



INSTRUCTIONS

BULLETIN 947977

OILGEAR TYPE "C" ACCELERATION/DECELERATION OPERATOR FOR TYPE "PVL" UNITS

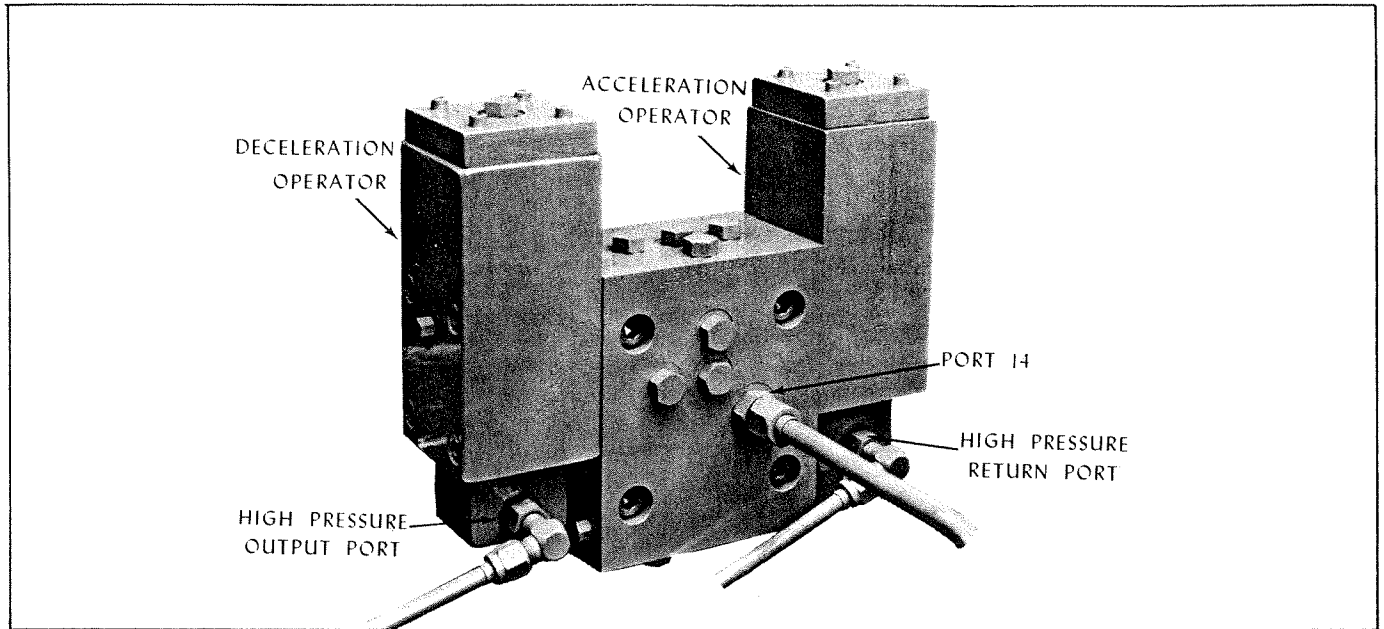


Fig. 1. Type "C" Operator (55267)

REFERENCE BULLETINS

Type "PVL" Pumps w/o Control-	- - - - -	947077
Fluid Recommendations	- - - - -	90000
Piping Recommendations-	- - - - -	90011

TO THE USER AND OPERATOR OF UNITS WITH TYPE "C" OPPOSING OPERATORS:

These instructions are printed to simplify and minimize your work at operating and maintaining Oilgear units with type "C" opposing operators. They will acquaint you with the construction, principle of operation and characteristics of these units. Some operators may be modified from those described in this bulletin and other changes may be made without notice.

I. CONSTRUCTION

The principle components of the type "C" opposing operator are an acceleration operator and a deceleration operator, each with a pilot plunger (365), and auxiliary plunger (363), a spring (372) and spring guide (368) and acceleration/deceleration heads (362 or 378). The acceleration/deceleration operator assemblies are attached to the operator housing (350) which is secured to the pump opposite a main control.

II. PRINCIPLE OF OPERATION (See Page 2)

III. SPECIFICATIONS

(See basic pump instructions.)

IV. MALFUNCTIONS AND CAUSES

- A. ERRATIC OR UNRESPONSIVE CONTROL
 1. Faulty main control (see reference bulletin).
 2. Faulty pump unit (see reference bulletin).
 3. Worn cradle bearings.
 4. Low control fluid pressure.
 5. High pressure relief valve setting below that of "C" operator.
 6. Damaged or disconnected fluid lines from operator ports "10A" and "10B" to unit auxiliary ports.
 7. Improper shimming at pilot plunger spring.
 8. Set Screw (383) improperly adjusted.
 9. Binding, sticking or worn pilot or auxiliary plunger.
 10. Damaged or worn operator piston.
 11. Dirt or foreign material obstructing fluid passages.

V. TESTING AND ADJUSTING

Test and adjust the units high pressure and control pressure relief valves (see basic unit reference bulletin). Operate unit with machine loaded and observe stroke indicator action during acceleration and deceleration.

(Cont'd on page 4)

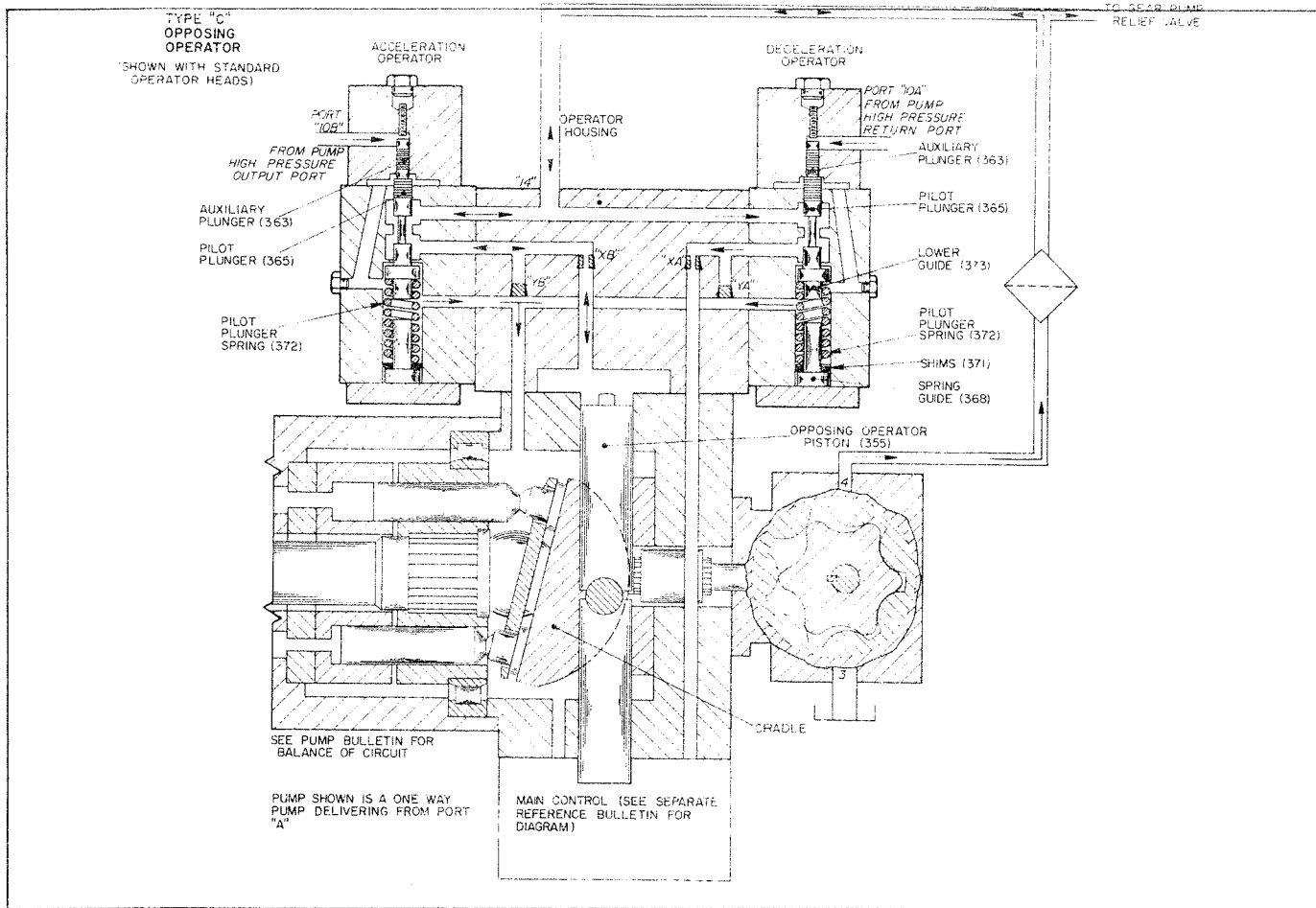


Fig. 2. Cutaway Circuit Diagram, Type "C" opposing operator (509805).

II. PRINCIPLE OF OPERATION (Simplified)

The type "C" opposing acceleration/deceleration operator governs the pump cradle shifting speed (the rate at which delivery can be changed) to prevent the accelerating or braking pressure from exceeding an adjustable preset value. It does this by throttling control fluid to the opposing piston or to the main control piston. When the main control cylinder is drained, control fluid behind the type "C" opposing operator piston shifts the cradle toward the main control. When control fluid is applied behind the main control piston, which must have an area larger than that of the "C" piston, the force generated overcomes the force of the smaller opposing operator piston and the cradle shifts toward the type "C" operator.

The example shown in the cutaway diagram (fig. 2) depicts a one-way pump delivering from port "A". Note that the "C" operator is mounted on the left side of the pump facing the driveshaft.

When the pump goes on stroke, load pressure is developed at pump port "A" and, consequently, acceleration operator port "10B". The auxiliary plunger (363) forces the pilot plunger (365) against spring (372). If pressure on the acceleration operator auxiliary plunger rises above pilot plunger spring setting, (adjustable by shims) the pilot plunger tends to close and throttle gear pump flow into the area behind the opposing operator piston (355) and thus control rate at which pump goes on stroke and the acceleration rate of output load.

When the load is decelerated, the inertia of the load drives the output (motors) which causes pressure to build up at port "B" (pump is stroking toward neutral and will not accept full volume being returned). This pressure is transmitted to deceleration operator port "10A". If pressure on auxiliary plunger rises above pilot plunger spring setting, the deceleration operator pilot plunger tends to close and throttle gear pump flow into the main control and thus control the rate at which the pump goes off stroke and the deceleration rate of output load.

Initial on/off stroke rate (before automatic acceleration/deceleration control over-rides) can also be preset. On standard operator heads, set screw (383) is provided for this adjustment. On alternate operator heads, plugs in ports "YA" and "YB" can be replaced by suitable sized orifices.

Pump pressure port connections to control ports are reversed for one-way pumps delivering from port "B".

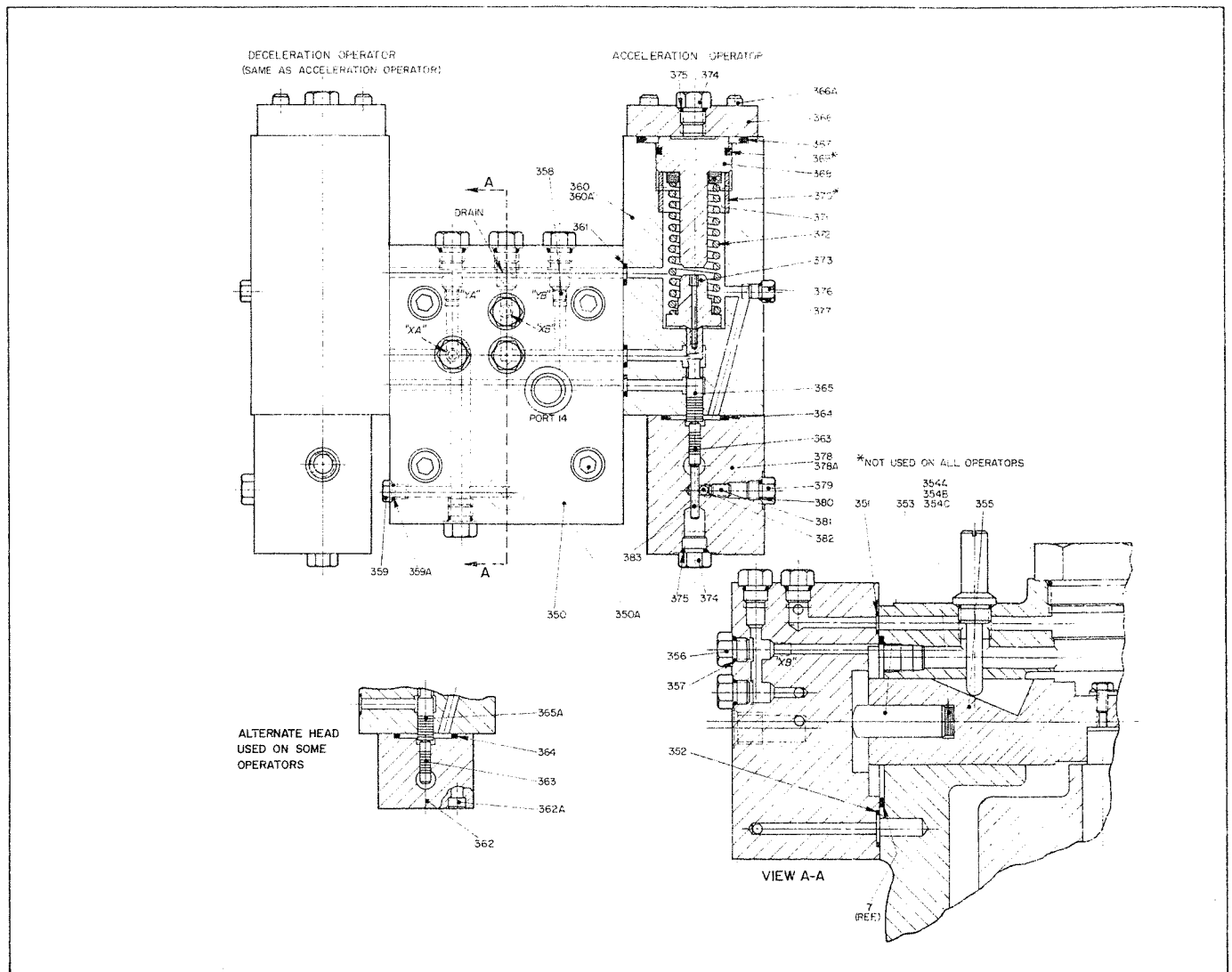


Fig. 3. Parts Drawing, Type "C" opposing operator (509805).

IX. PARTS LIST

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
350	Housing, Acceleration/Deceleration Operator	365	Plunger, Pilot
350A	Screw, Cap	365A	Plunger, Pilot
351	Seal, O'Ring	366	Cover, Operator
352	Seal, O'Ring	366A	Screw, Cap
353	Pin, Push	367	Seal, O'Ring
354A	Shim	368	Guide, Upper Spring
354B	Shim	*369	Packing, Block Vee
354C	Shim	*370	Stop
355	Piston, Opposing Operator	371	Shim
356	Plug, SAE	372	Spring, Pilot Plunger
357	Seal, O'Ring	373	Guide, Lower Spring
358	Plug, Pipe	374	Plug, SAE
359	Plug, SAE	375	Seal, O'Ring
359A	Seal, O Ring	376	Plug, SAE
360	Body, Acceleration/Deceleration Operator	377	Seal, O'Ring
360A	Screw, Cap	378	Head, Acceleration/Deceleration Operator
361	Seal, O'Ring	378A	Screw, Cap
362	Head, Acceleration/Deceleration	379	Plug, SAE
362A	Screw, Cap	380	Seal, O'Ring
363	Plunger, Auxiliary	381	Screw, Set
364	Seal, O'Ring	382	Ball, Nylon
		383	Screw, Set

* Not used on all operators

Parts used in this assembly are per Oilgear specifications. Use Oilgear parts to insure compatibility with assembly requirements. When ordering parts, be sure to specify type designation, serial number stamped on nameplate, bulletin number and item number. Specify type of hydraulic fluid for packings and seals.

O'RING SIZES
(CROSS SECTION x O.D. - DURO ± 5)

ITEM NO.

351	1/16	x	1/2	70
352	3/32	x	7/8	70
357	ARP 906		70	
359A	ARP 902		70	
361	1/16	x	1/2	70
364	1/8	x	1-1/2	70
367	3/16	x	2-1/4	70
375	ARP 906		70	
377	ARP 902		70	
380	ARP 904		70	

(Cont'd from page 1)

Normally, the pump cradle (stroke) will surge initially, then slow and move smoothly. The pump should reach full stroke, "F" mark, at approximately the same time the driven element reaches full speed. Excessive initial surge indicates air in operator or auxiliary plunger, or auxiliary or pilot plungers may be sticking (see sections IV and VII for disassembly and inspection). It may be necessary to adjust (turn in) set screws (383 standard operator) after backing out set screw (381) — or replace orifice plugs in "XA" and "XB" with smaller orifices if alternate operator is used.

To check and adjust acceleration and deceleration operators, install pressure gages (0-6000 psi minimum) in pump high pressure auxiliary ports. Be sure to check and adjust pump high pressure relief valve settings before proceeding (see pump instructions).

To check and adjust acceleration operator, command pump to full stroke. If stroke indicator moves rapidly to full stroke before machine reaches full speed, the "C" acceleration operator setting may be too high. If load does not accelerate rapidly enough, it may be the "C" acceleration operator setting is too low. Observe pressure gages during full stroke with an average load on machine. Initially, a peak approximately equal to pump high pressure output relief valve setting will occur as pump goes approximately on one quarter stroke. Then the pressure should decrease to a "steady value" until machine reaches full speed. "Steady value" reading is "C" acceleration operator pressure setting and should be at least 250 psi below pump's high pressure output relief valve setting. Remove shims (371) to lower setting or add shims to raise setting.

To check and adjust deceleration operator, command pump to neutral (zero stroke). If stroke indicator moves rapidly to neutral before machine halts, the "C" deceleration operator setting may be too high. If load does not decelerate rapidly enough, it may be the setting is too low. Observe pressure gages during deceleration with an average load on the machine. Initially, a peak approximately equal to pump high pressure return relief valve setting will occur, then the pressure should decrease to a steady value until the machine halts. The "steady value"

reading is "C" deceleration operator pressure setting and should be at least 250 psi below pump's high pressure return relief valve setting. Remove shims (371) to lower or add to raise setting.

VI. DISASSEMBLY

Disconnect any external connection. Remove screws (360A) and lift acceleration or deceleration operator body (360) assembly from operator housing (350).

To disassemble acceleration or deceleration operator heads: Remove operator head (378) or (362). Pull out auxiliary plunger (363). Pull out pilot plunger (365 or 365A). Do not remove set screw (381), nylon ball (382) and set screw (383) unless necessary. Take out screws (366A) and lift off operator cover (366). Remove spring guide (368), block vee packing (369, if used) stop (370, if used) and shims (371) being careful to keep them with respective operators spring (372) and lift out lower guide (373).

Remove screws (350A) and lift control housing (350) from pump. Pull out push pin (353) and shims (354 A, B, C) if necessary. Refer to pump bulletin for removal of stroke indicator and control piston (355).

VII. INSPECTION

Clean all parts thoroughly and make sure fluid passages are clean. Inspect auxiliary plunger (363), pilot plunger (365 or 365A) and push pin (353) for signs of excessive wear and replace, if necessary. Be sure the plungers move freely in their bores. Relap or replace, if necessary. Replace O'rings showing signs of hardening, deterioration or damage.

VIII. ASSEMBLY

See basic pump bulletin for replacement of operator piston (355) and stroke indicator. Insert shims (354A, B, C) and push pin (353) into operator piston. Install O'rings (351, 352, 7) and secure operator housing (350) to pump with screws (350A).

Both operators can be assembled as follows. Insert lower guide (373), spring (372), stop (370, if used) into bore. Place shims (370), block vee packing (369, if used), on spring guide (368) and insert into body (360). Install O'rings (367) and secure operator cover (366) with screws (366A). Place pilot plunger (365 or 365A) in bore. Insert auxiliary plunger (363) and O'ring (364) in head (378 or 362) and secure to operator. If removed, insert set screw (383) until it just touches auxiliary plunger and insert nylon ball (382), tighten set screw (381) and install plugs (379 and 374) with O'rings (380 and 375) in place. Return O'rings (361) and secure both acceleration and deceleration operator assemblies to their respective side of control housing (350) with screws (360A). Be sure all O'rings and plugs are in their proper places as shown in parts drawing. Make any external connections necessary.

Test and adjust operators as described in section V.