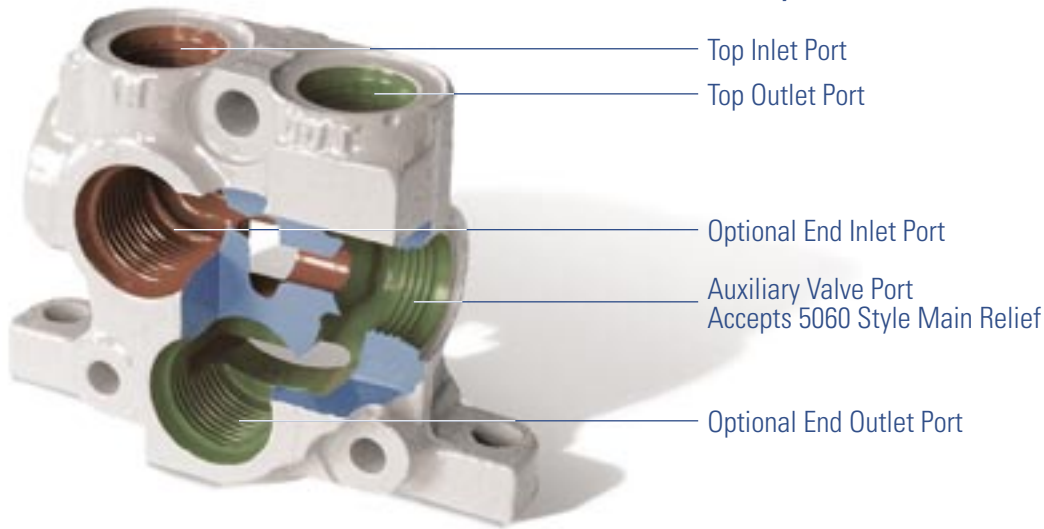


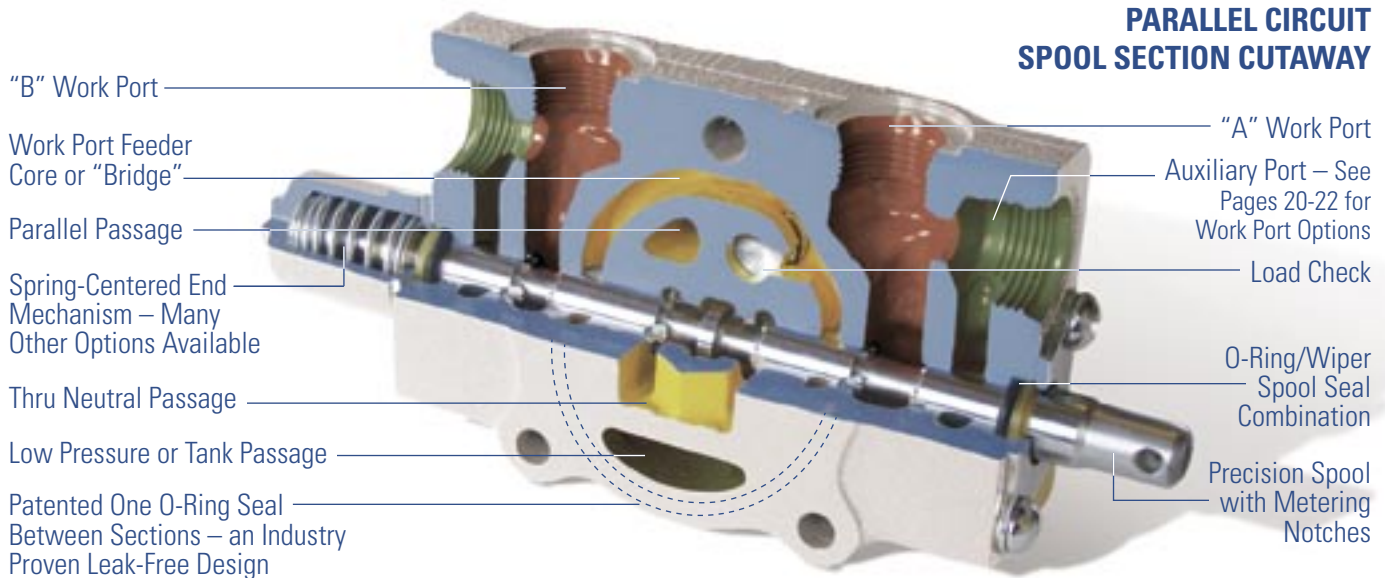
**HUSCO**  
**INTERNATIONAL**  
control focused - technology driven

# MODEL 5000 SECTIONAL CUTAWAY

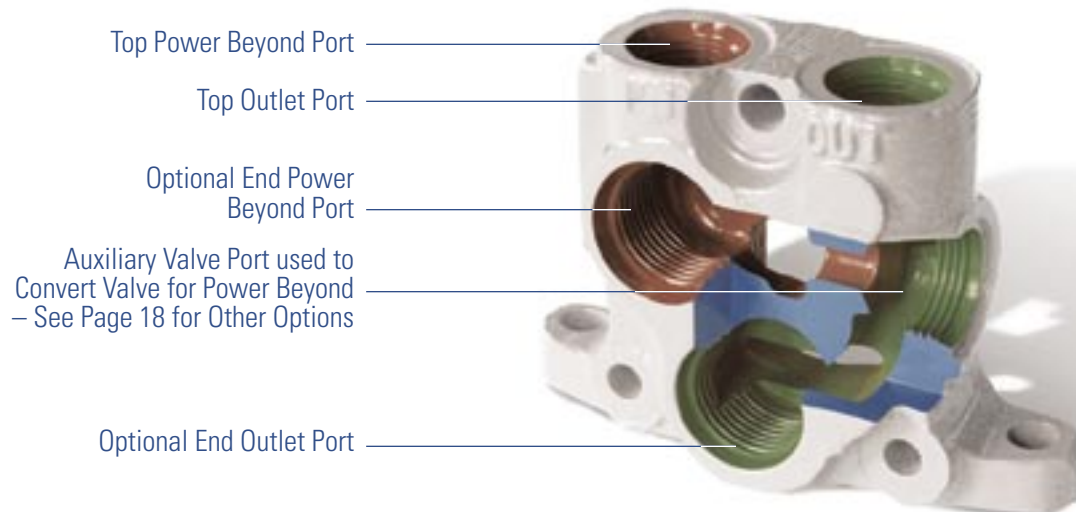
## INLET/OUTLET SECTION CUTAWAY



## PARALLEL CIRCUIT SPOOL SECTION CUTAWAY



## UNIVERSAL OUTLET/ POWER BEYOND SECTION CUTAWAY



## MODEL 5000

Since 1946, HUSCO International has established itself as the resource OEM engineers rely on for help designing high quality, innovative, customized products that meet precision motion control requirements. This catalog fully illustrates the component features and options you need to specify, build and service a Model 5000 sectional body directional control valve.

Designed for hydraulic systems, the Model 5000 valve line is made from an assortment of valve component sections and options that deliver the desired control valve circuit to match your specific application.

### FEATURES

- 3000 psi operating pressure rating (207 bar)
- Open-center or closed-center operation
- Hard chrome plated spools
- Load check in each section
- Single “low pressure” O-ring sealing between sections
- Precision spool with metering notches

### OPTIONS

- High pressure carryover (Power Beyond)
- Lock-out spool section (Built-in pilot operated check valve section)
- Mid-inlet flow combiner or separator
- Left-hand spool sections\*
- Parallel, Conventional and Series circuitry
- End mechanisms:
  - Spring centered
  - Detent – single or multi-position
  - 4th position float
  - Hydraulic remote
  - Pneumatic remote
  - Automatic kick-out
- Auxiliary valves:
  - Pilot-operated, anti-cavitation check combination; relief cartridges
  - Anti-cavitation; cartridges
- Regenerative spools\*
- Specialized spools\*

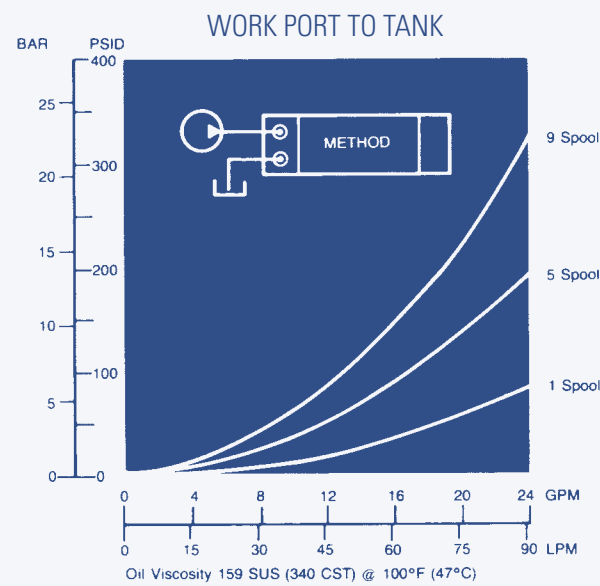
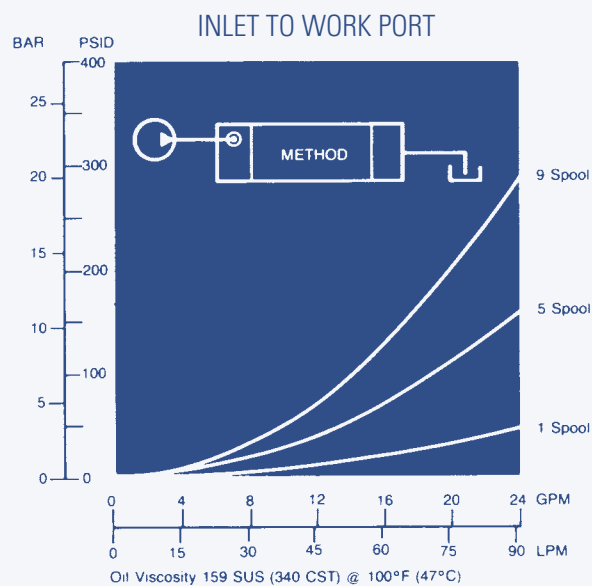
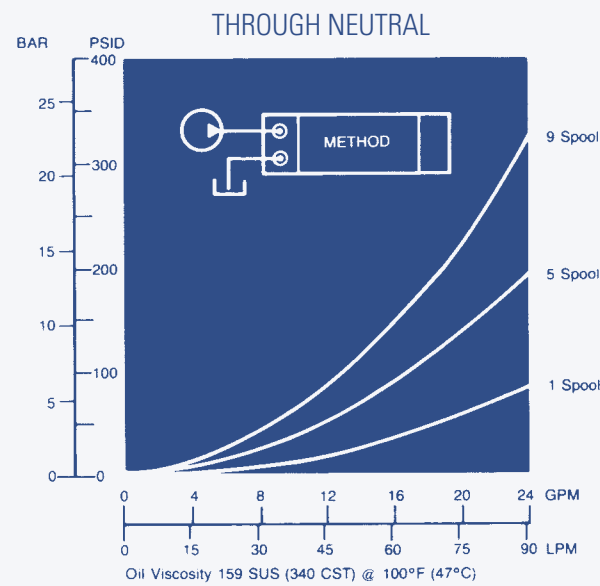
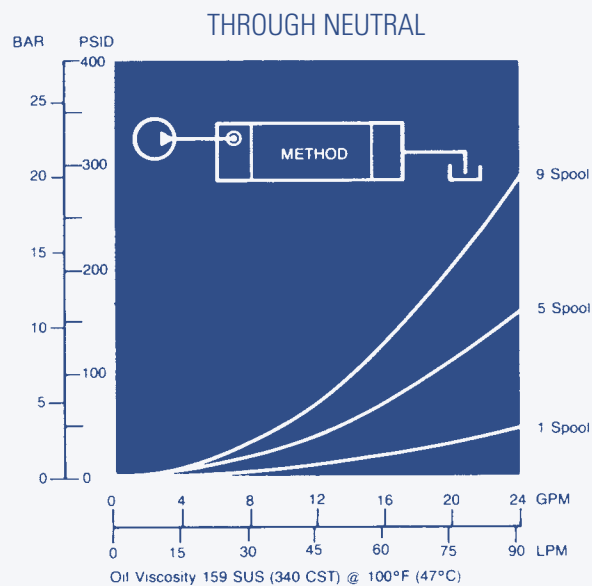
\* Consult HUSCO

|                                                                            |       |
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# PRESSURE DROP CURVES AND TECHNICAL DATA



|                             |                                                                                                                                                                                             |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flow rating (nominal) ..... | 20 gpm (75 lpm)                                                                                                                                                                             |
| Operating Pressure* .....   | 3000 psi (207 bar)<br>(Method of verifying<br>rated fatigue pressure of<br>the pressure containing<br>envelope conforms to<br>NFPA Recommended<br>Std., NFPA/2.6.1 – 1974<br>Category 1/90) |
|                             | * Higher pressure applications consult HUSCO                                                                                                                                                |

|             |                                    |
|-------------|------------------------------------|
| Seals ..... | Buna-N Standard<br>Vitron Optional |
|-------------|------------------------------------|

|                                                                                  |              |
|----------------------------------------------------------------------------------|--------------|
| Recommended<br>Filtration .....                                                  | ISO 20/18/13 |
| Maximum number of spool sections<br>(any combination of) per valve assembly .... | 11           |
| Maximum outlet port/tank<br>core (return) pressure .....                         | 500 psi      |

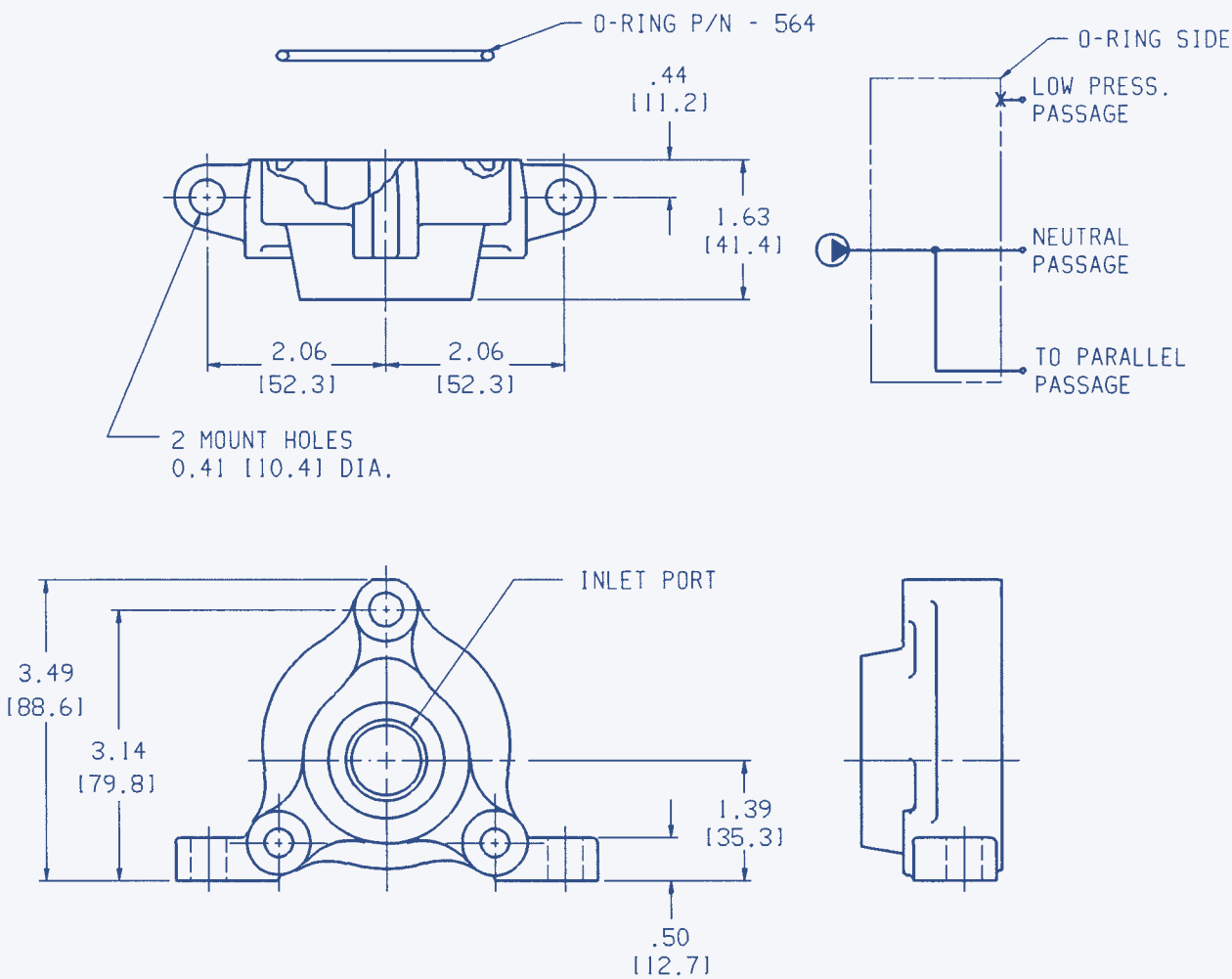
We reserve the right to amend these specifications at any time without notice.  
The only warranty applicable is our standard written warranty. We make no other  
warranty, expressed or implied.

Performance characteristics shown are typical of production units tested in the  
laboratory and are not necessarily representative of any one unit.



INLET SECTION ASSEMBLIES

WITH END PORT. NO AUXILIARY VALVE PORT OPTION (FOR APPLICATIONS THAT DO NOT REQUIRE A MAIN RELIEF VALVE AT THE VALVE ASSEMBLY)

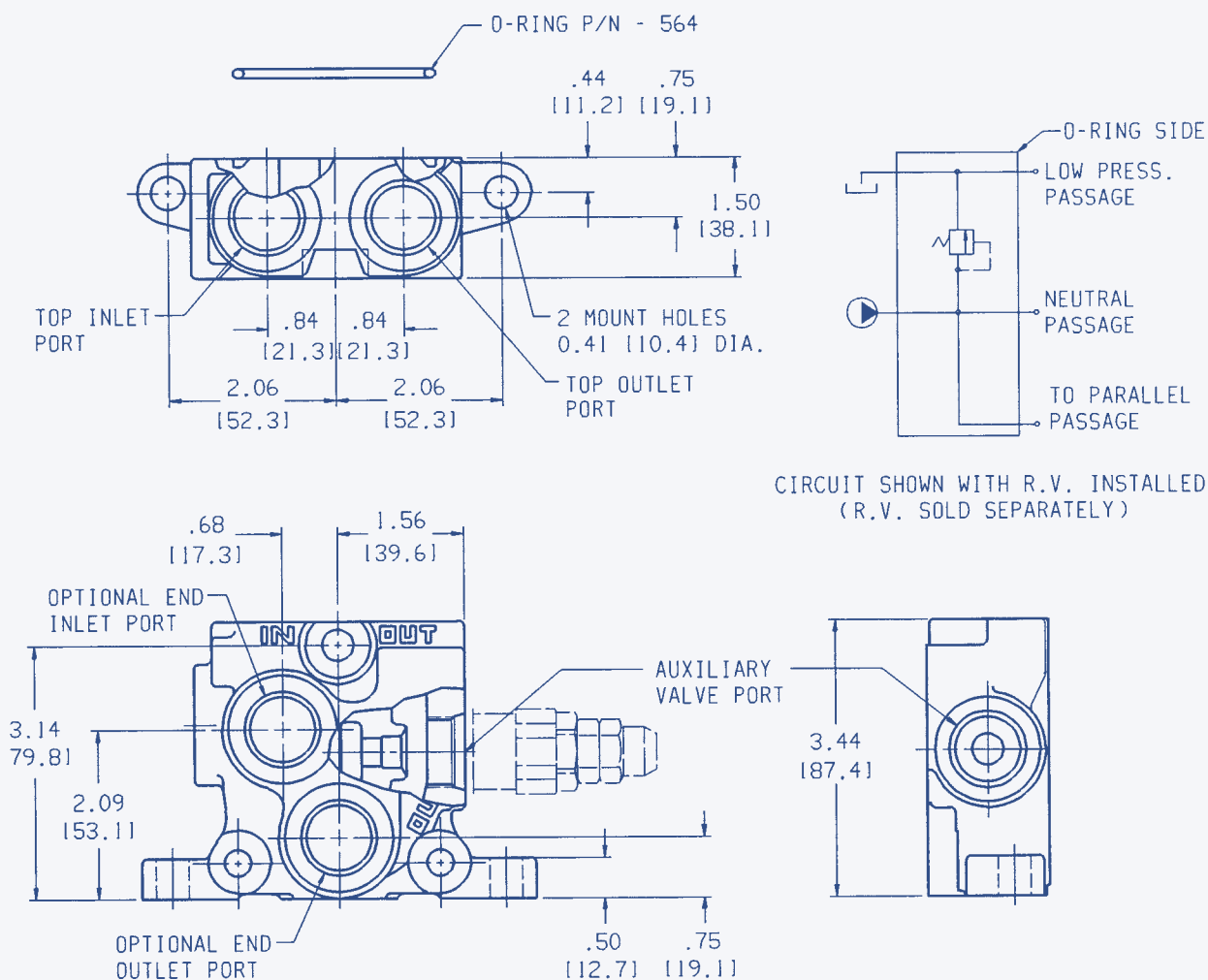


| PORT SIZE | INLET SECTION<br>PART NUMBER |
|-----------|------------------------------|
| SAE 10    | 5001-A35                     |

USED IN SECTION ① OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

INLET/OUTLET SECTION ASSEMBLIES

WITH AUXILIARY VALVE PORT FOR MAIN RELIEF VALVE.  
TOP INLET/OUTLET PORTS OPTIONAL END INLET/OUTLET PORTS.



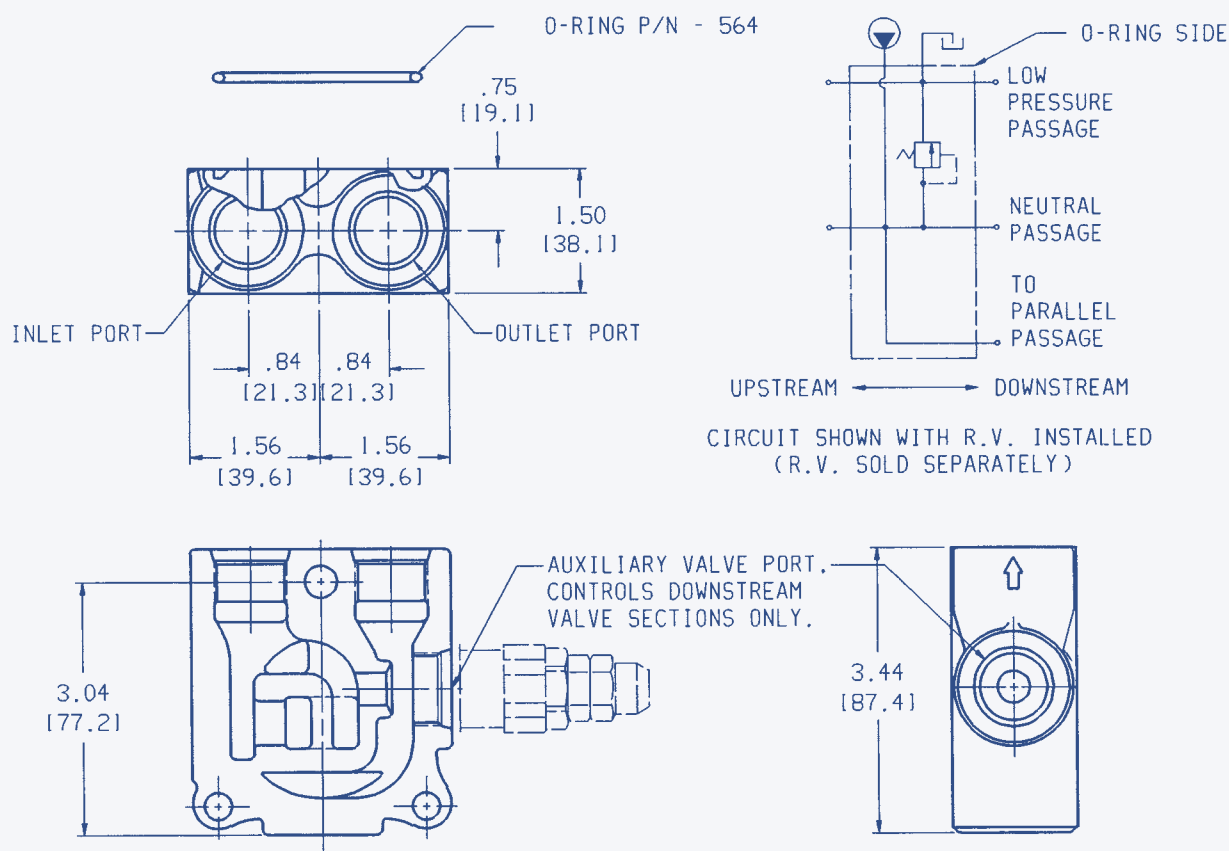
| PORT SIZES |              |        |               | INLET SECTION<br>PART NUMBERS |
|------------|--------------|--------|---------------|-------------------------------|
| TOP        | INLET<br>END | TOP    | OUTLET<br>END |                               |
| SAE 10     | NONE         | SAE 10 | NONE          | 5001-A59                      |
| SAE 10     | SAE 10       | SAE 10 | SAE 10        | 5001-A115                     |
| SAE 10     | SAE 12       | SAE 10 | SAE 12        | 5001-A88                      |

USED IN SECTION ① OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

SEE CUT-AWAY PHOTO ON PAGE 19

MID-INLET COMBINER SECTION ASSEMBLY

MID-INLET PUMP FLOW COMBINES WITH UPSTREAM PUMP FLOW TO FEED DOWNSTREAM SPOOL SECTIONS. WHEN UPSTREAM SPOOL SECTIONS ARE ACTIVATED, DOWNSTREAM SPOOL SECTIONS ARE EXPOSED TO MID-INLET PUMP FLOW ONLY.



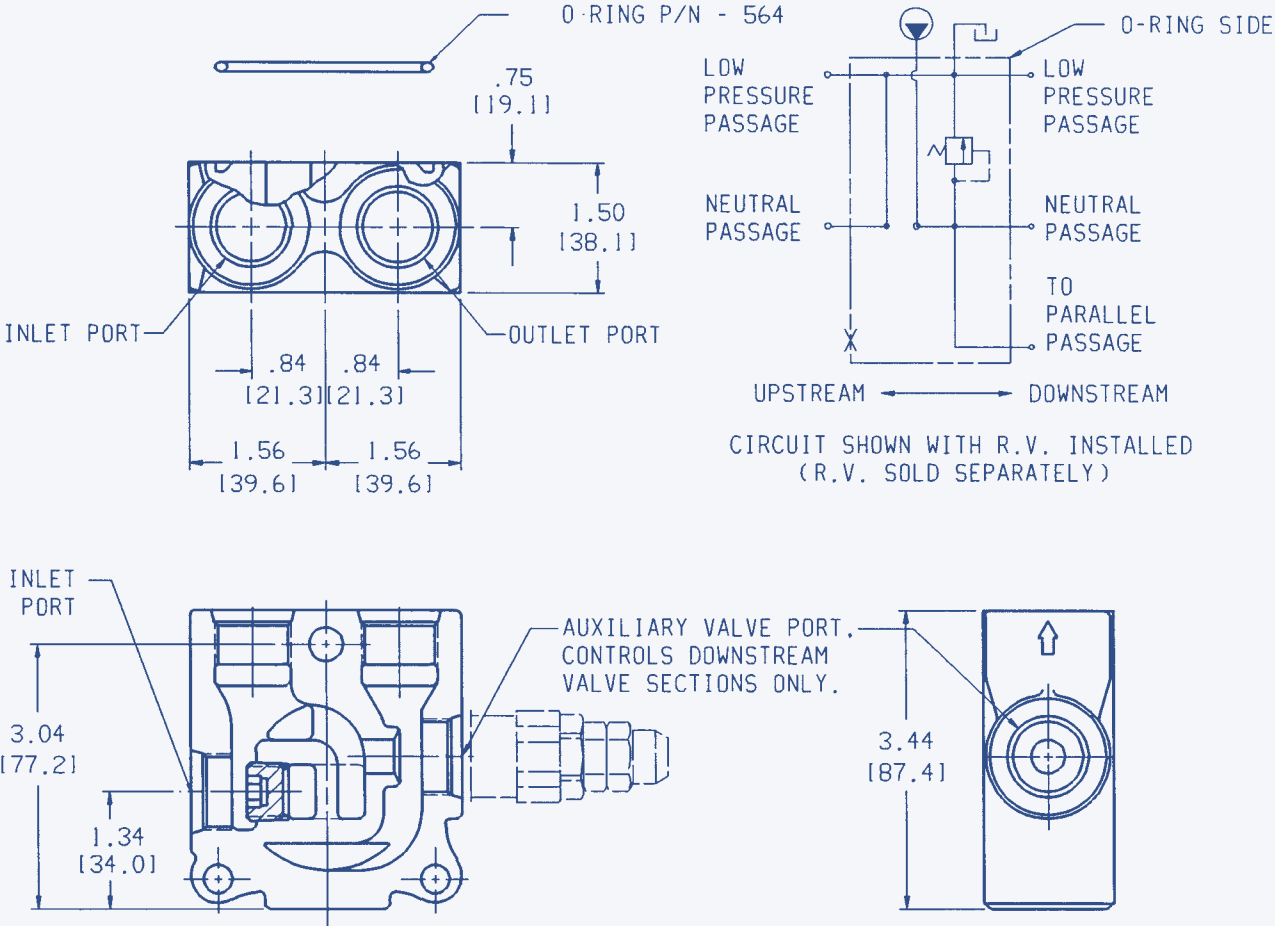
MID-INLET SECTIONS ARE USED IN-BETWEEN SPOOL SECTIONS EITHER TO ADD FLOW TO THE DOWNSTREAM SPOOL SECTIONS "COMBINER" OR TO INTRODUCE A "SEPARATE FLOW" CONDITION TO THE DOWNSTREAM SPOOL SECTIONS. MID-INLET SECTIONS ARE COUNTED AS A SPOOL SECTION WHEN DETERMINING TIE ROD KIT NUMBER.

| PORT SIZES |        | INLET SECTION<br>PART NUMBER |
|------------|--------|------------------------------|
| INLET      | OUTLET |                              |
| SAE 10     | SAE 10 | 5001-M15                     |

USED IN SECTION ② OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

MID-INLET SEPARATE FLOW SECTION ASSEMBLY

MID-INLET PUMP FLOW FEEDS DOWNSTREAM SPOOL SECTIONS.  
UPSTREAM PUMP FLOW TO LOW PRESSURE.

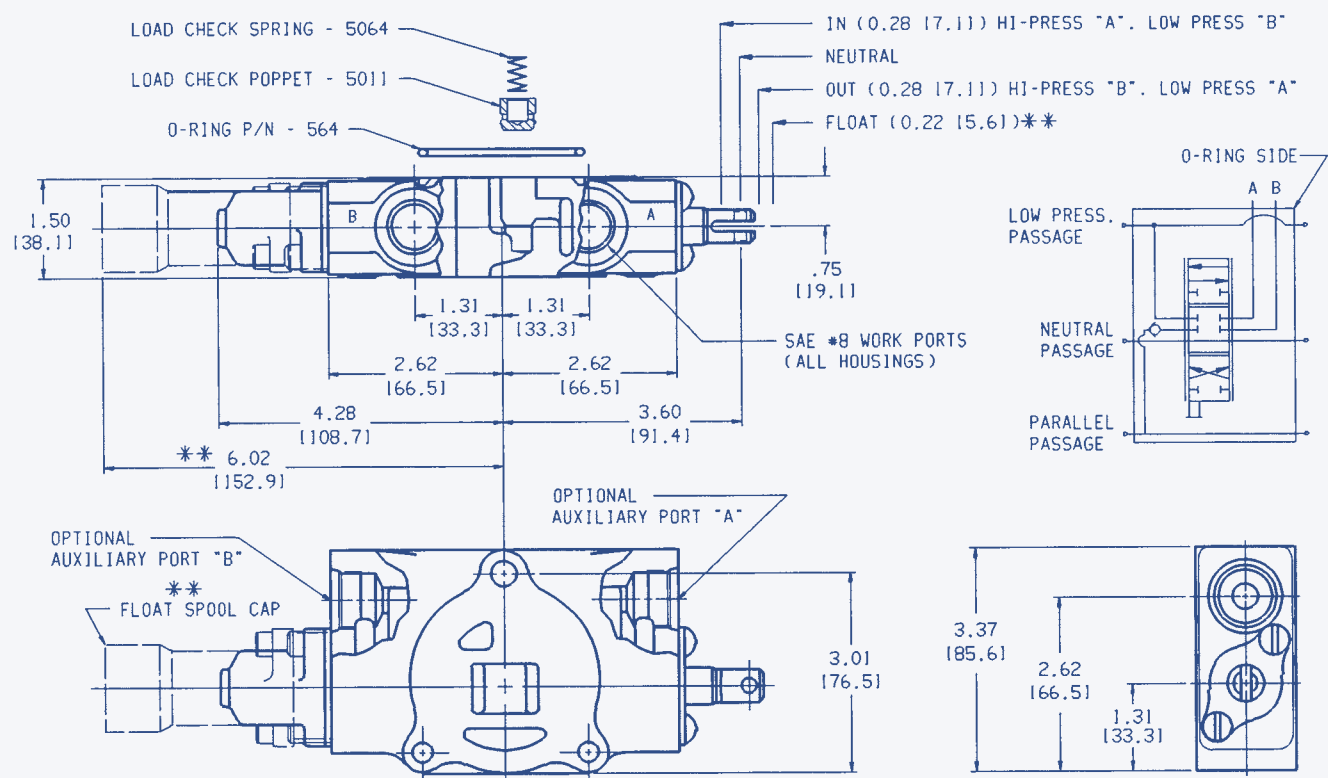


MID-INLET SECTIONS ARE USED IN-BETWEEN SPOOL SECTIONS EITHER TO ADD FLOW TO THE DOWNSTREAM SPOOL SECTIONS "COMBINER" OR TO INTRODUCE A "SEPARATE FLOW" CONDITION TO THE DOWNSTREAM SPOOL SECTIONS. MID-INLET SECTIONS ARE COUNTED AS A SPOOL SECTION WHEN DETERMINING TIE ROD KIT NUMBER.

| PORT SIZES   |        | INLET SECTION<br>PART NUMBER |
|--------------|--------|------------------------------|
| INLET (BOTH) | OUTLET |                              |
| SAE 10       | SAE 10 | 5001-M16                     |

USED IN SECTION ② OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

# PARALLEL CIRCUIT MANUALLY OPERATED SPOOL SECTION ASSEMBLIES



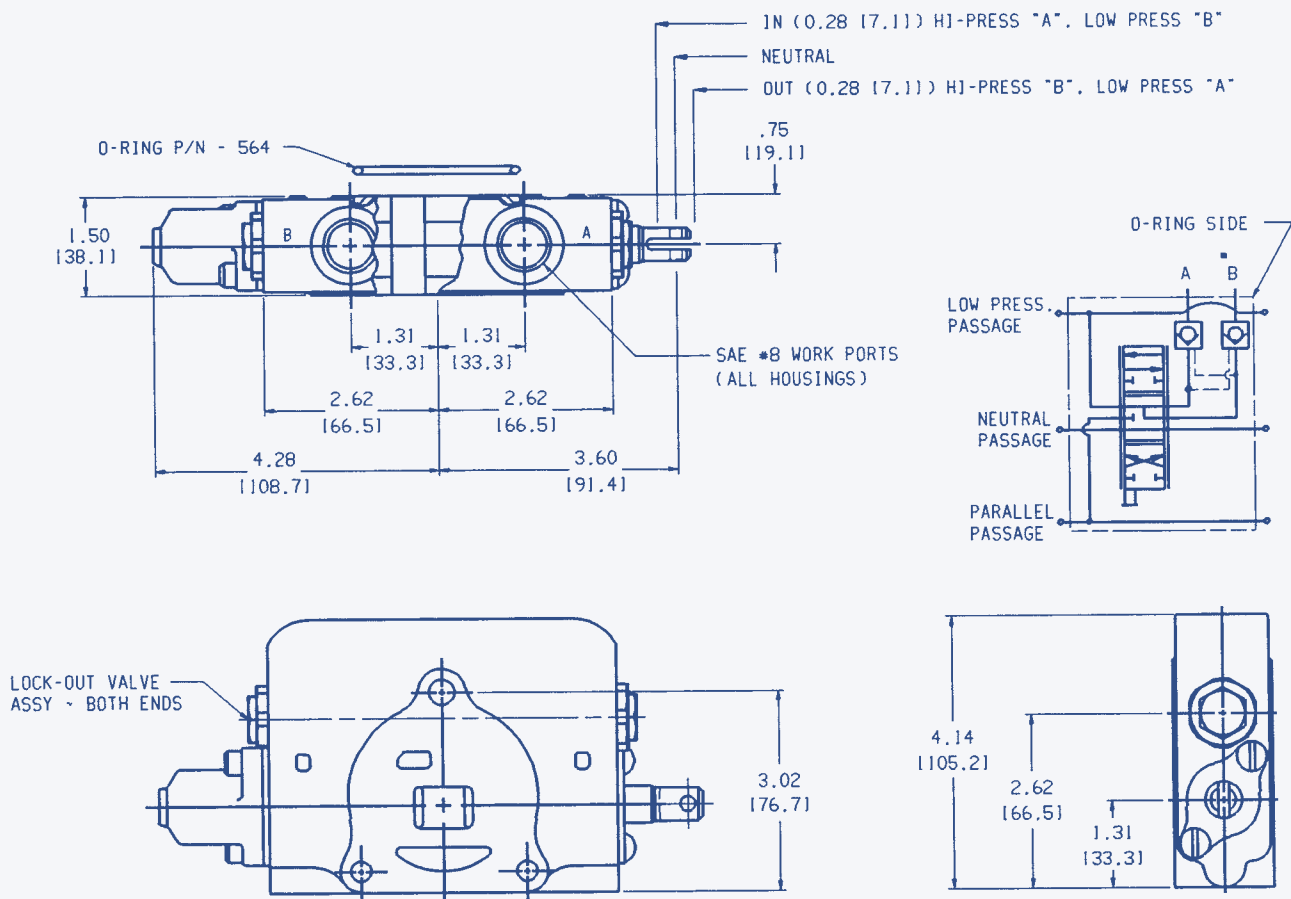
| 3 POS. - 4 WAY                      |             |                        | SPOOL SECTION ASSY. PART NUMBERS |                         |
|-------------------------------------|-------------|------------------------|----------------------------------|-------------------------|
| SPOOL AND END MECHANISM<br>IN → OUT | SPPOOL P/N: | END MECHANISM KIT P/N: | WITH NO AUX. VALVE PORTS         | WITH 2 AUX. VALVE PORTS |
| SPRING CTR                          | 5031        | B10-100                | 5002-A1                          | 5002-A269               |
| 3 POS. DETENTED                     | 5031        | B11-100                | 5002-A2                          | 5002-A511               |
| SPRING CTR FLT IN NEUTRAL (MOTOR)   | 5051        | B10-100                | 5002-A10                         | 5002-A522               |
| 3 POS DET FLT IN NEUTRAL (MOTOR)    | 5051        | B11-100                | 5002-A11                         | 5002-A654               |
| 3 POS. - 3 WAY                      |             |                        |                                  |                         |
| SPRING CTR (SINGLE ACTING)          | 5030        | B10-100                | 5002-A4                          | 5002-A655*              |
| ** 4 POS. - 4 WAY                   |             |                        | * ONLY ONE AUX. PORT ("A" SIDE)  |                         |
| SPRING CTR DETENTED FLOAT           | 5032        | B11-105                | 5002-A8                          | 5002-A465               |

STANDARD SPRING CENTERING FORCES (SPRING P/N: 5014) = 37 LBS.

USED IN SECTION ② OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

PARALLEL CIRCUIT MANUALLY OPERATED  
LOCK-OUT SPOOL SECTION ASSEMBLY

(PILOT OPERATED CHECK SECTION)

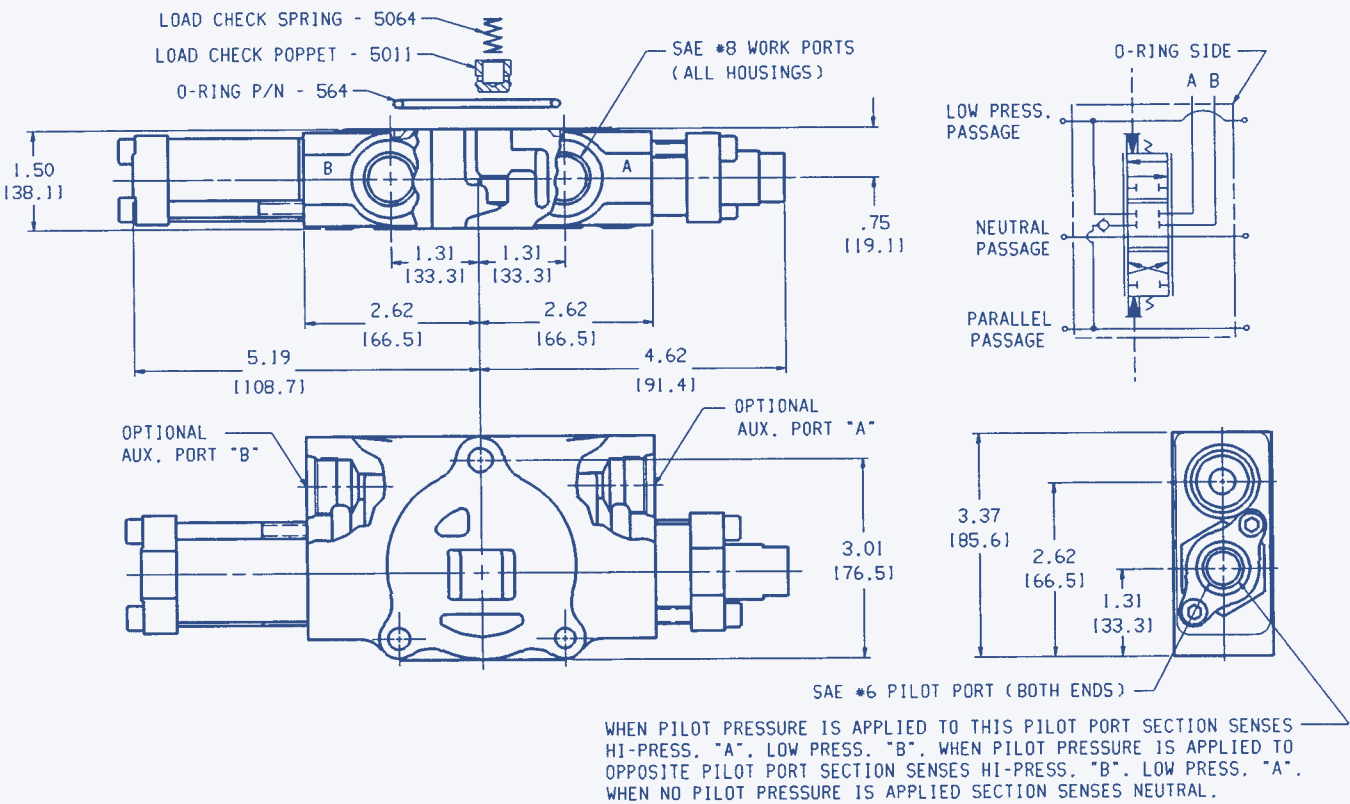


| 3 POS. - 4 WAY                                                                                 |                |                              |                                     |
|------------------------------------------------------------------------------------------------|----------------|------------------------------|-------------------------------------|
| SPOOL AND END MECHANISM<br>IN ← → OUT                                                          | SPPOOL<br>P/N: | END<br>MECHANISM<br>KIT P/N: | SPPOOL SECTION ASSY.<br>PART NUMBER |
|  SPRING CTR | 50963-1        | B10-100                      | 5002-YA2                            |

STANDARD SPRING CENTERING FORCES (SPRING P/N: 5014) = 37 LBS.

USED IN SECTION ② OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

# PARALLEL CIRCUIT HYDRAULIC REMOTE (OIL PILOT OPERATED) SPOOL SECTION ASSEMBLIES



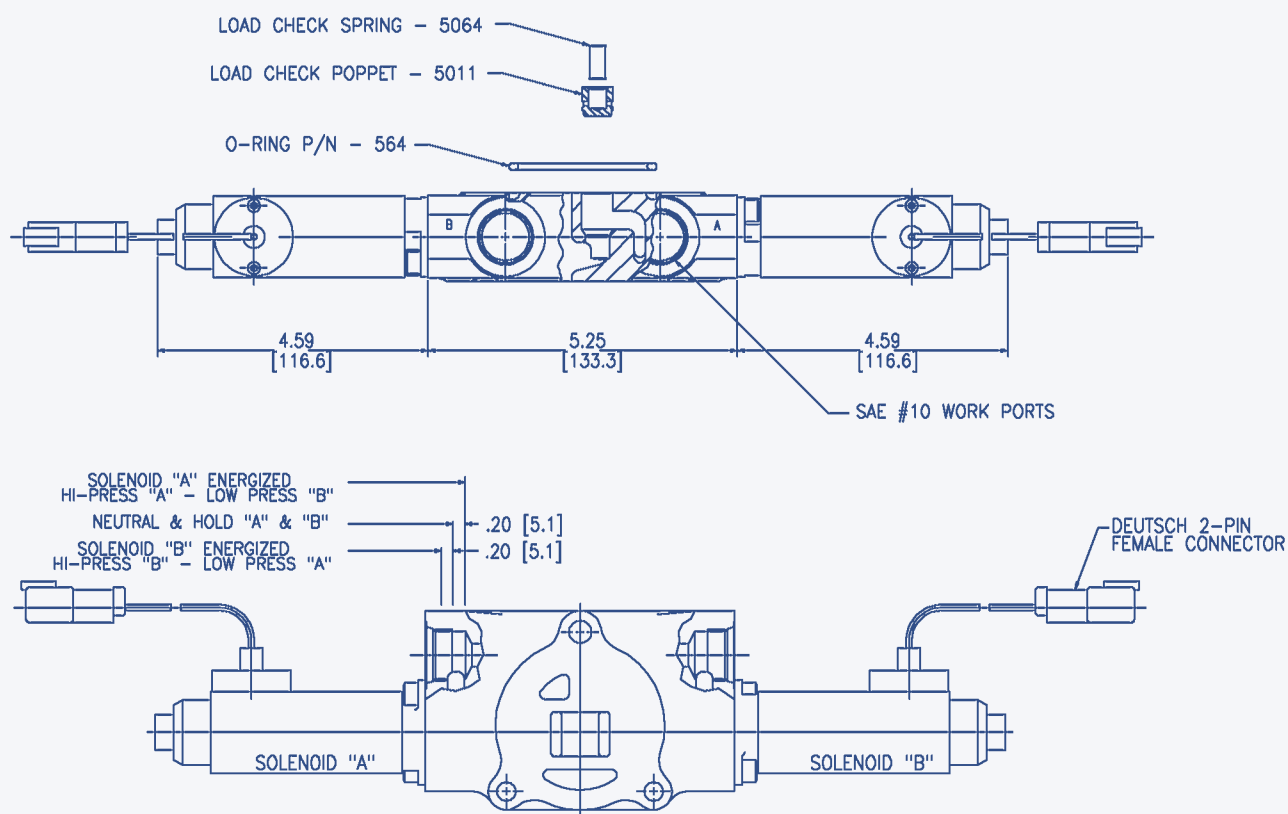
| 3 POS. - 4 WAY                                                                                       |             |                        | SPOOL SECTION ASSY. PART NUMBERS |                         |
|------------------------------------------------------------------------------------------------------|-------------|------------------------|----------------------------------|-------------------------|
| SPOOL AND END MECHANISM<br>IN → OUT                                                                  | SPPOOL P/N: | END MECHANISM KIT P/N: | WITH NO AUX. VALVE PORTS         | WITH 2 AUX. VALVE PORTS |
|  SPRING CTR       | 5031        | B12-108                | 5002-A831                        | 5002-A832               |
|  SPRING CTR MOTOR | 5051        | B12-108                | 5002-A833                        | 5002-A834               |

|                                             |                                          |
|---------------------------------------------|------------------------------------------|
| APPROXIMATE PILOT PRESSURE VS SPOOL TRAVEL: |                                          |
| 20 PSI                                      | -- SPOOL STARTS TO SHIFT                 |
| 80 PSI                                      | -- FLOW BEGINS AT WORK PORT              |
| 360 PSI                                     | -- FULL SPOOL SHIFT, FULL WORK PORT FLOW |
| 1000 PSI                                    | -- MAX.                                  |

|                                              |                                  |
|----------------------------------------------|----------------------------------|
| USE WITH HUSCO MANUAL HYDRAULIC CONTROLLERS: |                                  |
| STD. SECTIONAL TYPE:                         | P/N 7470-A15 (1-SPOOL OPERATION) |
| STD. JOYSTICK TYPE:                          | P/N 7480-19 (2-SPOOL OPERATION)  |

USED IN SECTION ② OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

PARALLEL CIRCUIT ELECTRIC  
SPOOL SECTION ASSEMBLIES

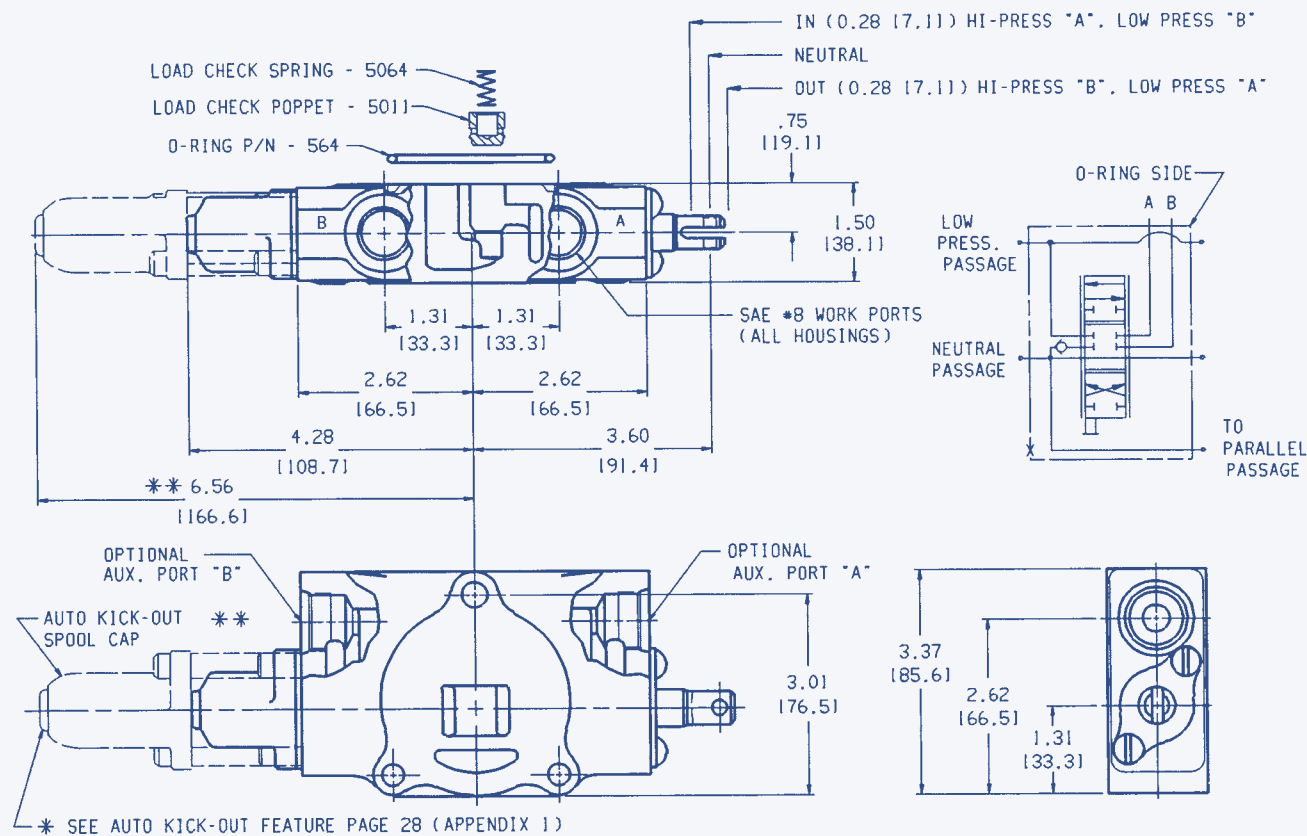


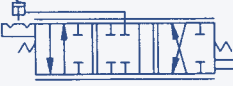
| 3 POS.-4 WAY                      |               | SPOOL SECTION ASSY.<br>PART NUMBERS |                             |                            |  |
|-----------------------------------|---------------|-------------------------------------|-----------------------------|----------------------------|--|
| SPOOL AND END MECHANISM<br>IN→OUT | SPOOL<br>P/N: | SOLENOID<br>P/N:                    | WITH NO AUX.<br>VALVE PORTS | WITH 2 AUX.<br>VALVE PORTS |  |
|                                   |               |                                     |                             |                            |  |
| SPRING CTR                        | 52310         | 54077-5                             | 5002-A1156                  | 5002-A963                  |  |

SOLENOID SPECIFICATIONS:  
VOLTAGE: 12 VDC NOMINAL  
CURRENT: 4.6 AMPS  
POWER: 54 WATTS  
FORCE: 40 N  
STROKE: 0.20" [5.1 mm]  
TYPE: ON/OFF  
CONTINUOUSLY RATED

USED IN SECTION ② OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

CONVENTIONAL CIRCUIT MANUALLY OPERATED  
SPOOL SECTION ASSEMBLIES (TANDEM)



| 3 POS. - 4 WAY                                                                                                                       |            |                        | SPOOL SECTION ASSY. PART NUMBERS |                         |
|--------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------|----------------------------------|-------------------------|
| SPOOL AND END MECHANISM<br>IN → OUT                                                                                                  | SPOOL P/N: | END MECHANISM KIT P/N: | WITH NO AUX. VALVE PORTS         | WITH 2 AUX. VALVE PORTS |
|  SPRING CTR                                       | 5031       | B10-100                | 5002-B3                          | 5002-B135               |
| ** 3 POS. - 4 WAY (AUTO KICK-OUT)                                                                                                    |            |                        |                                  |                         |
|  SPRING CTR<br>DETENT IN & OUT<br>(AUTO KICK-OUT) | N/A        | N/A                    | 5002-B141                        | 5002-B142               |

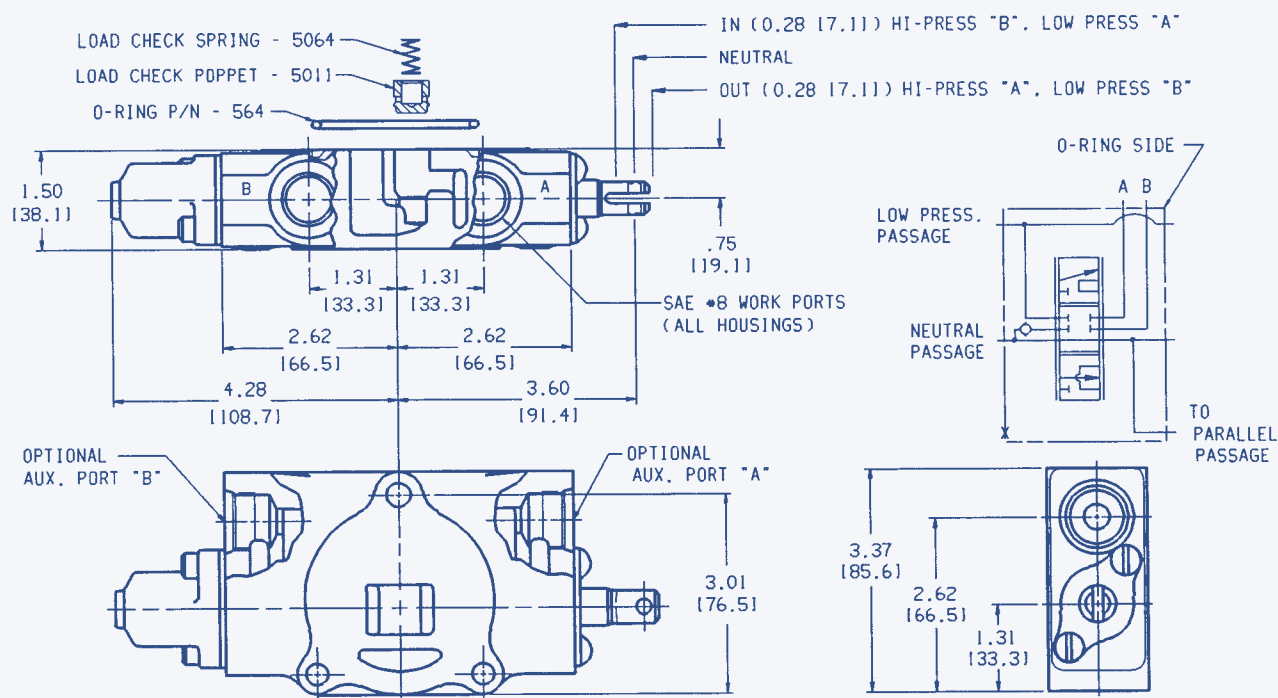
STANDARD SPRING CENTERING FORCES (SPRING P/N: 5014) • 37 LBS.

\* REMOVE CAP FOR AUTO KICK-OUT ADJUSTMENTS. USE FLAT HEAD SCREWDRIVER FOR ADJUSTING. (SEE Pg. 28)  
FACTORY SET AT 2000 PSI.  
SETTING RANGE: 1000 - 2500 PSI

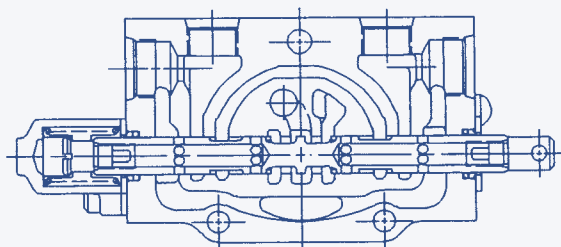
USED IN SECTION ② OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

WEIGHT: APPROX. 5.1 LBS. [2.3 kg] \*\*WEIGHT: APPROX. 5.6 LBS. [2.5 kg]

# SERIES CIRCUIT MANUALLY OPERATED SPOOL SECTION ASSEMBLIES



FULL SECTION VIEW OF P/N: 5002E36



SERIES CIRCUITRY IS ACCOMPLISHED BY USING A HOLLOW SPOOL

NOTE: BECAUSE THE WORK PORT TO TANK FLOW PATH IS THROUGH A HOLLOW SPOOL, THE WORK PORT TO TANK PRESSURE DROP ON SERIES SECTION ASSEMBLIES INCREASES APPROXIMATELY 300% OVER THE AMOUNT LISTED ON THE GRAPH ON PAGE 5. ALL OTHER PRESSURE DROPS REMAIN THE SAME. THE SERIES SPOOL SECTION ASSEMBLY IS THE ONLY SECTION THAT IS SYMMETRICAL AND CAN BE CONVERTED FROM R. H. (STD) TO L. H. ASSEMBLY.

| 3 POS. - 4 WAY                                                                      |            |               | SPOOL SECTION ASSY.<br>PART NUMBERS |                                                                                                                      |                                                                                                                     |
|-------------------------------------------------------------------------------------|------------|---------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| SPOOL AND END MECHANISM<br>IN↔OUT                                                   |            | SPOOL<br>P/N: | END<br>MECHANISM<br>KIT P/N:        | WITH NO AUX.<br>VALVE PORTS<br> | WITH 2 AUX.<br>VALVE PORTS<br> |
|  | SPRING CTR | 52261         | B10-103                             | 5002-E31                                                                                                             | 5002-E36                                                                                                            |

STANDARD CENTERING SPRING FORCES (SPRING P/N: 5014) = 37 LBS.

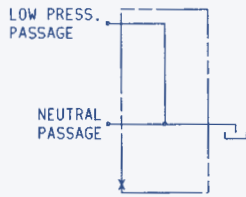
USED IN SECTION ② OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

# OUTLET SECTION ASSEMBLIES

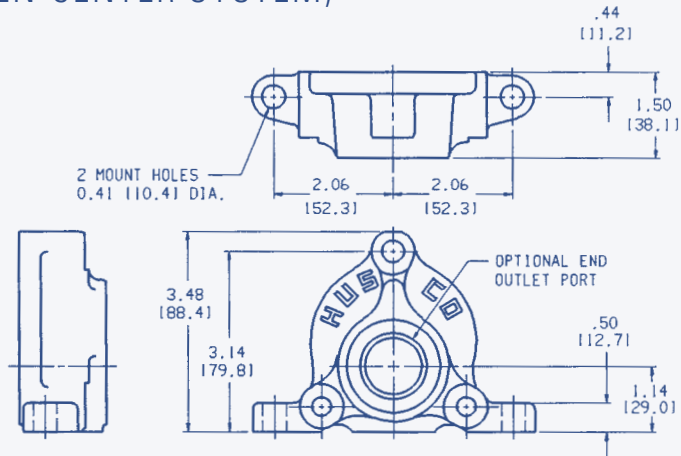
## END OUTLET/TURNAROUND (OPEN-CENTER SYSTEM)

| PORT SIZE | OUTLET SECTION PART NUMBER |
|-----------|----------------------------|
| NONE      | 5003-A1 *                  |
| SAE 12    | 5003-A3                    |

\* REQUIRES UPSTREAM OUTLET PORT SOMEWHERE ELSE IN VALVE STACK

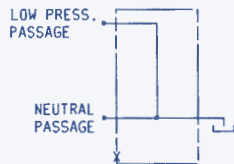


WEIGHT : APPROX. 2.0 LBS. 10.91 kg

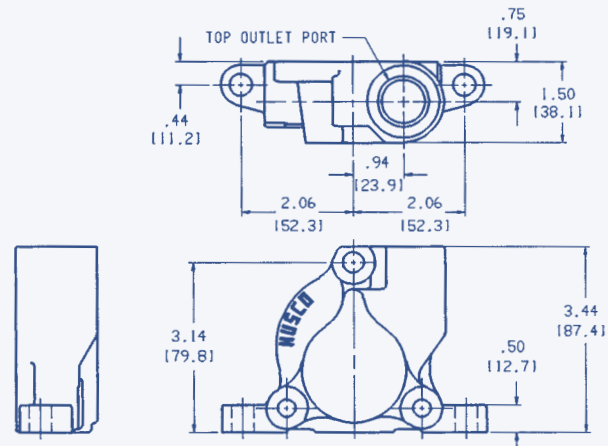


## OUTLET SECTION W/TOP OUTLET PORT (OPEN-CENTER SYSTEM)

| PORT SIZE | OUTLET SECTION PART NUMBER |
|-----------|----------------------------|
| SAE 10    | 5003-A9                    |



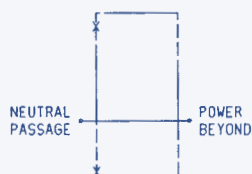
WEIGHT : APPROX. 2.6 LBS. 11.21 kg



## POWER BEYOND/CLOSED-CENTER

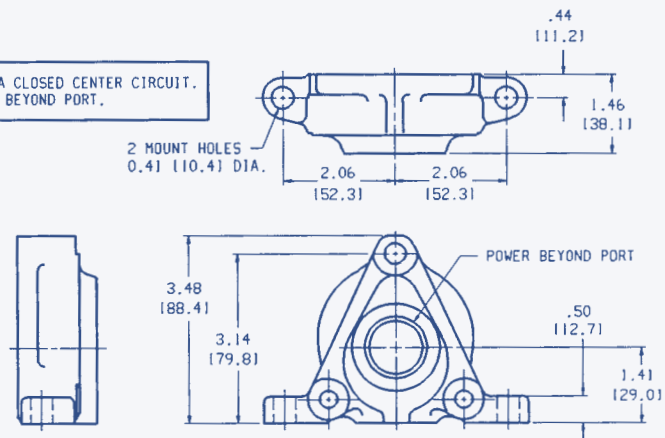
| PORT SIZE | OUTLET SECTION PART NUMBER |
|-----------|----------------------------|
| SAE 10    | 5003-E2                    |
| SAE 12    | 5003-E5                    |

REQUIRES UPSTREAM OUTLET PORT IN VALVE STACK FOR POWER BEYOND OPERATION.

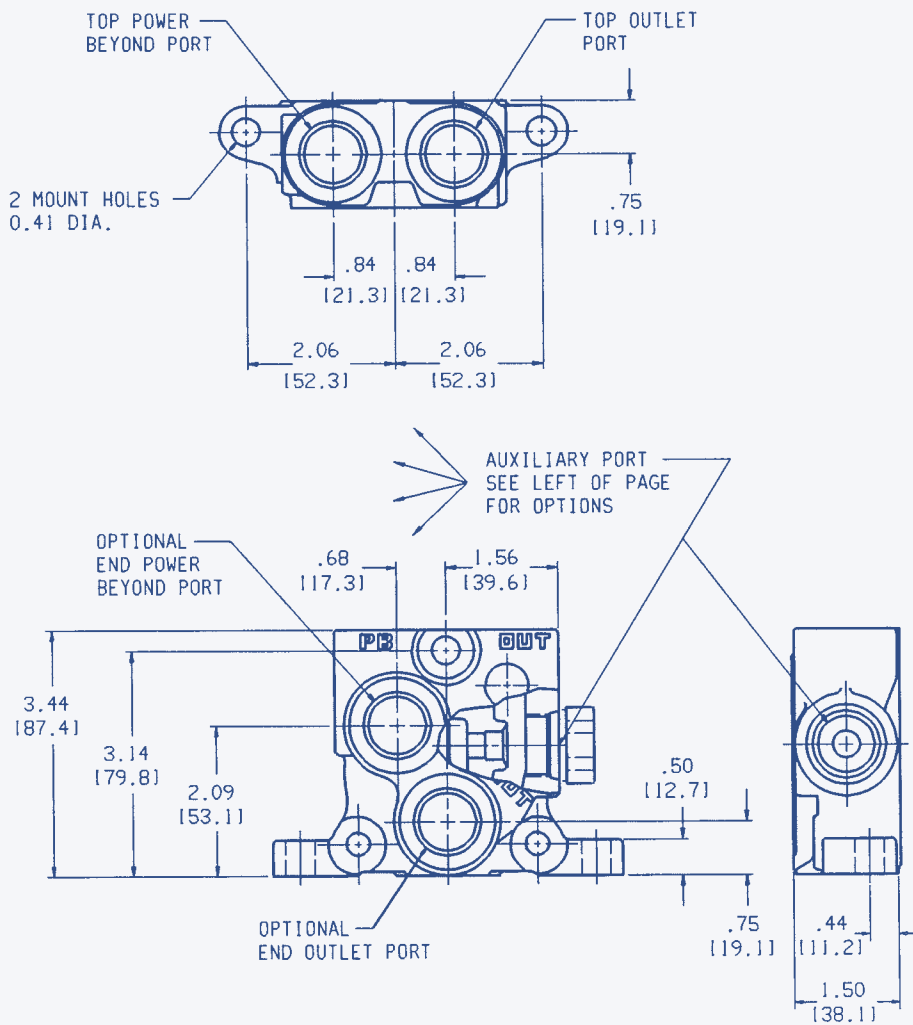
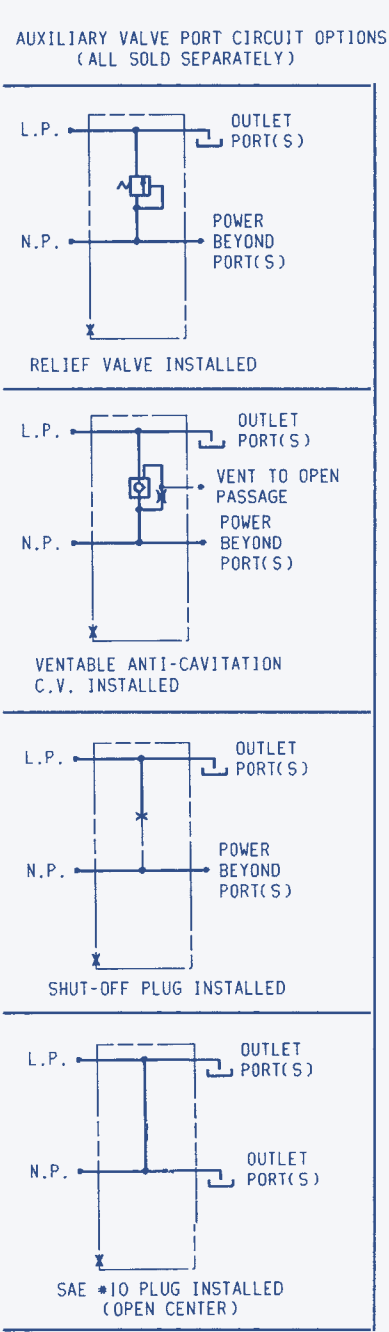


WEIGHT : APPROX. 2.4 LBS. 11.11 kg

TO CREATE A CLOSED CENTER CIRCUIT, PLUG POWER BEYOND PORT.



# UNIVERSAL OUTLET/POWER BEYOND OPTION SECTION ASSEMBLIES



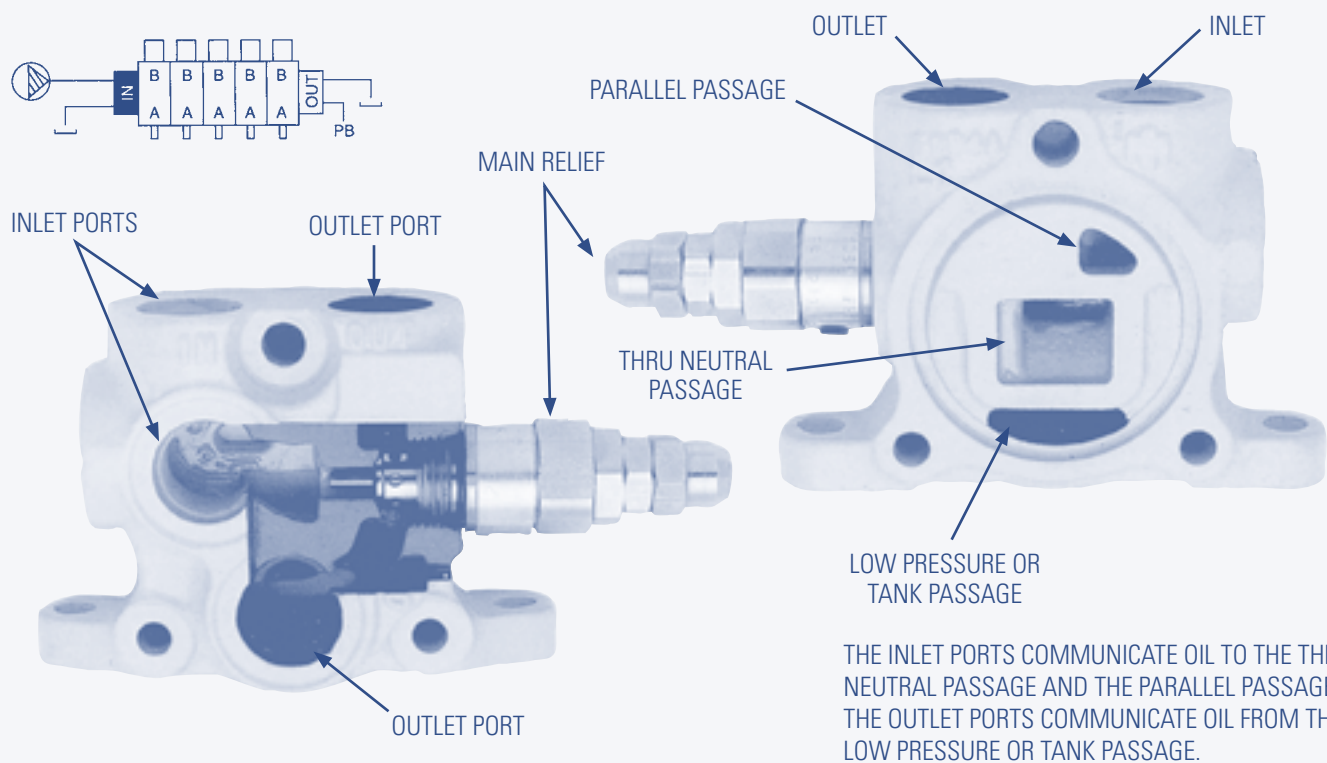
| PORT SIZES    |        |                     |        | OUTLET SECTION<br>PART NUMBERS |
|---------------|--------|---------------------|--------|--------------------------------|
| OUTLET<br>TOP | END    | POWER BEYOND<br>TOP | END    |                                |
| SAE 10        | NONE   | SAE 10              | NONE   | 5003-A67                       |
| SAE 10        | SAE 12 | SAE 10              | SAE 12 | 5003-A68                       |

TO CREATE A CLOSED CENTER CIRCUIT, PLUG POWER BEYOND PORT(S) AND INSTALL SHUT-OFF PLUG IN AUXILIARY PORT.

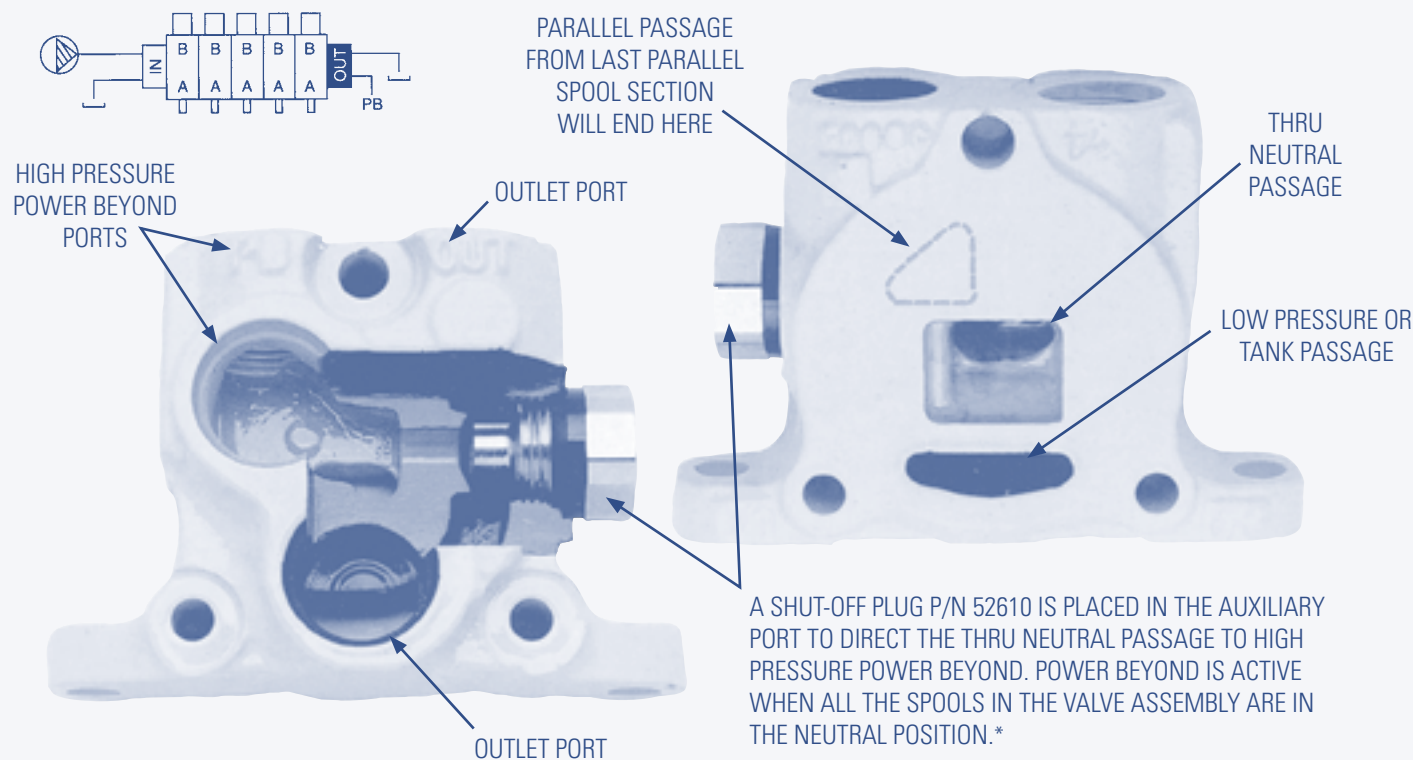
USED IN SECTION ③ OF THE VALVE  
ASSEMBLY SPECIFICATION SHEET

SEE CUT-AWAY PHOTO Pg. 19

# CUTAWAY VIEW AND DOWNSTREAM VIEW (O-RING FACE) OF INLET END SECTION ASSEMBLY P/N 5001-A88

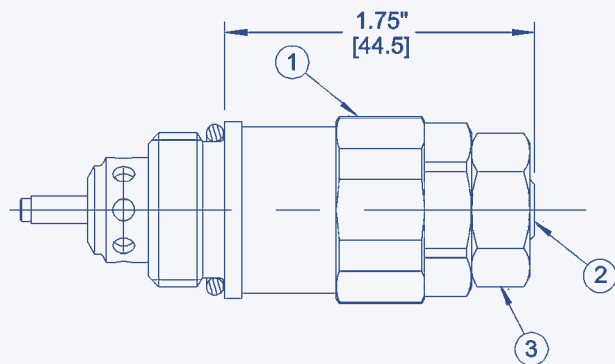


# CUTAWAY VIEW AND UPSTREAM VIEW (NON-O-RING FACE) OF OUTLET END SECTION ASSEMBLY P/N 5003-A68



\*Exception: series circuit valve section assemblies return discharged oil to neutral passage. (See page 18 for other circuit options)

MODEL 5060 PILOT OPERATED RELIEF VALVE WITH ANTI-VOID



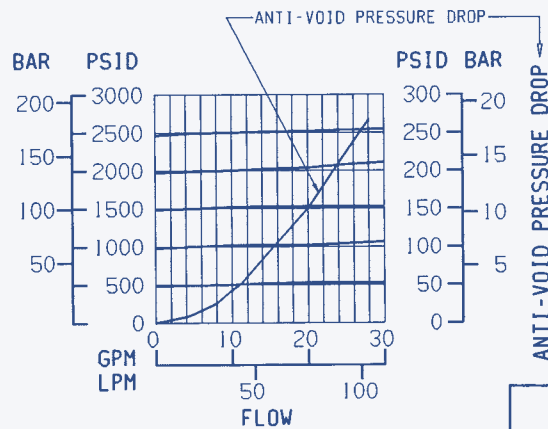
INSTALLATION AND ADJUSTMENT PROCEDURE

TORQUE MAIN BODY #1 INTO VALVE HOUSING USING 30 - 36 FT. LBS.

TO ADJUST PRESSURE SETTING, LOOSEN JAM NUT #3. TURN ADJUST SCREW #2 TO DESIRED SETTING. RE-TIGHTEN JAM NUT USING 6 - 8 FT. LBS.

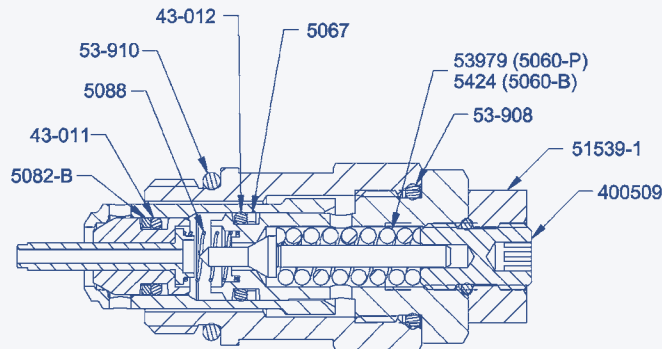
| RELIEF VALVE ASSY. P/N | PRESSURE SETTING RANGE: | SPRING & SEAL KIT P/N: | SPRING P/N: | FACTORY SETTING AT 5 GPM | ADJUSTMENT VALUES PER 1/4 TURN |
|------------------------|-------------------------|------------------------|-------------|--------------------------|--------------------------------|
| 5060-B                 | 100 - 1500 PSI          | 51790-1                | 5424        | 1000 PSI                 | 200 PSI                        |
| 5060-P                 | 1500 - 3500 PSI         | 51790-3                | 53979       | 2000 PSI                 | 550 PSI                        |

5060-P RELIEF VALVE PERFORMANCE DATA



ABOUT THE 5060....

THE 5060 RELIEF VALVE IS THE WORKHORSE OF THE MODEL 5000 CONTROL VALVE LINE. THE 5060 IS USED AS A MAIN, CYLINDER PORT OR POWER BEYOND PRESSURE RELIEF VALVE. ITS HIGH FLOW PERFORMANCE CHARACTERISTICS AND ANTI-VOID CAPABILITIES MAKE IT THE UNIVERSAL CHOICE. THERE ARE OVER 2 MILLION 5060 RELIEFS IN OPERATION TODAY.

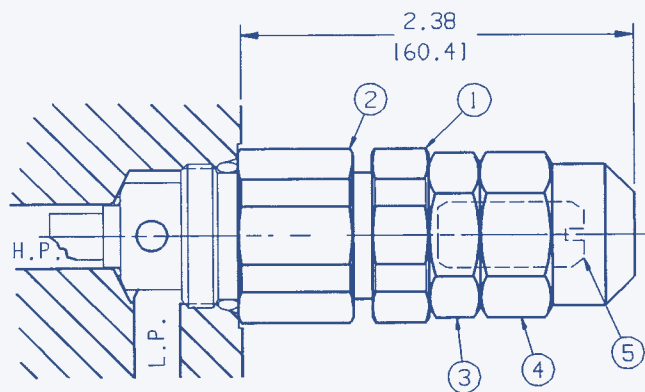


FOR KIT 51790-1 SPRING P/N 5424 REPLACES SPRING P/N 53979

SEAL & SPRING KIT 51790-3

| PART NO. | DESCRIPTION        | QTY. |
|----------|--------------------|------|
| 400509   | ADJUST SCREW ASSY. | 1    |
| 43-011   | O-RING             | 1    |
| 43-012   | O-RING             | 1    |
| 5067     | BACK-UP RING       | 1    |
| 5082-B   | BACK-UP RING       | 1    |
| 5088     | SPRING             | 1    |
| 51539-1  | JAM NUT            | 1    |
| 53-908   | O-RING             | 1    |
| 53-910   | O-RING             | 1    |
| 53979    | SPRING             | 1    |
| A1003-2  | INSTRUCTION SHEET  | 1    |

MODEL 52710 DIRECT ACTING RELIEF VALVE



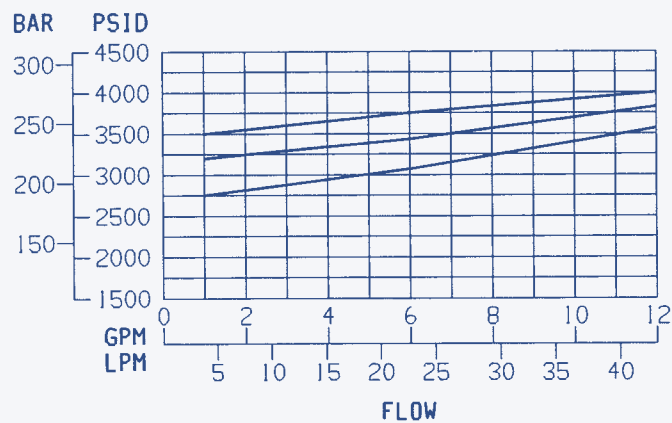
INSTALLATION AND ADJUSTMENT PROCEDURE

TORQUE MAIN BODY #1 INTO VALVE HOUSING THEN TORQUE LOCK NUT #2 USING 29.5 - 36.5 FT.-LBS. ON BOTH.

TO ADJUST PRESSURE SETTING, REMOVE ACORN NUT #4 AND LOOSEN JAM NUT #3. TURN ADJUST SCREW #5 TO DESIRED SETTING. RE-TIGHTEN JAM NUT AND ACORN NUT USING 9 - 11 FT.-LBS.

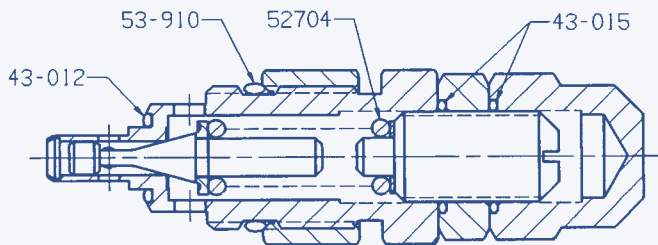
| RELIEF VALVE ASSY. P/N | PRESSURE SETTING RANGE: | SPRING & SEAL KIT P/N: | SPRING P/N: | FACTORY SETTING AT 5.0 GPM | ADJUSTMENT VALUES PER 1/4 TURN |
|------------------------|-------------------------|------------------------|-------------|----------------------------|--------------------------------|
| 52710-B                | 500-1500 PSI            | 52727-1                | 52708       | 1000 PSI                   | 175 PSI                        |
| 52710-C                | 1500-3500 PSI           | 52727-2                | 52704       | 2000 PSI                   | 250 PSI                        |

52710 RELIEF VALVE PERFORMANCE DATA



ABOUT THE 52710....

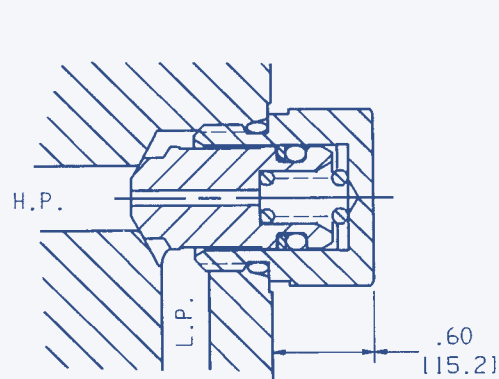
THE 52710 SERIES RELIEF IS A LOW COST, LOW FLOW, DIRECT ACTING RELIEF CARTRIDGE THAT FITS IN ALL THE AUXILIARY PORTS LISTED IN THIS CATALOG. IT IS USED EXTENSIVELY AS A CYLINDER PORT RELIEF WHEN A FULL FLOW RELIEF IS NOT NECESSARY. THIS RELIEF IS COMMONLY USED FOR ELIMINATING THE EFFECTS OF LOW FLOW PEAK PRESSURE SPIKES.



| SPRING & SEAL KIT 52727-2 * |             |      |
|-----------------------------|-------------|------|
| PART NO.                    | DESCRIPTION | QTY. |
| 43-012                      | O-RING      | 1    |
| 43-015                      | O-RING      | 2    |
| 52704                       | SPRING      | 1    |
| 53-910                      | O-RING      | 1    |

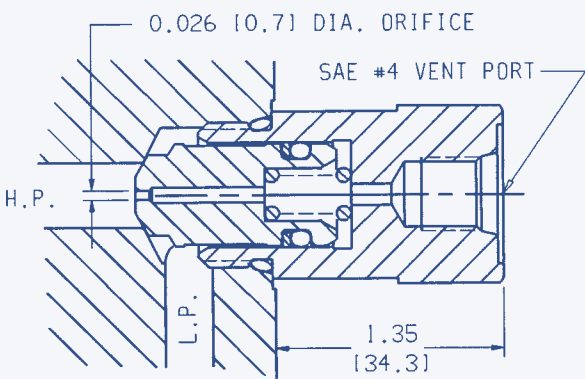
\* FOR KIT 52727-1 SPRING P/N 52708 REPLACES SPRING P/N 52704

ANTI-CAVITATION CHECK VALVE



THE ANTI-CAVITATION CHECK VALVE OPENS WHEN L.P. PASSAGE PRESSURE EXCEEDS THE H.P. PASSAGE PRESSURE.

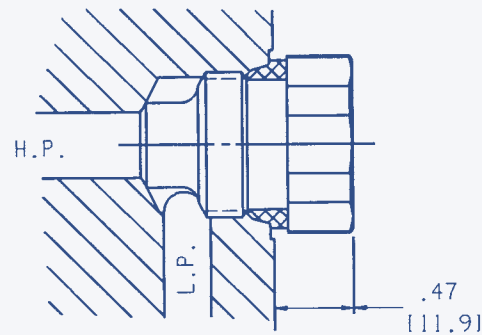
| P/N: | TORQUE               |
|------|----------------------|
| 5475 | 29.5 - 36.5 FT.-LBS. |



THE VENTABLE ANTI-CAVITATION CHECK VALVE OPENS WHEN THE L.P. PASSAGE PRESSURE EXCEEDS THE H.P. PASSAGE PRESSURE OR WHEN THE VENT PORT IS OPENED TO TANK.

| P/N:    | TORQUE               |
|---------|----------------------|
| 52540-1 | 29.5 - 36.5 FT.-LBS. |

SHUT-OFF PLUG ASSEMBLY



THE SHUT-OFF PLUG IS USED TO SHUT-OFF THE L.P. PASSAGE FROM THE H.P. PASSAGE IN ALL THE AUX. VALVE PORTS. IT IS USED TO PLUG THE AUX. VALVE PORT WHEN AN AUX. VALVE IS NOT REQUIRED. THE SHUT-OFF PLUG IS ALSO USED IN THE OUTLET SECTION TO ACTIVATE THE POWER BEYOND PORT(S).

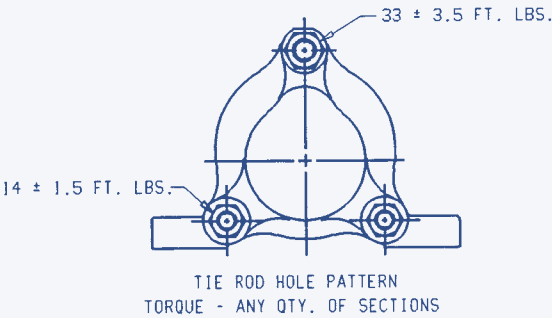
| P/N:  | TORQUE               |
|-------|----------------------|
| 52610 | 29.5 - 36.5 FT.-LBS. |

STANDARD SAE PLUG AND O-RING ASSEMBLY

| DESCRIPTION | P/N:  | TORQUE             |
|-------------|-------|--------------------|
| #8 SAE      | 11150 | 29.5-36.5 FT.-LBS. |
| #10 SAE     | 11180 | 43-53 FT.-LBS.     |
| #12 SAE     | 11210 | 66-82 FT.-LBS.     |

MODEL 5000 TIE ROD KITS

| P/N:    | NUMBER OF SECTIONS |
|---------|--------------------|
| 6131-1  | 1                  |
| 6131-2  | 2                  |
| 6131-3  | 3                  |
| 6131-4  | 4                  |
| 6131-5  | 5                  |
| 6131-6  | 6                  |
| 6131-7  | 7                  |
| 6131-8  | 8                  |
| 6131-9  | 9                  |
| 6131-10 | 10                 |
| 6131-11 | 11                 |

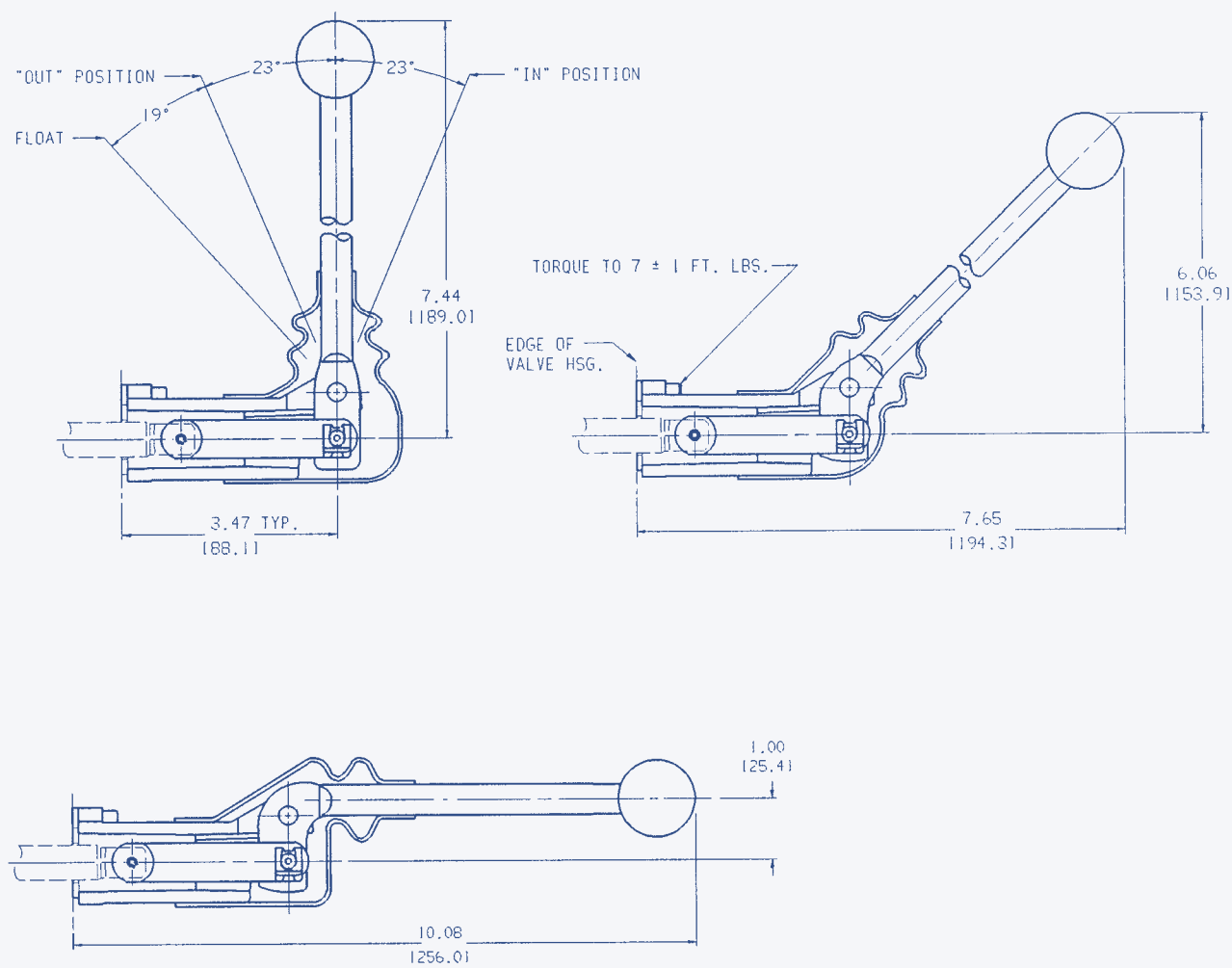


FIXED POSITION LEVER W/BOOT

NOTE: SEE APPENDIX 3 FOR PARTS LISTING

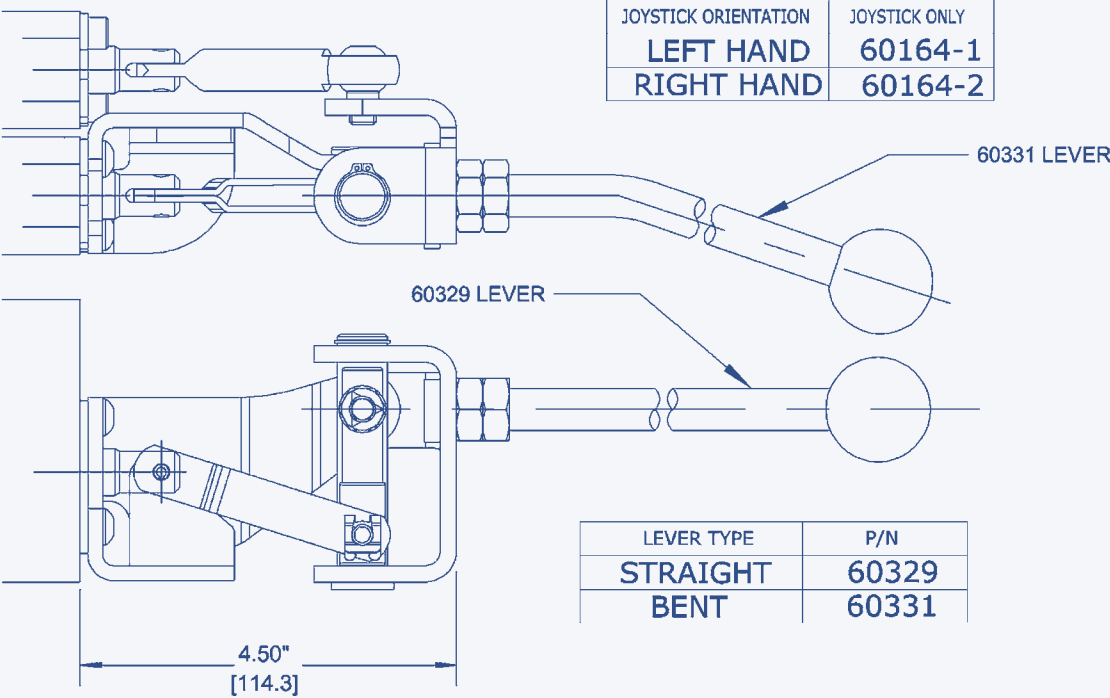
LEVER TRAVEL TYPICAL FOR EACH ASSY

NOTE: LEVERS MAY BE MOUNTED 180° FROM THE POSITIONS SHOWN

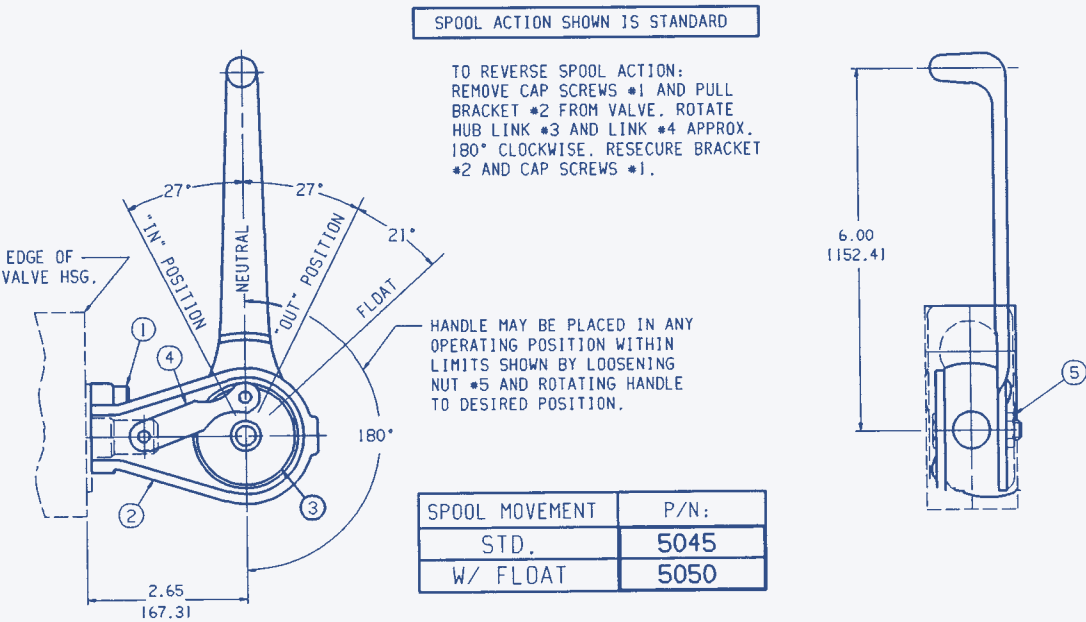


| FIXED POSITION | P/N:     |
|----------------|----------|
| VERTICAL       | 52250-1  |
| HORIZONTAL     | 52250-12 |
| 45°            | 52250-14 |

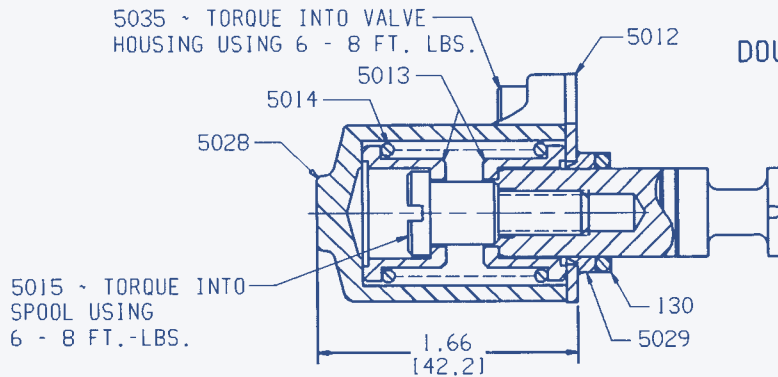
HEAVY DUTY MECHANICAL JOYSTICK  
FOR SIMULTANEOUS CONTROL OF TWO SPOOL SECTIONS



INFINITE POSITION LEVER



## FOR PARALLEL AND CONVENTIONAL CIRCUIT SECTIONS

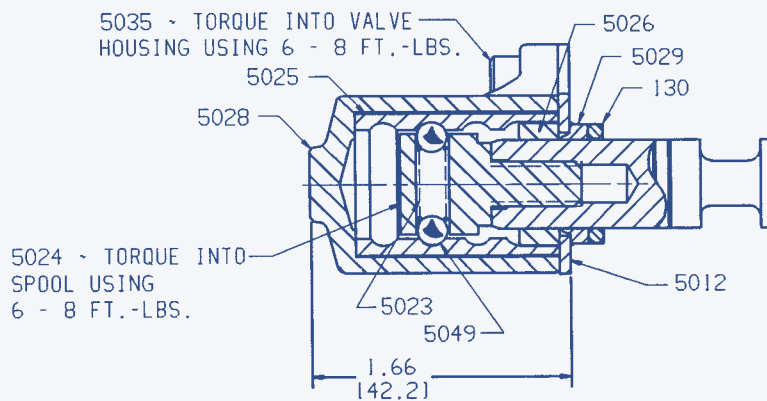


3 POSITION, 4 WAY  
DOUBLE ACTING SPRING CENTERED

KIT #B10-100

| PART NO. | DESCRIPTION | QTY. |
|----------|-------------|------|
| 130      | O-RING      | 1    |
| 5012     | SEALPLATE   | 1    |
| 5013     | SPRING SEAT | 2    |
| 5014     | SPRING      | 1    |
| 5015     | SPOOL END   | 1    |
| 5028     | CAP         | 1    |
| 5029     | WIPER       | 1    |
| 5035     | CAP SCREW   | 2    |

FOR SERIES CIRCUIT SECTIONS USE: KIT #B10-103 (P/N 51983 AND P/N 4623 REPLACE P/N 5015)

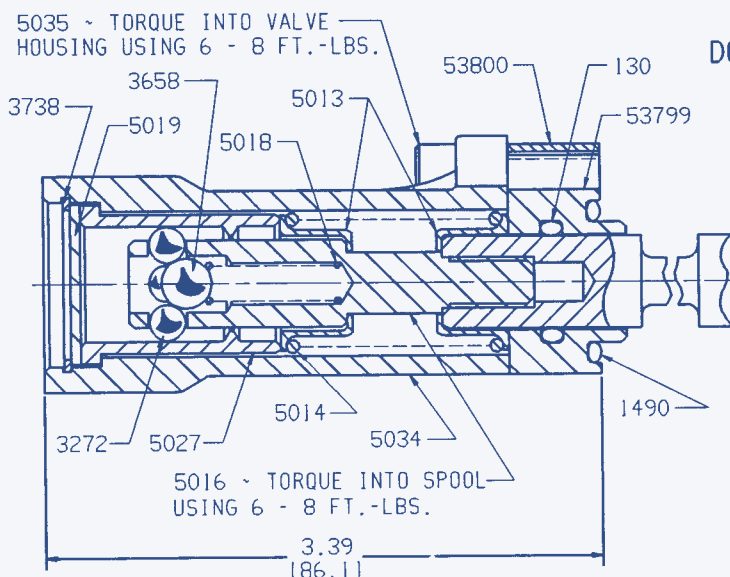


3 POSITION, 4 WAY  
DOUBLE ACTING DETENT

KIT #B11-100

| PART NO. | DESCRIPTION | QTY. |
|----------|-------------|------|
| 130      | O-RING      | 1    |
| 5012     | SEALPLATE   | 1    |
| 5023     | SPRING      | 1    |
| 5024     | DET. PIN    | 1    |
| 5025     | DET. SLEEVE | 1    |
| 5026     | SPACER      | 1    |
| 5028     | CAP         | 1    |
| 5029     | WIPER       | 1    |
| 5035     | CAP SCREW   | 2    |
| 5049     | BALL        | 2    |

FOR SERIES CIRCUIT SECTIONS USE: KIT #B11-119 (P/N 52272 AND P/N 4623 REPLACE P/N 5024)



4 POSITION, 4 WAY  
DOUBLE ACTING SPRING CENTERED  
DETENT "IN" FLOAT

KIT #B11-105

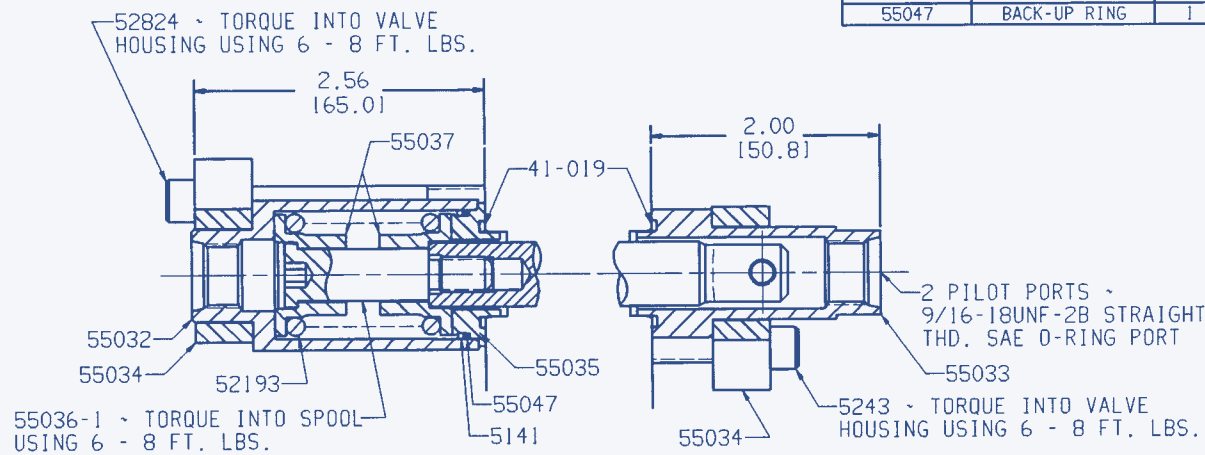
(NOT FOR CONVERSION)

| PART NO. | DESCRIPTION | QTY. |
|----------|-------------|------|
| 130      | O-RING      | 1    |
| 1490     | O-RING      | 1    |
| 3424     | CAP SCREW   | 2    |
| 5013     | SPRING SEAT | 2    |
| 5014     | SPRING      | 1    |
| 5018     | SPRING      | 1    |
| 5019     | SPACER      | 1    |
| 5021     | DET. PIN    | 1    |
| 5027     | DET. SLEEVE | 1    |
| 5034     | CAP         | 1    |
| 3272     | BALL        | 4    |
| 3658     | BALL        | 1    |
| 3738     | RET. RING   | 1    |
| 53799    | SPACER      | 2    |
| 53800    | SPACER      | 1    |

HYDRAULIC REMOTE (OIL PILOT OPERATED)

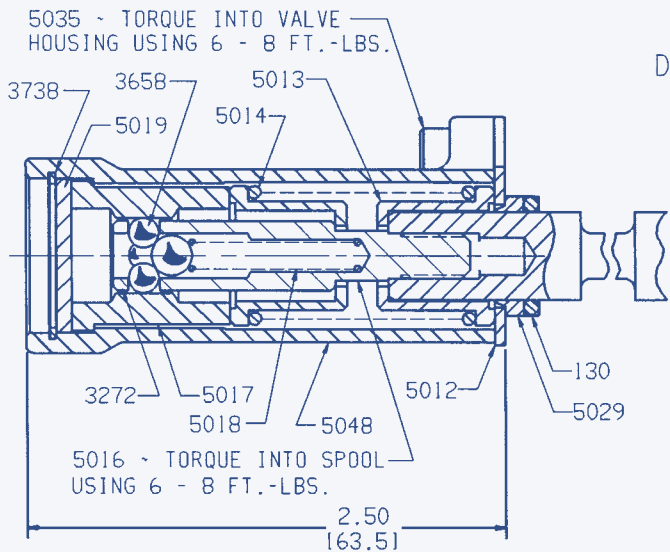
KIT P/N: B12-108

| PART NO. | DESCRIPTION  | QTY. |
|----------|--------------|------|
| 41-019   | O-RING       | 2    |
| 5141     | O-RING       | 1    |
| 52193    | SPRING       | 1    |
| 5243     | CAP SCREW    | 2    |
| 52824    | CAP SCREW    | 2    |
| 55032    | CAP          | 1    |
| 55033    | CAP          | 1    |
| 55034    | SEALPLATE    | 2    |
| 55035    | RETAINER     | 1    |
| 55036-1  | SPOOL END    | 1    |
| 55037    | SPRING SEAT  | 2    |
| 55047    | BACK-UP RING | 1    |



FOR SERIES CIRCUIT SECTIONS USE: KIT #B12-109  
(P/N 55036 AND P/N 4623 REPLACE P/N 55036-1)

FOR PARALLEL AND CONVENTIONAL CIRCUIT SECTIONS



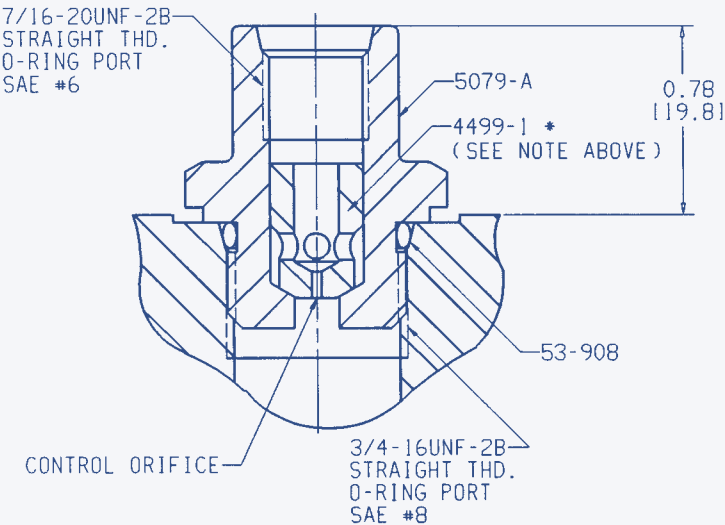
3 POSITION, 4 WAY  
DOUBLE ACTING SPRING CENTERED  
DETENT "IN" & "OUT"

KIT #B11-103

| PART NO. | DESCRIPTION | QTY. |
|----------|-------------|------|
| 130      | O-RING      | 1    |
| 5012     | SEALPLATE   | 1    |
| 5013     | SPRING SEAT | 2    |
| 5014     | SPRING      | 1    |
| 5016     | DET. PIN    | 1    |
| 5017     | DET. SLEEVE | 1    |
| 5018     | SPRING      | 1    |
| 5019     | SPACER      | 1    |
| 5029     | WIPER       | 1    |
| 5035     | CAP SCREW   | 2    |
| 5048     | CAP         | 1    |
| 3272     | BALL        | 4    |
| 3658     | BALL        | 1    |
| 3738     | RET. RING   | 1    |

FOR SPR. CTR. DETENT "IN" ONLY USE: KIT #B11-101 (DET.SLEEVE P/N 5283 REPLACES P/N 5017)  
FOR SPR. CTR. DETENT "OUT" ONLY USE: KIT #B11-102 (DET.SLEEVE P/N 5163 REPLACES P/N 5017)

FLOW RESTRICTORS



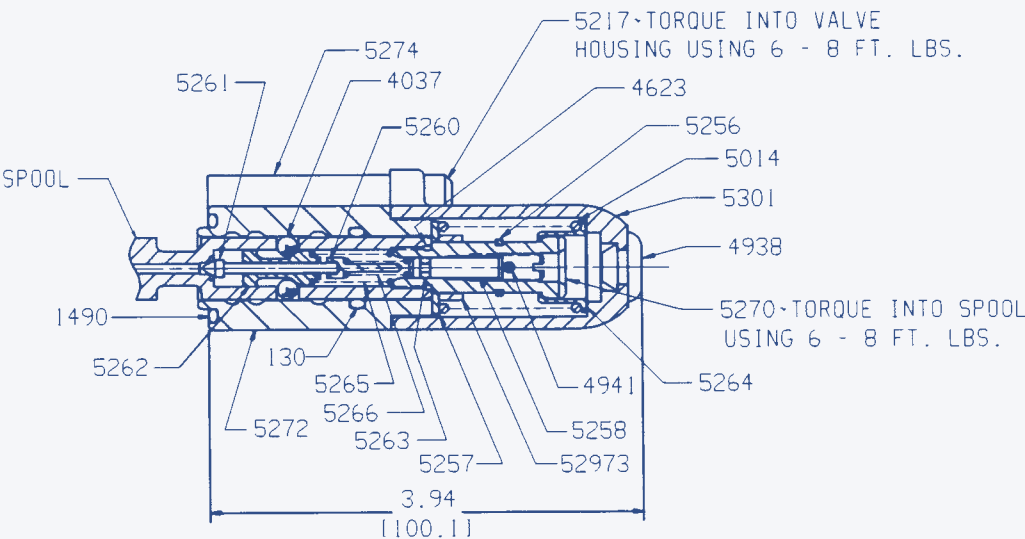
| KIT P/N: 11901-2 |              |      |
|------------------|--------------|------|
| PART NO.         | DESCRIPTION  | QTY. |
| 5079-A           | FITTING      | 1    |
| 4499-1           | POPPET *     | 1    |
| 53-908           | VITON O-RING | 1    |

\* POPPET HOLE SIZE .0430 IN. (1.1 MM)  
CONSULT HUSCO FOR OTHER POPPET  
SIZES THAT ARE AVAILABLE - OR  
MACHINE ORIFICE TO DESIRED SIZE.

AUTOMATIC KICK-OUT FEATURE

The auto kick-out mechanism will automatically release the spool to the center position at a pre-determined settable cylinder port pressure.

The illustration below identifies the working components of the auto kick-out mechanism. The auto kick-out mechanism is not available in kit conv maintenance procedures.



| PART NO. | DESCRIPTION    | QTY. |
|----------|----------------|------|
| 130      | O-RING         | 1    |
| 1490     | O-RING         | 1    |
| 4037     | BALL           | 4    |
| 4623     | O-RING         | 1    |
| 4938     | PLUG           | 1    |
| 4941     | LOCKING INSERT | 1    |
| 5014     | SPRING         | 1    |
| 5217     | CAP SCREW      | 2    |
| 5256     | RET. RING      | 1    |
| 5257     | WASHER         | 1    |
| 5258     | ADJUST SCREW   | 1    |
| 5260     | SPRING GUIDE   | 1    |

| PART NO. | DESCRIPTION | QTY. |
|----------|-------------|------|
| 5261     | POPPET      | 1    |
| 5262     | DET. CAM    | 1    |
| 5263     | O-RING      | 1    |
| 5264     | SPRING SEAT | 1    |
| 5265     | SPRING      | 1    |
| 5266     | SPRING      | 1    |
| 5270     | SPOOL END   | 1    |
| 5272     | DET. SLEEVE | 1    |
| 5274     | SPACER      | 2    |
| 52973    | SPACER      | 1    |
| 5301     | CAP         | 1    |

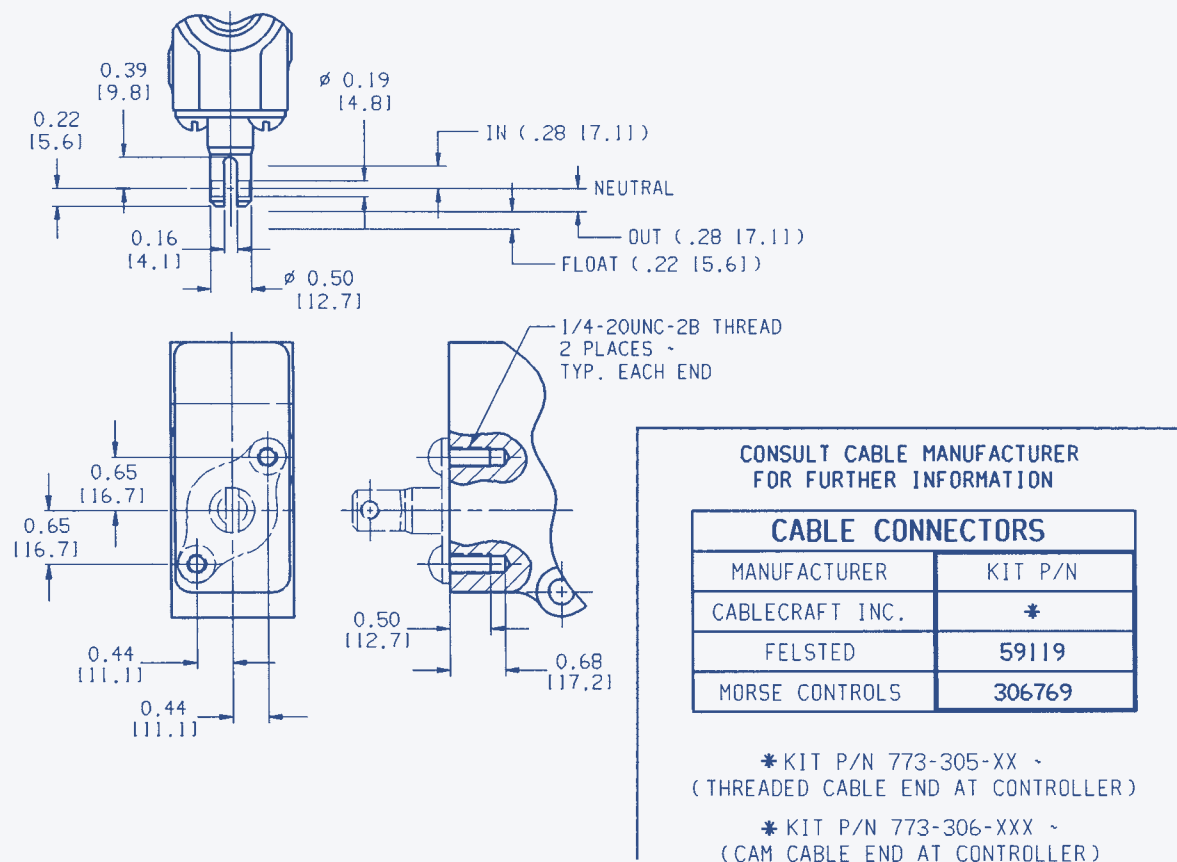
AUTO KICK-OUT SETTING AND ADJUSTMENT

Adjustments to the auto kick-out valve section are made when integrated within a hydraulic circuit.

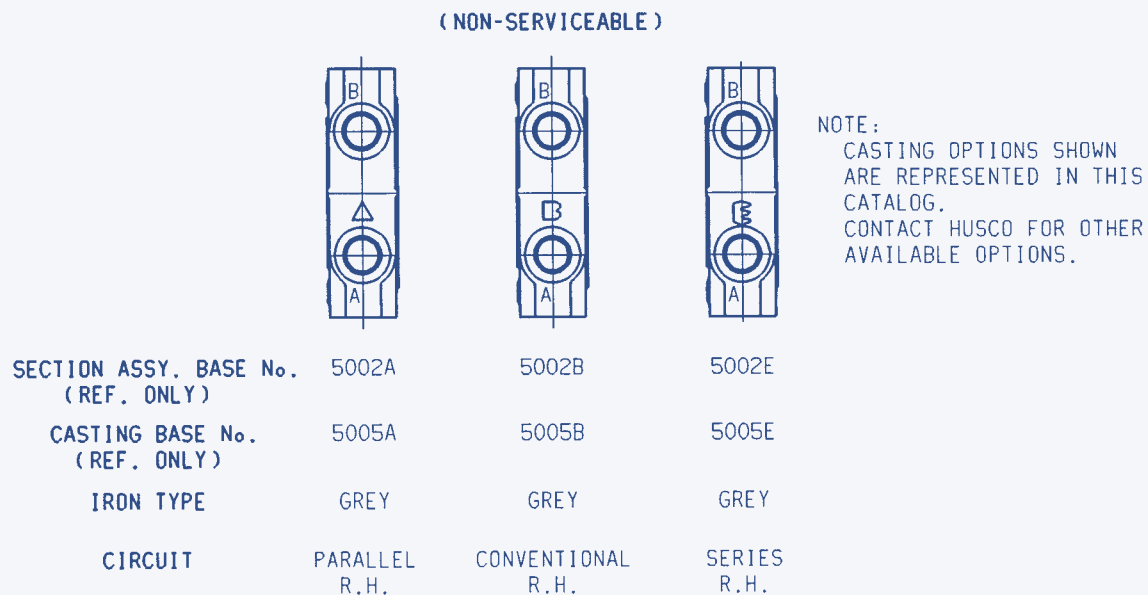
1. Install a pressure gauge and adjust the pressure to the desired setting.
2. With the hydraulic system off, shift auto kick-out valve section to a detented position.
3. Activate the hydraulic system to allow pressure to build. Note the pressure reading at time of kick-out; this will determine its current setting. Standard factory setting, if not specified, is 2000 PSI.
4. To make adjustment, turn the adjustment screw clockwise until desired setting is achieved. Adjustment range is 1000-2600 PSI. Run a few cycles to assure setting consistency, replace rubber plug. Note: Final main relief setting must be at least 250 PSI higher than the highest auto kick-out setting in the system.

Caution: To avoid damaged or lost parts do not remove adjustment screw.

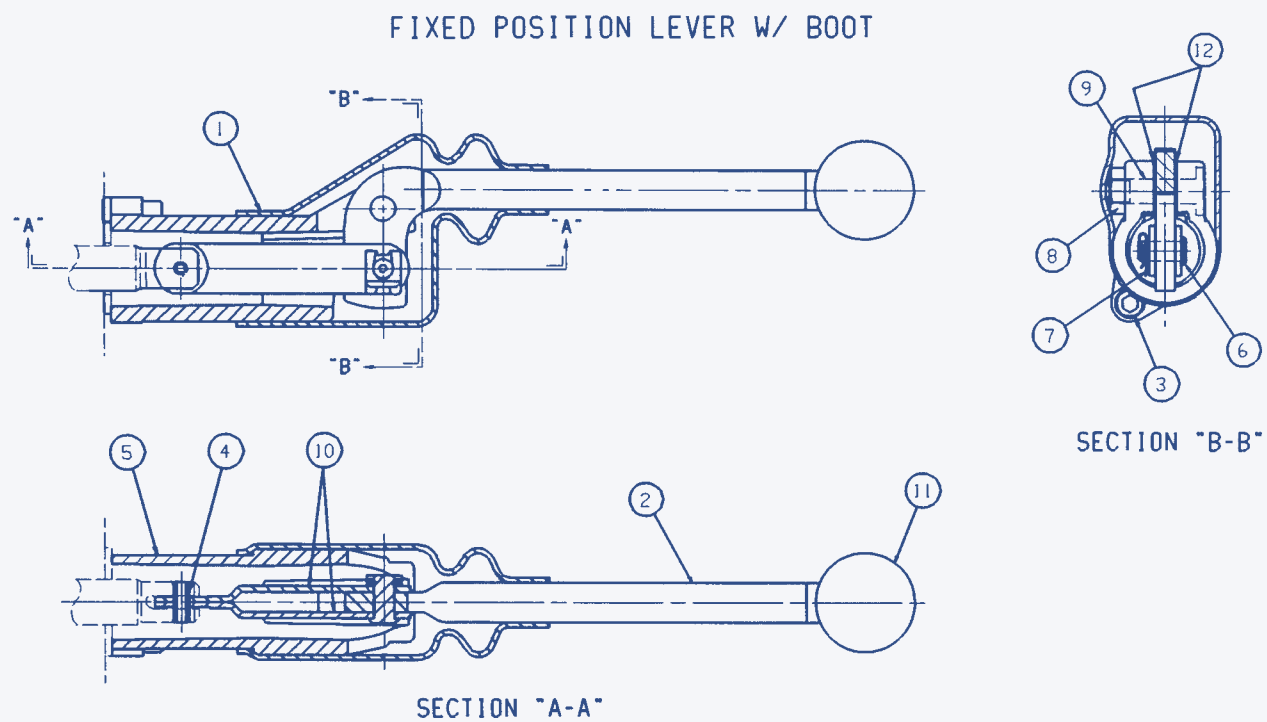
SPOOL END ORIENTATION



BASIC CASTING IDENTIFICATION



LEVER ASSEMBLIES – PARTS LISTING

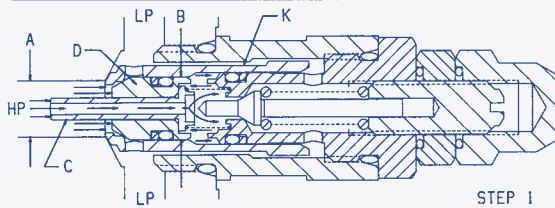


REF.: 52250-12 HANDLE ASSY. SHOWN

| ITEM | DESCRIPTION    | HANDLE ASSEMBLY P/N REFERENCE |            |          |
|------|----------------|-------------------------------|------------|----------|
|      |                | VERTICAL                      | HORIZONTAL | 45°      |
|      |                | 52250-1                       | 52250-12   | 52250-14 |
| 1    | BOOT           | 51662                         | 52348      | 51662    |
| 2    | HANDLE         | 52552                         | 52987-3    | 52663    |
| 3    | CAP SCREW      | 5035                          |            |          |
| 4    | ROLL PIN       | 5349                          |            |          |
| 5    | HANDLE BRACKET | 52128-1                       |            |          |
| 6    | PIN            | 52214                         |            |          |
| 7    | RETAINER       | 52216                         |            |          |
| 8    | NUT            | 52217                         |            |          |
| 9    | PIVOT BOLT     | 52218-1                       |            |          |
| 10   | LINK           | 52219A                        |            |          |
| 11   | KNOB           | 52508                         |            |          |
| 12   | SHIM           | 52986                         |            |          |

SEE PAGE 23 FOR ORDERING & DIMENSIONAL INFORMATION

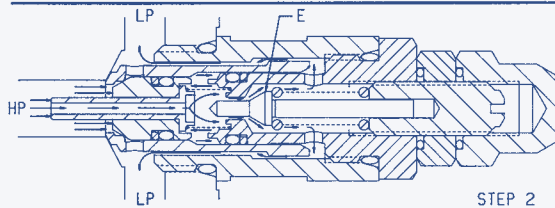
## HUSCO COMBINATION WORK PORT RELIEF AND ANTI-VOID UNIT



STEP 1

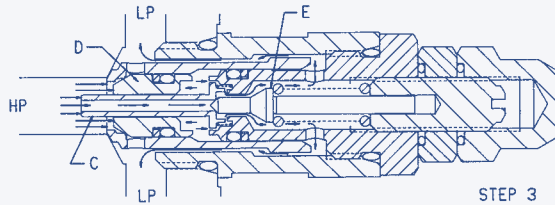
### AS WORK PORT RELIEF

The relief valve is in communication between the high pressure port "HP" and low pressure "LP." Oil is admitted through the hole in poppet "C" and because of the differential area between diameters "A" and "B" relief valve poppet "D" and check valve poppet "K" are tightly seated as shown in the first step.



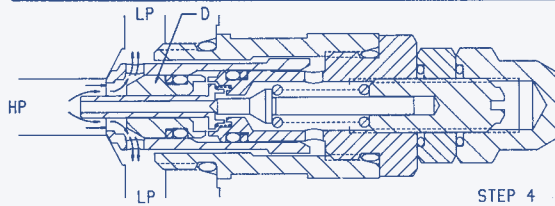
STEP 2

The oil pressure in the high pressure port "HP" has reached the setting of the pilot poppet spring force and unseats the pilot poppet "E." Oil flows around the poppet—through the cross drilled holes and to the low pressure area "LP."



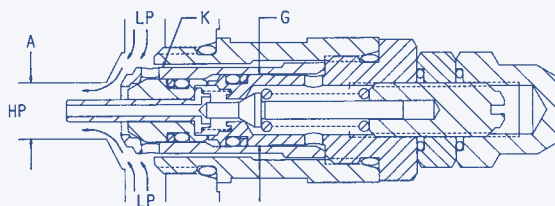
STEP 3

The loss of oil behind Poppet "C," effected by the opening of pilot poppet "E," causes poppet "C" to move back and seat against pilot poppet "E." This shuts off the oil flow to the area behind relief valve poppet "D," and causes a low pressure area internally.



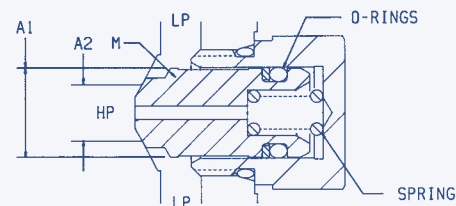
STEP 4

The imbalance of pressure on the inside, as compared to that of the high pressure port "HP," forces the relief valve poppet "D" to open and relieve the oil directly to the low pressure chamber "LP" in the valve.



### AS ANTI-VOID

The anti-void unit supplies oil to the high pressure port "HP" when cavitation has occurred. A lower pressure exists in the port "HP" compared to the low pressure chamber "LP." The difference between the effective area of diameter "A" and "G" causes imbalance of the check valve poppet "K" which unseats, thus allowing oil from the low pressure chamber "LP" to enter the port "HP" and fill the void.



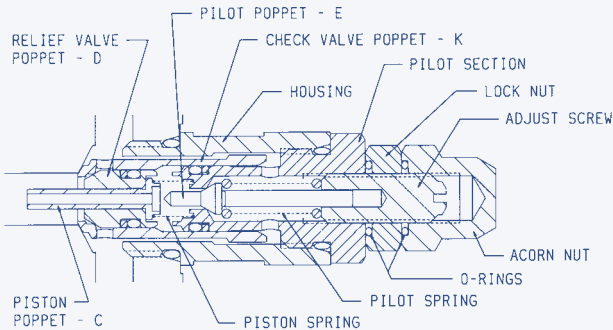
### AS SEPARATE ANTI-VOID

The anti-void check valve opens when cavitation occurs in the high pressure port "HP" and supplies oil from the reservoir "LP" to help fill this void. The poppet "M" is held on its seat by the port pressure "HP," acting on the larger area behind the O-ring. When pressure "HP" drops below atmosphere, the tank pressure "LP" operating on the annular area A1-A2 will overcome the port pressure "HP" and the spring force to open the poppet. When the void is eliminated the spring will return the poppet which will then be tightly seated by the port pressure "HP."

Check HUSCO first for modern hydraulic/electrohydraulic components and systems engineered to your specific needs.

## MAINTENANCE PROCEDURE

## HUSCO COMBINATION WORK PORT RELIEF AND ANTI-VOID UNIT



**There are several variations to the Work Port Relief. However all are similar in nature regarding service and repair.**

## HOW TO SET PRESSURE ON WORK PORT RELIEF

A good pressure gage must be installed in the line which is in communication with the work port relief. A load must be applied in a manner to reach the set pressure of the port relief unit. Then, follow these steps:

- Remove acorn nut and loosen lock nut
- Set adjusting screw to desired pressure setting
- Tighten lock nut and reassemble acorn nut
- Retest in similar manner as above

The Void Control Feature is not adjustable but is designed to operate whenever the work port pressure is lower than the reservoir pressure.

## SERVICE AND REPAIR INFORMATION

The cartridge type work port reliefs used in the HUSCO valves are typically of the pilot poppet type with external adjustment. Any malfunctioning is usually the result of foreign matter lodging between the piston, relief valve poppet and check valve.

To perform service, clean the surrounding area and remove the complete relief valve cartridge. Examine the seat in the main valve housing and if grooves or ridges are present, the valve must be returned to HUSCO for re-machining.

The design of the pilot poppet and its seat provides positive seating and very seldom requires any maintenance. Therefore, the pilot section can be removed from the cartridge housing without disturbing the setting. With it will come the check valve poppet and other internal parts. These are easily disassembled and should be examined for foreign matter. All seats and seating surfaces should be smooth and free of nicks, scratches or grooves. Examine O-rings and backup washers for any damage and replace if necessary. All moving parts should slide freely, with only seal friction being present.

After inspecting and cleaning, immerse all parts in hydraulic oil and reassemble. Since pressure setting was not disturbed, unit can be tested for proper functioning under actual working conditions.

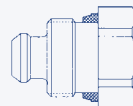
If operating difficulties indicate that the pilot poppet is leaking or sticking, remove internal parts of the pilot section and follow the same procedure as above, plus follow "How to Set Pressure" previously discussed.

If unit still does not function properly, you may wish to return the cartridge to HUSCO.

| DIFFICULTY                   | PROBABLE CAUSE                                                          | REMEDY                                                                                              |
|------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Can't get Pressure           | Poppet D, E or K stuck open or contamination under seat.                | Check for foreign matter between poppets D, E or K and their mating parts. Parts must slide freely. |
| Erratic Pressure             | Pilot poppet seat damaged.<br>Poppet C sticking in D.                   | Replace the relief valve.<br>Clean and remove surface marks for free movement.                      |
| Pressure setting not correct | Normal wear. Lock nut & adj. screw loose.                               | See "How to set pressure on work port relief."                                                      |
| Leaks                        | Damaged seats.<br>Worn O-rings.<br>Parts sticking due to contamination. | Replace the relief valve.<br>Install seal and spring kit.<br>Disassemble and clean.                 |

## TROUBLE SHOOTING – ANTI-VOID

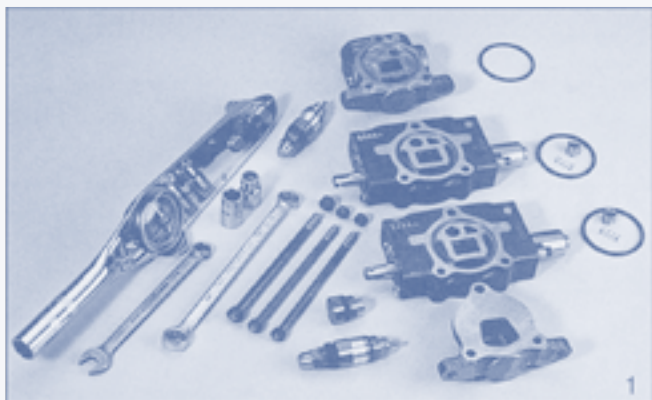
Trouble resulting in malfunctioning can usually be traced to foreign matter plugging and sensing hole or preventing free movement of poppet. Also check seat for scratches, nicks or other marks.



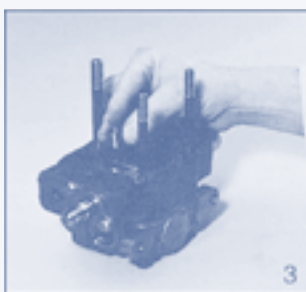
## SHUT-OFF VALVE

Shut-off valves are available to fit most work port and main relief valve machining locations.

## ASSEMBLY PROCEDURES FOR THE HUSCO 5000 VALVE

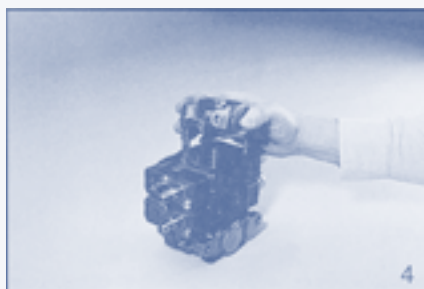


1. Lay out valve components on a clean, flat working surface. The inlet assembly will include an O-ring, and the spool section(s) include an O-ring, a load check poppet and a load check spring. Tools required for basic valve assembly include 1/2" and 9/16" open or box end wrenches and a torque wrench with thin wall sockets.



2. Assemble tie rod nuts to one end of each tie rod with one or two threads showing. Insert tie rods through tie rod holes of inlet (larger tie rod at top). Lay inlet on end with tie rods up, place O-ring into position.

3. Place first spool section (O-ring side up) on inlet section, position O-ring and insert load check poppet (nose down) and spring (behind poppet) into load check cavity as shown. Repeat this procedure for each spool section; the load check springs are compressed by the following sections during assembly.

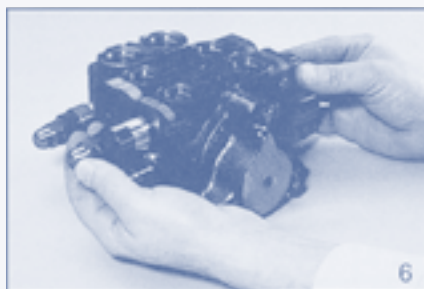


4. Position end section on last spool section as shown and hand tighten tie rod nuts. The end section is a "turn around" section without ports. Universal outlet/power beyond section and power beyond and closed center sections are also used as end sections. These end sections do not have O-ring grooves.



5. Position valve assembly with the mounting pads of the end sections on a flat surface. To obtain proper alignment of end sections relative to the spool sections, apply downward pressure to the end sections; snug tie rod nuts to about 10 ft-lb.

Final torque the two 1/2" nuts to 14 ft-lb; final torque the 9/16" nut to 33 ft-lb. Check for proper spool movement.



6. Install auxiliary valves and plugs and torque to proper specifications.

## GENERAL ASSEMBLY NOTES:

- A. Lever assemblies can be installed on section before or after complete valve assembly.
- B. The load check and spring may be omitted from assembly in certain conditions (i.e., motor spools).

## MODEL 5000 SECTIONAL VALVE ASSEMBLY SPECIFICATION SHEET

| MODEL 5000 SECTIONAL VALVE ASSEMBLY SPECIFICATION SHEET                                                                                                                                                                                                                                                                                                                                                            |                                     |                      |                           |                                                                                                                                                   |                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| CUSTOMER: _____                                                                                                                                                                                                                                                                                                                                                                                                    |                                     | CUSTOMER P/N: _____  |                           |                                                                                                                                                   |                 |
| MACHINE TYPE: _____                                                                                                                                                                                                                                                                                                                                                                                                |                                     | MACHINE MODEL: _____ |                           |                                                                                                                                                   |                 |
| ESTIMATED ANNUAL USAGE: _____                                                                                                                                                                                                                                                                                                                                                                                      |                                     | SUBMITTED BY: _____  |                           | DATE: _____                                                                                                                                       |                 |
| OPERATING PRESSURE: _____                                                                                                                                                                                                                                                                                                                                                                                          |                                     | INLET FLOW: _____    |                           | MID-INLET FLOW: _____                                                                                                                             |                 |
|                                                                                                                                                                                                                                                                                                                                   |                                     |                      | <b>④</b> AUXILIARY VALVES |                                                                                                                                                   | <b>⑤</b> LEVERS |
| SECTIONS                                                                                                                                                                                                                                                                                                                                                                                                           |                                     |                      | AUX. "A"                  | AUX. "B"                                                                                                                                          | ASSEMBLY P/N    |
| <b>①</b>                                                                                                                                                                                                                                                                                                                                                                                                           | INLET END COVER                     | 5001- _____          | P/N: _____<br>PSI: _____  | INLET END COVER PORT PLUGS<br><small>SEE LISTING OF PLUG P/N'S BELOW</small><br>TOP IN: _____ TOP OUT: _____<br>END IN: _____ END OUT: _____      |                 |
| <b>②</b><br><br>OR MID-INLETS<br><br>SPOOL SECTIONS                                                                                                                                                                                                                                                                                                                                                                | FUNCT: _____<br>TIE-ROD KIT 6131-1  | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                    | FUNCT: _____<br>TIE-ROD KIT 6131-2  | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                    | FUNCT: _____<br>TIE-ROD KIT 6131-3  | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                    | FUNCT: _____<br>TIE-ROD KIT 6131-4  | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                    | FUNCT: _____<br>TIE-ROD KIT 6131-5  | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                    | FUNCT: _____<br>TIE-ROD KIT 6131-6  | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                    | FUNCT: _____<br>TIE-ROD KIT 6131-7  | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                    | FUNCT: _____<br>TIE-ROD KIT 6131-8  | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                    | FUNCT: _____<br>TIE-ROD KIT 6131-9  | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                    | FUNCT: _____<br>TIE-ROD KIT 6131-10 | 500 __ - _____       | P/N: _____<br>PSI: _____  | P/N: _____<br>PSI: _____                                                                                                                          |                 |
| <b>③</b>                                                                                                                                                                                                                                                                                                                                                                                                           | OUTLET END COVER                    | 5003- _____          | P/N: _____<br>PSI: _____  | OUTLET END COVER PORT PLUGS<br><small>SEE LISTING OF PLUG P/N'S BELOW</small><br>TOP P.B.: _____ TOP OUT: _____<br>END P.B.: _____ END OUT: _____ |                 |
| <b>COMMENTS:</b><br>SAE PLUG ASSY P/N's: <span style="border: 1px solid black; padding: 2px;">6 SAE - 11120</span> <span style="border: 1px solid black; padding: 2px;">8 SAE - 11150</span> <span style="border: 1px solid black; padding: 2px;">10 SAE - 11180</span> <span style="border: 1px solid black; padding: 2px;">12 SAE - 11210</span><br>TIE ROD TORQUE: LARGE DIA. 33 FT.LBS., SMALL DIA. 14 FT.LBS. |                                     |                      |                           |                                                                                                                                                   |                 |

## CONTROL FOCUSED - TECHNOLOGY DRIVEN

For over 50 years, HUSCO International has been designing and producing some of the most important custom hydraulic and electrohydraulic products in the construction, forestry and material handling industry. Today HUSCO control products can be found on a variety of leading off-highway equipment including: Caterpillar, CNH, Crown, Daewoo, Deere & Company, Hyundai, JCB, Jerr-Dan, JLG, Komatsu, Kubota, Liebherr, Manitowoc Crane Group, NACCO, Volvo, Terex, just to name a few.

Dedicated to meeting and exceeding the changing control needs of the off-highway market for today and well into tomorrow, HUSCO employs an extensive engineering staff capable of designing customized, cost-effective solutions to maximize the efficiency, productivity, controllability and reliability of vehicles.

And with vehicle fit-up and testing capabilities, we're able to design, install and test valve configurations at HUSCO facilities, reducing product development time while optimizing vehicle performance through iterative testing.

With manufacturing facilities in North America, Europe and Asia, we continue to expand as we work with international partners in South America, Korea, Japan, India, South Africa and Australia to bring you any product you need, anywhere in the world.

# **HUSCO**

## **INTERNATIONAL**

*control focused - technology driven*

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