COMPONENT
MAINTENANCE MANUAL

HYDRAULIC PRESSURE RELIEF VALVE ASSEMBLY

PART NUMBER 270T2400-1

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

K39615

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.

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COMPONENT
MAINTENANCE MANUAL

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL

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*[1] Special instructions not required. Use standard industry practices.

INTRODUCTION

The instructions in this manual provide the information necessary to perform maintenance functions ranging from simple checks and replacement to complete shop-type repair.

This manual is divided into separate sections:

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

Refer to the Table of Contents for the page location of applicable sections.

The beginning of the REPAIR section includes a list of the separate repairs, a list of applicable standard Boeing practices, and an explanation of the True Position Dimensioning symbols used.

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.

Verification:

HYDRAULIC PRESSURE RELIEF VALVE ASSEMBLY

DESCRIPTION AND OPERATION

1. Description

   A. The hydraulic pressure relief valve assembly consists of a housing, a pressure port, a return port and a pressure relief valve.

2. Operation

   A. The valve assembly is used to relieve excess hydraulic system pressure.

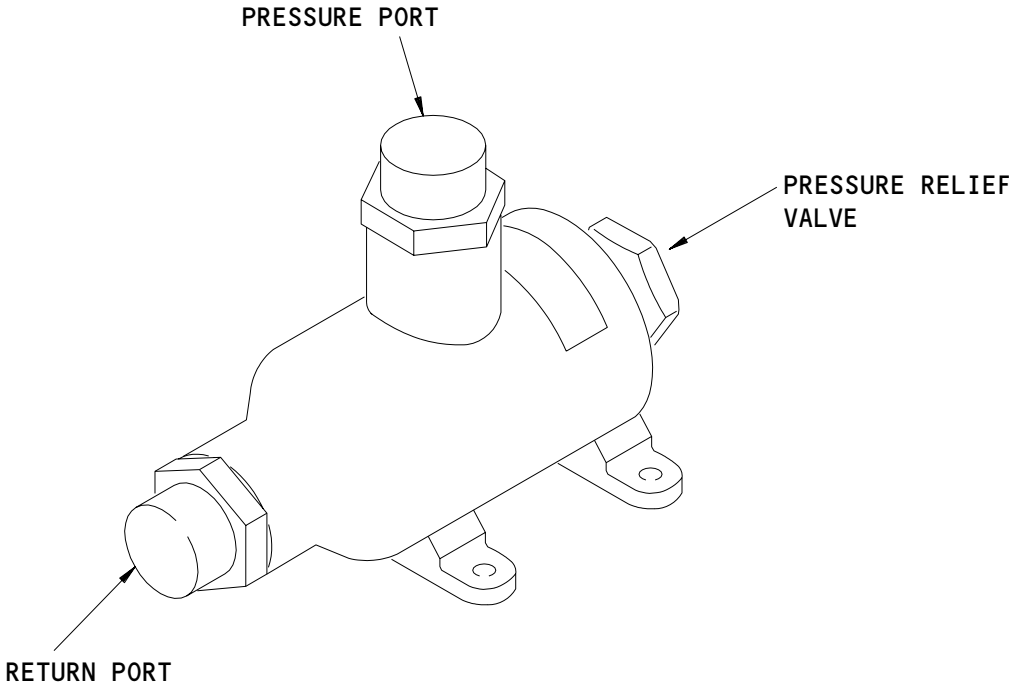
3. Leading Particulars (Approximate)

   A. Length -- 6 inches

   B. Width -- 3 inches

   C. Height -- 3 inches

   D. Weight -- 3.75 pounds (dry)



Hydraulic Pressure Relief Valve Assembly
Figure 1

K47299

TESTING AND FAULT ISOLATION

1. General

   A. This procedure has the data necessary to do a test of the mechanism after an overhaul or for fault isolation. There are two tests:

      (1) Proof pressure test

      (2) Operational test

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for details of the SOPM chapters identified in this procedure.

   C. Refer to IPL Fig. 1 for item numbers.

2. Test Conditions

   A. Maintain the following conditions unless otherwise specified.

      (1) Ambient Conditions

         (a) Temperature - 80 ±20°F

         (b) Pressure - 15 ±2 psia

         (c) Humidity - 10 to 90%

      (2) Hydraulic Fluid

         (a) Test hydraulic fluid must be as shown in BMS 3-11

         (b) Test hydraulic fluid must be continuously filtered by a 15 micron absolute filter

         (c) Test hydraulic fluid temperature - 90 ±30°F

      (3) Measurement Tolerances

         (a) Temperature - ± 4°F

         (b) Pressure - ± 2%

         (c) Humidity (relative) - ± 2%

         (d) Hydraulic flows - ± 2%

3. Testing and Fault Isolation

A. Special Tools and Equipment - See Section 2.A.(3) for measurement tolerances.

NOTE: Equivalent tool/equipment can be used.

(1) Hydraulic test equipment capable of following:

(a) 63 gallons per minute at 4100 psig

(b) 4500 psig when a 15-micron absolute filter is used

(c) Able to measure hydraulic fluid temperature

(2) Ambient pressure gage

(3) Ambient temperature gage

(4) Relative humity gage

(5) Hydraulic flowmeter

(6) G01041 lockwire -- MS20995NC32 (SOPM 20-60-04)

B. References

(1) 29-11-48/301, Disassembly

(2) 29-11-48/701, Assembly

C. Proof Pressure Test

(1) Apply 4500 psig to both the pressure port and return port.

(2) Hold the pressure for 2 minutes.

(3) Examine the valve assembly for evidence of the following:

(a) External leakage

(b) Permanent set

(c) Internal binding

(d) Other damage

D. Operational Test

(1) Connect the pressure port to a pressure switch capable of 63 gpm at 4100 psig.

(2) Connect the return port to a flowmeter (or leave open to atmosphere as appropriate).

(3) Gradually apply pressure to the pressure port until 3400 psig is reached.

(4) Make sure the flow at the return port does not exceed 20 cc per minute.

(5) Increase the pressure until you get a flow at 63 gpm.

(6) Make sure the pressure differential between the pressure and return ports does not exceed psid at any flow up to 63 gpm.

(7) Make sure the flow at the return port shall not exceed 20 cc per minute after maximum wait of 2 minutes.

E. After Testing

(1) Install lockwire from the valve (20) to the housing (40) using the double-twist method as shown in SOPM 20-50-02.

DISASSEMBLY

1. General

   A. This procedure has the data necessary to disassemble the hydraulic pressure relief valve assembly.

   B. Disassemble this component sufficiently to isolate the defects, do the necessary repairs, and put the component back to a serviceable condition.

   C. Refer to the Standard Overhaul Practices Manual (SOPM) for details of the SOPM chapters identified in this procedure.

   D. Refer to IPL Fig. 1 for item numbers.

2. Disassembly

   A. The following parts are recommended for replacement.

      (1) Lockwire

      (2) All packings

   B. Use standard industry procedures to disassemble this component.

CHECK

1. General

   A. This procedure has the data necessary to find defects in the material of the specified parts.

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for details of the SOPM chapters identified in this procedure.

   C. Refer to IPL Fig. 1 for item numbers.

2. Check

   A. References

      (1) SOPM 20-20-02, Penetrant Methods of Inspection

   B. Procedure

      (1) Use standard industry procedures to do a visual check of all the parts for defects. Do the penetrant check if the visual check shows possible damage or if you suspect possible damage on the parts listed below:

      (2) Do a penetrant check (SOPM 20-20-02) of these parts:

         (a) Housing (40)

REPAIR - GENERAL

1. General

A. Instructions for repair, refinish, and replacement of the specified subassembly parts are included in each REPAIR when applicable:

PART NUMBER	NAME	REPAIR
---	REFINISH OF OTHER PARTS	1-1
BAC27THY209	NAMEPLATE	2-1

2. Dimensioning Symbols

A. Standard True Position Dimensioning Symbols used in the applicable repair procedures are shown in Fig. 601.

—	STRAIGHTNESS
▱	FLATNESS
⊥	PERPENDICULARITY (OR SQUARENESS)
//	PARALLELISM
○	ROUNDNESS
⌭	CYLINDRICITY
⌒	PROFILE OF A LINE
⌓	PROFILE OF A SURFACE
◎	CONCENTRICITY
⌯	SYMMETRY
∠	ANGULARITY
↗	RUNOUT
↗↗	TOTAL RUNOUT
⌴	COUNTERBORE OR SPOTFACE
⌵	COUNTERSINK
⌖	THEORETICAL EXACT POSITION OF A FEATURE (TRUE POSITION)
∅	DIAMETER
S ∅	SPHERICAL DIAMETER
R	RADIUS
SR	SPHERICAL RADIUS
()	REFERENCE
BASIC (BSC) OR DIM	A THEORETICALLY EXACT DIMENSION USED TO DESCRIBE SIZE, SHAPE OR LOCATION OF A FEATURE. FROM THIS FEATURE PERMISSIBLE VARIATIONS ARE ESTABLISHED BY TOLERANCES ON OTHER DIMENSIONS OR NOTES.
-A-	DATUM
Ⓜ	MAXIMUM MATERIAL CONDITION (MMC)
Ⓛ	LEAST MATERIAL CONDITION (LMC)
Ⓢ	REGARDLESS OF FEATURE SIZE (RFS)
Ⓟ	PROJECTED TOLERANCE ZONE
FIM	FULL INDICATOR MOVEMENT

EXAMPLES

— 0.002	STRAIGHT WITHIN 0.002
⊥ 0.002 B	PERPENDICULAR TO DATUM B WITHIN 0.002
// 0.002 A	PARALLEL TO DATUM A WITHIN 0.002
○ 0.002	ROUND WITHIN 0.002
⌭ 0.010	CYLINDRICAL SURFACE MUST LIE BETWEEN TWO CONCENTRIC CYLINDERS, ONE OF WHICH HAS A RADIUS 0.010 INCH GREATER THAN THE OTHER
⌒ 0.006 A	EACH LINE ELEMENT OF THE SURFACE AT ANY CROSS SECTION MUST LIE BETWEEN TWO PROFILE BOUNDARIES 0.006 INCH APART RELATIVE TO DATUM A
⌓ 0.020 A	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.020 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE
◎ ∅ 0.0005 C	CONCENTRIC TO DATUM C WITHIN 0.0005 DIAMETER
⌯ 0.010 A	SYMMETRICAL WITH DATUM A WITHIN 0.010
∠ 0.005 A	ANGULAR TOLERANCE 0.005 WITH DATUM A
⌖ ∅ 0.002 Ⓢ B	LOCATED AT TRUE POSITION WITHIN 0.002 DIA RELATIVE TO DATUM B, REGARDLESS OF FEATURE SIZE
⊥ ∅ 0.010 Ⓜ A 0.510 Ⓟ	AXIS IS TOTALLY WITHIN A CYLINDER OF 0.010 INCH DIAMETER, PERPENDICULAR TO DATUM A, AND EXTENDING 0.510 INCH ABOVE DATUM A, MAXIMUM MATERIAL CONDITION
2.000 OR 2.000 BSC	THEORETICALLY EXACT DIMENSION IS 2.000

True Position Dimensioning Symbols
Figure 601

K39624

REFINISH OF OTHER PARTS - REPAIR 1-1

1. General

   A. This procedure has the data necessary to refinish the parts which are not given in the specified repairs.

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for details of the SOPM chapters identified in this procedure.

   C. Refer to IPL Fig. 1 for item numbers.

2. Refinish of Other Parts

   A. General

      (1) Instructions for the repair of the parts listed in Table 601 are for repair of the initial finish.

   B. References

      (1) SOPM 20-30-02, Stripping of Protective Finishes

      (2) SOPM 20-30-03, General Cleaning Procedures

      (3) SOPM 20-41-01, Decoding Table for Boeing Finish Codes

      (4) SOPM 20-41-02, Application of Chemical and Solvent Resistant Finishes

      (5) SOPM 20-60-02, Finishing Materials

   C. Procedure

IPL FIG. & ITEM	MATERIAL	FINISH
IPL Fig. 1		
Housing (40)	Aluminum alloy	Chromic acid anodize (F-17.02).

Refinish Details
Table 601

NAMEPLATE - REPAIR 2-1

BAC27THY209

1. General

   A. This procedure has the data necessary to replace the nameplate (45).

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for details of the SOPM chapters identified in this procedure.

   C. Refer to IPL Fig. 1 for item numbers.

2. Nameplate Replacement

   A. Consumable Materials

      NOTE: Equivalent material can be used.

      (1) A00359 Sealant -- BMS 5-95 (SOPM 20-60-04)

      (2) A00629 Sealant -- BMS 5-92 (SOPM 20-60-04)

      (3) C00406 Coating -- Bostik 683-3-2

   B. References

      (1) SOPM 20-41-02, Application of Chemical-Resistant Finishes

      (2) SOPM 20-50-10, Application of Identification Markings

   C. Procedure

      (1) Remove existing nameplate (45).

      (2) Steel-stamp the dash number and serial number on the replacement nameplate.

      (3) Apply one coat of primer BMS 10-11, Type 1 as shown in SOPM 20-41-02 at the locations where the nameplate will sit.

      (4) After the primer is dry, install the nameplate with wet sealant BMS 5-95 or BMS 5-92.

      (5) After the sealant is dry, brush the edges of the nameplate with Bostik coating 683-3-2.

ASSEMBLY

1. General

   A. This procedure has the data necessary to assemble the valve assembly.

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for details of the SOPM chapters identified in this procedure.

   C. Refer to IPL Fig. 1 for item numbers.

2. Assembly

   A. Consumable Materials

      NOTE: Equivalent material can be used.

      (1) D00199 Fluid -- Hydraulic, BMS 3-11 (SOPM 20-60-03)

      (2) D00366 Lube -- MCS352 Skydrol Assembly Lube (SOPM 20-60-03)

      (3) C00432 Primer -- BMS 10-11, Type 1 (SOPM 20-60-02)

      (4) G01041 Lockwire -- MS20995NC32 (SOPM 20-60-04)

   B. References

      (1) SOPM 20-50-02, Installation Safetying Devices

      (2) SOPM 20-50-06, Installation of O-Rings and Teflon Seals

      (3) SOPM 20-60-02, Finishing Materials

      (4) SOPM 20-60-03, Lubricants

      (5) SOPM 20-60-04, Miscellaneous Materials

   C. Procedure

      (1) Use standard industry procedures and the steps shown below to assemble this component.

      (2) Apply a light layer of Skydrol assembly lube MCS352 to packing and install as shown in SOPM 20-50-06.

(3) Apply a light layer of Skydrol assembly lube MCS352 to internal threads of valve (2O) at assembly.

(4) Torque the valve (2O) to 12O-125 pound-inches.

(5) Test unit as shown in Testing and Trouble Shooting.

(6) Install lockwire from valve (2O) to housing (4O) using the double-twist method as shown in SOPM 2O-5O-O2.

3. Storage

A. Flush the valve assembly with hydraulic fluid BMS 3-11.

B. Fill the valve assembly with hydraulic fluid BMS 3-11 to lubricate all seals.

(1) Allow some air inside valve for thermal expansion.

C. Install plugs BACP2OBA to both parts.

D. Make sure all plastic enclosures are resistant to hydraulic fluid BMS 3-11.

FITS AND CLEARANCES

1. Torque Values

A. For valve (20), installation torque is 120-125 pound-inches.

SPECIAL TOOLS

NOTE: Equivalent substitutes can be used.

1. Special Tools and Equipment

A. Special Tools and Equipment - See Section 2.A.(3) for measurement tolerances.

NOTE: Equivalent tool/equipment can be used.

(1) Hydraulic test equipment capable of following:

(a) 63 gallons per minute at 4100 psig

(b) 4500 psig when a 15-micron absolute filter is used

(c) Able to measure hydraulic fluid temperature

(2) Ambient pressure gage

(3) Ambient temperature gage

(4) Relative humity gage

(5) Hydraulic flowmeter

(6) G01041 lockwire -- MS20995NC32 (SOPM 20-60-04)

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 is the same.

5. Service Bulletin modifications are shown by the notations PRE SB XXXX and POST SB XXXX.

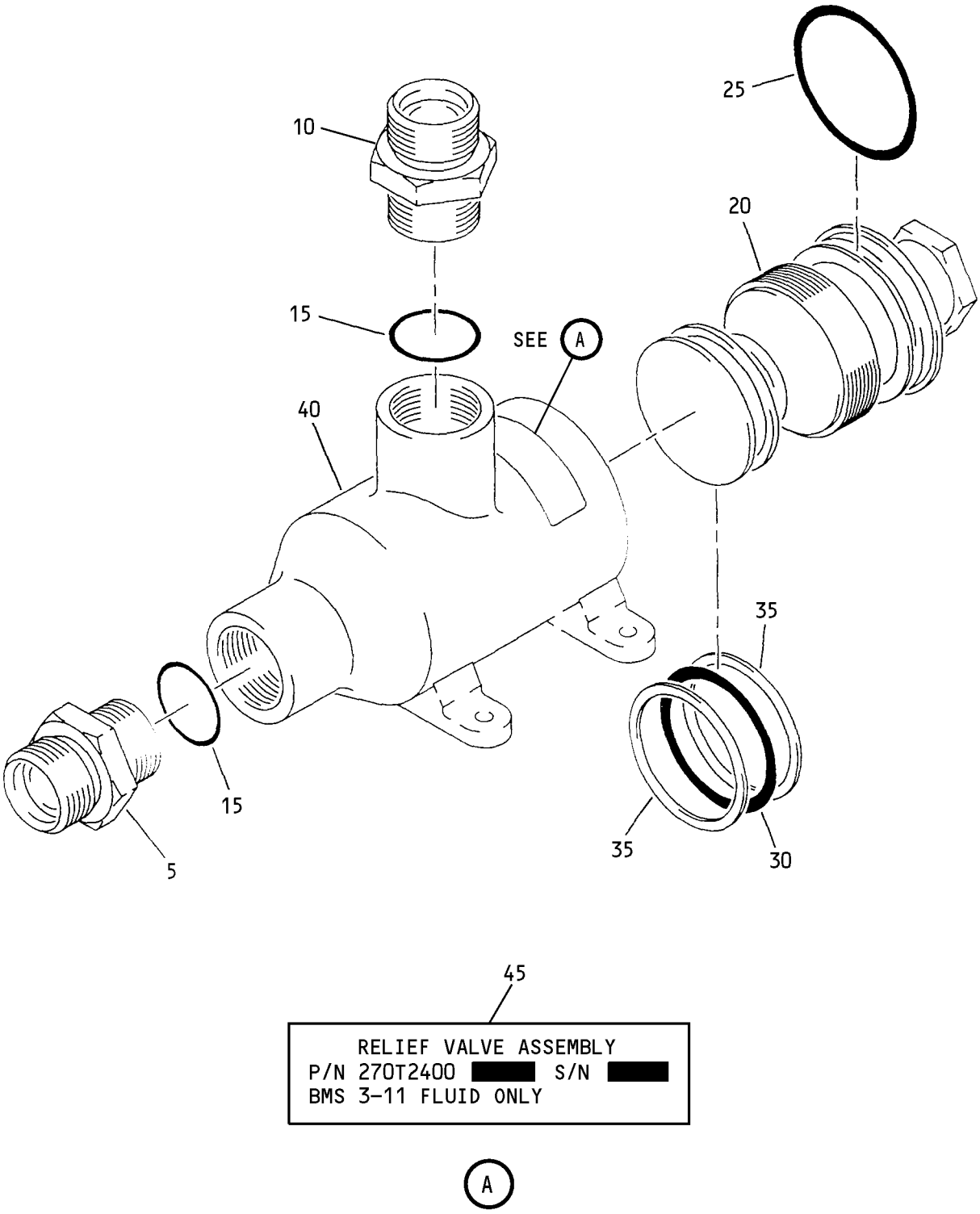
    A. When a new top assembly part number is assigned by Service Bulletin, the notations appear at the top assembly level only. The configuration differences at detail part level are then shown by use code letter.

    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.

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
BAC27THY209		1	45	1
MS21902-16T		1	5	1
MS21902D16		1	10	1
MS27595-225		1	35	2
NAS1611-225		1	30	1
NAS1611-228		1	25	1
NAS1612-16		1	15	2
S271N202-4		1	20	1
270T2400-1		1	1A	RF
271N5066-3		1	40	1



Hydraulic Pressure Relief Valve Assembly
Figure 1

K39641

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1A	27OT2400-1		VALVE ASSY-HYDR PRESSURE RELIEF		RF
5	MS21902-16T		.UNION		1
10	MS21902D16		.UNION		1
15	NAS1612-16		.PACKING		2
20	S271N202-4		.VALVE		1
25	NAS1611-228		.PACKING		1
30	NAS1611-225		.PACKING		1
35	MS27595-225		.RETAINER		2
40	271N5066-3		.HOUSING		1
45	BAC27THY209		.NAMEPLATE		1

- Item Not Illustrated