

# OVERFLOW VALUES

**American Bosch** † **Ambac**



Subsidiary of  
**UNITED  
TECHNOLOGIES**

D275/1002  
OVERFLOW VALVE ASSEMBLIES  
Service Instructions

**Springfield, Mass. 01107**

SUPERSEDES MANUAL  
SECTION D275/1002  
ISSUED JUNE, 1967

# **SERVICE INSTRUCTIONS**

For

## **AMERICAN BOSCH OVERFLOW VALVE ASSEMBLIES**

### **DESCRIPTION AND OPERATION**

American Bosch overflow valve assemblies are pressure regulating units which consist of a housing (or valve body), valve, spring and retaining screw. The assembly is threaded into the pump housing or hydraulic head depending on the application. Their function is to maintain a predetermined pressure in the pump gallery or sump.

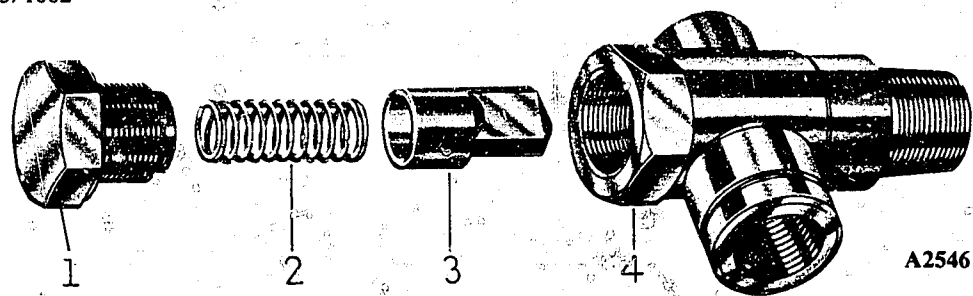


FIGURE 1 - Exploded View of Steel Housing Type Assembly.

1. Overflow valve assembly (steel housing type)

NOTE: Numbers in parentheses refer to illustration numbers in Figure 1.

A. Disassembly

- 1) Clamp hex portion of housing (4) in soft jawed vise.

- 2) Remove retaining screw (1), spring (2) and valve (3) from housing (4).

B. Cleaning

- 1) Wash all parts in Varsol or equivalent cleaning agent.

C. Inspection

Part	Inspect for Following Conditions	Corrective Action
SCREW (1)	Damaged hex; damaged threads or seating surfaces; indentations in excess of 0.005" in spring contact area.	Replace screw
SPRING (2)	Broken, nicked or worn (flat spots on coils).	Replace spring
VALVE (3)	Scored or worn O.D.; scored, worn or damaged seat; indentations in excess of 0.005" in spring contact area.	Replace valve
HOUSING (4)	Damaged threads or screw seating surface; scored, worn or damaged valve seat; scored or worn valve bore; loose cross member; damaged hex; coined valve seat.	Replace housing

D. Reassembly

- 1) Install valve (3), spring (2) and screw (1) into housing (4).

- 2) Clamp hex portion of housing (4) in soft-jawed vise.

- 3) Tighten screw (1) to 20-25 lb. ft. torque.

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### E. Testing

**IMPORTANT:** Perform test on pump with which valve assembly will be used.

1) Install valve assembly onto injection pump.  
NOTE: Use hex of housing (4) to tighten.

2) Fill overflow valve completely with test oil and install pipe plugs in female outlets of housing (4).

3) Using test stand fuel pump, supply test oil to pump at 100 psi for 2-3 minutes; no leakage should occur.

NOTE: Retighten or replace fittings and/or pipe plugs to eliminate leakage.

4) Replace parts if necessary and repeat testing until all leaks are eliminated.

5) Reduce supply pressure to zero and remove 1/4" pipe plug.

6) Connect line for fuel return to tank.

7) Check opening or regulating pressure as follows:

NOTE: Requirement is specified in Manual Section D275/100. Use applicable method.

#### Method I (opening pressure test).

a) Slowly increase pressure in supply system with hand primer or test stand fuel pump.

b) Observe maximum pressure reading on gauge; pressure must be within limits as specified in Manual Section D275/100.

c) Replace spring and/or other faulty parts if required opening pressure is not obtained; then retest.

NOTE: It is not necessary for overflow valve to maintain pressure when fuel system is stopped. However, valve must maintain solid column of fuel in pumping region to insure satisfactory starting characteristics. After overflow valve opens and fuel supply has stopped, observe the rate of pressure drop. Slow to moderate drop indicates that valve will maintain required column of fuel in pump region. Rapid rate of pressure drop indicates valve is not seating properly and required column of fuel will not be maintained; this condition could result in hard starting. Replace part(s) until slow to moderate rate of pressure drop is obtained.

#### Method II (regulating pressure test).

a) Make necessary test stand connections and operate injection pump at low idle speed.

b) Allow pressure to stabilize; pressure must be within limits as specified in Manual Section D275/100.

c) Replace spring and/or other faulty parts if required regulating pressure is not obtained; then retest.

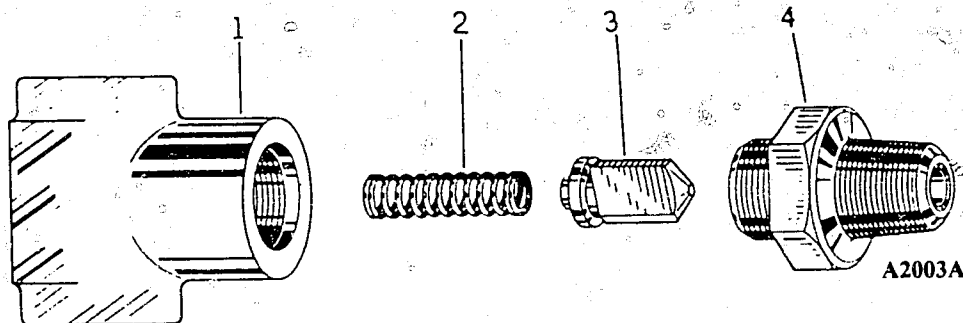


FIGURE 2 - Exploded view of cast iron type assembly

2. Overflow valve assembly (cast iron type)

NOTE: Numbers in parentheses refer to illustration numbers in Figure 2.

A. Disassembly

- 1) Clamp reinforced flats of valve body (1) in soft-jawed vise.

CAUTION: Do not over-tighten in vise or distortion of internal bore and valve seat will occur.

- 2) Remove valve nut (4), valve (3) and spring (2) from valve body (1).

B. Cleaning

- 1) Wash all parts in Varsol or equivalent cleaning agent.

C. Inspection

Part	Inspect for Following Conditions	Corrective Action
VALVE BODY (1)	Cracks, damage, porosity; damaged threads or screw seating surface; indentations in excess of 0.005" ..	Replace complete assembly
SPRING (2)	Broken, nicked or worn (flat spots).	Replace spring
VALVE (3)	Scored or worn piston; scored or worn flutes; nicked, scored, worn or damaged valve seat; indentations of 0.005" in spring contact area.	Replace valve
VALVE NUT (4)	Damaged hex; damaged threads or seating surface; scored, worn, damaged or coined valve seat; scored or worn valve bore.	Replace complete assembly

D. Re-Assembly

- 1) Install spring (2) to counterbore in valve body (1) then assemble valve (3) and valve nut (4) finger tight.

- 2) Clamp reinforced flats of valve body (1) in soft-jawed vise.

CAUTION: Do not over-tighten in vise or distortion of internal bore and valve seat will occur.

- 3) Tighten valve nut (4) to 20-25 lb. ft. torque.

E. Testing

IMPORTANT: Perform test on pump with which valve assembly will be used.

- 1) Install valve assembly onto injection pump.

NOTE: Use hex of valve nut (4) to tighten.

- 2) Fill overflow valve completely with test oil and install pipe plugs in female outlets of valve body (1).

- 3) Using test stand fuel pump, supply test oil to pump at 100 psi for 2-3 minutes; no leakage should occur.

NOTE: Retighten or replace fittings and/or pipe plugs to eliminate leakage.

- 4) Replace parts if necessary and repeat testing until all leaks are eliminated.

- 5) Reduce supply pressure to zero and remove 1/4" pipe plug.

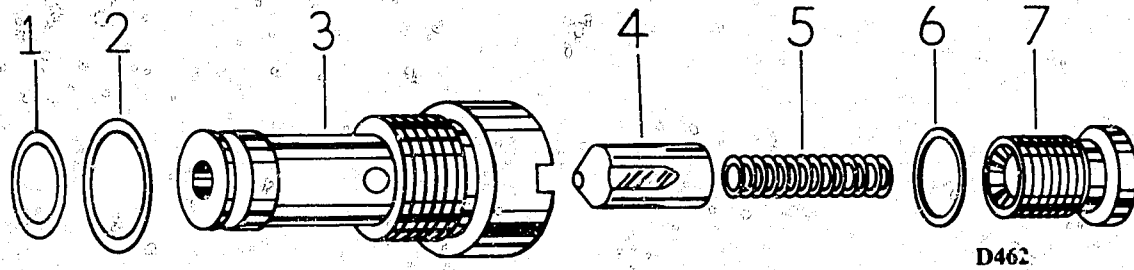
- 6) Connect line for fuel return to tank.

- 7) Check opening or regulating pressure requirement as specified in Manual Section D275/100. Use applicable method as denoted in paragraph 1.E.7 of this section.

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**FIGURE 3.** - Exploded view of assembly used on APE8V pumps.

**3. Overflow valve assembly used on APE8V pumps.**

NOTE: Numbers in parentheses refer to illustration numbers in Figure 3.

**A. Disassembly**

- 1) Remove screw (7) gasket (6) and spring (5) from overflow valve assembly.

- 2) Use modified drag link socket (see Figure 4) to remove valve body (3) from pump housing.

- 3) Disassemble gaskets (1 & 2) and valve (4) from body (3).

**B. Cleaning**

- 1) Wash valve body (3), screw (7), spring (5) and valve (4) in Varsol or equivalent cleaning agent.

**C. Inspection**

<u>Part</u>	<u>Inspect for Following Conditions</u>	<u>Corrective Action</u>
GASKETS (1, 2 & 6)	(Not re-usable)	Replace all gaskets
VALVE BODY (3)	Cracked, damaged threads or O-ring grooves; scored or damaged valve seat or bore.	Replace complete assembly
VALVE (4)	Scored seat or flutes; wear from spring contact.	Replace valve
SPRING (5)	Broken, nicked or worn (flat spots on coils); pitted or corroded.	Replace spring
SCREW (7)	Damaged thread; wear from spring contact.	Replace screw

**D. Reassembly**

- 1) Assemble valve (4), spring (5), copper gasket (6) and screw (7) to valve body (3).

NOTE: Screw should be finger tight.

- 2) Apply film of grease to O-ring gaskets (1 & 2) and assemble gaskets to respective grooves in body (3).

- 3) Use modified drag link socket to tighten overflow valve into pump housing to required torque value (refer to Manual Section D173/3302).

- 4) Use Allen adapter to tighten screw (7) to required torque value (refer to Manual Section D173/3302).

E. Testing

**IMPORTANT:** Perform test on pump with which valve assembly will be used.

- 1) Install pipe plugs to female outlets in pump housing.
- 2) Using test stand fuel pump, supply test oil to pump fuel inlet.

**NOTE:** Insure pump fuel gallery is purged by allowing trapped air to escape.

- 3) Increase test oil supply pressure to 100 psi and hold for 2-3 minutes; no leakage should occur.

**NOTE:** Retighten or replace fittings and/or pipe plugs to eliminate leakage.

- 4) Replace parts if necessary and repeat testing until all leaks are eliminated.

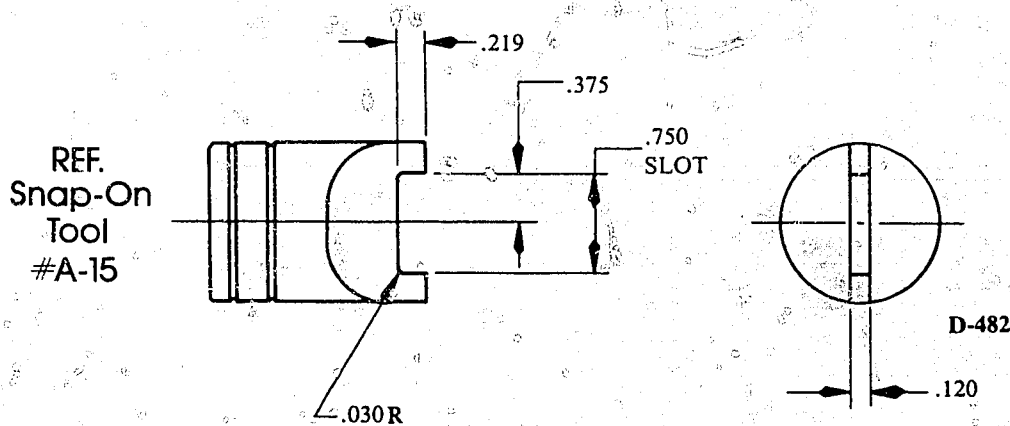
- 5) Reduce supply pressure to zero and remove 1/4" pipe plug.

- 6) Connect line for fuel return to tank.

- 7) Operate injection pump at low idle speed.

- 8) Allow pressure to stabilize; pressure must be within limits as specified in Manual Section D275/100.

- 9) Replace spring and/or other faulty parts if required regulating pressure is not obtained; then retest.



**FIGURE 4 - Modified drag link socket for assembly and disassembly of APE8V overflow valve.**