

DMWR 55-1650-150

Rescinded

DEPOT MAINTENANCE

WORK REQUIREMENT

for

IRREVERSIBLE HYDRAULIC PRESSURIZED VALVE

| | |
|-------------|-------------------|
| P/N 42550 | NSN 1650-833-1600 |
| P/N 42550-1 | NSN 1650-992-0940 |
| P/N 42550-2 | NSN 1650-911-7349 |
| P/N 42550-3 | NSN 1650-130-5964 |

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US Army Aviation
Systems Command
15 October 1966

CHANGE 5 - 15 JANUARY 1988



WARNING**PRECAUTIONARY DATA**

Personnel performing operations, procedures, and practices which are included or implied in this work requirement shall observe the following warnings. Disregard of these warnings and precautionary information can cause serious injury, death, or destruction of material.

CLEANING SOLVENTS

Cleaning solvents may be toxic. Use in well ventilated areas. Avoid prolonged inhalation of fumes or direct contact with skin. Do not use solvents near open flame or in areas where very high temperatures prevail. Solvent flush paint must not be less than 100°F.

COMPRESSED AIR

Do not direct compressed air near or directly against skin. Do not use air under high pressure, or from a source not having a moisture-trap when drying parts. Do not roll bearings with compressed air. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi and only then with an effective chip guarding and personnel protection equipment.

TOXIC POISONS

Lubricating oil contains additives which are poisonous and are readily absorbed through the skin. Avoid prolonged contact with the skin.

TRANSMISSION TEST STAND OPERATION

Test stand shall be operated by authorized personnel only.

NOISE

Operation and maintenance personnel shall wear ear protection devices when working near or around an operating transmission test stand.

WARNING

An operating procedure, practice, etc., which, if not correctly followed, could result in personnel injury or loss of life.

CAUTION

An operating procedure, practice, etc., which, if not strictly observed, could result in damage to or destruction of equipment.

NOTE

An operating procedure, condition etc., which it is essential to highlight.



LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with regulations.

NOTE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

| | | | |
|----------------|-----------------|----------------|------------------|
| Original | 15 October 1966 | Change 3 | 15 December 1973 |
| Change 1 | 15 June 1969 | Change 4 | 31 December 1985 |
| Change 2 | 15 August 1972 | Change 5 | 15 January 1988 |

Total number of pages in this manual is 76 consisting of the following:

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CHAPTER 2

GENERAL ADMINISTRATIVE REQUIREMENTS

2-1. HANDLING AND INVENTORY. The contractor shall exercise the greatest possible care to prevent damage and deterioration to Government equipment while undergoing movement, unpacking, test, and repair operations, and to prevent damage after Government acceptance. Equipment shall be stored in a controlled location approved by the Contracting Officer or his designated representative.

2-2. COMPLIANCE WITH TECHNICAL DIRECTIVES. When the Work Requirement incorporates other Army directives which in themselves require a form entry to indicate compliance, such directives are identified by title, number, and date and require applicable component form entry upon compliance. Further, when such directives are incorporated into the Work Requirement, each specific paragraph pertaining thereto is identified as being part of such directives.

2-3. QUALITY CONTROL PERSONNEL. Quality control personnel shall insure complete compliance with Quality Program and/or Inspection System Requirements specified in the contract and this Work Requirement. Any deviations from the established requirements shall be approved by the Contracting Officer or his designated representative.

2-4. DEVIATIONS AND EXCEPTIONS. When any work segment as set forth in this Depot Maintenance Work Requirement cannot be accomplished, or can be accomplished only in a manner other than specified, the contractor shall submit a Request for Action Form AMSAV-M 1379 through the Contracting Officer to AMSAV-MC with a copy to AMSAV-MD. If the problem is publications related or requires a change to a publication, a DA Form 2028 shall also accompany the request for action. The request for action shall state the problems, the reason for urgencies, and give the following specifics:

- a. Serial number (if applicable), part numbers and NSN of affected equipment.
- b. Work elements which will not be completed or which will not be accomplished exactly as specified herein.
- c. Reason for nonaccomplishment or deviation.
- d. Action taken to correct condition causing nonaccomplishment or need for deviation.
- e. Data relative to availability of parts required, if applicable.
- f. Estimated man-hours.
- g. Instructions and inspection required to maintain the integrity of the end item because of such omission or deviation.



CHAPTER 3
PRESHOP ANALYSIS

3-1. PURPOSE. The purpose of preshop analysis is to determine, prior to the beginning of depot maintenance and at the highest assembly level possible, the extent of repair, modification, or part replacement required to return the valve assemblies, Part Nos. 42550, 42550-1, 42550-2, and 42550-3, to a completely serviceable condition, as specified herein, and to prepare estimates of work and parts required for performing the depot maintenance. If inspection at the highest level of assembly is precluded by missing, damaged, or diagnosed defective assemblies, consideration will be given to techniques that would allow continued inspection at that level. If this is not possible, inspection will proceed at the next lower level. A preshop analysis checklist will be used to record the results of the analysis and any required maintenance. All safety of flight and mandatory inspections and/or modifications will be accomplished.

3-2. INSPECTION OF FORMS. The contractor will physically check all tags and forms attached to the valve to determine:

a. Reason for removal from service. Record reason and any other helpful data on the preshop analysis checklist, table 3-1.

b. Open items of work on delayed discrepancies, including any Time Compliance TMs, TBs, or MWOs not accomplished.

3-3. CLEANING AND CORROSION TREATMENT. a. Detail methods to be used for cleaning and corrosion treatment of the valve have been integrated, where applicable, in this Work Requirement.

b. Immediately after disassembled parts are cleaned and are not immediately processed, utmost care shall be exercised to prevent damage or deterioration, due to corrosion or decay. If inspection is delayed, apply temporary preservative (MIL-C-16173 Class II).

3-4. PRESHOP ANALYSIS. The following guidelines will be used to determine the repair, modification, and replacements required to restore the valve to a completely serviceable condition:

a. All valves shall be modified as specified in table 3-2 unless otherwise specified within the contract.

b. Valves removed from stock for modification only shall be disassembled by the contractor only to the extent required to accomplish the modification(s).

c. When the valve was removed from service for external leakage or malfunction, complete disassembly and overhaul are required. (Refer to paragraph 4-10).

d. If valve body is cracked, broken, warped, or severely corroded, complete disassembly is required. Specifically if damage and corrosion exceed 25 percent of surface or 0.025 inch diameter or 0.040 inch deep, complete disassembly is required. If valve meets these parameters, repair per paragraph 4-16 rather than by complete disassembly.

e. If complete disassembly is not required per step c or d, test in accordance with paragraph 4-25. If valve fails test parameters, disassemble the valve only as required in order to perform the evaluations of the components or sub-assemblies in the preshop analysis checklist, table 3-1, to determine the repair, modification, and replacements required to restore the valve to a completely serviceable condition as specified in the Work Requirement. The wear and damage limits cited in the preshop analysis checklist, table 3-1, should be observed for all surfaces. Overprocessing will be restricted by segregation of parts that are within the limits of table 3-1.

f. The results of preshop analysis will be recorded on a copy of the preshop analysis checklist, table 3-1.

Table 3-1. Preshop Analysis Checklist

| INSPECTION POINT | CONDITION | ACTION | REMARKS | DONE |
|--------------------------|---|------------------------|---------|------|
| Valve Assembly | Reason for removal from service | Record: | | |
| | Modification only | Paragraph 3-4b | | |
| | External leakage, malfunction | Paragraph 3-4c | | |
| | Fails paragraph 4-25 test parameters | Paragraph 3-4e | | |
| Valve Body | Cracks, corrosion | Paragraph 3-4d | | |
| | Mount holes are scored | Visual, paragraph 4-10 | | |
| Screws | Thread or head damage | Visual, paragraph 4-10 | | |
| Data Plate | Fails to identify part number and serial number | Visual, replace | | |
| Preformed Packing, Seals | Disturbed | Visual, replace | | |
| Passageways and Orifices | Contamination | Table 4-2, replace | | |
| Accumulator Bore | Wear | Table 4-2 | | |

Table 3-2. Mandatory Modifications

| Modification Description | | Applicability | | | |
|----------------------------------|--------------------------------|------------------------|---------|---------|---------|
| | | Valve Assembly Applied | | | |
| Convert To | Requirements | 42550 | 42550-1 | 42550-2 | 42550-3 |
| 1. Valve Assembly P/N 42550-3 | See Section VI of Chapter 4 | X | X | X | |

CHAPTER 4
DETAIL WORK REQUIREMENTS
Section I General Requirements

4-1. GENERAL. This chapter contains specific overhaul instructions, including dismantling, disassembly, cleaning, repair and replacement, modification criteria, reassembly and testing of assemblies, final reassembly, run in and test procedures.

4-2. GENERAL DISASSEMBLY PROCEDURE. a. Separate and index all parts for reassembly in proper positions.

b. Record and tag parts that are defective with reason for rejection. (Exclude parts which are normally replaced at every overhaul such as gaskets, preformed packings, etc.).

4-3. GENERAL REPAIR, REPLACEMENT, AND/OR MODIFICATION CRITERIA. a. Repair or replace as applicable any parts which are not within tolerances or show evidence of failure by measurement or special inspection methods specified herein.

b. Replace all preformed packing seals, packing retainers and retaining rings.

c. When specific tolerances and/or repairs are not specified herein, replace all parts having scratches, or burrs which could cause binding.

4-4. GENERAL REASSEMBLY PROCEDURE. General precautions shall be adhered to during reassembly to insure that all internal parts have been properly installed and necessary tolerance checks performed.

4-5. LUBRICATION. Lubricate parts during reassembly as required using lubricants specified in this Work Requirement.

4-6. STAMPING AND/OR REPLACEMENT OF DATA PLATE. When applicable, to provide a convenient record of overhaul or modification that will at all times accompany equipment, stamping shall be done as follows:

a. The stamping of equipment data plates shall include initials of the facility performing the overhaul or modification, date of overhaul or modifications, and part number. The data shall be stamped on the data plate using letters and figures 1/8 inch high, placed in the area adjacent to the manufacturer's data. In the event overhaul or modification has exceeded stamping spaces on the data plate, the plate shall be replaced and all pertinent data will be transferred to the new plate.

CAUTION: Stamping directly on the surface, or installed data plate of any assembly or item of equipment is prohibited.

4-7. ILLUSTRATED PARTS BREAKDOWN. This Illustrated Parts Breakdown is composed of a group assembly parts list and illustrations (figure 4-1) in exploded form to provide complete identification for all parts comprising the valve assemblies, Part Nos 42550, 42550-1, 42550-2 and 42550-3. The group assembly breakdown lists all parts in their sequence of disassembly and parts are indexed and shown on the illustration.

4-8. Usable on Code. Part number applicability to valve assemblies is indicated by a letter symbol in the USABLE ON CODE column. When no symbol is shown, the part is used on all valve assemblies listed in the corresponding parts list.

| CODE | PART NUMBER |
|------|-------------|
| A | 42550 |
| B | 42550-1 |
| C | 42550-2 |
| D | 42550-3 |

4-9. Vendors Code. The following vendors' code, with the vendors' name and address, is used in the DESCRIPTION column to indicate vendors' parts.

| CODE | NAME AND ADDRESS |
|-------|--|
| 60995 | Tubing Seal Cap, Inc. San Gabriel, California |
| 81873 | Hydraulic Research and Mfg. Co. Burbank, California |

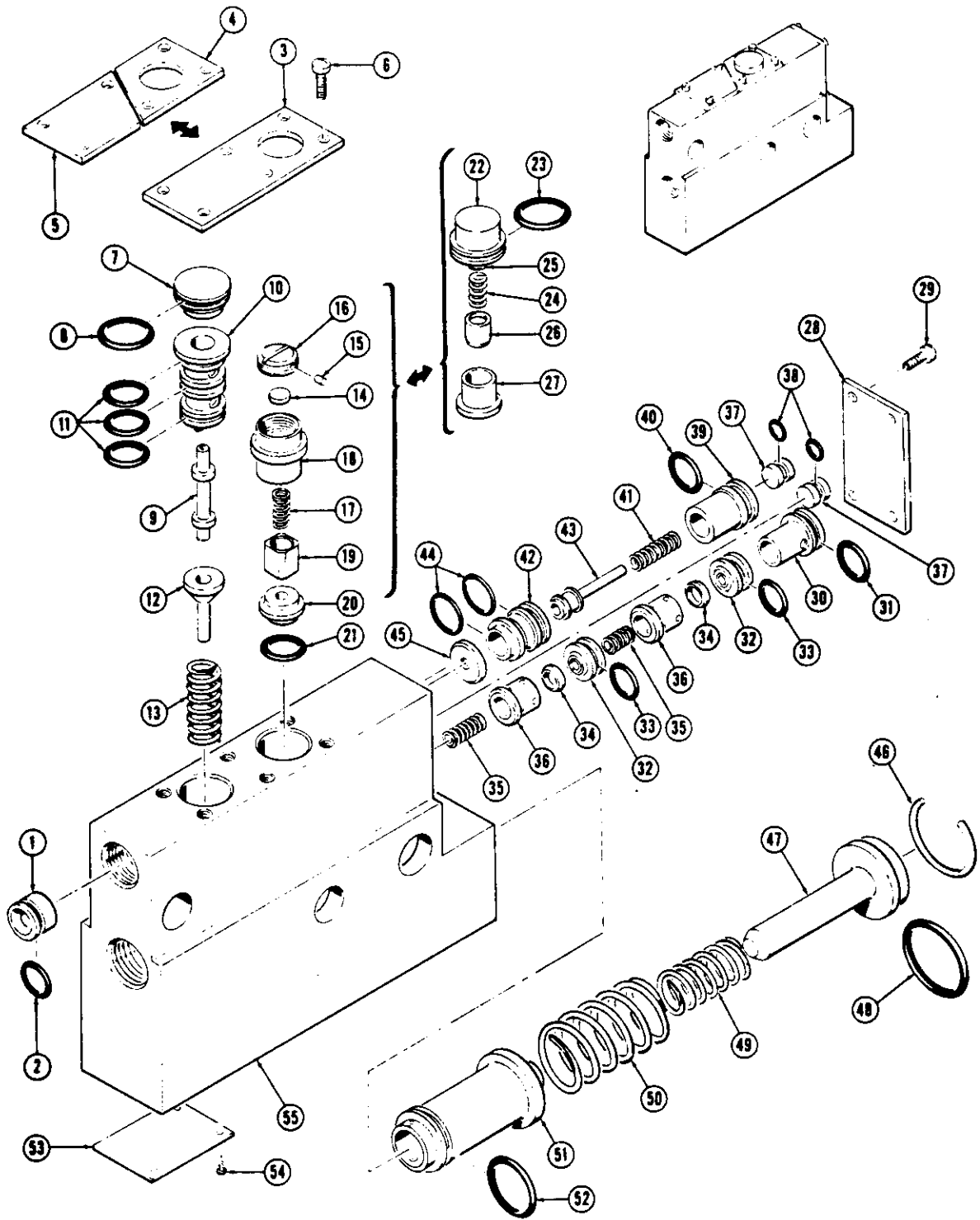


Figure 4-1. Irreversible Hydraulic Pressurized Valve Assembly.

Parts Nos. 42550, 42550-1, 42550-2 & 42550-3

Change 5

4-2A (4-2B Blank)



Section II Dismantling

Not Applicable

Section III Disassembly

4-10. **SPECIAL INSPECTIONS.** If upon receipt of accompanying records and/or physical appearance of component indicates the unit has been subjected to an accident or incident outside the realm of normal usage, the following evaluation criteria should be accomplished to determine the disposition of the unit. Should the unit meet the requirements, proceed with normal overhaul. Any variation from these inspection requirements is cause for rejection of the valve assembly.

- a. Inspect all surfaces and threaded areas for damage, galling, burrs, excessive wear and/or corrosion.

NOTE: Excessive wear shall be defined as any obvious deformation or deterioration of parts which may render the unit inoperative. If doubt exists concerning the serviceability of a part, replace the part.

- b. Examine identification plate (53, figure 4-1) for security of attachment and for legibility.

4-11. **DISASSEMBLY.** Use a clean working area for disassembly. As parts are removed, place them in a clean container for protection against dirt and rough handling. If unit is to remain disassembled for a considerable length of time, the parts must be protected from moisture preferably immersed in preservative oil, Specification MIL-H- 83282 (Reference item 1, table 8-1).

a. Disassemble according to numerical sequence of index numbers assigned to the exploded view illustration (figure 4-1), noting the following:

- b. Cut and remove lockwire.

c. Using a flat bottom type small hole gage No. 78B (Lufken Rule Co., Saginaw, Michigan, or equivalent) remove filter assembly (1); then remove and discard packing (2).

- d. Remove six screws (6), holding plate (3), or three screws (6), holding plate (5).

CAUTION: Sequence valve can pop out of body when plate is removed; use care when removing plate (3 or 5) as not to damage parts.

e. Remove cap (7) and packing (8). Discard packing. Carefully pull slide (9) from sleeve (10). Using sleeve puller, T100345-1, carefully extract sleeve (10) from body (see figure 4-2); then remove and discard packings (11). Remove retainer (12) and spring (13) by inverting body allowing retainer and spring to drop out.

CAUTION: Slide (9) and sleeve (10) are lap-matched parts. Do not interchange parts with components from other assemblies. Handle with care as not to damage lapped finish.

f. For valve assembly 42550, unscrew retainer assembly (14 through 16), then remove filter (14) and nylok (15) from retainer (16).

- g. Remove spring (17), housing (18), poppet assembly (19) and seat (20). Remove and discard packing (21).

- h. For valve assembly 42500-1, 42550-2 and 42550-3, remove remaining 3 screws (6), holding plate (4).

- i. For valve assemblies 42550-1, 42550-2 and 42550-3, remove cap (22) and packing (23). Discard packing. Remove spring (24), shim (25) and seat and poppet assy (26,27). Remove and discard packing (21) and shim (25).

CAUTION: The seat and poppet assembly (26, 27) are matched parts; do not interchange with parts from other assemblies. If valve is to remain disassembled, place shipping cap (Tapered Capplug No. 4, Protective Closure Co., Buffalo, New York, or equivalent) over end of assembly to protect assembly and retain matched components.

j. Remove four screws (29), securing plate (28). (See figure 4-1.)

k. Insert Truarc plier No. 2 or equivalent, in two removal holes (figure 4-3) on cap (30) and with twisting motion, remove cap with packing (31). Remove packing from cap and discard packing (31).

l. Using Assembly Aid, T42550-3, insert rod end into seat (32) counterbore and carefully remove seat. (See figure 4-4.) The seat is held by packing (33) drag only. Remove and discard packing (33).

m. Invert body (55), poppet (34) and spring (35) will fall out.

CAUTION: Protect seating surface of seat (32) and poppet (34) from marring.

n. Remove guide (36); then repeat procedures l and m for second seat (32), packing (33), poppet (34), spring (35) and guide (36).

o. Remove two plugs (37) and packings (38). Discard packings (38).

p. Insert Truarc plier No. 2 or equivalent, in two removal holes (figure 4-3) on cap (39); then remove cap (39) with packing (40) and spring (41). Discard packing (40).

q. Carefully remove slide (43); then using Sleeve Puller, T42568, remove sleeve (42) with packing (44). (See figure 4-5.) Remove and discard packings.

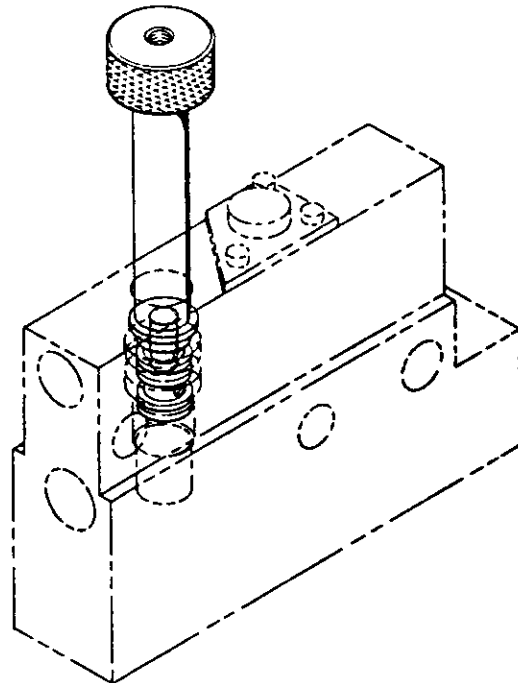


Figure 4-2. Removal of Sleeve, Part No. 42582, Using Sleeve Puller, T100345-1

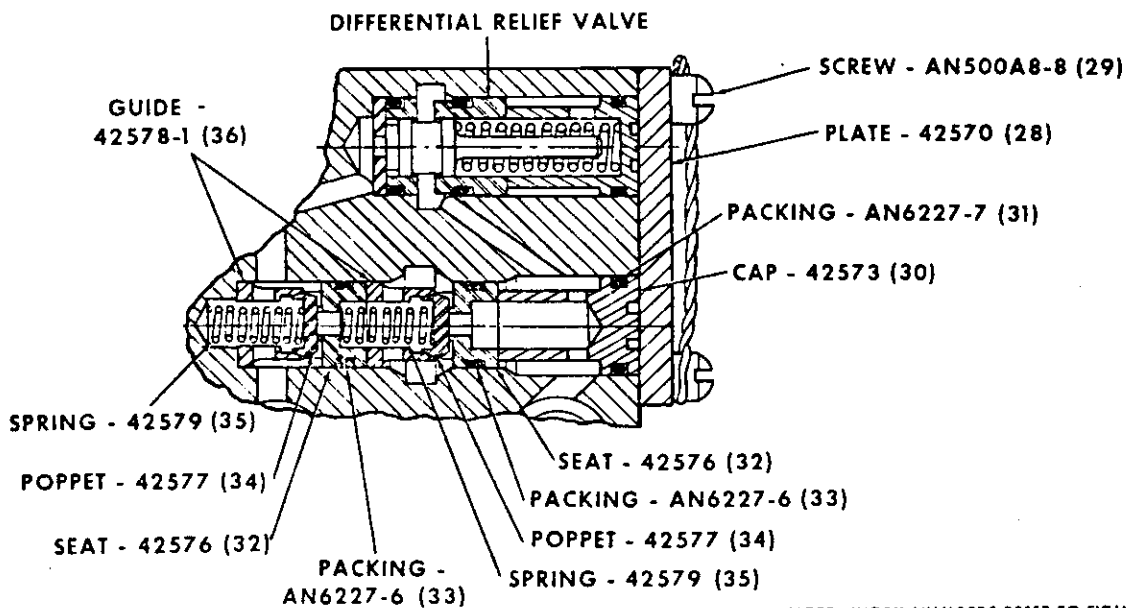


Figure 4-3. Removal and Installation Procedure of Check Valve

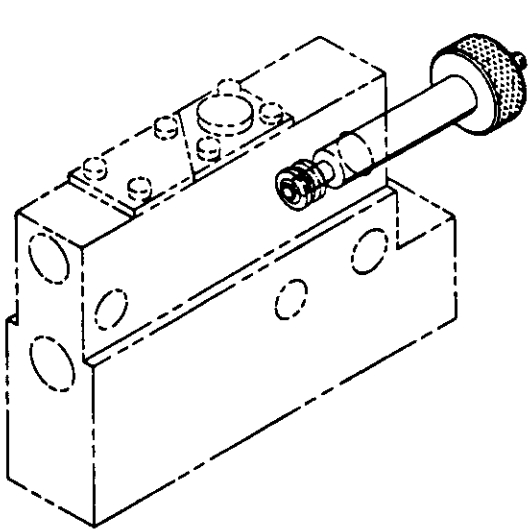


Figure 4-4. Removal of Seat, Part No. 42576.
Using Assembly Aid Tool. T42550-3

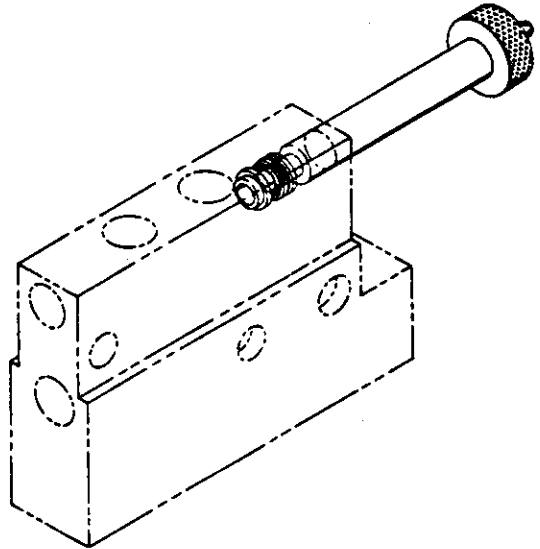


Figure 4-5. Removal of Sleeve, Part No. 42568.
Using Sleeve Puller T42568

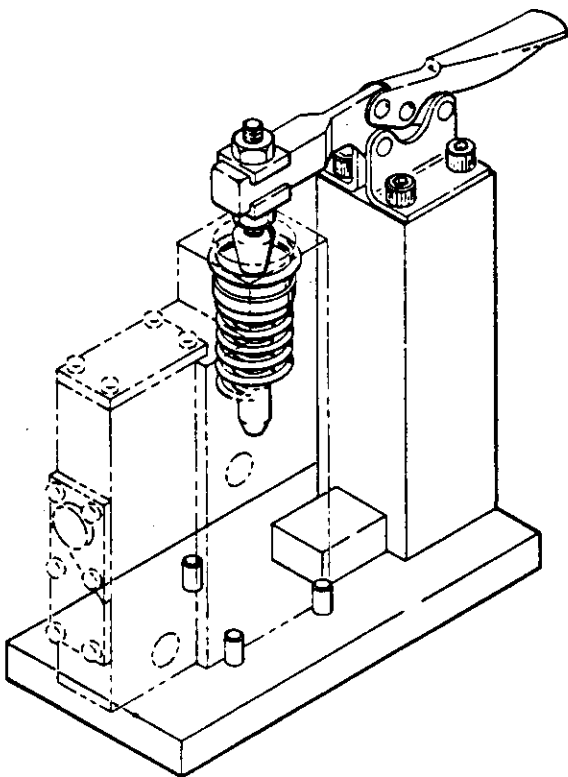
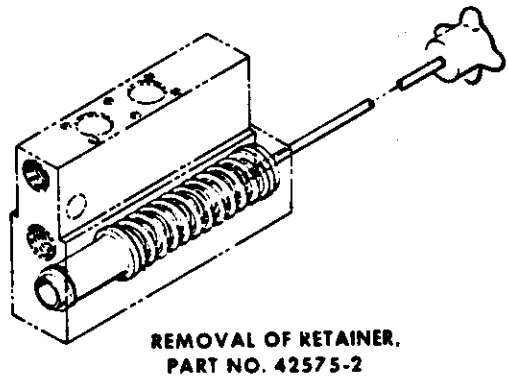
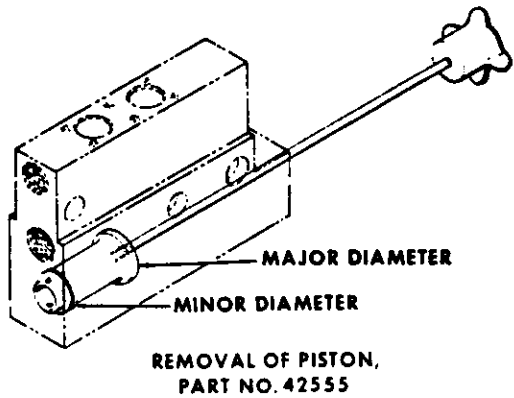


Figure 4-6. Removal of Retaining Ring,
Part No. 42574. Using Accumulator
Fixture. T42550-6A



REMOVAL OF RETAINER,
PART NO. 42575-2



REMOVAL OF PISTON,
PART NO. 42555

Figure 4-7. Removal of Accumulator
Using Retainer and Piston
Remover. T42550-4

CAUTION: Slide and sleeve (42, 43) are precision matched components. Handle with care. Do not interchange parts with similar parts from other valves.

r. Using nylon rod, insert end into hole of stop (45) and carefully extract from body assembly (55).

s. Using Fixture, T42550-6A (see figure 4-6), remove retaining ring (46).

t. Insert Retainer and Piston Remove, T42550-4 (see figure 4-7), into retainer (47) and remove retainer with packing (48), springs (49, 50) and piston (51) with packing (52). Discard packings (48, 52).

CAUTION: Remove piston (51) with care to avoid damage to major and minor diameters (see figure 4-7).

u. If identification plate is damaged or illegible, remove four drive screws (54) securing plate (53) to body assembly (55).

Section IV Cleaning

4-12. CLEANING.

NOTE: Remove all preformed packings before cleaning.

a. Immerse and wash all metallic parts in dry-cleaning solvent (item 3, Table 8-1). Pay particular attention to narrow passages and threaded areas. Stubborn accumulations of dirt may be removed with a stiff-bristled non-metallic brush moistened in dry-cleaning solvent. Dry all parts with compressed air not in excess of 15 psig.

WARNING: Dry-cleaning solvent may be toxic. Use in well-ventilated area. Avoid inhalation of fumes and prolonged contact with skin. Observe all necessary fire precautions. Do not direct compressed air against skin.

CAUTION: Do not drop lapped components in container of solvent; hold in hand to clean, protecting polished surfaces.

4-13. INSPECTION. After cleaning, visually inspect parts for any signs of damage. Refer to paragraph 4-10 and Tables 4-1 and 4-2 for requirements.

a. Carefully inspect the "O" ring working area of the accumulator bore for pits, nicks and scratches. Any damage shall be repaired per paragraph 4-16-d.

Section V Repair and Replacement

4-14. REPAIR AND REPLACEMENT. Repair or replace components of the valve assemblies in accordance with paragraphs 4-15 through 4-16.

4-15. GENERAL REPLACEMENT. Replace all preformed packings. Replace all parts that do not meet inspection requirements (see paragraph 4-10 and Table 4-1 and 4-2). Replace all damaged parts rather than attempt difficult or extensive repairs.

CAUTION: Slide and sleeve assemblies (42, 43 and 9, 10) and seat and poppet assembly (26, 27) are precision matched parts. If either of the matched components require replacement, replace as an assembly.

a. Roll springs (13, 17, 24, 35, 41, 49, 50, Figure 4-1) across smooth flat surface; there must be no evidence of distortion. Check springs for reuse in accordance with Table 4-1.

b. Guide P/N 42578 (gray) and or guide P/N 42578-1 (blue) shall be considered obsolete and shall be replaced with guide P/N 42578-2 at overhaul and repair of the irreversible hydraulic pressurized valve assembly if not previously performed.

4-16. REPAIR. Repair all components according to the following procedure.

a. Polish out minor scoring on non-sealing ferrous surfaces with No. 600 crocus cloth (item 4, Table 8-1).

b. On aluminum parts, polish out minor scoring with polishing cloth (item 5, Table 8-1). Replace anodized surfaces as required using alodine 1200 or equivalent per Specification MIL-A-8625 (item 6, Table 8-1).

c. Thoroughly clean polished components according to cleaning instructions given in paragraph 4-12.

d. The accumulator bore shall be repaired in the following manner:

(1) Light surface damaged can be repaired by honing with a 500 grit stone. The maximum diameter of 0.751 in. and the 16 micro-inch surface finish shall be maintained.

(2) Deleted.

(a) Drill the accumulator bore as shown in Figure 4-8A.

(b) Manufacture bushing as shown in Figure 4-8B. Since a class 6 transition fit is specified selective assembly will be required. Selected fit of .0005T is required.

(c) Install bushing by heating the body 10 minutes at 200°F and freeze the bushing to approximately -40°F, then press the bushing into the bore.

(d) Finish bore bushing inner diameter concentric within .005 inch of accumulator bore major diameter. (Reference Figure 4-8c).

(e) Alodine the reworked areas with Item 6, Table 8-1, per MIL-A-8625.

Table 4-1. Spring Test Data

| DESCRIPTION AND INDEX NUMBER (see figure 4-1) | FREE LENGTH (IN.) REFERENCE ONLY | TEST LOAD | LENGTH UNDER TEST LOAD (IN.) |
|---|--|-------------------|------------------------------------|
| Spring (17) Part No. 42564 | 0.503 | 15.0 to 17.0 (lb) | 0.406 ± .010 |
| Spring (41) Part No. 42571 | 0.825 | 30.0 to 32.0 (lb) | 0.731 ± .010 |
| Spring (35) Part No. 42579 | 0.695 | 1.00 to 1.25 (oz) | 0.498 ± .010 |
| Spring (24) Part No. 42593 | 0.589 | 60.0 to 65.0 (oz) | 0.437 ± .010 |
| Spring (13) Part No. 42556 | 1.133 | 25.0 to 25.4 (lb) | 0.835 ± 0.001 |
| Spring (49) Part No. 42554 | 3.252 | 73 to 83 (lb) | 2.110 ± .010 |
| Spring (50) Part No. 42553 | 3.280 | 140 to 150 (lb) | 2.050 ± .010 |

Table 4-2. Allowable Wear Limits

| PART DESCRIPTION AND INDEX NUMBER (see figure 4-1) | DIMENSION | ALLOWABLE WEAR LIMITS (IN.) | |
|--|-------------------------------------|--------------------------------|--------------------------|
| | | MIN. | MAX. |
| *Slide assembly-relief valve (42, 43) | Diametral Clear- ance of lap fit | No allowable limits * | No allowable limits * |
| Poppet (34) | OD | 0.299 | 0.301 |
| *Slide and sleeve assembly (9, 10) | Diametral | No allowable limits * | No allowable limits * |
| | Major OD (see figure 4-7) | 0.996 | 0.998 |
| Piston (51) | Minor OD (see figure 4-7) | 0.746 | 0.748 |
| Accumulator Bore | Bore diameter | 0.749 | 0.751 |

*These are lap matched assemblies. Allowable limits are determined by "Internal Leakage Test No. 1" (reference 4-25c).

Section VI. Modification Criteria

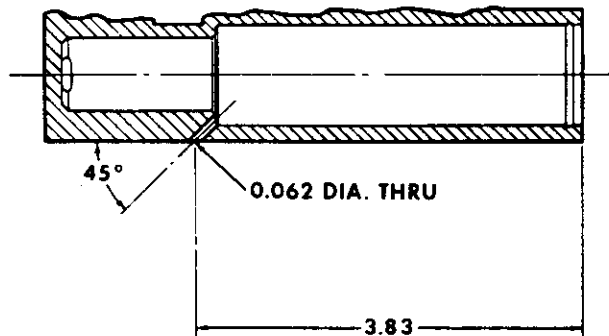
4-17/ MODIFICATION CRITERIA. Modify valve assemblies Part No. 42550 to 42550-2, 42550-1 to 42550-2 to 42550-3 by removing and replacing parts as listed in Table 4-3. All index number references are to figure 4-1.

Table 4-3. Modification

| 42550 TO 42550-2: | | | | | | | | |
|---------------------|-----------|----------|--------------------------|-----------------------|-----------|----------|-----------------------|--------------------|
| REMOVE PART NO. | INDEX NO. | PER ASSY | NOMENCLATURE | REPLACE WITH PART NO. | INDEX NO. | PER ASSY | NOMENCLATURE | |
| 42560 | 3 | 1 | Plate | 42596-1 | 4 | 1 | Plate | |
| | | | | 42596-2 | 5 | 1 | Plate | |
| 42562-3 | 14 | 1 | Filter | 42592 | 22 | 1 | Cap | |
| 42562-2 | | 1 | Nylok | MS28775-014 | | 23 | 1 | Packing, Preformed |
| 42562-1 | | 1 | Retainer | 42593 | | 24 | 1 | Spring |
| 42564 | | 1 | Spring | 42597 | | 25 | 1 | Shim |
| 42561 | | 1 | Housing | 42590 | | 26 | 1 | Poppet Assy |
| 42565 | | 1 | Poppet Assy | 42591 | | 27 | 1 | Seat |
| 42566 | 20 | 1 | Seat | | | | | |
| 42578 | 36 | 2 | Guide | 42578-1 | 36 | 2 | Guide | |
| *ADD | | | | 42588 | 1 | 1 | Filter | |
| 42575 | 47 | 1 | Retainer | 42575-2 | 1 | 1 | Retainer | |
| ADD | | | | MS28775-020 | 48 | 1 | Packing, Preformed | |
| 42585 | 53 | 1 | Plate, Identification | 42563 | 53 | 1 | Plate, Identification | |
| 42552 | 55 | 1 | Body Assy | 42595-3 | 55 | 1 | Body Assy | |
| 42550-1 TO 42550-2: | | | | | | | | |
| 42578 | 36 | 2 | Guide | 42578-1 | 36 | 2 | Guide | |
| 42575 | 47 | 1 | Retainer | 42575-2 | 47 | 1 | Retainer | |
| ADD | | | | MS28775-020 | 48 | 1 | Packing, Preformed | |
| 42594 | 53 | 1 | Plate, Identification | 42563 | 53 | 1 | Plate, Identification | |
| 42595 | 55 | 1 | Body Assy (See fig. 4-8) | 42595-3 | 55 | 1 | Body Assy | |
| 42550-2 TO 42550-3 | | | | | | | | |
| 42578-1 | 36 | 2 | Guide | 42578-2 | 36 | 2 | Guide | |
| ** 42563 | 53 | 1 | Plate, Identification | 41000437 | 36 | 1 | Plate, Identification | |

*For use on valves prior to Serial Number 798.

**If blank line is available on data plate 42563, delete P/N 42550-2 and stamp, P/N 42550-3.



NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES.
UNLESS OTHERWISE INDICATED.

Figure 4-8. Rework of Body, Part No. 42595 to Part No. 42595-3 Configuration
All data on page 4-10A including figures 4-8A, 4-8B, and 4-8e are deleted.

Section VII Reassembly and Testing of Subassemblies

Not Applicable

Section VIII Final Assembly

4-18. GENERAL. Cleanliness is extremely important to the successful overhaul of this assembly. Metal particles, chips, etc., can cause malfunction of the check valves, sequence valves, etc. which can cause in-flight difficulties of serious consequence prior to any assembly, whatsoever, the body assembly will be thoroughly inspected using both visual and offset mirror techniques. (Borescopic means preferred). Any evidence of improper cleaning after lapping or machining will be cause for recleaning and reinspection. Immerse all packings in hydraulic fluid, Specification MIL-H-83282 or lightly coat with petrolatum. Specification VV-P-236, to aid in reassembly. Exercise care to seat packings properly on lands or grooves to prevent damage and contamination of the assembly.

4-19. PROCEDURE. The following procedure is for reassembly of valve, Part No. 42550-3 (see figure 4-1).

a. Replace identification plate (53) on body assembly (55) using four screws (54), if removed.

b. Install packing (52) on piston (51); then using Retainer and Piston Remover, T42550-4 (see figure 4-7), install in body (55).

CAUTION: Install piston (51) with care to avoid damage to major and minor diameters.

c. Install packing (48) on retainer (47).

d. Place spring (49) inside spring (50) and slip over retainer (47); then install body (55).

e. To secure retainer (47) in body with retaining ring (46), use Retaining Ring Assembly Aid, T42550-6 (see figure 4-9) in the following procedure:

(1) Place Cap, T42550-6-1 on bench.

(2) Install Guide, T42550-6-2 on cap.

(3) Place retaining ring (46) in guide.

(4) Place Spring, T42550-6-3 over Plunger, T42550-6-4 and insert in guide, pushing plunger down until it bottoms on end cap.

(5) Remove cap carefully and place tool against body. Push against plunger until retaining ring (46) locks in groove in body (55) securing retainer (47).

f. Install stop (45) into body carefully.

CAUTION: Make certain that chamfered side of stop bottoms in bore.

g. Preassemble packings (44) on sleeve (42) and packing (40) on cap (39). Carefully insert slide (43) in sleeve (42). Install spring (41) over slide (43) and install cap (39).

CAUTION: Handle slide and sleeve assembly with care as these are precision machined components.

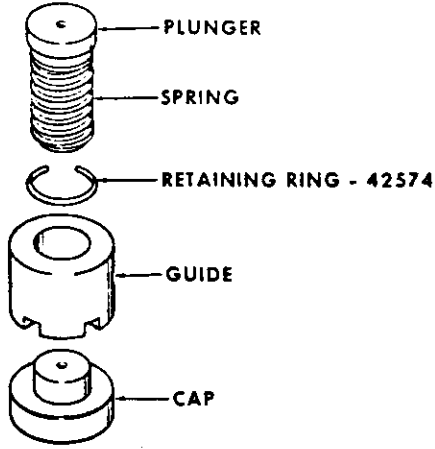
h. Using Differential Valve Installer, T42550-8 (see figure 4-10), carefully insert slide and sleeve assembly in body (55).

i. Preassemble packings (38) on plugs (37) and install in body.

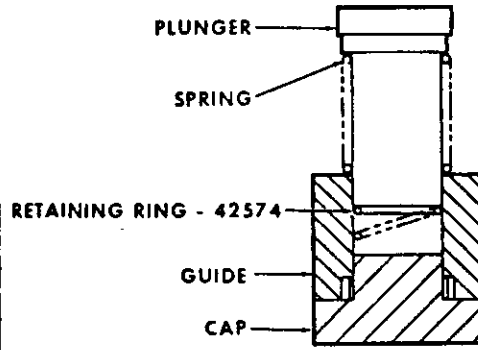
j. Install guide (36) with castellated end up and spring (35) in body; then using tweezers, install poppet (34) with recess down over spring (35) in guide (36).

k. Preassemble packing (33) on seat (32) and install in body using Assembly Aid, T42550-3 (see figure 4-4); then repeat procedure for second guide (36), spring (35), poppet (34) and seat (32) with packing (33).

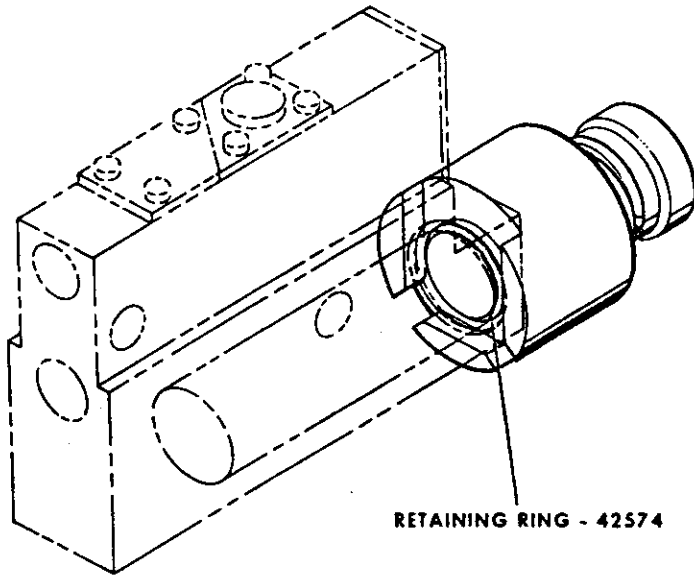
l. Preassemble packing (31) on cap (30); then install in body using No. 2 Truarc pliers, or equivalent.



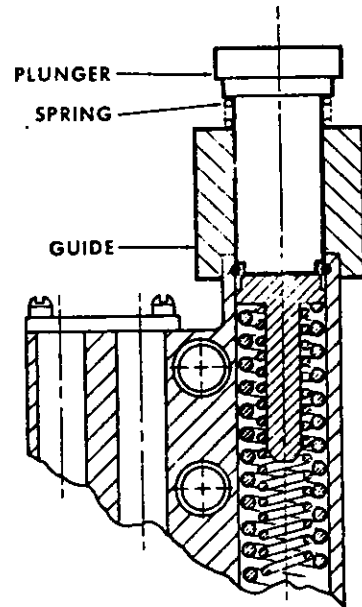
PREASSEMBLY OF RING AND COMPONENTS
OF ASSEMBLY AID - T42550-6



RING INSTALLED
IN ASSEMBLY AID - T42550-6



INSTALLATION OF RING IN BODY



CUTAWAY VIEW
SHOWING RING IN POSITION

Figure 4-9. Installation of Retaining Ring, Part No. 42574, Using Assembly Aid Tool, T42550-6

- m. Secure plate (28) with four screws (29), torque screws 15 to 20 inch lbs.
- n. Preassemble preformed packing (21), poppet assembly (26) and seat (27); then install in body (55).
- o. Place spring (24) inside seat and poppet assembly (26, 27).
- p. Preassemble packing (23) on cap (22); then place shim (25) inside cap (22) and install in body (55).
- q. Secure plate (4) with three screws (6).
- r. Install spring (13). Insert retainer (12).

CAUTION: Handle slide and sleeve assembly (9, 10) with care as not to damage precision machined surfaces.

- s. Preassemble three preformed packings (11) onto sleeve (10) and install the slide (9) into the sleeve so the short shank of the slide will mate with the retainer (12).
- t. Preassemble packing (8) on cap (7) and install in body (55).
- u. Secure plate (5) with three screws (6).
- v. Preassemble packing (2) on filter assembly (1) and install in body (55), using small hole gage No. 788 (Lufkin Rule Co., Saginaw, Michigan), or equivalent (see Table 10-1).
- w. If required, install identification plate (53) on body (55) using four drive screws (54).
- x. Using Wire, Part No. MS20995-F32 lockwire all screws per Military Standard MS33540.

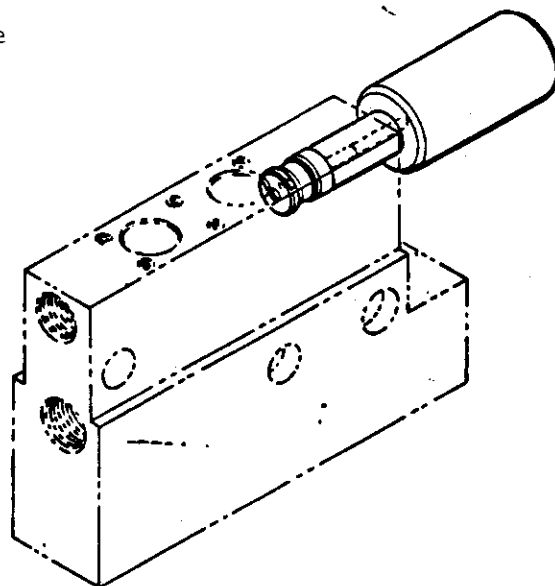


Figure 4-10. Installation of the Slide and Sleeve Assembly, Part No. 42584, Using Differential Valve Installer, Th2550-8

Section IX Run-In and Test

NOTE: Paragraphs 4-20, 4-21 and 4-22, Run-In Procedures, have been deleted.

4-23. **TEST PROCEDURE.** For setup convenience, the test operations do not necessarily have to follow the sequence called out. However, all tests must be performed. Refer to figure 4-11, Hydraulic Schematic, for system identification contained within the valve.

4-24. **PREPARATION FOR HYDRAULIC TESTING.** Use a suitable test stand capable of delivering hydraulic fluid at pressures up to 3000 psig, and using hydraulic fluid, Specification MIL-H-5606 or MIL-H-6083 at +21° to +43°C (+70° to +110°F), filtered through a 10-micron filter as test medium.

a. Assemble to Test Block, Th2550-1: Test Fittings, Th2550-1A, Th2550-1B, packings, AN6230-4, AN6230-5 and standard fittings to AND10050-4 and AND10050-5 ports and then install valve assembly as shown in figure 4-12.

b. Hook up to stand using valves and gages as shown in figure 4-13. Valve and gage numbers referenced in Test Procedures are identified in figure 4-13.

c. Unless otherwise specified, a three-minute seating period is permissible prior to each measurement for interport leakage.

d. Bleed all air from unit before applying fluid pressure, using the following procedure.

- (1) Close all valves.

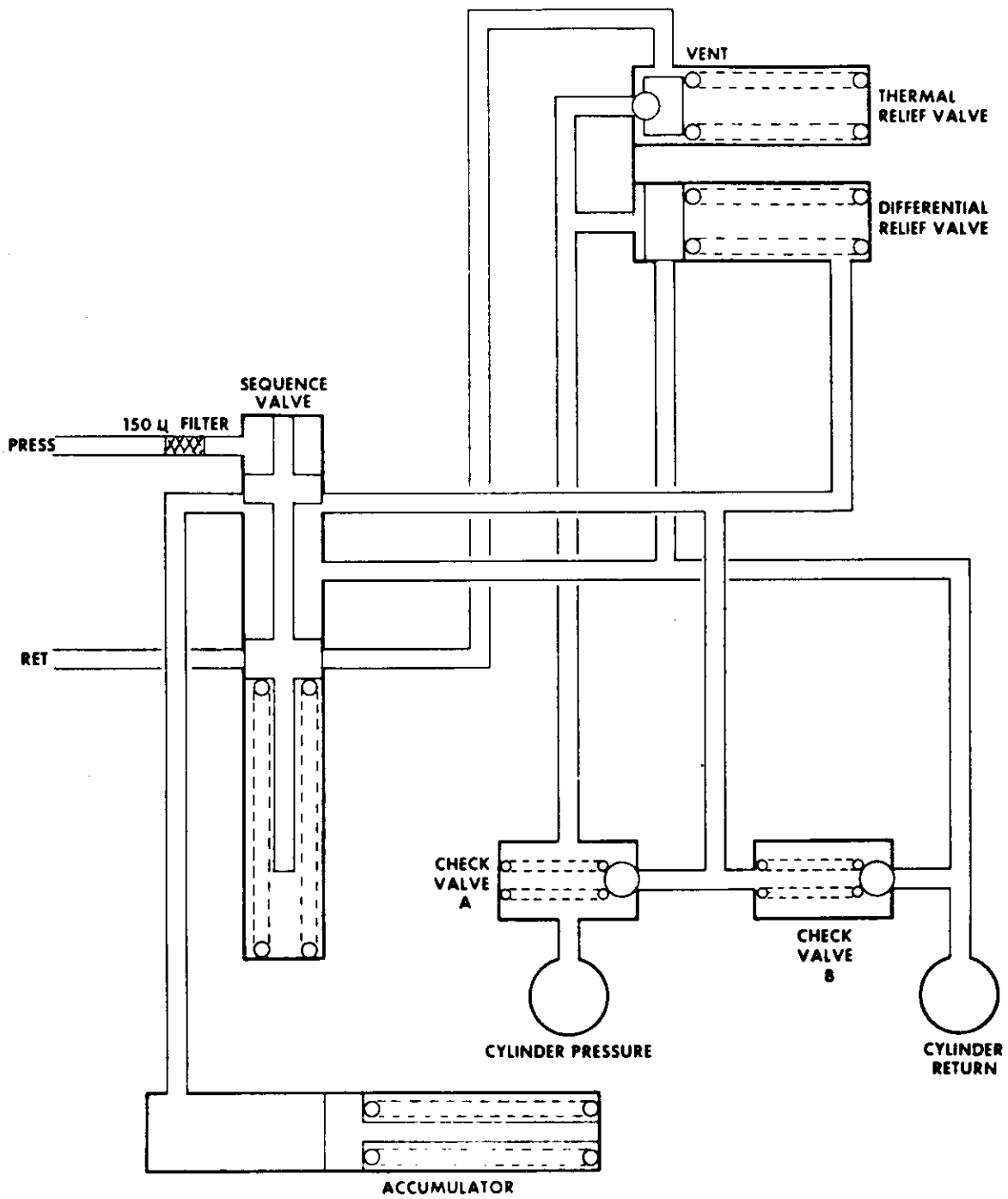


Figure 4-11. Hydraulic Schematic

(2) Open valves No. 2, 4, 7, 11, 15 and 16. Adjust regulator valve No. 3 to raise pressure to 575 psig reading on gage No. 2. Adjust regulator valve No. 1 to slowly raise pressure until fluid flows from valve No. 11. Allow fluid to flow until all air is bled from test valve.

(3) Adjust regulator valves No. 1 and 3 to reduce pressure to indicate less than 500 psig on gages No. 1 and 2.

(4) Close all valves.

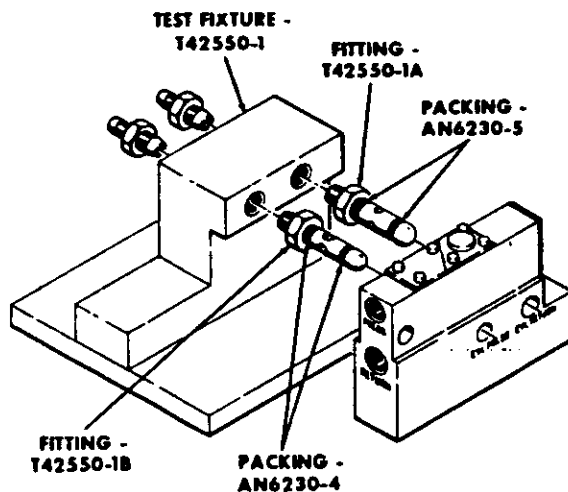


Figure 4-12. Installation of Valve in Test Fixture, T42550-1, With Fittings T42550-1A and T42550-1B

4-25. HYDRAULIC TESTS.

a. Using a test setup similar to figure 4-13, perform a "Proof Pressure Test" on the valve as follows:

(1) Open valves No. 4, 7, and 15. Adjust regulator valve No. 3 to raise pressure to 2250 psig reading on gage No. 2.

(2) Maintain pressure setting for two minutes and visually inspect valve assembly for external leakage. There shall be no external leakage.

(3) Adjust regulator valve No. 3 to reduce pressure to indicate less than 500 psig on gage No. 2. Close all valves.

b. Perform "Sequence Valve Operation Test No. 1" as follows:

- (1) Open valve No. 11.
- (2) Open valves No. 2, 8, and 16. Adjust regulator valve No. 1 to slowly raise pressure until fluid begins to flow from valve No. 8.
- (3) Gage No. 1 shall read 500 to 525 psig.
- (4) Close all valves.

c. Perform "Internal Leakage Test No. 1" as follows:

- (1) Open valves No. 4, 5, 7, 11 and 15.
- (2) Adjust regulator valve No. 3 to raise supply pressure to 500 psig reading on gage No. 2. Check leakage at valves No. 5 and 11.

ACCEPTABLE LIMITS: Maximum leakage, zero drops in three minutes or two drops in twenty minutes, either valve.

- (3) Adjust regulator valve No. 3 to reduce pressure to indicate less than 500 psig on gage No. 2.
- (4) Close all valves.

d. Perform "Sequence Valve Operation Test No. 2" as follows:

- (1) Open valves No. 2, 8, and 16. Adjust regulator valve No. 1 to momentarily raise pressure to 1500 psig on gage No. 1. Fluid will flow from valve No. 8. Reduce pressure until flow stops. Indication on gage No. 1 shall be 525 ± 50 psig.
- (2) Close all valves.

e. Perform "Sequence Valve Operation Test No. 3" as follows:

- (1) Open valves No. 2, 4, 7, 11, and 15.
- (2) Adjust regulator valve No. 3 to raise pressure to 550 ± 25 psig reading on gage No. 2.

NOTE: Be careful not to get wet.

(6) Close all valves.

m. Perform "Internal Leakage Test No. 2" as follows:

(1) Open valves No. 4, 5, 7, 8, 11, 13 and 14.

(2) Adjust regulator valve No. 3 to momentarily raise pressure to 1500 psig reading on gage No. 2.

(3) Turn regulator valve No. 3 to reduce supply pressure to 405 ± 5 psig on gage No. 2.

(4) Maintain 405 ± 5 psig setting for 10 minutes.

(5) Check for leakage at valves No. 5, 8 and 11. Combined leakage shall not exceed seven drops per minute after first minute.

(6) Check for leakage after ten minutes. Combined leakage shall not exceed three drops per minute after ten minutes.

(7) Close all valves.

n. Perform "Thermal Relief Test No. 1" as follows:

(1) Open valves No. 4, 7, 11 and 14.

(2) Adjust regulator valve No. 3 to raise pressure to obtain full flow from valve No. 11. Fuel flow should occur between 2600 to 2800 psig reading on gage No. 2.

(3) Adjust regulator valve No. 3 to momentarily reduce pressure to indicate less than 500 psig on gage No. 2. Then adjust regulator valve No. 3 to raise pressure until flow starts from valve No. 11.

(4) Flow shall start at 2200 ± 100 psig indicated on gage No. 2 (thermal relief valve cracks).

(5) Adjust regulator valve No. 3 to reduce pressure until flow stops at valve No. 11.

(6) Note reading on gage No. 2 when flow stops.

(7) Wait one minute and check for leakage at valve No. 11.

ACCEPTABLE LIMITS: Thermal relief shall reseal at not less than 1900 psig and after one minute there shall not be more than ten (10) drops leakage at valve No. 11.

(8) Adjust regulator valve No. 3 to reduce pressure to indicate less than 500 psig on gage No. 2. Close valve No. 4. Open valve No. 8 and allow to drain.

(9) Close all valves.

p. Perform "Internal Leakage Test No. 3" as follows (See Figure 4-13):

(1) Open valves No. 2, 6, 11 and 15. Adjust regulator valve No. 1 to increase pressure to 1000 psig on gage No. 1.

(2) Wait ten minutes and check combined leakage at valves No. 11 and 6. Combined leakage shall not exceed ten drops per minute after the ten-minute wait.

(3) Adjust regulator valve No. 1 to reduce pressure to less than 500 psig on gage No. 1.

(4) Close valve No. 2.

(5) Open valves No. 5, 6, 8, 11, 15 and 16.

(6) Disconnect and remove all hydraulic connections from valve.

(7) Remove valve from Test Block, T42550-1 and Fittings, T42550-1A and -1B.

4-26. PREPARATION FOR AIR TEST. a. Install Air Test Fittings, T42550-2A and -2B and packings, AN6230-4 and AN6230-5 in valve as shown in figure 4-14. Refer to Check Valve Test Setup (figure 4-15) for referenced valves and gages.

b. Install one AN813-4 nipple in each of Air Fittings, T42550-2A and T42550-2B and install a 1/4 inch drip spout on the T42550-2B fitting. Insert drip spout into bottle containing MIL-H-83282 (see figure 4-15).

c. Connect lower pressure AIR line (maximum 5 psi) to T42550-2A (see figure 4-14).

4-27. AIR TEST. A. Perform "Check Valve Test No. 1" as follows:

(1) Adjust regulator valve No. 10 to slowly raise air pressure until air (bubble) flow is first observed in test fluid.

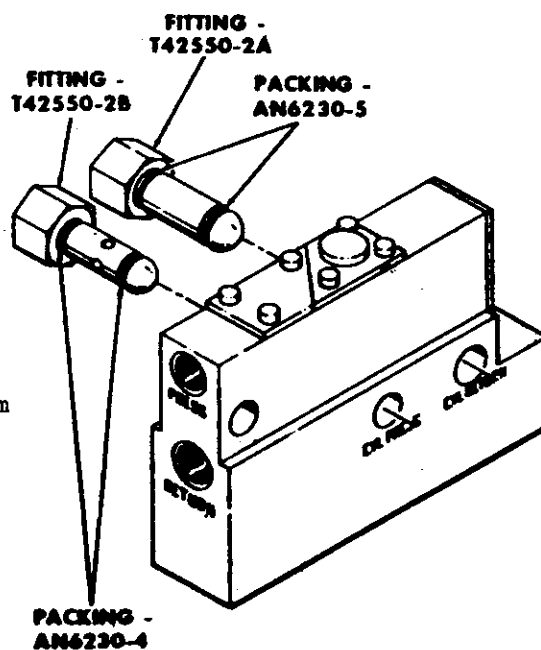


Figure 4-14. Installation of Test Fittings T42550-1B and T42550-2B

(2) Air flow will start from CYLINDER PRESSURE port at 2 to 5 psi air pressure indicated on gage No. 4.

b. Perform "Check Valve Test No. 2" as follows:

(1) Adjust regulator valve No. 10 to slowly reduce air pressure until air flow (bubbles) stop. Flow shall stop before pressure is reduced 1 psi below "air flow pressure".

(2) Adjust regulator valve No. 10 to reduce air pressure to zero indicated on gage No. 4. Remove drip spout test fluid.

(3) Disconnect drip spout and low pressure air line from valve test fittings. Then remove test fittings.

4-28. Refer to Table 4-4, Troubleshooting Chart, for probable causes and remedies of any existing malfunctions.

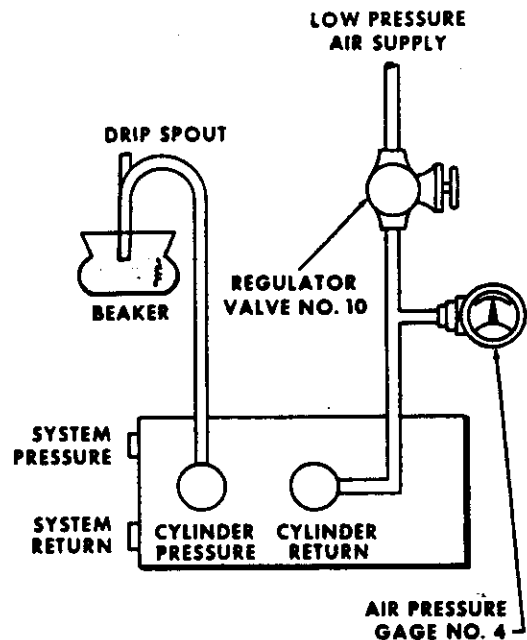


Figure 4-15. Check Valve Test Setup

Table 4-4. Troubleshooting Chart

| TROUBLE | PROBABLE CAUSE | REMEDY |
|------------------|---|--|
| External leakage | Packings (38) damaged | Replace packings. |
| | Leakage under plate (28) | Replace packings (31, 40). |
| | Leakage at vent hole on bottom of body | Check body accumulator bore for pitting and/or corrosion. Replace body if finish of bore is less than 63 microinches. Replace packing (48) if finish is within above drawing limits. |
| | Leakage at plate (4) through damaged packing (23) | Replace packing. |
| | Leakage at plate (5) through damaged packing (8) | Replace packing. |
| Internal leakage | Damaged packings (11) | Replace packings. |
| | Damaged slide and sleeve assembly (9, 10) | Replace slide and sleeve assembly. |
| | Damaged packing (44) | Replace packing. |

Table 4-4. Troubleshooting Chart (Cont)

| TROUBLE | PROBABLE CAUSE | REMEDY |
|---|---|---------------------------------------|
| Internal leakage (Cont) | Damaged slide and sleeve assembly (42, 43) | Replace slide and sleeve assembly. |
| | Damaged packings (33) | Replace packings. |
| | Damaged seat and poppet (32, 34) | Replace seat and poppet. |
| | Damaged packing (21) | Replace packing. |
| | Damaged poppet and seat (26, 27) | Replace poppet and seat. |
| Restricted flow at CYL RET. or CYL PRESS. ports | Dirty filter (1) | Replace filter. |
| | Sticking slide and sleeve assembly (9, 10) | Replace slide and sleeve assembly. |

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