

OPERATOR'S MANUAL

EXXXXX-XXX-X

INCLUDING: APPLICATION, LUBRICATION, INSTALLATION & SERVICE

RELEASED: 11-20-87

REVISED: 2-7-01

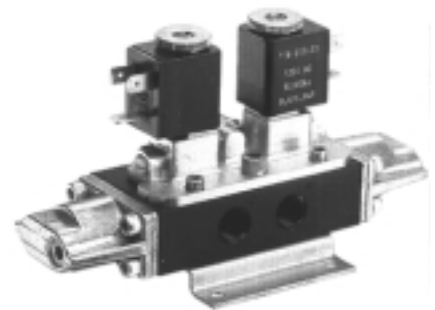
(REV. A)

E SERIES VALVES



**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,
OPERATING OR SERVICING THIS EQUIPMENT.**

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.



Rated Pressure: 150 PSI (10.2 Bar) Maximum
Temperature Ratings: -10° to 180° F (-23° to 82° C)

Flow: 26 SCFM
Cv Factor : .70 Cv

MODEL DESCRIPTION CHART

E X X 2 XX - XXX - X

VALVE TYPE

- 1 - 2 Position Detent
- 2 - 2 Position
- 3 - 3 Position Spring Centered
- 5 - 3 Position Detent
(3 & 5 - all ports blocked in neutral)
- 6 - 3 Position Detent
- 7 - 3 Position Spring Centered
(6 & 7 - inlet ports blocked,
cylinder ports open in neutral)

BODY STYLE

- 1 - 4 Way Side Ported (pages 12 - 23)
- 4 - 4 Way Bottom Ported (pages 18 - 23)
- 5 - 3 Way Side Ported (pages 3 - 11)

PORT SIZE

- 2 - 1/4" NPT

CURRENT TYPE

- A - AC
- D - DC
- N - No Coil

COIL VOLTAGE

- 000 - No Coil
- 005 - 5 V
- 012 - 12 V
- 024 - 24 V
- 120 - 120 V
- 240 - 240 V

ACTUATOR / RETURN

- BD - Bleed / Bleed (pages 10 & 21)
- BS - Bleed / Spring (pages 10 & 21)
- CS - Cam Stem / Spring (pages 7 & 17)
- FP - Pedal / Pilot (page 14)
- FS - Pedal / Spring (pages 4 & 14)
- GS - Roller Cam / Spring (page 6)
- HM - Palm / Manual (pages 5 & 15)
- HP - Palm / Pilot (pages 5 & 15)
- HS - Palm / Spring (pages 5 & 15)

- LM - Hand Lever / Manual (pages 3, 12 & 13)
- LP - Hand Lever / Pilot (pages 3 & 12)
- LS - Hand Lever / Spring (pages 3, 12 & 13)
- PD - Pilot / Pilot (pages 8, 18 & 19)
- PE - Pilot / Ext. Pilot (page 18)
- PS - Pilot / Spring (pages 8 & 18)
- RP - Roller Cam / Pilot (page 16)
- RS - Roller Cam / Spring (pages 6 & 16)
- SD - Solenoid / Solenoid (page 23)

- SN - Solenoid / Spring - N.O. (page 11)
- SP - Solenoid / Pilot (page 22)
- SS - Solenoid / Spring (pages 11 & 22)
- TM - Treadle / Manual (pages 9 & 20)
- TS - Treadle / Spring (page 20)
- US - Cam Stem / Spring (page 7)
- WM - Palm w/o Button / Manual (pages 5 & 15)
- WP - Palm w/o Button / Pilot (pages 5 & 15)
- WS - Palm w/o Button / Spring (pages 5 & 15)

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Unit 16, Upminster Trading Park, Warley St., Upminster, Essex, RM14 3PJ, ENGLAND



Warnings and Cautions

APPLICATION

WARNINGS:

1. ARO valves are designed for use only in industrial pneumatic (air) and / or vacuum systems applications and are NOT to be used for individual consumer use, application or service.
2. When any ARO valve is used in any type application, safeguards must be provided to insure against bodily injury for the operator and / or other persons in the immediate area.
3. ARO valves are NOT to be used as a safety device or to operate and / or control the operation of full revolution clutch systems and / or brake systems on power presses or similar equipment. ARO valves are not designed or intended for such uses.

LUBRICATION

Lubrication is required with ARO "E" Series Valves for optimum performance. ARO recommends using a Filter-Regulator-Lubricator combination unit to maintain proper lubrication for the valves and other air line devices used in conjunction with ARO valves that require lubrication. Refer to ARO Catalog A-8531-R to select a Filter-Regulator-Lubricator combination unit of proper capacity for the system being used. To insure that lubrication oils are compatible with the valve seals and are of sufficient viscosity to assure adequate lubrication, Aro recommends an oil lubricant with a viscosity of 100 - 200 SUS at 100° F and an aniline point above 200° F. Aro does not recommend the use of compound oils containing graphite fillers, extremely low viscosities and other non-fluidic lubricants. **RECOMMENDED:** Aro 29665 air line lubricator oil is available in one quart containers.

INSTALLATION AND SERVICE

WARNINGS:

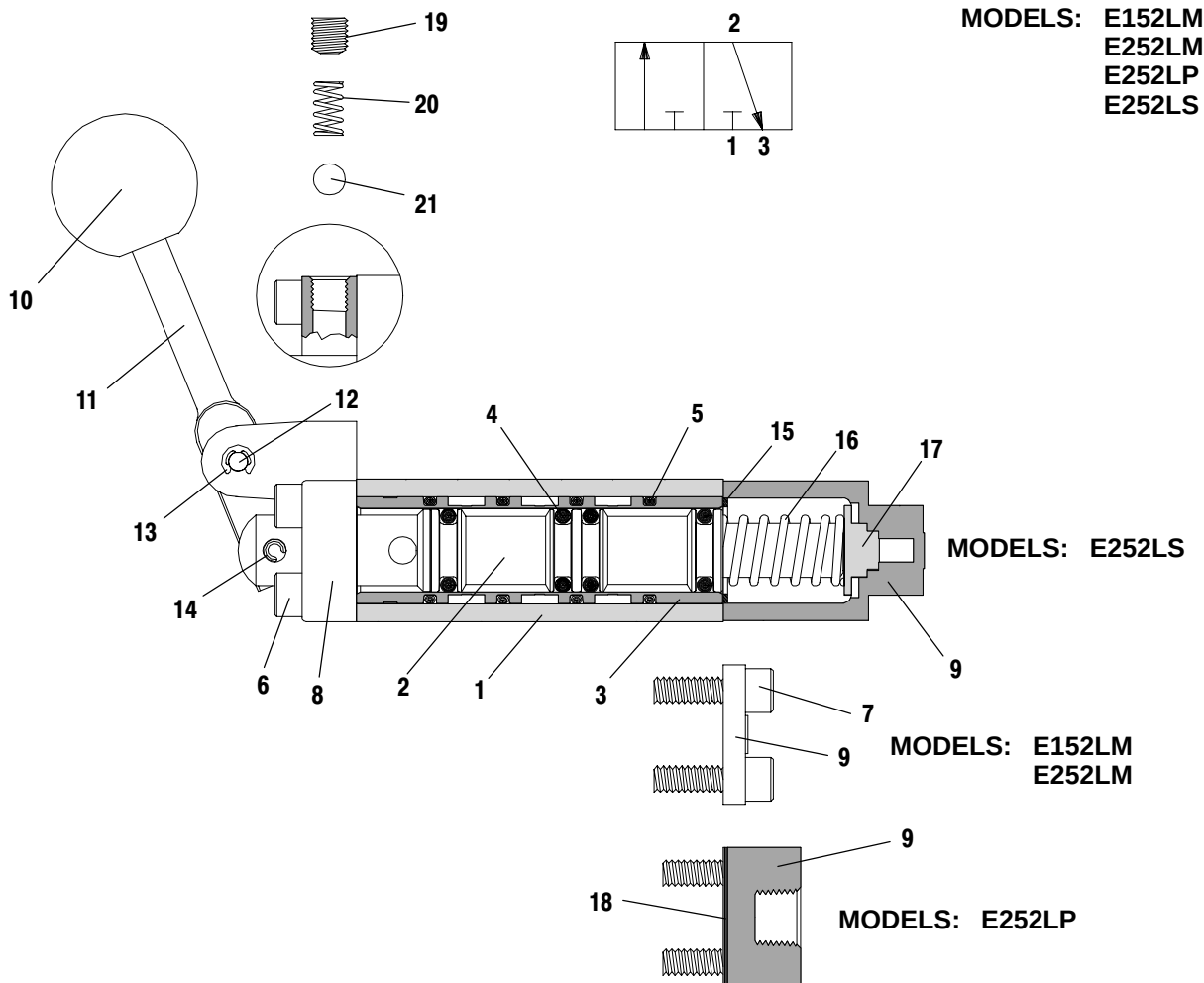
1. Shut off, disconnect and exhaust air pressure from system before installing or performing service to any ARO valve.
2. Shut off and disconnect electrical supply to system before installing or performing service to any ARO valve.
3. Allow only persons with a thorough understanding of the operation and application of all ARO valves being used in a particular system and how the ARO valve(s) relate to and interact with other components of the system to install or perform maintenance or service to any ARO valve or other components of the system.
4. DO NOT subject any ARO valve to any condition that exceeds the limits set forth in the specifications for a particular valve

model.

5. When a manually operated (actuated) valve is used or installed into a system, provisions must be made to prevent the valve from being accidentally operated (actuated), which may in turn cause bodily injury or otherwise cause a hazardous or dangerous condition.
6. Damaged air pressure hoses or electrical wiring, or connections, can cause accidental valve operation (actuation), which may in turn cause bodily injury or otherwise cause a hazardous or dangerous condition. **KEEP ALL HOSES, ELECTRICAL WIRING, FITTINGS AND CONNECTIONS IN FIRST CLASS OPERATING CONDITION.**
7. **ARO 2-POSITION, 4-WAY VALVES:** Regardless of which of the 2-positions this type of ARO valve is in, when air pressure is applied to the inlet port(s) of these valves, there will always be an open flow path of air from the inlet to one of the valve outlets. A method to exhaust this trapped air pressure must be installed into the system so all air pressure can be removed from valve or system before performing service or maintenance to valve.
8. **ARO 3-POSITION, 4-WAY VALVES:** To actuate this type of ARO valve, either a double solenoid, double remote air pilot pressure or manual operation is used. When the valve actuator has shifted the valve, air pressure applied at the inlet port(s) will flow thru the valve to one of the two outlet ports. When the valve is not in a shifted position, the valve will automatically move to a center position. ARO valves can be either closed center or open center type and will reveal the following characteristics when the valve is in the center position:
 - a. **OPEN CENTER VALVES:** When this type ARO valve is in the center position, the inlet port(s) is blocked and the two outlet ports are open to the exhaust port(s) of the valve. With this type valve, in the center position, air pressure is not present at either outlet port. Do not use this type ARO valve if exhausting the air pressure from the valve will cause hazardous or dangerous condition.
 - b. **CLOSED CENTER VALVES:** When this type valve is in the center position, all inlet, outlet and exhaust ports are blocked. Do not use this type valve if having the air pressure blocked at the port(s) may cause a dangerous or hazardous condition in the application, installation and / or servicing of an ARO valve. These valves must not be used to control load holding devices without an additional mechanical positive stop on the holding device.

PARTS LIST

SERIES E SPOOL VALVES 1/4" N.P.T.F. PIPE PORTS 3-WAY, HAND LEVER



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20183	10	Ball Knob	(1)	13512-A
2	Spool Assembly (E152LM, E252LM, E252LP)	(1)	20765	11	Hand Lever	(1)	115642
	Spool Assembly (E252LS)	(1)	20766	12	Pin	(1)	20155
3	Sleeve	(1)	116770	13	"E" Ring	(2)	Y180-12
* 4	"O" Ring	(4)	15066	14	Roll Pin (5/32" o.d. x 7/16" long)	(1)	Y178-138
* 5	"O" Ring (1/16" x 3/4" o.d.)	(4)	Y325-16	15	Washer (E252LS)	(1)	20129
6	Screw (#10 - 24 x 3/4")	(4)	Y195-96-C	* 16	Spring (E252LS)	(1)	20759
7	Screw (#10 - 24 x 5/8")	(4)	Y195-95-C	* 17	Bumper (E252LS)	(1)	20758-1
8	End Cap (E252LM, E252LP, E252LS)	(1)	20163	* 18	Gasket (E252LP)	(1)	15002
	End Cap (E152LM)	(1)	20178	19	Set Screw (1/4" - 28 x 1/4") (E152LM)	(1)	Y23-42
9	End Cap (E152LM, E252LM)	(1)	15008	20	Spring (E152LM)	(1)	16618
	End Cap (E252LP)	(1)	20225	21	Ball (7/32" dia.) (E152LM)	(1)	Y16-7
	End Cap Assembly (E252LS)	(1)	20763	*	Repair Kit		116772

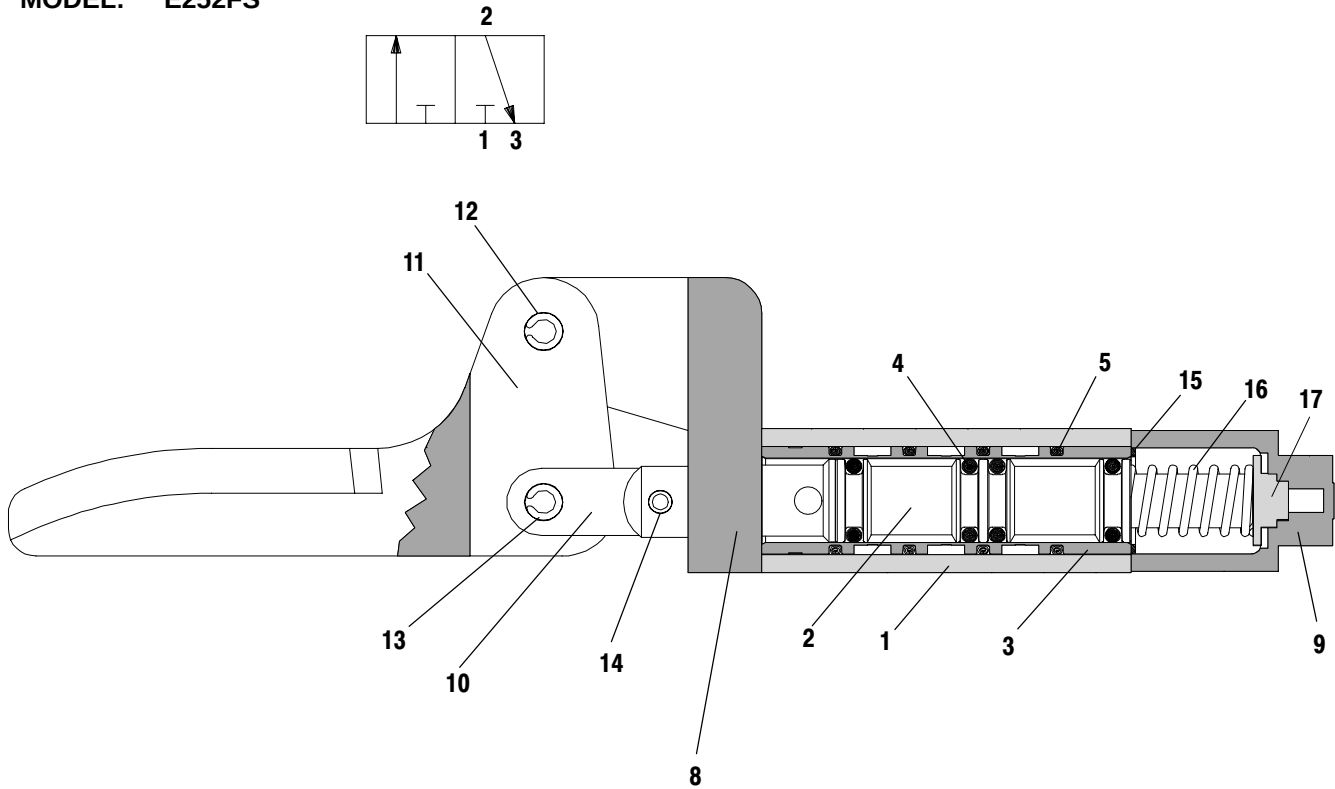
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

3-WAY, PEDAL

MODEL: E252FS

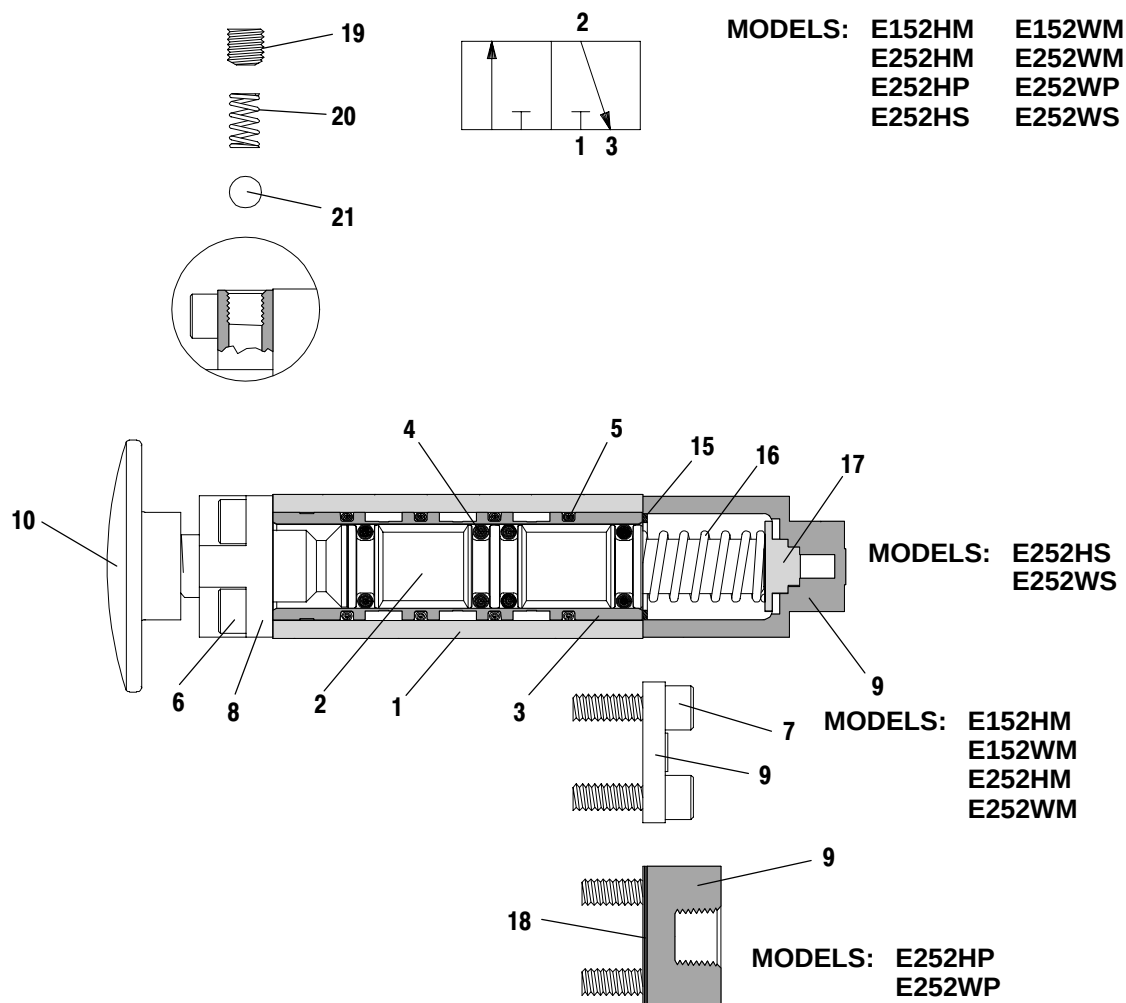


PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size In Inches)	QTY	PART NO.
1	Body	(1)	20183	11	Foot Pedal	(1)	24113
2	Spool Assembly	(1)	20766	12	Roll Pin (1/4" o.d. x 1-3/4" long)	(1)	Y178-109
3	Sleeve	(1)	116770	13	Roll Pin (1/4" o.d. x 7/8" long)	(1)	Y178-102
* 4	"O" Ring	(4)	15066	14	Roll Pin (5/32" o.d. x 7/16" long)	(1)	Y178-138
* 5	"O" Ring (1/16" x 3/4" o.d.)	(4)	Y325-16	15	Washer	(1)	20129
6	Screw (#10 - 24 x 5/8") (not shown)	(8)	Y195-95-C	* 16	Spring	(1)	20759
8	End Cap	(1)	20399	* 17	Bumper	(1)	20758-1
9	End Cap Assembly	(1)	20763	*	Repair Kit		116772
10	Link	(1)	20140				

PARTS LIST

SERIES E SPOOL VALVES 1/4" N.P.T.F. PIPE PORTS 3-WAY, PALM BUTTON



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20183	9	End Cap Assembly (E252XS)	(1)	20763
2	Spool Assembly (E152XM, E252XM, E252XP)	(1)	20764		End Cap (E152XM, E252XM)	(1)	15008
	Spool Assembly (E252XS)	(1)	20767		End Cap (E252XP)	(1)	20225
3	Sleeve	(1)	116770	10	Palm Button (EX52HX)	(1)	13111
* 4	"O" Ring	(4)	15066	15	Washer (E252XS)	(1)	20129
* 5	"O" Ring (1/16" x 3/4" o.d.)	(4)	Y325-16	* 16	Spring (E252XS)	(1)	20759
6	Screw (#10 - 24 x 5/8") (E252XX)	(4)	Y195-95-C	* 17	Bumper (E252XS)	(1)	20758-1
	Screw (#10 - 24 x 3/4") (E152HM, E152WM)	(4)	Y195-96-C	* 18	Gasket (E252XP)	(1)	15002
7	Screw (#10 - 24 x 5/8")	(4)	Y195-95-C	19	Set Screw (1/4" - 28 x 1/4") (E152XM)	(1)	Y23-42
8	End Cap (E252XX)	(1)	20130	20	Spring (E152XM)	(1)	16618
	End Cap (E152HM, E152WM)	(1)	20851	21	Ball (7/32" dia.) (E152XM)	(1)	Y16-7
				*	Repair Kit		116772

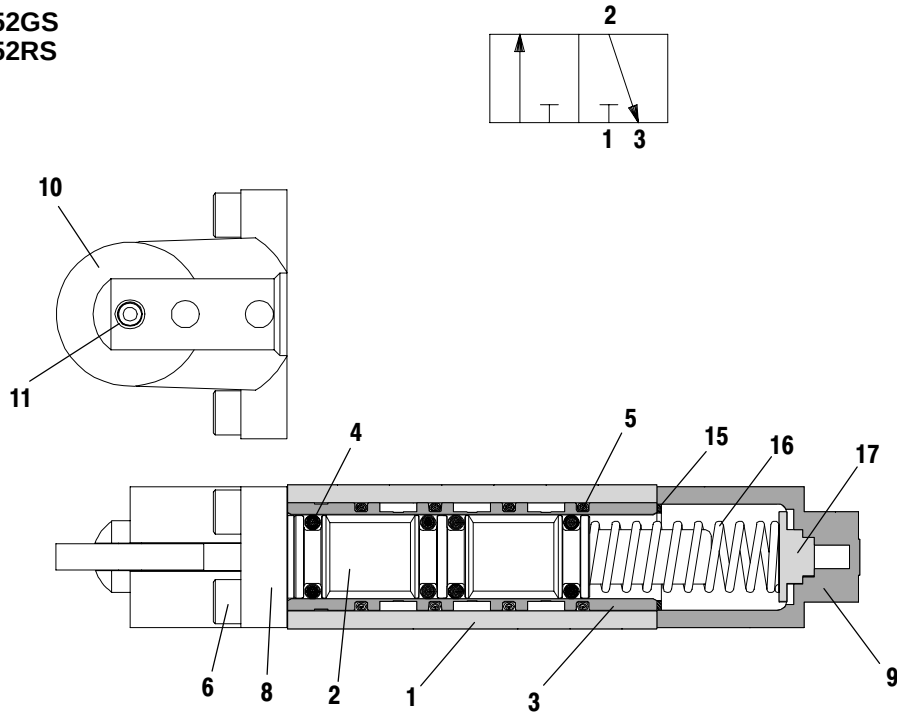
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

3-WAY, ROLLER CAM

MODELS: E252GS
E252RS



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20183	8	End Cap	(1)	20109
2	Spool Assembly (E252GS)	(1)	20169	9	End Cap Assembly	(1)	20763
	Spool Assembly (E252RS)	(1)	20766	10	Roller Cam	(1)	20164
3	Sleeve	(1)	116770	11	Pin	(1)	20151
* 4	"O" Ring (E252GS)	(3)	15066	15	Washer	(1)	20129
*	"O" Ring (E252RS)	(4)	15066	* 16	Spring	(1)	20759
* 5	"O" Ring (1/16" x 3/4" o.d.)	(4)	Y325-16	* 17	Bumper	(1)	20758-1
6	Screw (#10 - 24 x 5/8")	(8)	Y195-95-C	*	Repair Kit		116772

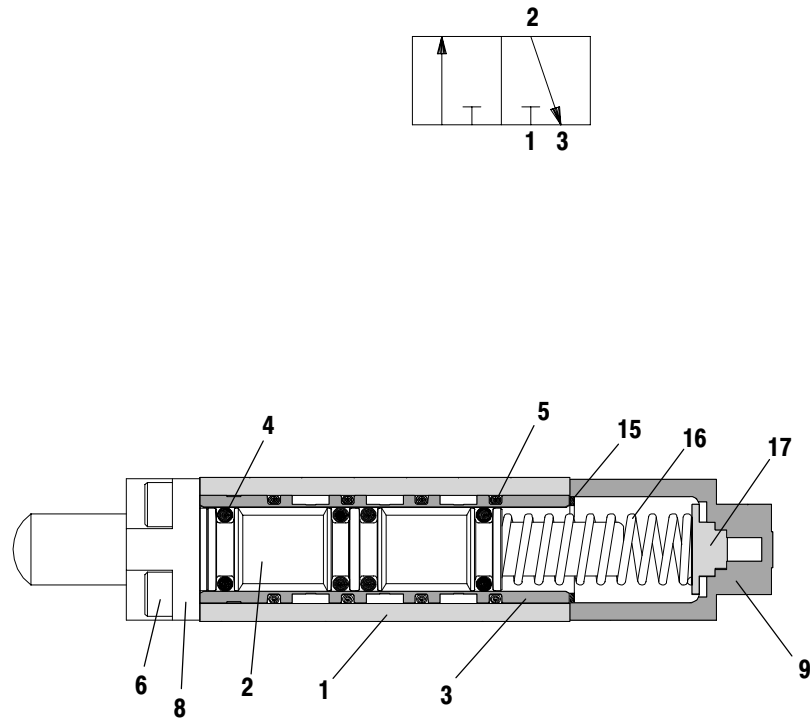
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

3-WAY, CAM STEM

MODELS: E252CS
E252US



PARTS LIST							
ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size In Inches)	QTY	PART NO.
1	Body	(1)	20183	6	Screw (#10 - 24 x 5/8")	(8)	Y195-95-C
2	Spool Assembly (E252CS)	(1)	20768	8	End Cap	(1)	20130
	Spool Assembly (E252US)	(1)	20174	9	End Cap Assembly	(1)	20763
3	Sleeve	(1)	116770	15	Washer	(1)	20129
* 4	"O" Ring (E252CS)	(4)	15066	* 16	Spring	(1)	20759
*	"O" Ring (E252US)	(3)	15066	* 17	Bumper	(1)	20758-1
* 5	"O" Ring (1/16" x 3/4" o.d.)	(4)	Y325-16	*	Repair Kit		116772

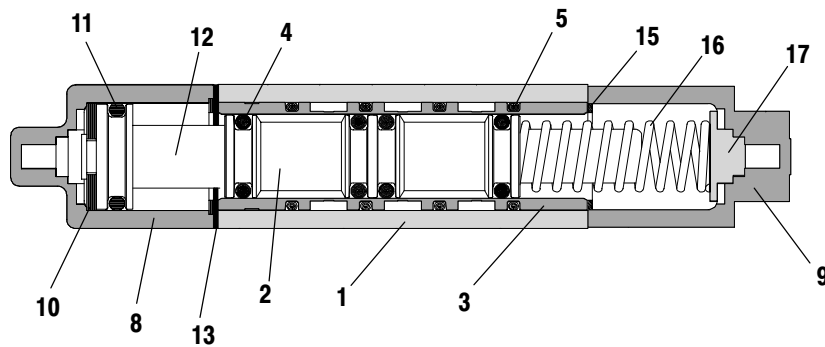
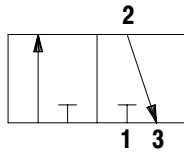
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

3-WAY, PILOT

MODELS: E252PD
E252PS



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20183
2	Spool Assembly (E252PS)	(1)	20769
	Spool (E252PD)	(1)	20135
3	Sleeve	(1)	116770
†* 4	"O" Ring	(4)	15066
†* 5	"O" Ring (1/16" x 3/4" o.d.)	(4)	Y325-16
6	Screw (#10 - 24 x 5/8") (not shown)	(8)	Y195-95-C
8	End Cap	(1)	20173
9	End Cap Assembly (E252PS)	(1)	20763
	End Cap (E252PD)	(1)	20173
* 10	Bumper (E252PS)	(1)	20757
†	Bumper (E252PD)	(2)	20757

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
* 11	"O" Ring (3/32" x 3/4" o.d.) (E252PS)	(1)	Y325-113
†	"O" Ring (3/32" x 3/4" o.d.) (E252PD)	(2)	Y325-113
12	Piston (E252PS)	(1)	20131
	Piston (E252PD)	(2)	20131
* 13	Gasket (E252PS)	(1)	20165
†	Gasket (E252PD)	(2)	20165
15	Washer	(2)	20129
* 16	Spring (E252PS)	(1)	20759
* 17	Bumper (E252PS)	(1)	20758-1
*	Repair Kit (E252PS)		116772
†	Repair Kit (E252PD)		116773

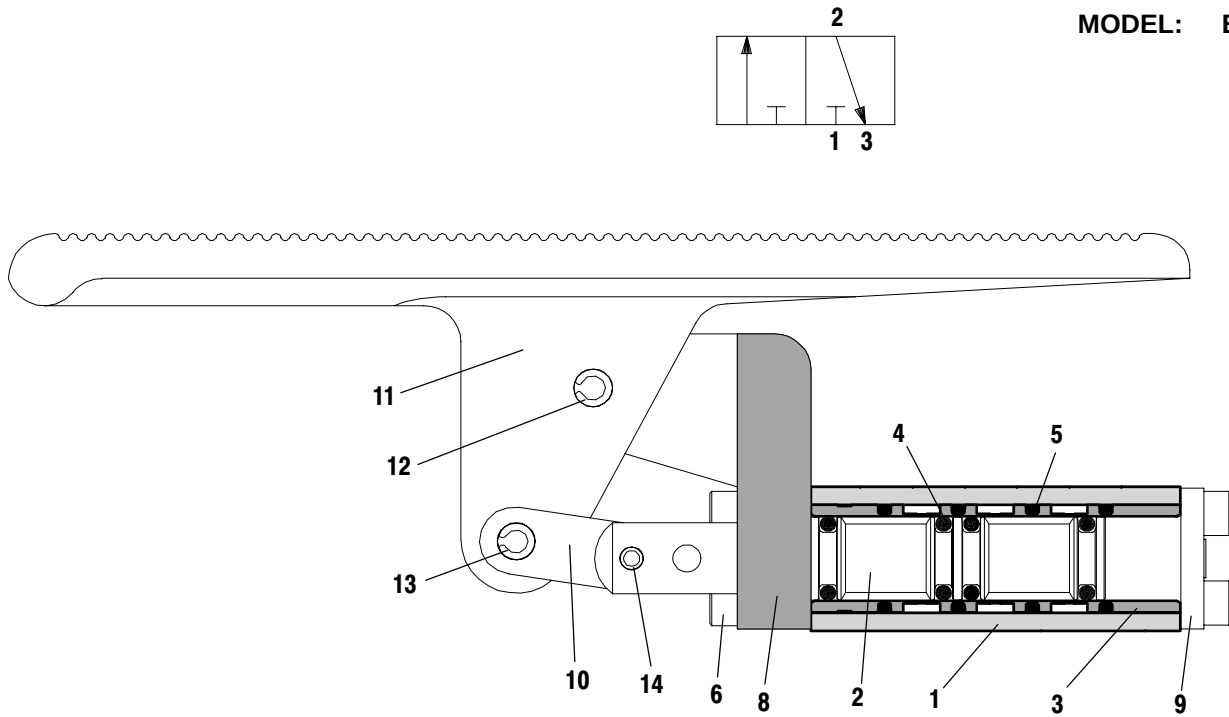
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

3-WAY, TREADLE

MODEL: E252TM



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size In Inches)	QTY	PART NO.
1	Body	(1)	20183	9	End Cap	(1)	15008
2	Spool Assembly	(1)	20765	10	Link	(1)	20140
3	Sleeve	(1)	116770	11	Foot Treadle	(1)	24112
* 4	"O" Ring	(4)	15066	12	Roll Pin (1/4" o.d. x 1-3/4" long)	(1)	Y178-109
* 5	"O" Ring (1/16" x 3/4" o.d.)	(4)	Y325-16	13	Roll Pin (1/4" o.d. x 7/8" long)	(1)	Y178-102
6	Screw (#10 - 24 x 5/8")	(8)	Y195-95-C	14	Roll Pin (5/32" o.d. x 7/16" long)	(1)	Y178-138
8	End Cap	(1)	20399	*	Repair Kit		116772

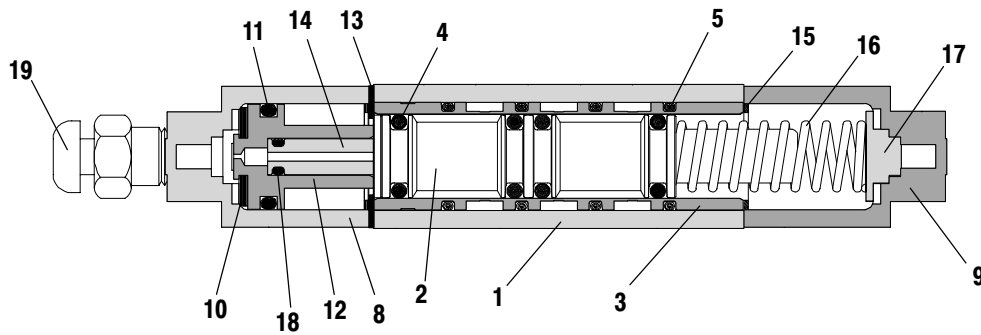
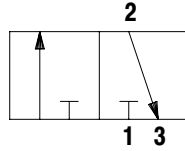
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

3-WAY, BLEED

MODELS: E252BD
E252BS



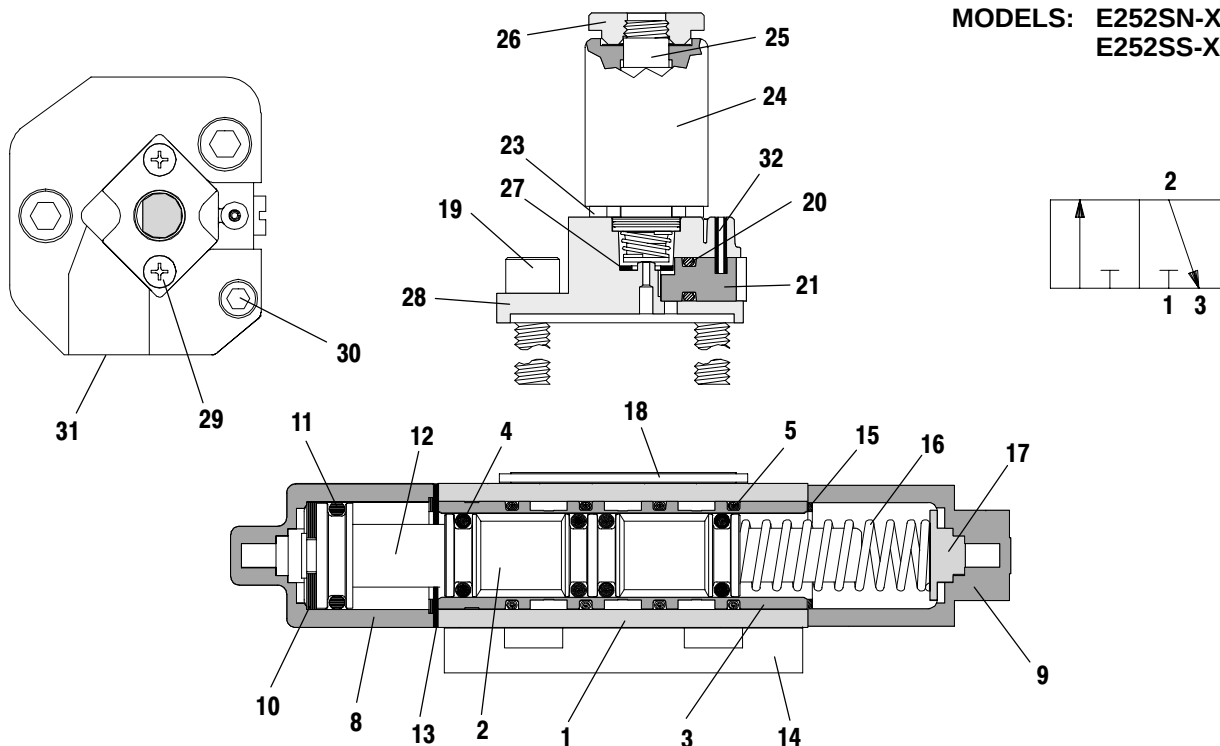
PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20183		Piston (E252BD)	(2)	20188
2	Spool Assembly (E252BS)	(1)	20494	* 13	Gasket (E252BS)	(1)	20165
	Spool (E252BD)	(1)	20216	†	Gasket (E252BD)	(2)	20165
3	Sleeve	(1)	116770	14	Connector (E252BS)	(1)	20187
†* 4	"O" Ring	(4)	15066		Connector (E252BD)	(2)	20187
†* 5	"O" Ring (1/16" x 3/4" o.d.)	(4)	Y325-16	15	Washer	(2)	20129
6	Screw (#10 - 24 x 5/8") (not shown)	(8)	Y195-95-C	* 16	Spring (E252BS)	(1)	20759
8	End Cap	(1)	20173	* 17	Bumper (E252BS)	(1)	20758-1
9	End Cap Assembly (E252BS)	(1)	20763	* 18	"O" Ring (1/16" x 1/4" o.d.) (E252BS)	(2)	Y325-6
	End Cap (E252BD)	(1)	20173	†	"O" Ring (1/16" x 1/4" o.d.) (E252BD)	(4)	Y325-6
* 10	Bumper (E252BS)	(1)	20757	19	Button Bleeder Assembly (E252BS)	(1)	24130
†	Bumper (E252BD)	(2)	20757		Button Bleeder Assembly (E252BD)	(2)	24130
* 11	"O" Ring (3/32" x 3/4" o.d.) (E252BS)	(1)	Y325-113	*	Repair Kit (E252BS)		116772
†	"O" Ring (3/32" x 3/4" o.d.) (E252BD)	(2)	Y325-113	†	Repair Kit (E252BD)		116773
12	Piston (E252BS)	(1)	20188				

PARTS LIST

SERIES E SPOOL VALVES 1/4" N.P.T.F. PIPE PORTS 3-WAY, SOLENOID

MODELS: E252SN-XXX-X
E252SS-XXX-X



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body (E252SN-XXX-X)	(1)	20826	20	"O" Ring (1/16" x 5/16" o.d.)	(1)	Y325-8
	Body (E252SS-XXX-X)	(1)	20827	21	Override Pin	(1)	118127
2	Spool Assembly	(1)	20769	23	Flange Plate	(1)	116506
3	Sleeve	(1)	116770	24	Coil (E252SX-012-A)	(1)	116218-31
* 4	"O" Ring	(4)	15066		Coil (E252SX-120-A)	(1)	116218-33
* 5	"O" Ring (1/16" x 3/4" o.d.)	(4)	Y325-16		Coil (E252SX-240-A & E252SX-120-D)	(1)	116218-35
6	Screw (#10 - 24 x 5/8") (not shown)	(8)	Y195-95-C		Coil (E252SX-005-D)	(1)	116218-37
8	End Cap	(1)	20173		Coil (E252SX-024-A & E252SX-012-D)	(1)	116218-38
9	End Cap Assembly	(1)	20763		Coil (E252SX-024-D)	(1)	116218-39
* 10	Bumper	(1)	20757	25	Armature Assembly	(1)	116507
* 11	"O" Ring (3/32" x 3/4" o.d.)	(1)	Y325-113	26	Coil Nut	(1)	119380
12	Piston	(1)	20131	27	Lift Washer	(1)	117382
* 13	Gasket	(1)	20165	28	Base Plate	(1)	116497
14	Bracket Assembly	(1)	20823	29	Screw	(2)	116346
15	Washer	(2)	20129	30	Screw (#8 - 32 x 5/8")	(1)	Y195-65-C
* 16	Spring	(1)	20759	31	Pipe Plug (not shown)	(2)	118126
* 17	Bumper	(1)	20758-1	32	Roll Pin (5/64" o.d. x 3/8" long)	(1)	Y178-3
18	Gasket	(1)	116500	*	Repair Kit		116772
19	Screw (1/4" - 20 x 1-1/2")	(2)	Y99-44-C	■	Repair Kit		116573

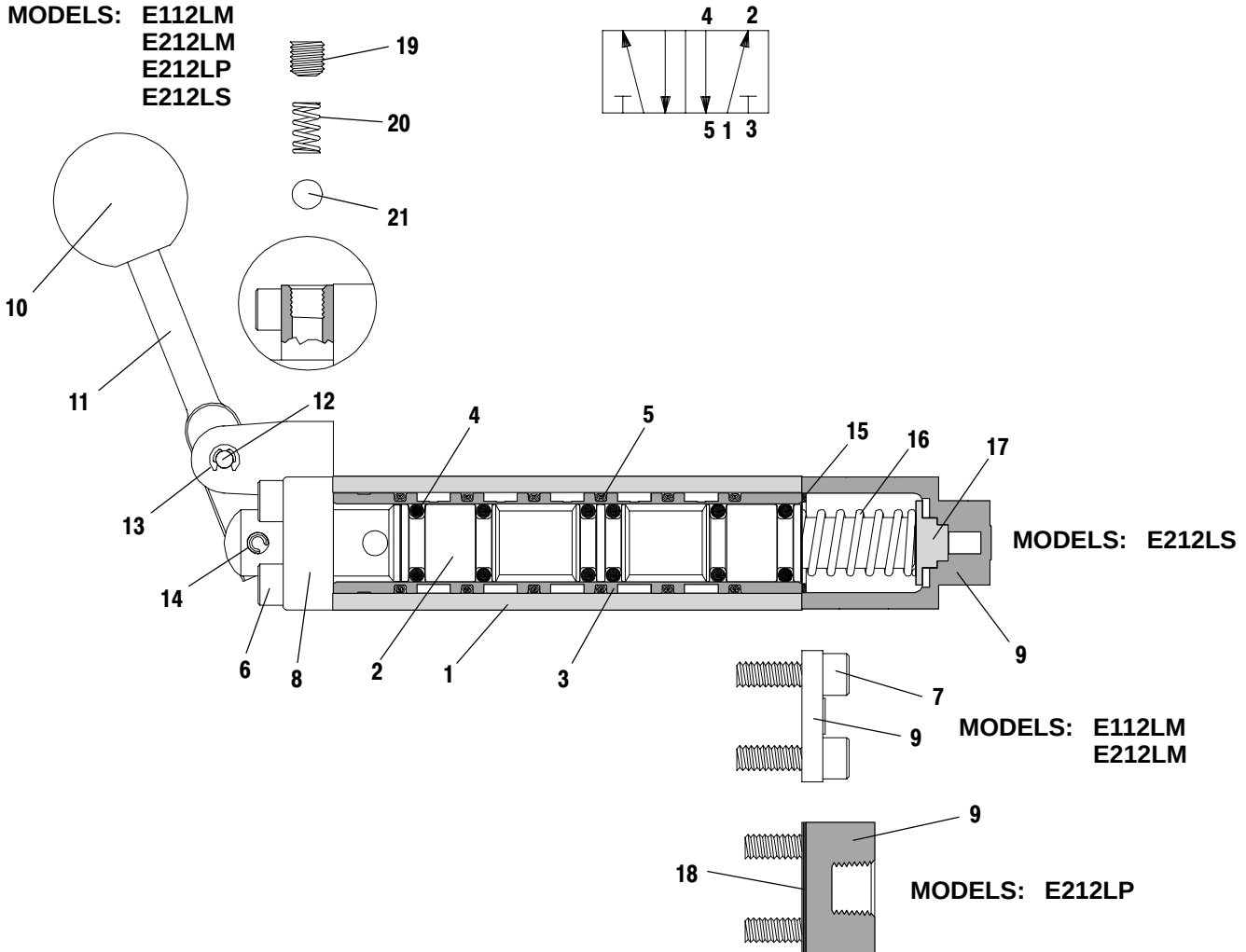
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

4-WAY, HAND LEVER

MODELS: E112LM
E212LM
E212LP
E212LS



PARTS LIST

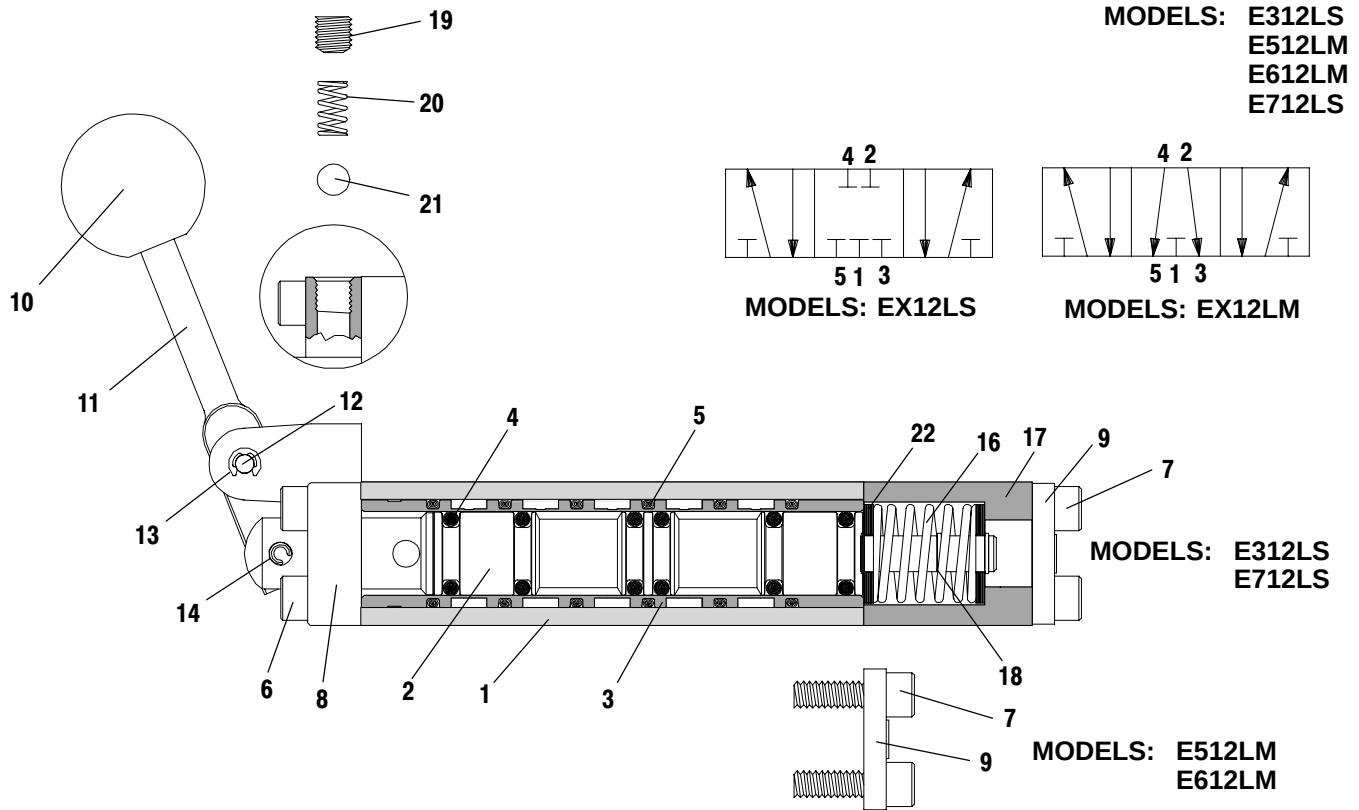
ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20148	10	Ball Knob	(1)	13512-A
2	Spool Assembly (E112LM, E212LM, E212LP)	(1)	20773	11	Hand Lever	(1)	115642
	Spool Assembly (E212LS)	(1)	20770-1	12	Pin	(1)	20155
3	Sleeve	(1)	116771	13	"E" Ring	(2)	Y180-12
* 4	"O" Ring	(6)	15066	14	Roll Pin (5/32" o.d. x 7/16" long)	(1)	Y178-138
* 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16	15	Washer (E212LS)	(1)	20129
6	Screw (#10 - 24 x 3/4")	(4)	Y195-96-C	* 16	Spring (E212LS)	(1)	20759
7	Screw (#10 - 24 x 5/8")	(4)	Y195-95-C	* 17	Bumper (E212LS)	(1)	20758-1
8	End Cap (E212LM, E212LP, E212LS)	(1)	20163	* 18	Gasket (E212LP)	(1)	15002
	End Cap (E112LM)	(1)	20178	19	Set Screw (1/4" - 28 x 1/4") (E112LM)	(1)	Y23-42
9	End Cap (E112LM, E212LM)	(1)	15008	20	Spring (E112LM)	(1)	16618
	End Cap (E212LP)	(1)	20225	21	Ball (7/32" dia.) (E112LM)	(1)	Y16-7
	End Cap Assembly (E212LS)	(1)	20763	*	Repair Kit		116772

PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

4-WAY, HAND LEVER, 3-POSITION

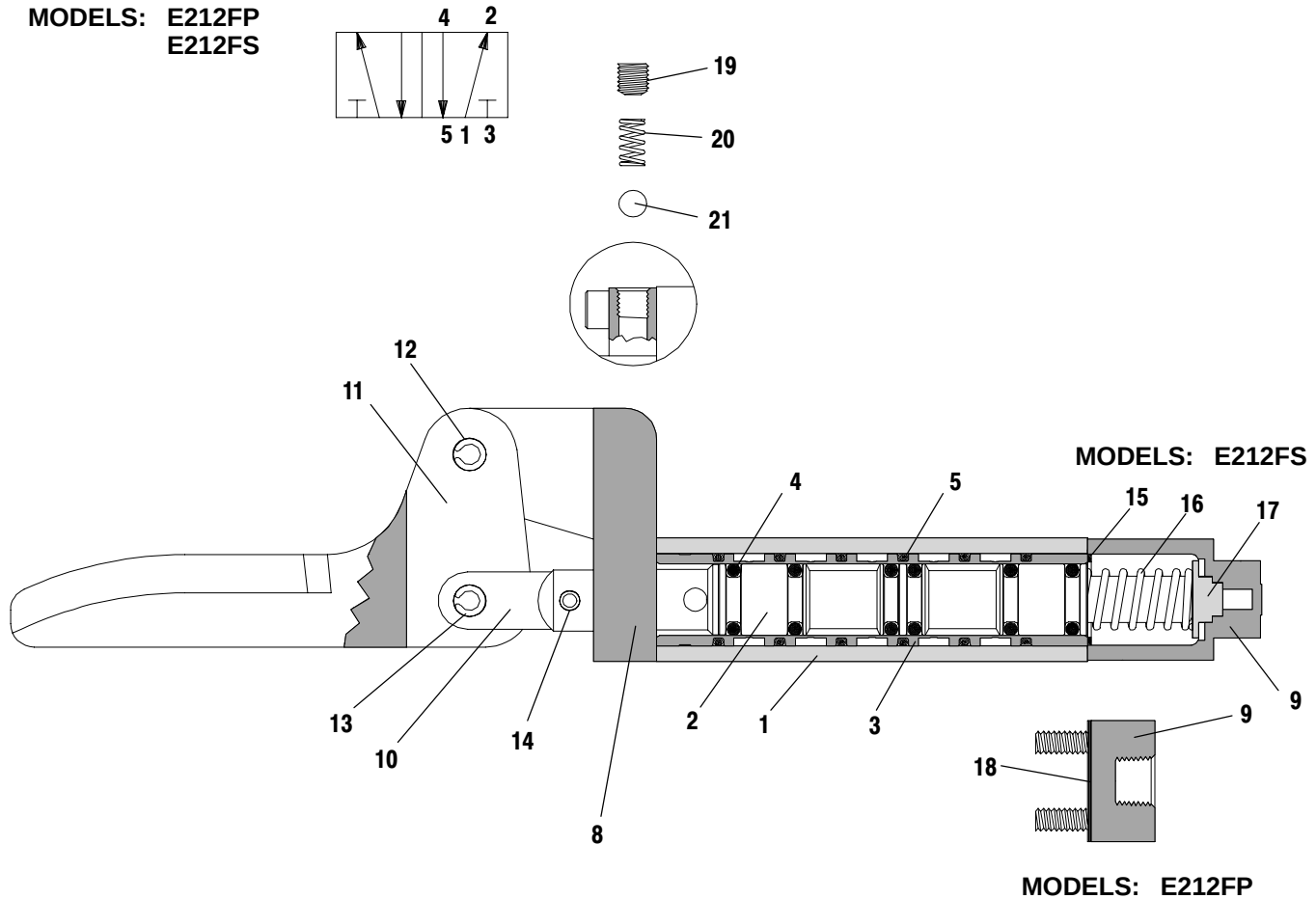


PARTS LIST							
ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20148	10	Ball Knob	(1)	13512-A
2	Spool Assembly (E312LS)	(1)	20777	11	Hand Lever	(1)	115642
	Spool Assembly (E512LM)	(1)	20776	12	Pin	(1)	20155
	Spool Assembly (E612LM)	(1)	20778	13	"E" Ring	(2)	Y180-12
	Spool Assembly (E712LS)	(1)	20780	14	Roll Pin (5/32" o.d. x 7/16" long)	(1)	Y178-138
3	Sleeve	(1)	116771	† 16	Spring (E312LS, E712LS)	(1)	16953
* † 4	"O" Ring	(6)	15066	17	Housing (E312LS, E712LS)	(1)	20144
* † 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16	† 18	Retaining Ring (1/4" dia.) (E312LS, E712LS)	(3)	Y145-7
6	Screw (#10 - 24 x 3/4")	(4)	Y195-96-C	19	Set Screw (1/4" - 28 x 1/4") (E512LM, E612LM)	(1)	Y23-42
	Screw (#10 - 24 x 5/8") (E512LM, E612LM)	(4)	Y195-95-C	20	Spring (E512LM, E612LM)	(1)	16618
7	Screw (#10 - 24 x 1-23/32") (E312LS, E712LS)	(4)	Y195-102-C	21	Ball (7/32" dia.) (E512LM, E612LM)	(1)	Y16-7
	Screw (#10 - 24 x 1-23/32") (E312LS, E712LS)	(4)	Y195-102-C	22	Washer (E312LS, E712LS)	(2)	20217
8	End Cap (E312LS, E712LS)	(1)	20163	*	Repair Kit (E512LM, E612LM)		116772
	End Cap (E512LM, E612LM)	(1)	20178	†	Repair Kit (E312LS, E712LS)		116773
9	End Cap	(1)	15008				

PARTS LIST

SERIES E SPOOL VALVES 1/4" N.P.T.F. PIPE PORTS 4-WAY, PEDAL

MODELS: E212FP
E212FS

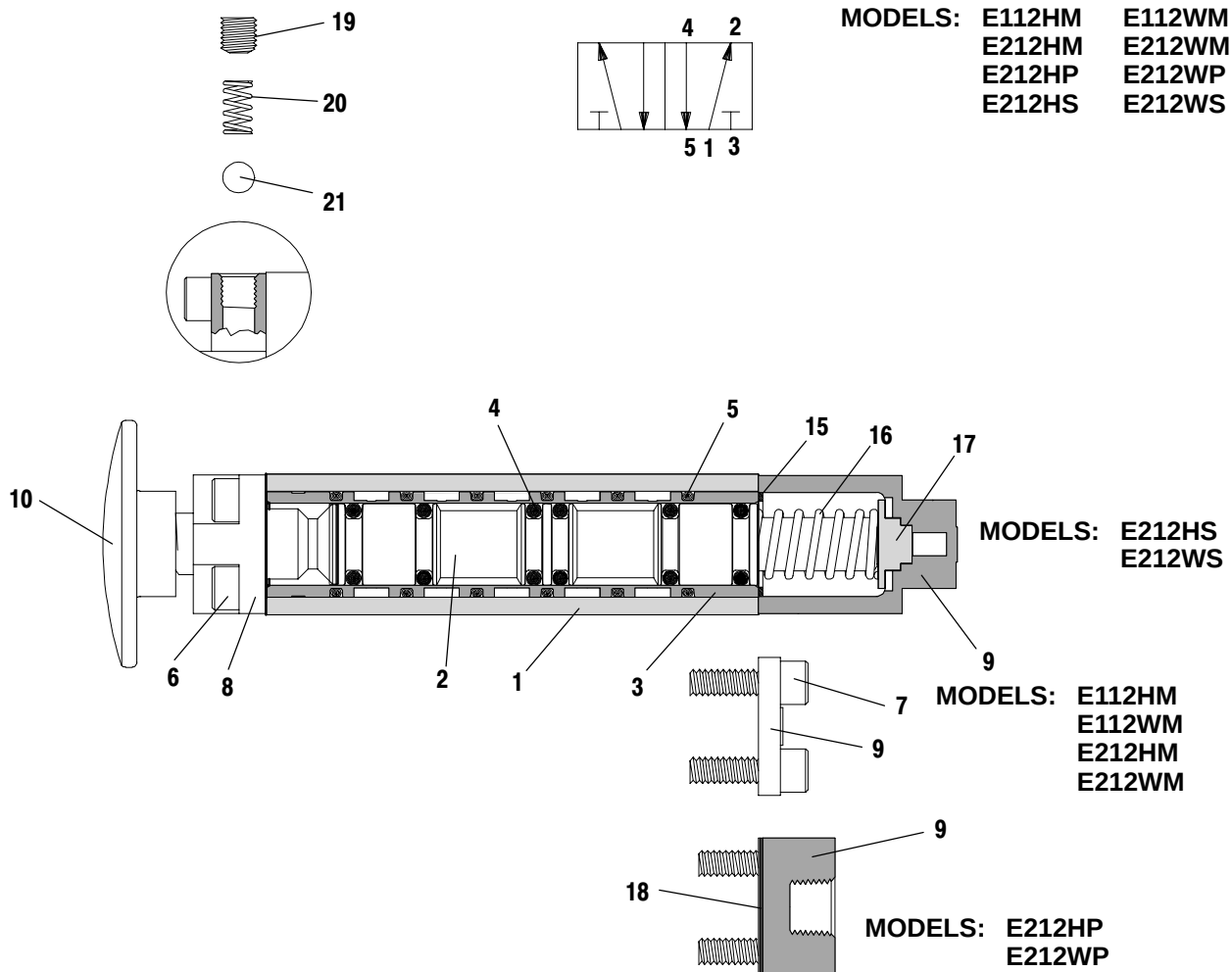


PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20148	11	Foot Pedal	(1)	24113
2	Spool Assembly (E212FS)	(1)	20770-1	12	Roll Pin (1/4" o.d. x 1-3/4" long)	(1)	Y178-109
	Spool Assembly (E212FP)	(1)	115355	13	Roll Pin (1/4" o.d. x 7/8" long)	(1)	Y178-102
3	Sleeve	(1)	116771	14	Roll Pin (5/32" o.d. x 7/16" long)	(1)	Y178-138
* 4	"O" Ring	(6)	15066	15	Washer (E212FS)	(1)	20129
* 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16	* 16	Spring (E212FS)	(1)	20759
6	Screw (#10 - 24 x 5/8") (not shown)	(8)	Y195-95-C	* 17	Bumper (E212FS)	(1)	20758-1
8	End Cap (E212FS)	(1)	20399	* 18	Gasket (E212FP)	(1)	15002
	End Cap (E212FP)	(1)	115353	19	Set Screw (1/4" - 28 x 1/4") (E212FP)	(1)	Y23-42
9	End Cap Assembly (E212FS)	(1)	20763	20	Spring (E212FP)	(1)	16618
	End Cap (E212FP)	(1)	20225	21	Ball (7/32" dia.) (E212FP)	(1)	Y16-7
10	Link	(1)	20140	*	Repair Kit		116772

PARTS LIST

SERIES E SPOOL VALVES 1/4" N.P.T.F. PIPE PORTS 4-WAY, PALM BUTTON



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20148	9	End Cap Assembly (E212XS)	(1)	20763
2	Spool Assembly (E112XM, E212XM, E212XP)	(1)	20774		End Cap (E112XM, E212XM)	(1)	15008
	Spool Assembly (E212XS)	(1)	20771		End Cap (E212XP)	(1)	20225
3	Sleeve	(1)	116771	10	Palm Button (E112HX, E212HX)	(1)	13111
* 4	"O" Ring	(6)	15066	15	Washer (E212XS)	(1)	20129
* 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16	* 16	Spring (E212XS)	(1)	20759
6	Screw (#10 - 24 x 5/8") (E212XX)	(4)	Y195-95-C	* 17	Bumper (E212XS)	(1)	20758-1
	Screw (#10 - 24 x 3/4") (E112XM)	(4)	Y195-96-C	* 18	Gasket (E212XP)	(1)	15002
7	Screw (#10 - 24 x 5/8")	(4)	Y195-95-C	19	Set Screw (1/4" - 28 x 1/4") (E112XM)	(1)	Y23-42
8	End Cap (E212XX)	(1)	20130	20	Spring (E112XM)	(1)	16618
	End Cap (E112XM)	(1)	20851	21	Ball (7/32" dia.) (E112XM)	(1)	Y16-7
				*	Repair Kit		116772

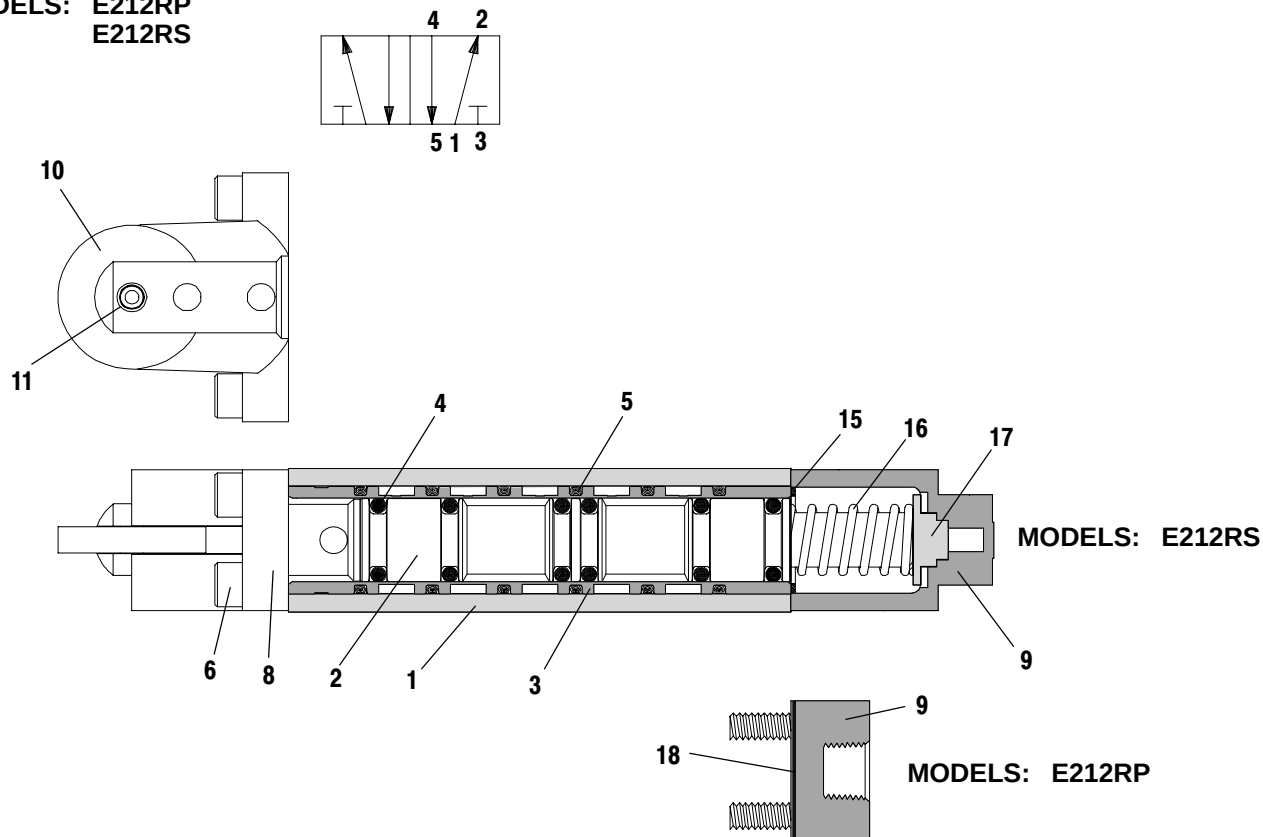
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

4-WAY, ROLLER CAM

MODELS: E212RP
E212RS



PARTS LIST

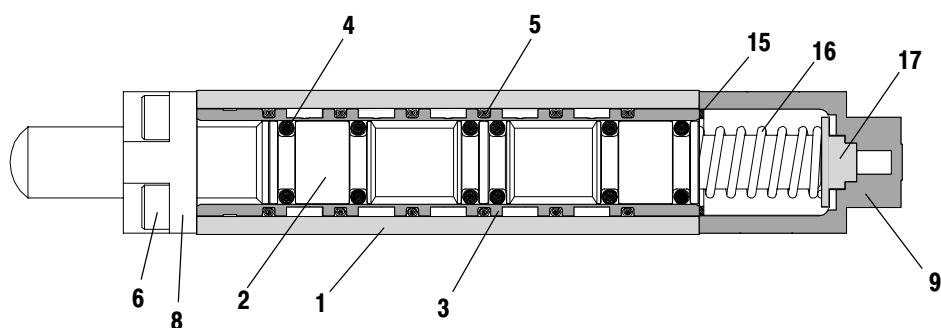
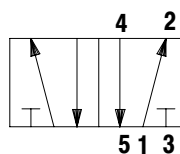
ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20148
2	Spool Assembly (E212RS)	(1)	20770-1
	Spool Assembly (E212RP)	(1)	20773
3	Sleeve	(1)	116771
* 4	"O" Ring	(6)	15066
* 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16
6	Screw (#10 - 24 x 5/8")	(8)	Y195-95-C
8	End Cap	(1)	20109

ITEM	DESCRIPTION (Size In Inches)	QTY	PART NO.
9	End Cap Assembly (E212RS)	(1)	20763
	End Cap (E212RP)	(1)	20225
10	Roller Cam	(1)	20164
11	Pin	(1)	20151
15	Washer (E212RS)	(1)	20129
* 16	Spring (E212RS)	(1)	20759
* 17	Bumper (E212RS)	(1)	20758-1
* 18	Gasket (E212RP)	(1)	15002
*	Repair Kit		116772

PARTS LIST

SERIES E SPOOL VALVES
1/4" N.P.T.F. PIPE PORTS
4-WAY, CAM STEM

MODELS: E212CS



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size In Inches)	QTY	PART NO.
1	Body	(1)	20148	8	End Cap	(1)	20130
2	Spool Assembly	(1)	20772-1	9	End Cap Assembly	(1)	20763
3	Sleeve	(1)	116771	15	Washer	(1)	20129
* 4	"O" Ring	(6)	15066	* 16	Spring	(1)	20759
* 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16	* 17	Bumper	(1)	20758-1
6	Screw (#10 - 24 x 5/8")	(8)	Y195-95-C	*	Repair Kit		116772

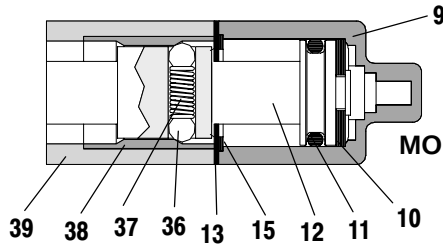
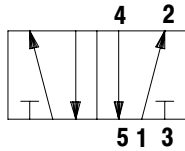
PARTS LIST

SERIES E SPOOL VALVES

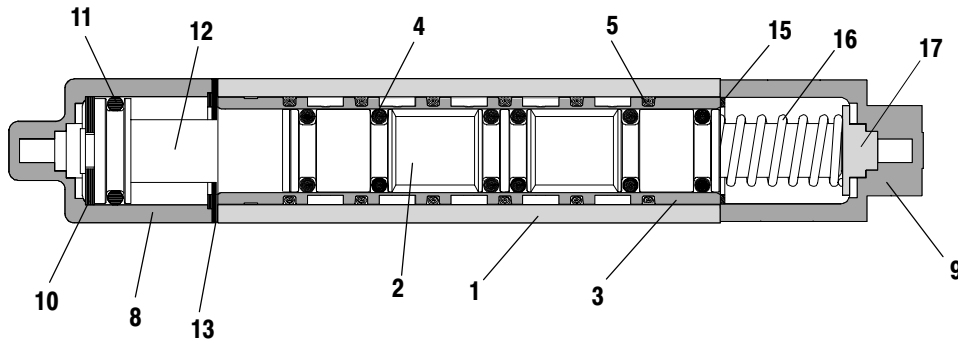
1/4" N.P.T.F. PIPE PORTS

4-WAY, PILOT

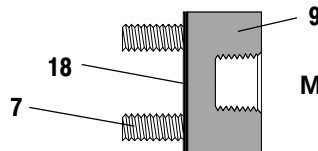
MODELS: E112PD E142PD
 E212PD E242PD
 E212PE
 E212PS E242PS



MODELS: E112PD
E142PD



MODELS: E212PD
E212PS
E242PD
E242PS



MODELS: E212PE

PARTS LIST

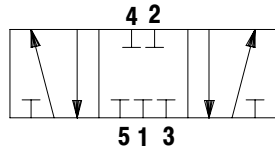
ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body (EX12PX)	(1)	20148	12	Piston (E2X2PS, E212PE)	(1)	20131
	Body (EX42PX)	(1)	115641		Piston (EXX2PD)	(2)	20131
2	Spool (E2X2PD, E212PE)	(1)	20220	* 13	Gasket (E2X2PS, E212PE)	(1)	20165
	Spool Assembly (E2X2PS)	(1)	20782		Gasket (EXX2PD)	(2)	20165
	Spool Assembly (E1X2PD)	(1)	20853	15	Washer (E212PE)	(1)	20129
3	Sleeve	(1)	116771		Washer (EXX2PD, EXX2PS)	(2)	20129
† * 4	"O" Ring	(6)	15066	* 16	Spring (E2X2PS)	(1)	20759
† * 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16	* 17	Bumper (E2X2PS)	(1)	20758-1
6	Screw (#10 - 24 x 5/8") (not shown)	(4)	Y195-95-C	* 18	Gasket (E212PE)	(1)	15002
	Screw (#10 - 24 x 5/8") (E2X2PX)	(4)	Y195-95-C	19	Screw (1/4" - 20 x 1-1/2") (EX42PX) (not shown)	(3)	Y99-44-C
7	Screw (#10 - 24 x 1-7/8") (E1X2PD)	(4)	Y195-106-C		Pipe Plug (EX42PD) (not shown)	(2)	118126
8	End Cap	(1)	20173	34	Gasket (EX42PX) (not shown)	(1)	20170
9	End Cap Assembly (E2X2PS)	(1)	20763	35	Seal (EX42PX) (not shown)	(1)	115741
	End Cap (EXX2PD)	(1)	20173	36	Ball (E1X2PD)	(2)	73556
	End Cap (E212PE)	(1)	20225	37	Spring (E1X2PD)	(1)	20470
* 10	Bumper (E2X2PS, E212PE)	(1)	20757	38	Insert (E1X2PD)	(1)	20854
	Bumper (EXX2PD)	(2)	20757	39	Housing (E1X2PD)	(1)	20469
* 11	"O" Ring (3/32" x 3/4" o.d.) (E2X2PS, E212PE)	(1)	Y325-113	† * 40	"O" Ring (1/16" x 1/4" o.d.) (E142PD) (not shown)	(1)	Y325-6
	"O" Ring (EXX2PD)	(2)	Y325-113	*	Repair Kit (E2X2PS, E212PE)		116772
				†	Repair Kit (EXX2PD)		116773

PARTS LIST

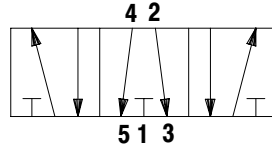
SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

4-WAY, PILOT SPRING CENTERED

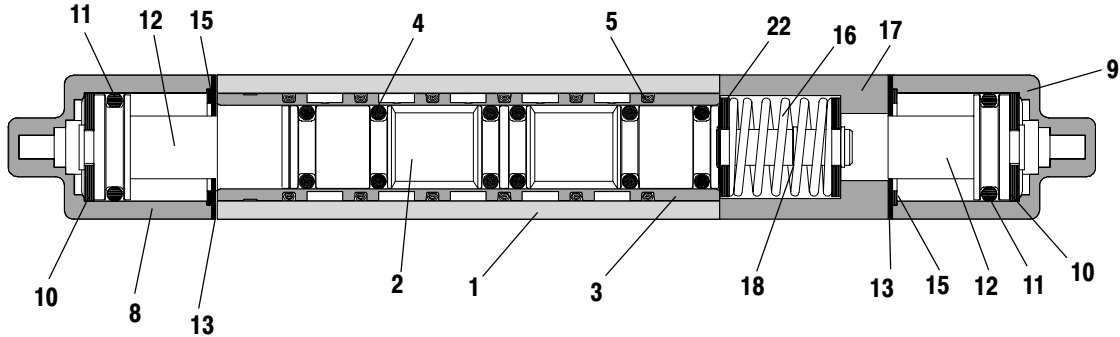


MODELS: E3X2PD



MODELS: E7X2PD

MODELS: E312PD E342PD
E712PD E742PD



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body (E312PD, E712PD)	(1)	20148	† 13	Gasket	(2)	20165
	Body (E342PD, E742PD)	(1)	115641	15	Washer	(2)	20129
2	Spool Assembly (E312PD, E342PD)	(1)	20779	† 16	Spring	(1)	16953
	Spool Assembly (E712PD, E742PD)	(1)	20781	17	Housing (E312PD, E712PD)	(1)	20144
3	Sleeve	(1)	116771		Housing (E342PD, E742PD)	(1)	20821
† 4	"O" Ring	(6)	15066	† 18	Retaining Ring (1/4" dia.)	(2)	Y145-7
† 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16	19	Screw (1/4" - 20 x 1-1/2") (EX42PD) (not shown)	(3)	Y99-44-C
6	Screw (#10 - 24 x 5/8") (not shown)	(4)	Y195-95-C	22	Washer	(2)	20217
7	Screw (#10 - 24 x 1-7/8") (not shown)	(4)	Y195-106-C	31	Pipe Plug (E342PD, E742PD) (not shown)	(2)	118126
8	End Cap	(1)	20173	34	Gasket (E342PD, E742PD) (not shown)	(1)	20170
9	End Cap	(1)	20173	35	Seal (E342PD, E742PD) (not shown)	(1)	115741
† 10	Bumper	(2)	20757	† 40	"O" Ring (1/16" x 1/4" o.d.) (EX42PD) (not shown)	(1)	Y325-6
† 11	"O" Ring (3/32" x 3/4" o.d.)	(2)	Y325-113	†	Repair Kit		116773
12	Piston	(2)	20131				

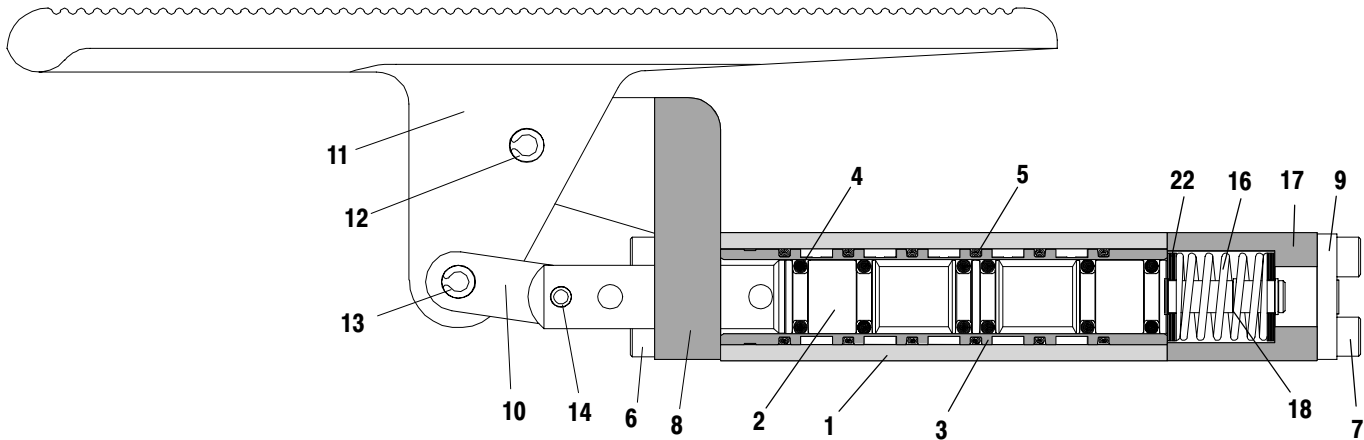
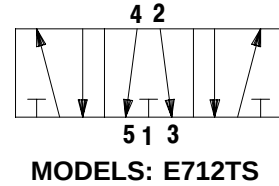
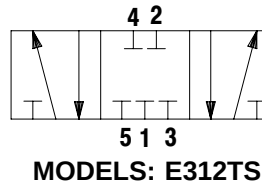
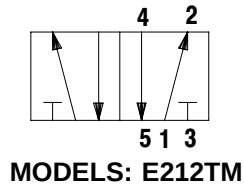
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

4-WAY, TREADLE

MODELS: E212TM
E312TS
E712TS



PARTS LIST

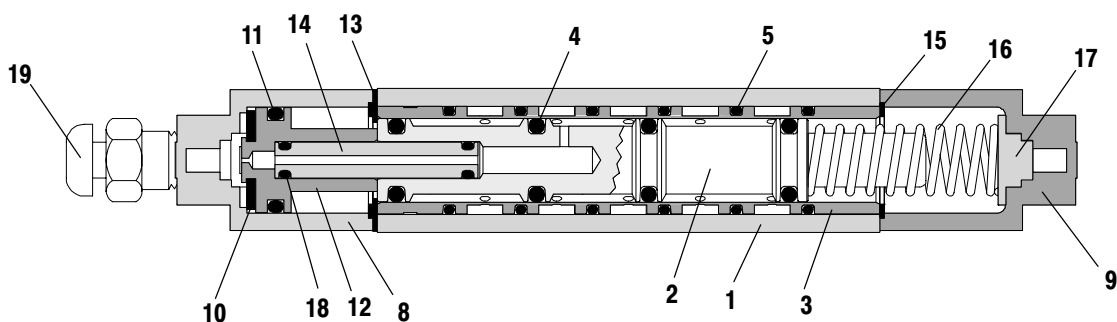
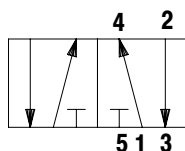
ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body	(1)	20148
2	Spool Assembly (E212TM)	(1)	20773
	Spool Assembly (E312TS)	(1)	20777
	Spool Assembly (E712TS)	(1)	20780
3	Sleeve	(1)	116771
†* 4	"O" Ring	(6)	15066
†* 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16
6	Screw (#10 - 24 x 5/8")	(4)	Y195-95-C
7	Screw (#10 - 24 x 5/8") (E212TM)	(4)	Y195-95-C
	Screw (#10 - 24 x 1-23/32") (E312TS, E712TS)	(4)	Y195-102-C
8	End Cap	(1)	20399
9	End Cap	(1)	15008

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
10	Link	(1)	20140
11	Foot Treadle	(1)	24112
12	Roll Pin (1/4" o.d. x 1-3/4" long)	(1)	Y178-109
13	Roll Pin (1/4" o.d. x 7/8" long)	(1)	Y178-102
14	Roll Pin (5/32" o.d. x 7/16" long)	(1)	Y178-138
† 16	Spring (E312TS, E712TS)	(1)	16953
17	Housing (E312TS, E712TS)	(1)	20144
† 18	Retaining Ring (1/4" dia.) (E312TS, E712TS)	(3)	Y145-7
22	Washer (E312TS, E712TS)	(2)	20217
*	Repair Kit (E212TM)		116772
†	Repair Kit (E312TS, E712TS)		116773

PARTS LIST

SERIES E SPOOL VALVES 1/4" N.P.T.F. PIPE PORTS 4-WAY, BLEED

MODELS: E212BD
E212BS
E242BS



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body (E212BD, E212BS)	(1)	20148	12	Piston (E212BS, E242BS)	(1)	20188
	Body (E242BS)	(1)	115641		Piston (E212BD)	(2)	20188
2	Spool (E212BD)	(1)	20190	* 13	Gasket (E212BS, E242BS)	(1)	20165
	Spool Assembly (E212BS, E242BS)	(1)	20855	†	Gasket (E212BD)	(2)	20165
3	Sleeve	(1)	116771	14	Connector (E212BS, E242BS)	(1)	20187
† * 4	"O" Ring	(4)	15066		Connector (E212BD)	(2)	20187
† * 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16	15	Washer	(2)	20129
6	Screw (#10 - 24 x 5/8") (not shown)	(8)	Y195-95-C	* 16	Spring (E212BS, E242BS)	(1)	20759
8	End Cap	(1)	20173	* 17	Bumper (E212BS, E242BS)	(1)	20758-1
9	End Cap Assembly (E212BS, E242BS)	(1)	20763	* 18	"O" Ring (1/16" x 1/4" o.d.) (E212BS, E242BS)	(2)	Y325-6
	End Cap (E212BD)	(1)	20173	†	"O" Ring (1/16" x 1/4" o.d.) (E212BD)	(4)	Y325-6
* 10	Bumper (E212BS, E242BS)	(1)	20757	19	Button Bleeder Assembly (E2X2BS)	(1)	24130
	† Bumper (E212BD)	(2)	20757		Button Bleeder Assembly (E212BD)	(2)	24130
* 11	"O" Ring (3/32" x 3/4" o.d.) (E212BS, E242BS)	(1)	Y325-113	*	Repair Kit (E2X2BS)		116772
	† "O" Ring (3/32" x 3/4" o.d.) (E212BD)	(2)	Y325-113	†	Repair Kit (E212BD)		116773

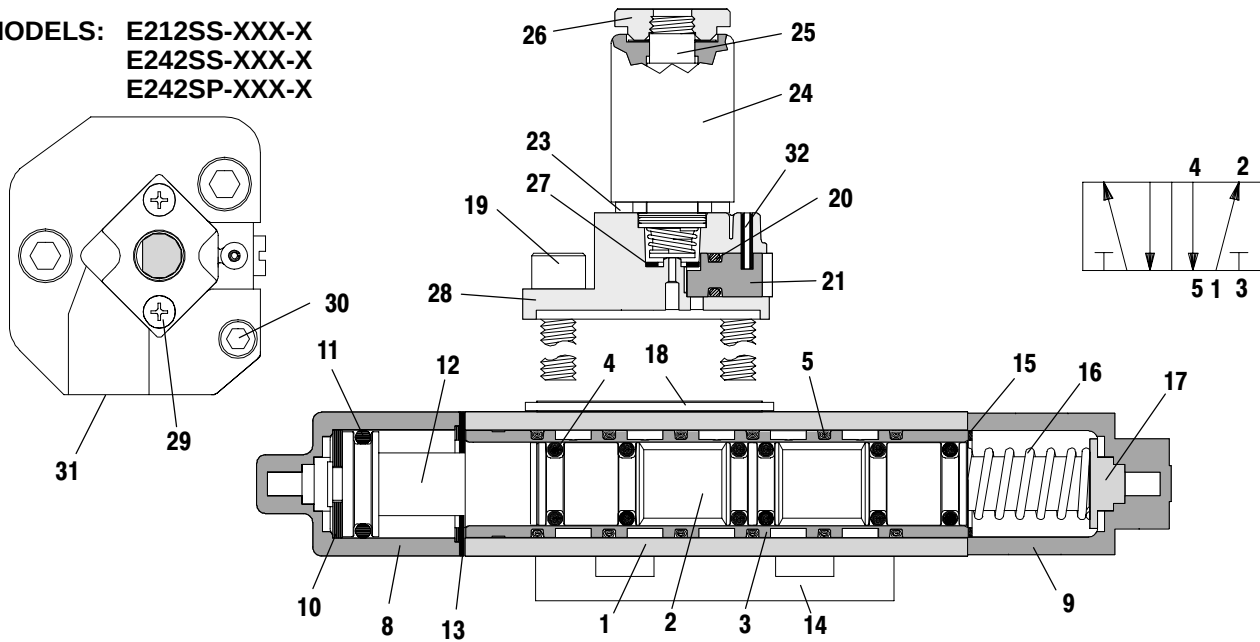
PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

4-WAY, SINGLE SOLENOID

MODELS: E212SS-XXX-X
E242SS-XXX-X
E242SP-XXX-X



PARTS LIST

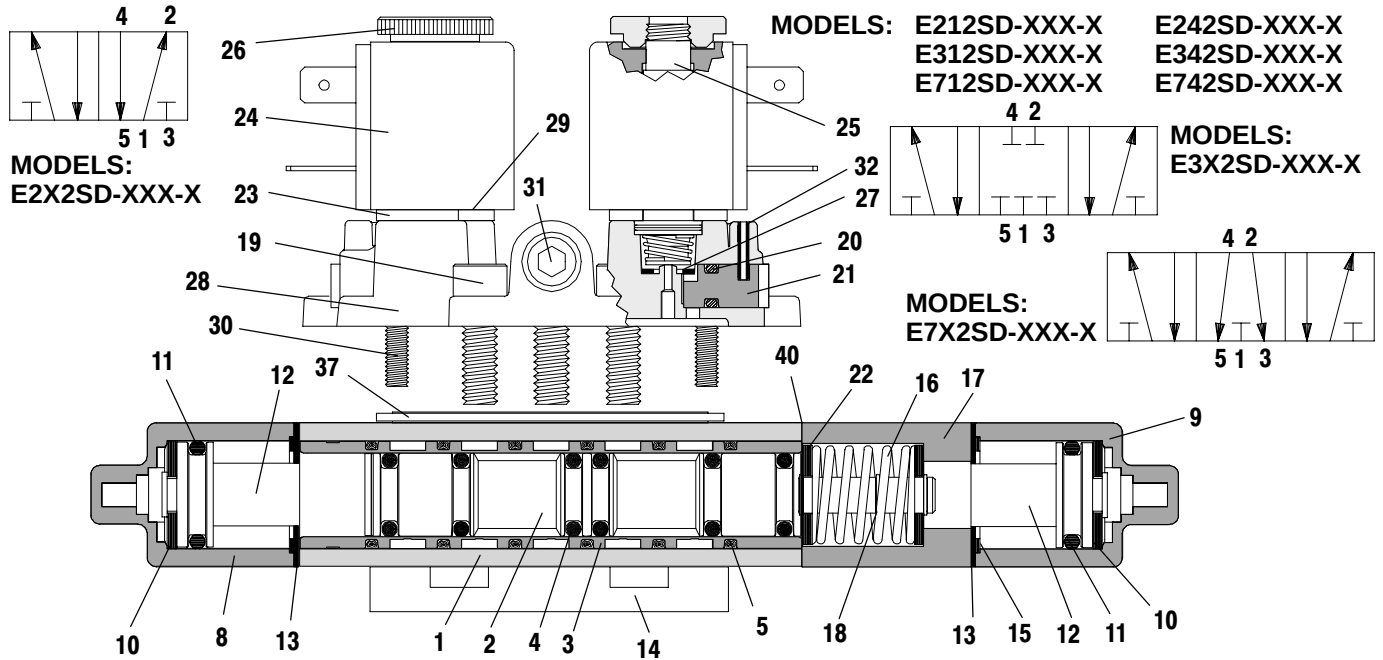
ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body (E212SS-XXX-X)	(1)	20833	19	Screw (E212SS-XXX-X) (1/4" - 20 x 1-1/2")	(2)	Y99-44-C
	Body (E242SS-XXX-X, E242SP-XXX-X)	(1)	119305		Screw (E242SX-XXX-X) (1/4" - 20 x 1-3/4")	(2)	Y99-45-C
2	Spool Assembly (E2X2SS-XXX-X)	(1)	20782	20	"O" Ring (1/16" x 5/16" o.d.)	(1)	Y325-8
	Spool (E242SP-XXX-X)	(1)	20220	21	Override Pin	(1)	118127
3	Sleeve	(1)	116771	23	Flange Plate	(1)	116506
† 4	"O" Ring	(6)	15066	24	Coil (E252SX-012-A)	(1)	116218-31
† 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16		Coil (E252SX-120-A)	(1)	116218-33
6	Screw (#10 - 24 x 5/8") (not shown)	(8)	Y195-95-C		Coil (E252SX-240-A & E252SX-120-D)	(1)	116218-35
8	End Cap	(1)	20173		Coil (E252SX-005-D)	(1)	116218-37
9	End Cap Assembly (E2X2SS-XXX-X)	(1)	20763		Coil (E252SX-024-A & E252SX-012-D)	(1)	116218-38
	End Cap (E242SP-XXX-X)	(1)	20173		Coil (E252SX-024-D)	(1)	116218-39
* 10	Bumper (E2X2SS-XXX-X)	(1)	20757	25	Armature Assembly	(1)	116507
†	Bumper (E242SP-XXX-X)	(2)	20757	26	Coil Nut	(1)	119380
* 11	"O" Ring (3/32" x 3/4" o.d.) (E2X2SS-XXX-X)	(1)	Y325-113	27	Lift Washer	(1)	117382
†	"O" Ring (3/32" x 3/4" o.d.) (E242SP-XXX-X)	(2)	Y325-113	28	Base Plate	(1)	116497
12	Piston (E2X2SS-XXX-X)	(1)	20131	29	Screw	(2)	116346
	Piston (E242SP-XXX-X)	(2)	20131	30	Screw (#8 - 32 x 5/8")	(1)	Y195-65-C
* 13	Gasket (E2X2SS-XXX-X)	(1)	20165	31	Pipe Plug (not shown)	(2)	118126
†	Gasket (E242SP-XXX-X)	(2)	20165	32	Roll Pin (5/64" o.d. x 3/8" long)	(1)	Y178-3
14	Bracket Assembly (E212SS-XXX-X)	(1)	20823	34	Gasket (E242SX-XXX-X) (not shown)	(1)	20170
15	Washer	(2)	20129	35	Seal (E242SX-XXX-X) (not shown)	(1)	115741
* 16	Spring (E2X2SS-XXX-X)	(1)	20759	*	Repair Kit (E2X2SS-XXX-X)		116772
* 17	Bumper (E2X2SS-XXX-X)	(1)	20758-1	†	Repair Kit (E242SP-XXX-X)		116773
18	Gasket	(1)	116500	■	Repair Kit		116573

PARTS LIST

SERIES E SPOOL VALVES

1/4" N.P.T.F. PIPE PORTS

4-WAY, DOUBLE SOLENOID



PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.
1	Body (EX12SD-XXX-X)	(1)	20830	20	"O" Ring (1/16" x 5/16" o.d.)	(2)	Y325-8
	Body (EX42SD-XXX-X)	(1)	115625	21	Override Pin	(2)	118127
2	Spool (E2X2SD-XXX-X)	(1)	20220	22	Washer (E3X2SD-XXX-X, E7X2SD-XXX-X)	(2)	20217
	Spool Assembly (E3X2SD-XXX-X)	(1)	20779	23	Flange Plate	(2)	116506
	Spool Assembly (E7X2SD-XXX-X)	(1)	20781	24	Coil (EXX2SD-012-A)	(2)	116218-31
3	Sleeve	(1)	116771		Coil (EXX2SD-120-A)	(2)	116218-33
† 4	"O" Ring	(6)	15066		Coil (EXX2SD-240-A & EXX2SD-120-D)	(2)	116218-35
† 5	"O" Ring (1/16" x 3/4" o.d.)	(6)	Y325-16		Coil (EXX2SD-005-D)	(2)	116218-37
6	Screw (#10 - 24 x 5/8") (not shown)	(4)	Y195-95-C		Coil (EXX2SD-024-A & EXX2SD-012-D)	(2)	116218-38
7	Screw (#10 - 24 x 5/8")(E2X2SD-XXX-X)(not shown)	(4)	Y195-95-C		Coil (EXX2SD-024-D)	(2)	116218-39
	Screw (#10 - 24 x 1-7/8") (E3X2SD-, E7X2SD-) (not shown)	(4)	Y195-106-C	25	Armature Assembly	(2)	116507
8	End Cap	(1)	20173	26	Coil Nut	(2)	119380
9	End Cap	(1)	20173	27	Lift Washer	(2)	117382
† 10	Bumper	(2)	20757	28	Base Plate	(1)	116503
† 11	"O" Ring (3/32" x 3/4" o.d.)	(2)	Y325-113	29	Screw (not shown)	(4)	116346
12	Piston	(2)	20131	30	Screw (#8 - 32 x 5/8")	(2)	Y195-65-C
† 13	Gasket	(2)	20165	31	Pipe Plug	(3)	118126
14	Bracket Assembly (EX12SD-XXX-X)	(1)	20823	32	Roll Pin (5/64" o.d. x 3/8" long)	(2)	Y178-3
15	Washer	(2)	20129	34	Gasket (EX42SD-XXX-X) (not shown)	(1)	20170
† 16	Spring (E3X2SD-XXX-X, E7X2SD-XXX-X)	(1)	16953	35	Seal (EX42SD-XXX-X) (not shown)	(1)	115741
17	Housing (E3X2SD-XXX-X, E712SD-XXX-X)	(1)	20821	37	Gasket	(1)	116504
† 18	Retaining Ring (1/4" dia.) (E3X2SD-, E712SD-)	(2)	Y145-7	† 40	"O" Ring (1/16" x 1/4" o.d.)(E3X2SD-,E7X2SD-)(not shown)	(1)	Y325-6
19	Screw (1/4" - 20 x 1-1/2") (EX12SD-XXX-X)	(3)	Y99-44-C	†	Repair Kit		116773
	Screw (1/4" - 20 x 1-3/4") (EX42SD-XXX-X)	(3)	Y99-45-C	☐	Repair Kit		116575

