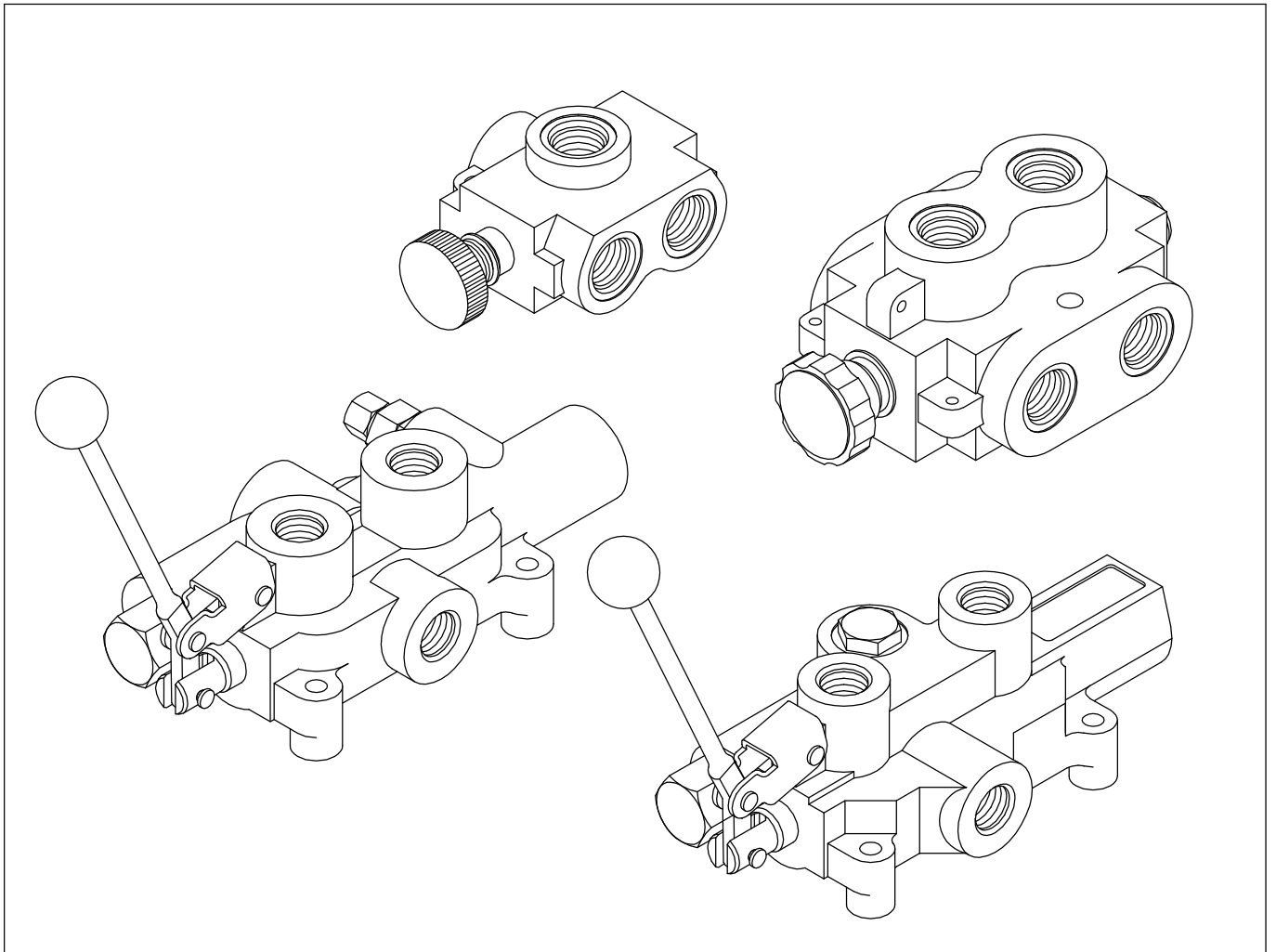


MODELS RD-2500, LS-3000
LSR-3060-3, SS AND DS
DIRECTIONAL CONTROL VALVES

PARTS MANUAL



PRINCE MANUFACTURING CORPORATION



Date: Oct. 2012

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GENERAL SAFETY PRECAUTIONS FOR HYDRAULIC VALVES

1) ALL HYDRAULIC VALVES MUST BE PROPERLY INSTALLED INTO THE HYDRAULIC SYSTEM TO PREVENT PERSONAL INJURY AND/OR PROPERTY DAMAGE. FURTHER, THE IMPROPER SERVICING OF A VALVE MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. PLEASE READ AND UNDERSTAND ALL CATALOG AND SERVICE INFORMATION BEFORE STARTING. AS WITH ALL MECHANICAL WORK THE PROPER TOOLS, KNOWLEDGE, AND SAFETY EQUIPMENT ARE REQUIRED. ALWAYS WEAR SAFETY GLASSES.

2) MAKE SURE ALL PRESSURE HAS BEEN RELIEVED IN THE HYDRAULIC LINES BEFORE INSTALLING OR SERVICING A HYDRAULIC VALVE.



WARNING: ESCAPING HYDRAULIC FLUID UNDER PRESSURE CAN HAVE SUFFICIENT FORCE TO PENETRATE SKIN, CAUSING SERIOUS PERSONAL INJURY. DO NOT USE YOUR HAND TO CHECK FOR HYDRAULIC LEAKS.

3) BEFORE INSTALLING OR SERVICING A HYDRAULIC COMPONENT MAKE SURE ALL WEIGHT HAS BEEN REMOVED FROM THE CYLINDERS OR MOTORS BEFORE DISCONNECTING HYDRAULIC LINES.



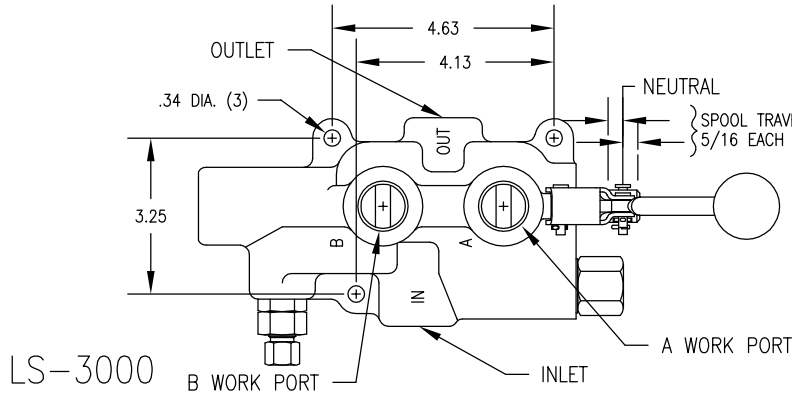
WARNING: DISCONNECTING THE HYDRAULIC LINES WHILE THE CYLINDER OR MOTOR IS UNDER LOAD MAY RESULT IN THE UNEXPECTED RAPID MOVEMENT OF MACHINE RESULTING IN SERIOUS PERSONAL INJURY.

4) DO NOT EXCEED THE OPERATING SPECIFICATIONS FOR PRESSURE, FLOW OR TEMPERATURE. ALL HYDRAULIC SYSTEMS REQUIRE A MEANS TO LIMIT THE MAXIMUM PRESSURE. THIS REQUIRES EITHER A PRESSURE RELIEF VALVE IN THE SYSTEM OR A PUMP THAT HAS PRESSURE COMPENSATION.

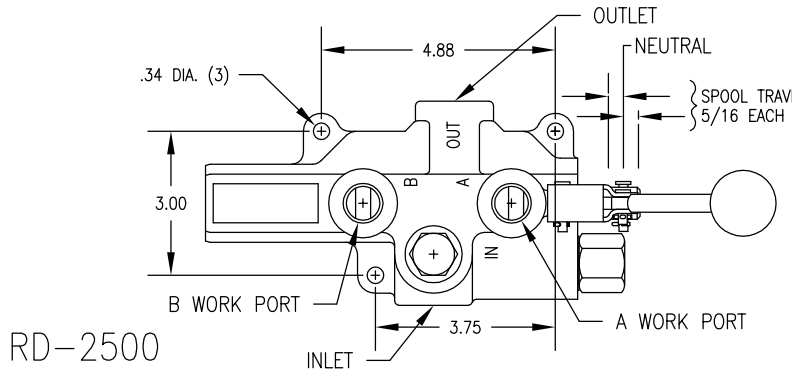


WARNING: OVERPRESSURE MAY CAUSE SUDDEN AND UNEXPECTED FAILURE OF A COMPONENT IN THE HYDRAULIC SYSTEM RESULTING IN SERIOUS PERSONAL INJURY. ALWAYS USE A GAUGE WHEN ADJUSTING A RELIEF VALVE.

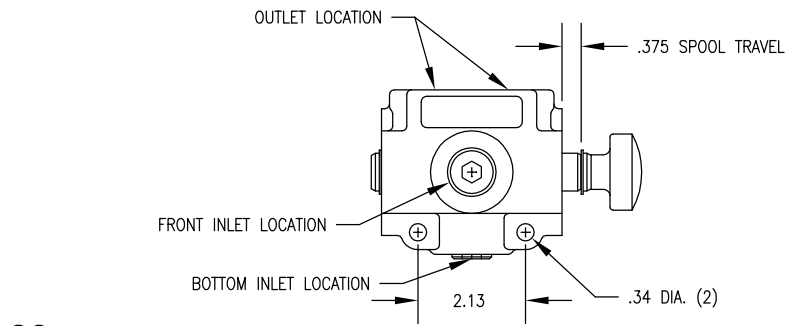
PORT IDENTIFICATION



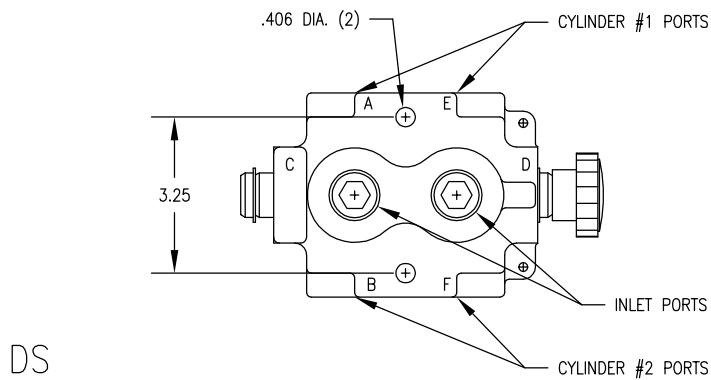
LS3000 SPECIFICATIONS
 MAXIMUM OPERATING PRESSURE.....2750 PSI
 MAXIMUM TANK PRESSURE.....500 PSI
 MAXIMUM OPERATING TEMPERATURE.....180°F
 RECOMENDED SYSTEM FILTRATION.....10 MICRON
 FLOW RATING.....25 GPM



RD2500 SPECIFICATIONS
 MAXIMUM OPERATING PRESSURE.....3000 PSI
 MAXIMUM TANK PRESSURE.....500 PSI
 MAXIMUM OPERATING TEMPERATURE.....180°F
 RECOMENDED SYSTEM FILTRATION.....10 MICRON
 FLOW RATING.....20 GPM

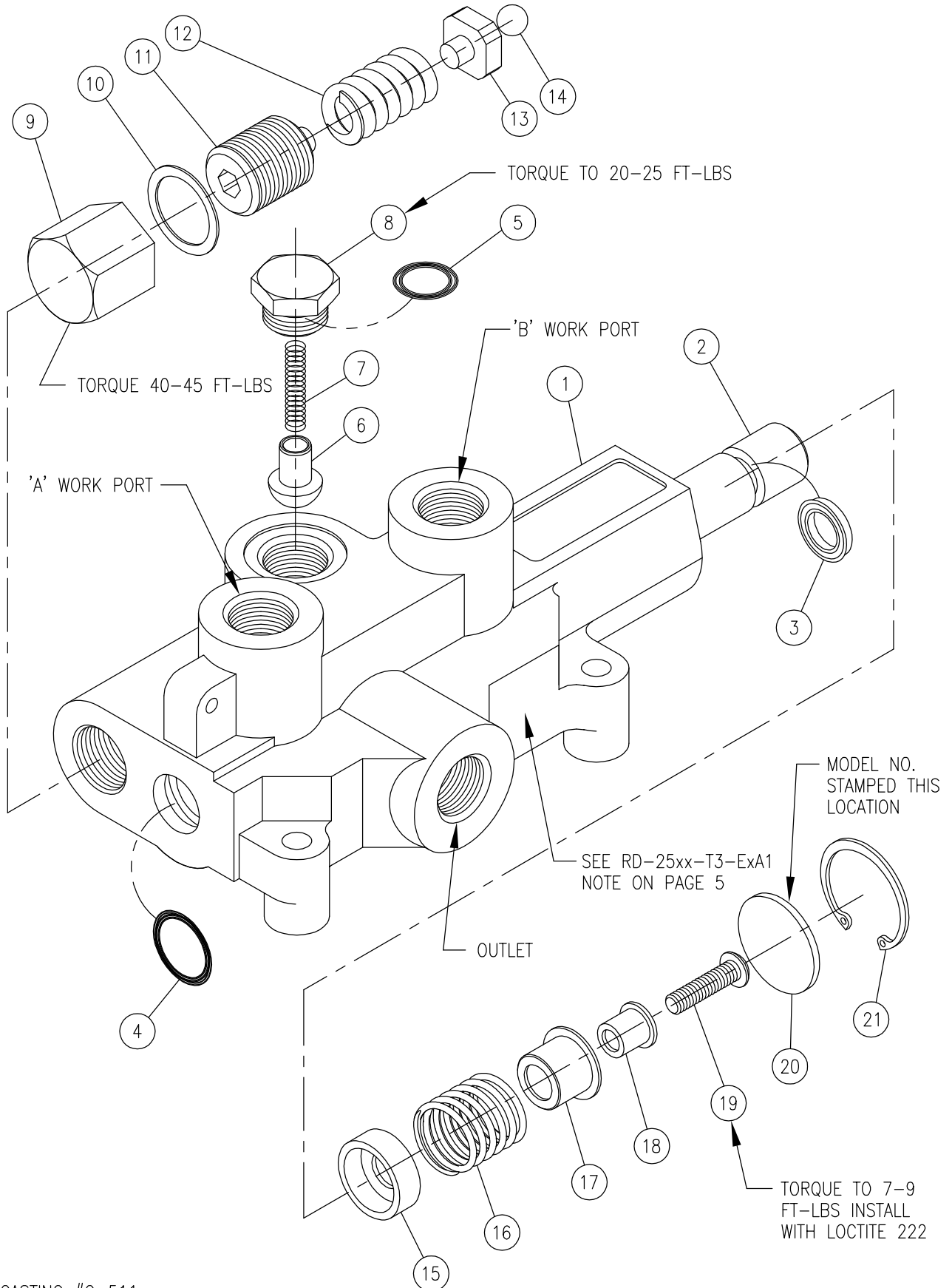


SS SPECIFICATIONS
 MAXIMUM OPERATING PRESSURE.....2500 PSI
 MAXIMUM OPERATING TEMPERATURE.....180°F
 RECOMENDED SYSTEM FILTRATION.....10 MICRON
 FLOW RATING.....20 GPM



DS SPECIFICATIONS
 MAXIMUM OPERATING PRESSURE.....2500 PSI
 MAXIMUM OPERATING TEMPERATURE.....180°F
 RECOMENDED SYSTEM FILTRATION.....10 MICRON
 FLOW RATING.....40 GPM

RD-2500



RD-25xx-T4-ESA1 MONO-BLOCK VALVE

RD-25xx-T4-ESA1 MONO-BLOCK VALVE

ITEM	QTY	PART NO.	DESCRIPTION
1	1	-	VALVE BODY
2	1	-	SPOOL
3	1*	240016086	U-CUP
4	1*	240000210	210 O-RING
5	1*	240000908	908 O-RING
6	1	670100001	LOAD CHECK POPPET
7	1	670300007	LOAD CHECK SPRING
8	1	671600001	LOAD CHECK PLUG
9	1	671800009	ACORN NUT
10	1*	671500008	ALUM. WASHER
11	1	671900007	ADJUSTING SCREW
12	1	670300024	SPRING, RELIEF
13	1	671100013	ADAPTER
14	1	230009003	STEEL BALL
15	1	671400012	STOP CUP
16	1	670300020	SPRING, CENTERING
17	1	671400010	STOP CUP
18	1	671400013	CENTERING SPACER
19	1	220000956	CAP SCREW
20	1	670500032	SPACER
21	1	230001125	SNAP RING
	*	660525001	SEAL KIT

SEE PAGE 12 FOR HANDLE KIT
& 3-POSITION DETENT KIT INFO.

RD-25xx-T3-ExA1 MODELS HAVE 3 WAY SPOOL OPERATION. A 1/4-NPTF PLUG WILL BE INSTALLED IN THE LOCATION SHOWN ON PAGE 4. THE 'B' PORT IS PLUGGED AND THE 'A' PORT IS CONNECTED TO THE PORT OF A SINGLE ACTING CYLINDER.

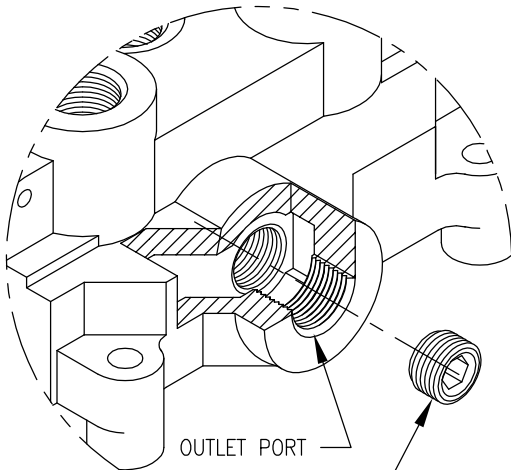


WARNING: OVERPRESSURE MAY CAUSE SUDDEN AND UNEXPECTED FAILURE OF A COMPONENT IN THE HYDRAULIC SYSTEM RESULTING IN SERIOUS PERSONAL INJURY. ALWAYS USE A GAUGE WHEN ADJUSTING A RELIEF VALVE.

RELIEF VALVE

An adjustable ball spring relief valve is standard on most RD-2500 valves. The standard factory setting is 1500 psi @ 12 gpm and 105°F. Other settings can be specified.

The relief pressure is adjusted by removing the acorn nut, item 9, and turning the adjusting screw, item 11. Turning the adjusting screw clockwise will increase the pressure, and counterclockwise will decrease the pressure (a pressure gauge must be installed in the inlet line when ever the relief pressure is adjusted).

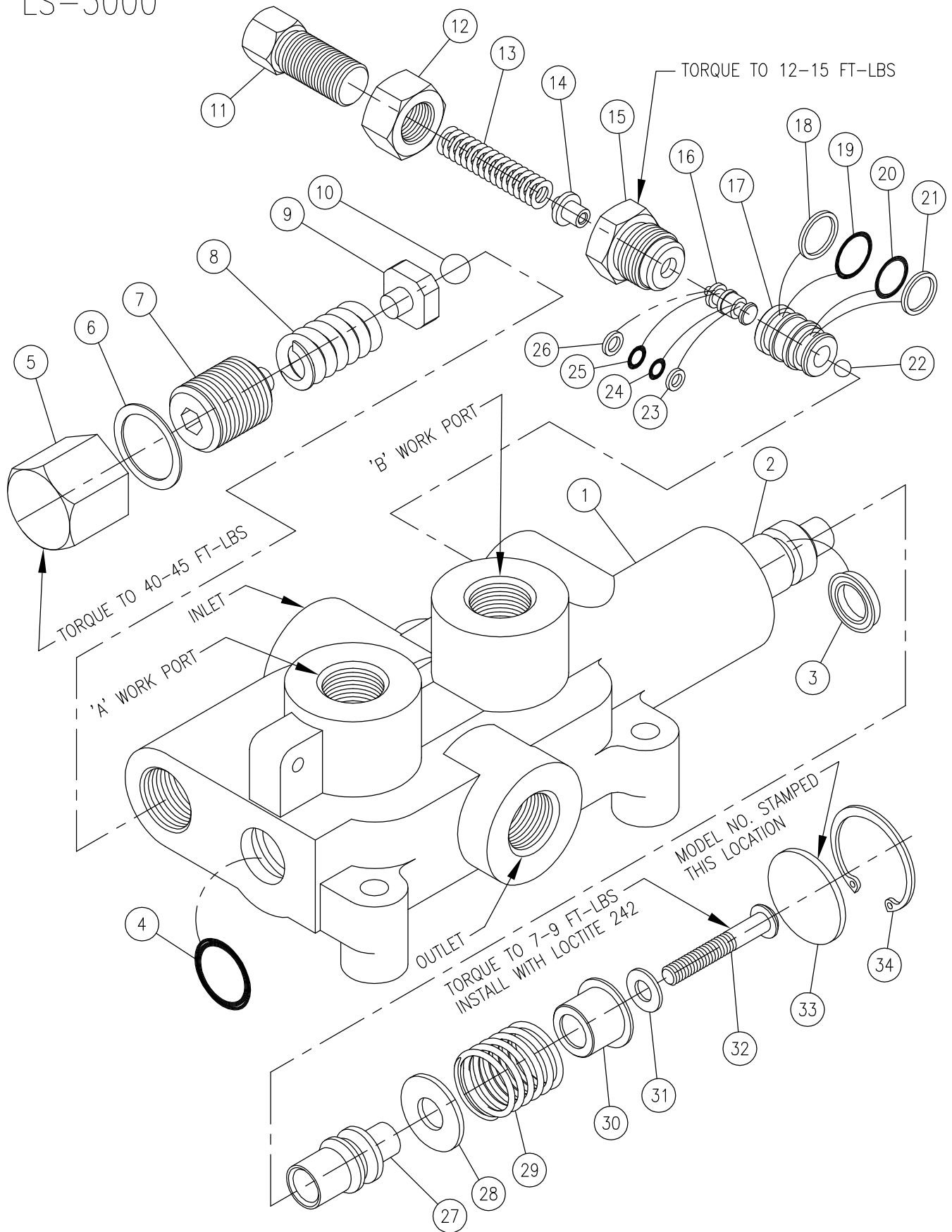


3/8 NPTF PIPE PLUG
PART NO. 200018002

**OPEN CENTER TO CLOSED CENTER CONVERSION
RD-2575 MODELS ONLY**

THIS FEATURE ALLOWS AN OTHERWISE OPEN CENTER VALVE TO BE CONVERTED TO CLOSED CENTER OPERATION. AS SHOWN ABOVE, A 3/8 NPTF PIPE PLUG IS INSTALLED IN THE BOTTOM OF THE OUTLET PORT TO BLOCK OPEN CENTER PASSAGE. A PIPE THREAD SEALANT SHOULD BE USED. THIS FEATURE IS STANDARD ON ALL VALVES WITH 3/4 NPTF INLET AND OUTLET PORTS. THE PIPE PLUG IS INCLUDED WITH THESE MODELS. DISCARD THE PIPE PLUG IF THE VALVE IS USED ON AN OPEN CENTER APPLICATION.

LS-3000



USES CASTING #C-505

LS-3000 VALVE

ITEM	QTY	PART NO.	DESCRIPTION
1	1	—	VALVE BODY
2	1	—	SPOOL
3	1*	240016735	U-CUP
4	1*	240000210	210 O-RING
5	1	671800009	ACORN NUT
6	1*	671500008	ALUMINUM WASHER
7	1	671900007	ADJUSTING SCREW
8	1	670300024	SPRING, RELIEF
9	1	671100013	ADAPTER
10	1	230009003	STEEL BALL
11	1	671900016	ADJUSTING SCREW
12	1	671800013	JAM NUT
13	1	670300033	SPRING, DETENT
14	1	671100016	SPRING ADAPTER
15	1	671600052	PLUG, RETAINER
16	1	671100011	PISTON
17	1	671100012	PISTON SLEEVE
18	1*	240019014	014 BACK-UP WASHER
19	1*	240000014	014 O-RING
20	1*	240016737	O-RING (SPECIAL)
21	1*	240019013	013 BACK-UP WASHER
22	1	230009009	STEEL BALL
23	1*	240019007	007 BACK-UP WASHER
24	1*	240016736	O-RING (SPECIAL)
25	1*	240016068	O-RING (SPECIAL)
26	1*	240019008	008 BACK-UP WASHER
27	1	670700019	SPOOL SLEEVE
28	1	670500033	WASHER
29	1	670300020	SPRING, CENTERING
30	1	671400010	STOP CUP
31	1	670500026	WASHER
32	1	220000953	CAP SCREW
33	1	670500032	SPACER
34	1*	230001125	SNAP RING
	*	660530001	PACKING KIT

These are matched parts and are not sold separately.

RELIEF KIT P/N 660125004

DETENT ADJUSTING CARTRIDGE P/N 660330002

PRESSURE RELEASE DETENT KIT P/N 660130007

PLEASE NOTE:
BEFORE REMOVING SPOOL OR SPOOL SLEEVE (ITEM 27), THE PRESSURE RELEASE DETENT PARTS (ITEMS 11-16) AND BALL (ITEM 22) MUST BE REMOVED.
ALSO, SPOOL AND SPOOL SLEEVE MUST BE IN PLACE BEFORE INSTALLING THESE PARTS.

SEE PAGE 12 FOR HANDLE KIT.
SEE PAGE 8 & 9 FOR LS-3030, LS-3040.

PRESSURE RELEASE DETENT

This feature provides a pressure release detent for the spool 'out' (handle in) position. When the spool is manually placed in the detent position oil is directed to the 'B' work port (the port away from the handle). When the pressure in the 'B' port reaches a preset level the detent will release and the spool will center. The factory setting is 1400 psi. The detent release pressure is adjustable by loosening the jam nut, item 12, and turning the adjusting screw, item 11. Turning the adjusting screw clockwise will increase the detent release pressure and counterclockwise will decrease the pressure. NOTE; if the detent release pressure is adjusted too high the spool will not center, if the pressure is too low the detent will not hold.

BASE SPOOL ACTION CODE:

LS-3000-x	Std.; 1-pos pr rel detent, spool out
LS-3010-x	2-pos pr rel detent, spool in/out
LS-3030-x	Spring center to neutral
LS-3040-x	3-pos manual detent
LS-3060-x	1-pos pr rel detent, spool in
LS-3110-x	Non-std.; 3W/3P spool, 2-pos pr rel detent, spool in/out

RELIEF VALVE

An adjustable ball spring relief valve is standard on all LS-3000 valves. The standard factory setting is 2250 psi @ 3 gpm and 105°F. Other settings can be specified. The relief pressure is adjusted by removing the acorn nut, item 5, and turning the adjusting screw, item 7. Turning the adjusting screw clockwise will increase the pressure and counterclockwise will decrease the pressure (a pressure gauge must be installed in the inlet line when ever the relief pressure is adjusted).



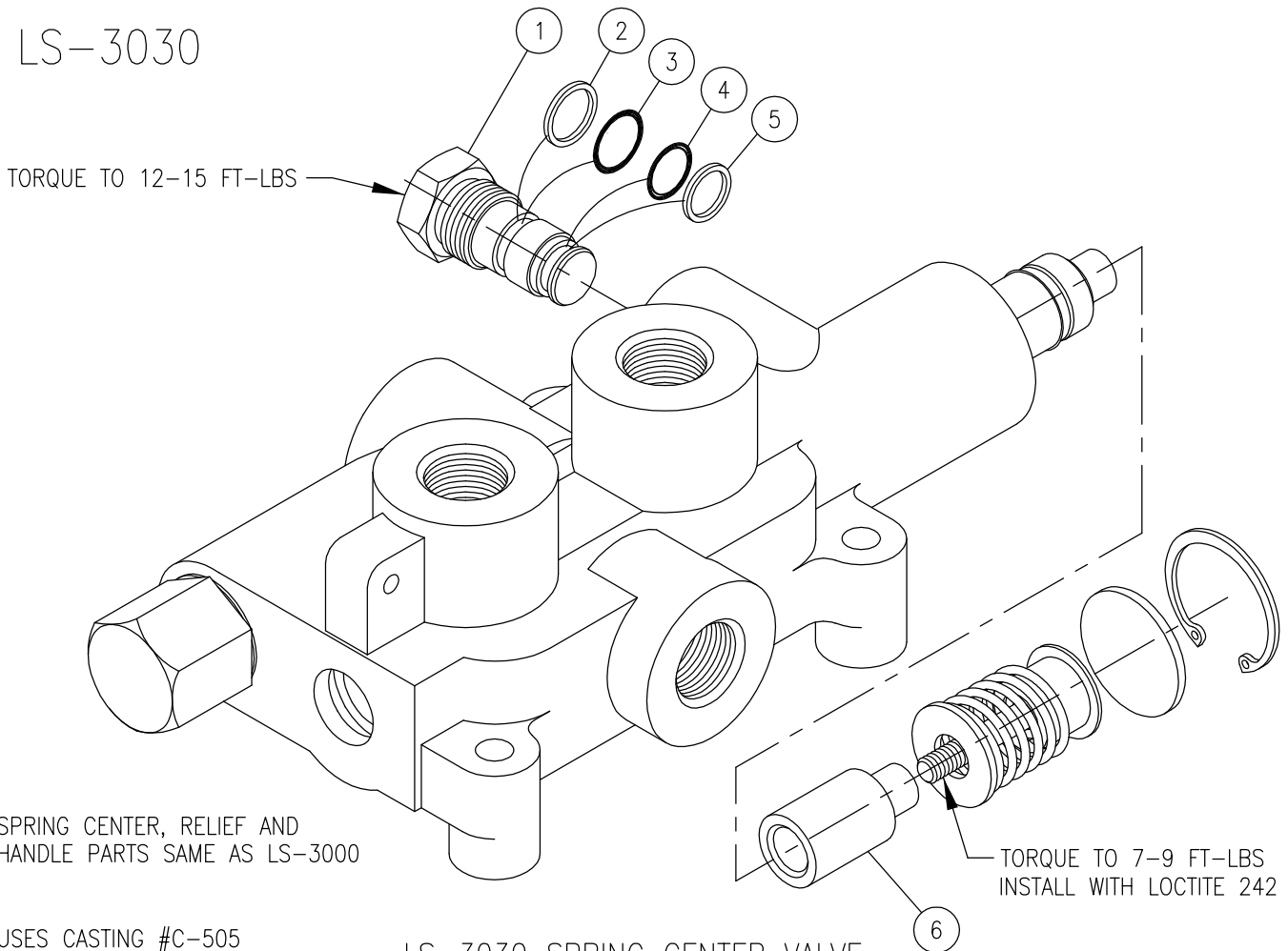
WARNING: OVERPRESSURE MAY CAUSE SUDDEN AND UNEXPECTED FAILURE OF A COMPONENT IN THE HYDRAULIC SYSTEM RESULTING IN SERIOUS PERSONAL INJURY. ALWAYS USE A GAUGE WHEN ADJUSTING A RELIEF VALVE.

LS-3000 SPOOL U-CUP REPLACEMENT PROCEDURE:

To replace the u-cup on the spool the following procedure must be followed.

1. Remove the detent adjuster cartridge by loosening the inner hex and then removing the cartridge.
2. Use a needle nose pliers to reach into the cavity and to grip onto the small stem on the piston. Remove the piston.
3. Remove the steel ball at the bottom of the piston cavity (a magnet may help in removal).
4. After removing the snap ring and end plate at the rear, remove the spool assembly by pushing the spool out the rear.
5. Secure the spool and remove the button head cap screw. The spool may be secured by using a vice to clamp over the handle end clevis slot (with the slot perpendicular to the jaws) or by placing the clevis slot over a rigid bar. Do not clamp on the outside surface of the spool. Remove the cap screw from the spring end of the spool. Note the cap screw was installed using high strength thread locker and will be difficult to remove. There is a possibility that the hex socket on the cap screw can be rounded out. It is recommended that a hex wrench with no wear be used. It is also recommended to soften the thread locker by using a high wattage (approximately 1400 watt/1000 °F) heat gun aimed at the interface between the spool and the detent sleeve. If the cap screw socket is rounded out, it can be removed by using a drill to remove the button head, then removing the attachment parts and then using a locking pliers to grasp and remove the screw shank.
6. The existing u-cup can be cut off by using a box cutter type knife. The new u-cup is installed from the attachment end, with the lip towards the handle end of the spool. A small flat bladed screw driver or similar tool should be used to aid installation. One portion of the u-cup should be started over the full diameter of the spool and held in place with a finger. The flat tool is inserted between the inside of the u-cup and the spool and then worked around with the u-cup being gradually pushed onto the spool as the tool is worked around the spool. The seal groove on the spool may be used to help anchor the tool as it is being rotated around the spool. The U-cup will stretch slightly as it is installed and may fit loosely in the seal groove to begin with. After a few minutes, the u-cup will go back to it's normal shape and the inside of the u-cup will fit snugly to the bottom of the seal groove. Allow the u-cup to regain it's shape before reinstalling the spool.
7. The valve is reassembled by following the directions in reverse. The u-cup and lead in chamfer in the casting should be lubricated with oil before installation. The spool should be inserted into the body using a twisting motion.

LS-3030

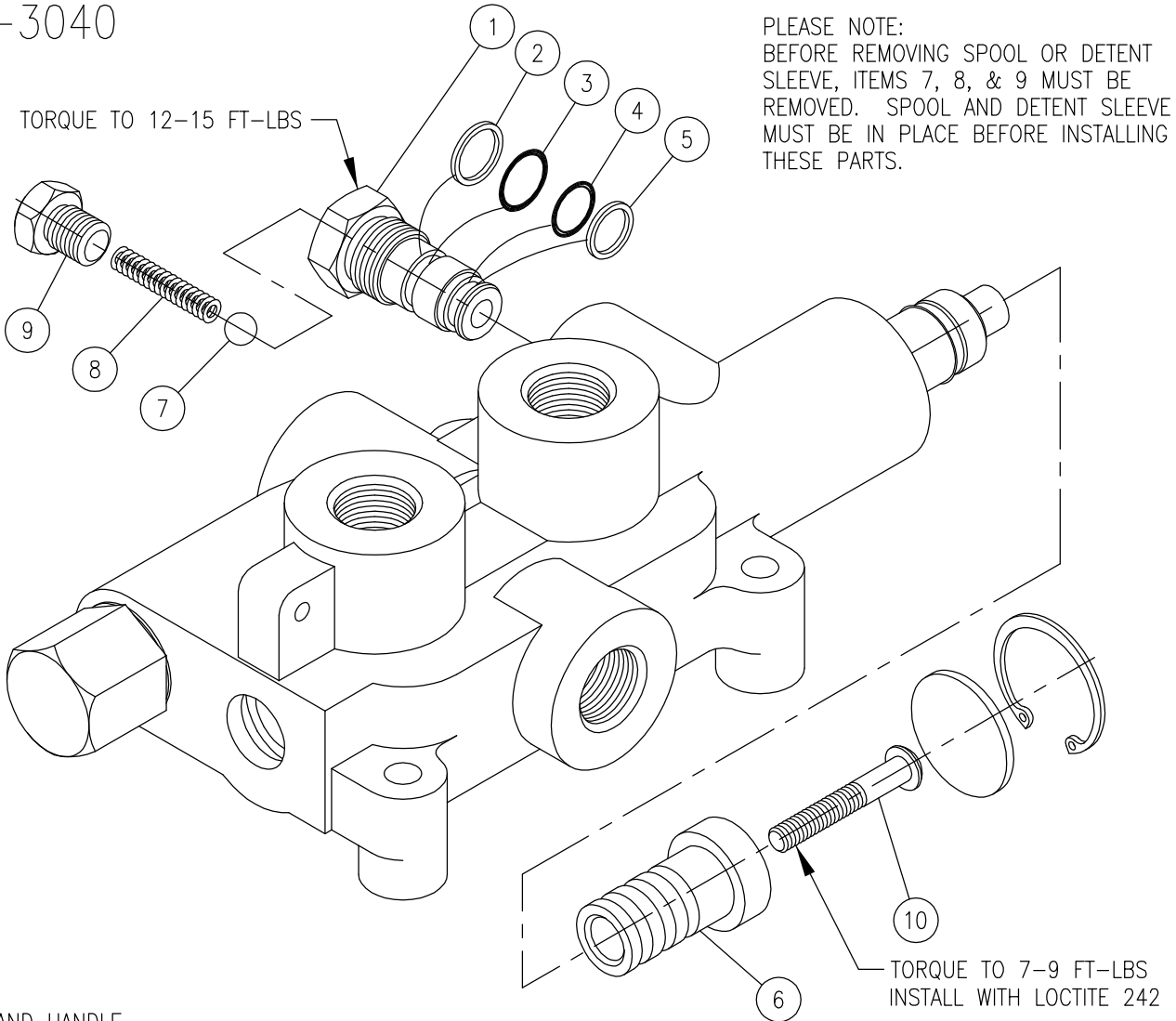


LS-3030 SPRING CENTER VALVE

ITEM	QTY	PART NO.	DESCRIPTION
1	1	671600042	PLUG, DETENT
2	1	240019014	BACK-UP WASHER
3	1	240000014	O-RING
4	1	240016737	O-RING
5	1	240019013	BACK-UP WASHER
6	1	670700023	SPOOL SLEEVE

} KIT P/N 660130004;
CONVERTS AN LS-3000 OR LS-3040
TO AN LS-3030

LS-3040



PLEASE NOTE:
BEFORE REMOVING SPOOL OR DETENT SLEEVE, ITEMS 7, 8, & 9 MUST BE REMOVED. SPOOL AND DETENT SLEEVE MUST BE IN PLACE BEFORE INSTALLING THESE PARTS.

RELIEF AND HANDLE PARTS SAME AS LS-3000

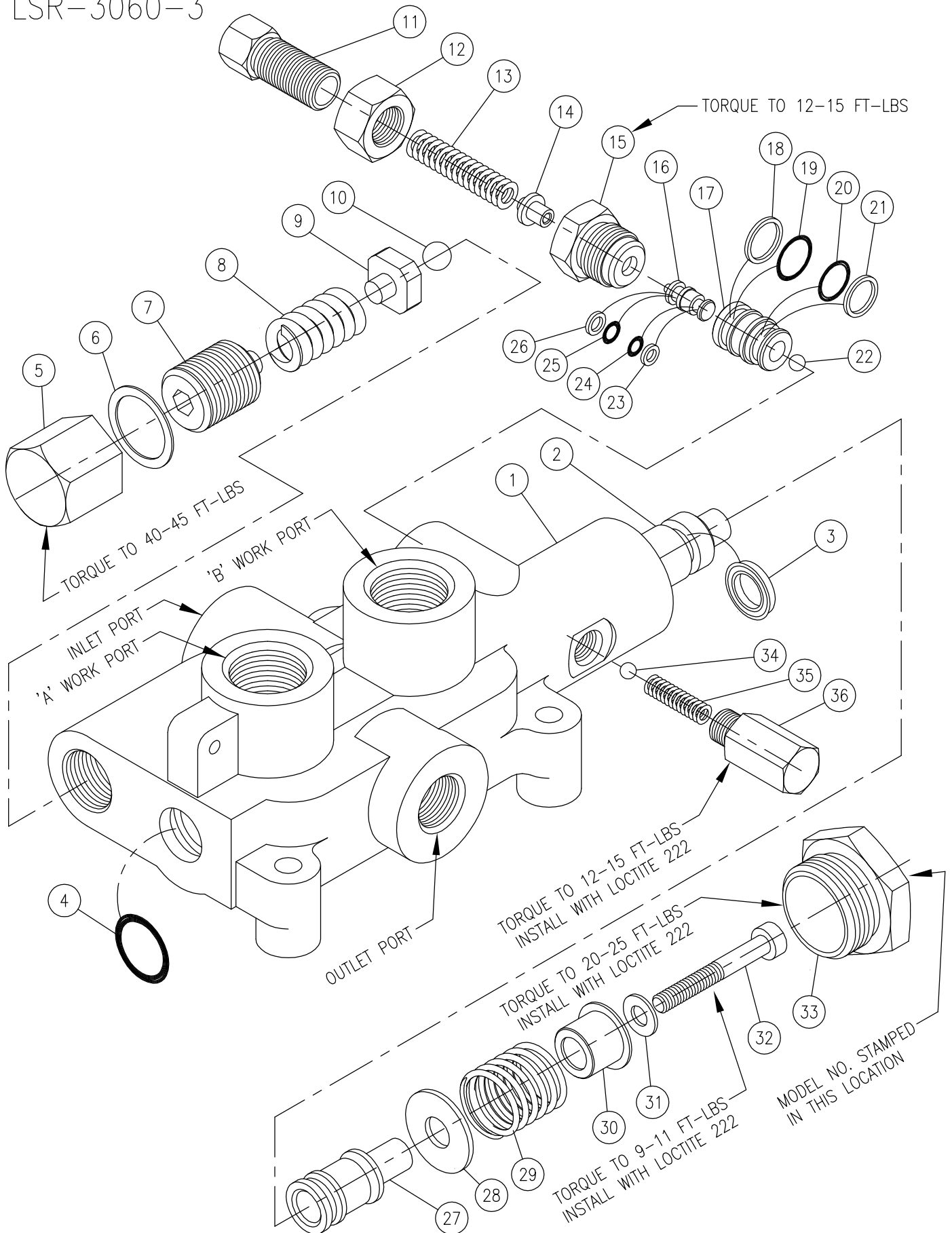
USES CASTING #C-505

LS-3040 3 POSITION (MANUAL) DETENT VALVE

ITEM	QTY	PART NO.	DESCRIPTION
1	1	671600043	PLUG
2	1	240019014	BACK-UP WASHER
3	1	240000014	O-RING
4	1	240016737	O-RING
5	1	240019013	BACK-UP WASHER
6	1	670700022	DETENT SLEEVE
7	1	230009009	STEEL BALL
8	1	670300023	SPRING, DETENT
9	1	671600044	PLUG
10	1	220000953	CAP SCREW

KIT P/N 660130003;
CONVERTS AN LS-3000 OR LS-3030
TO AN LS-3040

LSR-3060-3



CASTING NO.: C-505

LSR-3060-3 RAPID EXTEND LOG SPLITTER VALVE

ITEM	QTY	PART NO.	DESCRIPTION
1	1	-	VALVE BODY
2	1	-	SPOOL
3	1*	240016735	U-CUP
4	1*	240000210	210 O-RING
5	1	671800009	ACORN NUT
6	1*	671500008	ALUMINUM WASHER
7	1	671900007	ADJUSTING SCREW
8	1	670300024	SPRING, RELIEF
9	1	671100013	ADAPTER, BALL
10	1	230009003	STEEL BALL
11	1	671900016	ADJUSTING SCREW
12	1	671800013	NUT, HEX
13	1	670300033	SPRING, DETENT
14	1	671100016	SPRING ADAPTER
15	1	671600052	PLUG, RETAINER
16	1	671100011	PISTON
17	1	671100012	PISTON SLEEVE
18	1*	240019014	BACK-UP WASHER
19	1*	240000014	O-RING
20	1*	240016737	O-RING (SPECIAL)
21	1*	240019013	BACK-UP WASHER
22	1	230009009	STEEL BALL
23	1*	240019007	BACK-UP WASHER
24	1*	240016736	O-RING (SPECIAL)
25	1*	240016068	O-RING (SPECIAL)
26	1*	240019008	BACK-UP WASHER
27	1	670700100	DETENT SLEEVE
28	1	670500127	WASHER
29	1	670300111	SPRING, CENTERING
30	1	671400294	STOP CUP
31	1	670500026	WASHER
32	1	170003019	CAP SCREW
33	1	671600136	PLUG, HEX
34	1	230009009	STEEL BALL
35	1	670300023	SPRING, DETENT
36	1	671600137	PLUG, HEX, REGEN
	*	660530001	PACKING KIT

} These are matched parts and are not sold seperately.

} RELIEF KIT P/N 660125004

} DETENT ADJUSTING CARTRIDGE P/N 660330002

} PRESSURE RELEASE DETENT KIT P/N 660130007

PLEASE NOTE:
BEFORE REMOVING SPOOL OR DETENT SLEEVE (ITEM 27), THE PRESSURE RELEASE DETENT PARTS (ITEMS 11-16), BALL (ITEM 22) AND SOFT STOP PARTS (ITEMS 34, 35 & 36) MUST BE REMOVED.
ALSO, SPOOL AND DETENT SLEEVE MUST BE IN PLACE BEFORE INSTALLING THESE PARTS.

SEE PAGE 12 FOR HANDLE KIT DETAILS.

672100038 - INSTRUCTION SHEET, LSR

NOMINAL INLET FLOW RATING: 4 GPM

PRESSURE RELEASE DETENT (LSR-3060-3):

This feature provides a pressure release detent for the spool 'in' (handle out) position. When the spool is manually placed in the detent position oil is directed to the 'A' work port (the port nearest to the handle). When the pressure in the 'A' port reaches a preset level the detent will release and the spool will center. The factory setting is 1400 psi. The detent release pressure is adjustable by loosening the jam nut, item 12, and turning the adjusting screw, item 11. Turning the adjusting screw clockwise will increase the detent release pressure and counterclockwise will decrease the pressure. NOTE: If the detent release pressure is adjusted too high the spool will not self-center, if the pressure is too low the detent will not hold.

RELIEF VALVE:

An adjustable ball spring relief valve is standard on all LSR-3060-3 valves. The standard factory setting is 2250 psi @ 3 gpm and 120°F. Other settings can be specified. The relief pressure is adjusted by removing the acorn nut, item 5, and turning the adjusting screw, item 7. Turning the adjusting screw clockwise will increase the pressure and counterclockwise will decrease the pressure (a pressure gauge must be installed in the inlet line when ever the relief pressure is adjusted).

REGEN CURCUIT:

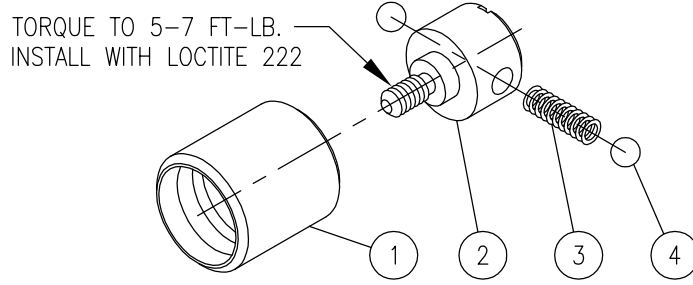
This feature provides for the rapid extend of a cylinder. When the spool is manually held in the full spool 'out' (beyond the initial soft stop) position, inlet oil is directed to the 'B' work port while return oil from the 'A' work port is also redirected to the 'B' work port. The cylinder will extend rapidly but with reduced force. Move handle back to soft stop for max extend force. Lines to the cylinder must be adequately sized to handle the added regen flow (3/4" typical).



WARNING: OVERPRESSURE MAY CAUSE SUDDEN AND UNEXPECTED FAILURE OF A COMPONENT IN THE HYDRAULIC SYSTEM RESULTING IN SERIOUS PERSONAL INJURY. ALWAYS USE A PRESSURE GAUGE WHEN ADJUSTING A RELIEF VALVE.

RD-2500

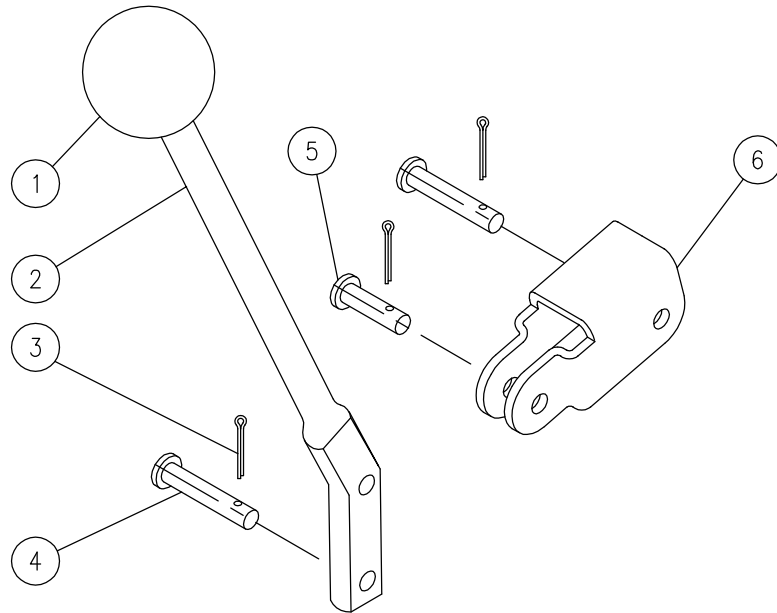
IMPORTANT NOTE:
 DETENT BALLS ARE UNDER
 SPRING PRESSURE AND CAN FLY
 OUT WHEN DETENT SLEEVE IS
 REMOVED. WEAR SAFETY GLASSES.



3 POSITION DETENT KIT (RD-2500): 660125001

ITEM	QTY	PART NO.	DESCRIPTION
1	1	670700024	DETENT SLEEVE
2	1	670700025	DETENT RETAINER
3	1	670300025	DETENT SPRING
4	2	230009009	STEEL BALL

RD-2500/LS-3000



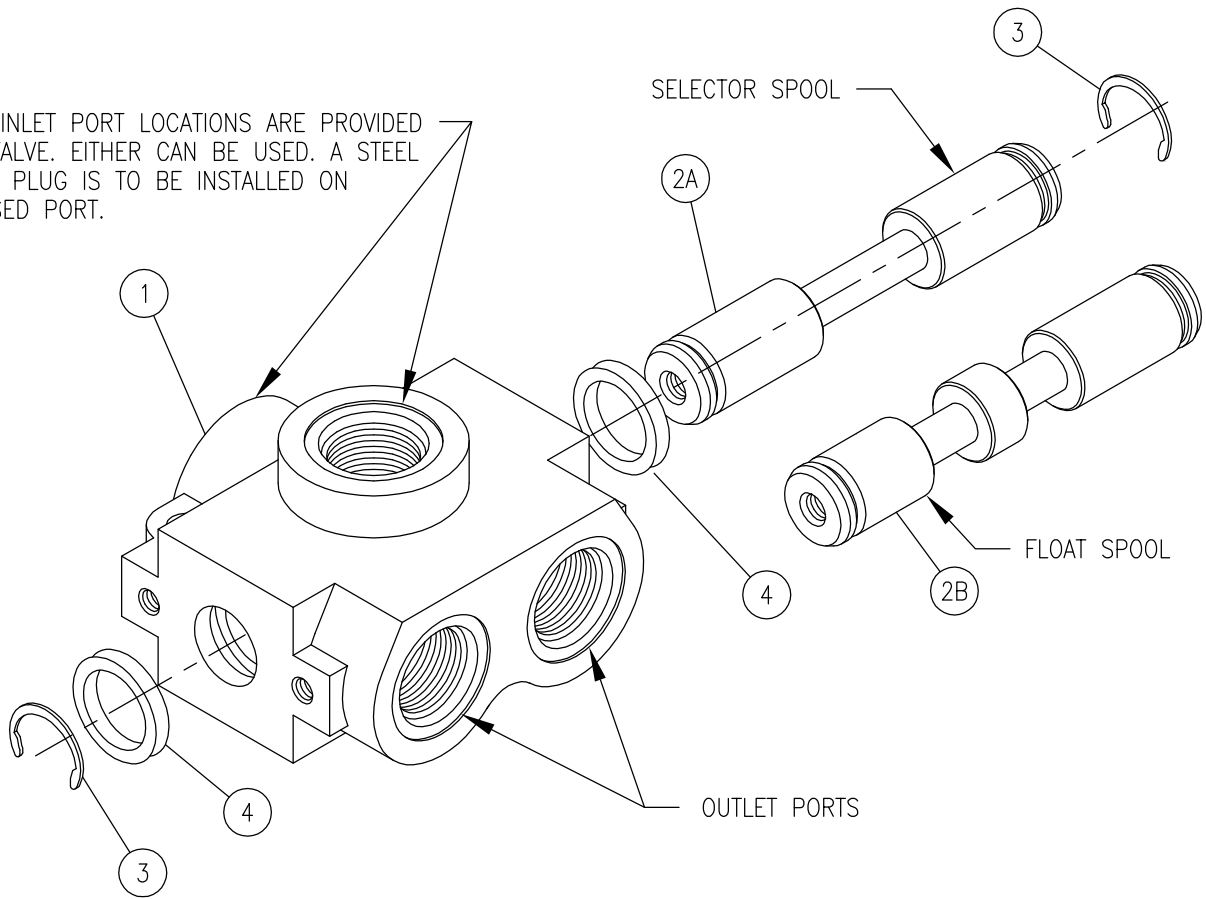
HANDLE KIT (RD-2500 AND LS-3000): 660130001

ITEM	QTY	PART NO.	DESCRIPTION
1	1	670400010	KNOB
2	1	670400012	HANDLE
3	3	220001512	COTTER PIN
4	2	671700013	CLEVIS PIN
5	1	671700012	CLEVIS PIN
6	1	670500035	LINK, FORMED

} PIN KIT P/N 660130006

SS

TWO INLET PORT LOCATIONS ARE PROVIDED ON VALVE. EITHER CAN BE USED. A STEEL PORT PLUG IS TO BE INSTALLED ON UNUSED PORT.

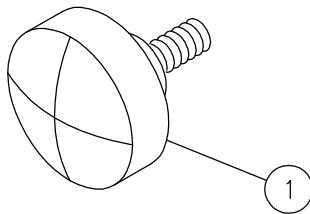


CASTING NO.: C-570

SS SINGLE SELECTOR VALVE

ITEM	QTY	PART NO.	DESCRIPTION
1	1	-	VALVE BODY
2A	1	-	SELECTOR SPOOL
2B	1	-	FLOAT SPOOL
3	2	230017021	SNAP RING
4	2	240016221	QUAD RING
			} SEAL KIT 660590006

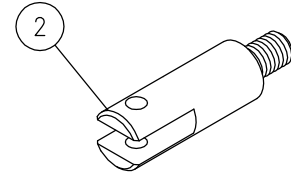
SS



KNOB (SS HANDLE OPTION D)

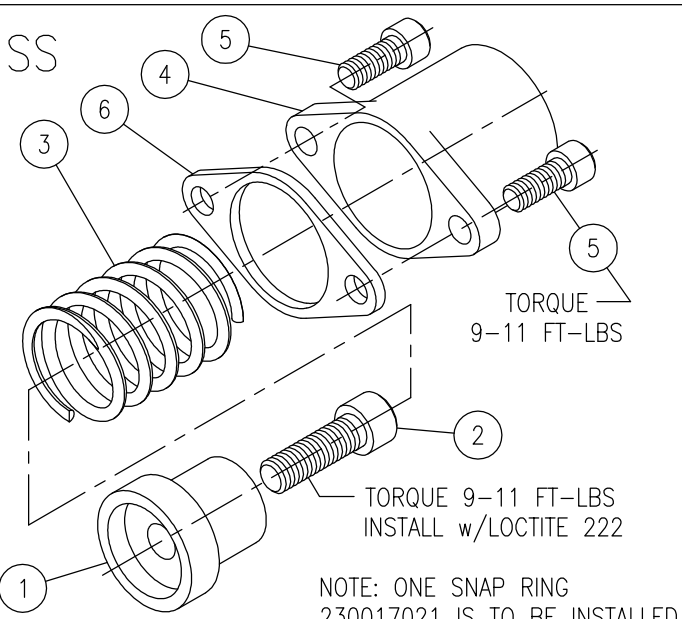
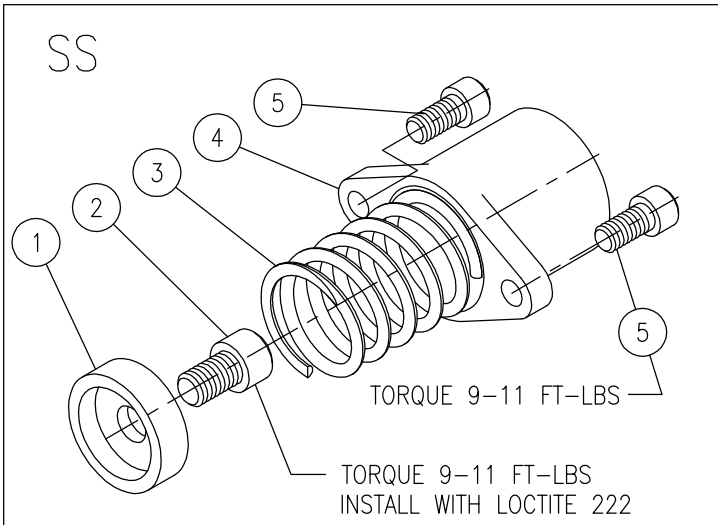
ITEM	QTY	PART NO.	DESCRIPTION
1	1	670400031	KNOB

SS



CLEVIS ONLY (SS HANDLE OPTION B)

ITEM	QTY	PART NO.	DESCRIPTION
2	1	671900011	SPOOL END ADAPTER



NOTE: ONE SNAP RING
230017021 IS TO BE INSTALLED
ON HANDLE END ONLY WHEN
THIS OPTION IS USED.

NOTE: ONE SNAP RING
230017021 IS TO BE INSTALLED
ON HANDLE END ONLY WHEN
THIS OPTION IS USED.

SPOOL ATTACHMENT KITS; SS OPTIONS 2, 3

SPOOL ATTACHMENT KIT; SS OPTION 4

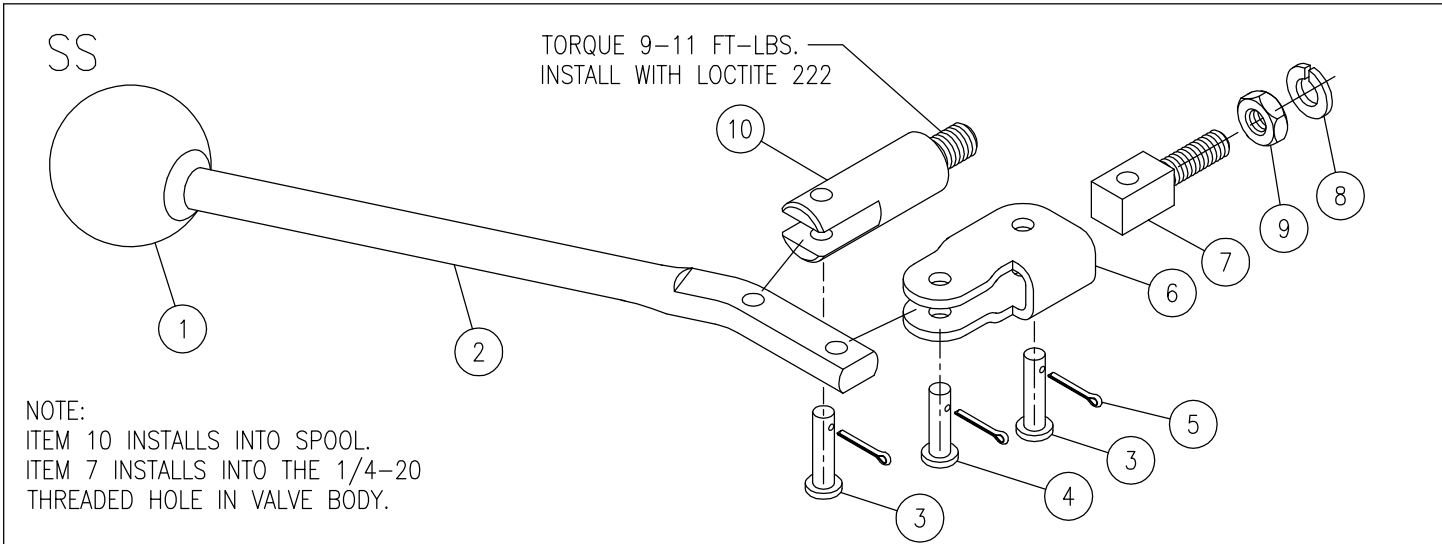
ITEM	QTY	PART NO.	DESCRIPTION
1	1	671400064	STOP CUP
2	1	170003022	CAP SCREW
3	1	670300030	SPRING
4	1	671400033	END CAP
5	2	170003017	CAP SCREW

} OPTION 2;
} #660170009

} OPTION 3;
} #660170008

ITEM	QTY	PART NO.	DESCRIPTION
1	1	671400313	STOP CUP
2	1	170003084	CAP SCREW
3	1	670300031	SPRING, HEAVY
4	1	671400033	END CAP
5	2	170003080	CAP SCREW
6	1	670500103	SPACER

} OPTION 4;
} #660170073



NOTE:
ITEM 10 INSTALLS INTO SPOOL.
ITEM 7 INSTALLS INTO THE 1/4-20
THREADED HOLE IN VALVE BODY.

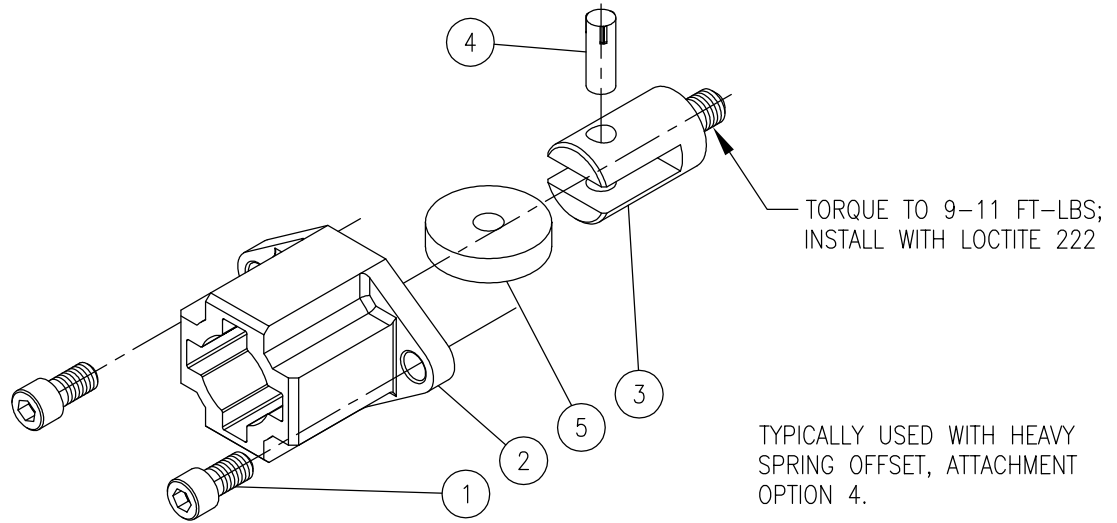
LEVER HANDLE KITS; SS OPTIONS C & E

ITEM	QTY	PART NO.	DESCRIPTION
1	1	670400010	KNOB
2	1	670400012	HANDLE
3	2	671700014	CLEVIS PIN, LONG
4	1	671700012	CLEVIS PIN, SHORT
5	3	220001512	COTTER PIN
6	1	670500047	LINK, FORMED
7	1	671900028	MOUNTING ADAPTER
8	1	220001002	LOCK WASHER
9	1	220001301	JAM NUT
10	1	671900011	SPOOL ADAPTER

} OPTION C;
} KIT #660170006

} OPTION E;
} KIT #660170007

SS

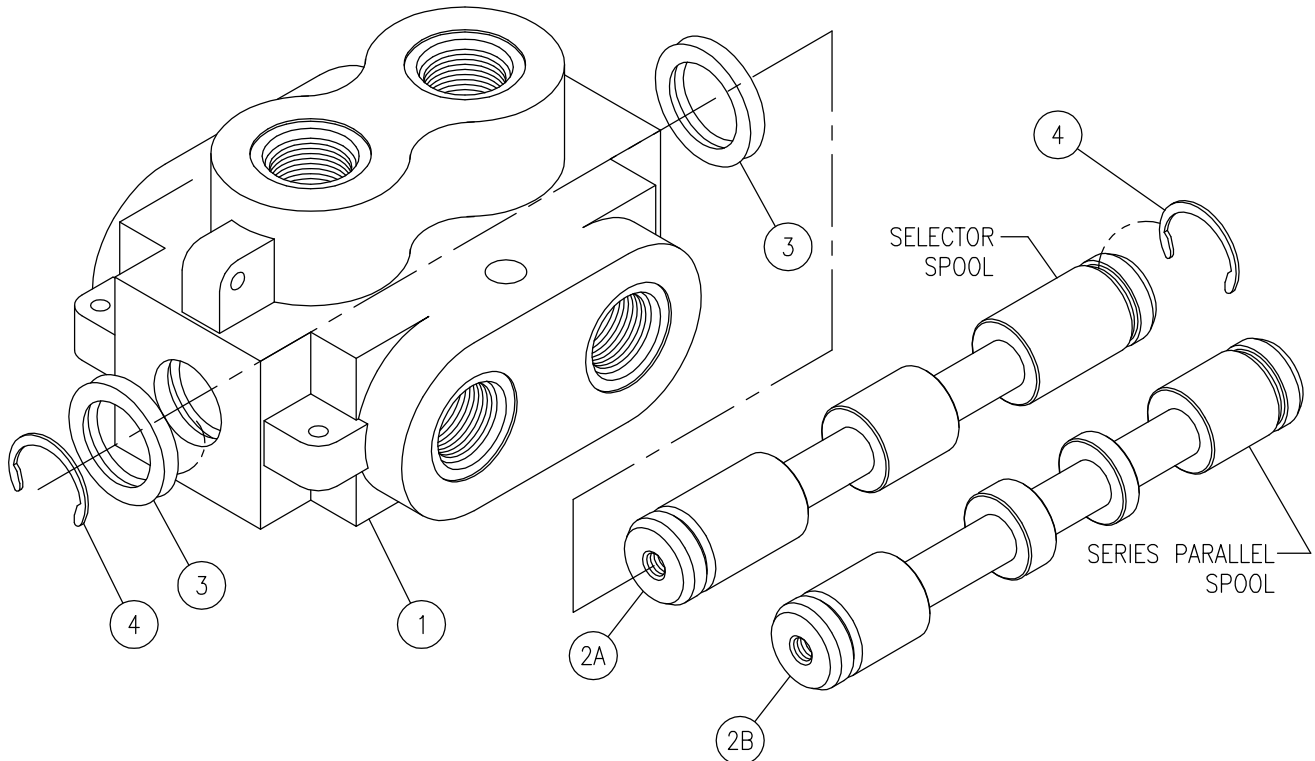


ROLLER, SPRING OFFSET KIT; SS OPTION R

ITEM	QTY	PART NO.	DESCRIPTION
1	2	170003017	CAP SCREW
2	1	671400311	HOUSING, ROLLER
3	1	671900124	ADAPTER, SPOOL
4	1	190100093	DOWEL PIN
5	1	671400312	ROLLER

} OPTION R;
KIT #660170076

DS



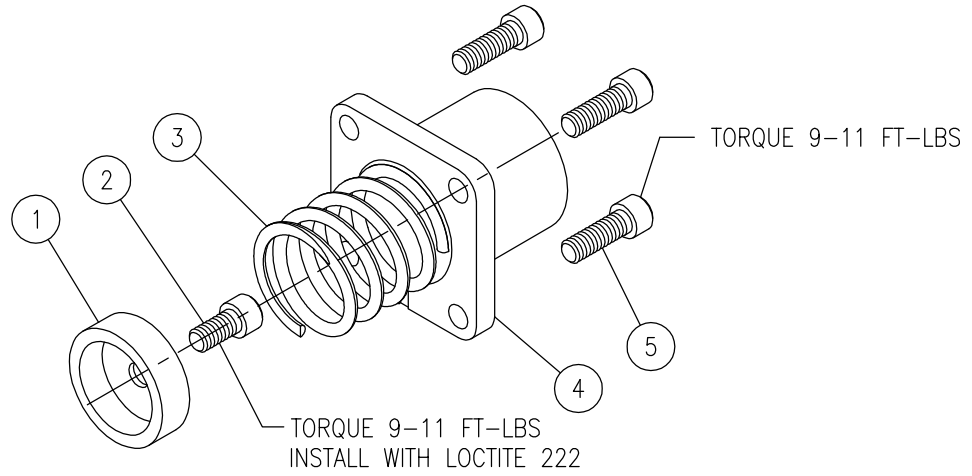
CASTING NO.: C-569

DS DOUBLE SELECTOR VALVE

ITEM	QTY	PART NO.	DESCRIPTION
1	1	-	VALVE BODY
2A	1	-	SPOOL, SELECTOR
2B	1	-	SPOOL, SERIES/PARALLEL
3	2	240016213	QUAD RING
4	2	230017018	SNAP RING

} These are matched parts and are not sold separately.
} SEAL KIT #660590005

DS



NOTE:
ONE SNAP RING 230017018 IS
TO BE INSTALLED ON HANDLE
END ONLY WHEN THIS OPTION
IS USED.

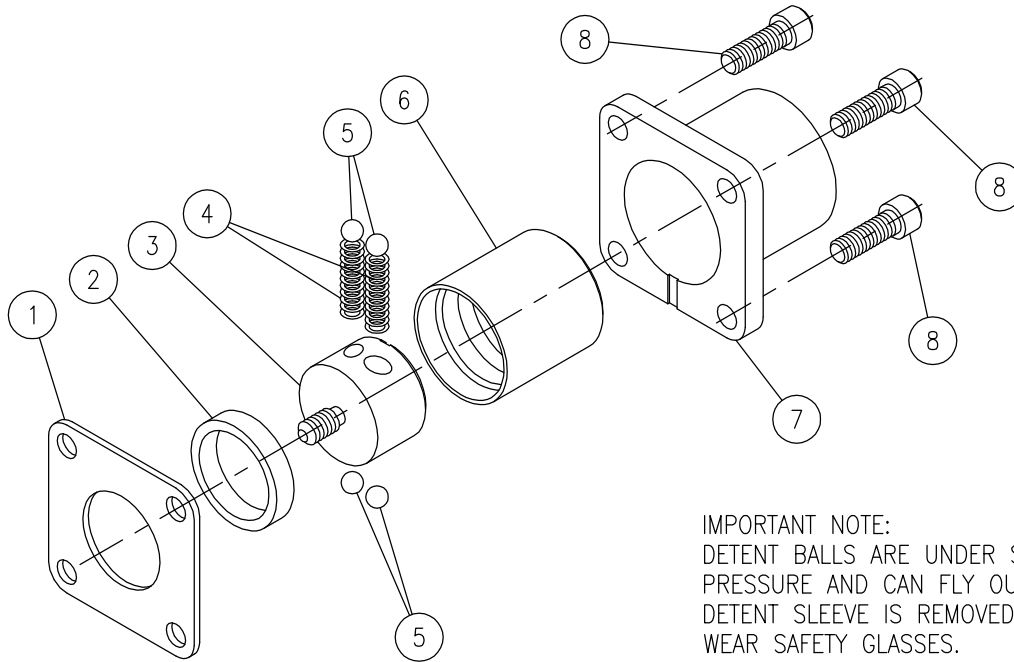
SPRING OFFSET KITS; DS OPTIONS 2 & 3

ITEM	QTY	PART NO.	DESCRIPTION
1	1	671400058	STOP CUP
2	1	170003017	CAP SCREW
3	1	670300043	SPRING
4	1	670500005	END CAP
5	4	170003008	CAP SCREW

} OPTION 2;
KIT #660170010

} OPTION 3;
KIT #660170003

DS



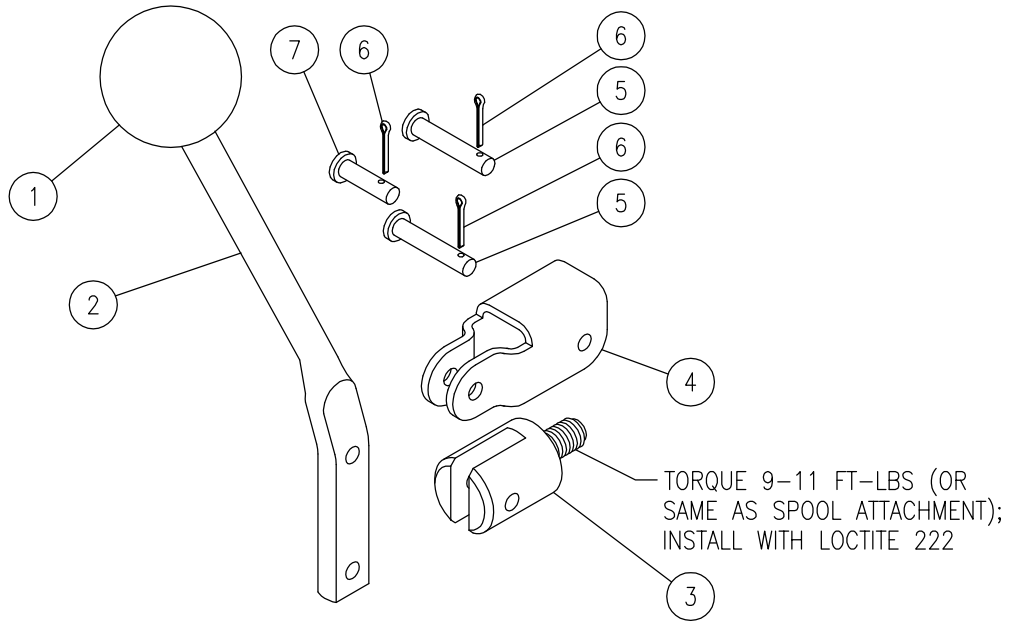
IMPORTANT NOTE:
DETENT BALLS ARE UNDER SPRING
PRESSURE AND CAN FLY OUT WHEN
DETENT SLEEVE IS REMOVED.
WEAR SAFETY GLASSES.

2 POSITION DETENT; DS OPTION 4

ITEM	QTY	PART NO.	DESCRIPTION
1	1	670500003	RETAINER PLATE
2	1	671200018	SPACER
3	1	670700008	DETENT RETAINER
4	2	670300002	DETENT SPRING
5	4	230009009	STEEL BALL
6	1	670700039	DETENT SLEEVE
7	1	670500005	END CAP
8	4	170003008	CAP SCREW

} OPTION 4;
KIT #660170004

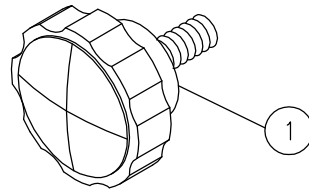
DS



LEVER HANDLE KITS; DS OPTIONS B, C & E

ITEM	QTY	PART NO.	DESCRIPTION
1	1	670400010	KNOB HANDLE CLEVIS } OPTION B LINK PIN } OPTION C; COTTER PIN } KIT #660170002 PIN } OPTION E; KIT #660170001
2	1	670400030	
3	1	671400059	
4	1	670500035	
5	2	671700013	
6	3	220001512	
7	1	671700012	

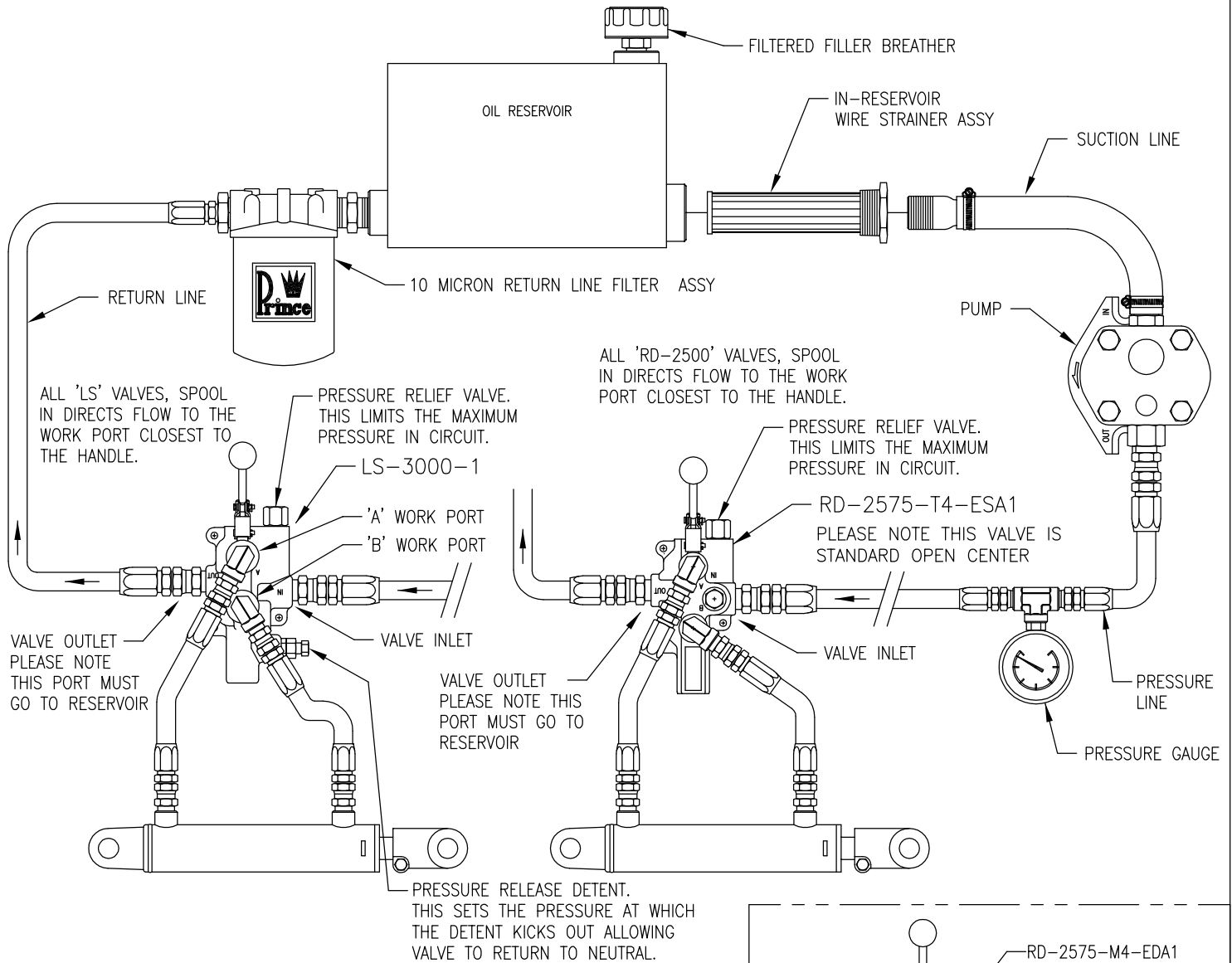
DS



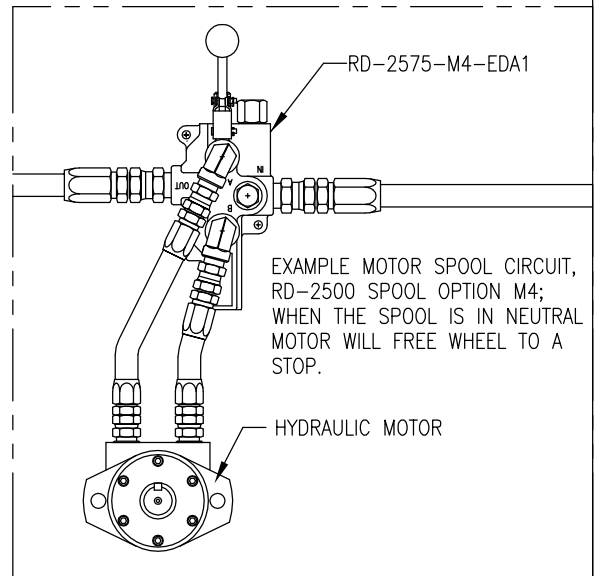
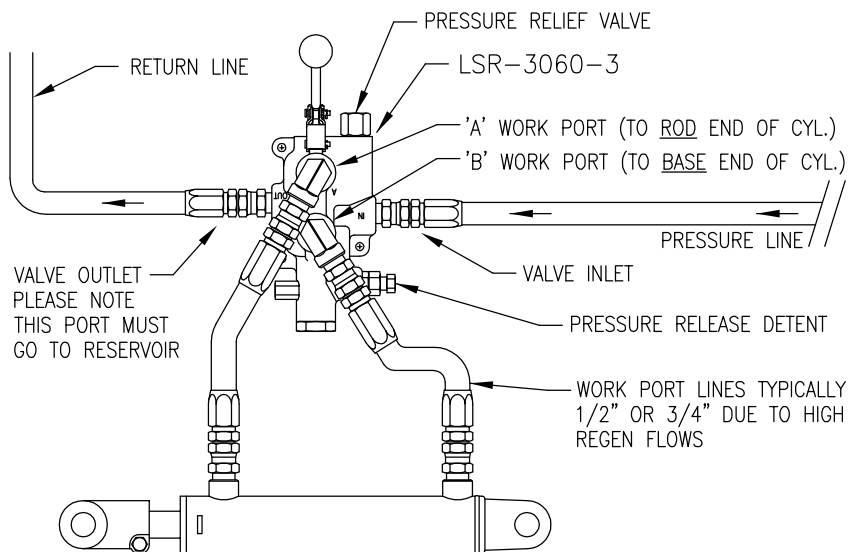
KNOB; DS OPTION D

ITEM	QTY	PART NO.	DESCRIPTION
1	1	670400029	KNOB

EXAMPLE LS-3000 OR RD-2500 HYDRAULIC CIRCUIT

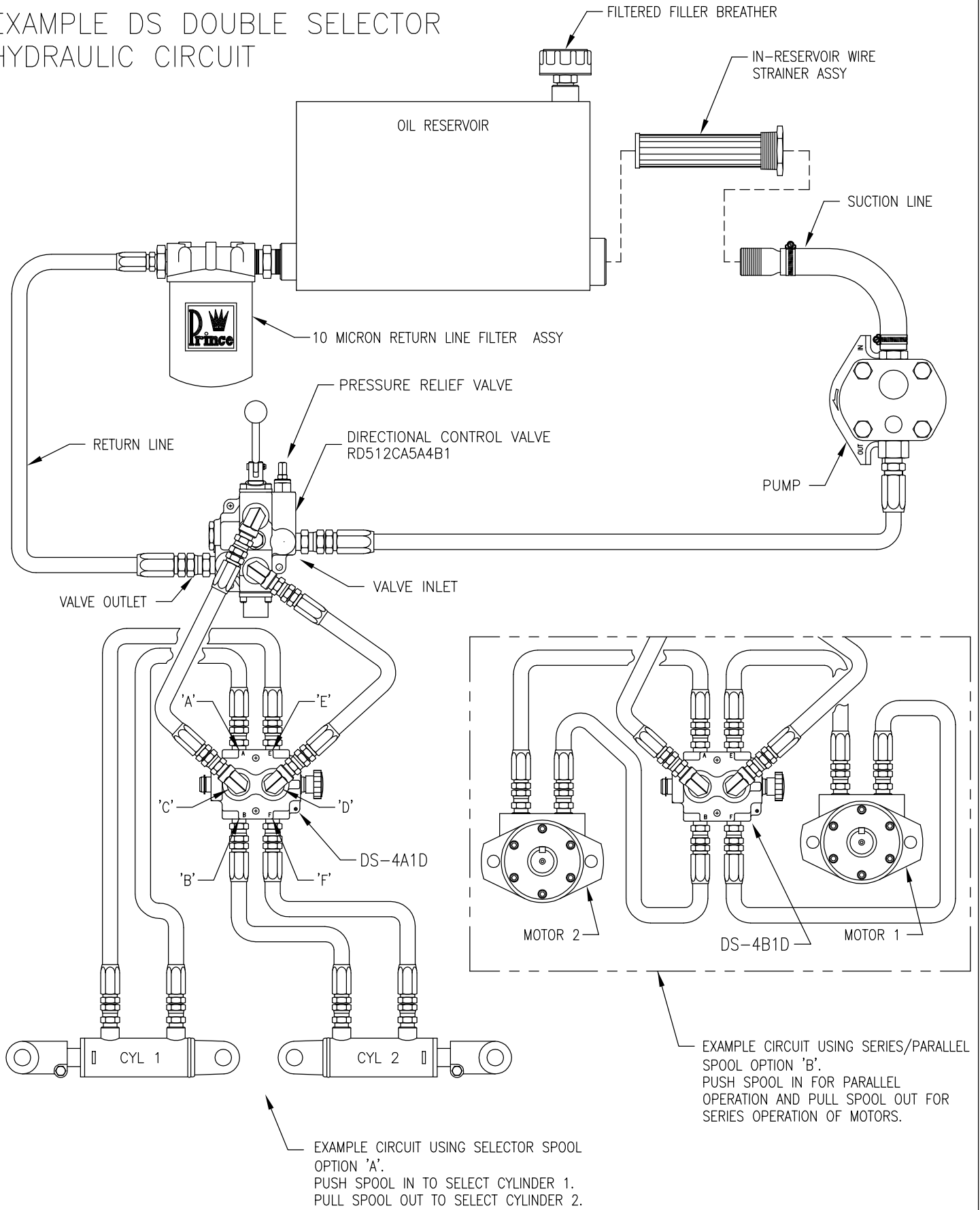


EXAMPLE LSR-3060-3 HYDRAULIC CIRCUIT



NOTE: THREAD SEALANT—
USE OF A QUALITY NON-TEFLON THREAD SEALANT IS RECOMMENDED FOR TAPERED PIPE THREADS.
(USE OF TEFLON TAPE IS NOT RECOMMENDED.)

EXAMPLE DS DOUBLE SELECTOR HYDRAULIC CIRCUIT



EXAMPLE CIRCUIT USING SELECTOR SPOOL OPTION 'A'. PUSH SPOOL IN TO SELECT CYLINDER 1. PULL SPOOL OUT TO SELECT CYLINDER 2.

NOTE: THREAD SEALANT— USE OF A QUALITY NON-TEFLON THREAD SEALANT IS RECOMMENDED FOR TAPERED PIPE THREADS. (USE OF TEFLON TAPE IS NOT RECOMMENDED.)



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