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Edmonton

SERVICE MANUAL No. I-0051

2" ANSI 600 MULTI-PORT SELECTOR VALVE

CUSTOMER: _____

P.O.#: _____

W.O.#: _____

TAG: _____

DATE: _____

APPLIES TO OPERATOR MODEL: _____

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I INTRODUCTION

As many as eight flow lines can be manifolded through one Bettis Multiport Selector Valve. The valve allows diversion of an individual flow-line to a test outlet for testing or sampling, while combining the flow of the other seven into a separate group outlet.

II VALVE SPECIFICATIONS

		RATING		CONNECTION			WEIGHT
BODY MATERIAL	TRIM	MAXIMUM WORKING PRESSURE PSIG	WORKING TEMP °C	EIGHT FLOWLINE INLET PORTS	ONE TEST OUTLET PORT	ONE GROUP OUTLET PORT	VALVE lbs.
DUCTILE IRON	STD.	1000	200	2 NPT	2 NPT	4 NPT	140
	HIGH TEMP	1440	260				
CAST STEEL	STD.	1000	200				
	HIGH TEMP	1440	260				

Cv = 67 FOR TEST OUTLET FLOW

Cv = 164 FOR GROUP OUTLET FLOW

SHELL HYDROSTATIC TEST PRESSURE = 2000 PSIG (13780 kPa)

STANDARD TRIM

MAXIMUM DIFFERENTIAL: TEST - GROUP = 120 PSIG (825 kPa)

MAXIMUM DIFFERENTIAL: GROUP - TEST = 80 PSIG (550 kPa)

HIGH TEMPERATURE TRIM

MAXIMUM DIFFERENTIAL: TEST - GROUP = 200 PSIG (1375 kPa)

MAXIMUM DIFFERENTIAL: GROUP- TEST = 120 PSIG (825 kPa)

INTERMITTENT SEAL EXPOSURE AT 285°C FOR 15 MINUTES WITH A MAXIMUM BODY PRESSURE OF 1100 PSIG AND MAXIMUM DIFFERENTIAL.

ACTUATOR SPECIFICATIONS

PLUG POSITION TOLERANCE: ±2°

TORQUE @ MAXIMUM DIFFERENTIAL SHOULD BE BETWEEN 35 AND 50 ft.lbs.

ACTUATOR SPEED: 1.4 RPM

ACTUATOR WEIGHT: 50 lbs.

POSITION ACCURACY: ±1°

III VALVE ASSEMBLY

Refer to typical valve assembly drawing on page 6, and valve detail drawing on page 7.

Ensure all the parts are clean and in good condition before assembling the Multiport Selector Valve. Use Esso Valve Grease No. 1, or a suitable equivalent, to lubricate the components.

A. BODY: (10)

1. Visually inspect internal and external surfaces and threads.
2. Install the teflon / 25% carbon bushing (20).

B. PLUG: (30)

1. Lubricate and install the lower plug o-ring (32) with the teflon backup ring (36) "above" the o-ring.
2. Lubricate and install the seal adjusting nut (38) with five wave springs (40) followed by the wave spring backup (43). Make sure these springs are placed properly on the step of the adjusting nut behind the plug seal. If these springs are not in the proper place, it is impossible to get the plug seal (42) to hold pressure.
3. Lubricate and place the o-ring (48) and two teflon backup rings (52) in the plug seal groove, then install the plug seal (42).

NOTE: Push seal in by hand only.

4. Install the circular scraper (54) with two wave springs (58).

NOTE: Apply a small amount of grease to the springs so they can stay in place during assembly. Make sure the scraper fits freely in the plug bore. To check, push in at both sides by hand, then let go and see if the scraper returns to its original position.

5. Place the plug (30) in the body making sure that the plug seal and scraper are flush with the plug bore (or has enough clearance between the scraper and the body bore to prevent contact).
6. Install and grease the bearing cone (60).

C. BONNET: (62)

1. Lubricate and install the bearing cup (60) inside the bonnet.
2. Lubricate and install the o-ring (66) with the teflon backup ring (70) "above" the o-ring in the inner groove.
3. Lubricate and install the o-ring (74) in the outer groove.
4. Install the wiper (72) and the grease nipple (78)

NOTE: Grease to flush and fill passage at this time.

5. Set the bonnet in place with the actuator mounting holes straddling centreline of the "group outlet" port, ensuring that the bonnet is placed flat on top of the valve body to prevent damage to the o-ring (66). Place bonnet such that the 1/2 NPT vent plug (68) is located over the group outlet.

NOTE: Push bonnet down only by hand or rubber mallet.

6. Install studs (80) with anti-seize lubricant C5-A high-temp copper compound, or a suitable equivalent.
7. Tighten two of eight bonnet nuts (82) at 180° interval, then ensure that the plug (30) rotates freely through a complete revolution.
8. Tighten the remaining nuts after confirming that the bonnet (62) and plug (30) have been centered. Torque the nuts to 100 ft.lbs.
9. Adjust the plug seal (42), by first aligning the plug (30) with an open (ie. home test) port, then turn the adjusting nut (38) counter clockwise, viewing towards the valve centerline, with adjusting tool until the scraper (54) just touches the inside wall surface.
10. Rotate plug (30) at least one revolution and check for binding or excessive turning torque (ie. it should be 3 to 4 ft. lbs), then tighten the adjusting nut (30) with the supplied adjusting tool counter clockwise, viewing towards the valve centerline, to 35 ft.lbs. of torque.

NOTE: Do not overtighten the adjusting nut (38).

11. Turn the plug (30) at least one revolution and check for smooth movement. If plug seal (42) is binding at each port (30) when plug (30) is rotating, that means either the plug seal or the wave springs (40) are not in the proper position. See disassembly procedure below if required.
12. Install vent plug (68) in the bonnet port.
13. Perform any required leakage test(s).

IV VALVE DISASSEMBLY

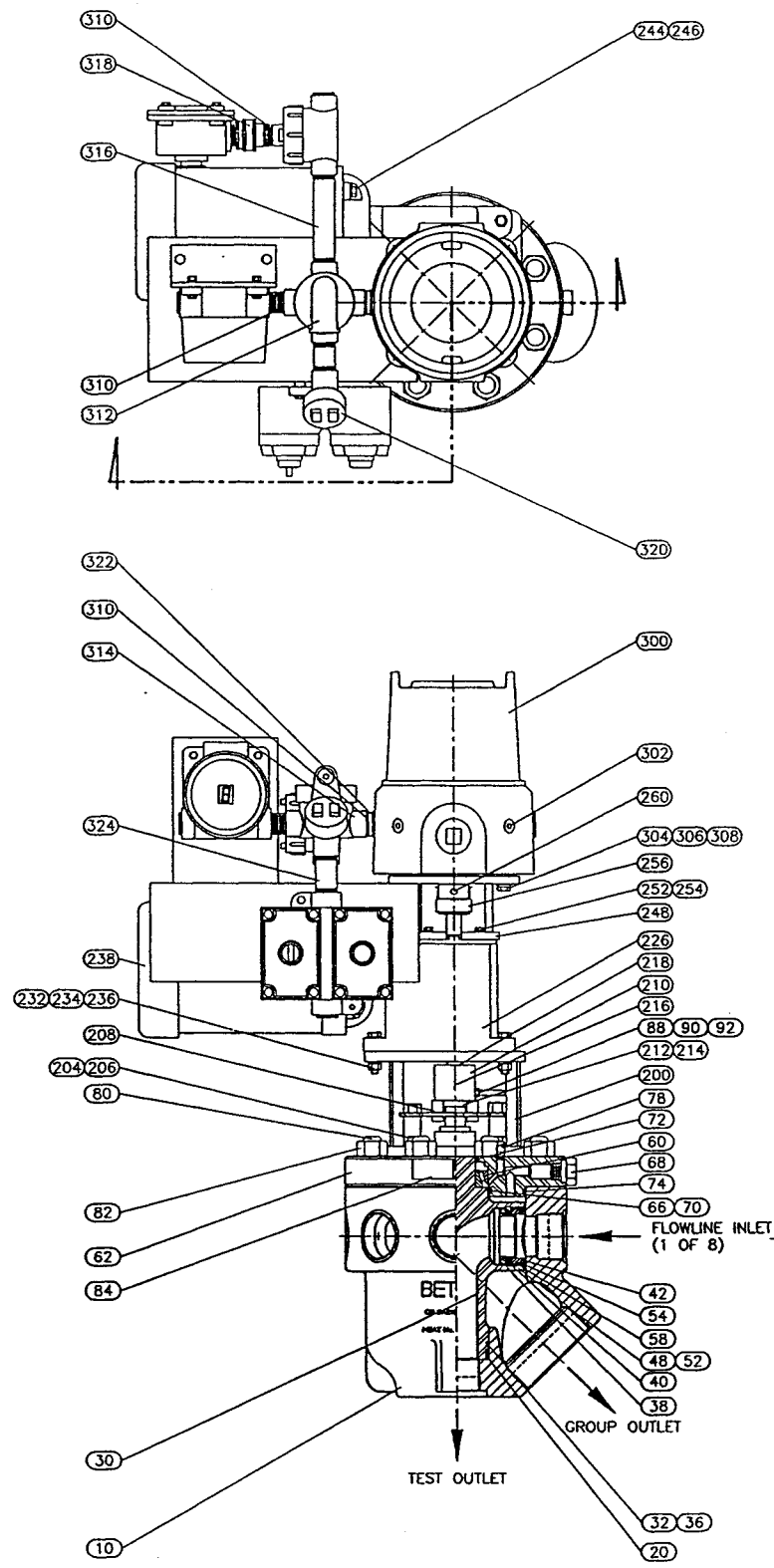
Refer to typical valve assembly drawing on page 6.

1. Release the pressure to zero before proceeding.
2. Remove plug or fitting from port for access and turn the seal adjusting nut (38) clockwise to release load on plug seal (42) and scraper (54) to clear body bore.
3. Remove the eight bonnet nuts (82) and studs (80). Remove the bonnet (62) with a straight lift along the axis.

NOTE: Bonnet has two 1/2NC tapped holes that can be used for lifting.

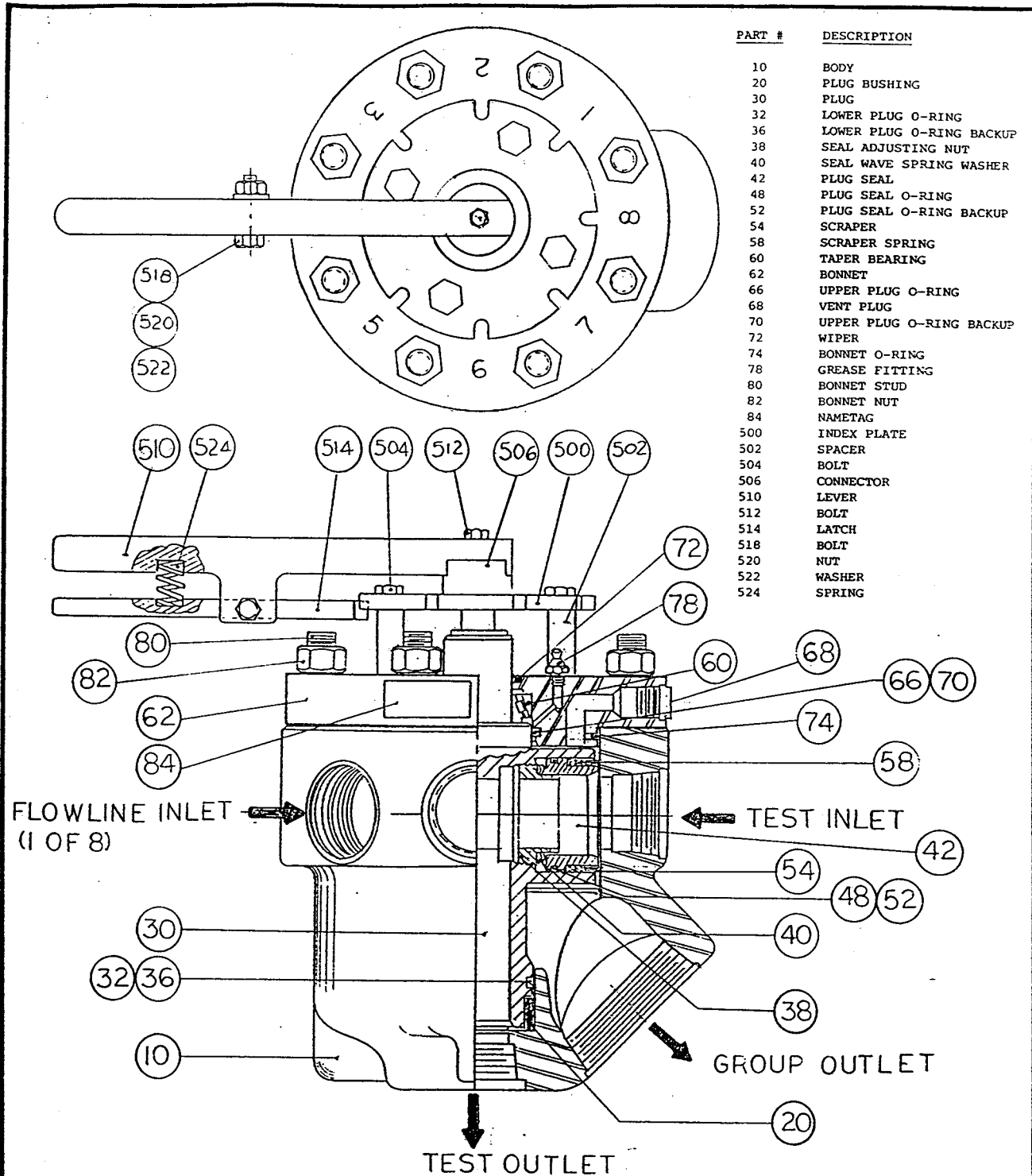
4. Remove the plug (30) from the valve body (10).

ITEM	DESCRIPTION
10	BODY
20	PLUG BUSHING
30	PLUG
32	O-RING, LOWER PLUG
36	O-RING BACKUP
38	SEAL ADJUSTER NUT
40	WAVE SPRING WASHER
42	PLUG SEAL
48	O-RING, PLUG SEAL
52	O-RING BACKUP
54	SCRAPER
58	SPRING, SCRAPER
60	TAPER BEARING
62	BONNET
66	O-RING, UPPER PLUG
68	VENT PLUG
70	O-RING BACKUP
72	WIPER
74	O-RING, BONNET
78	GREASE FITTING
80	BONNET STUD
82	BONNET NUT
84	NAMETAG
88	INDICATOR
90	BOLT, INDICATOR
92	NUT, INDICATOR
200	PEDESTAL, VALVE
204	BOLT, PEDESTAL
206	FLATWASHER, PEDESTAL
208	CONNECTOR, LOWER
210	CONNECTOR, UPPER
212	BOLT, CONNECTOR
214	LOCKNUT, CONNECTOR
216	SET SCREW, CONNECTOR
218	KEY, REDUCER
226	SPEED REDUCER
232	BOLT, REDUCER
234	NUT, REDUCER
236	FLATWASHER, REDUCER
438	MOTOR
244	BOLT, MOTOR
246	LOCKWASHER, MOTOR
248	PEDESTAL, SWITCHPAK
252	BOLT, PEDESTAL
254	WASHER, PEDESTAL
256	CONNECTOR, SWITCHPAK
260	SETSCREW, CONNECTOR
300	SWITCHPAK
302	PORT PLUGS
304	BOLT, SWITCHPAK
306	NUT, SWITCHPAK
308	FLATWASHER, SWITCHPAK
310	NIPPLE
312	ELBOW
314	SEAL
316	NIPPLE
318	UNION
320	CAPPED ELBOW
322	REDUCER
324	NIPPLE



NOTE: ILLUSTRATES ESSENTIAL PARTS AND CONSTRUCTION
END CONNECTIONS MAY VARY

UNLESS SPECIFIED OTHERWISE ALL DIMENSIONS INCHES (mm)		BETIS BETTIS CANADA LTD. Actuators & Controls	
REDDRAW, UPDT STD RS-1996-07-24 @ HRP REQ VENT PLUG AA-1988-09-23 @ HRP REQ		ASSEMBLY FOR NPS 2 X 4 MULTI-PORT SELECTOR VALVE WITH ACTUATOR GROUP OUTLET AT 45°	
REV BY-DATE-REF	A-0272--DWG_VIEW_00 JAL-24-96	WEIGHT	350 LB
TOLERANCES XXX ±0.5 (±10) XX ±0.2 (±5) X ±0.1 (±2)	SCALE 1:6 BY AA V.D. 1154-E	CHK W. J. 1988-09-24	DATE APR-01-87
		DWG. NO.	AB0272
		REV	2-



PART #	DESCRIPTION
10	BODY
20	PLUG BUSHING
30	PLUG
32	LOWER PLUG O-RING
36	LOWER PLUG O-RING BACKUP
38	SEAL ADJUSTING NUT
40	SEAL WAVE SPRING WASHER
42	PLUG SEAL
48	PLUG SEAL O-RING
52	PLUG SEAL O-RING BACKUP
54	SCRAPER
58	SCRAPER SPRING
60	TAPER BEARING
62	BONNET
66	UPPER PLUG O-RING
68	VENT PLUG
70	UPPER PLUG O-RING BACKUP
72	WIPER
74	BONNET O-RING
78	GREASE FITTING
80	BONNET STUD
82	BONNET NUT
84	NAMETAG
500	INDEX PLATE
502	SPACER
504	BOLT
506	CONNECTOR
510	LEVER
512	BOLT
514	LATCH
518	BOLT
520	NUT
522	WASHER
524	SPRING

REVISION/DATE
MATERIAL/FINISH

UNLESS SPECIFIED OTHERWISE ALL DIMENSIONS IN INCHES.	
TOLERANCES:	
DECIMALS	FRACTIONS
.x ± 0.05	500 xx - $\frac{x}{500}$ ± 1/16
.xx ± 0.02	250 x - $\frac{x}{250}$ ± 1/32
.xxx ± 0.005	125 $\frac{x}{125}$ ± 1/64
T.I.R. ± .010	∠ ± 1°
BREAK SHARP EDGES CHAMFER FIRST THREAD REMOVE ALL BURRS	

BETTIS BETTIS CANADA LTD.
Actuators & Controls

LEVER OPERATED FOR
MULTIPOINT SELECTOR VALVE
AT 45° GROUP OUTLET

SCALE = 1/4	W.O. # PART #	DRAWING NO. C-0114
DRAWN AA	CHECKED	DATE 88-09-14
		REV.

V ACTUATOR ASSEMBLY

A. PEDESTAL, CONNECTOR, SPEED REDUCER AND MOTOR

Refer to typical valve assembly drawing on page 6.

1. Set the speed reducer pedestal (200) in place.
2. Install two bolts (204), two lockwashers (206), two spacers (201), two studs (203), four nuts (205), and four flatwashers (207) with indicator plate (202).
3. Install the lower connector (208).
4. Install the indicator (88) on the upper connector (210).
5. Install the upper connector (210) with setscrew (216) started.
6. Install the speed reducer (226) with key (218) and four bolts (232), lockwashers (236) and nuts (234).
7. Check for free rotation between connector halves to confirm shaft alignment. Adjust if necessary.
8. Tighten all mounting bolts and nuts.
9. Install and tighten the connector bolt (212) and locknut (214) and tighten the setscrew (216).
10. Install the motor (238) with four bolts (244) and lockwashers (246). Align and tighten.

B. LOCAL STEPPING COMMAND ELECTRICAL CONDUIT, SWITCHPAK PEDESTAL AND CONNECTOR

Refer to the local stepping command electrical assembly drawing on page 13.

1. Set the Switchpak pedestal (449) in place and install four studs (452), four flatwashers (455), four lockwashers (453), and four nuts (454).
2. Install the Switchpak connector (457) on the speed reducer shaft, followed by the Switchpak coupling (455) and the Switchpak coupling adapter.
3. Off of the Switchpak pedestal, assemble the Switchpak (300), 1 NPT x 3/4 NPT reducer (322), two 3/4 NPT close nipples (310), seal enclosure (315), seal cover (314) and the junction box (370).
4. Position the Switchpak and junction box assembly on the pedestal using the spacers (371), bolts (372), lockwashers (374) and nuts (373), engaging the Switchpak coupling adapter.
5. Install the four Switchpak bolts (458) and lockwashers (462).

6. Off the Switchpak pedestal assemble the push button station (350), local/remote switch (355), jog push button (356), 3/4 NPT capped elbow (321), 3/4 NPT x 2.50 long nipple (317) and 3/4 NPT x 3.00 long nipple (318). Thread into the seal enclosure until the back of the push button station is flush with the Switchpak pedestal. Loosely install the push button station bolts (351), lockwashers (354) and nuts.
7. Between the motor terminal box (438) and the seal enclosure, install one 3/4 NPT close nipple (310), one 3/4 NPT x 3.00 long nipple (318), one 3/4 NPT x 3.25 long nipple (311), one 3/4 NPT x 3.50 long nipple (312), two 3/4 NPT capped elbows (321), and the 3/4 NPT union (320).
8. Install all wiring according to the applicable wiring diagram and local regulations.
9. Check shaft alignment by rotating both shafts independently, without binding occurring in the connector. Adjust if necessary.
10. With the Switchpak relay bracket and push button station aligned on the Switchpak pedestal, tighten all mounting bolts, nuts and setscrews.

VI CAM ADJUSTING

Refer to Switchpak assembly drawing on page 12 and the typical wiring diagram on page 16.

A. Objective: To align valve plug (130) at each port upon application of command signal to electric actuator.

B. Pre-requisites

1. Switchpak is assembled and installed according to factory specifications.
2. Typical wiring and controls are according to wiring diagram on page 16, and the eight on/off command switches and main on/off switch (disconnect means) are in place.
3. Power supply is present.
4. Connections
 - a) Terminals 13 and 14 connect 110 VAC electrical supply.
 - b) Terminals 11 and 12 connect 24 VDC command electrical supply with the positive (+) lead to terminal 12.

NOTE: The negative (-) will be connected to terminals 1 through 8 as the desired port is selected. The 24 VDC electrical supply should have an ON/OFF switch to isolate it from the unit while adjustments are being made.

C. Before proceeding with cam adjustment, ensure that:

1. All port plugs are removed; or the indicator is in place accurately, whichever is applicable, to check for plug (130) and port position.
2. Cam setscrew (12) is flush with cam (10) and the signal adjuster screw (13) standout is just sufficient to trigger microswitch (16).
3. Limit switch No. 1 (lowest on stack) corresponds with Port #1.

NOTE: If signal adjuster screw (13) standout is excessive, it could damage the microswitch (16) or lever during rotation. Notice that since cam setscrew (12) is opposite to signal adjuster screw (13) on each cam, some cams can be preset to reduce trial and error repetitions.

D. Cam Adjusting Procedure:

NOTE: Before locking each cam (10) in place, confirm that signal adjuster screw (13) standout is just sufficient to actuate microswitch (16).

1. Close main switch and command switch #1 to start actuator, then open main switch manually when plug (130) and port #1 are aligned.
2. Rotate cam #1 until the signal adjuster screw (13) triggers the switch then advance the cam, radially approximately 1° , to account for the motor and drive train momentum to preset cam #1.

With the plug (130) still aligned to #1 port, make the following preliminary adjustments:

NOTE: Opposing ports (180° to each other) can be preset.
i.e. number 4 port is opposite to number 8.

3. Preset cam #5. Align the trigger screw of cam #5 with the setscrew of cam #1. To tighten cam #5 setscrew, insert Allen key between the two switch stacks.
4. Apply power (connect negative to terminal #2, turn switch on and off) and manually stop at port #2. Adjust cam #2 as per step 2 above.
5. Preset cam #6. Align the trigger screw of cam #6 with the setscrew of cam #2. Again, to tighten the setscrew, insert the Allen key between the two switch stacks.
6. Apply power (connect negative to terminal #3, turn switch on and off) and manually stop at port #3, adjust cam #3 as per step 2 above.
7. Preset cam #7. Align the trigger screw of cam #7 with the setscrew of cam #3 and tighten.

8. Apply power (connect negative to terminal #4, turn switch on and off) and manually stop at port #4. Adjust cam #4 as per step 2 above. Preset cam #8 as per step 3 above.
9. Continue to activate command switches for remainder of ports, and adjust cams for over/under travel.

NOTE: Always open main switch or disconnect power when adjusting or servicing Switchpak.

E. Jog Feature

1. Select "local setting" on the remote/local switch.
2. Depress the "JOG" switch and maintain it until the indicator is aligned over the desired port then release it.

NOTE: When viewed from above, the plug rotates counter-clockwise (CCW) only.

F. Finally

1. Pour seal or tag.
2. Install the 2 NPT caplug in the eight flowline ports.
3. Install the 2 NPT caplug in the test outlet port.
4. Install the 4 NPT caplug in the group outlet.
5. Install the 1 NPT caplug in the Switchpak.
6. Install the 1/2 NPT port plugs in the Switchpak.

ITEM	DESCRIPTION	MATERIAL	QTY	NOTE
1	HOUSING	TENZALDY	1	
2	COVER	TENZALDY	1	
5	SHAFT	SS 316	1	
10	CAM	AL 6061-T6	8	
12	SETSCREW, CAM	SS 304	8	
13	TRIGGER SCREW	NYLON	8	
14	PRESSURE LAMINATE	PHENOL FABRIC	10	
15	TERMINAL BLOCK	MK3/12 MELAMINE	2	
16	MICROSWITCH	DT-2RV3-A7	8	
17	GROUND SCREW	SS 304	1	
18	O-RING, SHAFT	NITRILE	1	
19	O-RING, HOUSING	NITRILE	1	
28	HEATER	CERAMIC	1	(D)
31	DRAIN	SS 304	1	

NOTE:
 - (D) DENOTES SUPPLIED AS OPTION
 - FASTENERS AND SERVICE TOOLS ARE ANSI/INCH SIZE

SWITCHPAK INSTALLATION AND SERVICE

SWITCHPAK ROTARY POSITION INDICATING SWITCHES, MODELS SW28XX, ARE SUPPLIED WITH 8 SWITCHES, ADJUSTABLE THROUGH 360° OF SHAFT ROTATION. THE DRAWING ILLUSTRATES A TYPICAL 8 SWITCH UNIT AND MOUNTING ARRANGEMENT. THE ENCLOSURE IS WATERTIGHT AND SUITABLE FOR INSTALLATION IN CLASS 1 DIV. 1 GROUP C & D HAZARDOUS LOCATIONS.

INSTALLATION

1. REMOVE COVER (2).
2. ATTACH HOUSING (1) TO STATIONARY BRACKET, WITH CAM SHAFT AND ROTARY STEM ENGAGED.
3. BEFORE TIGHTENING MOUNTING BOLTS, ALIGN CAM SHAFT CONCENTRIC TO STEM AND POSITION CAMS WITH SETSCREWS (12) AS SHOWN. ENSURE THAT BOTH STEM AND SHAFT CAN BE ROTATED WITHOUT BINDING BEFORE TIGHTENING SETSCREWS.
4. IN HAZARDOUS LOCATIONS, INSTALL SEALING FITTING(S) IN ACCORDANCE WITH LOCAL REGULATIONS AND NATIONAL CODE.
5. SECURE GROUND WIRE(S) TO GROUND SCREW (17). ENSURE THAT ALL WIRES ARE FREE OF STRAIN AND LOCATED TO CLEAR COVER.

SETPOINT ADJUSTMENT

SETPOINTS ARE FACTORY SET PER WIRING DIAGRAM, IF APPLICABLE. TO ADJUST, LOOSEN SETSCREW (12), ROTATE CAM TO POSITION DESIRED AND RE-TIGHTEN SETSCREW.

SENSITIVITY ADJUSTMENT

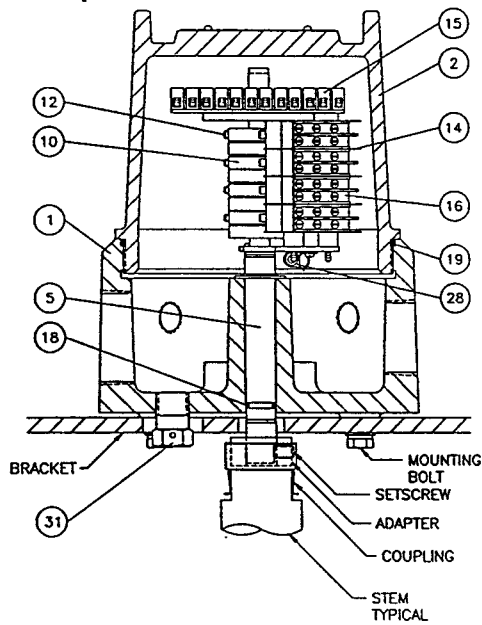
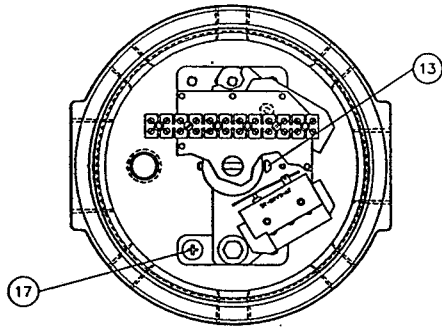
SENSITIVITY IS NORMALLY FACTORY SET. TO ADJUST, TURN TRIGGER SCREW (13) OUT TO ADVANCE AND LENGTHEN SIGNAL, TURN IN TO SHORTEN AND DELAY. USE 0.001" FEELER (GAP) GAUGE TO ENSURE NO SWITCH LEVER CONTACT WITH SWITCH BODY.

MICROSWITCH REPLACEMENT

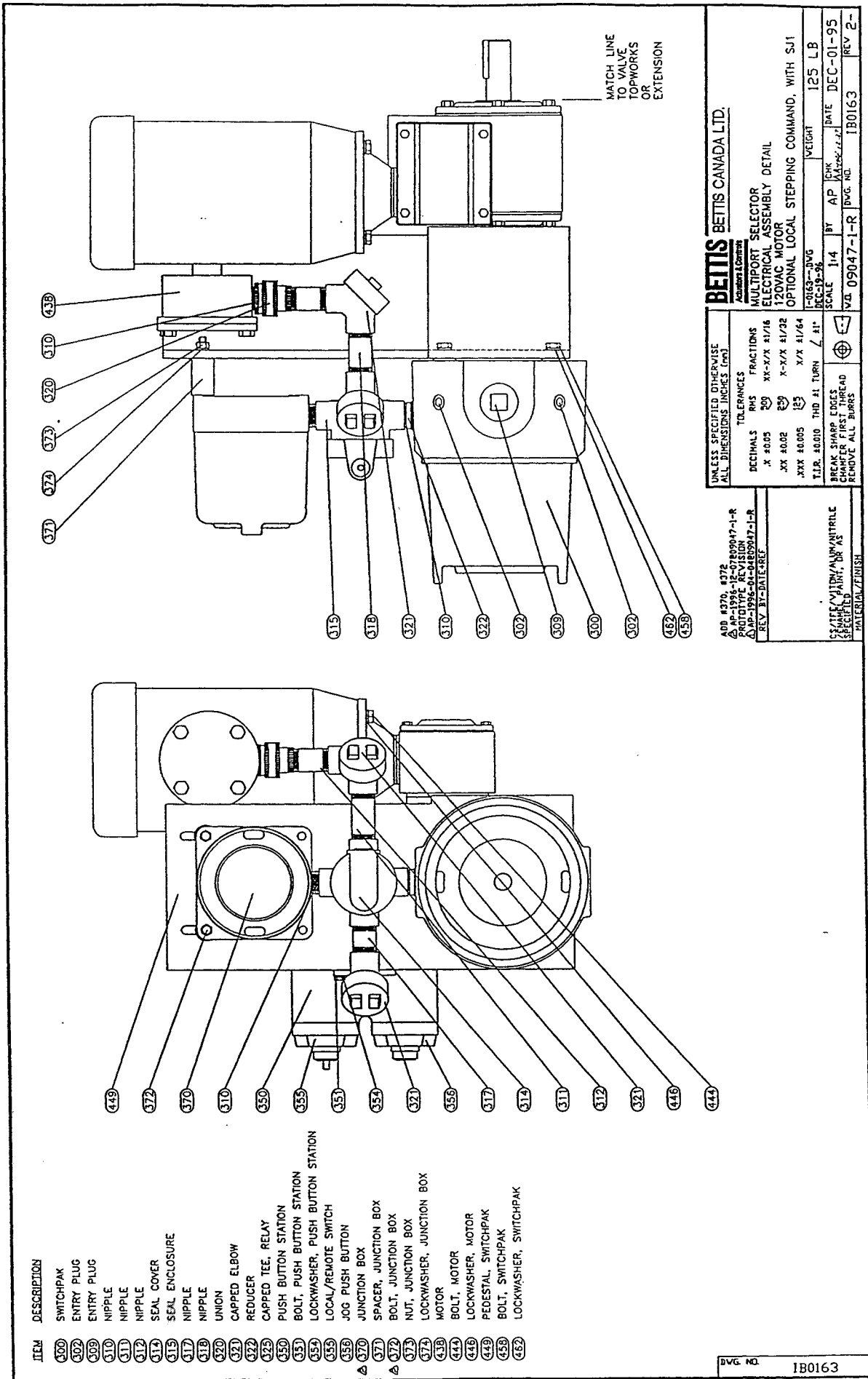
1. DISCONNECT SUPPLY CIRCUIT(S) BEFORE REMOVING COVER.
2. ROTATE CAM SHAFT TO INTERMEDIATE (MICROSWITCHES UNACTUATED) POSITION.
3. DEMOUNT TERMINAL STRIP(S) IF PRESENT.
4. NOTE MICROSWITCH ARRANGEMENT (TWO STACKS, STAGGERED WITH SPACERS ABOVE ONE, BELOW THE OTHER) FOR RE-ASSEMBLY.
5. REMOVE MICROSWITCH MOUNTING SCREWS.
6. REPLACE DEFECTIVE MICROSWITCH AND CHECK THAT LAMINATE SEPARATES EACH SWITCH.
7. REPLACE MICROSWITCH MOUNTING SCREWS

CAUTION

ENSURE COVER JOINT THREADS AND O-RING ARE FREE OF DEBRIS AND LUBRICATED BEFORE REPLACING COVER. IN HAZARDOUS LOCATIONS, KEEP COVER TIGHTLY CLOSED WHILE CIRCUITS ARE ALIVE.



UNLESS SPECIFIED OTHERWISE ALL DIMENSIONS INCHES (mm)		BETTIS BETTIS CANADA LTD. <small>Actuators & Controls</small>	
TOLERANCES DECIMALS RMS FRACTIONS .X ±0.05 200 XX-X/X ±1/16 .XX ±0.02 250 X-X/X ±1/32 .XXX ±0.005 300 X/X ±1/64 T.J.R. ±0.010 THD ±1 TURN ∠ 41°		SWITCHPAK SW28XX INSTALLATION AND ADJUSTMENT	
REV BY-DATE+REF MATERIAL/FINISH		I-0048--DWG_VIEW_08 JAN-99-96 SCALE 1:3 BY VL CHK MA/100-01/00 DATE DEC-04-95 V.D. 7482-1-B DWG. NO. I80048-08 REV --	



- | ITEM | DESCRIPTION |
|------|---------------------------------|
| 300 | SWITCHPAK |
| 302 | ENTRY PLUG |
| 309 | ENTRY PLUG |
| 310 | NIPPLE |
| 311 | NIPPLE |
| 312 | NIPPLE |
| 313 | SEAL COVER |
| 314 | SEAL ENCLOSURE |
| 317 | NIPPLE |
| 318 | NIPPLE |
| 320 | UNION |
| 321 | CAPPED ELBOW |
| 322 | REDUCER |
| 325 | CAPPED TEE, RELAY |
| 330 | PUSH BUTTON STATION |
| 331 | BOLT, PUSH BUTTON STATION |
| 334 | LOCKWASHER, PUSH BUTTON STATION |
| 335 | LOCAL/REMOTE SWITCH |
| 336 | JOG PUSH BUTTON |
| 337 | JUNCTION BOX |
| 338 | SPACER, JUNCTION BOX |
| 341 | BOLT, JUNCTION BOX |
| 342 | NUT, JUNCTION BOX |
| 343 | LOCKWASHER, JUNCTION BOX |
| 344 | MOTOR |
| 345 | BOLT, MOTOR |
| 346 | LOCKWASHER, MOTOR |
| 349 | PEDESTAL, SWITCHPAK |
| 350 | BOLT, SWITCHPAK |
| 351 | LOCKWASHER, SWITCHPAK |

BETTS BETTS CANADA LTD.
 Multiprot Selector
 ELECTRICAL ASSEMBLY DETAIL
 120VAC MOTOR
 OPTIONAL LOCAL STEPPING COMMAND, WITH SJ1

P-0063-JWG
 DEC-59-36
 SCALE 1:4
 WEIGHT 125 LB

BY AP
 DATE DEC-01-95
 Dwg. NO. IB0163
 REV 2-

UNLESS SPECIFIED OTHERWISE
 ALL DIMENSIONS INCHES (IN)

DECIMALS	RHS	FRACTIONS
.X ±0.05	20	X ¹ / _X ±1/16
.XX ±0.02	50	X ¹ / _X ±1/32
.XXX ±0.005	125	X ¹ / _X ±1/64

T.I.R. ±0.010 THD ±1 TURN / ±1°
 BREAK SHARP EDGES
 CHARTEE IRCS HEAD
 REMOVE ALL BURRS

ADD: 4370, 4372
 Δ AP-1996-12-07809047-1-R
 PROTOTYPE REVISION
 Δ AP-1996-04-0809047-1-R
 REV BY-DATE-REF

USA: 100% JAPANESE/AMERICAN
 MADE IN JAPAN, U.S.A.
 MATERIAL FINISH

DWG. NO. IB0163

VII VALVE INSTALLATION

Before installing the unit, observe the following:

1. Check for external physical damage.
2. Check for any visible leakage of gear oil from the speed reducer (226).
3. Visually inspect inside valve through group outlet port checking for damage, rust and debris.
4. Check the wiring arrangement using the attached diagram on page 16 or as supplied for a particular order/unit.
5. Connect power supply and signal circuits to test the plug (30) location and motor (238) rotation at each port.

NOTE: The Multiport Selector Valve is factory adjusted when supplied with actuator and should not require further adjustment.

6. Connect piping.

NOTE: When hydrotesting external piping, position the plug between any two inlet ports in order to equalize test pressure between the valve body and external piping, and prevent possible seal damage from occurring.

VIII VALVE MAINTENANCE

The Multiport Selector Valve is shipped completely greased and lubricated, but it is recommended to check the unit prior to operation if it is stored for more than one year.

1. Check speed reducer oil at regular intervals, and change the oil each hundred running hours or once a year, whichever comes first. Use Mobile Synthetic SHC-634 ISO VG460 lubricant, or a suitable equivalent.
2. Make sure oil in the speed reducer (226) is at indicated level.

NOTE: Excessive oil could cause pressure build-up, leakage and overheating which will result in rapid wear of oil seals, bearing and gears.

3. Lubricate bearing (60) through grease nipple every six months, or as needed. Use Dow Corning Extreme High Temp #41, or a suitable equivalent.
4. Do not lubricate motor since it is a sealed unit.

IX TROUBLESHOOTING

A. Actuator does not align plug (30) to port.

1. If the alignment is off only at one or two ports but the rest are aligned, then refer to assembly and adjustment procedure on pages 3 through 14.
2. If alignment is off in the same direction for all ports then:
 - a) Check the valve/actuator connector for looseness.
 - b) Check the Switchpak/actuator connector for looseness.
 - c) Check the motor for stalling or overload.
 - d) Check the speed reducer for visual leakage or noisy gear.
 - e) Check the accuracy of the position indicator itself.

NOTE: Refer to assembly and adjustment procedures on pages 3 through 14, as required.

B. Plug seal assembly leaks.

1. Refer to specifications for differential pressure limitations.
2. Check if plug is aligned with port.
3. Remove plug from (home test) port and check for plug seal assembly damage (ie. scratches).
4. If more information is required, contact the factory.

