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Carter® Brand Ground Fueling Equipment

SM61499

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Applicable additional manuals:

NONE

Maintenance & Repair Manual

Fuel - Defuel Valve

Model 61499

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MAINTENANCE, OVERHAUL & TEST INSTRUCTIONS
CARTER PART NUMBER 61499 FUEL-DEFUEL VALVE

1.0 INTRODUCTION

This manual furnishes detailed instructions covering the maintenance and overhaul of Carter Part Number 61499, Fuel-Defuel Valve used in the U.S. Army's 500 gallon collapsible fuel storage drum.

2.0 EQUIPMENT DESCRIPTION

The Carter 61499 Fuel-Defuel Valve is used in the end of the U.S. Army's 500 gallon fuel storage drum to allow for filling and emptying the drum. During fueling the valve allows flow until the internal pressure of the drum reaches 4.5 ± 0.5 psi at which time the valve stops the in-flow of fuel. The valve allows for the mating of a standard underwing refueling nozzle for the filling and emptying of the drum. During defueling or emptying, the valve opens with the application of a negative pressure augmented by the positive tank pressure to allow the flow of fuel from the drum.

3.0 SAFETY INFORMATION

The Carter Fuel-Defuel Valve, 61499, is designed to mate with any standard underwing nozzle, commercial or military. These nozzles are designed to be interlocked with the adapter on the 61499. That is, if the nozzle is connected to the 61499 and opened, it should be impossible to remove the nozzle from the valve. This is accomplished by the interaction of three interlock pins engaging into the three slots in the valve's adapter. Excessive wear on these slots can defeat the interlock system causing an inadvertent disconnect with a possibly open nozzle. This can result in a spillage of fuel. The adapter on the 61499 should be periodically inspected to assure that the wear experienced by the connection of the nozzle is not sufficient to cause this disonnect.

The following inspections of the valve adapter are recommended to be carried out at each refueling operation to assure that one is connecting to a safe adapter:

A. Visually check for bent, broken, missing or excessively worn lugs or slots. Worn slots are easily detected. A normal slot will have a slight machine broken edge (chamfer of .030 inch (0.762 mm)). If the edge is worn such that the corner is badly distorted and enlarged it should be inspected more closely and accurately. Carter Adapter Wear Gauge, 61657-2, should be utilized to check the width and thickness of the lugs if they appear to be worn. Wear of the thickness dimension of the lug will promote premature nose seal leakage. Wear of the width of the lug combines with slot wear in defeating the nozzle interlock.

B. Visually check the three slots for excessive wear. Excessive wear can permit disengagement of a nozzle without release of the three interlock pins and may permit accidental poppet opening on the disconnected nozzle. The use of Carter Gauge 61657-2 will provide a "no-go" check for the slots.

C. **If any of the above conditions are observed, and or the gauge proves the adapter to be defective, the refueling operation should be continued only with extreme caution.**

4.0 DISASSEMBLY

4.1 Remove Dust Cap (1) from unit only if replacement is needed.

4.2 Remove Screws (2) using a torque wrench. The running torque should not be less than 2 in-lb. Discard Screws (2) if the running torque is less. These screws

are self-locking and should be reused no more than 15 times before they are replaced. If a torque wrench is not used, replace the Screws (2).

4.3 Adapter (3) is removed as an assembly. Discard Packing (9). Remove Screws (6) using a torque wrench. The running torque should not be less than 1 in-lb. Discard Screws (6) if the running torque is less. If a torque wrench is not used, replace the Screws (6).

The remainder of the Adapter (3) can be disassembled.

4.4 Remove the twelve Screws (10) holding the Seat (18) in place. Measure the running torque. If the torque is less than 1.5 in-lb. or a torque wrench is not used, discard the Screws (10). Remove Seat (18).

Remove the eight Screws (11) from Ring (12). The running torque shall not be less than 1 in-lb. If less, or a torque wrench is not used, discard the Screws (11). Remove Ring (12).

Remove Diaphragm Assembly (13). Using a torque wrench, remove the Screws (14) in the Diaphragm Assembly (13). The running torque shall not be less than 1 in-lb. If less, or a torque wrench is not used, discard the Screws (14). Remove and discard the Diaphragm (16).

4.5 Do not remove Screws (19), Cage (20) and Poppet (21) from Seat (18) unless replacement is needed. If removed, the Screws (19) should be discarded.

4.6 Remove E-ring (22). Push Tube (23) out of hole in Housing (44) to remove. Discard O-rings (24).

4.7 Using a torque wrench remove Screws (25) and check the running torque. The running torque shall not be less than 0.5 in-lb. If less, or a torque wrench is not used, discard the Screws (25).

Pull Pilot Valve Assembly (29) away from the unit removing Poppet (27), Spring (28) and O-ring (26). Discard O-ring (26).

4.8 Remove the Screws (30) using a torque wrench. Check the running torque to be sure it is not less than 1.5 in-lb. If less, or a torque wrench is not used, discard the Screws (30). Remove Cover (31), Spring (32), Diaphragm (33) and Backup (34). Discard Diaphragm (33). .

Remove Spacer (35) and pull out Seat (36) from Housing (42). Remove and discard Packing (37). Do not disassemble Seat (36) with assembled Spring (32), Pin (39), Follower (38) and Poppet (41) unless replacement is needed. If needed, compress Spring (32) sufficiently to remove Pin (39). Disassemble Follower (38), Spring (32) and Poppet (41).

4.9 Remove and discard Packing (43) from Housing (44).

5.0 INSPECTION

5.1 It is recommended that all O-rings or Packings (9), (24), (26), (37) and (43), and Diaphragms (16) and (33) be replaced upon every overhaul.

Inspect all metal parts for dings, gouges, abrasions, etc. Use 320 grit paper to smooth and remove sharp edges. Replace any part with damage exceeding 15% of local wall thickness. Use alodine 1200 to touch up bared aluminum.

5.2 Inspect Dust Cap (1) for cracks or damage and replace as needed.

5.3 Inspect seal on Poppet (15) for nicks or other damage. Replace if needed.

5.4 Inspect the sealing area on Seat (36) where it contacts Poppet (41). If there are any nicks or gouges, replace it.

6.0 REASSEMBLY

Reassemble the parts in the reverse order of disassembly noting the following:

6.1 Make certain all components are clean and free from oil, grease, or any other corrosion resistant compound on all interior or exterior surfaces. Wash all parts with cleaning solvent, Federal Specification P-D-680 or equivalent, and dry thoroughly with a clean, lint-free cloth or compressed air.

WARNING:
Use cleaning solvent in a well-ventilated area. Avoid breathing of fumes and excessive solvent contact with skin. Keep away from open flame

A light coat of petrolatum, Federal Specification VV-P-236 or equivalent commercial quality, can be applied to all o-rings (packings), springs, and screws for ease of installation.

6.2 Assemble Poppet (41) into Seat (36), Position Spring (40) over Seat (36) and place Follower (38) over stem of Poppet (41). Compress Spring (40) sufficiently to uncover hole in Follower (38) into which Pin (39) is placed. Align hole in Follower (38) and Poppet (41) to push Pin (39) into place. Release Spring (40) to retain assembly.

Install Packing (37) onto Seat (36). Install assembled parts into Housing (42). Place Spacer (35) in place within the Housing (42) to retain. Place the Diaphragm (33) with loop facing upward away from the Spacer (35). Install the Backup (34) and Spring (32) in place and then the Cover (31). Run the Screws (30) into the unit until they just bottom. When observing the four screw pattern, number, mentally, the screws in a clockwise fashion 1, 3, 2 and 4. Tighten the four Screws (30) in that secquence to 15 in-lb, then to 20 in-lb and finally to 23 in-lb. Let the assembly set at room temperature for a minimum of 15 hours and retighten to 23 in-lb.

6.3 Install Spring (28), Poppet (27) and O-ring (26) into Housing (42). Place this assembled unit onto Housing (44) aligning the two holes in the Housing (44) with those in Housing (42). Install Screws (25) and tighten to 5 in-lb.

6.4 Place O-rings (24) onto Tube (23). Insert this assembly into the hole in the Housing (44) being sure that the end with the two grooves (one for the o-ring and one for the snap ring) is away from the Housing (44). Push into place until the E-ring (22) can be installed to retain the assembly in place.

6.5 The Diaphragms (16) shall be nested together and then placed between the Poppet Assembly (15) and the Ring (17) with the Ring (17) nested within the loop of the Diaphragms. The ten Screws (14) shall be installed to just bottom the heads of the Screws (14) onto the Ring (17). Metally number the Screws (14) in a clockwise direction 1, 8, 3, 10, 5, 2, 7, 4, 9 and 6. Torque the Screws (14) in that order to 10 in-lb. Repeat the sequence of tightening to 13 and then 15 in-lb. Let the assembly set at room temperature for a minimum of 15 hours and retighten to 15 in-lb.

6.6 Place the assembled Diaphragm Assembly (13) into the Housing (44) with the seal on the Poppet Assembly (15) facing upward, away from the Housing (44). Align the inner circle of holes in the Diaphragm (16) with the corresponding hole pattern in the Housing (44). Place the Ring (12) over the Diaphragm Assembly (13) and install the eight Screws (11) to bottom out only. Visually number the Screws (11) clockwise 1, 5, 3, 7, 2, 6, 4 and 8. Torque the Screws (11) in that order to 10 in-lb. Repeat the sequence of tightening to 13 and then 15 in-lb. Let the assembly set at room temperature for a minimum of 15 hours and retighten to 15 in-lb.

6.7 If the Poppet (21) and Cage (20) were disassembled from the Seat (18) reassemble with Screws (19) tightening to secure. Note that the Poppet (21) should be placed such that the conical side is facing toward the Cage (20) and away from the Seat (18).

6.8 Smooth the outer flange of the Diaphragms (16) out and assure that the hole pattern of the Diaphragms (16) match that of the Housing (44). Place the Seat (18) over the unit and secure with the Screws (10) (bottom out the screws only at this time). Mentally number the Screws (10) clockwise 1, 12, 5, 3, 9, 7, 2, 11, 6, 4, 10 and 8. Torque the Screws (10) in that order to 15 in-lb. Repeat the sequence of tightening to 20 and then 23 in-lb. Let the assembly set at room temperature for a minimum of 15 hours and retighten to 23 in-lb.

6.9 Place the Valve (8) into the Flange (4) with the seal of the Valve (8) facing into the Flange (4). Place the Spring (7) over the stem of the Valve (8) and then install the Spider (5) over this group of parts. Position the Spider (5) such that the six mounting holes align with the corresponding holes in the Flange (4). Install the Screws (6) and tighten to 5 in-lb. Place Packing (9) in the groove in the Flange (4) and install the assembly into the unit securing it with the six Screws (2) tightening to 8 in-lb. Reattach the Dust Cap (1) to the hole provided in the Flange (4).

7.0 TEST

7.1 The following test procedures will be accomplished after overhaul:

7.2 Test conditions

Test media shall be Test Fluid in accordance with MIL-C-7024, type II, JP-4 per MIL-J-5624D at 75° ± 15° F, Jet A or equivalent.

7.3 Functional Test

7.3.1 Install unit in a drum that has been modified to measure pressure within the drum. Install a pressure gauge capable of measuring 0-10 psi range.

7.3.2 Attach an underwing nozzle to the unit and establish a flow rate of at lease 100 gpm into the drum through the valve. Observe the internal pressure of the drum as it fills. The valve must shutoff when the drum pressure is between 4 and 5 psi.

7.3.3 Defuel the drum by applying a suction to the nozzle. When the drum is flat, remove the valve.

8.0 TROUBLE SHOOTING

8.1 Valve will not close during fueling of drum - There are several areas to check:

8.1.1 Diaphragm (16) or (33) may be ruptured or leaking severely. Replace Diaphragm (16) or (33).

8.1.2 Poppet (41) and/or Seat (36) may be leaking severely. Replace as necessary.

8.1.3 Screws (25) not tight causing a severe leak from the diaphragm chamber. Tighten Screws (25) per paragraph 6.3.

8.1.4 Orifice in Housing (44) may be plugged. Clean out orifice or replace Housing (44).

8.1.5 Screws (10) or (11) not tight. Retighten in accordance with paragraph 6.6 and 6.8.

8.1.6 O-ring (26) damaged or missing. Replace as needed.

8.1.7 Screws (14) loose. Tighten per paragraph 6.5.

8.2 Leakage of fuel from drum either through valve or around valve.

8.2.1 If leakage is through the small ambient sense port in Housing (44), O-rings (24) is damaged or missing. Replace as needed.

8.2.2 If leakage is from around the outside diameter of the valve, Packing (43) is damaged or missing. Replace as necessary.

8.3 Valve will not allow defuel from the drum.

8.3.1 Poppet (27) is missing or damage, replace as needed.

8.3.2 Diaphragm (16) damaged, replace as needed.

8.4 Leakage from Adapter (3). Valve (8) seal is damaged or missing, replace as needed.

9.0 ILLUSTRATED PARTS CATALOG

Table 1.0 tabulates the parts and sub-assemblies comprising the 61499 Fuel-Defuel Valve. The item numbers of the table are keyed to the exploded views of the nozzle diagrammed in Figure 1.

TABLE 1.0

Item	Part Number	Description	Units Per Assembly	Spares/10 Units/Period
1	41607	Dust Cap	1	2
2	NAS1189E3P8	Screw	6	-
3	61529	Adapter	1	-
4	20748-2	Flange	1	-
5	20876	Spider	1	-
6	LP500-6-5	Screws	6	-
7	2753	Spring	1	-
8	20780	Valve	1	2
9	201201-153	Packing	1	10
10	NAS1352C08LE6	Screw	12	-
11	NAS1352C06LE6	Screw	8	-
12	210026	Ring	1	-
13	44688	Diaphragm Assembly	1	-
14	NAS1352C06LE4	Screw	10	-
15	210024	Poppet Assembly	1	3
16	210023	Diaphragm	2	20
17	210025	Ring	1	-
18	210027	Seat	1	-
19	NAS1352C01LE2	Screw	8	-
20	210030	Cage	1	-
21	210029	Poppet, Defuel	1	-
22	5133-25-H	E-ring	1	3
23	210021	Tube	1	-
24	201201-006	O-ring	2	20
25	NAS1189E06P5L	Screw	2	-
26	201201-014	O-ring	1	10
27	210020	Poppet	1	-
28	210019	Spring	1	-
29	44671	Pilot Valve Assembly	1	-
30	NAS1352C08LE10	Screw	4	-
31	210018	Cover	1	-
32	210017	Spring	1	-
33	210015	Diaphragm	1	10
34	210016	Backup	1	-
35	210014	Spacer	1	-
36	210011	Seat	1	-
37	MS29513-011	Packing	1	-
38	210013	Follower	1	-
39	220266	Pin	1	-
40	210012	Spring	1	-
41	210008	Poppet	1	-
42	210007	Housing	1	-
43	MS29513-250	Packing	1	10
44	210022	Housing	1	-

Note: 1. The recommended spare parts shown above are the number required to support 10 Units for each overhaul period. These quantities do not include replacement spares for intermediate replacement of parts required by abuse or misuse of the equipment. The actual quantity required will vary from location to location.

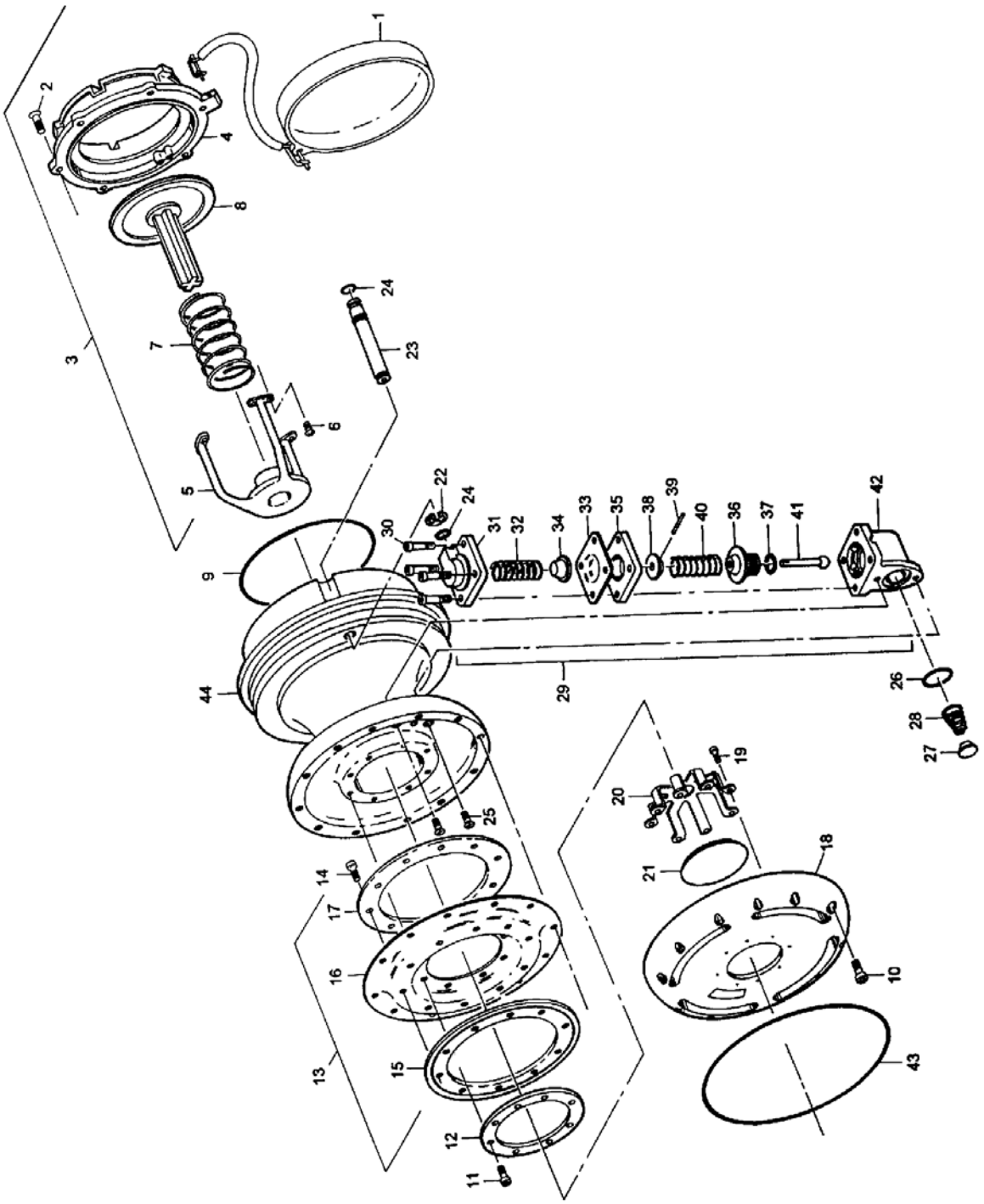
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Figure 1

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