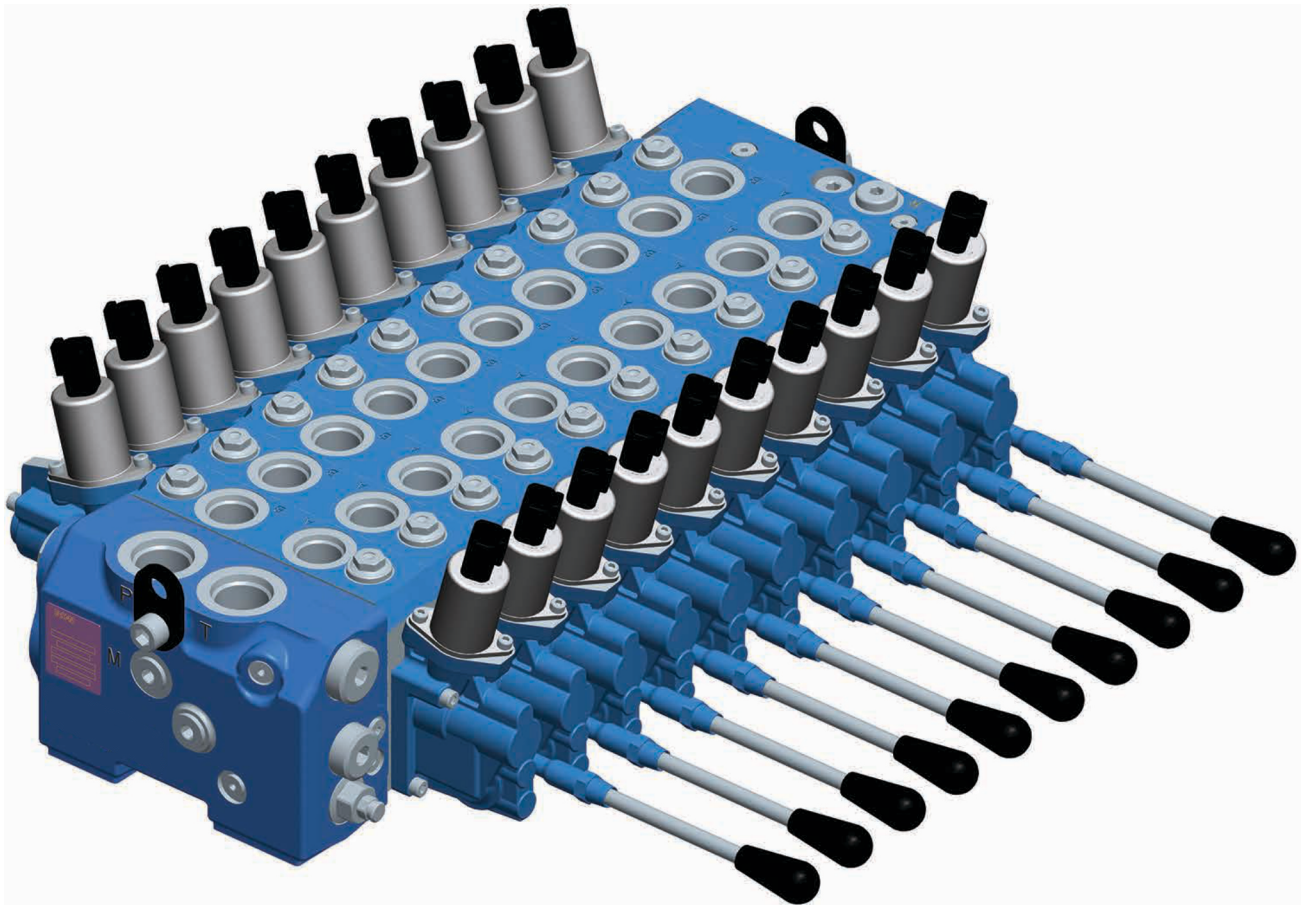


CLS100 Proportional Load Sensing Mobile Valve

Service Manual



Danfoss

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1.0 General information

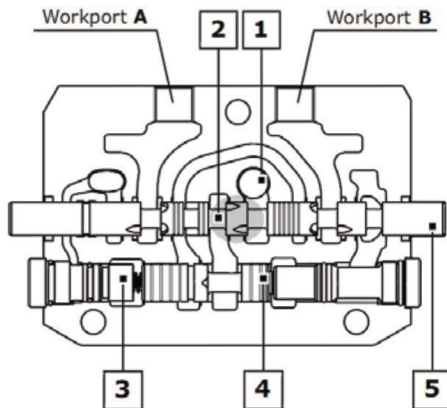
CLS100 Load Sense Sectional Mobile Valve

Rated pressure	Inlet	350 bar (5076 psi)
	Work port	350 bar (5076 psi)
	Tank port	10 bar (145 psi)
	Pilot Drain Port (D1/D2)	5 bar (73 psi)
Rated inlet flow		150 lpm (39.6 gpm)
Rated workport flow	Post Compensated	100 lpm(26.4 gpm)@ 14 bar differential pressure
	Pre Compensated	80 lpm(21.1 gpm)@14 bar differential pressure
	Pre Compensated	100 lpm(26.4 gpm)@17 bar differential pressure
Fluid cleanliness and viscosity	See Hydraulic Fluid Recommendations Bulletin 03-401	
Ambient operating temperature range	-40°C / 60°C (-40°F / 140°F)	
Oil temperature operating range	-25°C / 80°C (-13°F / 176°F)	
Construction		Sectional
Work sections		1-10
Maximum leakage,cylinder workport to tank		11 cc per minute at 100 bar (1450 psi)
Port types	Inlet and tank	SAE-12 or BSP G 3/4
	Work ports A and B	SAE-10 or BSP G 1/2
	Inlet Pr Gauge port "M", LS port and drain port	SAE-6 or BSP G 1/4
	Hydraulic pilot	SAE-6 or BSP G 1/4
Work section options	Spools	Doubleacting (4 way) cylinder
		Doubleacting (4 way) cylinder with 4th position float
		Bi-directional (4 way) motor, full open to tank in neutral
	Actuation	Hydraulic with top ports
		Hydraulic with top ports and lever override
		Hydraulic with end ports
		Hydraulic with end ports, lever override, and configured for EH pilot valve installation
		Electrohydraulic with lever override
		Electrohydraulic only
		Electrohydraulic with hydraulic ports and lever override
		Electrohydraulic with hydraulic ports
		Manual with enclosed lever box
		Manual with exposed spool connection
Coil voltages		12 Volt DC 24 Volt DC
Coil connectors		Integral Deutsch DT04-2P Amp Jr. Timer connector 106462-1
Electrohydraulic interface		Programmable controllers
PWM Frequency		90-120 Hz

1.0 General information

Operating principle:

CLS100 is a load sensing and flow sharing directional control valve. The flow sharing technology applied to the standard load sensing system characterizes the new CLS100. The valve, completely pressure compensated, guarantees great controllability to all actuators, making work port flow dependent only on metering area (spool position). When flow saturation occurs the system reacts by implementing an equal reduction of pressure margin across all spools, generating a proportional reduction of work port flow.



Legends:

1. Inlet passage (high pressure)
2. Metering notches
3. Load sensing passage
4. Local compensator
5. Metering spool

Single section:

Coming from the common inlet the main flow, passing across the metering area, reaches the local compensator. Depending on the main spool chosen, the metering area controls the total amount of flow to the work port based on the margin pressures. The load sensing signal, picked up downstream the local compensator which feeds the common load-sensing line. When a single section is actuated, the local compensator fully opens to the left side, reaching its complete balanced position. The control of the LS system is made by the inlet compensator for fixed displacement pump or pump compensator for variable displacement pump.

Multi-section:

When two or more sections are actuated only one, characterized by the highest pressure (dominant), is involved in the LS signal transmission, working as briefly described in the previous paragraph. The other functions (slaves) become directly dependent on it. The common LS line transfers the information coming from the dominant local compensator to all dependent compensators. Driven by the LS signal, the unbalanced slave compensators activate the pressure compensation creating an artificial pressure drop able to keep pressure margin nominally the same on all the spools. Work port flow becomes only a function of metering area making the system totally load independent.

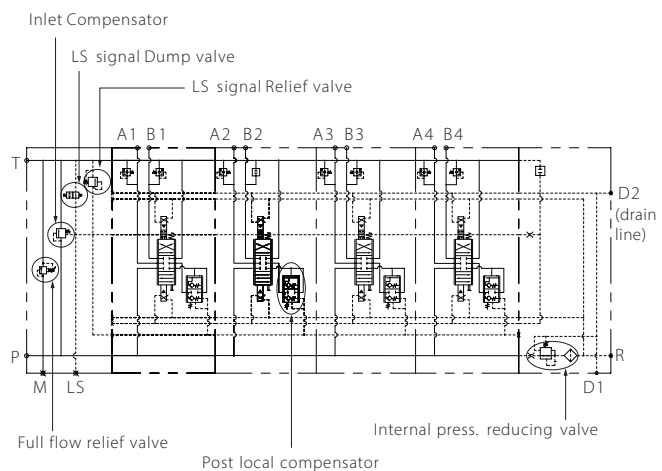
Flow sharing function:

When saturation occurs the total amount of flow required by actuators is higher than the maximum pump flow rate. When this occurs, system is no longer able to hold nominal margin pressure. The actual margin pressure reduces according to real flow demand. Since all the local compensators have the same LS signal and the same pressure drop is applied to different metering areas, then work port flows are reduced proportionally in order to keep all actuators completely under control.

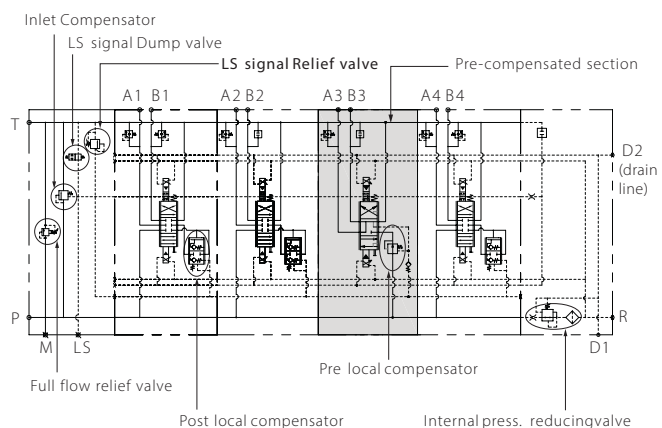
Pre and post compensated solution:

The CLS100 valve line allows the customer the ability to combine pre and post compensated valve sections in the same valve bank. The pre compensated section acts as a priority flow sharing function by diverting flow to the pre compensated function first, then to the remaining sections in the bank. The following schematics show an example of an all post compensated system, and a system with an integrated pre compensated section.

Post compensated system

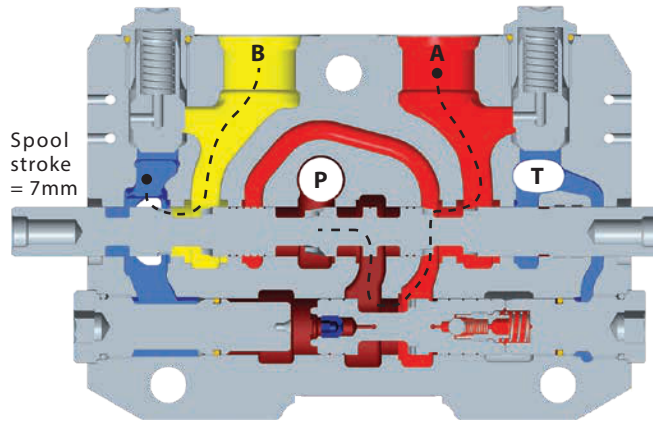


CLS100 pre and post compensated system

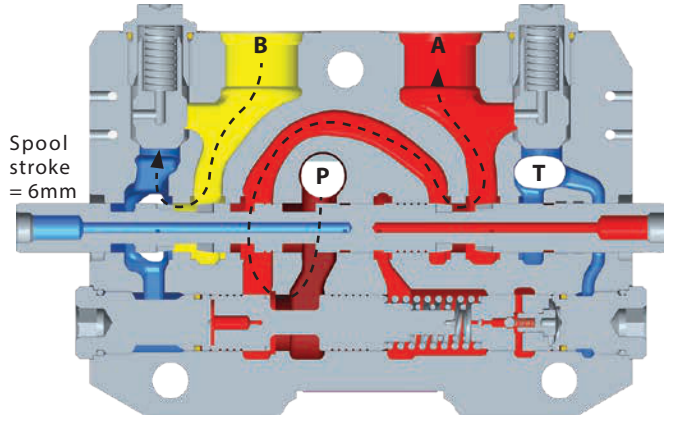


1.0 General information

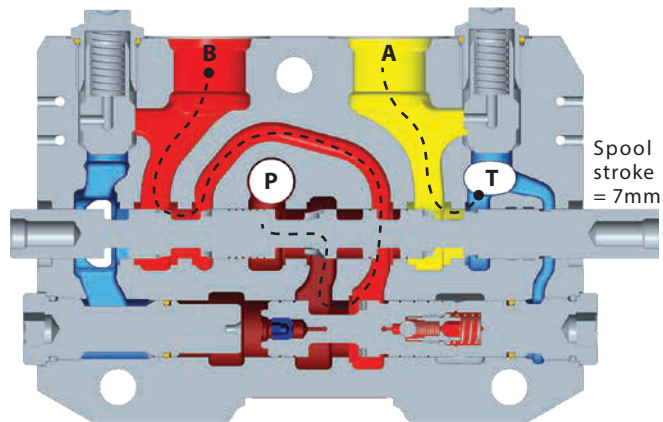
Work section flow path P-A and B-T (post comp)



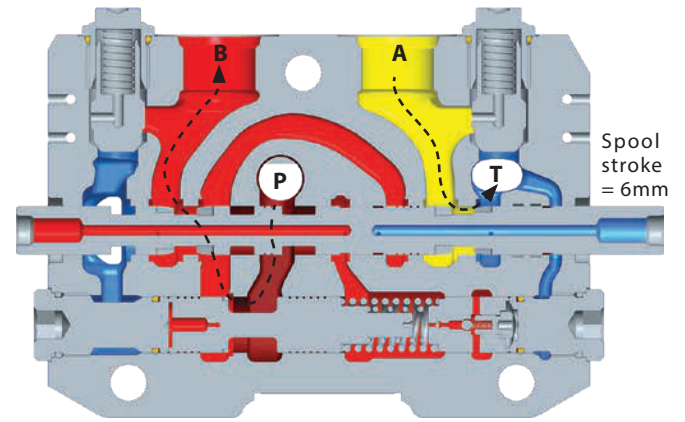
Work section flow path P-A and B-T (pre comp)



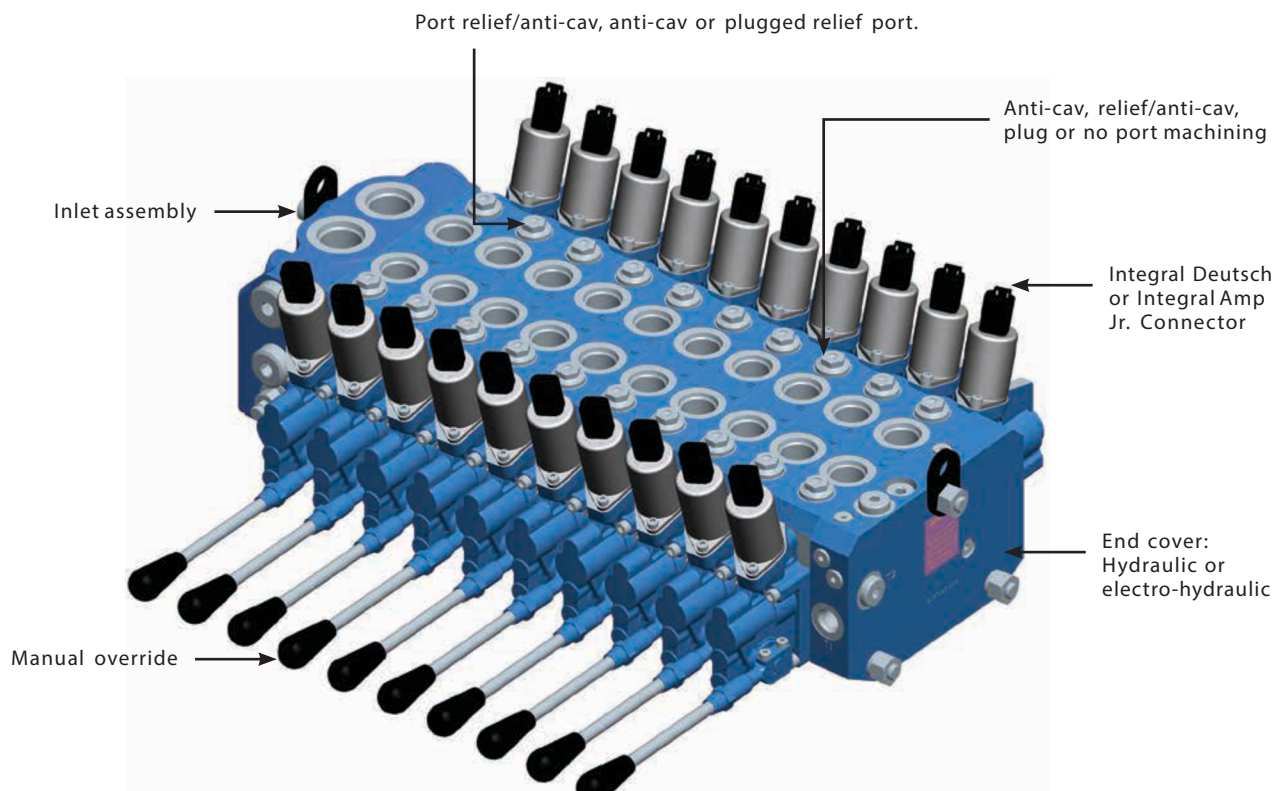
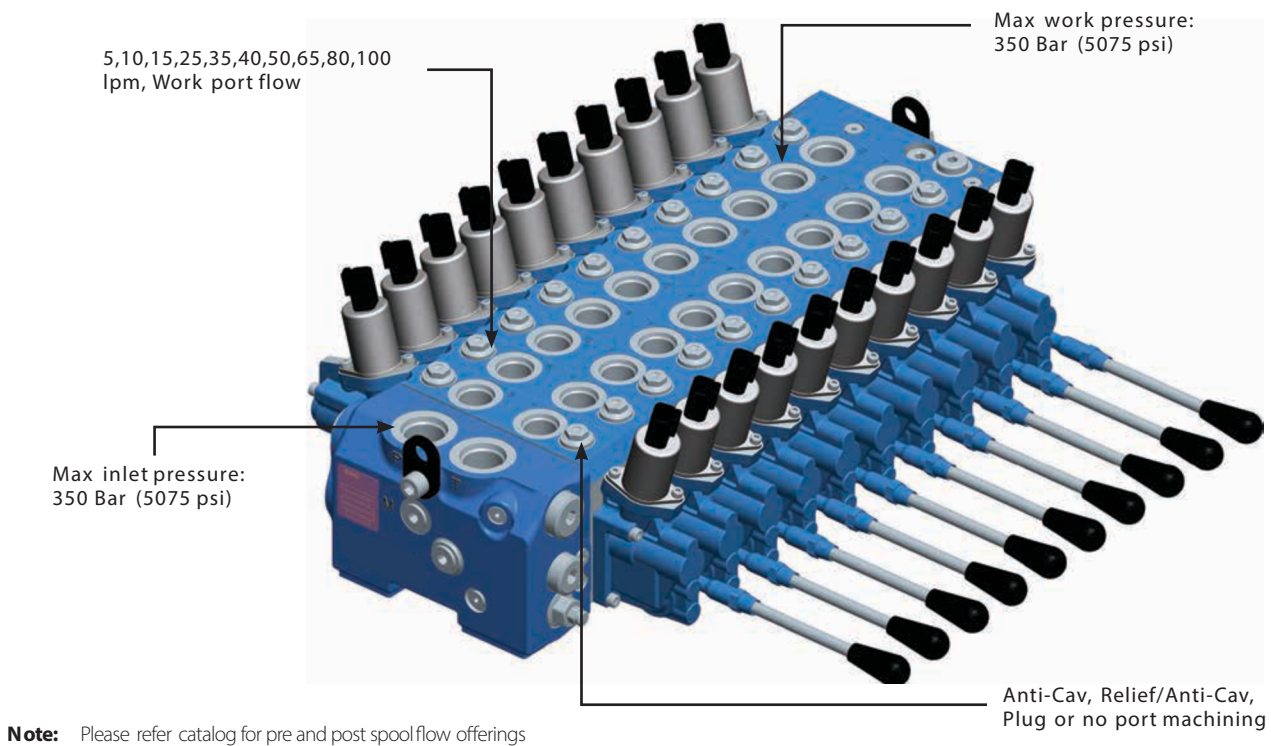
Work section flow path P-B and A-T (post comp)



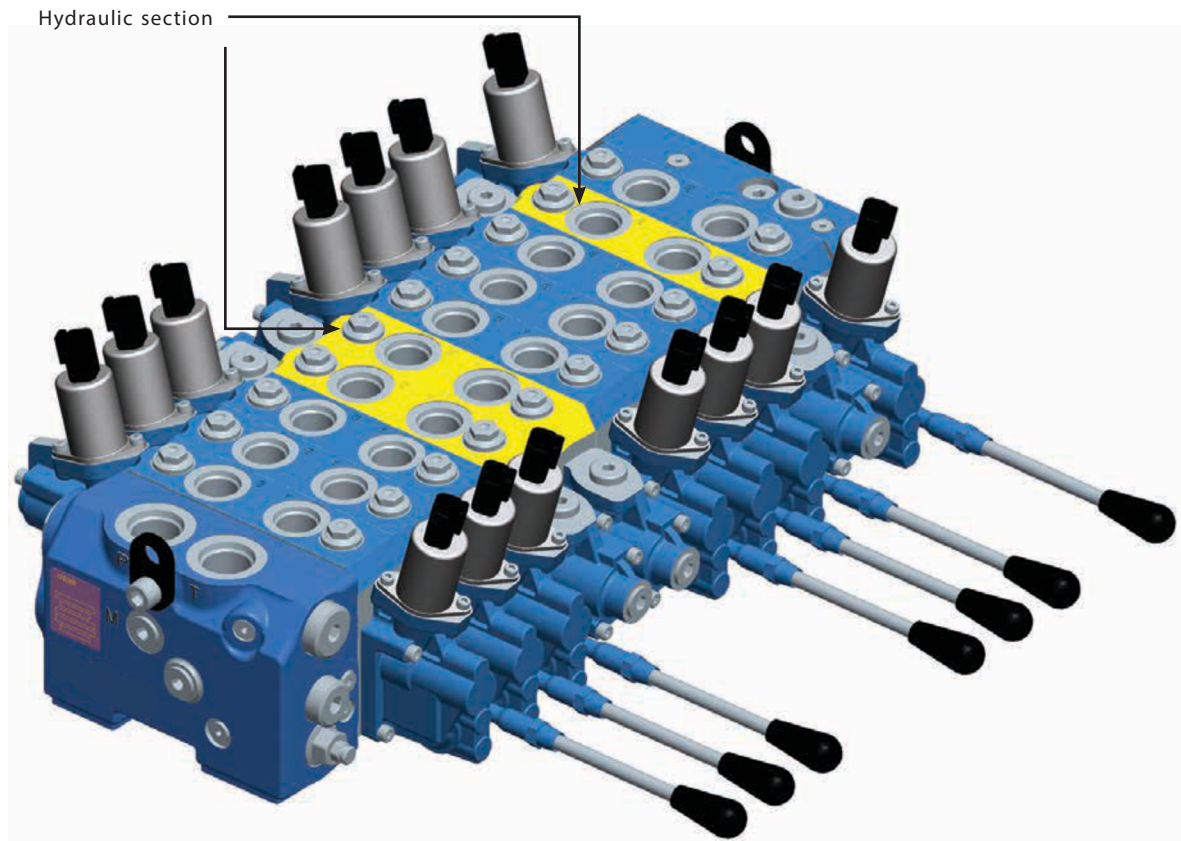
Work section flow path P-B and A-T (pre comp)



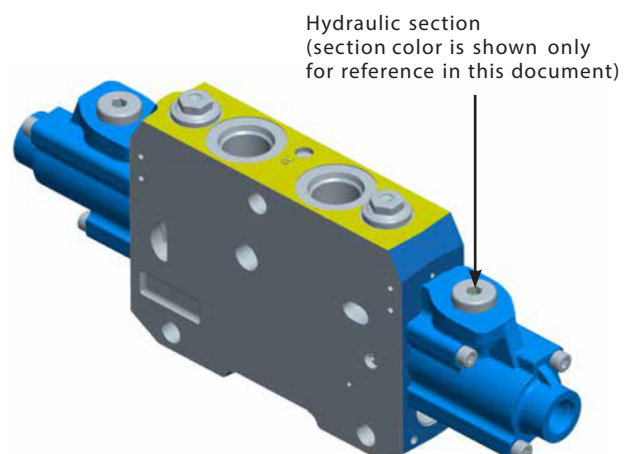
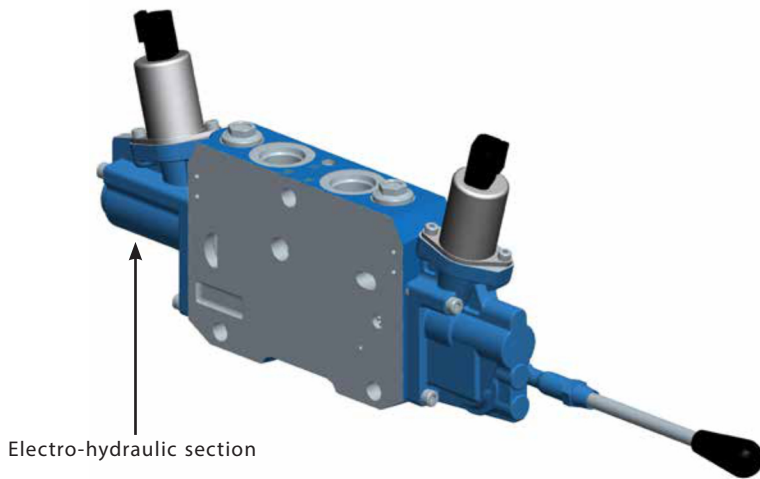
1.0 General information



1.0 General information



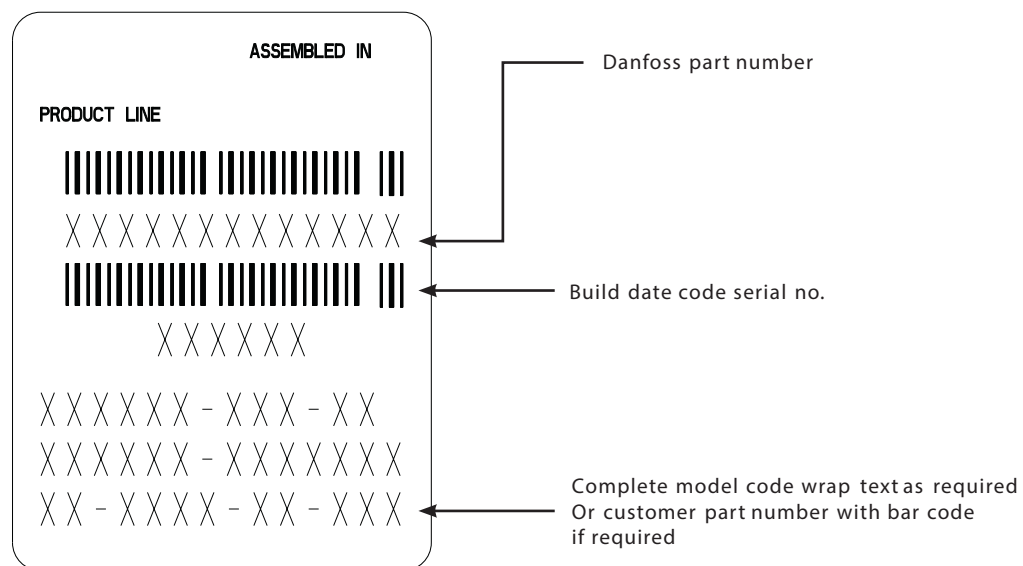
Sections can be placed in any order



1.0 General information

Identification of design level:

(Please refer labels on individual inlet/work/end section)



Last text of the model code or part number shows "A" Or "B" to identify design level.

A = Initial release

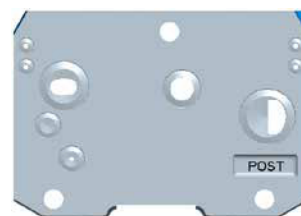
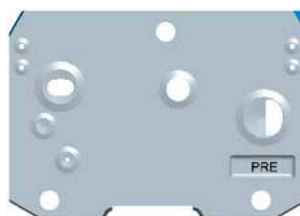
B = Latest design

Design Level "B" can also be identified by below identification marks:

Product Identification

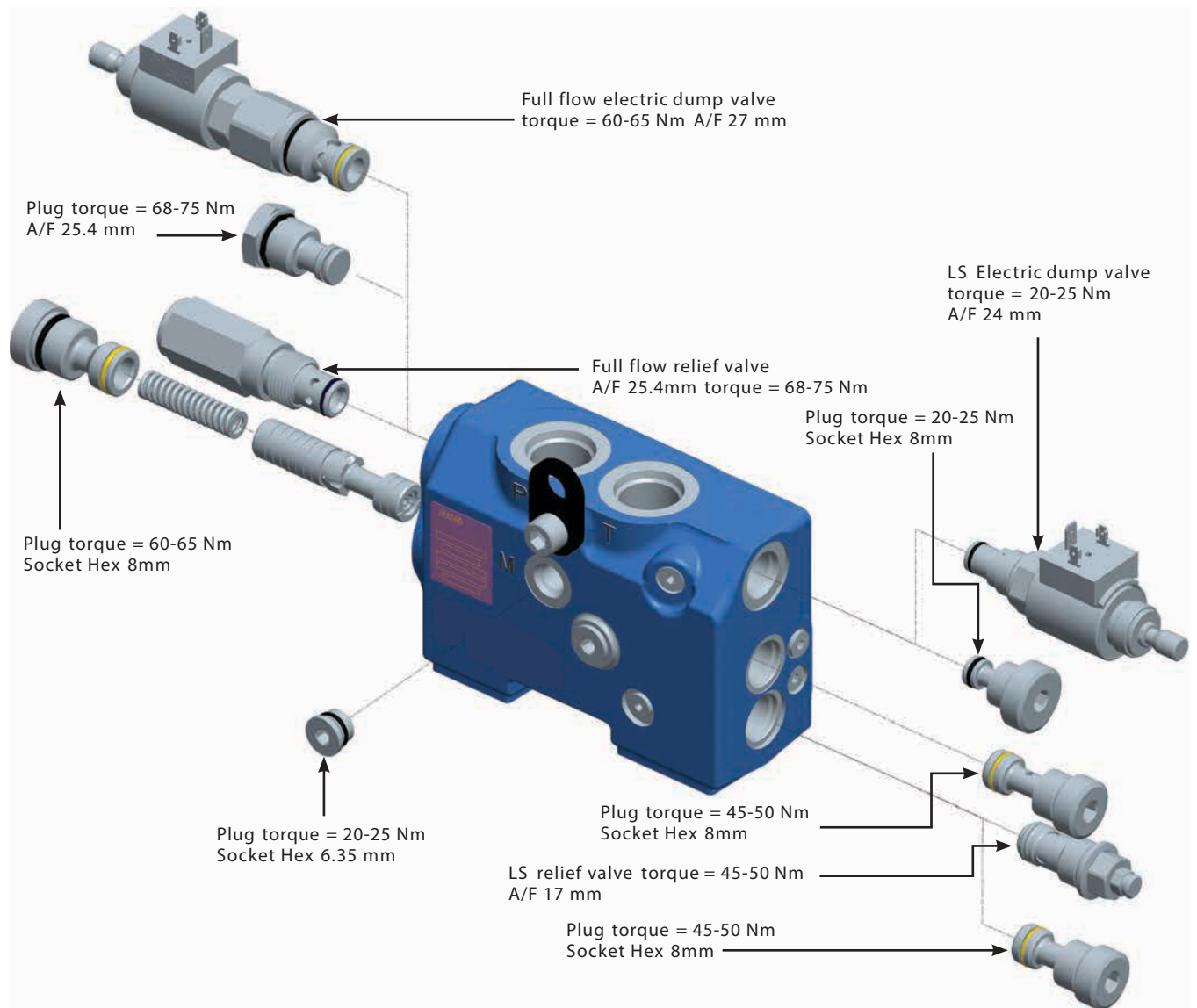


Pre or Post is stamped on work section casting as shown below.



2.0 Inlet section

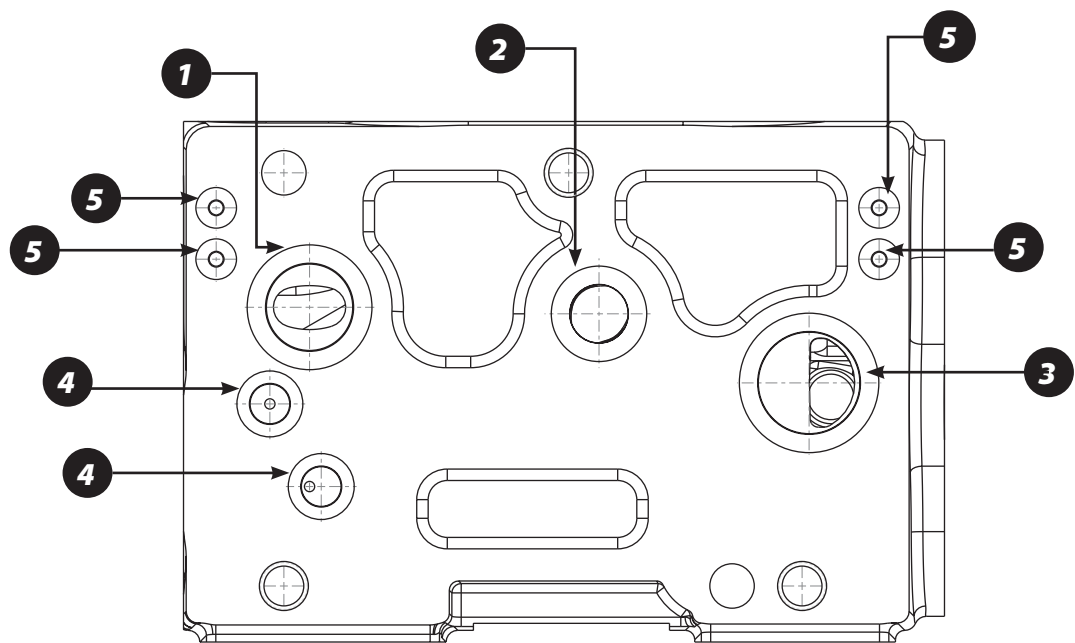
2.1 Inlet assembly:



2.0 Inlet section

2.2 Inlet interface:

(This interface kit is also applicable for work section interface)



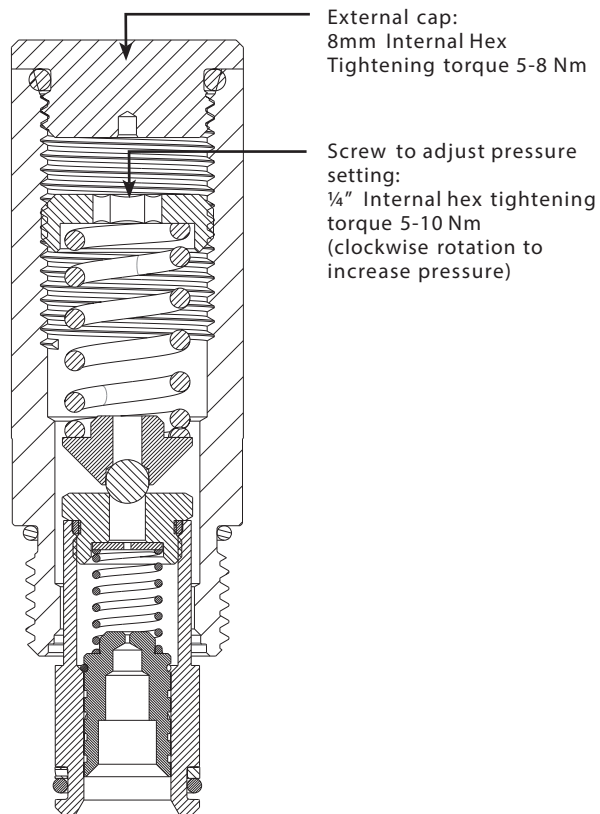
Interface Seal Kit P/N: 9901163-000

Ref #	Danfoss part#	Material / Size	Durometer	Qty
1	16015-18-90	Nitrile (Buna-N) / -118	90	1
2	16003-12-90	Nitrile (Buna-N) / -114	90	1
3	16015-20-90	Nitrile (Buna-N) / -120	90	1
4	16015-1-90	Nitrile (Buna-N) / -013	90	2
5	16003-4	Nitrile (Buna-N) / -009	70	4

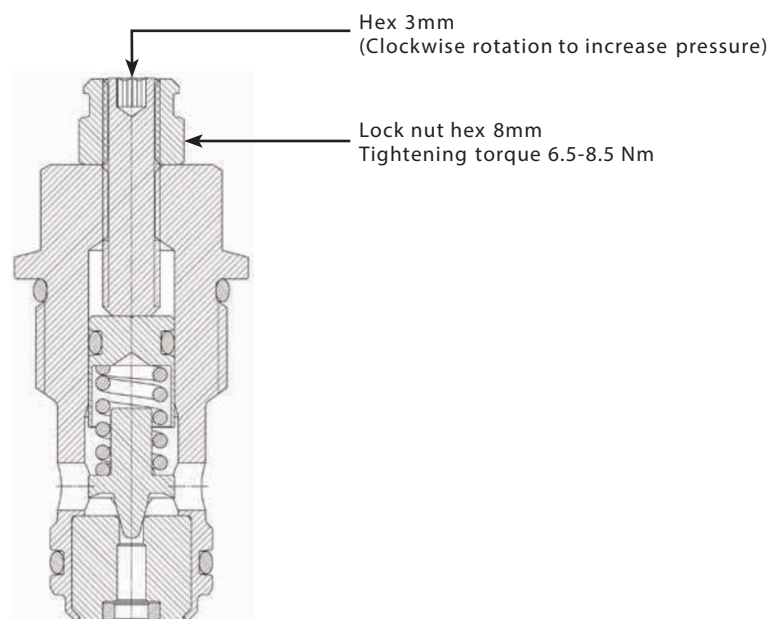
2.0 Inlet section

2.3 Inlet relief valve pressure setting adjustments:

2.3.1 Full flow relief valve:



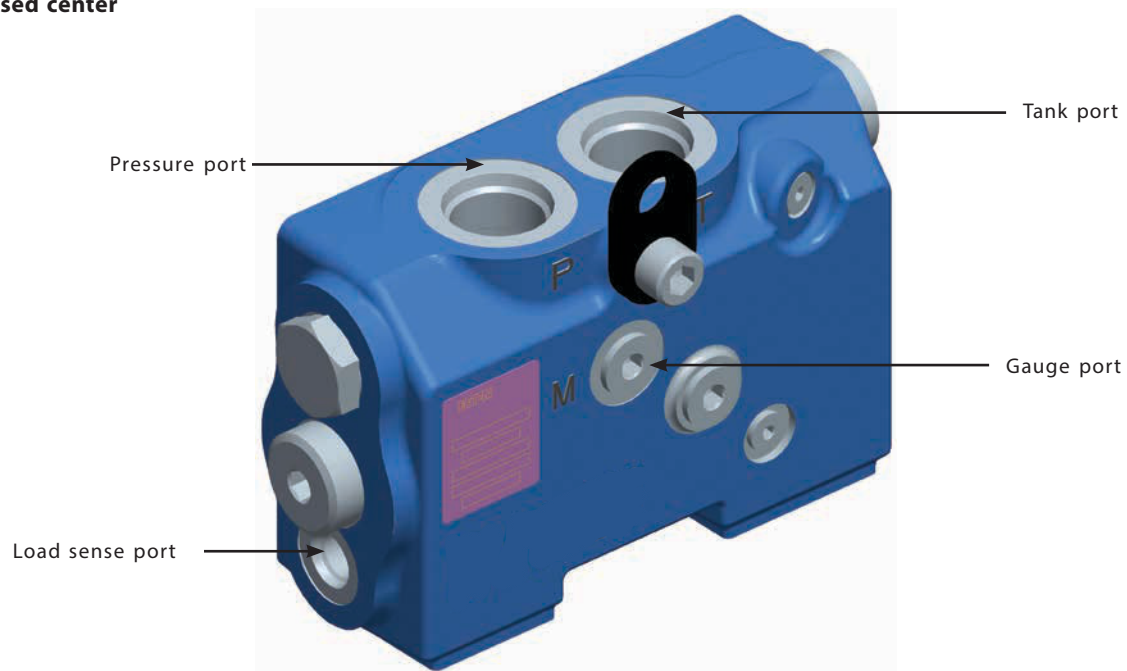
2.3.2 Load sense relief valve



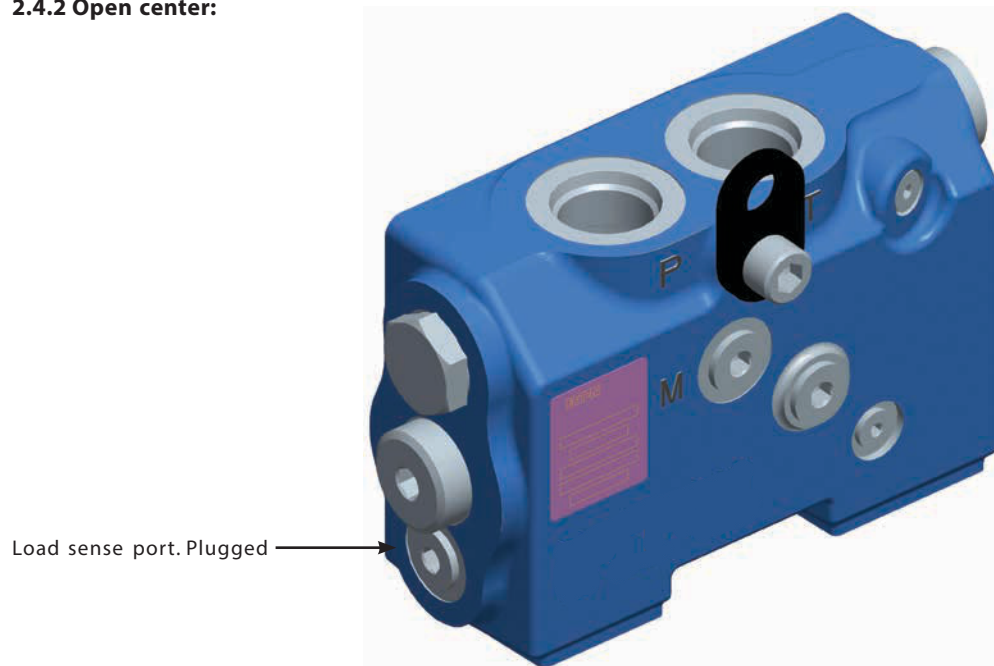
2.0 Inlet section

2.4 Inlet configuration

2.4.1 Closed center



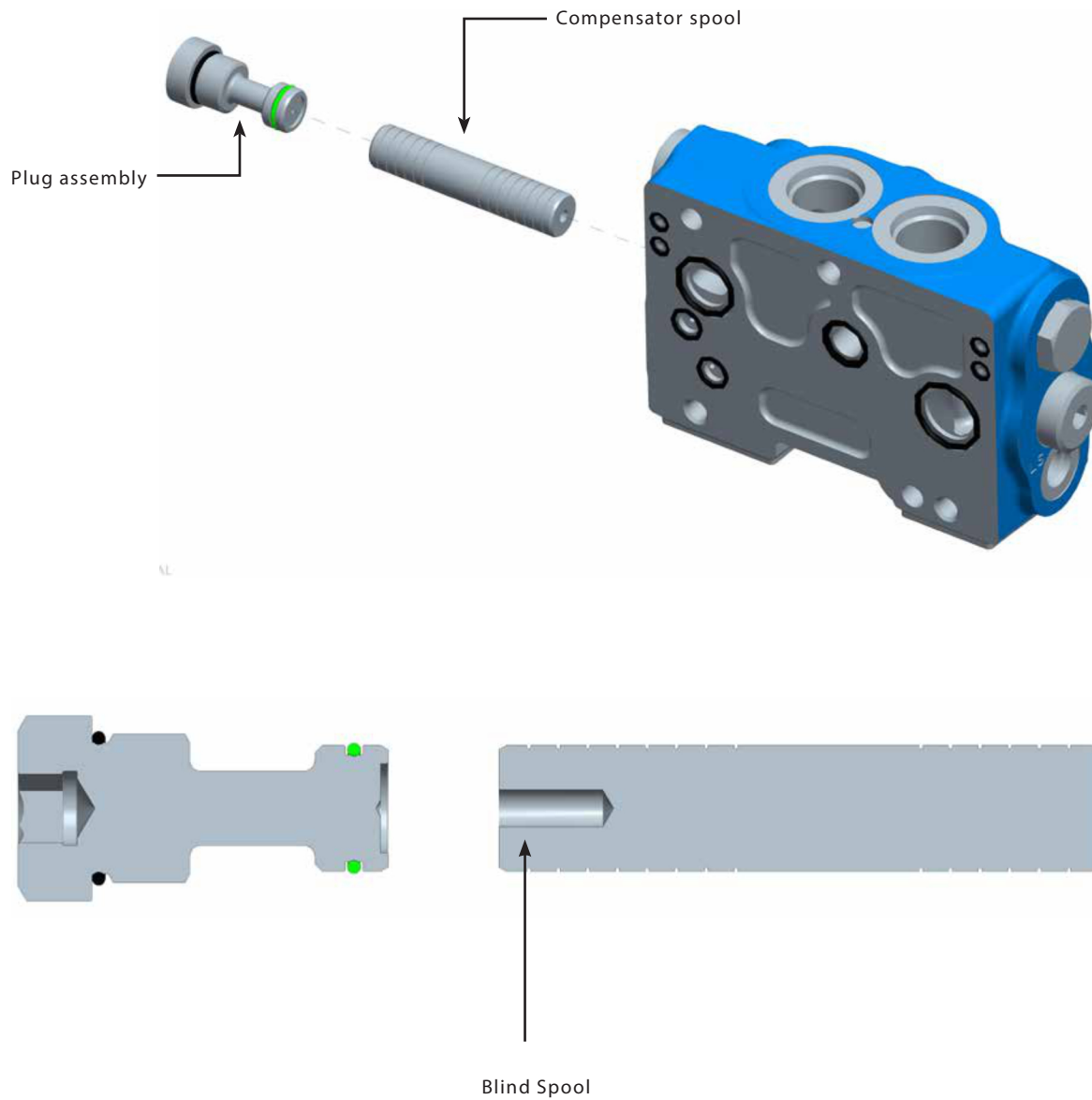
2.4.2 Open center:



2.0 Inlet section

2.5 Conversionkit

2.5.1 Open center to closed center conversion kit P/N: 9901178-000



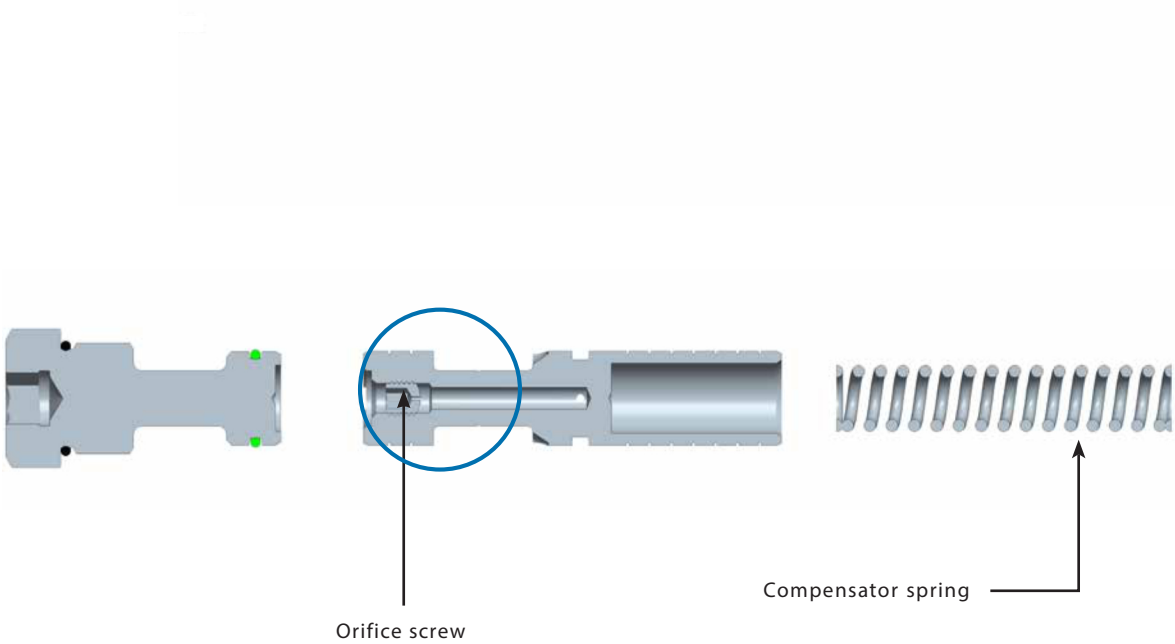
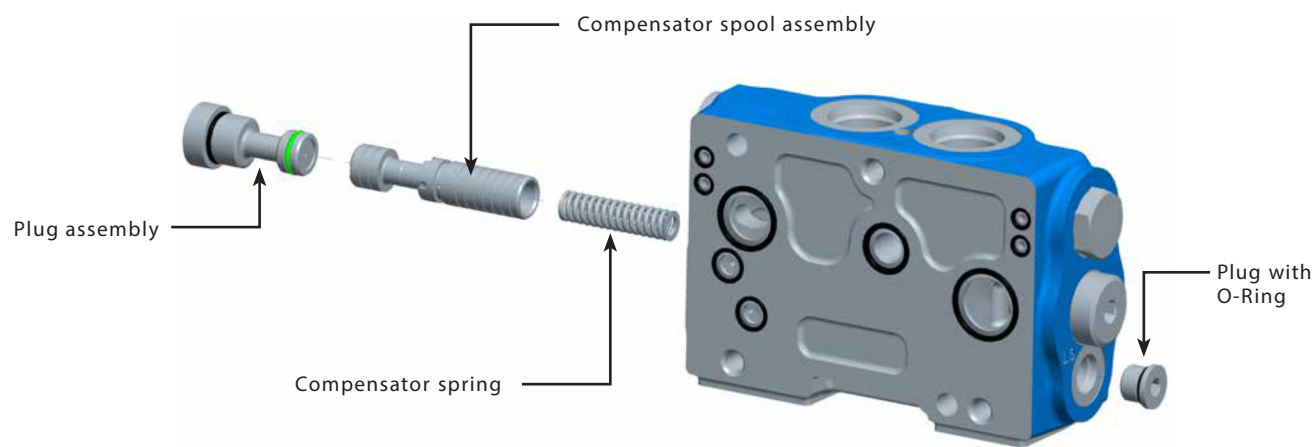
2.0 Inlet section

2.5 Conversionkit:

2.5.2 Closed center to open center conversion kit P/N:

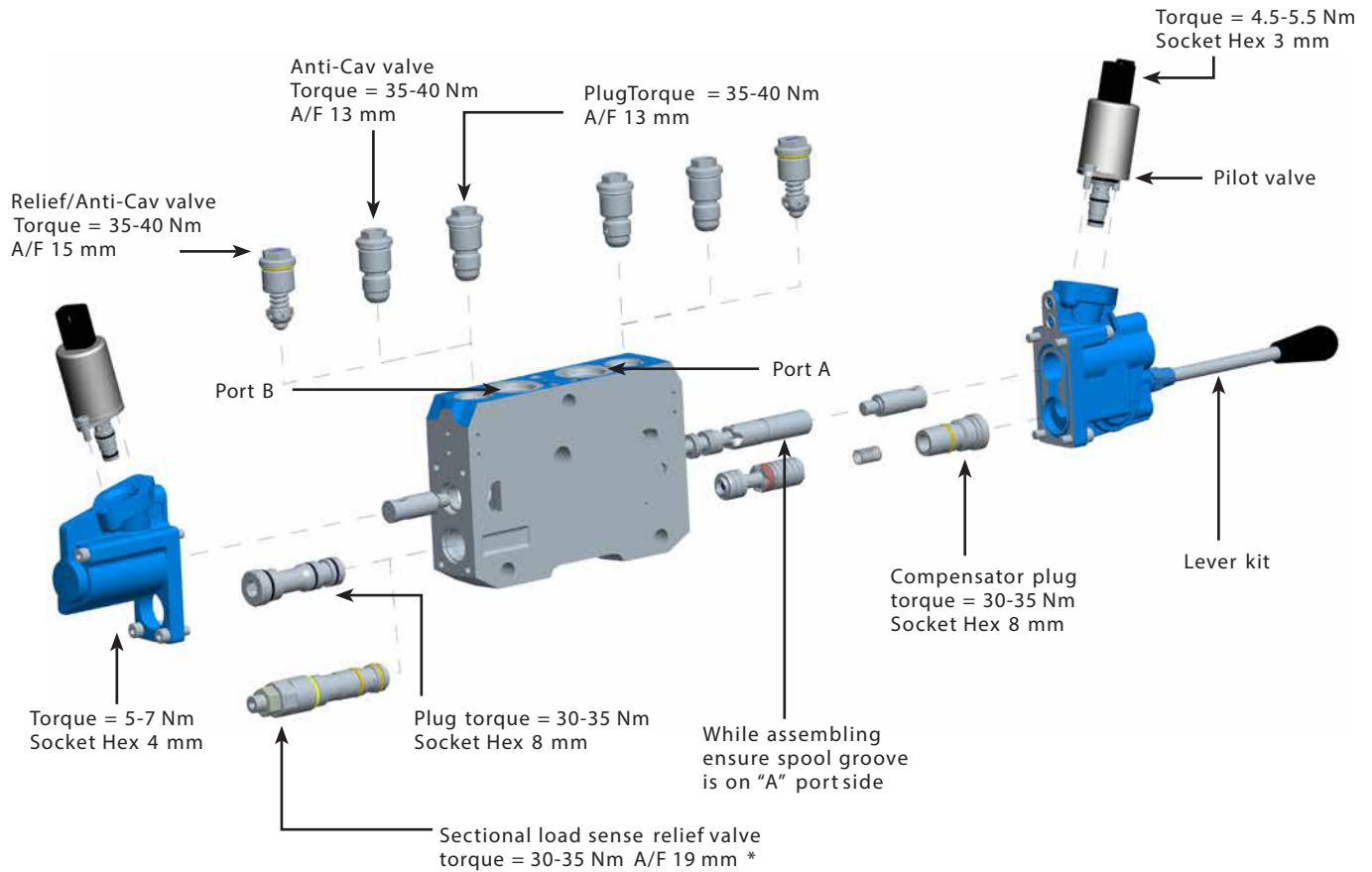
9901180-000 (for SAE port option)

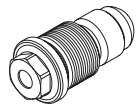
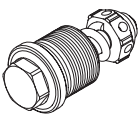
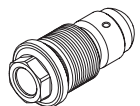
9901179-000 (for BSP port option)



3.0 Work section

3.1 work section assembly (post-comp):

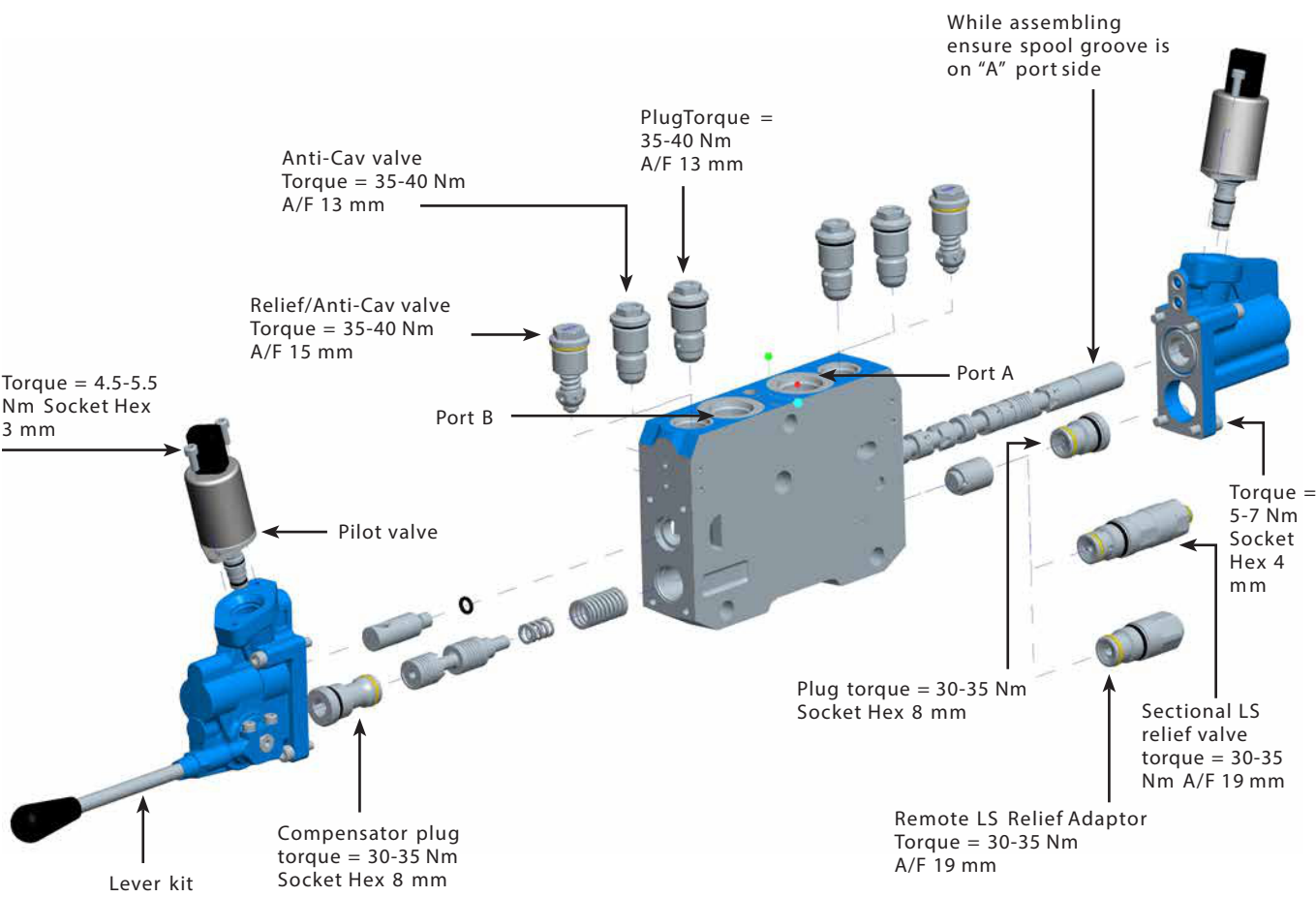


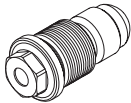
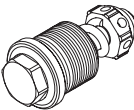
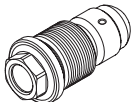
A	Anti cav	Fixed setting anticavitation valve		
R	Relief/Anti-cav	Fixed setting combined valve		
P	Plugged - work port cavities machined and plugged	Fixed setting prearrangement for auxiliary valve		

Note: Auxiliary valves (R-Relief/Anti-cav) are not field adjustable: Factory settings are available from 40 to 350 bar with 10 bar steps.
 *For un-installation of LSRV, remove actuation control caps, compensator components, unscrew the threads of LSRV & push the LSRV from opposite side of bore till it comes out of work section.

3.0 Work section

3.2 Work section assembly (pre-comp):



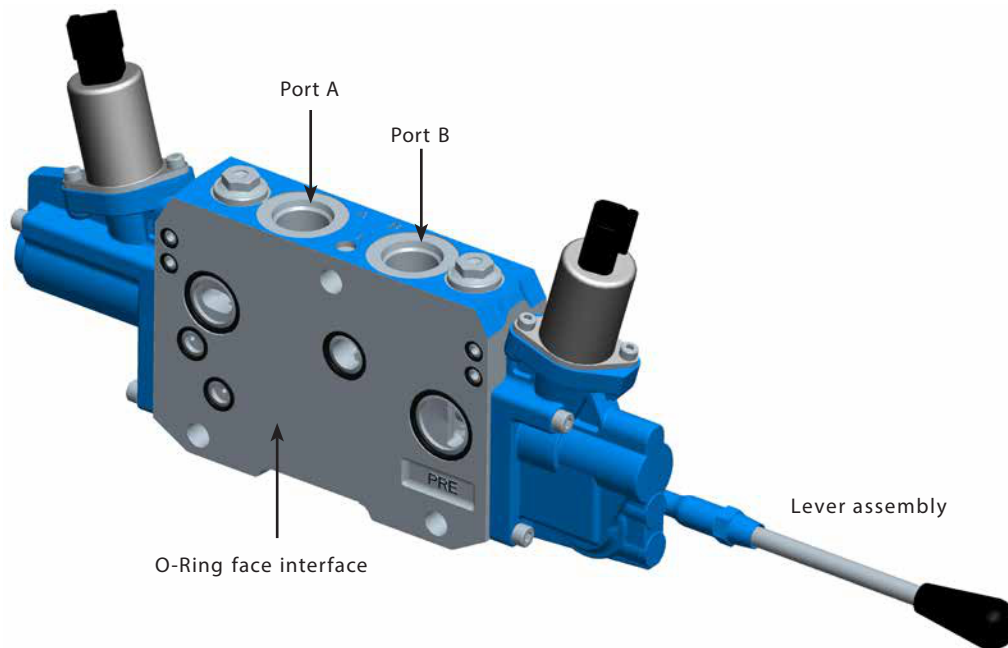
A	Anti cav	Fixed setting anticavitation valve		
R	Relief/Anti-cav	Fixed setting combined valve		
P	Plugged - work port of cavities machined and plugged	Fixed setting prearrangement for auxiliary valve		

Note: Auxiliary valves (R-Relief/Anti-cav) are not field adjustable: Factory settings are available from 40 to 350 bar with 10 bar steps.

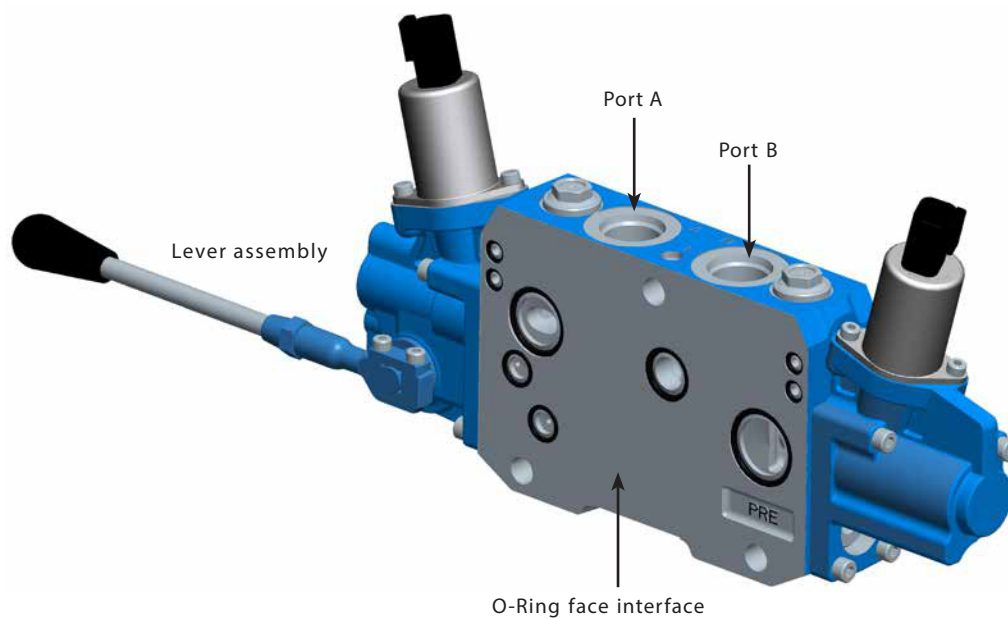
3.0 Work section

3.3 Identification of right hand (RH) and left hand (LH) build

RH Build



LH Build

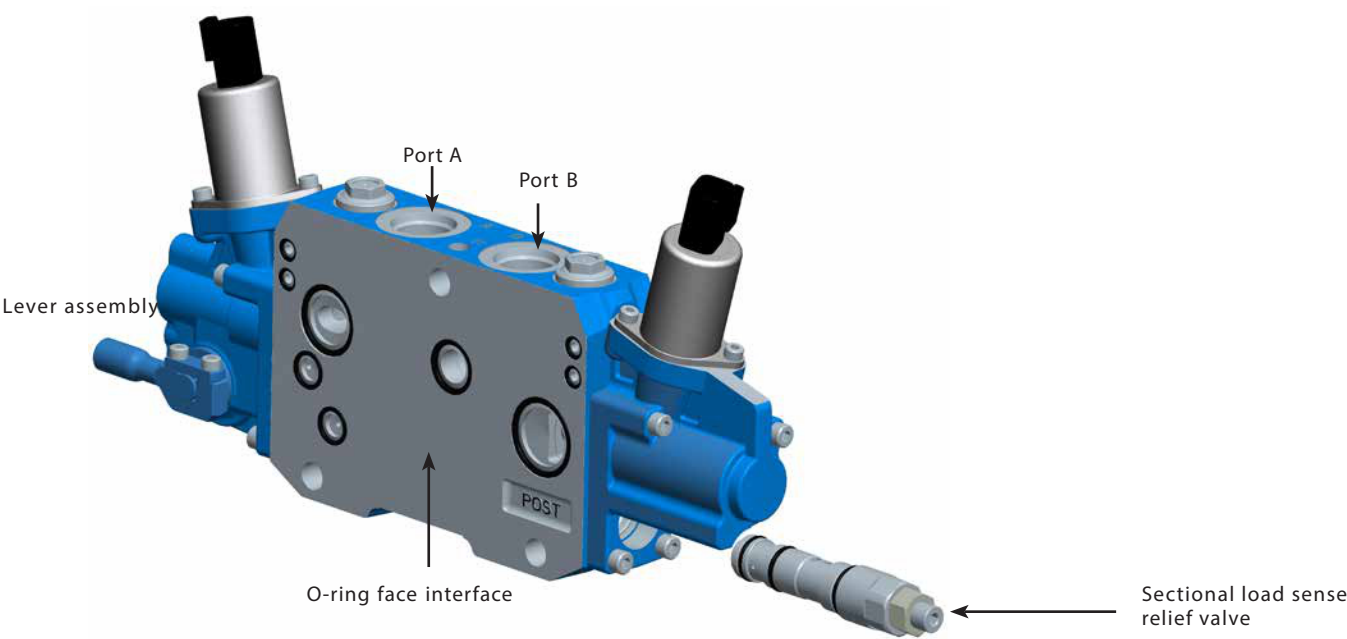


3.0 Work section

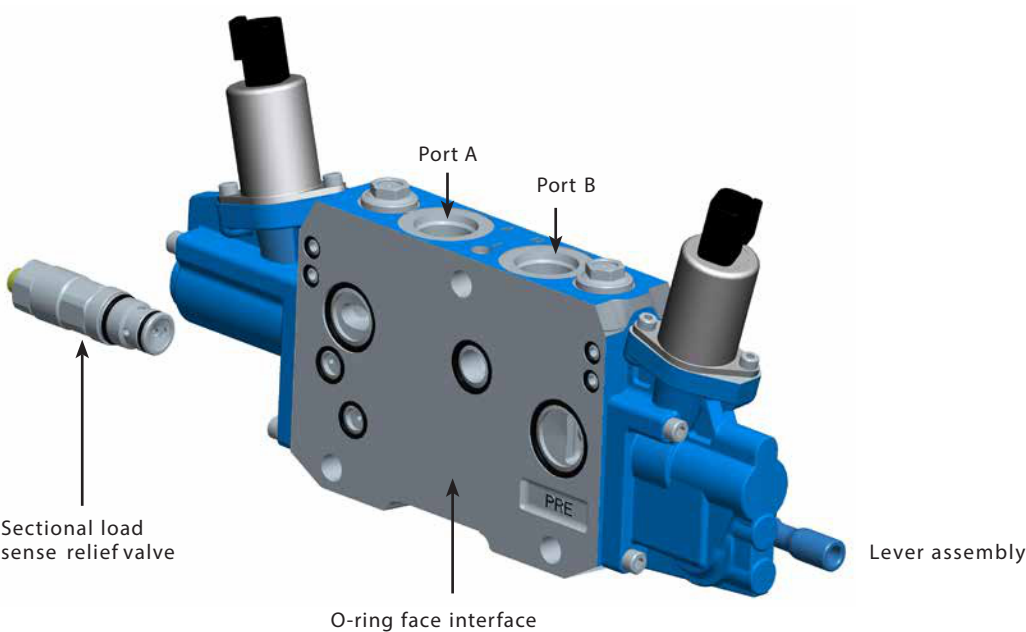
3.4 Sectional load sense relief valve (option):

Note: Care should be taken while ordering Sectional LS Relief Valve option in combination with Manual Override option. Please see below assembly possibilities.

3.4.1 - Post compensated - section load sense relief: available only for LH build



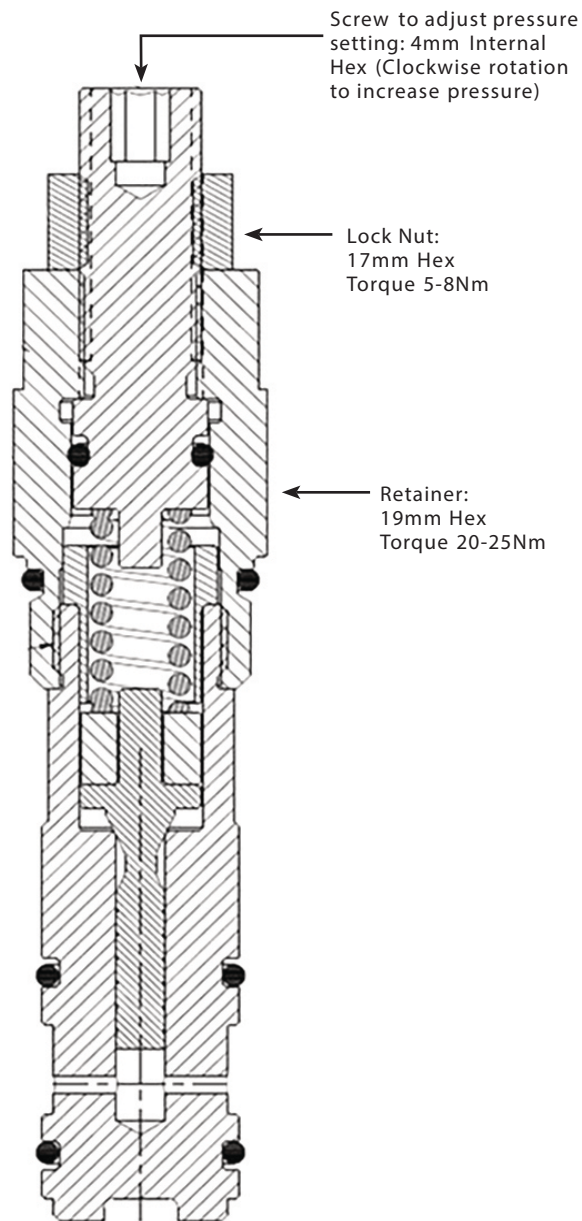
3.4.2 - Pre compensated - section load sense relief: Available only for RH build



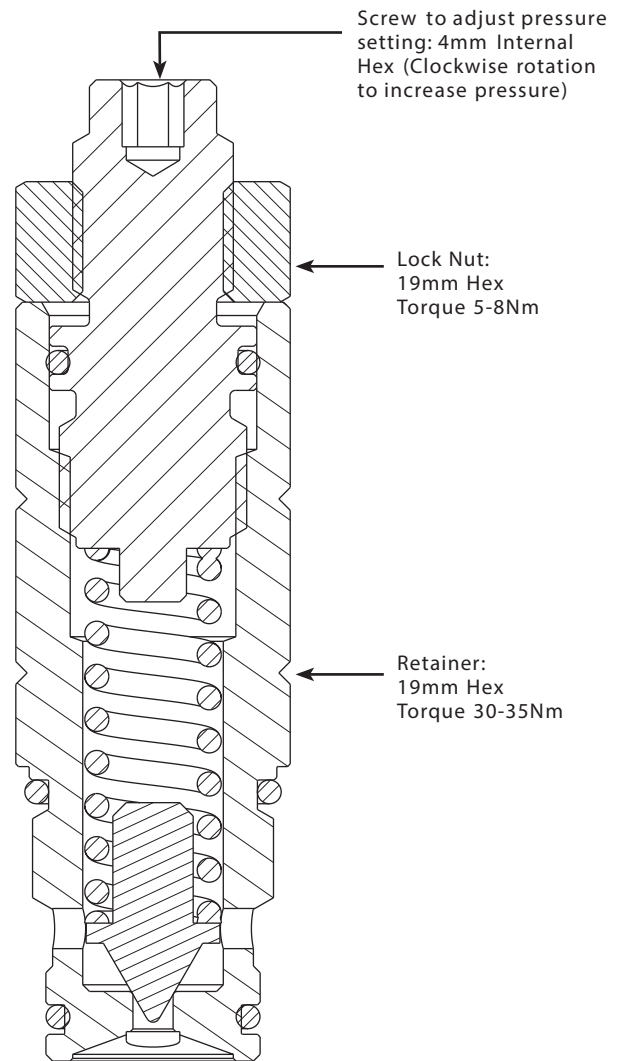
3.0 Work section

3.5 Sectional LS relief valve pressure setting

Post comp

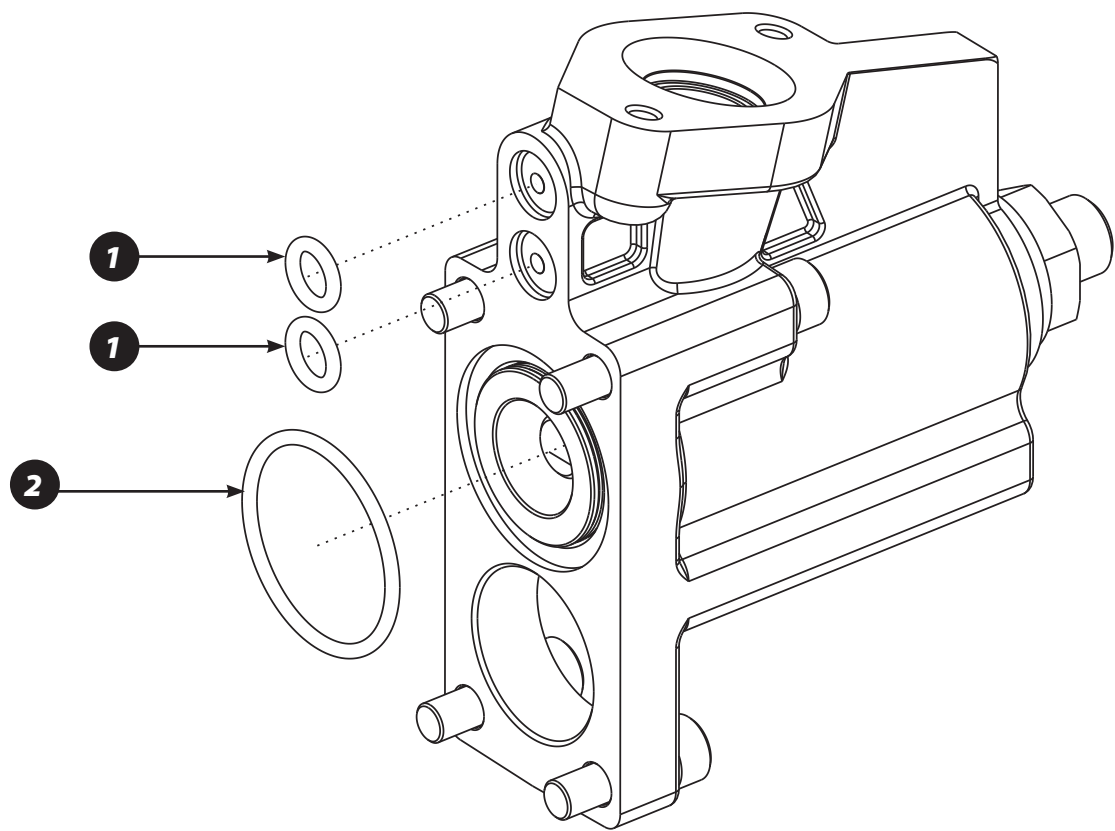


Pre comp



3.0 Work section

3.6.5. Interface seal kit for EH Actuation (spring end)

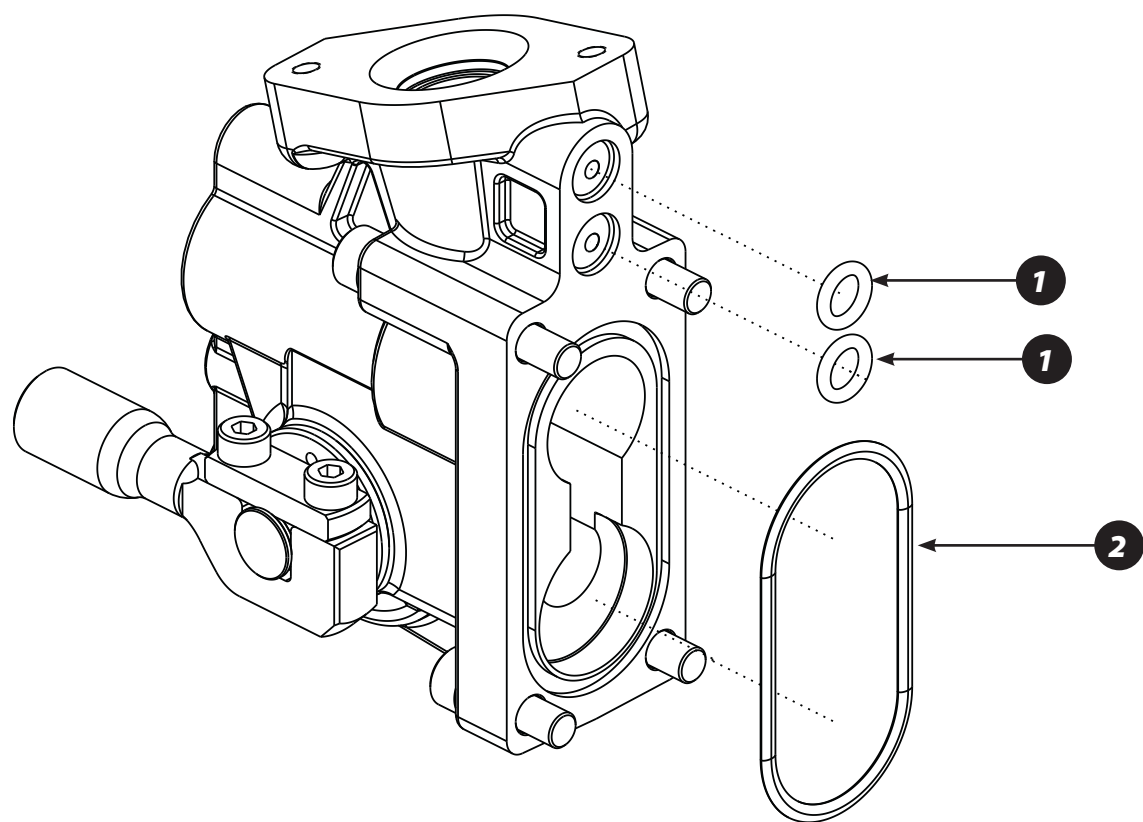


Seal kit number: 9901234-000

Ref #	Danfoss part #	Material / size	Durometer	Qty
1	16003-4	Nitrile (Buna-N) / -009	70	2
2	16015-10	Nitrile (Buna-N) / -022	70	1

3.0 Work section

3.6.4. Interface seal Kit For EH actuation (lever side)



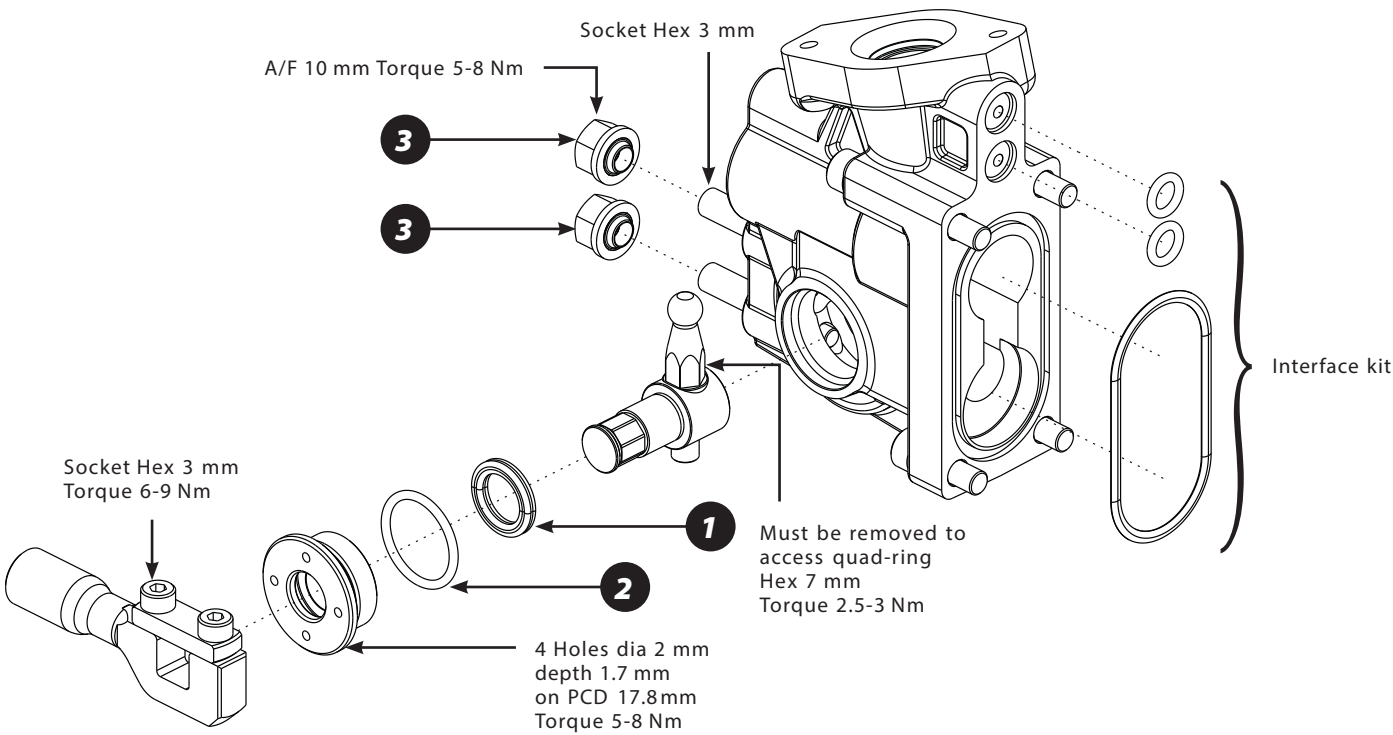
Seal kit number: 9901235-000

Ref #	Danfoss part #	Material / Size	Durometer	Qty
1	16003-4	Nitrile (Buna-N) / -009	70	2
2	278542	Nitrile (Buna-N) / -030	70	1

3.0 Work section

3.6.6. Seal kits for lever over-ride,hyd port & stroke limiter parts:

Seal kit for EH Actuation lever side with stroke limiter (pre & post comp)

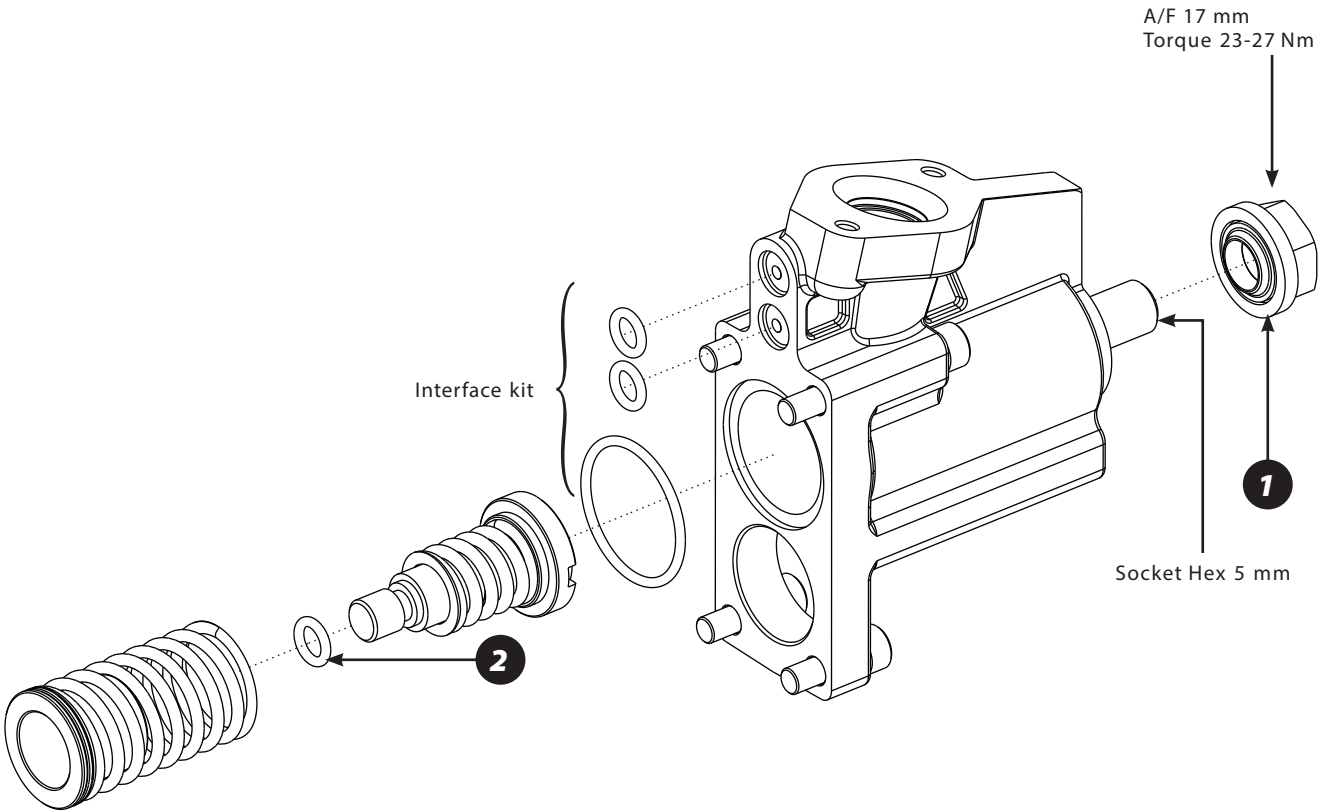


Seal kit number: 9901236-000

Ref #	Danfoss part#	Material/ Size	Durometer	Qty
1	16051-9	Nitrile (Buna-N)	70	1
2	16015-5	Nitrile (Buna-N) / (-017)	70	1
3	6041710-001	Seal lock nut M6	-	2

3.0 Work section

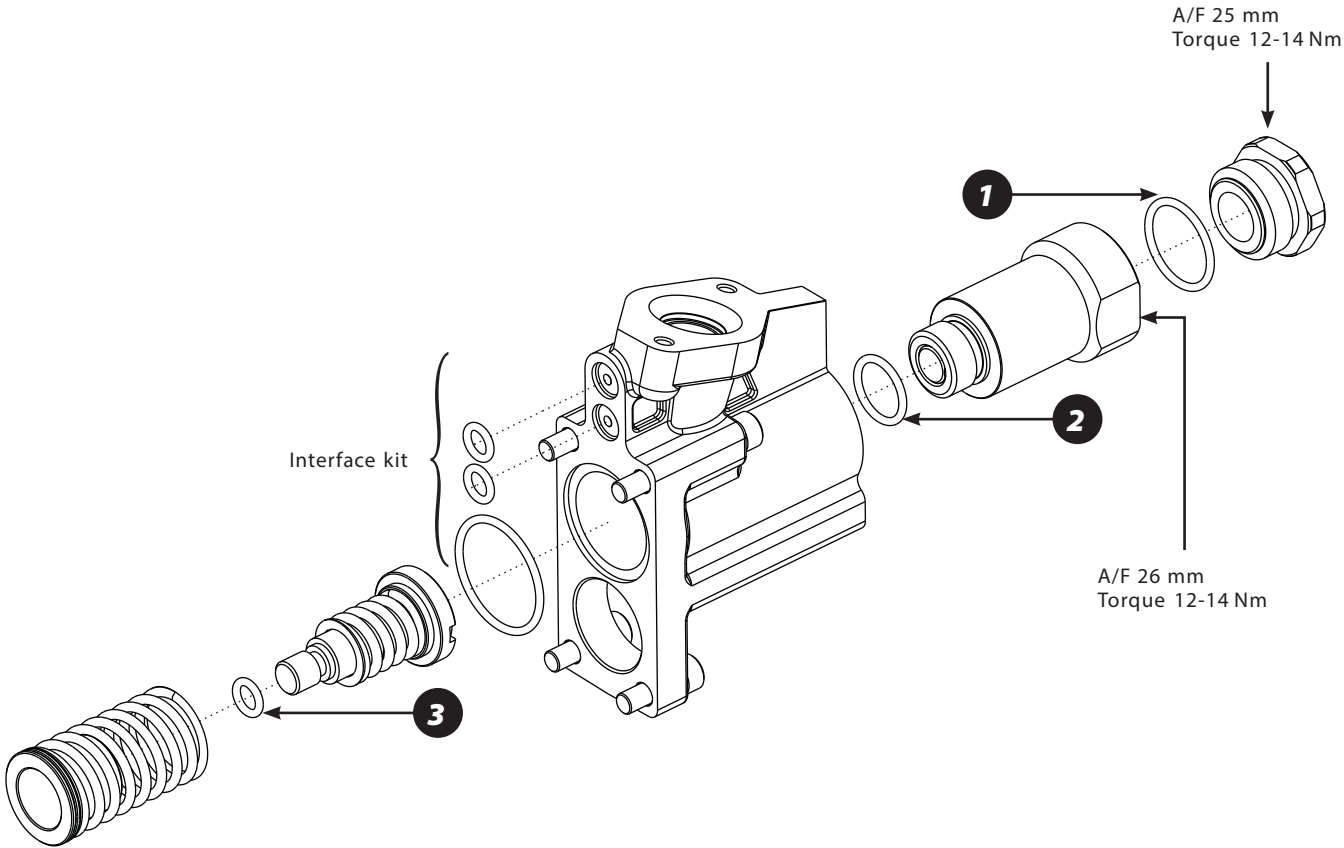
3.6.7. Seal kit for EH actuation spring side with stroke limiter (pre-comp)



Seal kit number: 9901237-000

Ref #	Danfoss part#	Material/Size	Durometer	Qty
1	6037602-001	Seal Lock nutM10	-	1
2	16003-4-90	Nitrile (Buna-N) / (-009)	90	1

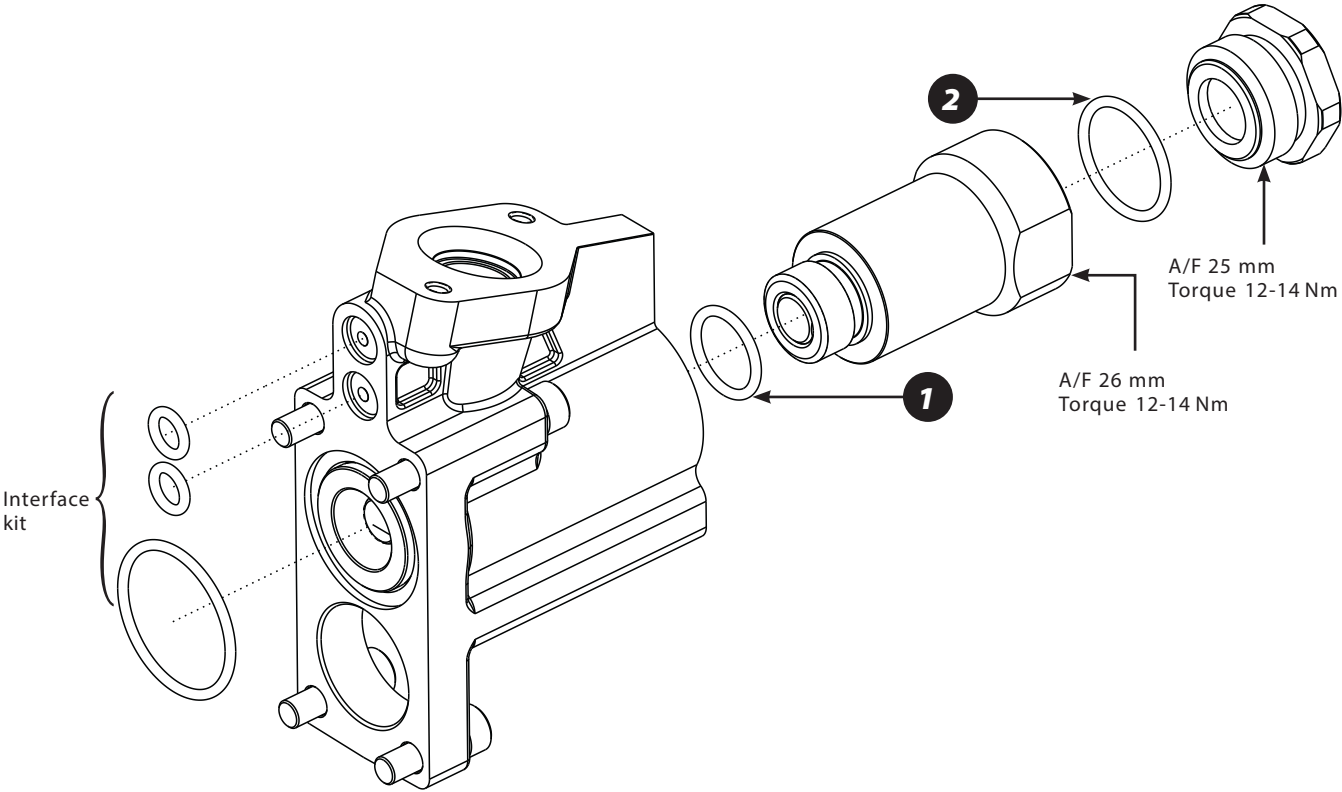
3.6.8. Seal kit for EH actuation spring side with Hyd.Port option (pre-comp)



Seal kit number: 9901238-000

Ref #	Danfoss part#	Material / Size	Durometer	Qty
1	16015-6	Nitrile (Buna-N) / (-018)	70	1
2	6037168-002	Nitrile (Buna-N) / (6-129)	70	1
3	16003-4-90	Nitrile (Buna-N) / -009	90	1

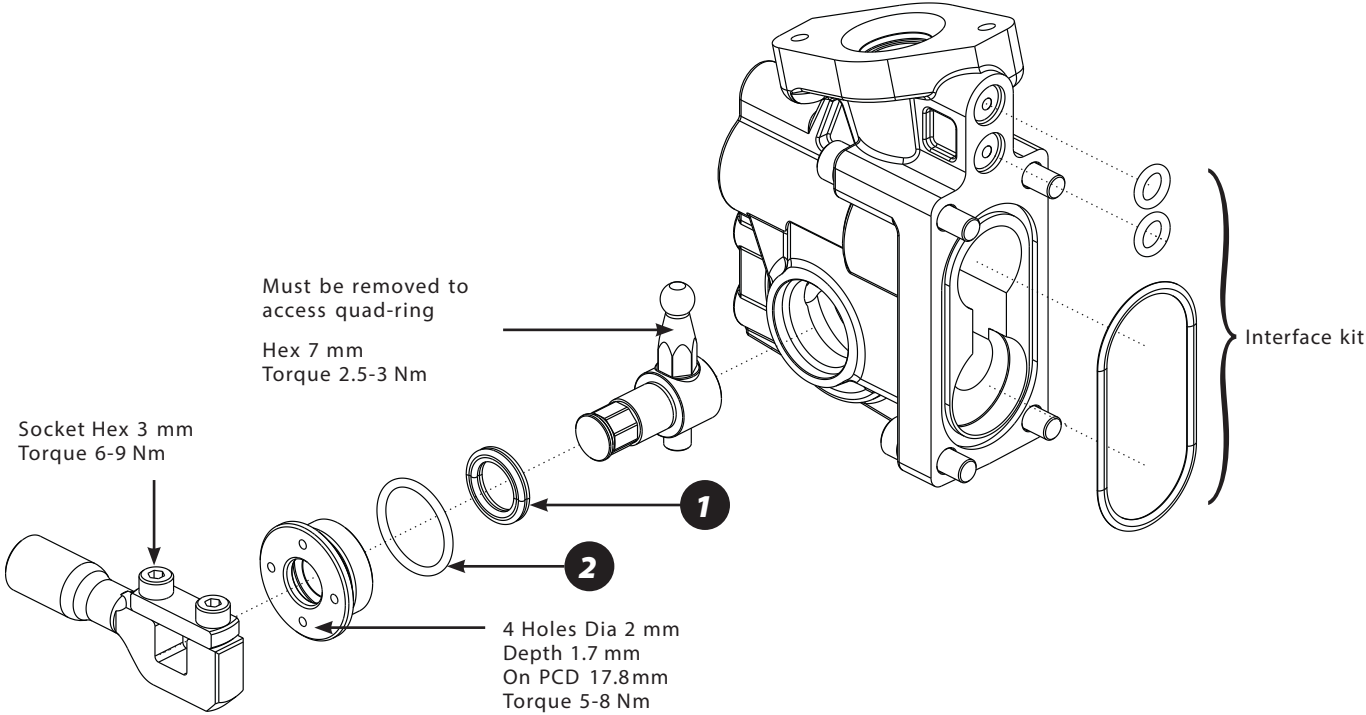
3.6.9. Seal kit for EH & Hyd. Port option, spring side (post-comp)



Seal kit number: 9901239-000

Ref #	Danfoss part#	Material / Size	Durometer	Qty
1	6037168-002	Nitrile (Buna-N) / (6-129)	70	1
2	16015-6	Nitrile (Buna-N) / (-018)	70	1

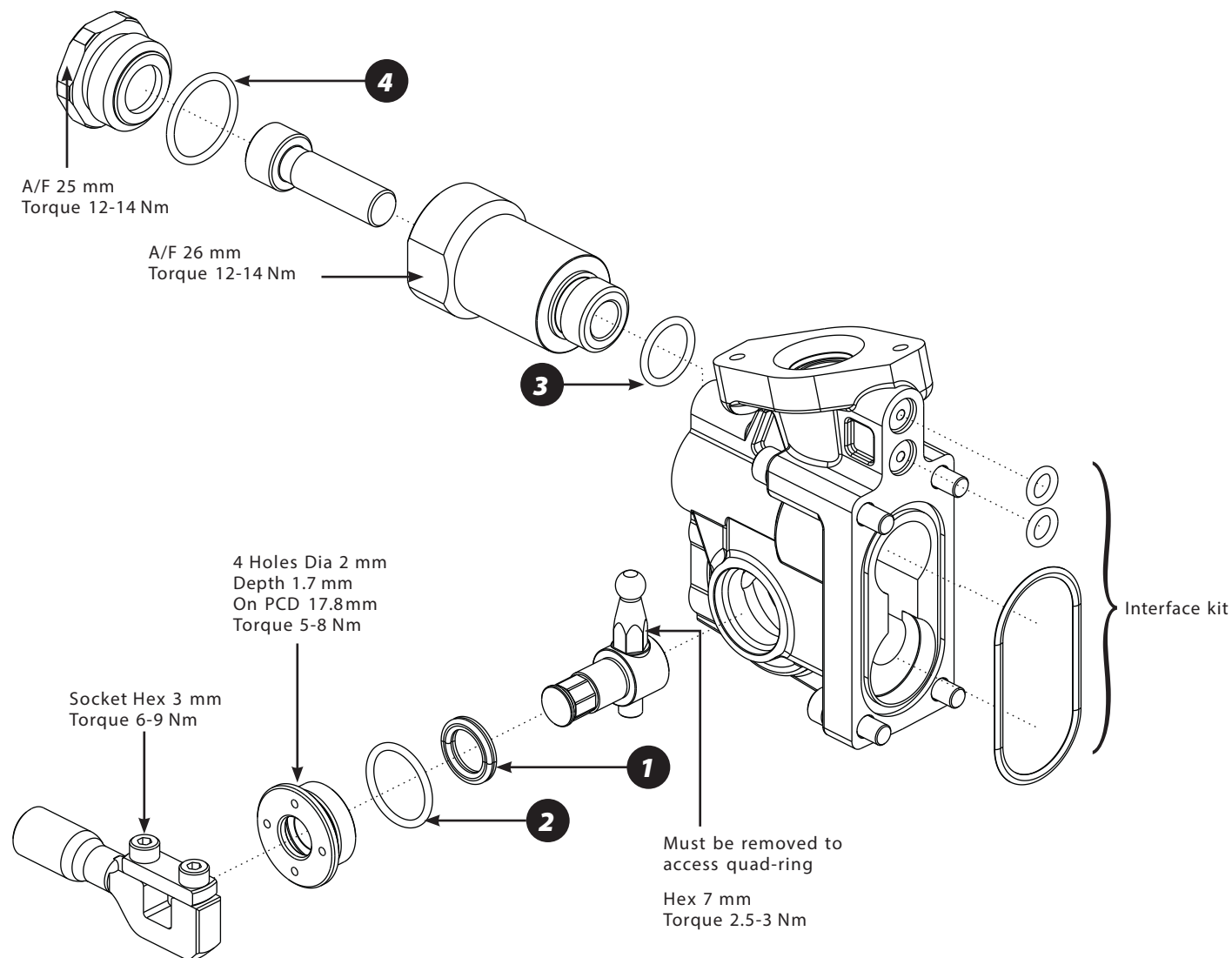
3.6.10.Seal kit for EH actuation with lever over-ride(pre & post comp)



Seal kit number: 9901240-000

Ref #	Danfoss part#	Material/ Size	Durometer	Qty
1	16051-9	Nitrile (Buna-N)	70	1
2	16015-5	Nitrile (Buna-N) / (-017)	70	1

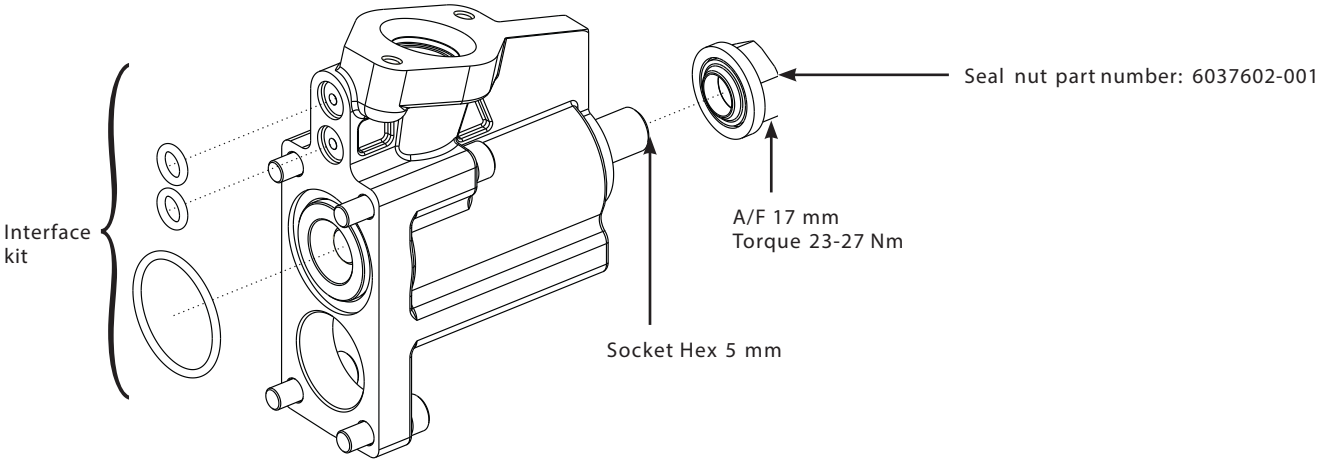
3.6.11. Seal kit for eh actuation with lever over-ride and hyd.Port option (pre & post comp):



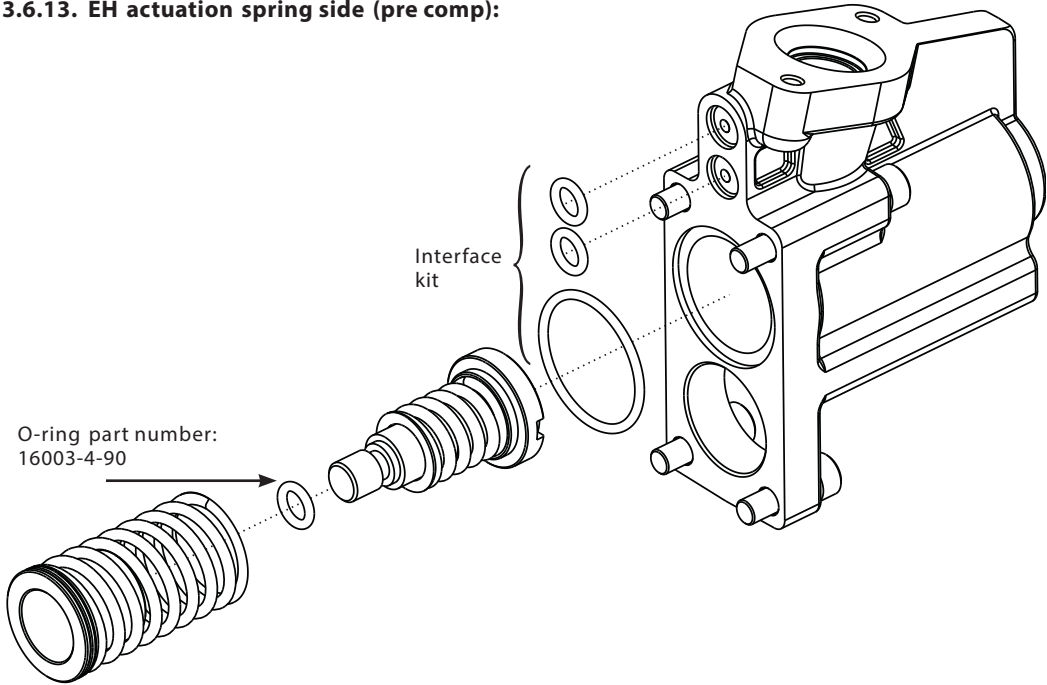
Seal kit number: 9901241-000

Ref #	Danfoss part#	Material / Size	Durometer	Qty
1	16051-9	Nitrile (Buna-N)	70	1
2	16015-5	Nitrile (Buna-N) / (-017)	70	1
3	6037168-002	Nitrile (Buna-N) / (6-129)	70	1
4	16015-6	Nitrile (Buna-N) / (-018)	70	1

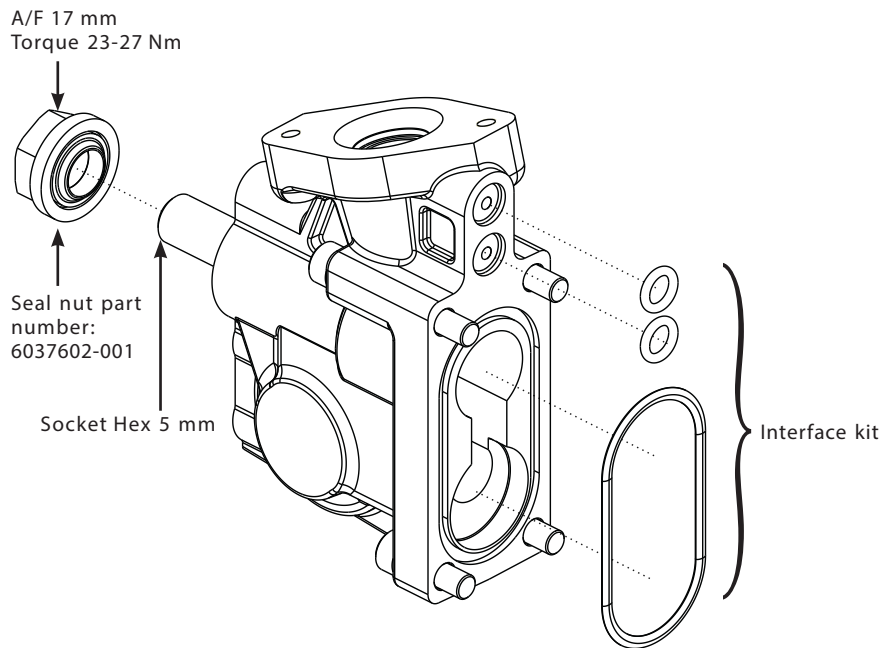
3.6.12. EH Actuation with stroke limiter, spring side (pre & post comp):



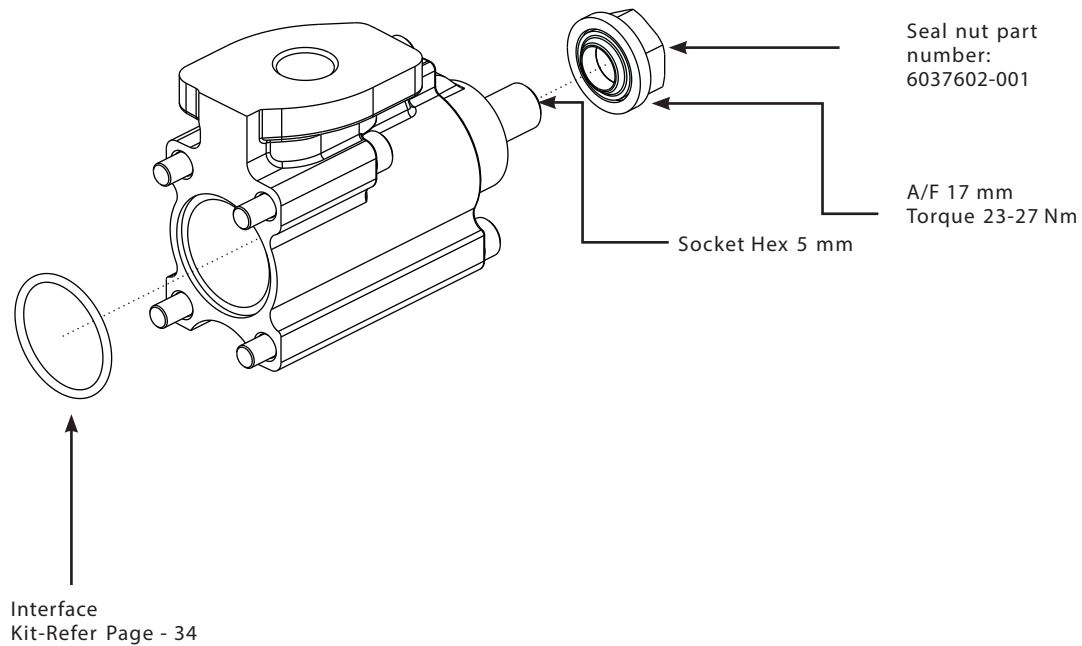
3.6.13. EH actuation spring side (pre comp):



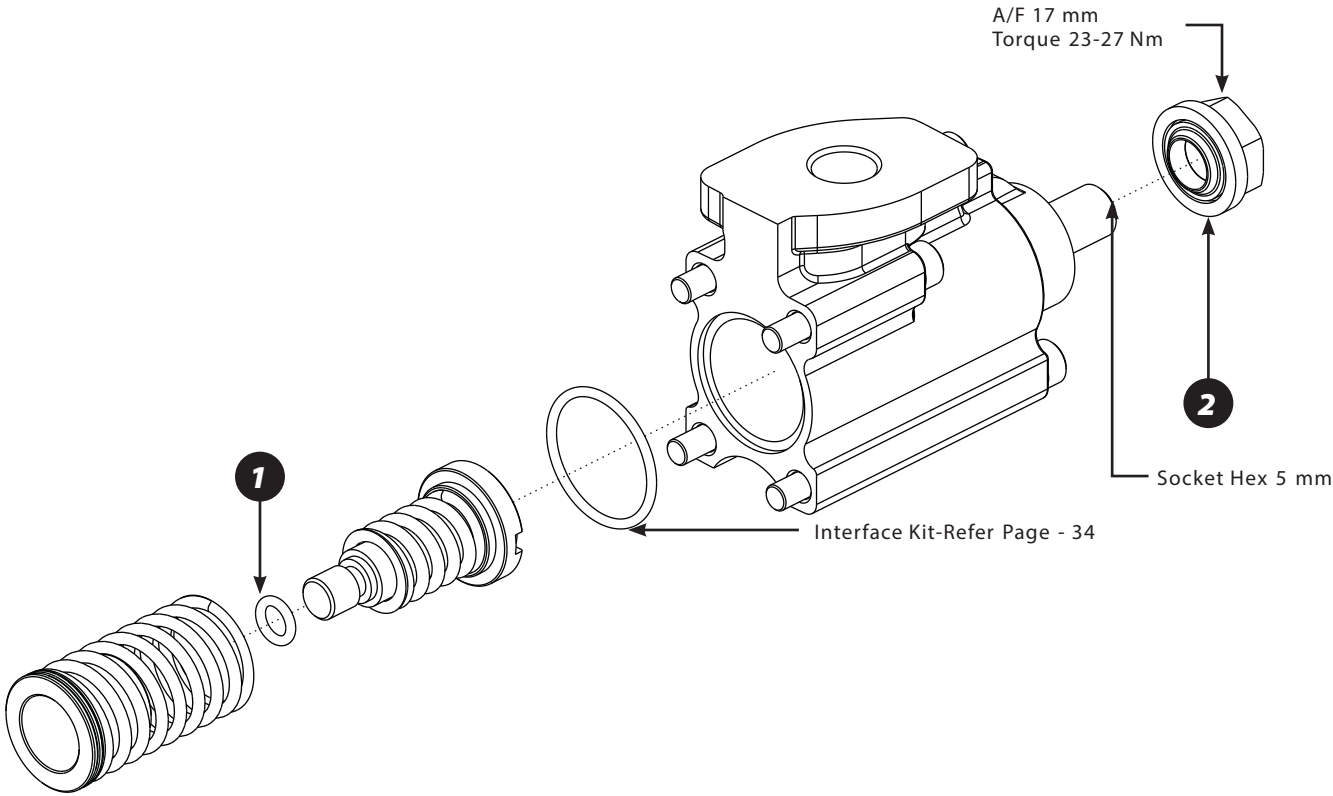
3.6.14. EH Actuation without lever over-ride, with stroke limiter (pre & post comp):



3.6.15. Seal nut for Hyd. Actuation with stroke limiter (post comp):



3.6.16. Seal kit for Hyd. actuation with stroke limiter (pre comp):

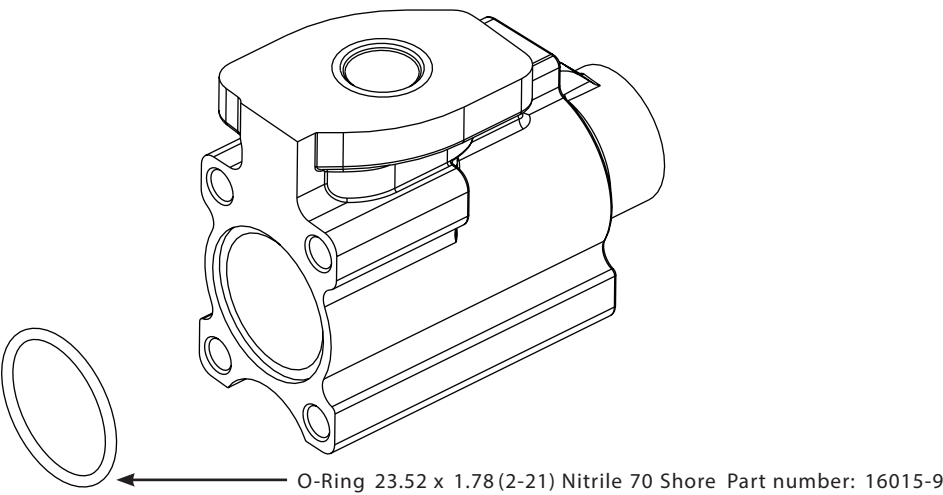


Seal Kit Hydraulic Act. with stroke limiter (Pre-Comp)
P/N: 9901242-000

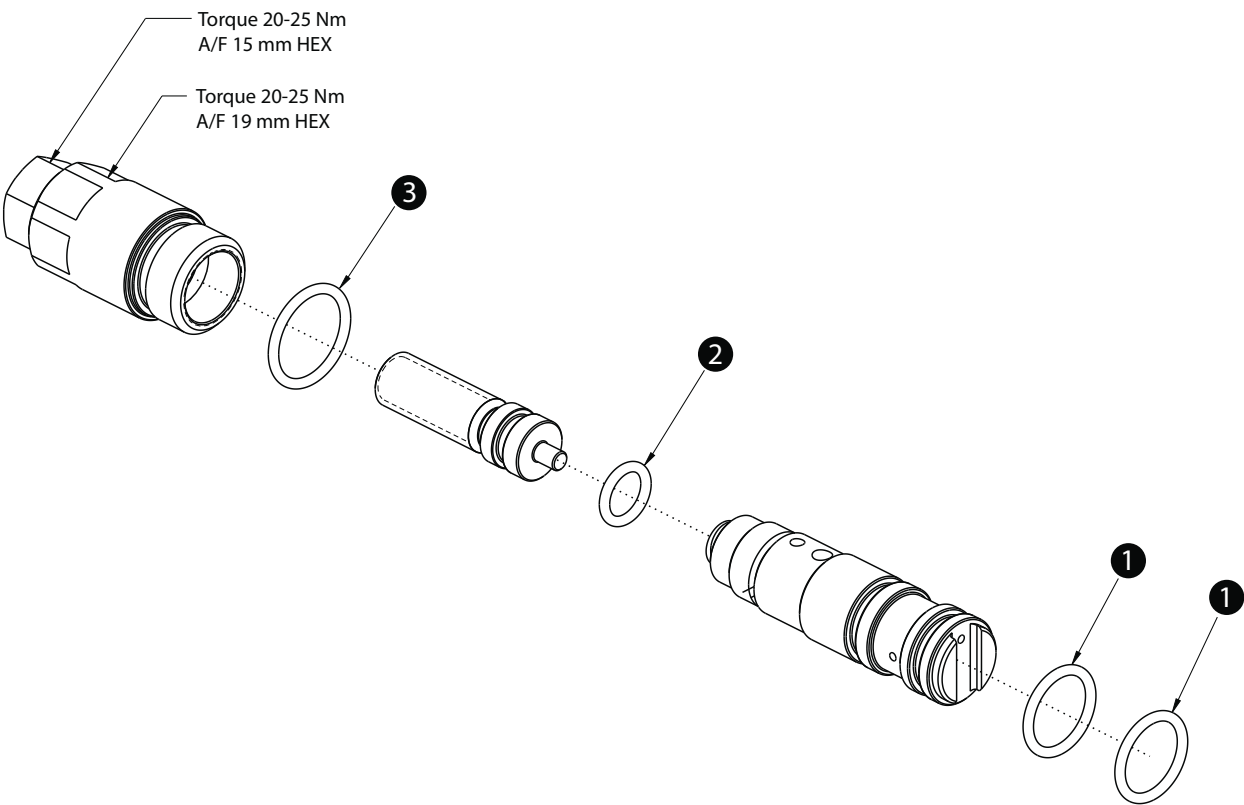
Ref #	Danfoss part#	Material/ Size	Durometer	Qty
1	16003-4-90	Nitrile (Buna-N) / -009	90	1
2	6037602-001	Seal Nut M10	-	1

3.0 Work section

3.6.17. Interface seal for hydraulic actuators:



3.6.18. Seal kit for load sensing relief valve (post-comp):



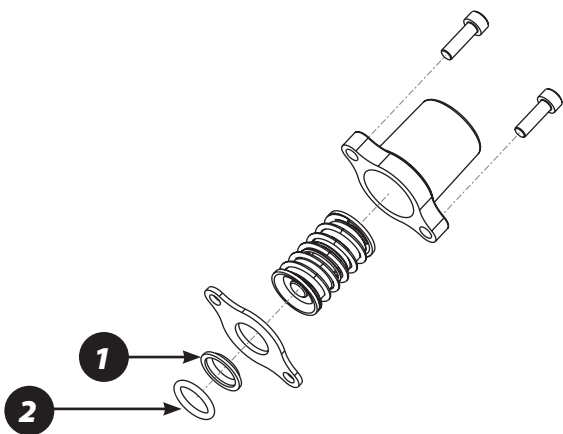
Seal kit number: 9901464-000

Ref #	Danfoss part#	Material / Size	Durometer	Qty
1	12-014	Nitrile (Buna-N)	90	2
2	16003-006	Nitrile (Buna-N)	70	1
3	16015-004	Nitrile (Buna-N)	70	1

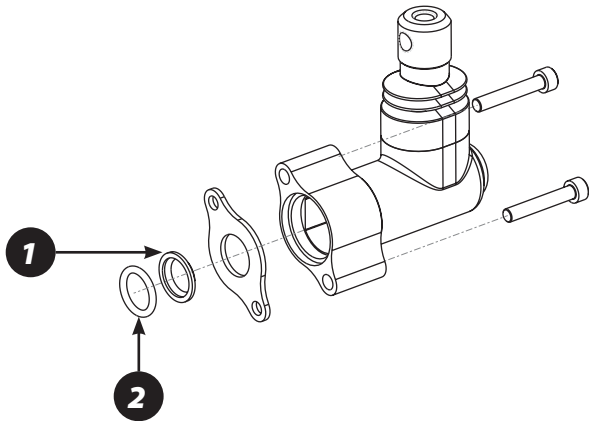
3.0 Work section

3.6.19. Interface seal kit for manual actuations:

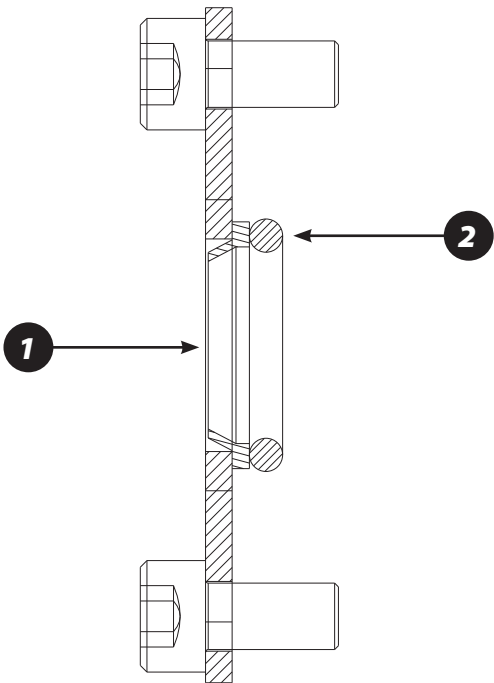
(Spring end)



(Lever end)



Manual actuation without lever box:



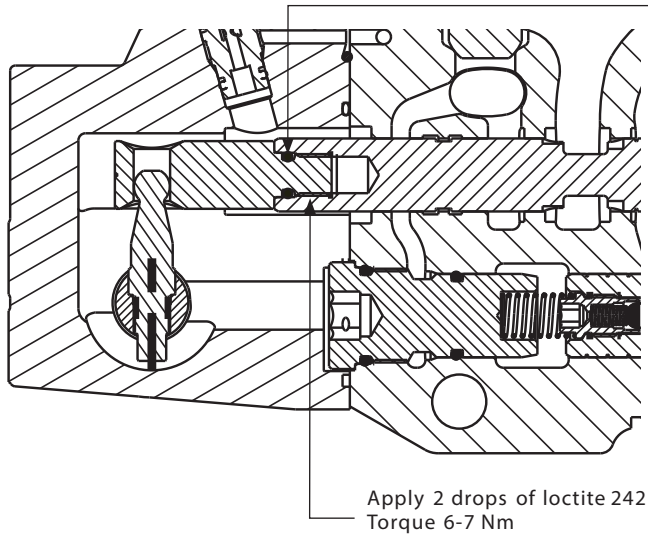
Seal Kit for Manual Actuation With/Without Lever Box
Seal Kit P/N : 9901169-000

Ref #	Danfoss part#	Material / Size	Durometer	Qty
1	6037239-001	Dust Seal	--	1
2	6037168-015	Nitrile 14.00*2.50	70	1

3.0 Work section

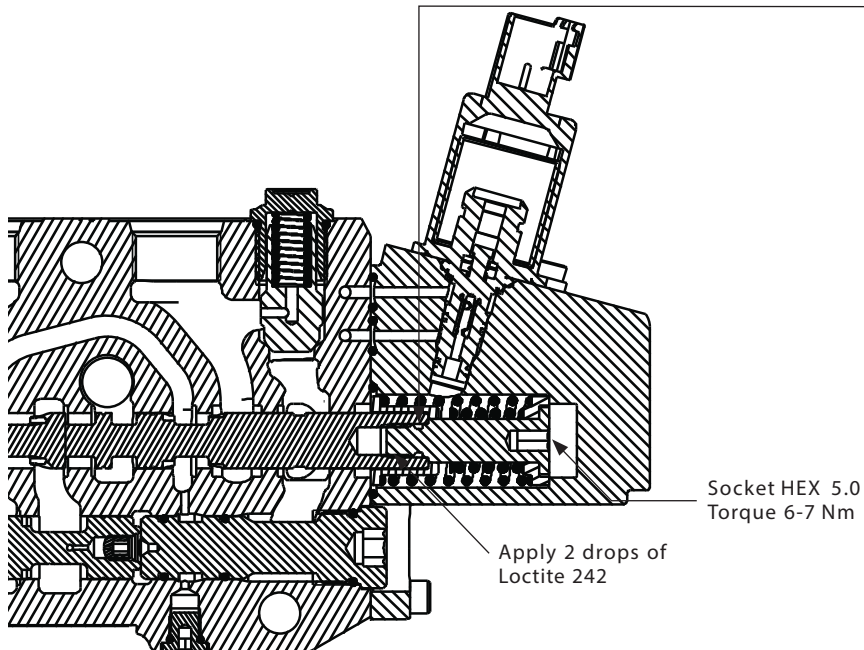
3.7 Spool End Arrangements

3.7.1. Spool with lever override:



O-Ring at this location is applicable only for pre-comp work Sections.
O-ring P/N: 16003-4-90

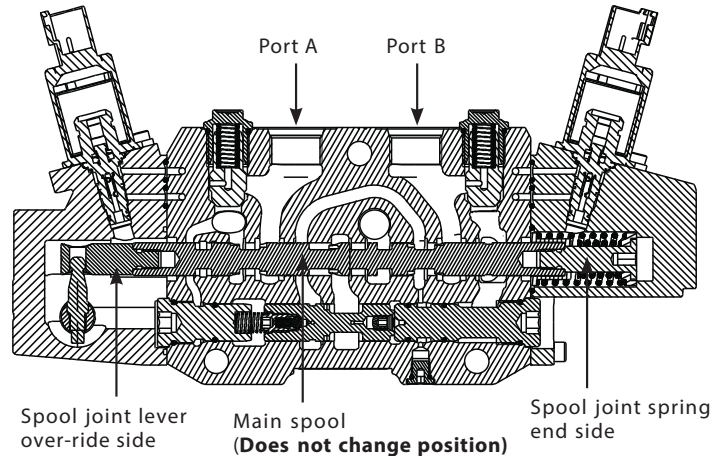
3.7.2. Spool-spring arrangement:



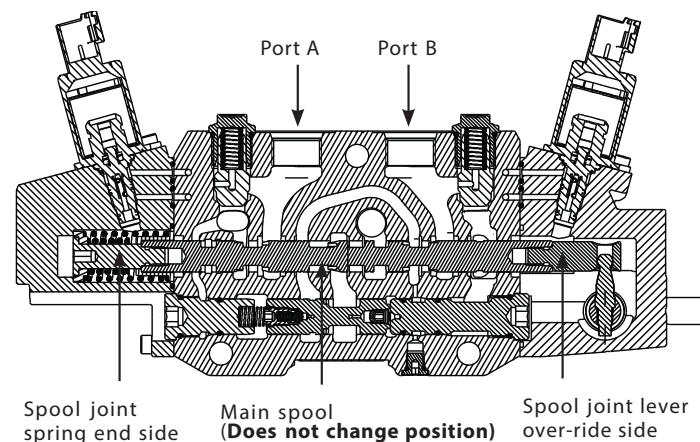
3.0 Work section

Procedure to change the build of a section from LH to RH or RH to LH build

Work section assembly LH build



Work section assembly RH build



To convert LH to RH build, below procedure is to be followed.

- Remove actuator end cap assemblies.
- Remove spool from section body from spring end side. It will be observed that spring sub-assembly will be in assembled condition to the spool.
- Preferably, it is best to mount spool into a collet in order to secure it. Spool can also be placed inside a rubber hose and clamped into a vise to avoid damage to spool diameter.
- Remove spool joints from both ends of the spool. It may take considerable torque to overcome the loctite while removing spool joints.
- Reinstall the spool joint and spool joint with spring assembly onto the opposite ends of the spool.
- Re-install the spool into work section. Please note spool orientation should be same and only spool joint orientation will be swapped.
- Then reassemble spring cap actuations by installing them on the opposite section ends. Care must be taken to ensure all cap orings are properly installed before attaching the cap to the section housing. Ensure the override pawl engages the spool clevis.
- Similar procedure can be followed to change from RH build to LH build.

3.0 Work section

3.8 Pilot valves:

General data

Installation position:	Any
Weight:	175g
Protection class	DIN 40050-9; IP6k 6/IPX9K
Electrical connection:	Deutsch connector DT04-2P
Min supply voltage:	12VDC/24VDC
Supply pressure:	35 ±2 BAR
Max supply pressure:	50 BAR
Standards cited:	ISO: 4406 DIN EN 60068 DIN EN 51524 DIN 40050-9 DIN 50021-SS
Usage of dropped down valves:	No warranty of valve function can be given if dropped down valves are mounted
Varnishing of connector:	No warranty of the connector resistance can be given by varnishing the connector
Screen function:	Specified values refer to clean screens, if more than 50% of the screen is contaminated, a break of the screen can follow.

Electrical data

Voltage	12V DC	24V DC
R20 (Ohm)	4.72 ±5%	20.8 ±5%
I (mA)	600 ±10	300 ±10
I _{max} (mA)	1500 ±10	750 ±10

Flow measurement P-A

Flow (lpm)	Delta P (bar)	Inlet (bar)
4	<12	35±2

Internal leakage - 35 bar supply

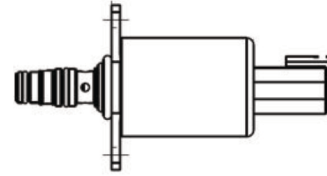
Leakage energized:	A-T	<150 (ml/min)
Leakage de-energized:	P-T	<30 (ml/min)

Temperature operating range

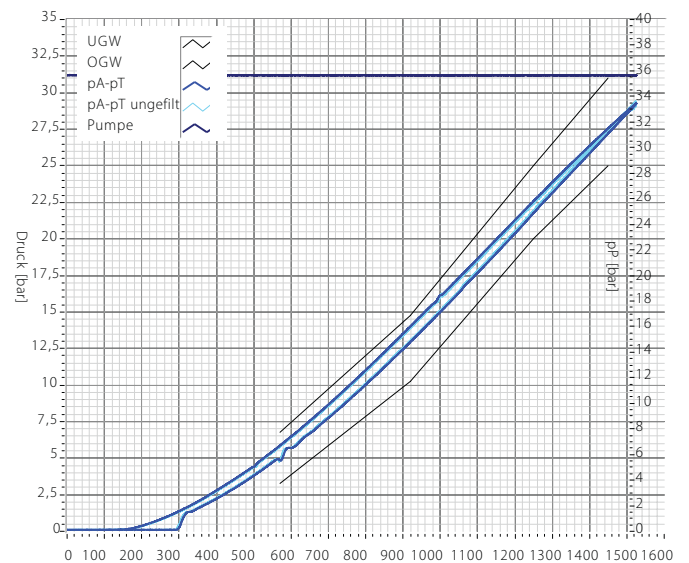
Ambient temperature:	-30°C to +80°C
Fluid temperature:	-30°C to +105°
Ref:	Thomas productspecification LHP-39

Note: Pilot valve part numbers are mentioned on work section assembly part list (Section 5.2)

Typical performance

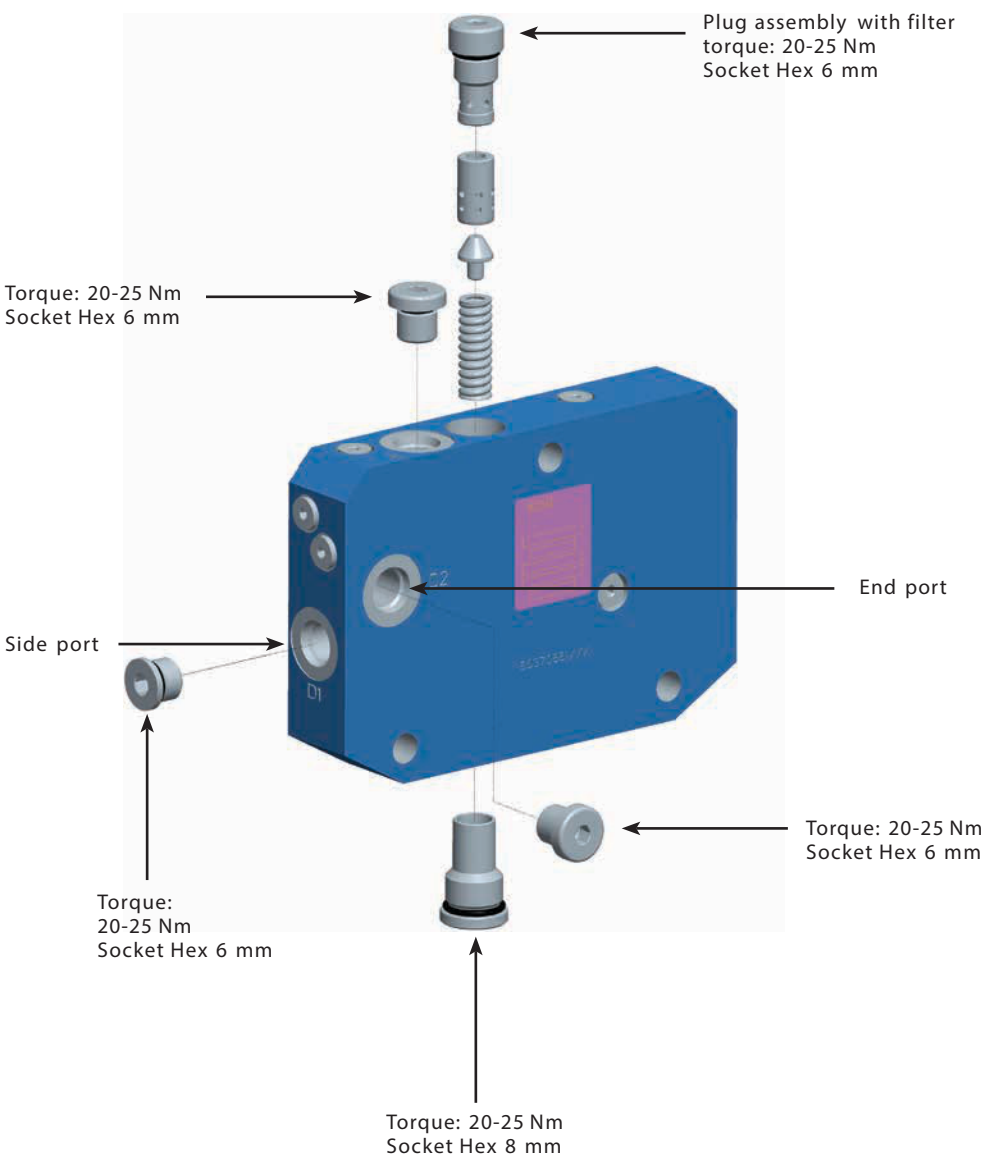


P-I: Characteristic curve (12V)



4.0 End covers

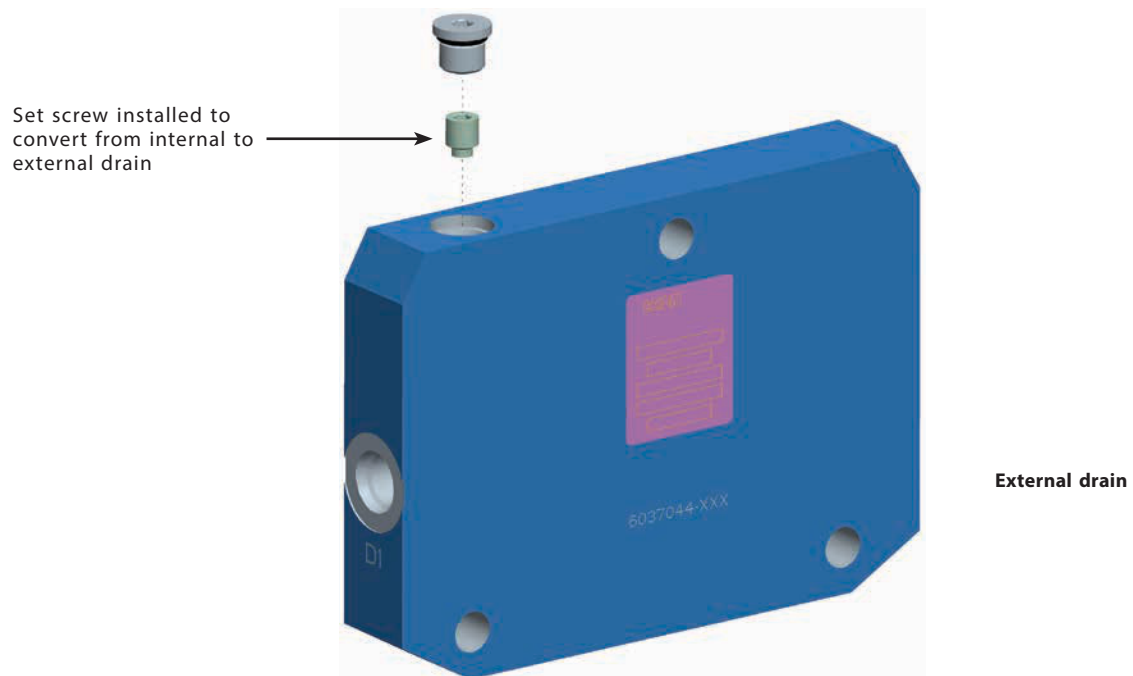
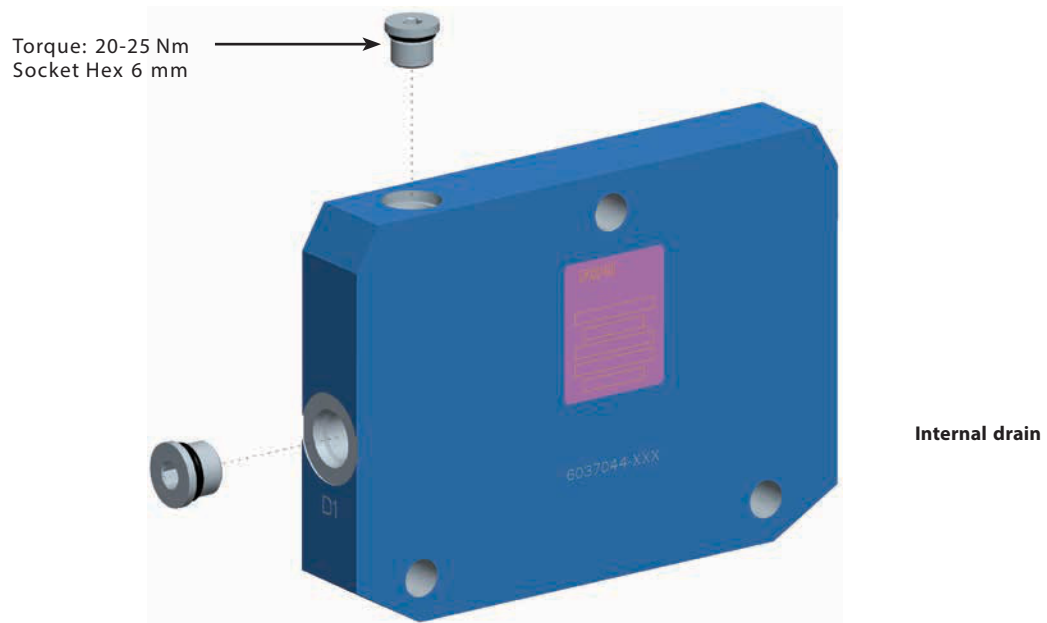
4.1 EH End plate assembly:



Note: Refer Section 5.3.1 For coversion between end port to side port option

4.0 End covers

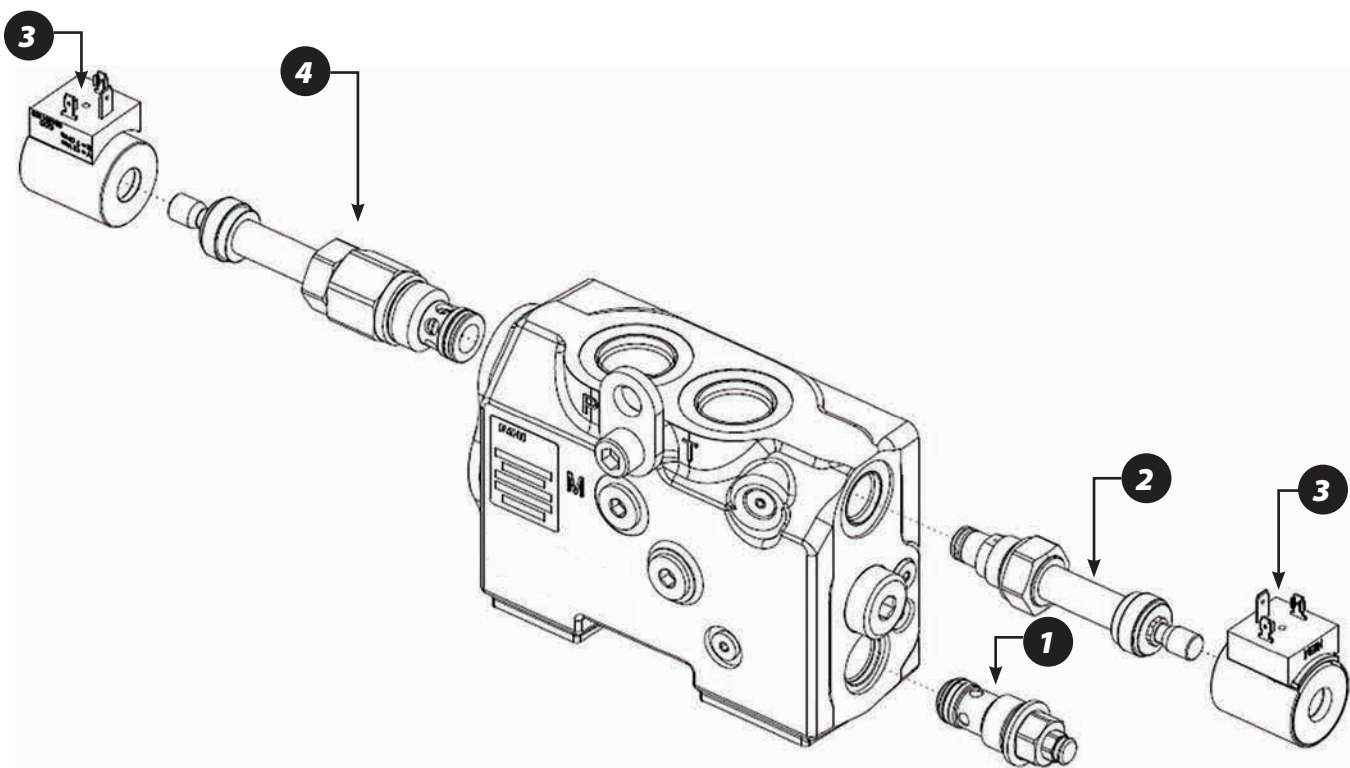
4.2 Hyd End plate assembly: Internal and external drain port option



Note: Refer section 5.3.2 for conversion between internal and external drain option.

5.0 Part list

5.1 Inlet assembly:

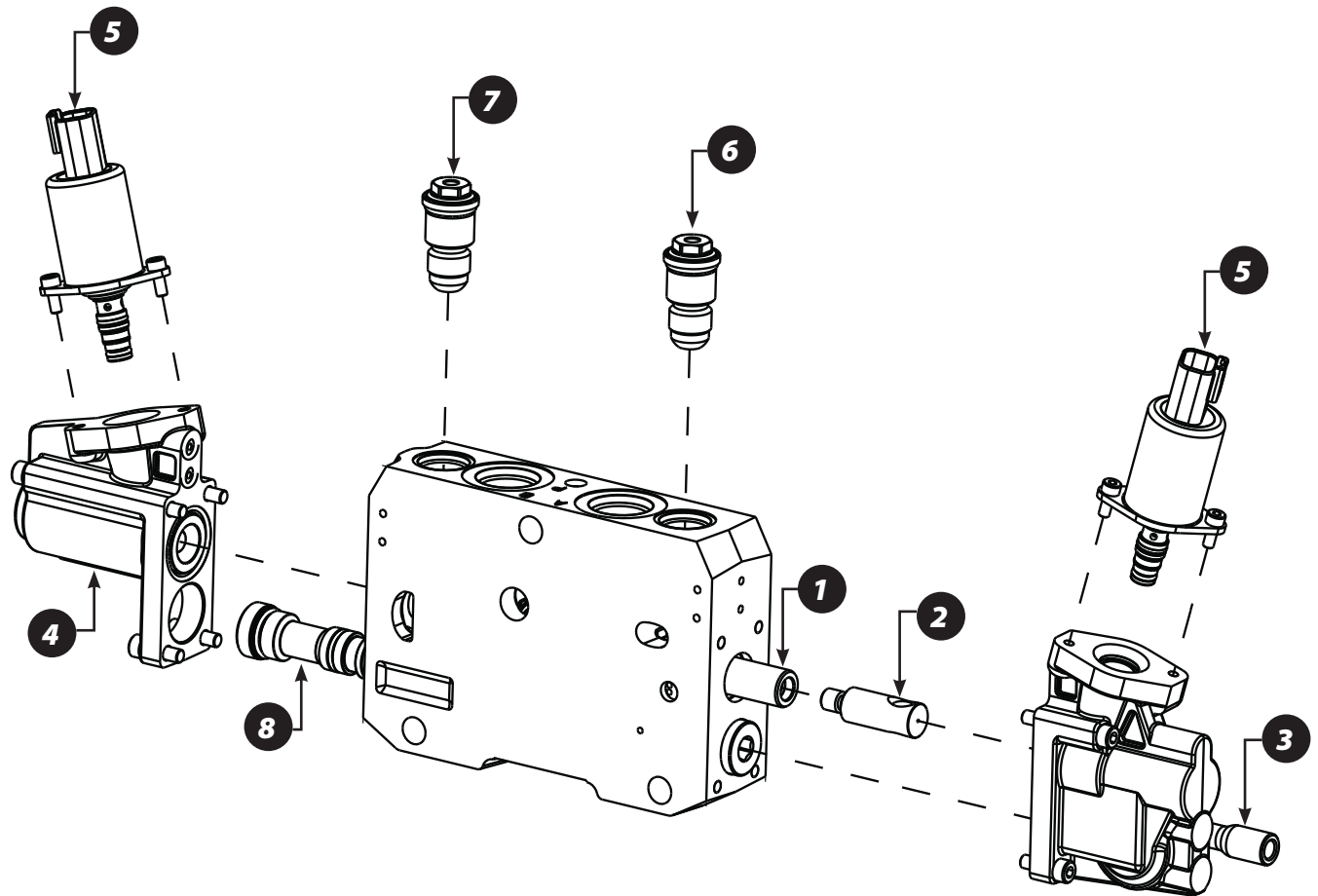


Ref #	Description	Eaton P/N	Qty	Note
1	LS pressure relief valve	6037161-001*	1	Setting range: 50-250 bar
		6037161-002*	1	Setting range: 255-350 bar
	LS relief plug	6037291-001	1	
2	LS plug at LS Dumpvalve	6036884-001	1	
	LS electric dumpvalve	6037163-001	1	For coil order per ref #3
3	Coil kit	6039324-001	1	DIN 43650 ISO 4400 - 12 Vdc
		6039324-002	1	DIN 43650 ISO 4400 - 24 Vdc
		6039324-003	1	DEUTSCH DT 4 - 12 Vdc
		6039324-004	1	DEUTSCH DT 4 - 24 Vdc
		6039324-005	1	AMP JUNIOR - 12 Vdc
		6039324-006	1	AMP JUNIOR - 24 Vdc
4	Full flow pilot operated pressure relief valve	RV5-10-1-0-50/++	1	
	Full flow relief plug assembly	34600-302	1	
	Full flow elec dumpvalve	6036882-001	1	For Coil Order Per Ref #3

Note: 1) Cannot have full flow relief valve and full flow dumpvalve in the same inlet
2) Full flow relief valve and full flow dumpcavities are different. These are not interchangeable.
3) *This valve pressure setting will be as per CLS inlet model code

5.0 Part list

5.2 Work section assembly:



5.2.1. Work section assembly- post comp.

Ref #	Description	Danfoss P/N	Qty	Note
1	D- Double acting (4 way) cylinder	6036979-001	1	Spool 5 L/Min
		6036981-001	1	Spool 10 L/Min
		6036977-001	1	Spool 15 L/Min
		6036982-001	1	Spool 25 L/Min
		6036976-001	1	Spool 35 L/Min
		6039964-001	1	Spool 40 L/Min
		6036974-001	1	Spool 50 L/Min
		6036978-001	1	Spool 65 L/Min
		6036975-001	1	Spool 80 L/Min
		6036980-001	1	Spool 100 L/Min
	H- Bi-Directional (4 way) motor, full open to tank in neutral	6036991-001	1	Spool 5 L/Min
		6037261-001	1	Spool 10 L/Min
		6037262-001	1	Spool 15 L/Min
		6036990-001	1	Spool 25 L/Min
		6036986-001	1	Spool 35 L/Min
		6037260-001	1	Spool 50 L/Min
		6036989-001	1	Spool 65 L/Min
		6036983-001	1	Spool 80 L/Min
		6037226-001	1	Spool 100 L/Min

Ref #	Description	Danfoss P/N	Qty	Note
1	F - Double acting (4 way) cylinder with fourth position float	6036985-001	1	Spool 10 L/Min
		6036988-001	1	Spool 35 L/Min
		6036987-001	1	Spool 65 L/Min
		6036984-001	1	Spool 80 L/Min
2	Spool end kit	6038704-001	1	For manual actuation exposed connection
		6038681-001	1	For manual with enclosed lever box
		6037442-001	1	For hydraulic and EH
		6041533-001	1	For manual float enclosed lever
		6042014-001	1	For hydraulic float
		6041968-001	1	For EH float
3	Actuation S/A (with or without lever over-ride side)	6037235-001	1	Manual with enclosed lever box
		6037236-001	1	Manual with exposed spool connection
		6041381-001	1	Manual with enclosed lever box - float
		6037363-001	1	Hydraulic with top ports (BSP-1/4" Port)
		6037363-002		Hydraulic with top ports (SAE-6 Port)
		6037371-001	1	Hydraulic with end ports (BSP-1/4" Port)
		6037371-002		Hydraulic with end ports (SAE-6 Port)
		6037375-001	1	Hydraulic with stroke limiter (BSP-1/4" Port)
		6037375-002		Hydraulic with stroke limiter (SAE-6 Port)
		6037388-001	1	Hydraulic with lever over-ride (BSP-1/4" Port)
		6037388-002		Hydraulic with lever over-ride (SAE-6 Port)
		6041775-001	1	Hydraulic with lever over-ride & Stroke Limiter (BSP-1/4" Port)
		6041775-002		Hydraulic with lever over-ride & Stroke Limiter (SAE-6 Port)
		6041652-001	1	EH with lever over-ride
		6037211-001	1	EH with lever over-ride & stroke limiter
		6041653-001	1	EH without lever over-ride
		6037213-001	1	EH without lever over ride with stroke limiter
		6041657-001	1	EH with lever over-ride & Hyd port option (BSP-1/4" Port)
		6041657-002		EH with lever over-ride & Hyd port option (SAE-6 Port)
		6037215-001	1	EH without lever over-ride & Hyd port option (BSP-1/4" Port)
		6037215-002		EH without lever over-ride & Hyd port option (SAE-6 Port)
4	Actuation S/A (spring side)	6041336-001	1	Manual standard spring
		6037240-001	1	Manual detent in A and B
		6041366-001	1	Manual float detent in 4th position
		6037345-001	1	Manual spool position indicator
		6037364-001	1	Hydraulic with top ports (BSP-1/4" Port)
		6037364-002		Hydraulic with top ports (SAE-6 Port)
		6037372-001	1	Hydraulic with end ports (BSP-1/4" Port)
		6037372-002		Hydraulic with end ports (SAE-6 Port)
		6037376-001	1	Hydraulic with stroke limiter (BSP-1/4" Port)
		6037376-002		Hydraulic with stroke limiter (SAE-6 Port)
		6037409-001	1	Hydraulic with top ports on EH housing (BSP-1/4" Port)
		6037409-002		Hydraulic with top ports on EH housing (SAE-6 Port)
		6041654-001	1	EH Actuation
		6037249-001	1	EH Actuation with stroke limiter
		6037296-001	1	EH Spool position indicator
		6041658-001	1	EH With Hyd port option (BSP-1/4" Port)
		6041658-002		EH with Hyd port option (SAE-6 Port)

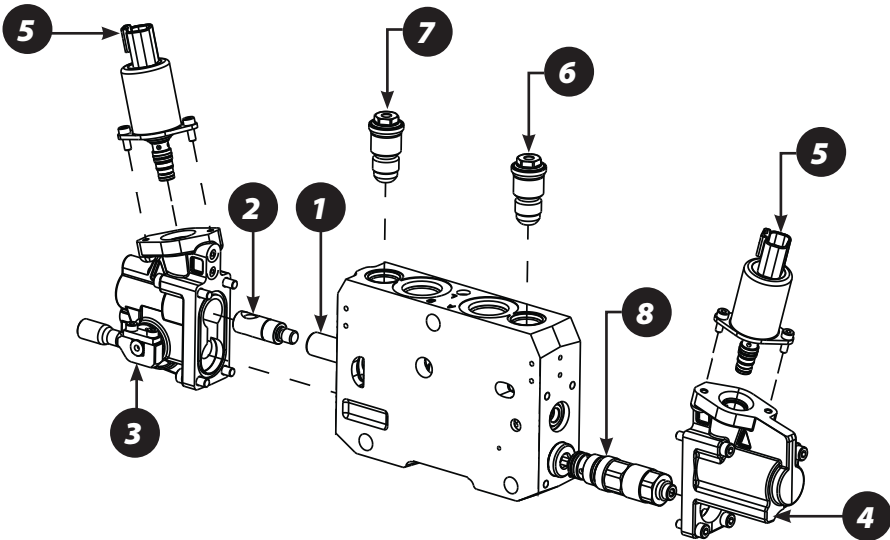
Ref #	Description	Danfoss P/N	Qty	Note
5	Pilot valve (proportional pressure reducing valve)	308AA00654A	2	Pilot valve-12V-deutsch (DT04-2P)
		308AA00656A		Pilot valve-24V-deutsch (DT04-2P)
		308AA00680A		Pilot valve-12V-Amp Jr connector
		308AA00681A		Pilot valve-24V-Amp Jr connector
6	Port-A option function	6037175-001	1	A - Anticavitation
		6037357-XXX*		R - Anticavitation/relief function
		6037664-001		P- Plugged - work port relief cavities machined and plugged
7	Port-B option function	6037175-001	1	A - Anticavitation
		6037357-XXX*		R - Anticavitation/relief function
		6037664-001**		P - Plugged - Work port relief cavities machined and plugged
8	Sectional Load Sense relief valve	6044364-001**	1	Sectional LSRV: 50-195 Bar
		6044364-002		Sectional LSRV: 200-350 Bar
		6047025-001		Plug Assembly

* Pressure Setting To Be Mentioned At XXX Between 040-350 Bar In 10 Bar Increments

** While Ordering, Please Mention Exact Pressure Setting Requirement

5.0 Part list

5.2.2 Work section assembly - pre comp.



Ref #	Description	Danfoss P/N	Qty	Note
1	D- Double acting (4 way) cylinder	6042073-001	1	Spool 10 L/Min
		6037055-001	1	Spool 15 L/Min
		6037056-001	1	Spool 25 L/Min
		6037057-001	1	Spool 40 L/Min
		6037058-001	1	Spool 65 L/Min
		6042074-001**	1	Spool 80 L/Min
		6042075-001***	1	Spool 100 L/Min
	H- Bi-Directional (4 way) motor, full open to tank in neutral	6043628-001	1	Spool 10 L/Min
		6037062-001	1	Spool 15 L/Min
		6037061-001	1	Spool 25 L/Min
		6037060-001	1	Spool 40 L/Min
		6037059-001	1	Spool 65 L/Min
		6045206-001**	1	Spool 80 L/Min
		6045152-001***	1	Spool 100 L/Min
	2 Spool end kit	6038708-001	1	For hydraulic and EH actuation
		6038706-001	1	For manual with enclosed lever
		6038707-001	1	For manual with exposed spool

Ref #	Description	Danfoss P/N	Qty	Note
3	Actuation S/A (with or without lever over-ride side)	6037235-001	1	Manual with enclosed lever box
		6037236-001	1	Manual with exposed spool connection
		6037363-001	1	Hydraulic with top ports (BSP-1/4" Port)
		6037363-002		Hydraulic with top ports (SAE-6 Port)
		6037371-001	1	Hydraulic with end ports (BSP-1/4" Port)
		6037371-002		Hydraulic with end ports (SAE-6 Port)
		6037375-001	1	Hydraulic with stroke limiter (BSP-1/4" Port)
		6037375-002		Hydraulic with stroke limiter (SAE-6 Port)
		6037388-001	1	Hydraulic with lever over-ride (BSP-1/4" Port)
		6037388-002		Hydraulic with lever over-ride (SAE-6 Port)
		6041775-001	1	Hydraulic with lever over-ride & stroke limiter (BSP-1/4" Port)
		6041775-002		Hydraulic with lever over-ride & stroke limiter (SAE-6 Port)
		6041652-001	1	EH With lever over-ride
		6037211-001	1	EH With lever over-ride & stroke limiter
		6041653-001	1	EH Without lever over-ride
		6037213-001		EH without lever over ride with stroke limiter
		6041657-001	1	EH with lever over-ride & Hyd port option (BSP-1/4" Port)
		6041657-002		EH with lever over-ride & Hyd port option (SAE-6 Port)
		6037215-001	1	EH without lever over-ride & Hyd port option (BSP-1/4" Port)
		6037215-002		EH without lever over-ride & Hyd port option (SAE-6 Port)
4	Actuation S/A (spring side)	6037218-001	1	Manual standard spring
		6037385-001	1	Hydraulic with top ports (BSP-1/4" Port)
		6037385-002		Hydraulic with top ports (SAE-6 Port)
		6037391-001	1	Hydraulic with end ports (BSP-1/4" Port)
		6037391-002		Hydraulic with end ports (SAE-6 Port)
		6037392-001	1	Hydraulic with stroke limiter (BSP-1/4" Port)
		6037392-002		Hydraulic with stroke limiter (SAE-6 Port)
		6037305-001	1	Hydraulic with top ports on EH housing (BSP-1/4" Port)
		6037305-002		Hydraulic with top ports on EH housing (SAE-6 Port)
		6041655-001	1	EH Actuation
		6037294-001	1	EH Actuation with stroke limiter
		6037295-001	1	EH Spool position indicator
		6041659-001	1	EH With Hyd port option (BSP-1/4" Port)
		6041659-002		EH With Hyd port option (SAE-6 Port)
5	Pilot valve (proportional pressure reducing valve)	308AA00654A	2	Pilot Valve-12V-DEUTSCH (DT04-2P)
		308AA00656A		Pilot Valve-24V-DEUTSCH (DT04-2P)
		308AA00680A		Pilot Valve-12V-Amp Jr Connector
		308AA00681A		Pilot Valve-24V-Amp Jr Connector
6	Port-A option function	6037175-001	1	A- Anticavitation
		6037357-XXX*		R-Anticavitation/relief function
		6037664-001		P- Plugged- work port relief cavities machined and plugged
7	Port-B option function	6037175-001	1	A- Anticavitation
		6037357-XXX*		R-Anticavitation/relief function
		6037664-001		P- Plugged- work port relief cavities machined and plugged
8	Sectional Load Sense Relief Valve	6039303-001	1	Sectional LS RV, 50-170 Bar
		6039303-002		Sectional LS RV, 175-350 Bar
	Sectional Load Sense Plug	6038732-001		Plug assembly
	Sectional remote load sense relief valve	6041258-001		Remote load sense relief valve (BSP)
		6041258-002		Remote load sense relief valve (SAE)

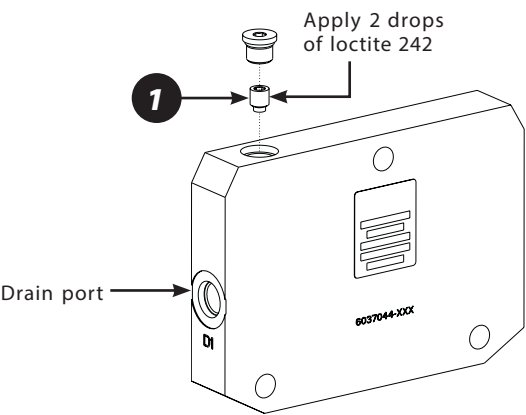
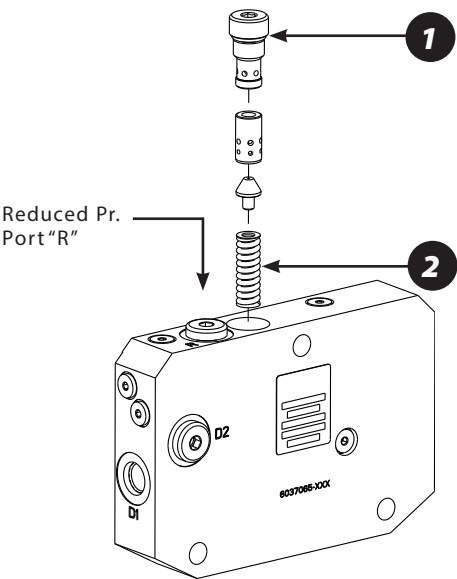
* Pressure setting to be mentioned at XXX between 040-350 Bar in 10 Bar increments

**Requires special section compensator spring

**Requires special section compensator spring (need special inlet with 17 bar margin spring when used with open center inlet)

5.0 Part list

5.3 End plate assembly:



5.3.1 EH End plate assembly

Ref #	Description	Danfoss P/N	Qty	Notes
1	Plug S/A with filter screen	6037466-001	1	
2	Compression spring	6036899-001	1	-

Note: 1) Sidedrain port option shown. To convert to end drain port option exchange plugs at ports "D1" and "D2" as required.
2) External reduced pressure port "R" is available as shown. Currently shown it plugged with standard SAE-6 or 1/4" BSP plug as per model code selection.

5.3.2 Hydraulic / Manual end plate assembly

Ref #	Description	Danfoss P/N	Qty	Notes
1	Set screw	16139-506	1	

Note: External drain port option shown. To convert to internal drain, item #1 can be omitted and drain port can be plugged with standard SAE-6 Or 1/4" BSP plug as per model code selection .

6.0 Service Kit

6.1 CLS Load Sense Sectional Mobile Valve

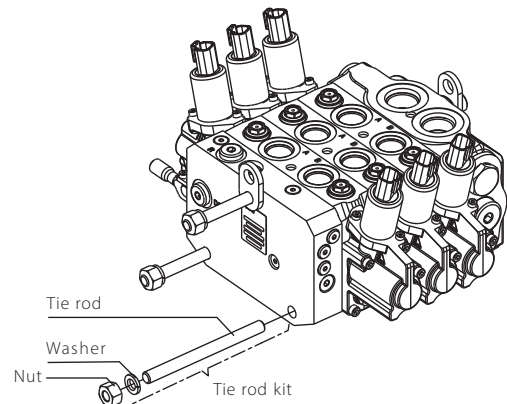
Tie Rod Kits

Tie rod kits are required to complete a valve bank assembly. Tie rod length depends on the number of sections in the bank. Each tie rod kit includes three (3) tie Rods, three (3) nuts and three (3) washers.

Tie rod kits for CLS100 bank assembly

Tie Rod Kit	Desc.	Tie Rod Kit	Length (mm)
CLS100/1	1 Sect.	6042571-001	102
CLS100/2	2 Sect.	6042571-002	140
CLS100/3	3 Sect.	6042571-003	178
CLS100/4	4 Sect.	6042571-004	217
CLS100/5	5 Sect.	6042571-005	255
CLS100/6	6 Sect.	6042571-006	293
CLS100/7	7 Sect.	6042571-007	331
CLS100/8	8 Sect.	6042571-008	370
CLS100/9	9 Sect.	6042571-009	408
CLS100/10	10 Sect.	6042571-010	445

Tightening : 40 Nm



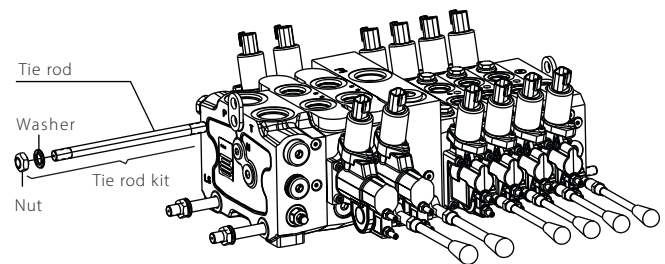
Tie rod kits for CLS180 sections for CLS180 to CLS100 transition plate part #6045191-001

Tie Rod Kit	Desc.	Tie Rod Kit	Length (mm)
CLS180/1	1 Sect.	6044401-001	156
CLS180/2	2 Sect.	6044401-002	202
CLS180/3	3 Sect.	6044401-003	249
CLS180/4	4 Sect.	6044401-004	295
CLS180/5	5 Sect.	6044401-005	341
CLS180/6	6 Sect.	6044401-006	387
CLS180/7	7 Sect.	6044401-007	434
CLS180/8	8 Sect.	6044401-008	480
CLS180/9	9 Sect.	6044401-009	526

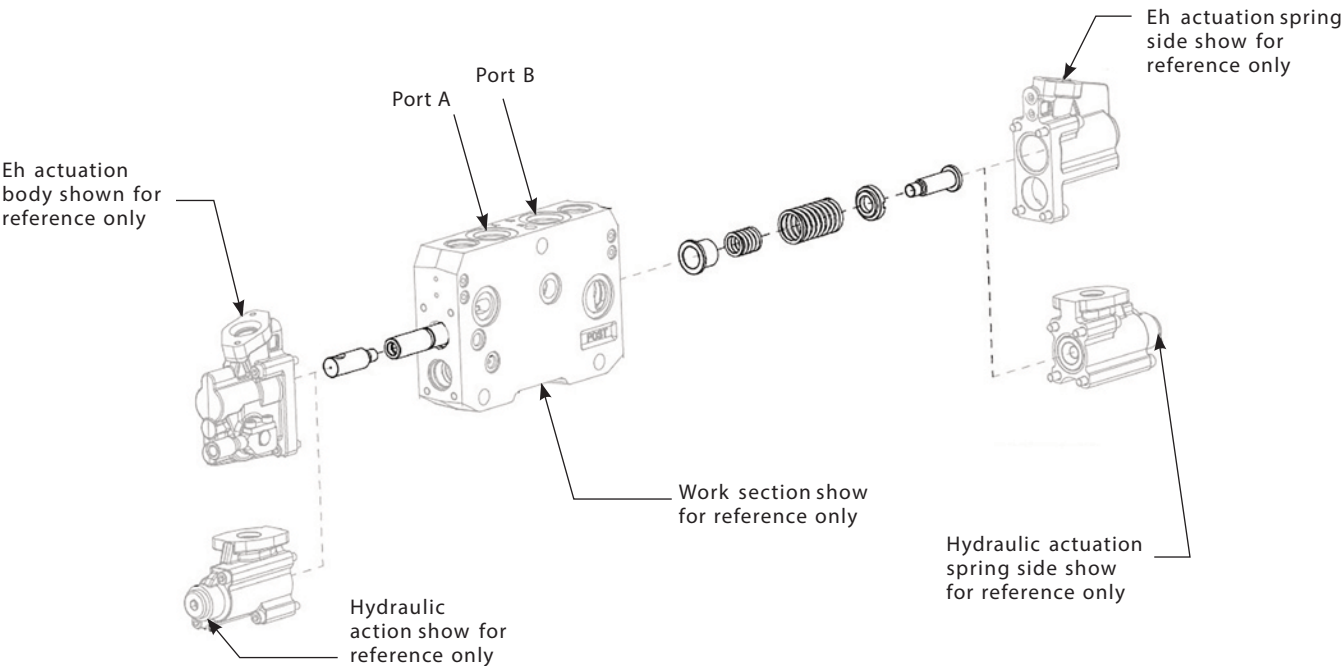
Tightening Torque: 70 Nm

Note:

This kit includes 3 tie rods, 3 nuts, 3 washers and used on CLS180 side interface.



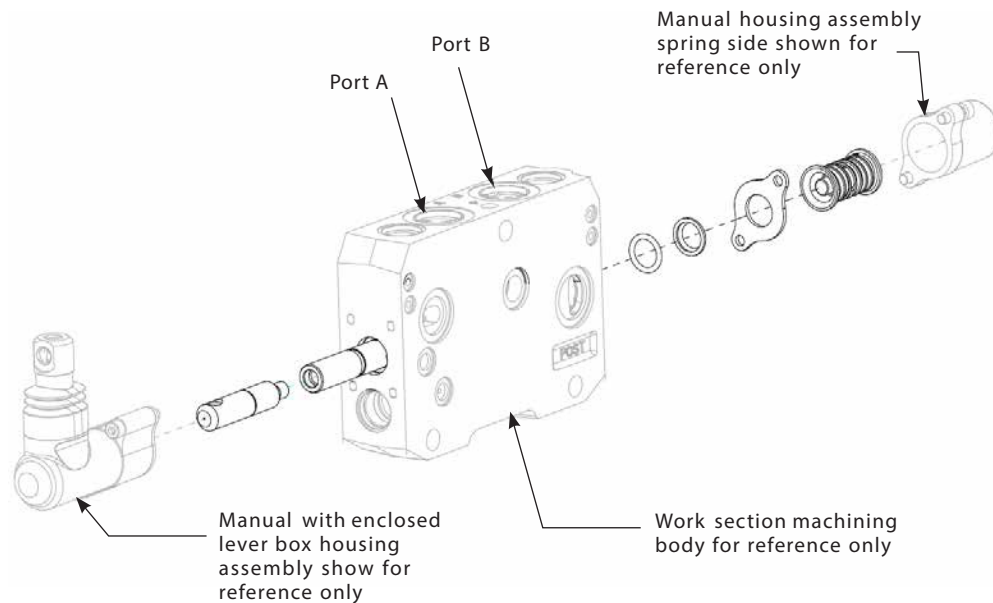
6.2 Spool kit, eh actuation & hydraulic actuation (post-compensated)



Spool kit, eh actuation & hydraulic actuation part number

9901348-001	SPOOL KIT EH/Hydraulic, D SPOOL - 5L(Post)
9901348-002	SPOOL KIT EH/Hydraulic, D SPOOL - 10L(Post)
9901348-003	SPOOL KIT EH/Hydraulic, D SPOOL - 15L(Post)
9901348-004	SPOOL KIT EH/Hydraulic, D SPOOL - 25L(Post)
9901348-005	SPOOL KIT EH/Hydraulic, D SPOOL - 35L(Post)
9901348-006	SPOOL KIT EH/Hydraulic, D SPOOL - 40L(Post)
9901348-007	SPOOL KIT EH/Hydraulic, D SPOOL - 50L(Post)
9901348-008	SPOOL KIT EH/Hydraulic, D SPOOL - 65L(Post)
9901348-009	SPOOL KIT EH/Hydraulic, D SPOOL - 80L(Post)
9901348-010	SPOOL KIT EH/Hydraulic, D SPOOL - 100L(Post)
9901348-011	SPOOL KIT EH/Hydraulic, H SPOOL - 5L(Post)
9901348-012	SPOOL KIT EH/Hydraulic, H SPOOL - 10L(Post)
9901348-013	SPOOL KIT EH/Hydraulic, H SPOOL - 15L(Post)
9901348-014	SPOOL KIT EH/Hydraulic, H SPOOL - 25L(Post)
9901348-015	SPOOL KIT EH/Hydraulic, H SPOOL - 35L(Post)
9901348-016	SPOOL KIT EH/Hydraulic, H SPOOL - 50L(Post)
9901348-017	SPOOL KIT EH/Hydraulic, H SPOOL - 65L(Post)
9901348-018	SPOOL KIT EH/Hydraulic, H SPOOL - 80L(Post)
9901348-019	SPOOL KIT EH/Hydraulic, H SPOOL - 100L(Post)

6.3 Spool kit, manual actuation (post compensated)

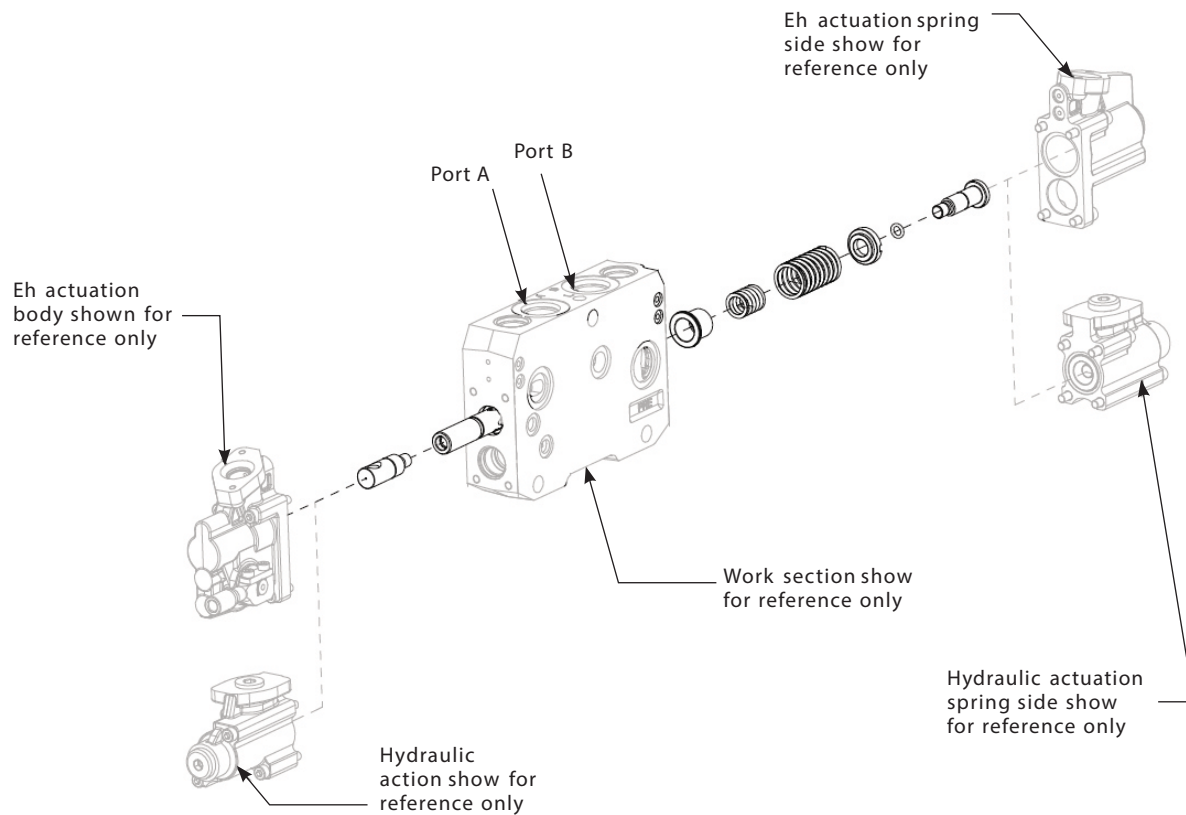


Spool kit, manual actuation

9901350-001	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 5L (POST), MANUAL WITH STANDARD SPRING
9901350-002	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 10L (POST), MANUAL WITH STANDARD SPRING
9901350-003	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 15L (POST), MANUAL WITH STANDARD SPRING
9901350-004	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 25L (POST), MANUAL WITH STANDARD SPRING
9901350-005	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 35L (POST), MANUAL WITH STANDARD SPRING
9901350-006	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 40L (POST), MANUAL WITH STANDARD SPRING
9901350-007	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 50L (POST), MANUAL WITH STANDARD SPRING
9901350-008	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 65L (POST), MANUAL WITH STANDARD SPRING
9901350-009	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 80L (POST), MANUAL WITH STANDARD SPRING
9901350-010	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 100L (POST), MANUAL WITH STANDARD SPRING
9901350-011	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 5L (POST), MANUAL WITH STANDARD SPRING
9901350-012	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 10L (POST), MANUAL WITH STANDARD SPRING
9901350-013	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 15L (POST), MANUAL WITH STANDARD SPRING
9901350-014	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 25L (POST), MANUAL WITH STANDARD SPRING
9901350-015	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 35L (POST), MANUAL WITH STANDARD SPRING
9901350-016	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 50L (POST), MANUAL WITH STANDARD SPRING
9901350-017	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 65L (POST), MANUAL WITH STANDARD SPRING
9901350-018	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 80L (POST), MANUAL WITH STANDARD SPRING
9901350-019	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 100L (POST), MANUAL WITH STANDARD SPRING
9901350-020	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 5L (POST), MANUAL WITH DETENT IN A & B
9901350-021	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 10L (POST), MANUAL WITH DETENT IN A & B
9901350-022	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 15L (POST), MANUAL WITH DETENT IN A & B
9901350-023	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 25L (POST), MANUAL WITH DETENT IN A & B
9901350-024	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 35L (POST), MANUAL WITH DETENT IN A & B
9901350-025	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 40L (POST), MANUAL WITH DETENT IN A & B
9901350-026	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 50L (POST), MANUAL WITH DETENT IN A & B

9901350-027	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 65L(POST), MANUAL WITH DETENT IN A & B
9901350-028	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 80L(POST), MANUAL WITH DETENT IN A & B
9901350-029	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, D SPOOL- 100L(POST), MANUAL WITH DETENT IN A & B
9901350-030	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 5L(POST), MANUAL WITH DETENT IN A & B
9901350-031	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 10L(POST), MANUAL WITH DETENT IN A & B
9901350-032	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 15L(POST), MANUAL WITH DETENT IN A & B
9901350-033	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 25L(POST), MANUAL WITH DETENT IN A & B
9901350-034	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 35L(POST), MANUAL WITH DETENT IN A & B
9901350-035	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 50L(POST), MANUAL WITH DETENT IN A & B
9901350-036	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 65L(POST), MANUAL WITH DETENT IN A & B
9901350-037	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 80L(POST), MANUAL WITH DETENT IN A & B
9901350-038	SPOOLKIT MANUAL WITH ENCLOSED LEVER BOX, H SPOOL- 100L(POST), MANUAL WITH DETENT IN A & B

6.4 Spool kit, eh actuation & hyd actuation (pre-compensated)



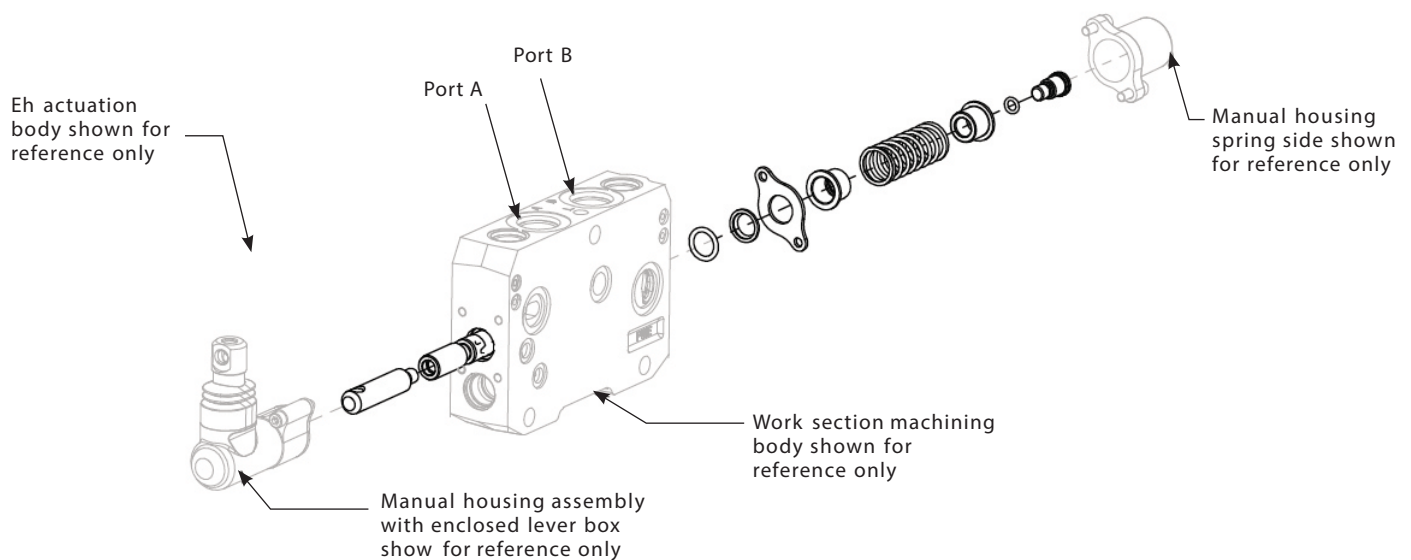
Spool kit, eh & hyd part number

9901351-001	SPOOL KIT EH/Hydraulic, D SPOOL - 15L (Pre)
9901351-002	SPOOL KIT EH/Hydraulic, D SPOOL - 25L (Pre)
9901351-003	SPOOL KIT EH/Hydraulic, D SPOOL - 40L (Pre)
9901351-004	SPOOL KIT EH/Hydraulic, D SPOOL - 65L (Pre)

9901351-005	SPOOL KIT EH/Hydraulic, H SPOOL - 15L (Pre)
9901351-006	SPOOL KIT EH/Hydraulic, H SPOOL - 25L (Pre)
9901351-007	SPOOL KIT EH/Hydraulic, H SPOOL - 40L (Pre)
9901351-008	SPOOL KIT EH/Hydraulic, H SPOOL - 65L (Pre)
9901351-009	SPOOL KIT EH/Hydraulic, D SPOOL - 10L (Pre)
9901351-010*	SPOOL KIT EH/Hydraulic, D SPOOL - 80L (Pre)
9901351-011*	SPOOL KIT EH/Hydraulic, D SPOOL - 100L (Pre)
9901351-012	SPOOL KIT EH/Hydraulic, H SPOOL - 10L (Pre)
9901351-013*	SPOOL KIT EH/Hydraulic, H SPOOL - 100L (Pre)
9901351-014*	SPOOL KIT EH/Hydraulic, H SPOOL - 80L (Pre)

80L and 100L spools requires special section compensatorsprings. Care should be Taken if being replaced with spools in the section rated below 80 LPM. 100 LPM spools require 17 bar inlet margin pressure. For open Center inlet 100lpm spool needs Special inlet compensatorspring with 17 bar margin.

6.5 Spool kit, manual actuation (pre compensated)



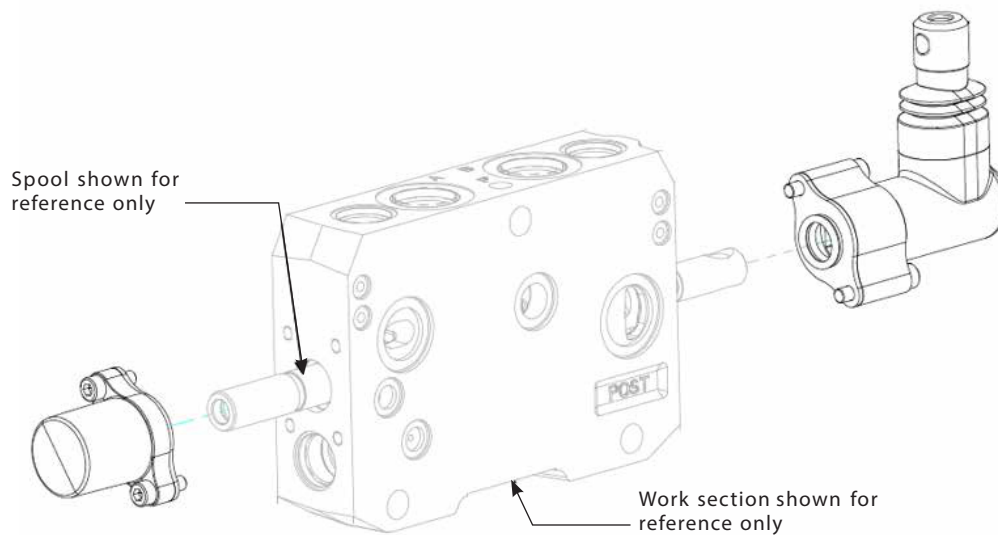
Spool kit, manual actuation part number

9901352-001	SPOOL KIT- MANUAL WITH ENCLOSED LEVER BOX, D SPOOL - 15L (Pre)
9901352-002	SPOOL KIT- MANUAL WITH ENCLOSED LEVER BOX, D SPOOL - 25L (Pre)
9901352-003	SPOOL KIT- MANUAL WITH ENCLOSED LEVER BOX, D SPOOL - 40L (Pre)
9901352-004	SPOOL KIT- MANUAL WITH ENCLOSED LEVER BOX, D SPOOL - 65L (Pre)
9901352-005	SPOOL KIT- MANUAL WITH ENCLOSED LEVER BOX, H SPOOL - 15L (Pre)
9901352-006	SPOOL KIT- MANUAL WITH ENCLOSED LEVER BOX, H SPOOL - 25L (Pre)
9901352-007	SPOOL KIT- MANUAL WITH ENCLOSED LEVER BOX, H SPOOL - 40L (Pre)
9901352-008	SPOOL KIT- MANUAL WITH ENCLOSED LEVER BOX, H SPOOL - 65L (Pre)
9901352-009	SPOOL KIT- MANUAL WITH EXPOSED SPOOL CONNECTION, D SPOOL - 15L (Pre)
9901352-010	SPOOL KIT- MANUAL WITH EXPOSED SPOOL CONNECTION, D SPOOL - 25L (Pre)

9901352-011	SPOOL KIT- MANUAL WITH EXPOSED SPOOL CONNECTION, D SPOOL - 40L (Pre)
9901352-012	SPOOL KIT- MANUAL WITH EXPOSED SPOOL CONNECTION, D SPOOL - 65L (Pre)
9901352-013	SPOOL KIT- MANUAL WITH EXPOSED SPOOL CONNECTION, H SPOOL - 15L (Pre)
9901352-014	SPOOL KIT- MANUAL WITH EXPOSED SPOOL CONNECTION, H SPOOL - 25L (Pre)
9901352-015	SPOOL KIT- MANUAL WITH EXPOSED SPOOL CONNECTION, H SPOOL - 40L (Pre)
9901352-016	SPOOL KIT- MANUAL WITH EXPOSED SPOOL CONNECTION, H SPOOL - 65L (Pre)
9901352-017	SPOOL KIT -MANUAL WITH ENCLOSED LEVER BOX, D SPOOL - 10L(Pre)
9901352-018*	SPOOL KIT-MANUAL WITH ENCLOSED LEVER BOX, D SPOOL - 80L(Pre)
9901352-019*	SPOOL KIT-MANUAL WITH ENCLOSED LEVER BOX, D SPOOL -100L (Pre)
9901352-020	SPOOL KIT-MANUAL WITH ENCLOSED LEVER BOX, H SPOOL -10L (Pre)
9901352-021*	SPOOL KIT-MANUAL WITH ENCLOSED LEVER BOX , H SPOOL-80L (Pre)
9901352-022*	SPOOL KIT-MANUAL WITH ENCLOSED LEVER BOX , H SPOOL -100L (Pre)
9901352-023	SPOOL KIT-MANUAL WITH EXPOSED SPOOL CONNECTION, D SPOOL - 10L(Pre)
9901352-024*	SPOOL KIT-MANUAL WITH EXPOSED SPOOL CONNECTION, D SPOOL - 80L(Pre)
9901352-025*	SPOOL KIT-MANUAL WITH EXPOSED SPOOL CONNECTION, D SPOOL - 100L(Pre)
9901352-026	SPOOL KIT-MANUAL WITH EXPOSED SPOOL CONNECTION, H SPOOL - 10L(Pre)
9901352-027*	SPOOL KIT-MANUAL WITH EXPOSED SPOOL CONNECTION, H SPOOL - 80L(Pre)
9901352-028*	SPOOL KIT-MANUAL WITH EXPOSED SPOOL CONNECTION, H SPOOL - 100L(Pre)

80L and 100L spools requires special section compensatorsprings. Care should be Taken if being replaced with spools in the section rated below 80 LPM. 100 LPM spools require 17 bar inlet margin pressure. For open Center inlet 100lpm spool needs Special inlet compensatorspring with 17 bar margin.

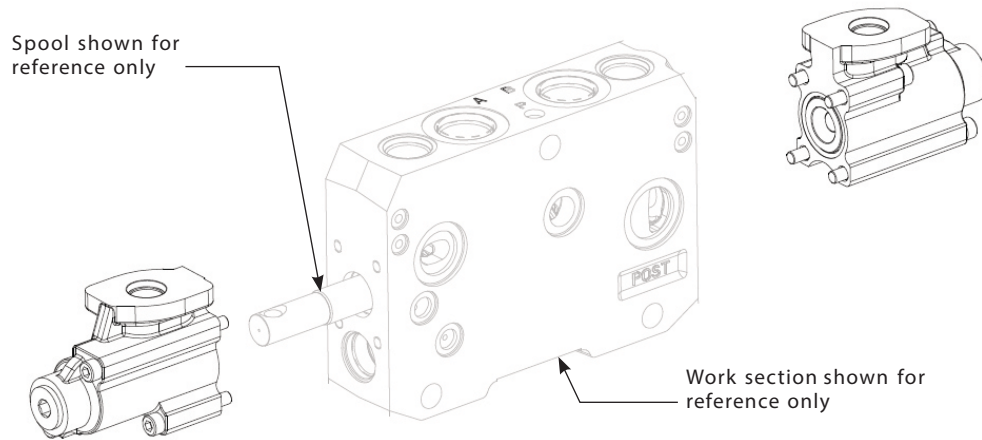
6.6 Service kit for manual actuation



Manual actuation kit part numbers

9901388-001	Service Kit For Manual Actuation With Enclosed Lever Box And Standard Spring-POST
9901388-002	Service Kit For Manual Actuation With Enclosed Lever Box And Standard Spring-PRE
9901388-003	Service Kit For Manual Actuation With Enclosed Lever Box And Manual Detent In A & B -POST
9901388-004	Service Kit For Manual Actuation With Enclosed Lever Box (Float) And 4th position Detent (Float)- POST

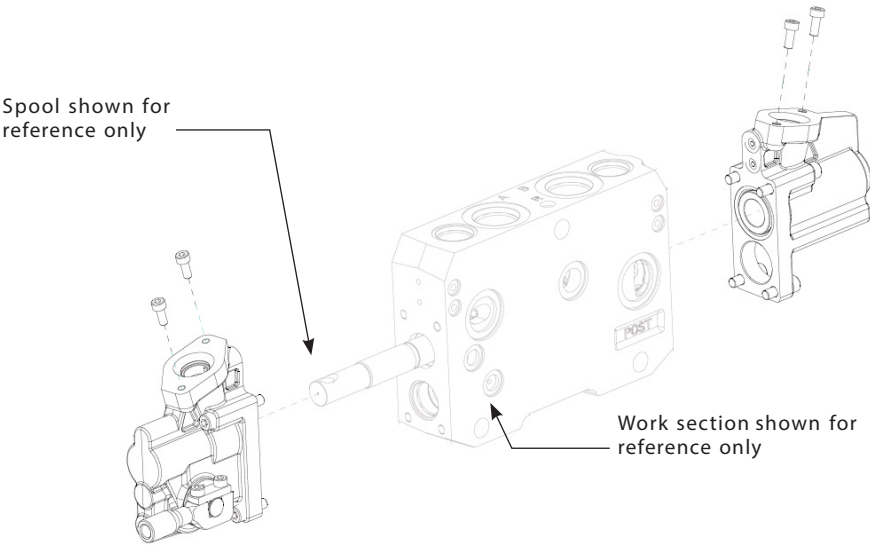
6.7 Service kit for hydraulic actuation



Hydraulic actuation kit part numbers

9901394-001	Service Kit For Hydraulic Actuation With Top Ports- SAE-6 - POST
9901394-002	Service Kit For Hydraulic Actuation With Top Ports- BSP 1/4 - POST
9901394-003	Service Kit For Hydraulic Actuation With Top Ports- SAE-6 - PRE
9901394-004	Service Kit For Hydraulic Actuation With Top Ports- BSP 1/4 - PRE
9901394-005	Service Kit For Hydraulic Actuation With End Ports- SAE-6 - POST
9901394-006	Service Kit For Hydraulic Actuation With End Ports- BSP 1/4 - POST
9901394-007	Service Kit For Hydraulic Actuation With End Ports- SAE-6 - PRE
9901394-008	Service Kit For Hydraulic Actuation With End Ports- BSP 1/4 - PRE
9901394-009	Service Kit Hydraulic Actuation With Lever Override And Top Ports- SAE-6 -POST
9901394-010	Service Kit Hydraulic Actuation With Lever Override And Top Ports- BSP 1/4 - POST
9901394-011	Service Kit Hydraulic Actuation With Lever Override And Top Ports- SAE-6 - PRE
9901394-012	Service Kit Hydraulic Actuation With Lever Override And Top Ports- BSP 1/4 - PRE
9901394-013	Service Kit For Hydraulic Actuation With Lever Override and Stroke Limiter And Top Ports-SAE-6 - POST
9901394-014	Service Kit For Hydraulic Actuation With Lever Override and Stroke Limiter And Top Ports-BSP 1/4 - POST
9901394-015	Service Kit For Hydraulic Actuation With Lever Override and Stroke Limiter And Top Ports-SAE-6 - PRE
9901394-016	Service Kit For Hydraulic Actuation With Lever Override and Stroke Limiter And Top Ports-BSP 1/4 - PRE

6.8 Service kit for electrohydraulic actuation



Service kit for eh actuation part number

9901395-001	Service Kit For EH Actuation With lever over ride - POST
9901395-002	Service Kit For EH Actuation With lever over ride -PRE
9901395-003	Service Kit For EH Actuation With Lever Over Ride & Stroke Limiter -POST
9901395-004	Service Kit For EH Actuation With Lever Over Ride & Stroke Limiter -PRE
9901395-005	Service Kit For EH Actuation Without Lever Over Ride - POST
9901395-006	Service Kit For EH Actuation Without Lever Over Ride - PRE
9901395-007	Service Kit For EH Actuation Without Lever Over Ride & Stroke Limiter - POST
9901395-008	Service Kit For EH Actuation Without Lever Over Ride & Stroke Limiter - PRE
9901395-009	Service Kit For EH Actuation With hydraulic port (BSP) & lever over ride - POST
9901395-010	Service Kit For EH Actuation With hydraulic port (SAE) & lever over ride - POST
9901395-011	Service Kit For EH Actuation With hydraulic port (BSP) & lever over ride - PRE
9901395-012	Service Kit For EH Actuation With hydraulic port (SAE) & lever over ride - PRE

7.0 Trouble shooting

Potential issue	Possible cause (s)	Checkup	Remedy
External leakage	Interface O-ring failures between a. Inlet and work section b. Adjacent work sections c. Work section and end cap d. End cap and work section	Dis-assemble and inspect for O-ring damage or missing	Replace damaged/missing O-rings
	a. Low tie rod tightening torque b. Low end cap mounting screw tightening torque c. Low cartridge valve torques	Check tie rod, end cap clamping and cartridge valve torque	Tighten tie rod, end cap mounting screw and cartridge valve with specified clamping torque
No movement of any attachment when command signal is given (No flow through any of the section)	Inlet compensator spool stuck open due to contamination	a. Measure inlet pressure and LS pressure b. Remove and inspect inlet compensator spool and bore c. Measure oil cleanliness level	a. Clean the spool and bore, if damaged replace the inlet assy b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
	Inlet compensator spring break	a. Measure inlet pressure and LS pressure b. Remove inlet compensator and inspect spring	Replace the spring if found broken
	Inlet relief valve issue (Spring break or spool stuck open)	Measure inlet pressure and LS pressure	Replace inlet relief valve if found faulty.
	Incorrect inlet main relief or inlet LS relief setting	Measure inlet pressure and LS pressure	Adjust the relief setting to required pressure.
	Pressure reducing valve (PRV) spool stuck closed or high leakage between PRV spool and seat (Only for electrohydraulic end cap)	a. Measure reduced pressure b. Remove PRV and inspect reducing valve spool, poppet and bore c. Measure oil cleanliness level	a. Clean reducing valve spool and bore and if damaged replace b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
	Pressure Reducing Valve (PRV) spring break (Only for electrohydraulic end cover)	a. Measure reduced pressure. b. Remove PRV and inspect reducing valve spring	If spring found broken replace the PRV assembly
	Filter in PRV valve getting clogged	a. Measure reduced pressure b. Remove PRV and inspect the filter c. Measure oil cleanliness	a. Replace the plug assembly with filter b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
No movement in a particular attachment when command signal is given (No flow through particular section)	Main spool stuck	a. Measure inlet, work port and load sense pressure. b. Remove and inspect spool and bore. c. Ensure tie rod torque are not high. d. Measure Oil cleanliness level	a. Clean the main spool and bore. If damaged replace the spool and body b. Apply specified tie rod torque. c. Ensure oil cleanliness level of 18/16/14 per ISO 4406
	Main spool mounted backwards	a. Remove main spool and check LS groove location	a. Ensure LS groove on spool is towards 'A' port side
	Section compensator Spool stuck	a. Measure inlet, work port and load sense pressure b. Remove and inspect spool and bore c. Measure Oil cleanliness level	a. Clean the compensator spool and bore. If damaged replace the spool and body b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
	Section compensator orifice clogged due to contamination	a. Measure inlet, work port and load sense pressure b. Remove spool c. Measure Oil cleanliness level	a. Replace the Orifice b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
	No electrical signal to EH Pilot valve (EH actuation).	Verify the pilot valve is receiving electrical signal with proper voltage and current	Ensure proper electrical signal is available to the pilot valves
	Incorrect setting of section LS relief valve	Measure LS pressure and Inlet pressure	Adjust the LS relief valve to required pressure and tighten the lock nut
	Loosened adjusting screw of LS relief valve		Adjust the LS relief valve to required pressure and tighten the lock nut
	EH Pilot valve malfunction (EH actuation)	Replace and test with new pilot valve	Replace EH Pilot valve if found faulty
	Less pilot pressure supply to actuation (Hydraulic actuation)	Measure pilot pressure	Ensure proper pilot pressure signal is supplied to the actuations.

Potential Issue	Possible cause (s)	Checkup	Remedy
Low attachment speed (Low flow)	Inlet compensator break	a. Measure inlet pressure and LS pressure b. Remove inlet compensator and inspect spring	Replace the spring if found broken
	Incorrect inlet main relief or inlet LS relief setting	Measure inlet pressure and LS pressure	Adjust the relief setting to required pressure.
	Incorrect Relief/Anti Cav valve setting	Measure inlet pressure, work port pressure and LS pressure	Replace relief/anti cav valve with correct setting
	Inadequate electrical signal to EH Pilot valve (EH actuation).	Verify the pilot valve is receiving electrical signal with proper voltage and current	Ensure proper electrical signal is available to the pilot valves
	EH Pilot valve malfunction (EH actuation)	Replace and test with new pilot valve	Replace EH pilot valve if found faulty.
	Inadequate pilot pressure supply to actuation (Hydraulic actuation)	Measure pilot pressure	Ensure proper pilot pressure signal is supplied to the actuators.
	In correct stroke limiter setting	Move the stroke limiter completely out and check adjust the stroke limiter to proper setting	the speed
	Pressure Reducing Valve (PRV) spool stuck or high leakage between PRV spool and seat (Only for EH end cover)	a. Measure reduced pressure b. Remove PRV and inspect reducing valve spool, poppet and bore c. Measure oil cleanliness level	a. Clean reducing valve spool and bore and if damaged replace b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
	Filter in PRV valve getting clogged	a. Measure reduced pressure b. Remove PRV and inspect the filter c. Measure oil cleanliness	a. Replace the plug assembly with filter b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
Attachment drops down in neutral condition (No load holding)	Main Spool stuck due to contamination	a. Measure inlet, work port and load sense pressure. b. Remove and inspect spool and bore. c. Measure Oil cleanliness level	a. Clean the main spool and bore. If damaged replace the spool and body b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
	Wrong Main spool assembled, Motor spool instead of cylinder spool	a. Remove the main spool and confirm motor (H) or cylinder spool (D)	a. If wrong spool installed, replace the spool and then tighten the spool ends with specified torque
	Spool wear	a. Remove and inspect spool and bore. b. Measure Oil cleanliness level	a. Replace the spool if damaged b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
	Leakage through Aux Valve	c. Remove the aux valve and inspect the seat of the aux valve a. Measure Oil cleanliness level	a. Replace the aux valve if the seat is damaged b. Ensure oil cleanliness level of 18/16/14 per ISO 4406
	Incorrect Relief/Anti Cav setting	a. Measure inlet pressure, work port pressure and LS pressure	a. Replace relief/anti cav with correct setting

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Danfoss Power Solutions (US) Company
2800 East 13th Street
Ames, IA 50010, USA
Phone: +1 515 239 6000

Danfoss Power Solutions GmbH & Co. OHG
Krokamp 35
D-24539 Neumünster, Germany
Phone: +49 4321 871 0

Danfoss Power Solutions ApS
Nordborgvej 81
DK-6430 Nordborg, Denmark
Phone: +45 7488 2222

Danfoss Power Solutions Trading (Shanghai) Co., Ltd.
Building #22, No. 1000 Jin Hai Rd
Jin Qiao, Pudong New District
Shanghai, China 201206
Phone: +86 21 2080 6201