



SERVICE MANUAL

VMD03M Manual Actuated Directional Control Valves

“A” Design Series



CAUTION – Before performing any service operation on any Directional Control Valve, be sure that all pressure has been relieved from BOTH SIDES of the system.



CAUTION – Before performing any service operation on any Directional Control Valve, disconnect or lock off power supply.



CAUTION – Before manually actuating any Directional Control Valve, be sure that any resulting machine function will not endanger persons or equipment.

PRODUCT IDENTIFICATION

Each Directional Control Valve has an Ordering Code stamped on its top label. See Figure 1 for the location of the Ordering Code.

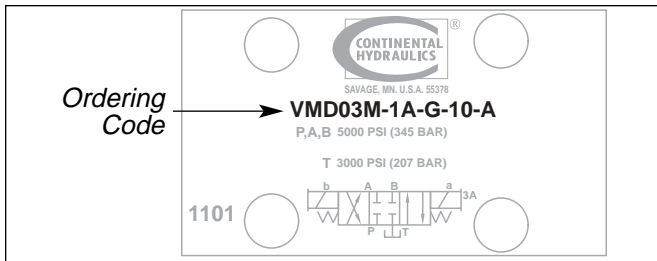


Figure 1

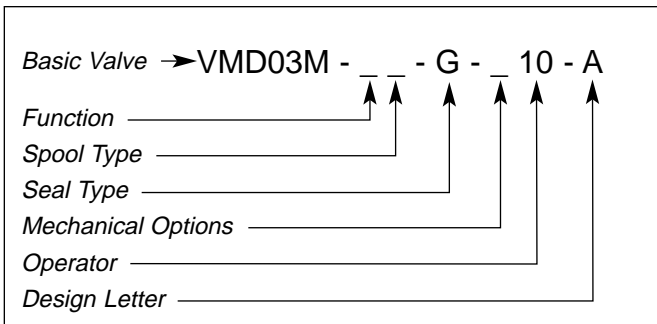


Figure 2

This Service Booklet applies to products with Ordering Codes like the sample in Figure 2.

GENERAL SPECIFICATIONS

RECOMMENDED FLUID

Petroleum, water-based fluids (not more than 40% water) and most phosphate esters. Other fluids may be acceptable, but special O-rings may be required. Viton seals standard.

FLUID TEMPERATURE RANGE

Fluid temperature up to 200° F. (93° C.) will not appreciably affect valve performance. However, for safety reasons, temperatures above 130° F. (54° C.) are not recommended.

RECOMMENDED OPERATING VISCOSITY

80 to 350 SUS (16 to 70 cSt).

FILTRATION

ISO 18/16/13 or better.

MOUNTING POSITION

Any unrestricted position acceptable. Horizontal mounting preferred.

NFPA FLOW PATH/ACTUATING PATTERN MANUAL:

Push lever – connects flow to cylinder port A.

Pull lever – connects flow to cylinder port B.

The NFPA flow path/actuating pattern is reversed for Code L Spools

GENERAL INFORMATION

MANUAL ACTUATED – Spring centered and spring offset valve types will be spring positioned unless actuated continuously. Detented, no-spring valves may be actuated momentarily. When solenoid is not actuated, the spool will remain in last position attained, provided there is no severe shock, vibration or pressure surge.

Pressure surges in a common tank line serving these and other valves can be great enough to cause inadvertent valve shifting. This is particularly critical in the no-spring, detented type valves. Separate tank lines may be necessary.

NOTE: Any sliding spool valve held shifted under pressure for long periods may stick and not spring return due to fluid residue formation. To prevent sticking, valves should be cycled periodically.

PREVENTIVE MAINTENANCE

After Directional Control Valves have been put in operation, provide periodic inspection and maintenance. The check points listed below will assist you in extending the life of your Continental valves.

Fluid Operating Temperature – Fluid temperature at the reservoir during operation should be kept between 100° F. and 130° F. (38° C. and 54° C.).

Fluid Cleanliness – Control particle contamination by changing or cleaning all filter elements periodically BEFORE they become clogged and start to by-pass.

After Extended Shutdowns – Some types of hydraulic fluids become tacky after long periods of non-use. Manually actuate valves several times after extended shutdowns to assure that all components move freely before powering up.



CAUTION – Before manually actuating any Directional Control Valve, be sure that any resulting machine function will not endanger persons or equipment.

VMD03M VALVE REPAIR PROCEDURES

DISASSEMBLY and REASSEMBLY

GENERAL

Disassembly and reassembly of Directional Control Valves is a delicate operation. Anyone attempting it must assume responsibility for the operation of the valve. Continental valves may be returned to the factory or to an Authorized Repair Center for repair. Contact your local Distributor or Continental Hydraulics for details.

If interchanging spool types or making other conversions, restamp the escutcheon plate to show the correct code. Include stops, spool, spring, and detent orientation. See Figure 2 to serve as a guide to correct numbering.

Disassembly in the field by other than an Authorized Repair Center technician, whether for repair or modification may void warranty.

Before disassembly, study the exploded view below and note the orientation and location of all parts. Note that the spring retainers are used only in the assemblies that are spring centered. Special care should be taken to avoid damage to the spool and/or body bore. Even a microscopic nick in a land on the spool or body may ruin the valve.

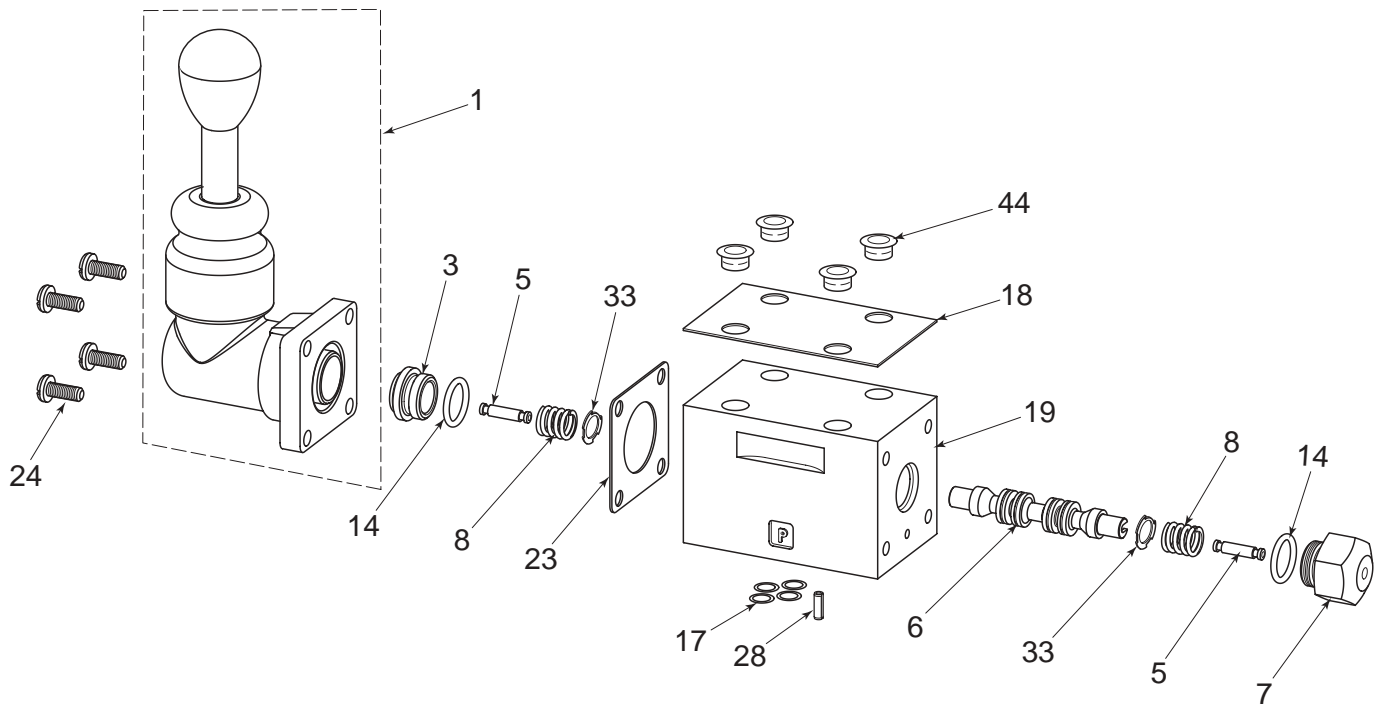
All valves can be disassembled and reassembled in a horizontal-mounted position, provided there is adequate space and the work area is clean.

Place the spool in a bath of clean oil to coat it with a protective film, and ease assembly. Inspect o-rings for nicks, and make sure they are well oiled. It's a good idea to replace all seals whenever the valve is disassembled.

Continental valves are precisely machined to exacting tolerances. Do not force any parts, or overtighten threaded fasteners.

PART AND ASSEMBLY IDENTIFICATION

The following illustrations and parts lists may be used to identify individual parts and assemblies in directional control valves.

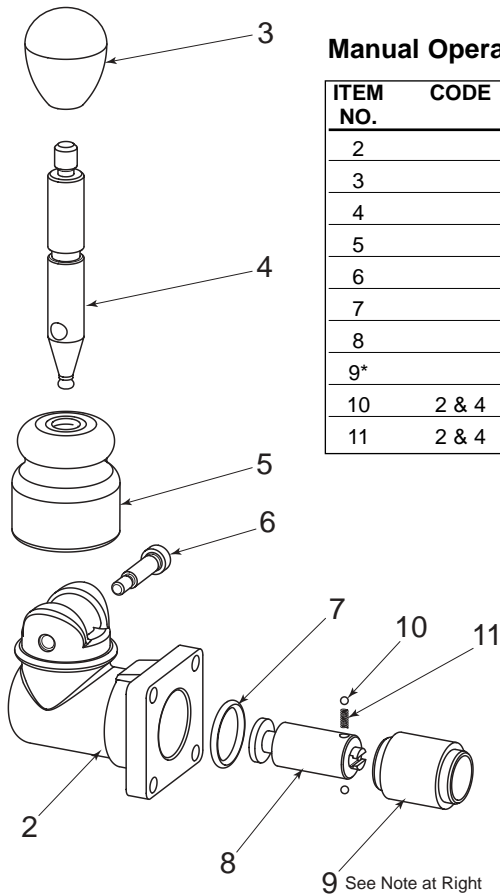


Spring Offset Code 1, B Port End	Detented Code 2 and 4	Spring Centered Code 3	L Spools Only Code 4

VMD03M Directional Control Valve Assembly

ITEM NO.	CODE	PART # NO.	DESCRIPTION	QUANTITY REQUIRED
1	1 & 3	350231	Manual Operator Assembly	1
1	2	350232	Manual Operator Assembly	1
1	4	350233	Manual Operator Assmby	1
3		253973	End Plug Assembly.	1
5		252260	Drive Pin	2
6		450913	A Spool	1
6		450915	B Spool	1
6		450916	F Spool	1
6		450987	F1 Spool	1
6		450917	G Spool	1
6		351447	L Spool	1
7		262296	End Cap Assembly	1
8	1	160131	Spring, Offset	1
8	3	253006	Spring, Centering	2
12	Code 4L, 4L-R	263710	Spool Retainer	1
13	Code 4L, 4L-R	122293	O-Ring	1
14		121533	O-Ring	2
17		108295	O-Ring	4
18		262390	Label*	1
19		552412	Valve Body	1
23		308244	Gasket	1
24		263151	Screw	4
28		004223	Roll Pin	1
33		262324	Spring Retainer	2
44		262765	Cap Plug Kit	1
Not Shown:				
90		121472	Bolt Kit	1

*NOTE: Specify model code when ordering label.

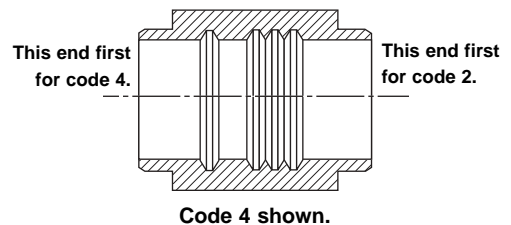


Manual Operator Assembly

ITEM NO.	CODE	PART # NO.	DESCRIPTION	QUANTITY REQUIRED
2		507243	Housing Sub-Ass'y.	1
3		103908	Knob	1
4		300228	Lever	1
5		300294	Boot	1
6		111479	Shoulder Screw	1
7		101195	O-Ring	1
8		350222	Push Rod	1
9*		350221	Sleeve	1
10	2 & 4	260424	1/8" Steel Ball	2
11	2 & 4	129938	Spring	1

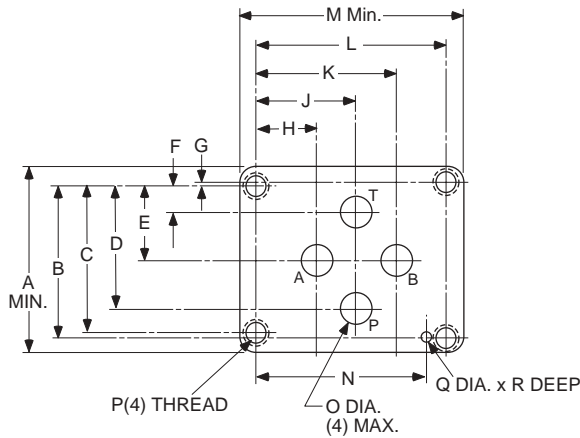
***NOTE:**

Orientation of Item #9 Sleeve shown below is in the 3-position detent mode (code 4). For 2-position detent mode (code 2), insert the opposite end first.



D03 MOUNTING SURFACE

Conforms to ANSI/B93.7-M-1986 ISO 4401 Size 03.



PERFORMANCE SPECIFICATIONS

Maximum Operating Pressure	P, A, B Ports	5000 psi	345 bar
	T Port	1000 psi	69 bar
NFPA Mounting Surface		D03	
Weight		3.4 lbs.	1.5 kg

DIMENSIONS

	inch	mm		inch	mm		inch	mm
A	1.70	43.0	G	0.03	.075	N	1.30	33.0
B	1.25	31.8	H	0.50	12.7	O	0.25	6.3
C	1.22	31.0	J	0.85	21.5	P	10-24 UNC-2B	
D	1.02	25.9	K	1.19	30.2	Q	0.16	4.0
E	0.61	15.5	L	1.594	40.5	R	0.16	4.0
F	0.20	5.1	M	2.00	51.0			

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE SOLUTION
Erratic or binding valve spools	Drain and flush the system. Disassemble valve and check spool and plug assemblies for burrs or other damage. Replace parts as necessary.
New valve does not function.	Improper installation. See page 1 for valve flow path/actuating patterns. Confirm that hydraulic fluid type and viscosity meet specifications given on page 1.
Overhauled valve does not function.	Improper reassembly or reinstallation. See page 2 for reassembly information. See page 1 for valve flow path/actuating patterns. Confirm that hydraulic fluid type and viscosity meet specifications given on page 1.
Valve leakage	Check for leaking seals. Replace as needed.
Cylinder controlled by valve won't hold its load.	Confirm that there is no internal leakage in the cylinder, and that there are no fluid leaks in the power system. If no other sources of leakage are found, disassemble valve and check for wear or scoring on body bore and spool. Replace defective parts.



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Because Continental Hydraulics is continually improving its products, specifications and appearance are subject to change without notice.