



Bulletin HY14-2000/US

Distributor Valve Program

Effective: June 1, 2003
Supersedes: DL101 dated 10/00



DVG18

DVA20

DVG20

DVA35

DVG35

DVG80

DVA / DVG Accessories

In-Line Accessories

Hand Pumps

Hydraulic Remote Controls

Pneumatic Remote Controls

Hydraulic Overspeed Control

 **WARNING**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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catalog.p65, dd



Valve Assembly Form

Inlet

Model _____

Main R/V

Yes No

Set at _____ psi
@ _____ gpm

Porting

Note Thread & Size

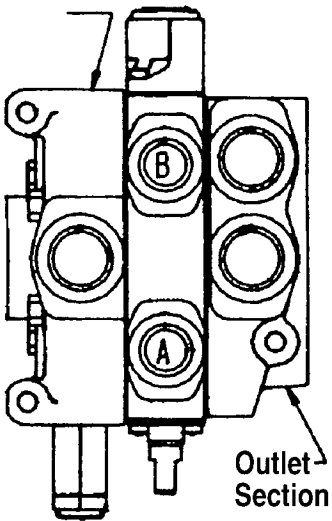
TOP

High Press _____
Low Press _____

SIDE

High Press _____
Low Press _____

Inlet Section



Clevis at Port A
Left Hand

Clevis at Port B
Rt Hand

HANDLES

- None
- Bracket
- Vertical

KA18 Only

- Horizontal Mechanical Joystick
- Left Hand Rt Hand

On Section #s _____

Section Information and Description

Circuit

- Parallel
- Series S.A. Port B
- Tandem D.A. Cylinder

- D.A. Motor
- 4way/4pos Float (DTT)
- Other _____

A & B

Port Size _____ SAE NPT

Spool Actuator

- Spring Return
- 3-Pos Detent
- Hyd Remote Meter
- Hyd Pilot On/Off
- Air Remote
- Solenoid 12 Vdc
- Other _____

Port _____ None A or B

Accessory _____ A/C _____ A _____ B

R/V + A/C _____ psi @ A
Setting _____ psi @ B

R/V _____ psi @ A
Setting _____ psi @ B

Plug _____ A _____ B

Restrict Out _____ A _____ B

Restrict In _____ A _____ B

Restrict Fix _____ A _____ B

D.A. Lock _____ A _____ B

S.A. Lock _____

KA18 ONLY

Split Flow

Mid-Section Inlets

- Comb Flow
- Main R/V
- Main R/V Plug

Port Size SAE NPT

Stacking Order

| | 1 | 2 | 3 | 4 | 5 | 6 |
|-----------------------|---|---|---|---|---|---|
| Parallel | | | | | | |
| Series | | | | | | |
| Tandem | | | | | | |
| S.A. Port B | | | | | | |
| D.A. Cylinder | | | | | | |
| D.A. Motor | | | | | | |
| 4way/4pos Float (DTT) | | | | | | |
| Other | | | | | | |
| Spring Return | | | | | | |
| 3-Pos Detent | | | | | | |
| Hyd Remote Meter | | | | | | |
| Hyd Pilot On/Off | | | | | | |
| Air Remote | | | | | | |
| Solenoid 12 Vdc | | | | | | |
| Other | | | | | | |
| None A or B | | | | | | |
| Accessory A | | | | | | |
| Accessory B | | | | | | |
| R/V + A/C @ A | | | | | | |
| R/V + A/C @ B | | | | | | |
| R/V @ A | | | | | | |
| R/V @ B | | | | | | |
| Plug A | | | | | | |
| Plug B | | | | | | |
| Restrict Out A | | | | | | |
| Restrict Out B | | | | | | |
| Restrict In A | | | | | | |
| Restrict In B | | | | | | |
| Restrict Fix A | | | | | | |
| Restrict Fix B | | | | | | |
| D.A. Lock A | | | | | | |
| D.A. Lock B | | | | | | |
| S.A. Lock | | | | | | |
| Split Flow | | | | | | |
| Comb Flow | | | | | | |
| Main R/V | | | | | | |
| Main R/V Plug | | | | | | |
| SAE | | | | | | |
| NPT | | | | | | |

Outlet

Type

- Tank Ret'n
- Press Beyond

Porting

Note Thread & Size

TOP

High Press _____
Low Press _____

SIDE

High Press _____
Low Press _____

Customer _____ Model No. _____

City _____ State _____ Zip _____ Phone () _____

Customer No. _____

Application _____

Comments _____

Assembly _____

Brief Circuit Descriptions

Series Circuit

Available in DVA20 sections only.

If a machine's work cycle requires simultaneous as well as separate operation of individual hydraulic work functions, a series circuit is right for the job.

As with the other circuits, the oil flows through the open center when all spools are in neutral. There is no parallel passage in standard series sections because they feed directly from the open center passage. If more than one spool is operated, pump flow goes first to the section closest to the inlet. Return flow from the first section is fed back into the open center for use by downstream sections.

Downstream sections can be series, parallel or tandem and will operate in series with the upstream section.

In series circuits, operating pressure is cumulative. Therefore, the sum of the pressures in the circuits can not exceed the circuit or main relief valve setting.

Parallel Circuits

Parallel circuits are the most common on mobile equipment because more than one function can be operated simultaneously and at random. If two or more functions are fully operated at the same time, the one with the lightest load will assert priority because the fluid will take the path of least resistance. However, the operator can divide the flow between functions by metering the spools.

Movement of the spool meters or shuts off the flow of oil thru the open center passage and pressurizes the parallel passage. Oil is then available, at the operator's discretion, to all work ports connected to the parallel passage.

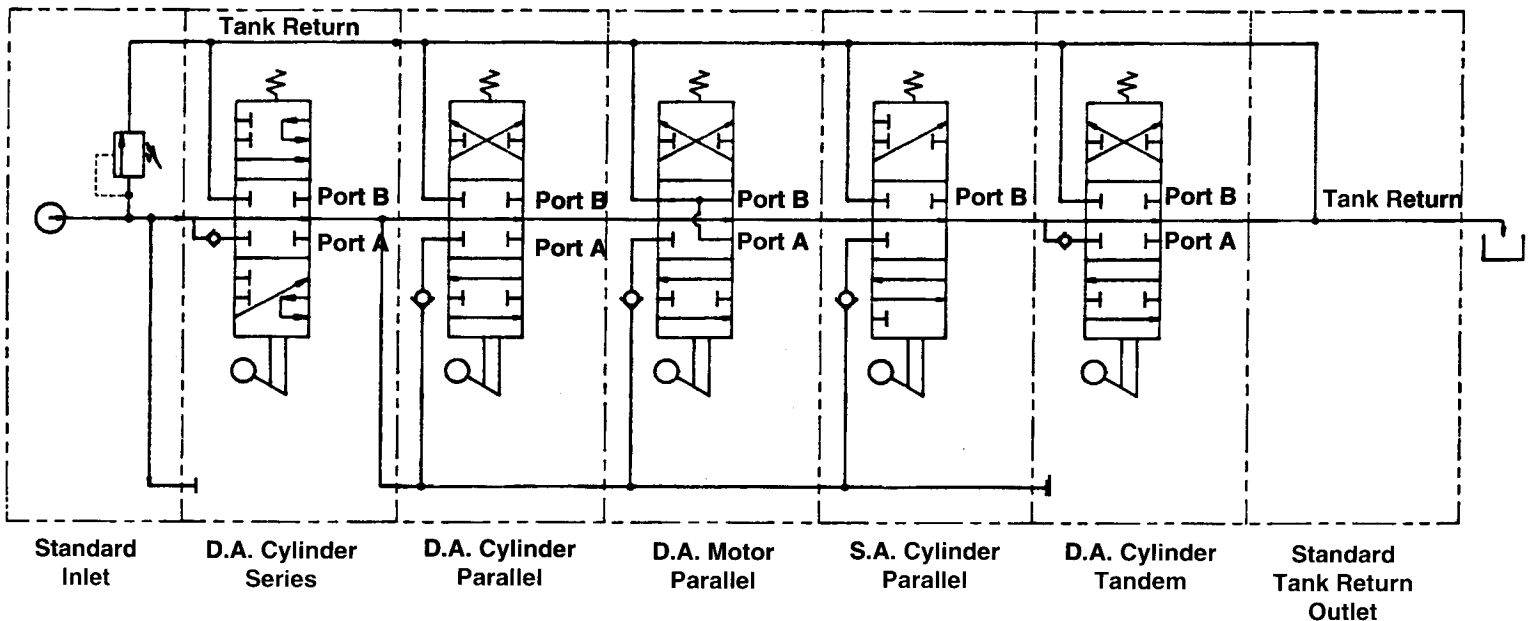
Tandem Circuits

(Not available in the program)

Tandem circuits are sometimes called priority or standard circuits by other manufacturers. Tandem sections feed from the open center passage like series sections but the return flow is directed to the tank return passage and is not available downstream.

If a tandem section is followed by a series or tandem section, operating the tandem section nearest the inlet will assert priority and downstream sections will not function.

Typical Work Section Schematics



Contents

Pages

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| Section B..... | DVA20 • 40 gpm • 2500 psi..... | 8 thru 13 |
| Section C..... | DVG20 • 40 gpm • 3500 psi..... | 15 thru 17 |
| Section D..... | DVA35 • 70 gpm • 2500 psi | 18 thru 23 |
| Section E..... | DVG35 • 70 gpm • 3500 psi..... | 25 thru 27 |
| Section F..... | DVG80 • 120 gpm • 3500 psi..... | 28 thru 30 |
| Section G..... | DVA / DVG Accessories | 32 thru 34 <i>(Relief Valves & Actuator Kits)</i> |
| Section H..... | In-Line Accessories | 35 thru 36 <i>(Selector Valves & In-line Relief Valves)</i> |
| Section I..... | Hand Pumps | 37 |
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Code Prefix Explanation

| Code | Used in: |
|-----------|----------------------|
| DV20..... | DVA20 & DVG20 Valves |
| DV35..... | DVA35 & DVG35 Valves |
| DV80..... | DVG80 Valves |

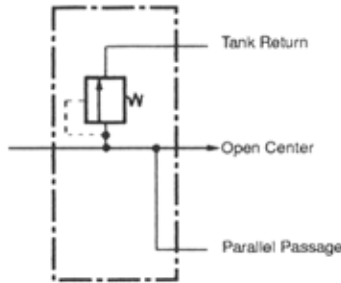
DVG18
DVA20
DVG20
DVA35
DVG35
DVG80



Can be used in respective series designation only

Combination Inlet-Outlet

This standard inlet includes a tank return outlet port which is used with the "TRB" outlet cover.



Schematic shown with main R/V

Inlets are machined for a main R/V or R/V plug and are furnished with plastic closures. See Section G, Page 32 for inlet port plugs.

| Code | Top Port | | End Port | |
|-------------|-----------------|-----------------|----------|---------|
| | HP | LP | HP | LP |
| DVG18-A0055 | SAE-10 Plugged | SAE-10 Plugged | SAE-12 | SAE-12 |
| DVG18-A0088 | 1/2"NPT Plugged | 1/2"NPT Plugged | 3/4"NPT | 3/4"NPT |
| DVG18-A0550 | SAE-10 Plugged | SAE-12 | SAE-12 | None |
| DVG18-A5005 | SAE-12 | SAE-12 Plugged | None | SAE-12 |
| DVG18-A5500 | SAE-12 | SAE-12 | None | None |
| DVG18-A7008 | 1/2"NPT | 1/2"NPT Plugged | None | 3/4"NPT |
| DVG18-A7700 | 1/2"NPT | 1/2"NPT | None | None |
| DVG18-A3333 | SAE-8 | SAE-8 | SAE-8 | SAE-8 |
| DVG18-A4444 | SAE-10 | SAE-10 | SAE-10 | SAE-10 |
| DVG18-A7777 | 1/2"NPT | 1/2"NPT | 1/2"NPT | 1/2"NPT |
| DVG18-A0000 | Not Ported | | | |

Mid-section Inlets

Split Flow

| Code | Top Port Size HP & LP |
|-------------|--------------------------|
| DVG18-SFA88 | 3/4" NPT |
| DVG18-SFA55 | SAE-12 |
| DVG18-SFA00 | NO PORTS |

Combined Flow

| | |
|--------------------------------------|----------|
| DVG18-CFA88 | 3/4" NPT |
| DVG18-CFA55 | SAE-12 |
| DVG18-CFA00 | NO PORTS |
| Combined flow with backflow check | |
| DVG18-CFAC88 | 3/4" NPT |

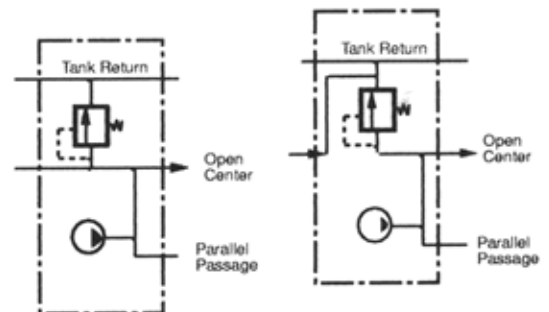
Flow Control

| | |
|-----------------------------------|----------|
| Pressure Compensated - Adjustable | |
| DVG18-MFC | No Ports |

Mid-section inlets are machined for a main R/V or R/V plug and are furnished with plastic closures. See Section G, Page 32 for inlet port plugs.

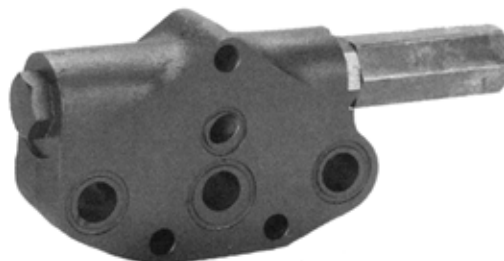
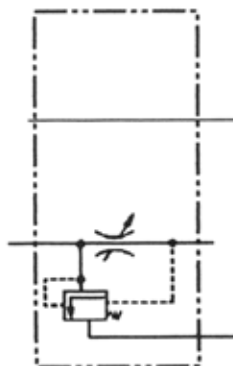
Separates primary and secondary pump flows which allows one valve bank to operate like two.

Split Flow



Combined Flow

Combines primary and secondary pump flows for faster operating speed of downstream functions





Adjustable R/V Cartridges For Inlets and Mid-section Inlets

Inlet Codes DVG18-MRV-1 Main R/V range 500 to 1450 psi. Factory set @ 1000 psi @ 15 gpm
 DVG18-MRV-2 Main R/V range 1450 to 3500 psi. Factory set @ 2500 psi @ 15 gpm.
 DVG18-MRVP Main Relief Valve Plug



Mid-Inlet Codes DVG18-MMRV-1 Main R/V range 500 to 1450 psi. Factory set @ 1000 psi @ 15 gpm
 DVG18-MMRV-2 Main R/V range 1450 to 3500 psi. Factory set @ 2500 psi @ 15 gpm.
 DVG18-MMRVP Main Relief Valve Plug

Outlets

| Code | End Port | | Top Port |
|--------------|--|--|----------|
| | HP | LP | LP |
| DVG18-TRC087 | | 3/4 NPT | 1/2 NPT |
| DVG18-TRC055 | | SAE-12 | SAE-12 |
| DVG18-TRC000 | Unported Outlet | | |
| DVG18-TRB | Outlet Cover ONLY. For use with combination Inlet/Outlet | | |
| DVG18-PBS10 | SAE-10 | Pressure beyond sleeves convert tank return outlets to pressure beyond | |
| DVG18-PBS75 | 3/4" NPT | | |

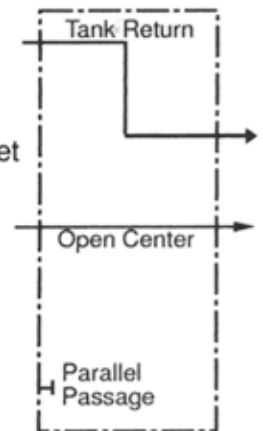
All TRC outlets are machined to accept PBS sleeves.



Standard Tank Return Outlet

TRC055 Tank Return Outlet Shown with DVG18-PBS10 Pressure Beyond Sleeve

Pressure Beyond Outlet



Stud Kits TORQUE TO 240 INCH POUNDS

| Code | Number of Sections Between Inlet and Outlet | | | | | | | |
|--------|---|------|------|------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DVG18- | SK-1 | SK-2 | SK-3 | SK-4 | SK-5 | SK-6 | SK-7 | SK-8 |



Work Sections with Additional Features

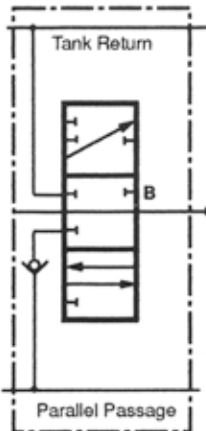
| Code | Product Description |
|--------------------------|--|
| Parallel Circuits | |
| DVG18-HK455 | 4-Way, 3-Position, Hold in Neutral, Double ended 12VDC Solenoid Operated. SAE 10 Ports with port relief valve machining. |
| DVG18-HKR455 | 4-Way, 3-Position, Hold in Neutral, Kickout Release Valve SAE-10 Ports with port relief valve machining. |
| DCG18-HV400 | 4-Way, 3-Position, Hold in Neutral, Air actuated SAE-10 Ports without port relief valve machining. |
| DVG18-HV455 | 4-Way, 3-Position, Hold in Neutral, Air Actuated SAE-10 Ports with port relief valve machining. |
| DVG18-HV755 | 4-way, 3-Position, Hold in Neutral, Air Actuated. 1/2" NPT Ports with port relief valve machining. |
| DVG18-HX400 | 4-Way, 3-Position, Hold in Neutral, Metered hydraulic Remote control. SAE-10 Ports without port relief valve machining. |
| DVG18-HX455 | 4-Way, 3-Position, Hold in Neutral, Metered hydraulic Remote control. SAE-10 Ports with port relief valve machining. |
| DVG18-HX755 | 4-Way, 3-Position, Hold in Neutral, Metered hydraulic Remote control. 1/2" NPT Ports with port relief valve machining. |
| DVG18-JLA405 | 3-Way, 3-Position, Float in Neutral, Spring Return. SAE-10 Ports with port relief valve machining. |
| DVG18-JLA705 | 3-Way, 3-Position, Float in Neutral, Spring Return. 1/2" NPT Ports with port relief valve machining. |
| DVG18-JLB405 | 3-Way, 3-Position, Float in Neutral, with 3-Position Detent. SAE-10 Ports with port relief valve machining. |
| DVG18-JLB705 | 3-Way, 3-Position, Float in Neutral, with 3-Position Detent. 1/2" NPT Ports with port relief valve machining. |
| DVG18-JLA505 | Same as JLA705 except work port is machined for Lock Valve. |
| DVG18-LK455 | 4-Way, 3-Position, Float in Neutral, Double ended 12 vDC Solenoid Operated. SAE 10 Ports with port relief valve machining. |
| DVG18-LX455 | 4-Way, 3-Position, Float in Neutral, Metered hydraulic Remote control. SAE-10 Ports with port relief valve machining. |
| DVG18-LX755 | 4-Way, 3-Position, Float in Neutral, Metered hydraulic Remote control. 1/2" NPT Ports with port relief valve machining. |
| Tandem Circuits | |
| DVG18-HKRT455 | 4-Way, 3-Position, Hold in Neutral, Double ended 12VDC Solenoid Operated. SAE 10 Ports with port relief valve machining. |
| DVG18-QHA455 | 4-Way, 3-Position, Hold in Neutral, Spring Return SAE-10 Ports with port relief valve machining |
| DVG18-QHA755 | 4-Way, 3-Position, Hold in Neutral, Spring Return 1/2" NPT Ports with port relief valve machining |

Many of the above work sections can be made from codes on page A4 and kits on page A7

Work Sections -- Parallel Circuit (3500 psi)

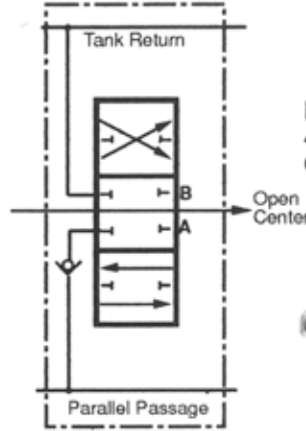
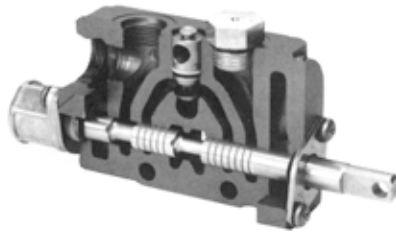
Sections with port relief valve machining are furnished with plastic closures

| CODE | 4-Way 3-Pos Hold In Neutral | 3-Way 3-Pos Hold In Neutral | 4-Way 3-Pos Float In Neutral | 4-Way 4-Pos Float Pos Detented | 1/2" NPT Ports | SAE-8 Ports | SAE-10 Ports | Work Port NOT Machined | Spring Return | 3-Pos Detent | Female Clevis Spool | Port R/V Machined |
|-----------------|---|--------------------------------------|---------------------------------------|---|-------------------|----------------|-----------------|---------------------------------|------------------|-----------------|---------------------------|-------------------------|
| DVG18-HA000 | . | | | | | | | . | . | | | |
| DVG18-HA055 | . | | | | | | | . | . | | | . |
| DVG18-HA300 | . | | | | | . | | | . | | | |
| DVG18-HA355 | . | | | | | . | | | . | | | . |
| DVG18-HA400 | . | | | | | | . | | . | | | |
| DVG18-HA400-FCL | . | | | | | | . | | . | | . | |
| DVG18-HA455 | . | | | | | | . | | . | | | . |
| DVG18-HA455-FCL | . | | | | | | . | | . | | . | . |
| DVG18-HA700 | . | | | | . | | | | . | | | |
| DVG18-HA700-FCL | . | | | | . | | | | . | | . | |
| DVG18-HA755 | . | | | | . | | | | . | | | . |
| DVG18-HA755-FCL | . | | | | . | | | | . | | . | . |
| DVG18-JA000 | | . | | | | | | . | . | | | |
| DVG18-JA005 | | . | | | | | | . | . | | | . |
| DVG18-JA300 | | . | | | | . | | | . | | | |
| DVG18-JA300-FCL | | . | | | | . | | | . | | . | |
| DVG18-JA305 | | . | | | | . | | | . | | | . |
| DVG18-JA400 | | . | | | | | . | | . | | | . |
| DVG18-JA405 | | . | | | | | . | | . | | | . |
| DVG18-JA405-FCL | | . | | | | | . | | . | | . | . |
| DVG18-JA700 | | . | | | . | | | | . | | | |
| DVG18-JA705 | | . | | | . | | | | . | | | . |
| DVG18-JA705-FCL | | . | | | . | | | | . | | . | . |
| DVG18-JB305 | | . | | | | . | | | . | . | | . |
| DVG18-LA000 | | | . | | | | | . | . | | | |
| DVG18-LA055 | | | . | | | | | . | . | | | . |
| DVG18-LA300 | | | . | | | . | | | . | | | |
| DVG18-LA355 | | | . | | | . | | | . | | | . |
| DVG18-LA400 | | | . | | | | . | | . | | | |
| DVG18-LA400-FCL | | | . | | | | . | | . | | . | |
| DVG18-LA455 | | | . | | | | . | | . | | | . |
| DVG18-LA455-FCL | | | . | | | | . | | . | | . | . |
| DVG18-LA700 | | | . | | . | | | | . | | | |
| DVG18-LA700-FCL | | | . | | . | | | | . | | . | |
| DVG18-LA755 | | | . | | . | | | | . | | | . |
| DVG18-LA755-FCL | | | . | | . | | | | . | | . | . |
| DVG18-HB355 | . | | | | | . | | | . | . | | . |
| DVG18-HB455 | . | | | | | | . | | . | . | | . |
| DVG18-HB755 | . | | | | . | | | | . | . | | . |
| DVG18-LB400 | | | . | | | | . | | . | . | | |
| DVG18-LB700 | | | . | | . | | | | . | . | | |
| DVG18-LB355 | | | . | | | . | | | . | . | | . |
| DVG18-LB455 | | | . | | | | . | | . | . | | . |
| DVG18-LB755 | | | . | | . | | | | . | . | | . |
| DVG18-GC355 | | | | . | | . | | | . | . | | . |
| DVG18-GC455 | | | | . | | | . | | . | . | | . |
| DVG18-GC755 | | | | . | . | | | | . | . | | . |
| DVG18-LA555 | SAME AS LA755 EXCEPT WORK PORTS ARE MACHINED FOR LOCK VALVE | | | | | | | | | | | |
| DVG18-LA555-FCL | SAME AS LA555 EXCEPT WITH FEMALE CLEVIS SPOOL | | | | | | | | | | | |



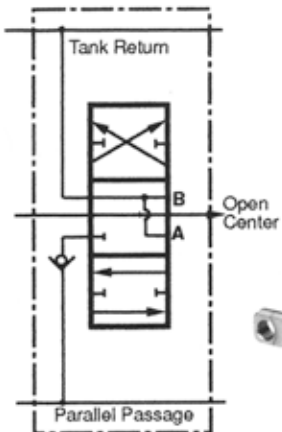
JA405

Single-Acting Section
3-Way, 3-Position, Hold in Neutral
Cylinder Spool



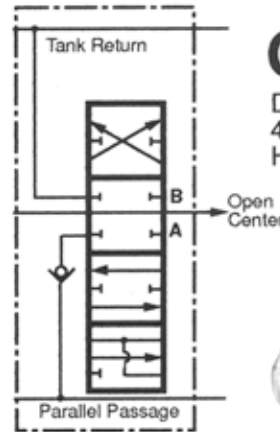
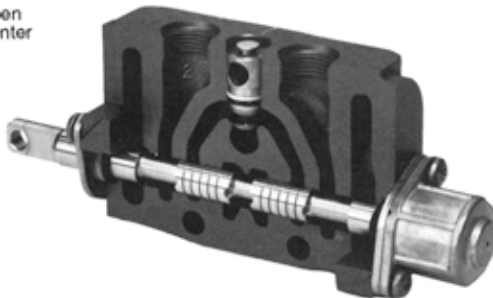
HA400

Double-Acting Section
4-Way, 3-Position, Hold in Neutral
Cylinder Spool



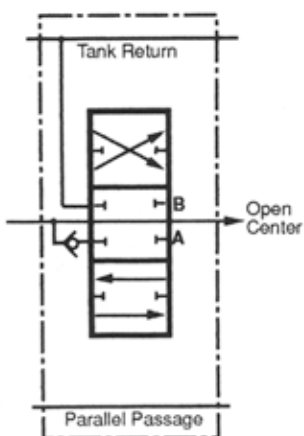
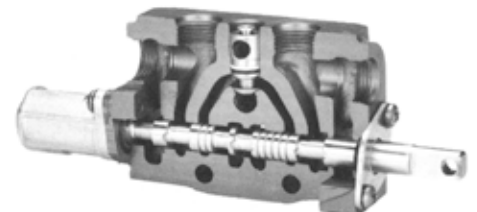
LA400

Double-Acting Section
4-Way, 3-Position, Float in Neutral
Motor Spool



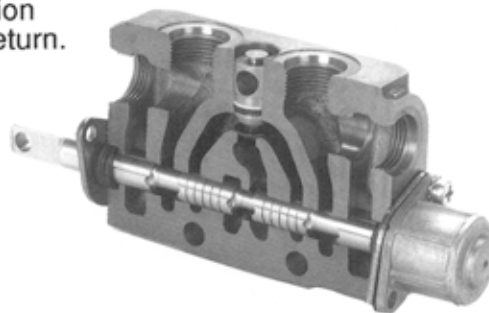
GC455

Double-Acting Float Section
4-Way, 4-Position, Detent in Float
Hold in Neutral, Float in 4th Position



QHA455

Double-Acting Tandem Section
4-Way, 4-Position, Spring Return.
Hold in Neutral



R/v, A/C and Plugs

NOTE: All port relief valves are FULL-FLOW. See inlet section for main relief valve codes.

Screw Adjusted Port Relief Valve With A/C

| | | |
|--------|--------------|---------------|
| Code | 500-1450 psi | 1450-4000 psi |
| DVG18- | *PRVAC-1 | **PRVAC-2 |



NOTE: *Factory set @ 1000 psi @ 10 gpm ** Factory set @ 2000 psi @ 10 gpm

Screw Adjusted Port Relief Valve Without A/C

| | | |
|--------|--------------|---------------|
| Code | 500-1450 psi | 1450-4000 psi |
| DVG18- | *PRV-1 | **PRV-2 |



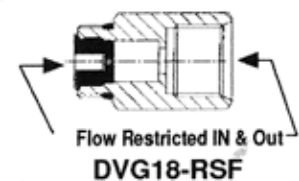
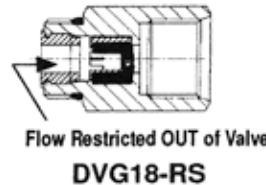
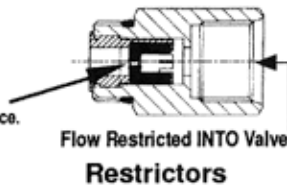
Port Relief Valve Plug
DVG18-PRVP



Anti-cavitation Check
DVG18-AC



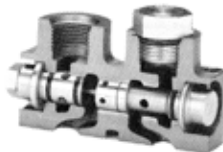
Restrictors furnished without orifice.
See Chart for Orifice drill Size.



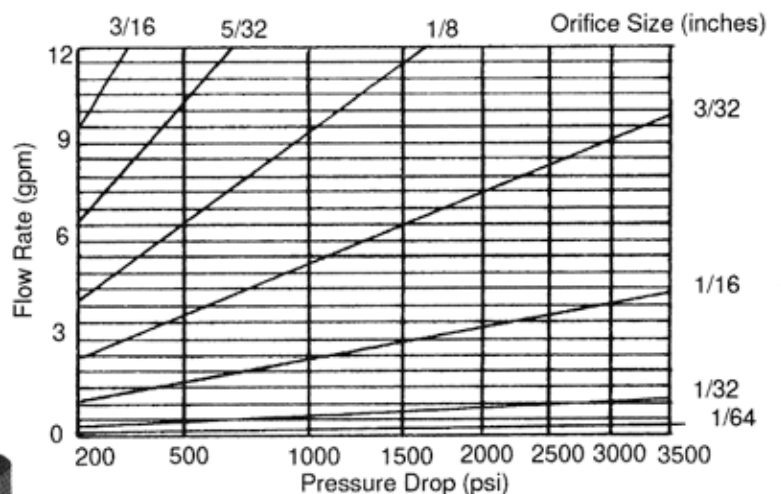
Work Port Restrictors and Lock Valves

DVG18 Lock Valve

Single-Acting DVG18-LVSA
use with JLA505 code



Double-Acting DVG18-LVDA
Use with LA555 codes



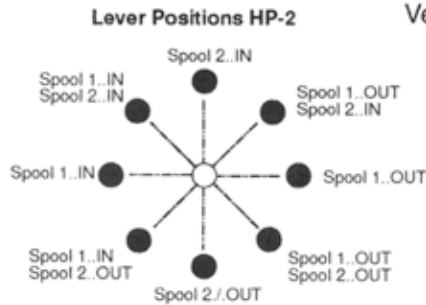
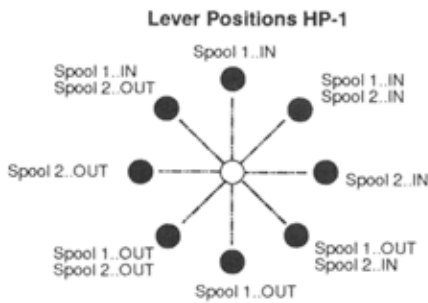
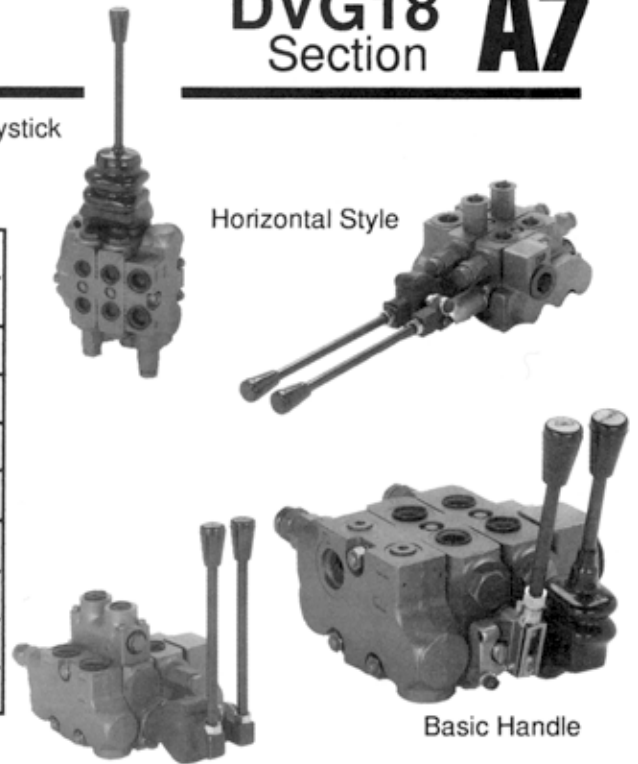
This graph is based on this formula: $Q = 24.12 \times A \times \sqrt{\Delta P}$
 Q = Gallons per minute
 A = Orifice area in inches squared
 ΔP = Pounds per sq. inch

DVG18 Section A7

Handle Assemblies

Mechanical Joystick
WITH BOOT

| Code | | | Description |
|--------------------------|---------|------|-------------------------------|
| Approximate Lever Length | | | |
| 8 1/4" | 10 3/4" | 13" | |
| HH-1 | HH-2 | HH-3 | DVG18 Horizontal (Industrial) |
| HV-1 | HV-2 | HV-3 | DVG18 Vertical (Industrial) |
| HIB | | | DVG18 Boot (Industrial) |
| HDL | | | DVG18 Basic Handle |
| HDLB | | | DVG18 Basic Handle w/Boot |
| HP-1 Left Hand | | | DVG18 Mechanical Joystick |
| HP-2 Right Hand | | | DVG18 Mechanical Joystick |
| HPB | | | DVG18 Boot for Joystick |



Work Section -- Spool Actuation Kits

| Code | Spring Return | 3-Pos Detent | Air Shift | Detent In Spr Ret'n Out | Detent Out Spr Ret'n In | Metered Remt Cont | Double-Ended Solenoid 12V | Rotary Control | Dbl Clevis End Cap | Microswitch Cap |
|-------|---------------|--------------|-----------|-------------------------|-------------------------|-------------------|---------------------------|----------------|--------------------|-----------------|
| DVG18 | K-300 | K-301 | K-303 | K-307 | K-308 | K-309 | K-310 | K-311 | K-312 | K-314 |

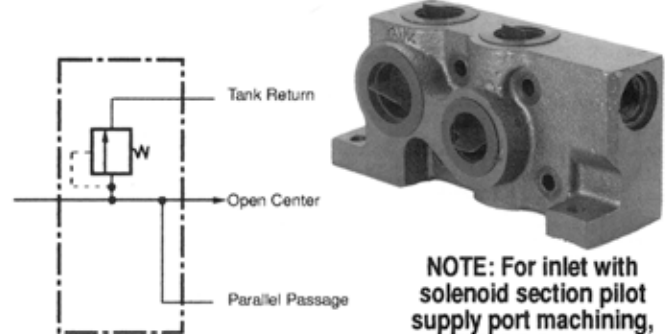
Seal Kits

| | Work Section Assembly Kit | Work Section Repair Kit |
|---------------|---------------------------|---------------------------------|
| Code | DVG18-K-1 | DVG18-K-2 |
| KIT CONTAINS: | SECTION SEALS | SECTION, SPOOL, and CHECK SEALS |

Inlets (2500 psi)

NOTE: Inlets are machined for a main R/V or R/V plug and are furnished with plastic closures. See Section G, Page 32 for inlet port plugs

| Code | End Port HP | Top Port HP | End Port LP | Top Port LP |
|-----------------------------------|--------------------|-------------|-------------|-------------|
| DVA20-A440 | 1" NPT | 1" NPT | N/A | N/A |
| DVA20-A880 | SAE-16 | SAE-16 | N/A | N/A |
| DVA20-A000 | NON-PORTED HOUSING | | | |
| Combination Inlet - Outlet | | | | |
| DVA20-N4444 | 1" NPT | 1" NPT | 1" NPT | 1" NPT |
| DVA20-N8888 | SAE-16 | SAE-16 | SAE-16 | SAE-16 |
| DVA20-N0000 | NON-PORTED HOUSING | | | |



Schematic shown with main R/V

NOTE: For inlet with solenoid section pilot supply port machining, see DVG20 inlet sections, page C1.

Mid-section Inlets

Split Flow

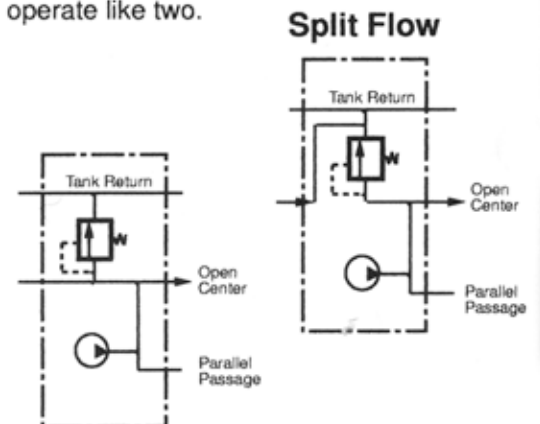
| Code | Top Port |
|-------------|------------|
| DVA20-SFA30 | 3/4" NPT |
| DVA20-SFA70 | SAE-12 |
| DVA20-SFA00 | Non-Ported |

Combined Flow

| | |
|-------------|------------|
| DVA20-CFA30 | 3/4" NPT |
| DVA20-CFA70 | SAE-12 |
| DVA20-CFA00 | Non-Ported |

NOTE: Mid-section inlets are machined for a main R/V or R/V plug and are furnished with plastic closures. See Section G, Page 32 for inlet port plugs

Separates primary and secondary pump flows which allows one valve bank to operate like two.



Combined Flow

Combines primary and secondary pump flows for faster operating speed of downstream functions

Schematics shown with main R/V

Adjustable Relief Valve Cartridges

For Inlets and Mid-section Inlets

| Code | Description |
|------------|---|
| DVA20-MRV | Main R/V pressure range 800-2500 psi. Factory set @ 2000 psi @ 30 gpm |
| DVA20-MRVP | Main relief valve plug |



For Code N Combination Inlet / Outlets

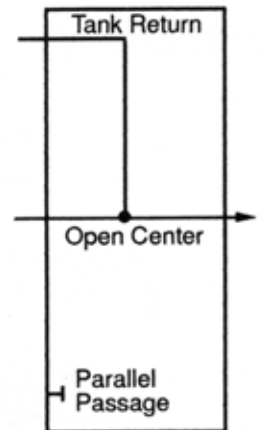
| | |
|----------|---------------------------------------|
| DV-PRVAC | Main R/V, Screw Adj., 500 to 2500 psi |
| DV-PRV-1 | Main R/V, Slug Adj., 500 to 1000 psi |
| DV-PRV-2 | Main R/V, Slug Adj., 1000 to 2500 psi |
| DV-PRVP | Main R/V, Plug |

Outlets

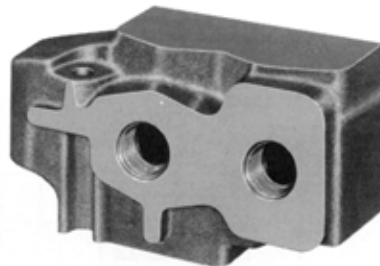
Tank Return Type

| Code | End Port | Top Port |
|------------|--------------------|----------|
| DVA20-TR44 | 1" NPT | 1" NPT |
| DVA20-TR88 | SAE-16 | SAE-16 |
| DVA20-TR00 | NON-PORTED HOUSING | |

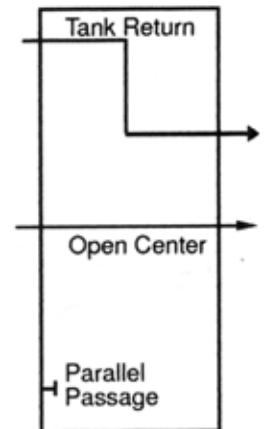
See section G, Page32 for port plugs



Pressure Beyond Type



| | End Port LP | End Port HP | Top Port LP | Top Port HP |
|------------|--------------------|-------------|-------------|-------------|
| DVA20-PB44 | 1" NPT | 1" NPT | 1" NPT | 1" NPT |
| DVA20-PB80 | SAE-16 | SAE-16 | | |
| DVA20-PB08 | | | SAE-16 | SAE-16 |
| DVA20-PB00 | Non-Ported Housing | | | |



Stud Kits

Torque to 350 inch pounds

Number of Sections Between Inlet and Outlet

| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|-------|-------|-------|-------|-------|-------|-------|-------|
| DVA20- | SK-1 | SK-2 | SK-3 | SK-4 | SK-5 | SK-6 | SK-7 | SK-8 |
| Code N - Combination Inlet / Outlet Studs | | | | | | | | |
| DVA20- | NSK-1 | NSK-2 | NSK-3 | NSK-4 | NSK-5 | NSK-6 | NSK-7 | NSK-8 |

Lo-Boy Work Sections -- Parallel Circuits

| Code | 4-Way 3-Position Hold In Neutral | 3-Way 3-Position Hold In Neutral | 4-Way 3-Position Float In Neutral | 4-Way 4-Position Float Position Detented | Port Size | Work Port NOT Machined | Spring Return | 3-Position Detent | Metered Hydraulic Remote Control | Solenoid Operated | Air Shift | | |
|---------------|---|---|--|--|--------------|---------------------------------|------------------|----------------------|---|----------------------|--------------|--|--|
| DVA20-DAO | • | | | | | • | • | | | | | | |
| DVA20-DA3 | • | | | | 3/4" NPT | | • | | | | | | |
| DVA20-DA7 | • | | | | SAE-12 | | • | | | | | | |
| DVA20-SAO | | • | | | | • | • | | | | | | |
| DVA20-SA3 | | • | | | 3/4" NPT | | • | | | | | | |
| DVA20-SA7 | | • | | | SAE-12 | | • | | | | | | |
| DVA20-MAO | | | • | | | • | • | | | | | | |
| DVA20-MA3 | | | • | | 3/4" NPT | | • | | | | | | |
| DVA20-MB3 | | | • | | 3/4" NPT | | | • | | | | | |
| DVA20-MA7 | | | • | | SAE-12 | | • | | | | | | |
| DVA20-MB7 | | | • | | SAE-12 | | | • | | | | | |
| DVA20-FC3 | | | | • | 3/4" NPT | | • | | | | | | |
| DVA20-FC7 | | | | • | SAE-12 | | • | | | | | | |
| DVA20-DK7-12V | • | | | | SAE-12 | | | | | • 12VDC | | | |
| DVA20-DK7-24V | • | | | | SAE-12 | | | | | • 24 VDC | | | |
| DVA20-DX3 | • | | | | 3/4" NPT | | | | • | | | | |
| DVA20-DX7 | • | | | | SAE-12 | | | | • | | | | |
| DVA20-DV3 | • | | | | 3/4" NPT | | | | | | • | | |
| DVA20-DV7 | • | | | | SAE-12 | | | | | | • | | |
| DVA20-MX3 | | | • | | 3/4" NPT | | | | • | | | | |
| DVA20-MX7 | | | • | | SAE-12 | | | | • | | | | |
| DVA20-DB3 | • | | | | 3/4" NPT | | | | • | | | | |
| DVA20-DB7 | • | | | | SAE-12 | | | | • | | | | |
| DVA20-WDA7 | Series | | | | SAE-12 | | • | | | | | | |
| DVA20-WMA7 | | | • Series | | SAE-12 | | • | | | | | | |

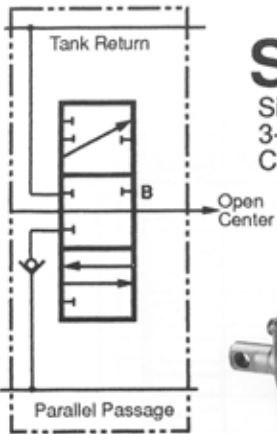
Note: See Section G, Page 33 for section seal kits.

Codes outside of the shaded area may require increased lead time.

Most codes outside the shaded area can be made from codes inside the area and kits on page 33.

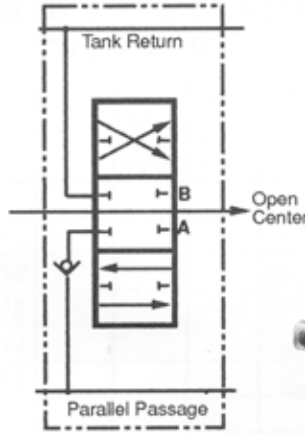
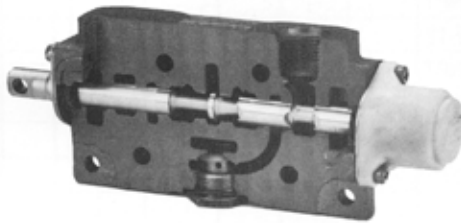
Solenoids are furnished with spade connectors

Machining instructions for standard housings are included in solenoid kits.



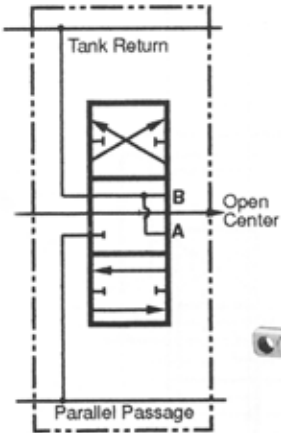
SA7

Single-Acting Section
3-Way, 3-Position, Hold in Neutral
Cylinder Spool



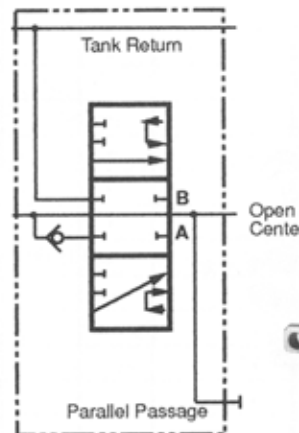
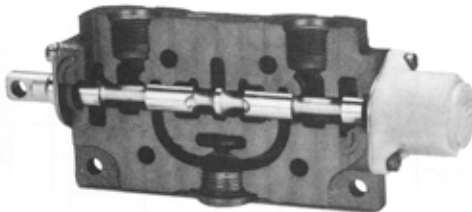
DA7

Double-Acting Section
4-Way, 3-Position, Hold in Neutral
Cylinder Spool



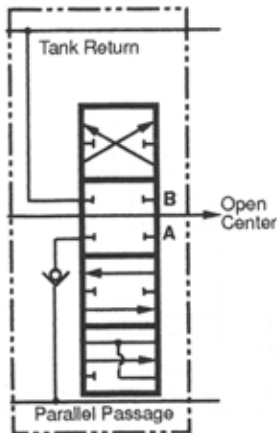
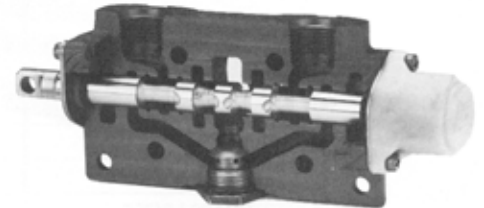
MA7

Double-Acting Section
4-Way, 3-Position, Float in Neutral
Motor Spool



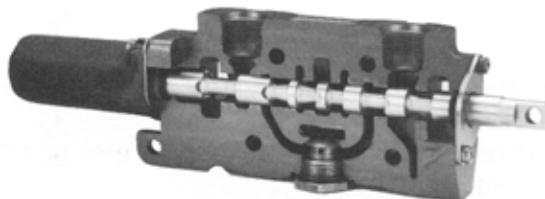
WDA7

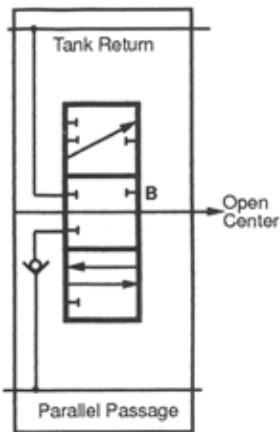
Double-Acting Section
Series Circuit
4-Way, 3-Position, Hold in Neutral
Cylinder Spool



FC7

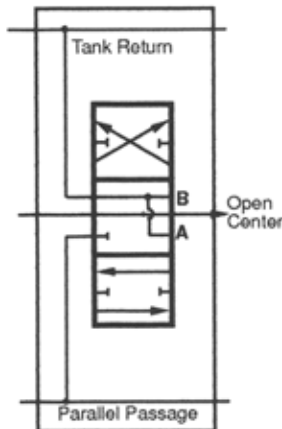
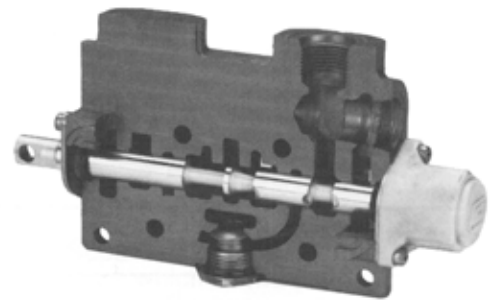
Double-Acting Float Section
4-Way, 4-Position, Detent in Float
Hold in Neutral, Float in 4th Position





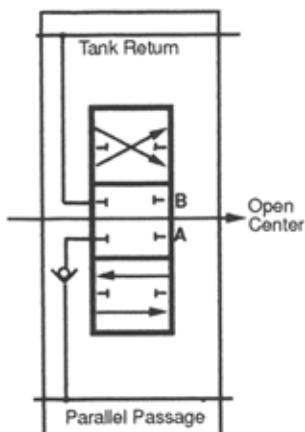
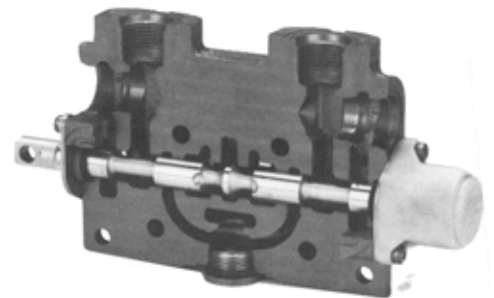
JA705

Single-Acting Section
3-Way, 3-Position, Hold in Neutral
Cylinder Spool



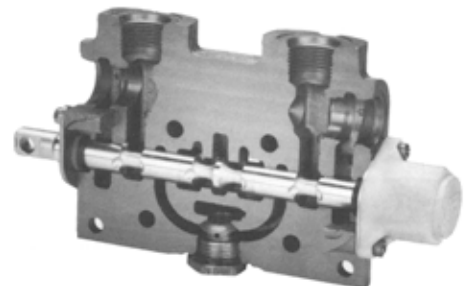
LA755

Double-Acting Section
4-Way, 3-Position, Float in Neutral
Motor Spool



HA755

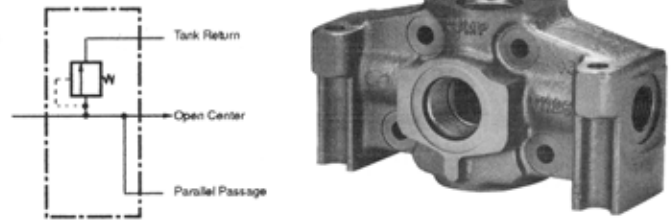
Double-Acting Section
4-Way, 3-Position, Hold in Neutral
Cylinder Spool



Inlets (3500 psi)

| Code | End Port | Top Port |
|---------------|------------|---|
| DVG20-A770 | SAE-12 | SAE-12 |
| DVG20-A770-SM | SAE-12 | SAE-12 Machined for solenoid sections pilot supply SAE-6 pilot Port |
| DVG20-A000 | NON-PORTED | |

Note: Inlets are machined for a main R/V or R/V plug and are furnished with plastic closures. See Section G, Page 32 for inlet port plugs

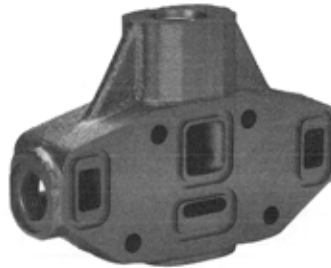


Schematic shown has main R/V

Mid-section Inlets

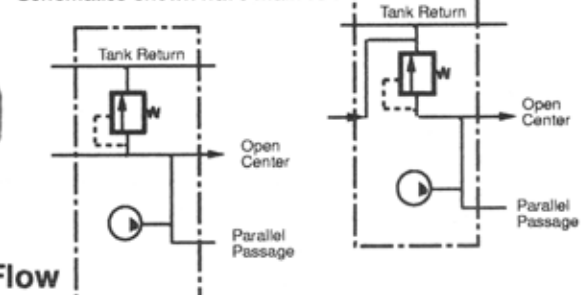
Split Flow

| Code | Top Port |
|-------------|------------|
| DVG20-SFA70 | SAE-12 |
| DVG20-SFA00 | NON-PORTED |



Separates primary and secondary pump flows which allows one valve bank to operate like two.

Schematics shown have main R/V



Combined Flow

Combined Flow

| Code | Top Port |
|-------------|------------|
| DVG20-CFA70 | SAE-12 |
| DVG20-CFA00 | NON-PORTED |

Combines primary and secondary pump flows for faster operating speed of downstream functions

Adjustable Relief Valves

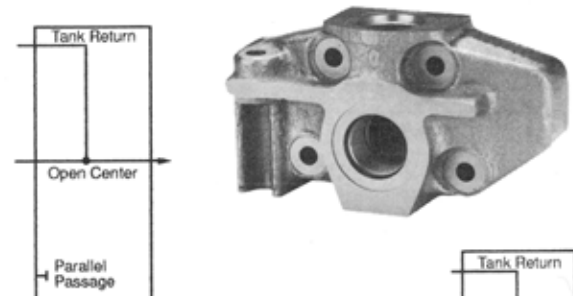
| | |
|--------------------|---|
| Code DVG20-HMRV | Screw - adjusted main relief valve Pressure range 2800 - 3500 psi Factory set @ 3000 psi @ 30 gpm |
| DVA20-MRVP | Main relief valve plug |



Outlets (Thru Stud Type)

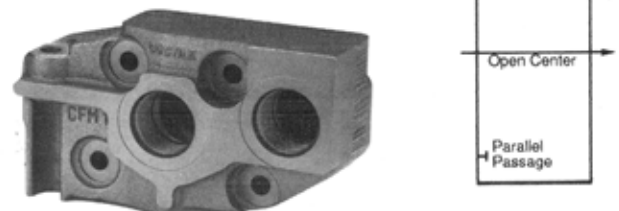
Tank Return Type

| Code | End Port | Top Port |
|-------------|------------|----------|
| DVG20-TTR88 | SAE-16 | SAE-16 |
| DVG20-TTR00 | NON-PORTED | |



Pressure Beyond Type

| Code | End Port LP | Top Port HP |
|-------------|-------------|-------------|
| DVG20-TPB80 | SAE-16 | SAE-16 |
| DVG20-TPB00 | NON-PORTED | |



Parallel Circuits (3500 psi) Low-boy Work Sections

| CODE | 4-Way 3-Pos Hold In Neutral | 3-Way 3-Pos Hold In Neutral | 4-Way 3-Pos Float In Neutral | Port Size | Work Port NOT Machined | Spring Return | 3-Pos Detent | Metered Hydraulic Remote Control | Solenoid Operated | Air Shift |
|-----------|--------------------------------------|--------------------------------------|---------------------------------------|--------------|---------------------------------|------------------|-----------------|---|----------------------|--------------|
| DVG20-DA0 | • | | | | • | • | | | | |
| DVG20-DA7 | • | | | SAE-12 | | • | | | | |
| DVG20-DB7 | • | | | SAE-12 | | | • | | | |
| DVG20-MA7 | | | • | SAE-12 | | • | | | | |
| DVG20-MB7 | | | • | SAE-12 | | | • | | | |
| DVG20-SA7 | | • | | SAE-12 | | • | | | | |
| DVG20-DX7 | • | | | SAE-12 | | | | • | | |
| DVG20-MX7 | | | • | SAE-12 | | | | • | | |
| DVG20-DK7 | • | | | SAE-12 | | | | | • 12vDC | |
| DVG20-MK7 | | | • | SAE-12 | | | | | • 12vDC | |
| DVG20-DV7 | • | | | SAE-12 | | | | | | • |

Hi-boy Work Sections

| CODE | 4-Way 3-Pos Hold In Neutral | 3-Way 3-Pos Hold In Neutral | 4-Way 3-Pos Float In Neutral | Port Size | Work Port NOT Machined | Spring Return | 3-Pos Detent | Metered Hydraulic Remote Control | Solenoid Operated | Air Shift | Port R/V Machined |
|-------------|--------------------------------------|--------------------------------------|---------------------------------------|--------------|---------------------------------|------------------|-----------------|---|----------------------|--------------|-------------------------|
| DVG20-HA055 | • | | | | • | • | | | | | • |
| DVG20-HA755 | • | | | SAE-12 | | • | | | | | • |
| DVG20-HB755 | • | | | SAE-12 | | | • | | | | • |
| DVG20-LA755 | | | • | SAE-12 | | • | | | | | • |
| DVG20-LB755 | | | • | SAE-12 | | | • | | | | • |
| DVG20-JA705 | | • | | SAE-12 | | • | | | | | • |
| DVG20-HX755 | • | | | SAE-12 | | | | • | | | • |
| DVG20-LX755 | | | • | SAE-12 | | | | • | | | • |
| DVG20-HK755 | • | | | SAE-12 | | | | | • 12vDC | | • |
| DVG20-LK755 | | | • | SAE-12 | | | | | • 12vDC | | • |
| DVG20-HV755 | • | | | SAE-12 | | | | | | • | • |

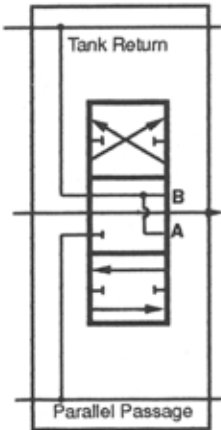
Note: See section G, pages 32 and 33, for section seal kits and R/V port accessories.

Codes outside the shaded area may require longer lead time.

Most codes outside the shaded area can be made from codes inside the area and the kits on page 33.

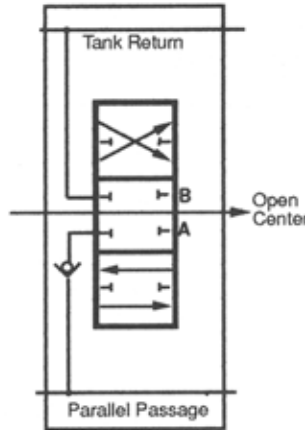
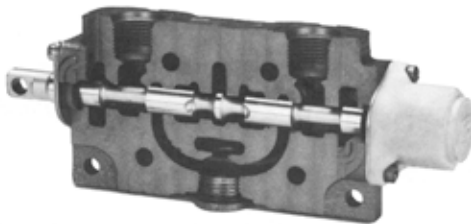
Solenoids are furnished with spade connectors.

Machining instructions for standard housings are included in solenoid kits.



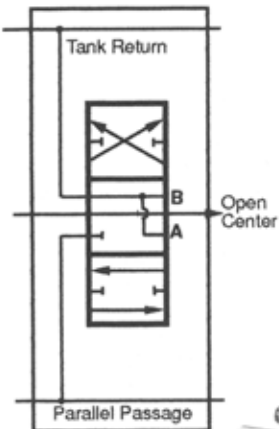
MA7

Double-Acting Section
4-Way, 3-Position, Float in Neutral
Motor Spool



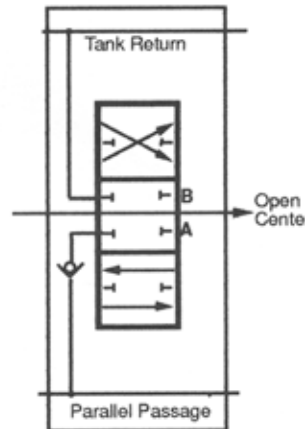
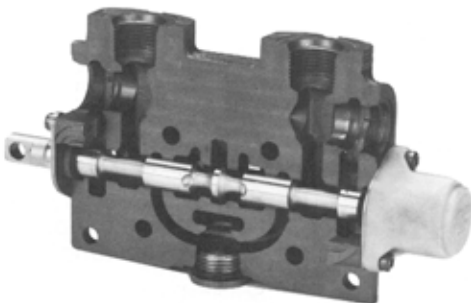
DA7

Double-Acting Section
4-Way, 3-Position, Hold in Neutral
Cylinder Spool



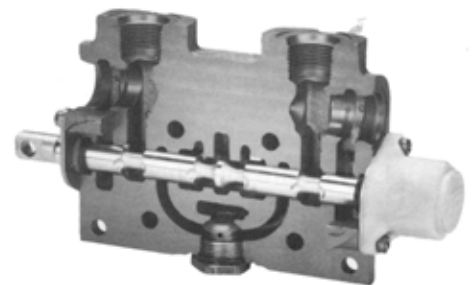
LA755

Double-Acting Section
4-Way, 3-Position, Float in Neutral
Motor Spool



HA755

Double-Acting Section
4-Way, 3-Position, Hold in Neutral
Cylinder Spool

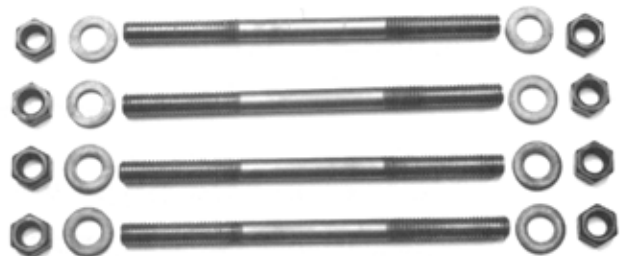


Stud Kits for Thru-Stud Outlets

| Code | Number of Sections Between Inlet and Outlet | | | | | | | |
|--------|---|-------|-------|-------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DVG20- | TSK-1 | TSK-2 | TSK-3 | TSK-4 | TSK-5 | TSK-6 | TSK-7 | TSK-8 |

Torque to 500 inch pounds

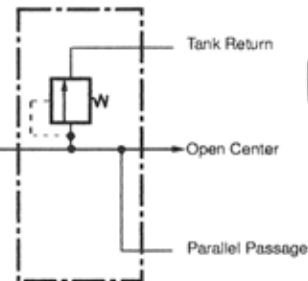
Stud Specifications are Grade 8



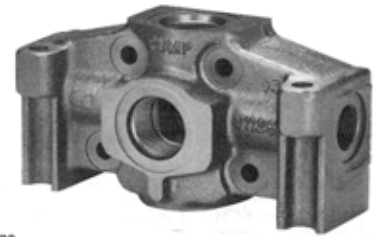
Inlets (2500 psi) End Inlet

| Code | End Port | Top Port |
|------------|--------------------|----------|
| DVA35-A440 | 1" NPT | 1" NPT |
| DVA35-A880 | SAE-16 | SAE-16 |
| DVA35-A980 | SAE-20 | SAE-16 |
| DVA35-A000 | NON-PORTED HOUSING | |

NOTE: Inlets are machined for a main R/V or R/V plug and are furnished with plastic closures. See Section G, Page 32 for inlet port plugs



Schematic shown with main R/V



Note: For inlets with solenoid section pilot supply machining, see DVG35 inlet section E1

Mid-section Inlets

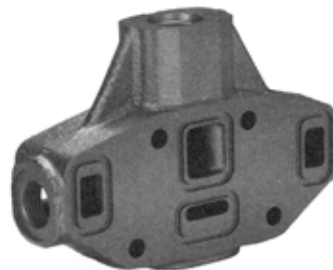
Split Flow

| Code | Top Port |
|-------------|------------|
| DVA35-SFA40 | 1" NPT |
| DVA35-SFA80 | SAE-16 |
| DVA35-SFA00 | Non-Ported |

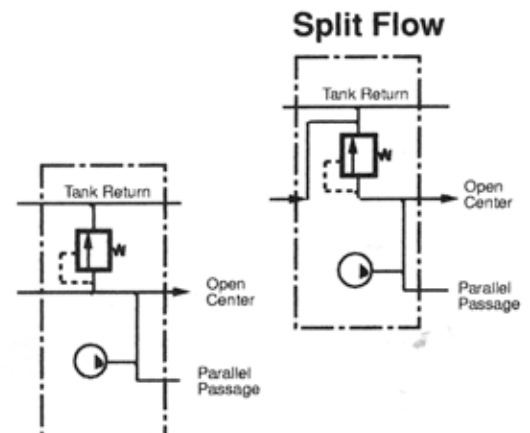
Combined Flow

| Code | Top Port |
|-------------|------------|
| DVA35-CFA40 | 1" NPT |
| DVA35-CFA80 | SAE-16 |
| DVA35-CFA00 | Non-Ported |

NOTE: Mid-section inlets are machined for a main R/V or R/V plug and are furnished with plastic closures. See Section G, Page 32 for inlet port plugs



Separates primary and secondary pump flows which allows one valve bank to operate like two.



Combined Flow

Combines primary and secondary pump flows for faster operating speed of downstream functions

Schematics shown with main R/V

Adjustable Relief Valve Cartridges For Inlets and Mid-section Inlets

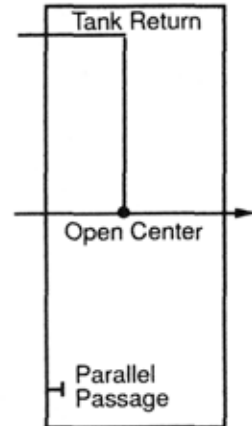
| Code | Description |
|-------------|--|
| DVA35-MRV-1 | Main R/V pressure range 800-2000 psi. Factory set @ 1500 psi @ 50 gpm |
| DVA35-MRV-2 | Main R/V pressure range 2001-2500 psi. Factory set @2500 psi @ 50 gpm. |
| DVA35-MRVP | Main relief valve plug |



Outlets

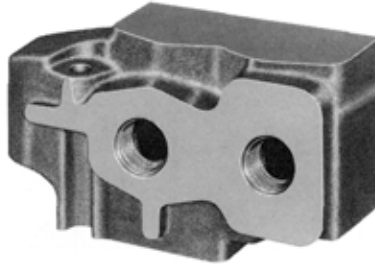
Tank Return Type

| Code | End Port | Top Port |
|------------|--------------------|------------|
| DVA35-TR55 | 1 1/4" NPT | 1 1/4" NPT |
| DVA35-TR99 | SAE-20 | SAE-20 |
| DVA35-TR00 | NON-PORTED HOUSING | |

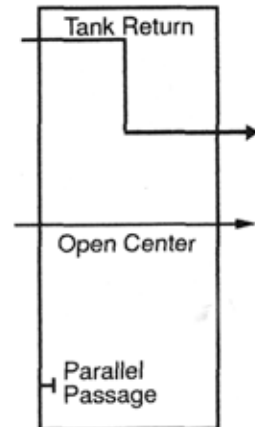


NOTE: See Section G, Page 32 for Port Plugs

Pressure Beyond Type



| | End Port LP | End Port HP | Top Port LP | Top Port HP |
|------------|--------------------|-------------|-------------|-------------|
| DVA35-PB55 | 1 1/4" NPT | 1 1/4" NPT | 1 1/4" NPT | 1 1/4" NPT |
| DVA35-PB90 | SAE-20 | SAE-20 | | |
| DVA35-PB09 | | | SAE-20 | SAE-20 |
| DVA35-PB00 | NON-PORTED HOUSING | | | |



Stud Kits

Number of Sections Between Inlet and Outlet

| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------|------|------|------|------|------|------|------|------|
| DVA35- | SK-1 | SK-2 | SK-3 | SK-4 | SK-5 | SK-6 | SK-7 | SK-8 |

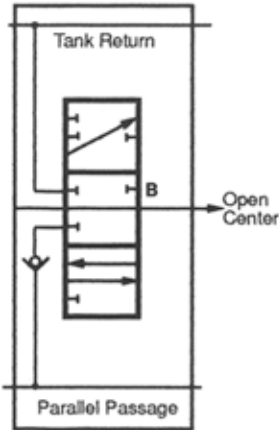
Torque to 400 inch pounds



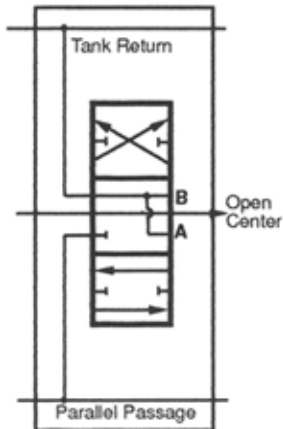
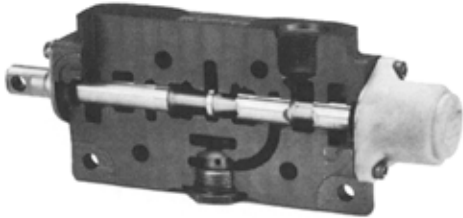
Lo-Boy Work Sections -- Parallel Circuits

| Code | 4-Way 3-Position Hold In Neutral | 3-Way 3-Position Hold In Neutral | 4-Way 3-Position Float In Neutral | 4-Way 4-Position Float Position Detented | Port Size | Work Port NOT Machined | Spring Return | 3-Position Detent | Metered Hydraulic Remote Control | Solenoid Operated | Air Shift | | |
|---------------|---|---|--|--|--------------|---------------------------------|------------------|----------------------|---|----------------------|--------------|--|--|
| DVA35-DAO | • | | | | | • | • | | | | | | |
| DVA35-DA4 | • | | | | 1" NPT | | • | | | | | | |
| DVA35-DA8 | • | | | | SAE-16 | | • | | | | | | |
| DVA35-SAO | | • | | | | • | • | | | | | | |
| DVA35-SA4 | | • | | | 1" NPT | | • | | | | | | |
| DVA35-SA8 | | • | | | SAE-16 | | • | | | | | | |
| DVA35-MA0 | | | • | | | • | • | | | | | | |
| DVA35-MA4 | | | • | | 1" NPT | | • | | | | | | |
| DVA35-MA8 | | | • | | SAE-16 | | • | | | | | | |
| DVA35-DK8-12V | • | | | | SAE-16 | | | | | 12 VDC | | | |
| DVA35-DK8-24V | • | | | | SAE-16 | | | | | 24 VDC | | | |
| DVA35-DX4 | • | | | | 1" NPT | | | • | | | | | |
| DVA35-DX8 | • | | | | SAE-16 | | | • | | | | | |
| DVA35-DV4 | • | | | | 1" NPT | | | | | | • | | |
| DVA35-DV8 | • | | | | SAE-16 | | | | | | • | | |
| DVA35-MX4 | | | • | | 1" NPT | | | • | | | | | |
| DVA35-MX8 | | | • | | SAE-16 | | | • | | | | | |
| DVA35-DB4 | • | | | | 1" NPT | | | • | | | | | |
| DVA35-DB8 | • | | | | SAE-16 | | | • | | | | | |
| DVA35-SB4 | | • | | | 1" NPT | | | • | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

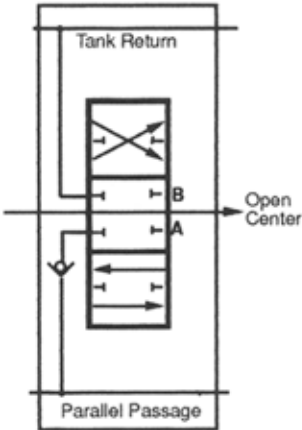
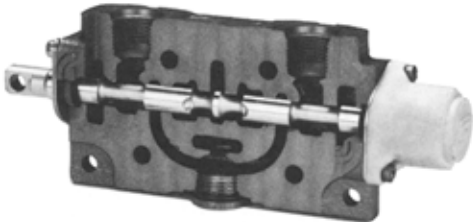
Note: See Section G, Page 33 for section seal kits.
 Codes outside of the shaded area may require increased lead time.
 Most codes outside the shaded area can be made from codes inside the area and kits on page 33.
 Solenoids are furnished with spade connectors
 Machining instructions for standard housings are included in solenoid kits.



SA8
Single-Acting Section
3-Way, 3-Position, Hold in Neutral
Cylinder Spool



MA8
Double-Acting Section
4-Way, 3-Position, Float in Neutral
Motor Spool



DA8
Double-Acting Section
4-Way, 3-Position, Hold in Neutral
Cylinder Spool



Hi-Boy Work Sections -- Parallel Circuit

Sections with port relief valve machining are furnished with plastic closures

| CODE | 4-Way 3-Pos Hold In Neutral | 3-Way 3-Pos Hold In Neutral | 4-Way 3-Pos Float In Neutral | 4-Way 4-Pos Float Pos Detented | Port Size | Work Port NOT Machined | Spring Return | 3-Pos Detent | Metered Hydraulic Remote Control | Solenoid Operated | Air Shift | Port R/V Machined |
|-----------------|--------------------------------------|--------------------------------------|---------------------------------------|---|--------------|---------------------------------|------------------|-----------------|---|----------------------|--------------|-------------------------|
| DVA35-HA000 | • | | | | | • | • | | | | | |
| DVA35-HA055 | • | | | | | • | • | | | | | • |
| DVA35-HA455 | • | | | | 1"NPT | | • | | | | | • |
| DVA35-HA400 | • | | | | 1"NPT | | • | | | | | |
| DVA35-HA855 | • | | | | SAE-16 | | • | | | | | • |
| DVA35-HA800 | • | | | | SAE-16 | | • | | | | | |
| DVA35-HB800 | • | | | | SAE-16 | | | • | | | | |
| DVA35-HB455 | • | | | | 1"NPT | | | • | | | | • |
| DVA35-HB855 | • | | | | SAE-16 | | | • | | | | • |
| DVA35-JA005 | | • | | | | • | • | | | | | • |
| DVA35-JA405 | | • | | | 1"NPT | | • | | | | | • |
| DVA35-JA805 | | • | | | SAE-16 | | • | | | | | • |
| DVA35-JB405 | | • | | | 1"NPT | | | • | | | | • |
| DVA35-JB805 | | • | | | SAE-16 | | | • | | | | • |
| DVA35-LA055 | | | • | | | • | • | | | | | • |
| DVA35-LA455 | | | • | | 1"NPT | | • | | | | | • |
| DVA35-LA855 | | | • | | SAE-16 | | • | | | | | • |
| DVA35-LB400 | | | • | | 1"NPT | | | • | | | | • |
| DVA35-LB800 | | | • | | SAE-16 | | | • | | | | • |
| DVA35-GC455 | | | | • | 1"NPT | | • | | | | | • |
| DVA35-GC855 | | | | • | SAE-16 | | • | | | | | • |
| DVA35-HK855-12V | • | | | | SAE-16 | | | | | •12vDC | | • |
| DVA35-HK855-24V | • | | | | SAE-16 | | | | | •24vDC | | • |
| DVA35-HX455 | • | | | | 1"NPT | | | • | | | | • |
| DVA35-HX800 | • | | | | SAE-16 | | | • | | | | • |
| DVA35-HX855 | • | | | | SAE-16 | | | • | | | | • |
| DVA35-HV455 | • | | | | 1"NPT | | | | | | • | • |
| DVA35-HV855 | • | | | | SAE-16 | | | | | | • | • |
| DVA35-LV400 | | | • | | 1"NPT | | | | | | • | • |
| DVA35-LV800 | | | • | | SAE-16 | | | | | | • | • |
| DVA35-LV855 | | | • | | SAE-16 | | | | | | • | • |
| DVA35-LX800 | | | • | | SAE-16 | | | • | | | | • |
| DVA35-LX855 | | | • | | SAE-16 | | | • | | | | • |

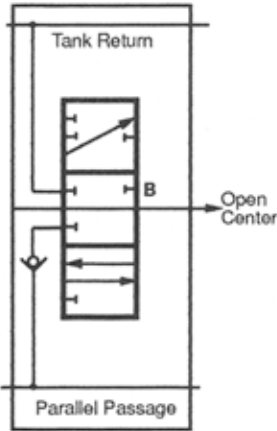
Note: See section G, pages 32 and 33, for section seal kits and R/V port accessories.

Codes outside the shaded area may require longer lead time.

Most codes outside the shaded area can be made from codes inside the area and the kits on page 33.

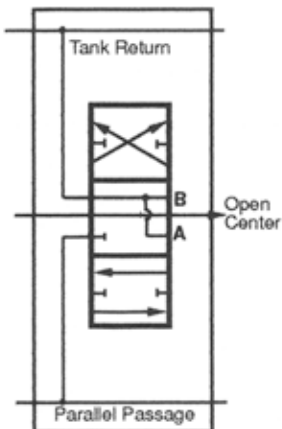
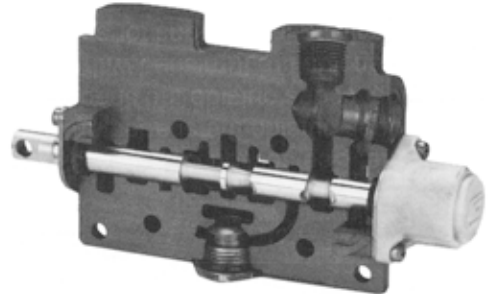
Solenoids are furnished with spade connectors.

Machining instructions for standard housings are included in solenoid kits.



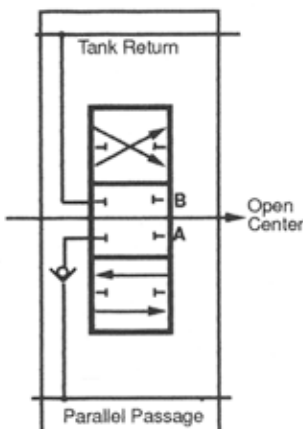
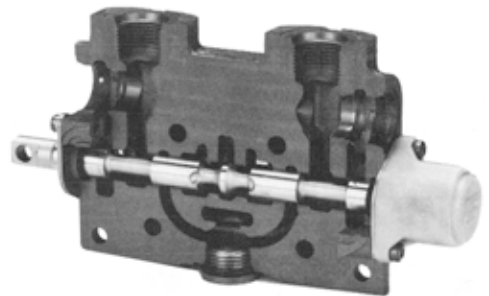
JA805

Single-Acting Section
3-Way, 3-Position, Hold in Neutral
Cylinder Spool



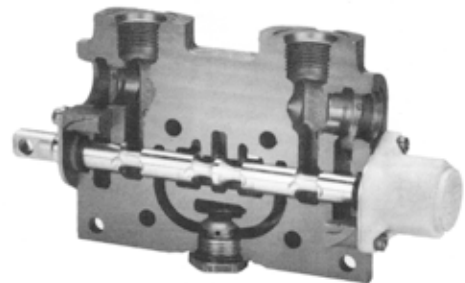
LA855

Double-Acting Section
4-Way, 3-Position, Float in Neutral
Motor Spool



HA855

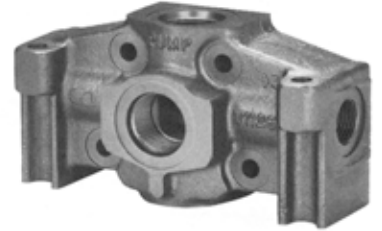
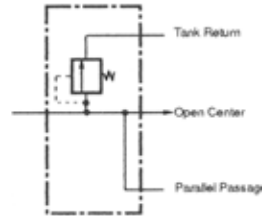
Double-Acting Section
4-Way, 3-Position, Hold in Neutral
Cylinder Spool



Inlets (3500 psi)

| Code | End Port | Top Port |
|---------------|--|----------|
| DVG35-A880 | SAE-16 | SAE-16 |
| DVG35-A880-SM | SAE-16 Machined for solenoid sections pilot supply. SAE-6 pilot port. | SAE-16 |
| DVG35-A980 | SAE-20 | SAE-16 |
| DVG35-A990 | SAE-20 | SAE-16 |
| DVG35-A000 | NON-PORTED | SAE-20 |

Note: Inlets are machined for a main R/V or R/V plug and are furnished with plastic closures. See Section G, Page 32 for inlet port plugs



Sections shown have main R/V

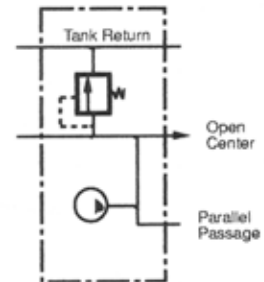
Mid-section Inlets

Split Flow

| Code | Top Port |
|-------------|------------|
| DVG35-SFA80 | SAE-16 |
| DVG35-SFA00 | NON-PORTED |

Separates primary and secondary pump flows which allows one valve bank to operate like two.

Note: Mid-section inlets are machined for a main R/V or R/V plug and are furnished with plastic closures. See Section G, Page 32 for inlet port plugs



Adjustable Relief Valves

| | |
|--------------------|---|
| Code DVG35-HMRV | Screw - adjusted main relief valve Pressure range 2800 - 3500 psi Factory set @ 3000 psi @ 30 gpm |
| DVA35-MRVP | Main relief valve plug |



Outlets (Thru Stud Type)

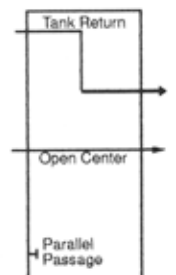
Tank Return Type

| Code | End Port | Top Port |
|-------------|------------|----------|
| DVG35-TTR99 | SAE-20 | SAE-20 |
| DVG35-TTR00 | NON-PORTED | |



Pressure Beyond Type

| Code | End Port LP | Top Port HP |
|-------------|-------------|-------------|
| DVG35-TPB99 | SAE-20 | SAE-20 |
| DVG35-TPB00 | NON-PORTED | |



See Section G, Page 32 for Outlet plugs

Parallel Circuits (3500 psi)

Low-boy Work Sections

| CODE | 4-Way 3-Pos Hold In Neutral | 3-Way 3-Pos Hold In Neutral | 4-Way 3-Pos Float In Neutral | Port Size | Work Port NOT Machined | Spring Return | 3-Pos Detent | Metered Hydraulic Remote Control | Solenoid Operated | |
|-----------|--------------------------------------|--------------------------------------|---------------------------------------|--------------|---------------------------------|------------------|-----------------|---|----------------------|--|
| DVG35-DA0 | • | | | | • | • | | | | |
| DVG35-DA8 | • | | | SAE-16 | | • | | | | |
| DVG35-MA8 | | | • | SAE-16 | | • | | | | |
| DVG35-DX8 | • | | | SAE-16 | | | | • | | |
| DVG35-DK8 | • | | | SAE-16 | | | | | • | |
| DVG35-SA8 | | • | | SAE-16 | | • | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Hi-boy Work Sections

| CODE | 4-Way 3-Pos Hold In Neutral | 3-Way 3-Pos Hold In Neutral | 4-Way 3-Pos Float In Neutral | Port Size | Work Port NOT Machined | Spring Return | 3-Pos Detent | Metered Hydraulic Remote Control | Solenoid Operated | Air Shift | Port R/V Machined |
|-------------|--------------------------------------|--------------------------------------|---------------------------------------|--------------|---------------------------------|------------------|-----------------|---|----------------------|--------------|-------------------------|
| DVG35-HA055 | • | | | | • | • | | | | | • |
| DVG35-LA055 | | | • | | • | • | | | | | • |
| DVG35-HA855 | • | | | SAE-16 | | • | | | | | • |
| DVG35-HB855 | • | | | SAE-16 | | | • | | | | • |
| DVG35-LA855 | | | • | SAE-16 | | • | | | | | • |
| DVG35-LB855 | | | • | SAE-16 | | | • | | | | • |
| DVG35-JA805 | | • | | SAE-16 | | • | | | | | • |
| DVG35-HX855 | • | | | SAE-16 | | | | • | | | • |
| DVG35-LX855 | | | • | SAE-16 | | | | • | | | • |
| DVG35-HK855 | • | | | SAE-16 | | | | | • 12vDC | | • |
| DVG35-LK855 | | | • | SAE-16 | | | | | • 12vDC | | • |
| DVG35-HV855 | • | | | SAE-16 | | | | | | • | • |
| DVG35-LV855 | | | • | SAE-16 | | | | | | • | • |

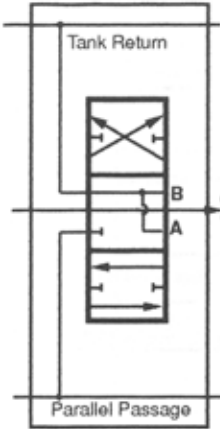
Note: See section G, pages 32 and 33, for section seal kits and R/V port accessories.

Codes outside the shaded area may require longer lead time.

Most codes outside the shaded area can be made from codes inside the area and the kits on page 33.

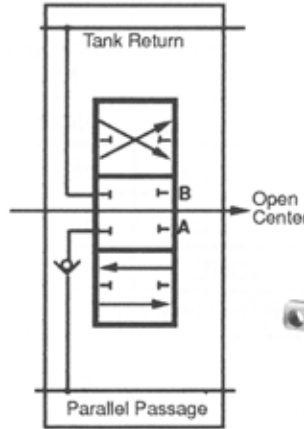
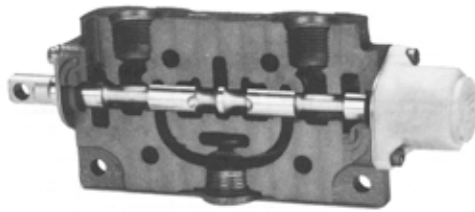
Solenoids are furnished with spade connectors.

Machining instructions for standard housings are included in solenoid kits.



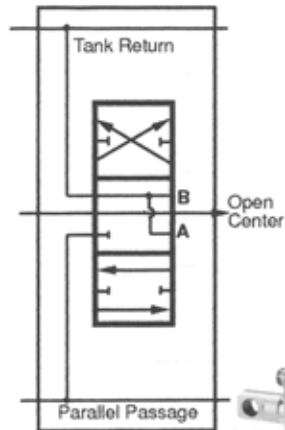
MA8

Double-Acting Section
4-Way, 3-Position, Float in Neutral
Motor Spool



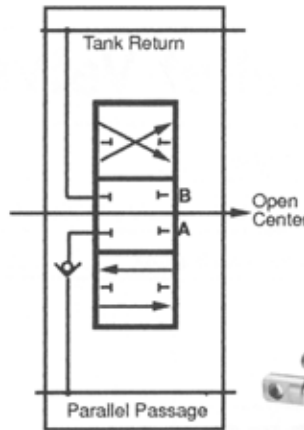
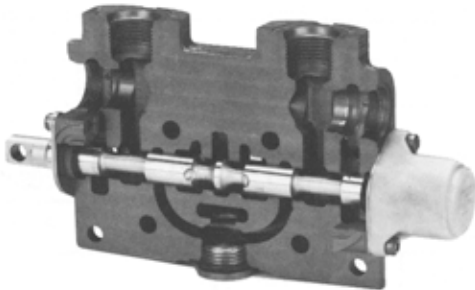
DA8

Double-Acting Section
4-Way, 3-Position, Hold in Neutral
Cylinder Spool



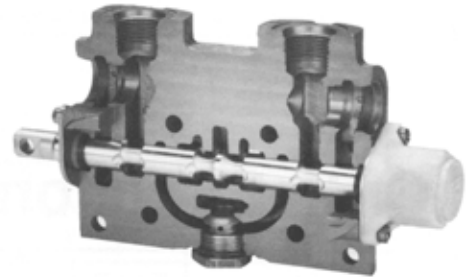
LA855

Double-Acting Section
4-Way, 3-Position, Float in Neutral
Motor Spool



HA855

Double-Acting Section
4-Way, 3-Position, Hold in Neutral
Cylinder Spool



Stud Kits for Thru-Stud Outlets

| Code | Number of Sections Between Inlet and Outlet | | | | | | | |
|--------|---|-------|-------|-------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DVG35- | TSK-1 | TSK-2 | TSK-3 | TSK-4 | TSK-5 | TSK-6 | TSK-7 | TSK-8 |

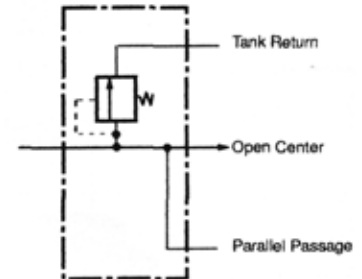
Torque to 900 inch pounds

Stud Specifications are Grade 8



Inlets (3500 psi)

| Code | End Port HP | Top Port HP | End Port LP | Top Port LP |
|-------------|--------------------|-------------|-------------|-------------|
| DVG80-A0404 | NONE | 1 1/2"SF | NONE | 1 1/2"SF |
| DVG80-A0808 | NONE | SAE-24 | NONE | SAE-24 |
| DVG80-A4040 | 1 1/2"SF | NONE | 1 1/2"SF | NONE |
| DVG80-A8080 | SAE-24 | NONE | SAE-24 | NONE |
| DVG80-A0000 | NON-PORTED HOUSING | | | |



Schematic shown has main R/V

NOTE: Inlets are machined for a main R/V or R/V plug and are furnished with plastic closures

See Section G for inlet port plugs... Page 32



Adjustable Relief Valves

| Code | Description |
|------------|---|
| DVG80-MRV | Main R/V pressure range 500-3500 psi. Factory set @ 2000 psi @ 80 gpm |
| DVG80-MRVP | Main relief valve plug |

Outlet Sections

| Code | End Port LP | Top Port LP | End Port HP | Top Port HP |
|---------------|------------------------|-------------|-------------|-------------|
| DVG80-TRC0404 | NONE | 1 1/2"SF | NONE | 1 1/2"SF |
| DVG80-TRC0808 | NONE | SAE-24 | NONE | SAE-24 |
| DVG80-TRC4040 | 1 1/2"SF | NONE | 1 1/2"SF | NONE |
| DVG80-TRC8080 | SAE24 | NONE | SAE-24 | NONE |
| DVG80-TRC0000 | Non-Ported housing | | | |
| DVG80-PBS | PRESSURE BEYOND SLEEVE | | | |

Note: The PBS Sleeve converts a tank return outlet to pressure beyond.

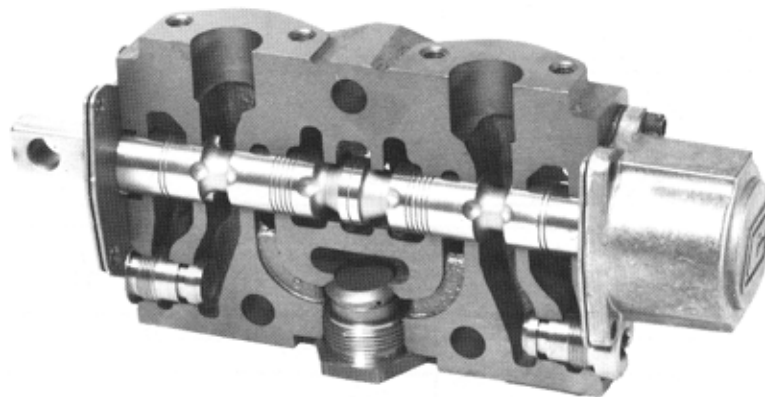
All TRC outlets are machined to accept PBS sleeves.

Hi-Boy Work Sections -- Parallel Circuits

Sections have port relief valve machining.
Furnished with plastic closures

| Code | 4-Way 3-Position Hold in Neutral | 3-Way 3-Position Hold in Neutral | 4-Way 3-Position Float in Neutral | Port Size SAE-20 | Port Size 1" SF | Port Size 1 1/4" SF | Work Port NOT Machined | Spring Return | 3-Position Detent | Metered Hydraulic Remote Control |
|-------------|---|---|--|------------------------|-----------------------|---------------------------|---------------------------------|------------------|----------------------|---|
| DVG80-HA055 | • | | | | | | • | • | | |
| DVG80-HA255 | • | | | | • | | | • | | |
| DVG80-HA355 | • | | | | | • | | • | | |
| DVG80-HA755 | • | | | • | | | | • | | |
| DVG80-HB755 | • | | | • | | | | | • | |
| DVG80-HX355 | • | | | | | • | | | | • |
| DVG80-HX755 | • | | | • | | | | | | • |
| DVG80-LA055 | | | • | | | | • | • | | |
| DVG80-LA255 | | | • | | • | | | • | | |
| DVG80-LA355 | | | • | | | • | | • | | |
| DVG80-LA755 | | | • | • | | | | • | | |
| DVG80-LB755 | | | • | • | | | | | • | |
| DVG80-LX355 | | | • | | | • | | | | • |
| DVG80-LX755 | | | • | • | | | | | | • |
| DVG80-JA205 | | • | | | • | | | • | | |
| DVG80-JA305 | | • | | | | • | | • | | |
| DVG80-JA705 | | • | | • | | | | • | | |

DVG80
Manually controlled
Spring returned section
4-Way – 3-Position
Hold in neutral



Port Relief Valves

| Code | Screw Adjustable Port R/V With A/C | A/C Only | Plug |
|------|------------------------------------|----------|-------|
| DV | -PRVAC | -AC | -PRVP |



Stud Kits

| Code | Number of sections between inlet and outlet | | | | | |
|--------|---|------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| DVG80- | SK-1 | SK-2 | SK-3 | SK-4 | SK-5 | SK-6 |

Torque to 1800 inch pounds

Stud Specifications are Grade 8



Work Section Spool Actuator Kits

| Code | Spring Return | 3-Position Detent | Metered Hydraulic Remote Control |
|-------|---------------|-------------------|----------------------------------|
| DV80- | K-300 | K-301 | K-309 |

Seal Kits

| Code | Work Section Assembly Kit | Work Section Repair Kit | Main RV Repair Kit |
|--------------|---------------------------|--------------------------------|-----------------------|
| DV80- | K-21 | K-22 | K-24 |
| Kit Contains | Section Seals | Section, Spool and Check Seals | All Replaceable Seals |

Relief Valves For DVA20/35 and DVG20/35

| Code | Screw Adjustable Port Relief Valve With A/C 500 to 5000 psi | Slug Adjustable Port Relief Valve Without A/C | | |
|------|--|---|--------------|--------------|
| | | 500 to 1000 | 1000 to 2500 | 2500 to 3500 |
| DV- | *** PRVAC | *PRV-1 | **PRV-2 | ***PRV-3 |
| DV- | --- | PRV-SK Shim Kit for Above | | |

All relief valves are full-flow
 See inlet sections for main relief valve codes
 Port relief valves are factory set at 10 gpm and:

- * 1000 psi
- ** 2000 psi
- *** 2500 psi



Accessories For DVA20/35 and DVG20/35

| Code | Anti-Cavitation Check | Port Relief Valve Plug |
|------|--------------------------|---------------------------|
| DV- | AC | PRVP |

Valve Work Port Plugs For all valve series

| Code | NPT Plugs | | | | | SAE Plugs | | | | | |
|---------|-----------|------|-----|--------|--------|-----------|--------|--------|--------|--------|--------|
| | 1/2" | 3/4" | 1" | 1 1/4" | 1 1/2" | SAE-8 | SAE-10 | SAE-12 | SAE-16 | SAE-20 | SAE-24 |
| DV-DPL- | 50 | 75 | 100 | 125 | 150 | 8 | 10 | 12 | 16 | 20 | 24 |

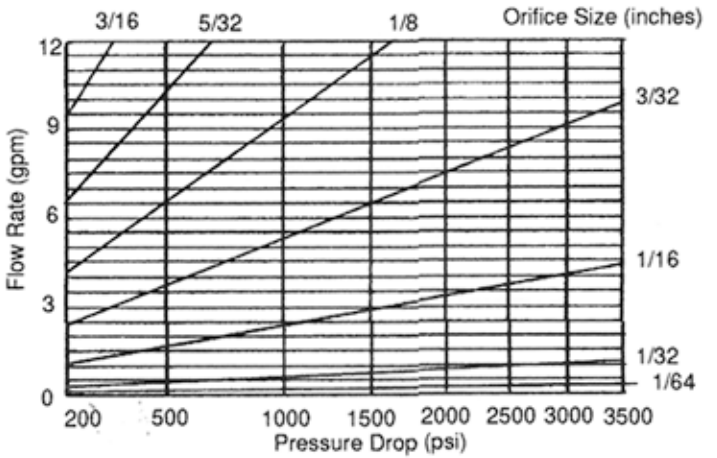
SAE PLUGS INCLUDE "O" RING



Work Port Restrictors

| Code | Description |
|-----------|----------------------|
| DV-PRT-8 | For SAE-8 Work Port |
| DV-PRT-10 | For SAE-10 Work Port |
| DV-PRT-12 | For SAE-12 Work Port |
| DV-PRT-16 | For SAE-16 Work Port |

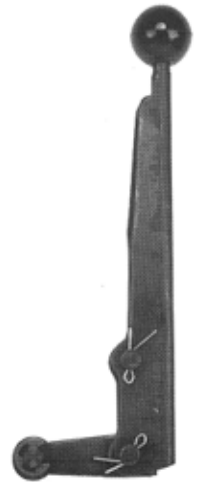
Restrictors are furnished without orifices.
 See chart for orifice drill size.



Handle Assembly

For DVA20/35 and DVG20/35

A=Old Style Handle W/ VA Linkage
VA=New Style Handle W/ VA Linkage



| Lever Length | 6" | | 8" | | 10" | | Linkage Kits Handle to Valve | | | |
|--------------|-----|-----|-----|-----|-----|------|------------------------------|---------|----------|--------|
| | A | VA | A | VA | A | VA | A to VA | VA to A | VA to VA | A to A |
| Code | | | | | | | | | | |
| DV20- | H-3 | H-6 | H-4 | H-8 | H-5 | H-10 | HK-1 | HK-2 | HK-5 | HK-7 |
| DV35- | H-3 | H-6 | H-4 | H-8 | H-5 | H-10 | HK-3 | HK-4 | HK-6 | HK-8 |

Work Section -- Spool Actuation Kits

For DVA20/35 and DVG20/35

| Code | Spring Return | 3-Position Detent | Rotary Control | Air Shift | Metering Hydraulic Remote Control | On / Off Pilot Operated | Single-Ended D. A. Solenoid 12 VDC | Double-Ended D.A. Solenoid 12VDC | Detent IN Spring Ret'n OUT | Detent OUT Spring Ret' IN | Single Ended DA Solenoid 24 v |
|-------|---------------|-------------------|----------------|-----------|-----------------------------------|-------------------------|------------------------------------|----------------------------------|----------------------------|---------------------------|-------------------------------|
| DV20- | K-100 | K-101 | K-102 | K-113 | K-109 | K-110 | K-106 | K-111 | K-107 | K-108 | K112 |
| DV35- | K-200 | K-201 | K-202 | K-213 | K-209 | K-210 | K-206 | K-211 | N/A | N/A | K212 |

These kits are for LH assemblies ONLY. RH kits are NOT AVAILABLE

Seal Kits

For DVA20/35 and DVG20/35

| Code | Work Section Assembly Kit | Work Section Repair Kit | Port R/V Without A/C Seal Kit | Port R/V With A/C Seal Kit | Main R/V Repair Kit | Main R/V Seal Kit |
|--------------|---------------------------|--------------------------------|-------------------------------|----------------------------|--|-----------------------|
| DV20- | K-1 | K-2 | K-3 | K-3-1 | K-4 | K-5 |
| DV35- | K-11 | K-12 | K-3 | K-3-1 | K-14 | K-15 |
| Kit Contains | Section Seals | Section, Spool and Check Seals | All Replaceable Seals | All Replaceable Seals | All Replaceable Seals & Cartridge Body | All Replaceable Seals |

Spools

For DVA20/35, DVG20/35 and DVG18

| Code | Description |
|----------------|---|
| DV20-SPL-1 | 4-Way 3-Position Hold in neutral Standard |
| DV20-SPL-3 | 4-Way 3-position Float in neutral Standard |
| DV20-SPL-5 | 3-Way 3-Position Hold in neutral Standard |
| DV20-SSPL-1 | 4-Way 3-Position Hold in neutral Standard (MARINE) |
| DV20-SSPL-3 | 4-Way 3-Position Float in neutral Standard (MARINE) |
| DV35-SPL-11 | 4-Way 3-Position Hold in neutral Standard |
| DV35-SPL-13 | 4-Way 3-position Float in neutral Standard |
| DV35-SPL-15 | 3-Way 3-Position Hold in neutral Standard |
| DV35-SSPL-11 | 4-Way 3-Position Hold in neutral Standard (MARINE) |
| DV35-SSPL-13 | 4-Way 3-Position Float in neutral Standard (MARINE) |
| DVG18-SPL-21 | 4-Way 3-Position Hold in neutral Standard |
| DVG18-SPL-23 | 4-Way 3-position Float in neutral Standard |
| DVG18-SPL-25 | 3-Way 3-Position Hold in neutral Standard |
| DVG18-SPL-26 | 3-Way 3-Position Float in neutral Standard |
| DVG18-SSPL-21 | 4-Way 3-Position Hold in neutral Standard (MARINE) |
| DVG18-SSPL-23 | 4-Way 3-Position Float in neutral Standard (MARINE) |
| DVG18-LFSPL-21 | 4-Way 3-Position Hold in neutral Low Flow |
| DVG18-LFSPL-23 | 4-Way 3-position Float in neutral Low Flow |
| DVG18-LFSPL-25 | 3-Way 3-Position Hold in neutral Low Flow |

DV35-SPL-11 

DV35-SPL-13 

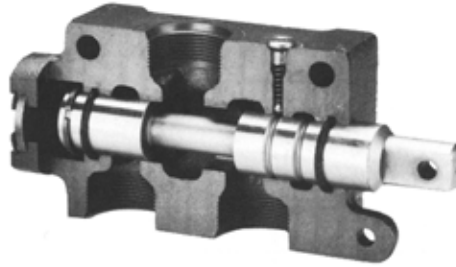
DV20-SPL-3 

DVD In-Line Accessories **H1**

Section

Diversion Valves

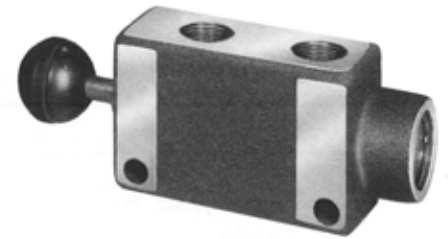
Single and Double Type



Code DVD -S61

40 gpm 2000 psi

| Code | Type | | Porting | Spring Return | Detent | Spool End | |
|---------|--------|--------|----------|---------------|--------|-----------|-----|
| | Single | Double | | | | Ball | Lug |
| DVD-S31 | • | | 3/4" NPT | | • | | • |
| DVD-S32 | • | | 3/4" NPT | | • | • | |
| DVD-S33 | • | | SAE-12 | | • | • | |
| DVD-S34 | • | | SAE-12 | | • | | • |



Code DVD -S32

60 gpm 2000 psi

| Code | Type | | Porting | Spring Return | Detent | Spool End | |
|---------|--------|--------|---------|---------------|--------|-----------|-----|
| | Single | Double | | | | Ball | Lug |
| DVD-S61 | • | | SAE-16 | | • | | • |
| DVD-S62 | • | | 1" NPT | | • | | • |
| DVD-S63 | • | | 1" NPT | | • | • | |
| DVD-D61 | | • | 1" NPT | • | | | • |
| DVD-D62 | | • | SAE-16 | • | | | • |
| DVD-D63 | | • | SAE-16 | | • | | • |

85 gpm 2000 psi

| Code | Type | | Porting | Spring Return | Detent | Spool End | |
|---------|--------|--------|-----------|---------------|--------|-----------|-----|
| | Single | Double | | | | Ball | Lug |
| DVD-S81 | • | | 1 1/4" SF | | • | | • |
| DVD-S82 | • | | SAE-20 | | • | | • |
| | | | | | | | |
| | | | | | | | |

In-Line Relief Valves

Rated @ 30 gpm

Code Description

| | |
|---------|--|
| DVLR-31 | 3/4" NPT ports • 250 to 900 psi adjustment range • Factory set @ 500 psi @ 10 gpm |
| DVLR-32 | 3/4" NPT Ports • 500 to 1500 psi adjustment range • Factory set @ 1000 psi @ 10 gpm |
| DVLR-33 | 3/4" NPT Ports • 1500 to 2500 psi adjustment range • Factory set @ 2000 psi @ 10 gpm |



DVLR-115



DVLR-64

Rated @ 60 gpm

Code Description

| | |
|----------|---|
| DVLR-61 | 1" NPT Ports • 800 to 2000 psi adj. range • Slug adj • Factory set @ 1000 psi @ 10 gpm |
| DVLR-62 | 1" NPT Ports • 2000 to 2500 psi adj range • Slug adj • factory set @ 2000 psi @ 10 gpm |
| DVLR-63 | 1" NPT Ports • 800 to 2000 psi adj. range • Screw adj. • Factory set @ 1000 psi @ 10 gpm |
| DVLR-64 | 1" NPT Ports • 2000 to 2500 psi adj. range • Screw adj. • Factory set @ 2000 psi @ 10 gpm |
| DVLR-115 | Inlet SAE-16, Outlet SAE-20 • 500 to 5000 psi adj range, Screw Adj. • Factory set @ 2000 psi @ 40 gpm |

Crossover Relief Valve

Rated @ 60 gpm

Code Description

| | |
|----------|---|
| DVLR-C61 | SAE-16 Ports • 800 to 2000 psi adj. range • Factory set @ 2000 psi @ 10 gpm |
| DVLR-C62 | SAE-16 Ports • 2000 to 2800 psi adj range • Factory set @ 2000 psi @ 10 gpm |

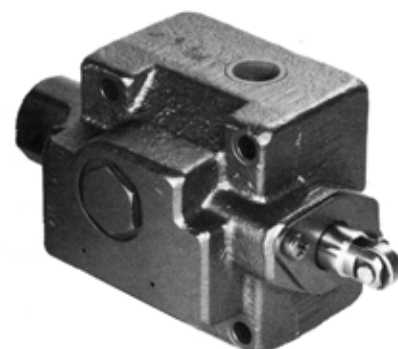
Deceleration Valve

Rated @ 40 gpm @ 3000 psi

Code Description

| | |
|----------|---|
| DDCV-N75 | 3/4 NPT Ports • Max Drain Pressure 50 psi |
| DDCV-S75 | SAE-12 Ports • Max Drain Pressure 50 psi |

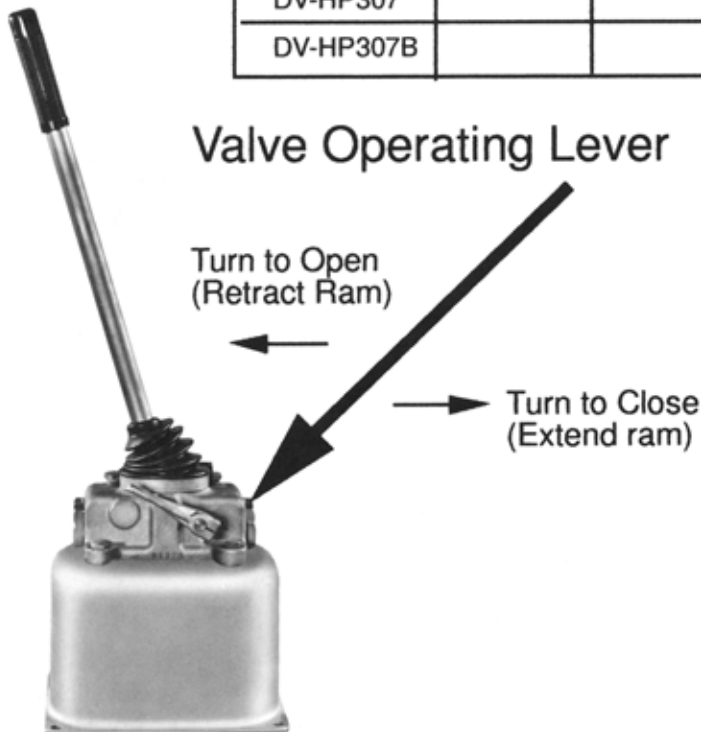
Cylinders moving at high speeds must frequently be decelerated to a slow smooth stop. Connecting a cam operated, 2-way, deceleration valve in the cylinder's output line will bring it to a smooth gradual stop by slowly closing off the return oil flow,



DDVC-N75

Hand Pumps 5000 psi (Including dust boot)

| CODE | Output in cubic inches per stroke | | | Boot | With 1- Gallon Tank | Remote Tank Piping |
|-----------|-----------------------------------|------|------|------|---------------------|--------------------|
| | .202 | .386 | .604 | | | |
| DV-HP301 | • | | | • | • | |
| DV-HP301B | • | | | • | | • |
| DV-HP304 | | • | | • | • | |
| DV-HP304B | | • | | • | | • |
| DV-HP307 | | | • | • | • | |
| DV-HP307B | | | • | • | | • |



Operation:

Replace shipping filler plug with vented cap plug. Connect flexible hose or tubing (minimum 8000 psi burst strength) to ports; if only one port is used, insert a solid plug in the unused port. Fill reservoir with enough oil to fully extend the ram plus a sufficient reserve to assure that the suction pipe is always submerged. Be careful not to contaminate the oil with dirt or water.

NEVER USE HYDRAULIC BRAKE FLUID.

Bleed lines before connecting to ram. Swivel connections will help prevent kinks and twists.

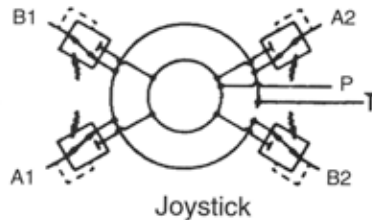
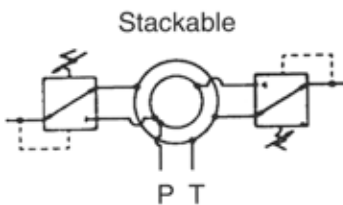
Place valve operating lever in closed position and stroke the handle back and forth to extend the ram. **CAUTION;** Moving the valve operating lever to the open position releases oil from the ram to the reservoir so that the ram retracts. A heavily loaded ram retracts rapidly and could cause injury or damage. Control the retracting speed with the operating lever.

| Model | 301 | 304 | 307 |
|---|-----------|------|------|
| Piston Diameter | .56" | .75" | .94" |
| Output/stroke (cu. in.) | .202 | .385 | .604 |
| Force (lbs) req'd on 19.5" handle for various output. | 1000 psi | 16 | 28 |
| | 1500 psi | 24 | 42 |
| | 2000 psi | 32 | 56 |
| | 3000 psi | 48 | 84 |
| | 4000 psi | 64 | |
| Strokes req'd to extend cylinder 1" | 1" cyl | 3.9 | 2 |
| | 1.5" cyl | 8.8 | 4.6 |
| | 1.75" cyl | 11.9 | 6.2 |
| | 2" cyl | 15.6 | 8.2 |
| | 2.5" cyl | 24.2 | 12.7 |

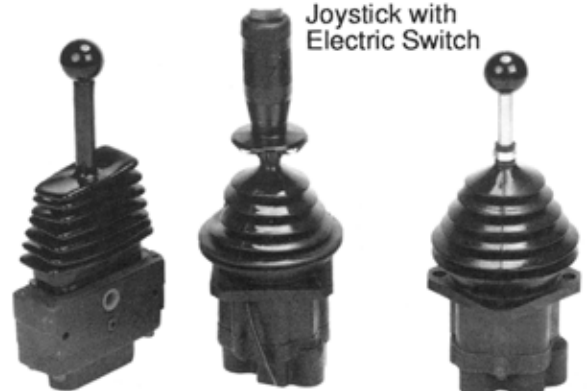
Hydraulic Remote Controls

3 to 5 gpm • 500 psi • SAE-6 Ports

| Code | Single-Function Stackable | Dual-Function Joystick | Single-Function Foot Pedal | V/A-V/G 20/35 100 to 300 psi | D-Line and VG80 50 to 200 psi | Ball Handle | Handle with Electric Switch | Marine Version |
|-----------|---------------------------|------------------------|----------------------------|------------------------------|-------------------------------|-------------|-----------------------------|----------------|
| DVHRC-DD | | • | | | • | • | | |
| DVHRC-AD | | • | | • | | • | | |
| DVHRC-DS | • | | | | • | • | | |
| DVHRC-AS | • | | | • | | • | | |
| DVHRC-DDE | | • | | | • | | • | |
| DVHRC-ADE | | • | | • | | | • | |
| DVHRC-DSM | • | | | | • | • | | • |
| DVHRC-ASM | • | | | • | | • | | • |
| DVHRC-DDM | | • | | | • | • | | • |
| DVHRC-ADM | | • | | • | | • | | • |
| DVHRC-DF | | | • | | • | | | |
| DVHRC-AF | | | • | • | | | | |



Stackable Unit



Kits

| Code | Description |
|-----------|--|
| DVHRC-KS2 | Seal kit for single-function Stackable codes DVHRC-AS & DS |
| DVHRC-KD2 | Seal Kit for dual-function Joystick codes DVHRC-AD • DD • ADE • DDE |
| DVHRC-KSM | Marine Conversion Kit for Stackable codes DVHRC-AS • DS |
| DVHRC-KDM | Marine Conversion Kit for Joystick codes DVHRC-AD • DD • ADE • DDE |
| DVHRC-KD | Conversion Kit VA to D-Line. 1-req'd for stackable, 2-req'd for joystick |
| DVHRC-KA | Conversion Kit D-Line to VA. 1-req'd for stackable, 2-req'd for joystick |
| DVHRC-KSE | Single-function Stackable Handle with Electric Switch |
| DVHRC-KDE | Dual-function Joystick Handle with Electric Switch |
| DVHRC-MB | Mounting bracket for stackable controllers |
| DVHRC-MBM | Marine mounting bracket for stackable controllers. |



Foot Pedal

Stud Kits Torque to 100 inch pounds Number of Stackable Controllers

| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| DVHRC | RSK-1 | RSK-2 | RSK-3 | RSK-4 | RSK-5 | RSK-6 | RSK-7 | RSK-8 |

Pneumatic Remote Controls

11.7 SCFM @ 100 PSIG / 140 psi Maximum
1/8" - 27 NPT Ports

* See Handle Kit chart for handles

| Code | Dual (one) Function | Quad (two) Function | Handle | Neutral Detent | 25/32 Spacer |
|----------|---------------------|---------------------|--------|----------------|--------------|
| DVPC-DC | • | | * | | |
| DVPC-QC | | • | • | | |
| DVPC-DCD | • | | • | • | |
| DVPC-SB | | | | | • |



Handle Kits for DVPC-DC

| Code | Degree of Bend | FEATURES |
|-----------|----------------|------------------|
| DVPC-H1 | Vertical | Std Handle |
| DVPC-H1LK | Vertical | Handle W/ Light |
| DVPC-H2 | 18° | Std Handle |
| DVPC-H3 | 35° | Std Handle |
| DVPC-H4 | 46° | Std Handle |
| DVPC-H5 | 55° | Std Handle |
| DVPC-HLK | — | Handle light kit |



DVPC-QC



DVPC-DCD



DVPC-DC

Controller Repair Kits

| Code | Description |
|----------|--------------------------------|
| DVPC-SR | Seal Repair Kit |
| DVPC-CR | Complete Repair Kit |
| DVPC-RR | Rocker Kit for Dual Controller |
| DVPC-QHK | Quad Controller Handle Kit |
| DVPC-BQ | Quad Controller Boot |
| DVPC-BDC | Dual Controller Boot |

Bank Assembly Kits

| Code | Description |
|-----------|----------------------------|
| DVPC-AK-1 | For ONE dual controller |
| DVPC-AK-2 | For TWO dual controllers |
| DVPC-AK-3 | For THREE dual controllers |
| DVPC-AK-4 | For FOUR dual controllers |
| DVPC-AK-5 | For FIVE dual controllers |
| DVPC-AK-6 | For SIX dual controllers |
| DVPC-AK-7 | For SEVEN dual controllers |

Torque to 60 inch pounds.

Control Valve Air Shift Cap & Seal Kits

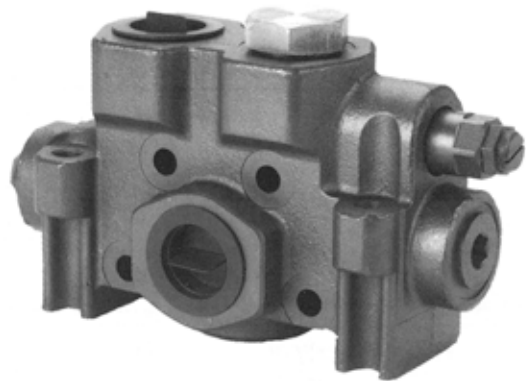
| Code | Description |
|------------|--------------------------------|
| DV20-K-113 | VA and VG20 Air Cap Kit |
| DV35-K-213 | VA and VG35 Air Cap Kit |
| DV20-K-6 | VA and VG20 Cap Seal Kit |
| DV35-K-16 | VA and VG35 Cap Seal Kit |
| DV-K-7 | VA & VG 20 and 35 Cap Seal Kit |

Unloader Inlet

| Code | End Port H.P. | Top Port H.P. | Bottom Port | Top Port L.P. |
|---------------|------------------|------------------|----------------|------------------|
| DVA35-AUL9909 | SAE-20 | SAE-20 | N/A | SAE-20 |

Flow Control

| CODE | Flow Control Range (gpm) |
|---------------|-----------------------------|
| DVHOC-FCBL | Flow Control Block |
| DVHOC-FCOR-40 | 40 - 44 Orifice |
| DVHOC-FCOR-45 | 45 - 49 Orifice |
| DVHOC-FCOR-50 | 50 - 54 Orifice |
| DVHOC-FCOR-55 | 55 - 60 Orifice |



Note: FCBL Block is furnished without orifice. Order the FCOR orifice to complete flow Control assembly

By-Pass Block

| Code | Porting |
|----------------|--------------------------|
| DVHOC-BPB-2-12 | 2" Split Flange X SAE-12 |

Stud Kits

Number of Sections between inlet and outlet

| Code | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| DVHOC- | USK-0 | USK-1 | USK-2 | USK-3 | USK-4 | USK-5 | USK-6 | USK-7 |

Torque to 400 inch pounds

Note: Use stud kits DVHOC-USK-0 for in-line unloader assembly

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6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges

paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property, Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. Patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter 'Intellectual Property Rights'). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights. If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

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