

CB, CBG, and CBF Series

# Check Valves

How to reduce costly turbine shutdowns for repairs and maintenance on fuel systems in dual-fuel turbines



**Parker**  
anything possible

Product Bulletin 4130-CB

# Use our uni-directional flow control check valves, and there's only one way for your maintenance costs to go.

**And that would be down.** Our CB, CBG, and CBF check valves have been designed to withstand the high temperatures, vibration, thermal cycling, and pressures encountered by dual-fuel turbines in virtually any application; from traditional power generation and oil & gas compressor drives to ship propulsion. By providing the best bubble-tight seal in the industry, these valves can significantly reduce or eliminate costly turbine shutdowns and maintenance caused by premature seat and seal failures.

## How does this unique family of valves work? Very simply.

Parker uses an internal seal design concept based on its existing floating ball valve design. The Parker B-series ball valve has an exceptional history of performance in virtually every fluid system. The self centering ball in the CB check valve design compensates for any misalignment, while all other poppet-style check valves can be adversely affected with seat leakage in a misaligned condition.

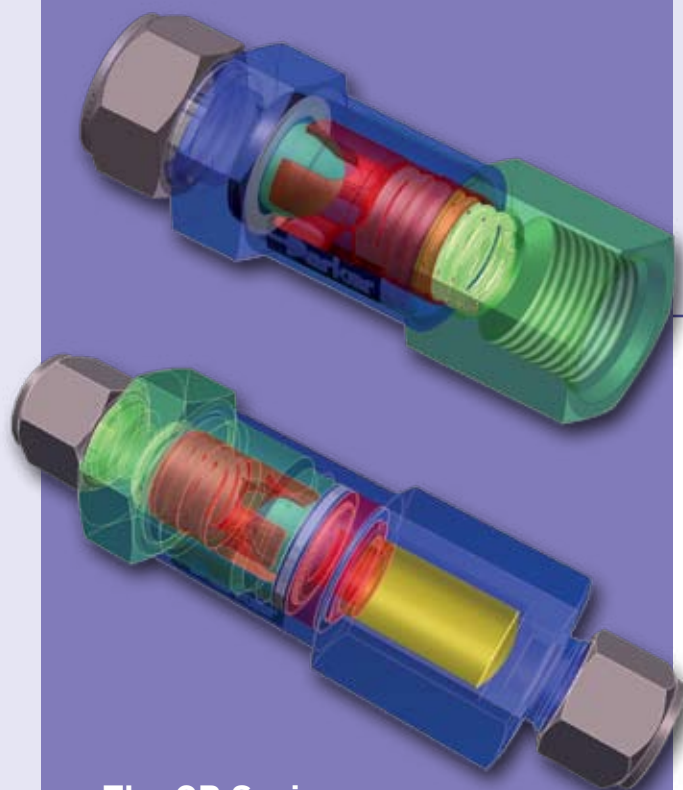
Location	Application	Run hours	Fuel switches	Starts
US (Florida)	Liquid fuel	1100	18	167
	Purge air	1100	18	167
US (Tennessee)	Water injection	246	12	80
	Liquid fuel	246	12	80
China	Liquid fuel	3500	6	Baseload
US (Tennessee)	Liquid fuel	240	5	25
	Purge air	240	5	25
US (Florida)	Purge air	850	8	220
US (New Jersey)	Liquid fuel	340	12	26
Middle East	Purge air	760	15	120
US (Florida)	Liquid fuel	620	12	84

**Table 1.** Sample data collected from some initial site installations of CB Series check valves (up to January 2006) demonstrate reliability in demanding usage situations.

Utilizing PTFE copolymer seats also proves invaluable due to the soft and forgiving nature of the material. Most importantly, the Parker Carbon and Parkerfill seats have been designed and optimized specifically for the demands of fuel oil, purge air, and water injection applications on turbines. These two compounds are chemically inert, highly resistant to "hot flow", resistant to coke sticking and, most importantly, provide an exceptional bubble-tight shutoff. Interestingly, the seal performance actually improves as the turbine heats up.

**Field proven.** Traditional check valves used in dual-fuel turbines are replaced or refurbished as frequently as every few months. Not so with the Parker CB Series.

Field history over the past three years has demonstrated CB valve reliability on a wide range of turbine types and frame sizes, including systems from the two largest turbine OEMs, as well as aeroderivatives. (See Table 1). After thousands of turbine run hours, and hundreds of fuel switches and start-ups, plant operators have found our CB Series of valves to have significantly reduced turbine downtime and maintenance.



## The CB Series

- A Teflon® coating on the internal parts of the check valve helps reduce coke deposits and build-up
- Large flow passages allow the internal cavities to drain more easily, which further reduces coking effects
- Valve seats and seals have been designed to withstand continuous operating conditions in excess of 500°F
- Actual turbine field data on temperatures, flows, and pressures was used to finalize CB design
- Integral “last chance” filter option for seat and nozzle protection

### Specifications

- 316 stainless steel in sizes from 3/8" to 3/4" (9.5 to 19 mm)
- Shell pressure rating: 3000 psi CWP / 20685 kPa
- Standard crack pressures: 1, 5, 10, 25, 50, 75, 100, 120

### Seat Materials, Back Pressure and Temperature Ratings

**Parkerfill:** A PTFE copolymer reinforced with carbon and graphite recommended for water injection and fuel oil lines.

- 1000 psi / 6895 kPa @ 100°F / 37°C
- 300 psi / 2069 kPa @ 450°F / 232°C

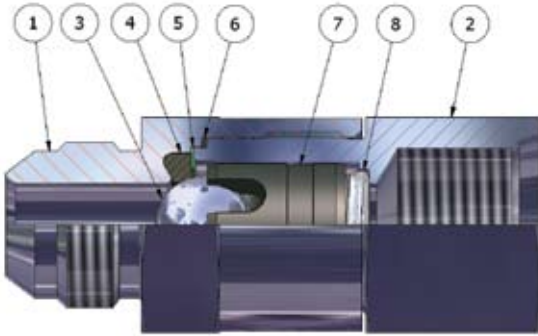
**Parker carbon:** A PTFE copolymer reinforced with carbon recommended for higher pressure purge air

- 2500 psi / 17237.5 kPa @ 100°F / 37°C
- 1250 psi / 8618.75 kPa @ 450°F / 232°C

**To further reduce downtime during repairs, utilize Parker's flexible metal hoses.**

# CB and CBG Series Check Valve

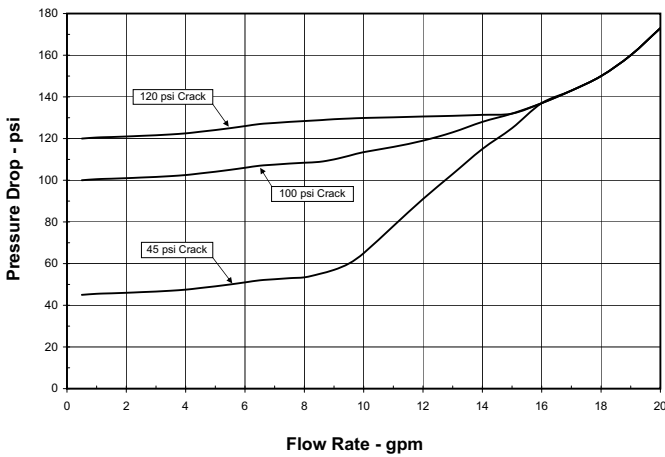
## Materials of Construction



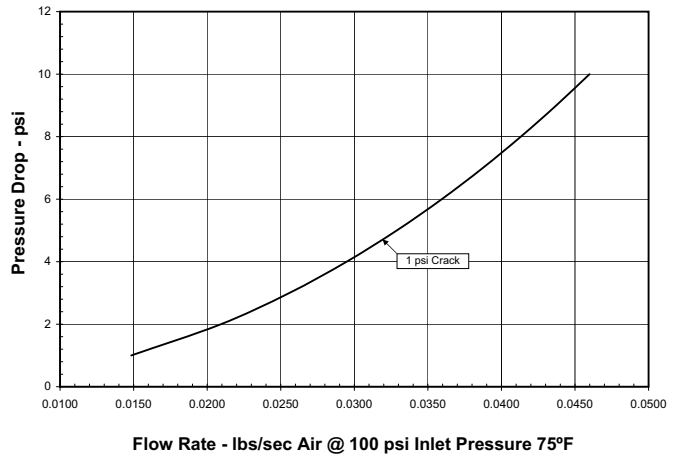
Item #	Part	Material
1	Body	ASTM A276 Type 316
2	Cap	ASTM A276 Type 316
3	Ball	440C SS
4	Seat	Parkerfill, Parker Carbon
5	Body Washer	316 SS PTFE Coated
6	Body Seal	Grafoil®
7	Ball Cage	ASTM A276 Type 316
8	Crack Spring	316 SS

A wide variety of end connections are available including male and female SAE ports, JIC, NPT, and Parker A-Lok and CPI. Parker CB, CBG, and CBF series check valves and filters can also be provided in many tee configurations as shown on page 5. Typical tee configurations are fuel oil/water injection, water injection/purge air, and fuel oil/purge air.

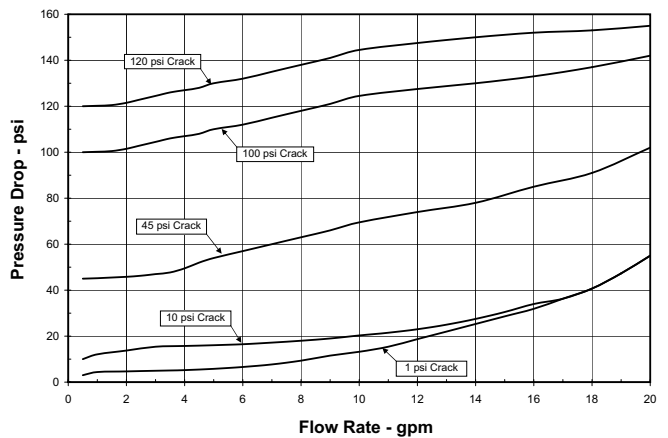
**CB6 Check Valve  
For Liquid Fuel**



**CB4 Check Valve  
For Purge Air**

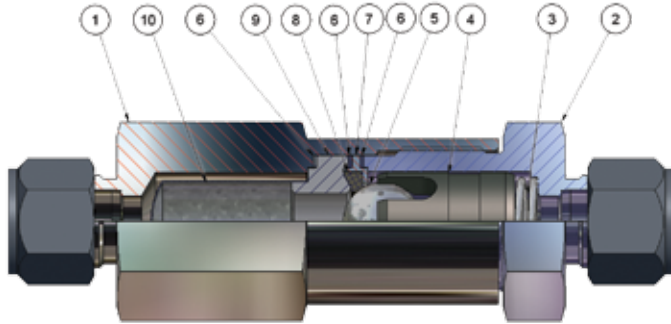


**CBG8 Check Valve  
For Liquid Fuel and Water Injection**



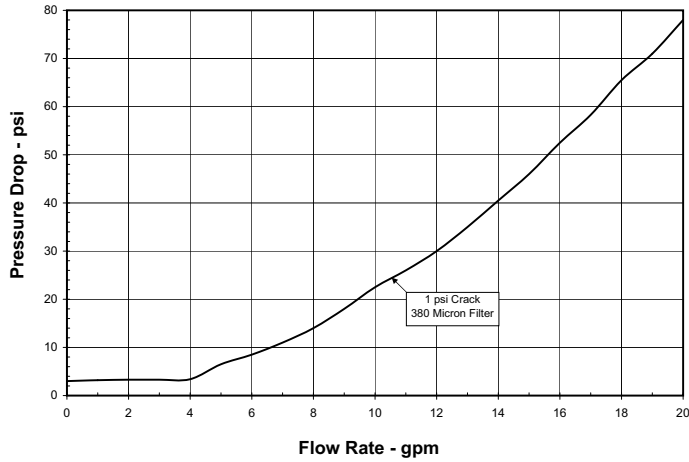
# CBF Series Filter Check Valves

## Materials of Construction

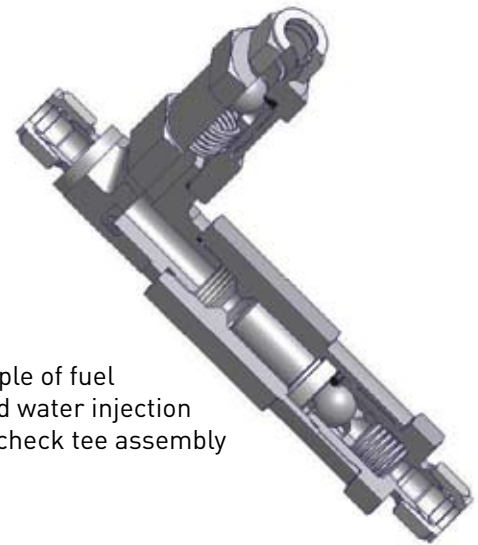


Item #	Part	Material
1	Cap	ASTM A276 Type 316
2	Body	ASTM A276 Type 316
3	Crack Spring	316 SS
4	Ball Cage	ASTM A276 Type 316 Hard PTFE Coated
5	Ball	440C SS
6	Body Seal	Grafoil®
7	Seat Retainer	316 SS
8	Seat	Parkerfill, Parker Carbon
9	Filter Base	316 SS
10	Filter Element	Perforated 316 SS Sheet

**CBF8 Filter Check Valve  
For Liquid Fuel and Water Injection**



Example of fuel  
oil and water injection  
filter check tee assembly



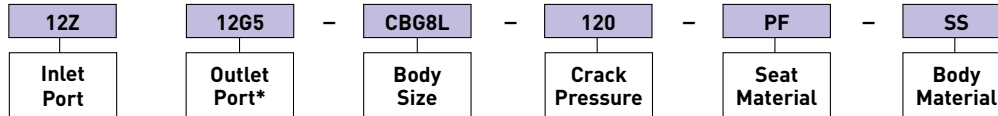
# How to Order

## CB Series Check Valves

The correct part number is easily derived from the following number sequence. The six product characteristics required are coded as shown below. \*Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Inlet Port	Outlet Port*	Body Size	Crack Pressure	Seat Material	Body Material
1 Inlet Port	2 Outlet Port	3 Body Size	4 Crack Pressure	5 Seat Material	6 Body Material
8X	8G5	CBG4L	1	PC - Parker Carbon (For Purge Air)	SS - 316 Stainless Steel
6A, 6Z 6M, 6F 8A, 8Z 8M, 8F	6A, 6Z 6M, 6F 8A, 8Z 8M, 8F 8G5	CB4L	1 5 10	PC - Parker Carbon (For Purge Air)	SS - 316 Stainless Steel
6A, 6Z 6M, 6F 8A, 8Z 8M, 8F	6A, 6Z 6M, 6F 8A, 8Z 8M, 8F	CB6L	1 5 10 45 100 120	PF - Parkerfill (For Liquid Fuel and Water Injection)	SS - 316 Stainless Steel
8A, 8Z 8M, 8F 10A, 10Z 12A, 12Z 12M, 12F 12X	8A, 8Z 8M, 8F 10A, 10Z 12A, 12Z 12M, 12F 12G5	CBG8L	1 5 10 45 100 120	PF - Parkerfill (For Liquid Fuel and Water Injection)	SS - 316 Stainless Steel

Example: 12Z12G5-CBG8L-120-PF-SS

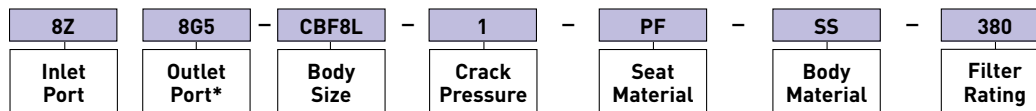


## CBF Series Filter Check Valves

The correct part number is easily derived from the following number sequence. The seven product characteristics required are coded as shown below. \*Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Inlet Port	Outlet Port*	Body Size	Crack Pressure	Seat Material	Body Material	Filter Rating
1 Inlet Port	2 Outlet Port	3 Body Size	4 Crack Pressure	5 Seat Material	6 Body Material	7 Filter Rating
8A, 8Z 8X 10A, 10Z 12A, 12Z 12X	8A, 8Z 8M, 8G5 10A, 10Z 12A, 12Z 12G5, 12M	CBF8L	1 5 10 25 50 75 100 120	PF - Parkerfill  PC - Parker Carbon	SS - 316 Stainless Steel	75 200 380 500 Microns

Example: 8Z8G5-CBF8L-1-PF-SS-380



## Sample of Parker CB Valves for Gas Turbine Applications

(Call for information if your OEM part is not shown, many others on file.)

Media	OEM Part Number	Parker Functional Equiv.	Turbine Frame	Inlet	Outlet	(psi)
Purge Air	336A2436p001	6Z6M-CB4L-1-PC-SS	9E, 6B, 7E	3/8" CPI	3/8" MNPT	1
Purge Air	336A2436p002	8F8M-CB4L-1-PC-SS	9E, 6B, 7E	1/2" FNPT	1/2" MNPT	1
Purge Air	336A2436p003	12Z-CB4L-1-PC-SS	9E, 6B, 7E	3/4" CPI	3/4" CPI	1
Purge Air	336A2436p004	8Z-CB4L-1-PC-SS	9E, 6B, 7E	1/2" CPI	1/2" CPI	1
Purge Air	336A2436p005	8Z8F5-CB4L-1-PC-SS	9E, 6B, 7E	1/2" CPI	SAE M-8	1
Purge Air	336A2436p006	8F8F5-CB4L-1-PC-SS	9E, 6B, 7E	1/2" FNPT	SAE M-8	1

Fuel Oil	348A5821p002	12Z12F5-CBG8L-120-PF-SS	7EA (primary)	3/4" CPI	SAE M-12	120
Fuel Oil	348A5821p004	12Z12F5-CBG8L-120-PF-SS	7EA (secondary)	3/4" CPI	SAE M-12	120

Water	355A7251p001	12X12G5-CBG8L-10-PF-SS	5P, 6B	3/4" CPI	SAE F-12	10
Water	355A7251p002	12X12G5-CBG8L-10-PF-SS	7EA DLN, 7F, 9E, 9F	3/4" CPI	SAE F-12	10
Water	355A7251p003	12X12G5-CBG8L-10-PF-SS-WI	7EA DLN, 7F, 9E, 9F	3/4" CPI	SAE F-12	10

Fuel Oil	361A2943P001	12X12G5-CBG8L-120-PF-SS	6C, 9E, 7EA	37 AN M-12	SAE F-12	120
Fuel Oil	361A2943P002	12X12G5-CBG8L-100-PF-SS	6B	37 AN M-12	SAE F-12	100
Fuel Oil	361A2943P003	12X12G5-CBG8L-45-PF-SS	6FA, 7FA, 9FA	37 AN M-12	SAE F-12	45
Fuel Oil	361A2943P004	12X12G5-CBG8L-100-PF-SS	5P	37 AN M-12	SAE F-12	100
Fuel Oil	361A2943P005	12X12G5-CBG8L-100-PF-SS	6FA, 7FA, 9FA	37 AN M-12	SAE F-12	100
Fuel Oil	361A2943P006	12X12G5-CBG8L-100-PF-SS	7H, 9H	37 AN M-12	SAE F-12	100
Fuel Oil	361A2943P007	12X12G5-CBG8L-120-PF-SS	crude, heavy fuel	37 AN M-12	SAE F-12	120
Fuel Oil	361A2943P008	12X12G5-CBG8L-45-PF-SS	crude, heavy fuel	37 AN M-12	SAE F-12	45

Purge Air	362A1331P001	8X8G5-CBG4L-1-PC-SS	5P, 6B, 6B DLN	37 AN M-8	SAE F-8	1
Purge Air	362A1331P002	8X8G5-CBG4L-1-PC-SS	7FA, 7EA, 9E, 9FA	37 AN M-8	SAE F-8	1
Purge Air	362A1331P003	12X12G5-CB6L-1-PC-SS	7FA, 9FA, 6B DLN, 7F& 9E water	37 AN M-12	SAE F-12	1
Purge Air	362A1331P004	8Z8G5-CB4L-1-PC-SS-3296	7FA, 7EA, 9E, 9FA	1/2" CPI	SAE F-8	1
Purge Air	362A1331P005	8X8G5-CBG4L-5-PC-SS	7FA, 7EA, 9E, 9FA	37 AN M-8	SAE F-8	5
Purge Air	362A1331P006	8Z8G5-CB4L-5-PC-SS-3296	7FA, 7EA, 9E, 9FA	1/2" CPI	SAE F-8	5

**NOTE:** For Multiple Media, there are 11 total OEM parts for p/n 348A5821.

Parker must verify customer end connections and crack pressures before supplying these replacement parts.

Parker can also replace OEM parts from drawings 114A3759, 235A9848 and others.

Parker CB checks can also be provided as "combos" which can eliminate extra fitting connections in the system plumbing. Please call for assistance if you wish to improve your plumbing arrangement at the same time you are improving your check valve performance.

## Repair Kits

### CB and CBG Series Check Valves

Kits include seat, body gasket, and crack spring. To order, fill in the designators from the chart below.

Kit	Size	Crack Pressure	Seat Material
KIT		1	PF – Parkerfill PC – Parker Carbon
	CB6	5	
	CB8	10	
	CB12	25	
	CBG8	50	
	CB4	75	
	CBG4	100 120	



Example kit part number: **KIT-CB12-120-PF**

### CBF Series Filter Check Valves

Seal kits (KITS) include seat, body gasket, and crack spring. Valve kits (KITV) include seat, body gaskets, crack spring, and ball. Optional parts for valve kits include ball cage and filter. To order, fill in the designators from the chart below.

Kit	Size	Crack Pressure	Seat Material	Valve Kit Options	Filter Rating
KITS KITV	CBF8	1	PF – Parkerfill PC – Parker Carbon	Blank – None 1 – Ball Cage 2 – Filter 3 – Ball Cage & Filter	75
		5			200
		10			380
		25			500
		50			Microns
		75			(Include with filter option)
		100 120			

Examples:

Seal kit part number: **KITS-CBF8-10-PF**

Valve kit part number: **KITV-CBF8-10-3-200** (with Ball Cage and 200 micron filter option)

#### 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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