4) (OPT ITEMS 50K, 50L)	E	1

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
R 01-50K	H509B		.TRANSMITTER- (V33463) (SPEC S250N104-6) (OPT ITEMS 50J, 50L)	E	1
R -50L	13TX0615A		.TRANSMITTER- (V51761) (SPEC 60B40042-7) (OPT ITEMS 50J, 50K)	E	1
R -50M	13TX0115A		.TRANSMITTER- (V51761) (SPEC 60B40042-3) (OPT 7977-18-01 (V86197)) (OPT ITEM 50R)	C,F	1
R -50N	7977-18-01		.TRANSMITTER- (V86197) (SPEC 60B40042-3) (OPT 13TX0115A (V51761)) (OPT ITEM 50R)	C,F	1
R -50P	7977-18-01		.TRANSMITTER- (V86197) (SPEC 60B40042-3) (OPT 13TX0115A (V51761)) (OPT ITEM 50C)	A	1
R -50Q	H509B		.TRANSMITTER- (V33463) (SPEC S250N104-6)	F	1
-50R	13TX0615A		.TRANSMITTER (V51761) (SPEC 60B40042-7) (OPT ITEMS 50M,50N)	C	1

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