INSTRUCTIONS

BULLETIN 947801A

OILGEAR TYPE "X" THREE POSITION
ELECTRIC REMOTE CONTROL FOR "D" & "DC" UNITS

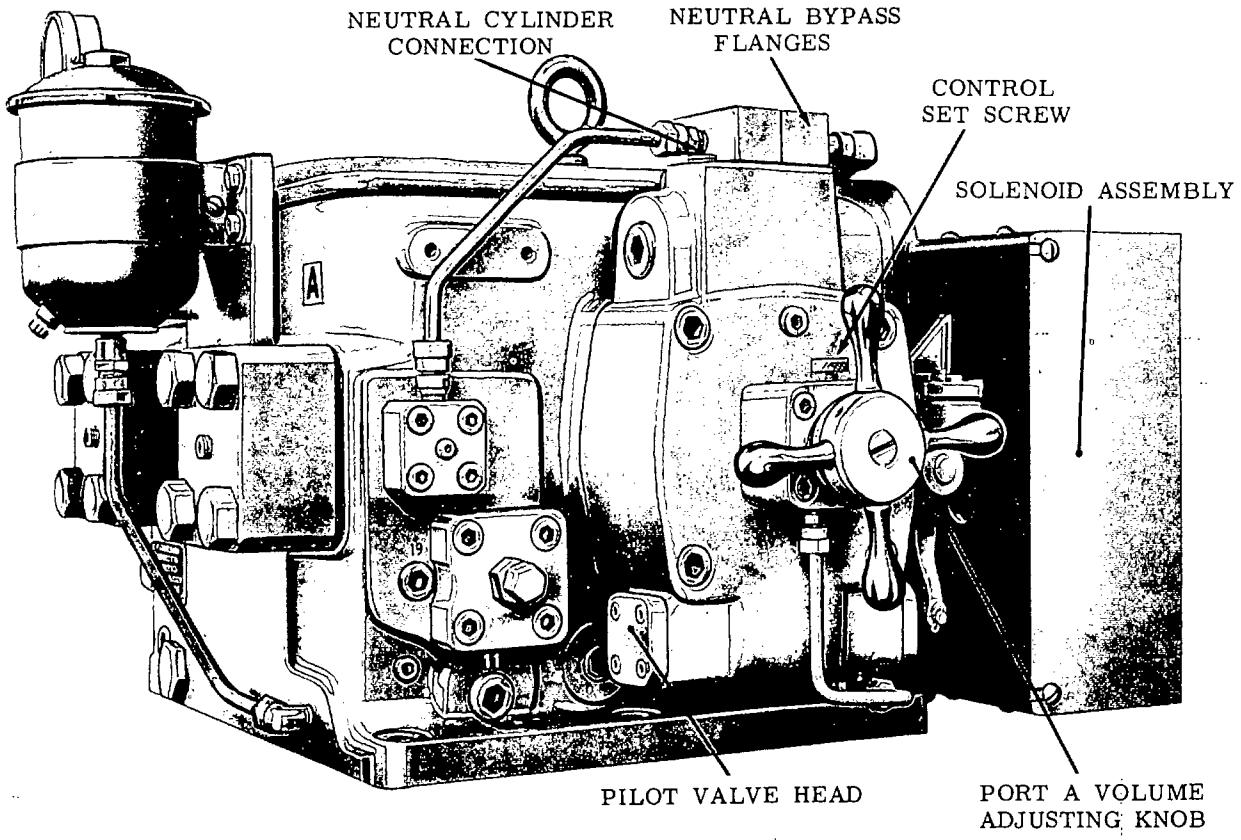

Figure 1. Typical "X" Control on a Type "D" Pump (53266).

REFERENCE INSTRUCTION BULLETINS

Type "D" Pumps without controls---------- 947000
Type "DC" Transmissions without controls---------- 967900

TO THE USER AND OPERATOR OF OILGEAR "X" CONTROLLED UNITS:

These instructions are printed to simplify and minimize your work of operating and maintaining Oilgear "X" controlled units. Your acquaintance with the construction, principle of operation and characteristics of these units will help you obtain optimum performance, reduce shutdowns and increase service life. We feel confident the unit will operate to your satisfaction if these instructions are adhered to. Some controls have been modified from those described in this bulletin for specific applications.

I. CONSTRUCTION.

The control consists of dual, pull type, solenoids (325) connected to a spring centered pilot valve plunger (318), a neutral control piston (312), a control piston (301), a neutral adjusting screw (310), and adjusting screw (313) with knob (341). The opposing control is usually a type "L" adjustable hydraulic operator. See "Standard Opposing Operators." Some units use two controls for additional functions.

II. PRINCIPLE OF OPERATION.

See reference instruction bulletin for radial piston unit principle of operation. The "X" control is usually mounted on left side of unit when facing the drive-shaft and provides remote pushbutton or switch selection of adjustable preset slideblock positions on either side of neutral and neutral on two-way units; or one adjustable preset position, one preset position (both on same side of neutral) and a neutral position on one-way units.

THE Oilgear COMPANY
2300 So. 51st St., Milwaukee, WI 53219

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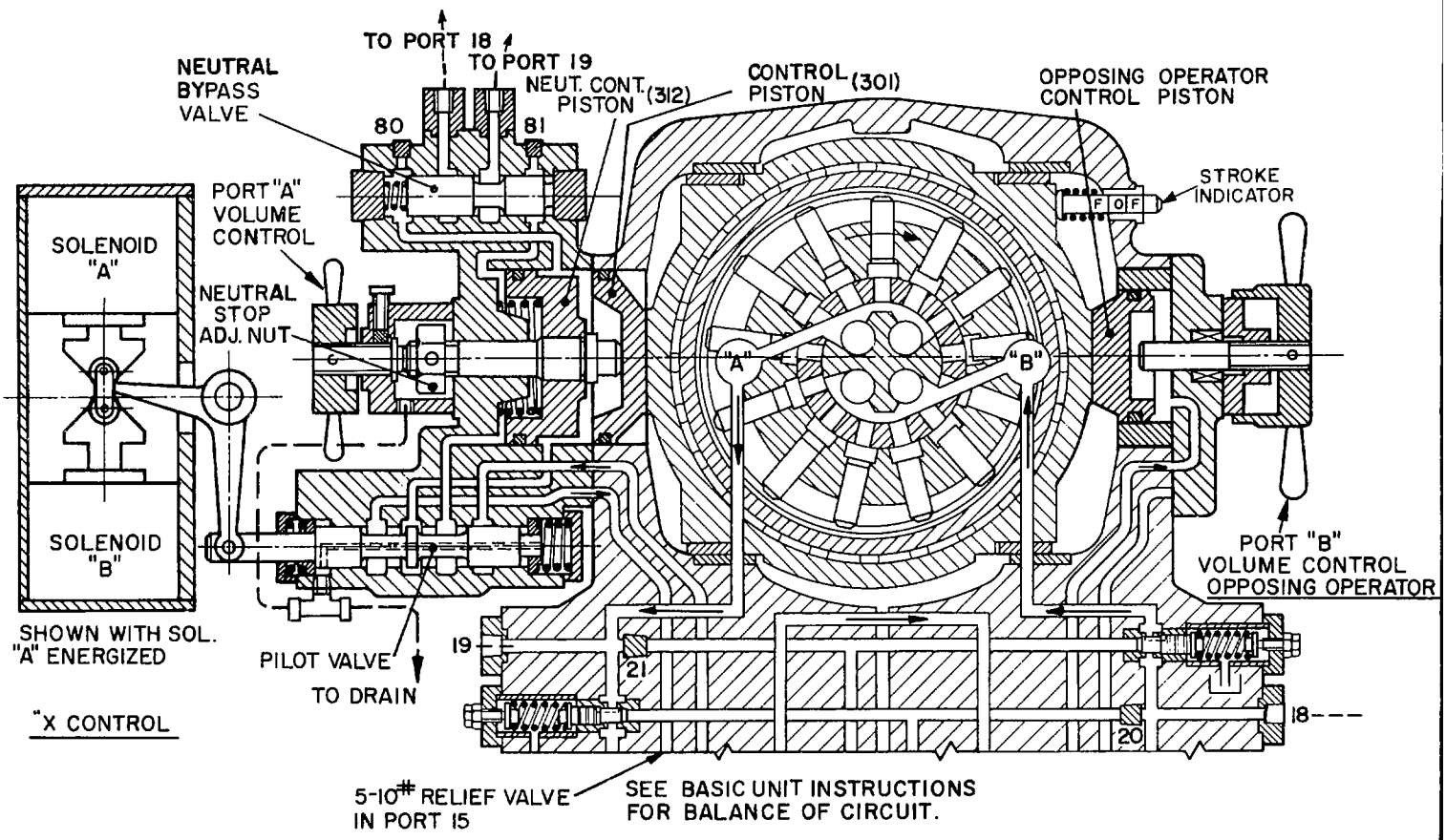


Figure 2. Cutaway Diagram of "X" Controlled Units DS-947820 G (53950G)

See figure 2. Energizing solenoid "A" moves pilot valve plunger to the left, blocking control fluid and connecting neutral piston (312) and control piston (301) chambers to drain thru a 5 to 10 lb. relief valve installed in port 15 (not used on transmissions). Control fluid, always present behind the opposing operators small area piston, forces the slideblock to the left until the control piston (301) and neutral stop adjusting screw meets port "A" volume control adjusting screw. Port "A" volume control adjusts the displacement of the unit port "A" side when solenoid "A" is energized.

Energizing solenoid "B" moves the pilot plunger to the right, control fluid is directed to both large area neutral (312) and control (301) piston chambers. Fluid is directed to both ends of the bypass valve - thus no movement of it is effected. The force behind these pistons overcomes the opposing operator control piston force and moves slideblock to the right until the opposing operator piston meets port "B" volume adjusting screw. The opposing operator adjusting knob controls displacement of the unit on port "B" side when solenoid "B" is energized. On one-way units it is set for neutral.

Deenergizing both solenoids allows the spring to center the pilot plunger. Control fluid is directed to the neutral piston (312) chamber and the control piston (301) chamber is connected to drain. Movement of pistons (301 & 312) toward the right is limited by the neutral stop adjusting nut (on two-way units, this nut is normally set for neutral). Control pressure is also directed to the end of the neutral bypass valve, pushing it to the left. Bypass valve connects ports 18 (or B) and 19 (or A) to bypass any minute delivery out of these ports. On some units, the bypass pipes are omitted or the neutral bypass plunger is blocked in the closed position.

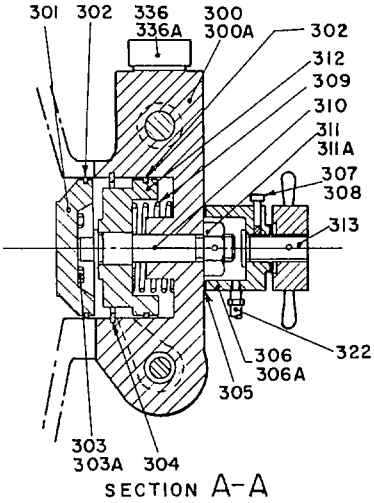
III. SPECIFICATIONS.

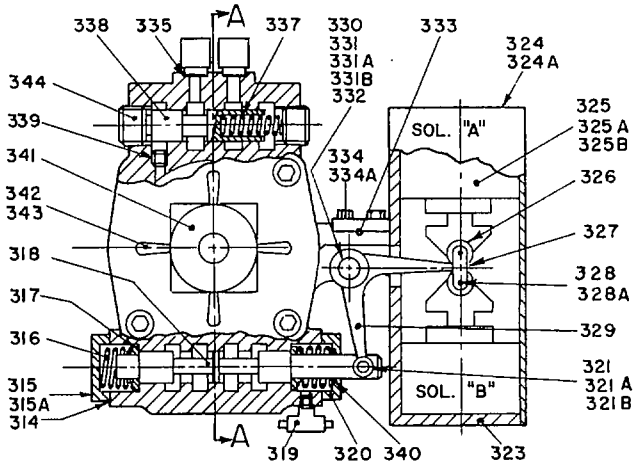
A. Maximum eccentricity, in inches.
B. Bypass plunger travel, in inches.
C. Pilot valve travel (each way from center), in in.

Unit Size	A	B	C
2	.150	11/32	11/32
4	.198	11/32	11/32
8	.187	1/2	7/16
12	.250	1/2	7/16
20	.250	1/2	7/16
35	.375	1/2	7/16
60	.375	1/2	7/16
100	.406	9/16	5/8
150	.531	9/16	5/8

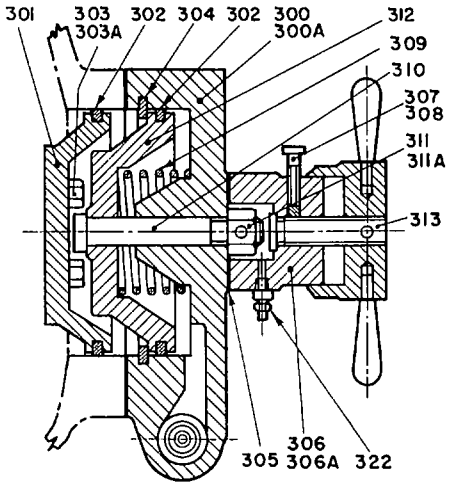
Continued on Page 4.

SIZE 4 THRU 35 CONTROLS





SIZE 60, 100 & 150 CONTROLS



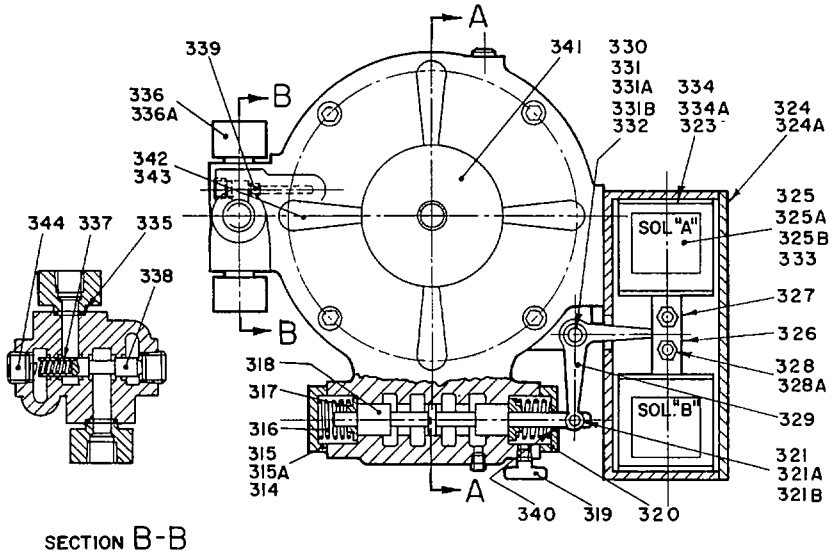


Figure 3. Parts Drawing, Type "X" Control, DS-947801-F (53364-F).

Part No.	Description	Part No.	Description	Part No.	Description
300.	Housing, Control	315A.	Screw, Sock. Hd. Cap	329.	Lever, Operating
300A.	Screw, Sock. Hd. Cap	316.	Spring, Centering	330.	Bushing, Oilite
301.	Piston, Control	317.	Seat, Valve Spring	331.	Pin, Lever
302.	Ring, Piston	318.	Plunger, Pilot Valve	331A.	Pin, Taper
303.	Screw, Control Piston	319.	Assembly, Tubing	331B.	Screw, Sock. Hd. Set
303A.	Gasket, Screw	320.	Head, Pilot Valve	332.	Collar, Lever
304.	Ring, Snap	321.	Pin, Valve Plunger	333.	Shims
305.	Gasket, Gland	321A.	Washer, Flat	334.	Screw, Hex. Hd. Cap
306.	Gland, Adj. Screw	321B.	Key, Cotter	334A.	Washer, Lock
306A.	Screw, Sock. Hd. Cap	322.	Assembly, Tubing	335.	Gasket, Flange
307.	Screw, Set.	323.	Bracket, Solenoid	336.	Flange, Bypass
308.	Plug, Brass	324.	Cover, Solenoid	336A.	Screw, Sock. Hd. Cap
309.	Spring, Neutral Piston	324A.	Screw, Rd. Hd. Mach.	337.	Spring, Bypass
310.	Screw, Neutral Adjusting	325.	Assembly, Solenoid	338.	Plunger, Bypass
311.	Nut, Adj. Screw	325A.	Screw, Rd. Hd. Mach.	339.	Plug, Orifice
311A.	Pin, Dowel	325B.	Nut, Hexagon	340.	Seal, Block Vee
312.	Piston, Neutral	326.	Roller, Solenoid	341.	Knob, Control
313.	Screw, Stroke Adj.	327.	Link, Solenoid	342.	Handle, Knob
314.	Gasket, End Head	328.	Pin, Solenoid	343.	Pin, Taper
315.	Head, Pilot Valve	328A.	Nut, Lock	344.	Cap, Bypass Plunger

When ordering replacement parts, be sure to include unit's serial number, part number and data sheet (DS-) number. Specify type of hydraulic fluid for O'rings and seals.

IV. MALFUNCTIONS & CAUSES.

A. SLUGGISH OR UNRESPONSIVE CONTROL.

1. Low control pressure (see unit instruction).
2. Binding pilot plunger, control pistons or bypass valve.
3. Broken neutral control piston spring.
4. Broken or binding solenoid linkage.
5. Broken neutral stop adjustment screw.
6. Defective solenoids or electrical circuit.
7. Relief valve in port 15 faulty.
8. Excessive leakage past control piston rings.

B. LOSS OF PRESSURE OR VOLUME.

1. Broken spring or sticking bypass plunger spring.
2. Faulty radial piston unit.

V. ADJUSTING.

Back off set screws (307). Turning adjusting knobs clockwise decreases delivery or speed and counter-clockwise increases delivery or speed. DO NOT exceed "F" (full eccentricity) position on indicator stem. Neutral position is set and pinned at the factory. If adjustment is necessary, remove adjusting knob, gland (306) and drive pin (311A). Turn the nut clockwise for adjustment toward the "A" side. Drill new hole in screw to lock nut with pin.

VI. DISASSEMBLY.

Observe positions of all parts, seals, gaskets, plugs during disassembly. Some controls vary from those illustrated and the parts must be returned to their original positions. Disconnect bypass lines and remove flanges (336) from control. Remove drain lines and unscrew cap screws (300A) holding control housing to pump case. Remove solenoid assembly (323) and pilot valve lever assembly (329). Remove pilot valve heads (315 and 320), springs (316), spring seats (317) and plunger (318). Unscrew pipe plug (344) and withdraw bypass plunger (338) and spring (337). Remove handles (342) and drive taper pin (343) from screw and knob (341) and remove knob. Remove screws (306A) and control gland (306) with adjusting screw (313) as an assembly. When disassembling neutral stop assembly, mark position of nut (311) on adjusting screw (310). Remove pin (311A) and turn nut (311) off of shaft. Remove snap ring (304) (some controls may not have this ring) in control cylinder and withdraw neutral control piston (312), spring (309) and adjusting screw (310). To remove control piston from slideblock, cut iron wire, unscrew bolts (303), remove gaskets (303A) and withdraw piston (301).

VII. INSPECTION.

Clean all parts thoroughly. Make certain both neutral bypass and pilot valve plungers are free of burrs and scratches. Inspect plunger bores for grooves or scratches. Lap or polish if necessary (be sure to remove lapping compound). Check for cracked, broken or worn control piston rings.

VIII. ASSEMBLY.

Anneal copper gaskets. Bolt control piston (301) with piston ring (302) to slideblock and secure bolts (303) and gaskets (303A) with soft iron lock wire. When installing neutral stop assembly, be sure to include control spring (309) between neutral control piston (312) and control housing. Pin nut (311) to adjusting screw (310). Install snap ring (304), if used, in groove in control cylinder making certain ends of snap ring straddle passage to neutral bypass valve. Mount control housing (300) on pump case making certain holes in housing gasket match holes in control housing and pump case. Insert pilot valve plunger (318) in control housing and install spring seats (317), springs (316), valve heads (315 and 320) with gaskets (314) and seal (340).

Install pilot valve lever (329) and solenoid bracket (323) with solenoid assembly. Check to be certain the springs center the pilot valve (318). If necessary, adjust solenoid lever linkage or plunger to eliminate any binding. Assemble neutral bypass valve (338) with plunger travel shown in III-B. Make certain bypass valve is assembled with spring (337) on correct end. Install control gland (306) with volume adjusting screw and knob assembly. Connect drain pipes to control gland and level end of pilot valve. Reinstall bypass flanges (336) and lines to controls. Adjust as outlined in section V.