

## New From Fetterolf

by A. M. Ritter, VP Fetterolf

# Easy Maintenance "Hatchback" Design

### Some Things to Think About

"There are only two things of importance. One is the customer, and the other is the product. If you take care of customers, they come back. If you take care of your product, it doesn't come back. It's just that simple, and it's just that difficult."

—Stanley Marcus  
Neiman Marcus

"In this era of growing universality, a company's nationality is far less important than its commitment to its customers."

—John Henrick, President  
Okuma America

"Great ideas need landing gear as well as wings."

—C. D. Jackson

"Many manufacturers remain too silent about their success. Let's all show more pride in the quality improvements we have achieved, while redoubling our efforts to improve the quality of our products and the quality of our lives."

—Jacob Jasinowski, President  
Nat'l Assoc. of Manufacturers

**F**lush-bottom tank valves of non-clogging design are all descended from an English design by Richard Klinger in the early 1900's. Various names have been used to describe this type of valve (Ram-type, Plunger-type, Drop Valve, Bottom Valve, Piston-type, Seatless, and Rod-Seal), all of which operate via a piston moving within a cylindrical body. Moving the piston up and down within the cylinder assures a smooth, unobstructed flow-path.

On closing, the piston rises through the cylindrical body, scouring all residue from the valve walls left by the previous batch, eliminating any stagnant materials which might remain in the valve body and contaminate future batches. Sealing of the piston or plunger within the valve is accomplished by compressing three seal rings plus a section of flexible packing material when closing the valve. This unique sealing system prevents leakage from the process vessel or reactor as well as preventing leakage to the atmosphere.

The second generation of valves utilizing this concept incorporated temperature compensated spring-loaded packing glands which eliminated the requirement of re-tightening the packing after cool-

down and ended the problem of valve "weeping". Not all Ram-type valves use multiple sealing rings plus spring-loaded glands. When the valve is closed, the increased compressive force seals the valve against leakage. This feature is also not found in all designs of this type.

An additional improvement made at the time of spring-loaded glands was a change in the angle of valve discharge to 45 degrees from the original sixty degrees. This 45 degree discharge angle greatly simplified downstream piping in that conventional, commercially available fittings could be used rather than a fabricated fitting to get back to horizontal or vertical flow. An additional benefit of the 45 degree discharge was an increase in Cv valve by some 15% per valve size. This equated to faster drainage time and more batches per day.

The upper seal ring, closest to the process vessel, is the one which sees the most wear from erosion or abrasion by the process fluid when the valve is in the open position. This erosion can cause leakage over time into the downstream piping as well as the possibility of dewatering the contents of the vessel.

Replacement of this seal ring to restore valve integrity can be a time-

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# How To Select Special Valves

By R. C. Merrick, P.E. Fluor Daniel

One of the most critical moments in an engineer's work day comes when you look at a flow sheet or read a report about a problem, and realize that you need a special valve.

## What's a special valve?

As a valve user, the obvious definition of a "special" valve is that it's one you don't use every day. However, "special" means something different to a valve manufacturer. To a manufacturer, "special" means something that they don't MAKE every day, or more precisely, something that doesn't fit in easily to the manufacturer's standard production system. The distinction is significant to a valve specifier, because you may be able to get a valve that's "special" to you from a manufacturer who builds such valves every day, and so considers building such a valve as a fairly normal practice. That's valuable to you because, although it's pretty important that you can correctly specify the valve requirements, it's even more crucial to the success of the final installation that the valve manufacturer do his job correctly. That's more likely to happen when that manufacturer is building a type of valve that he really knows how to build.

## Why do you want a special valve?

As you start to think about a piping problem, one of the first things you're likely to think is that you need "something" to solve your problem. You then would try to home in on exactly what that "something" is. A person with considerable experience in valving may know immediately what the final requirement will turn out to be, but it may be necessary first to go through a number of steps in a decision tree to arrive at a good solution. As you learn more about the exact nature of the problem, it will be easier to figure out what to do.

## What do I have to choose from?

The valves you might choose to solve your problem could very well be

pretty easy to get. For instance, if you are concerned with a hydrocarbon processing unit where almost every valve is a wedge gate, and say you have an acid line that needs a valve to seal bubble-tight at a reasonable fluid temperature, then maybe all you need is a sleeved plug valve. This is certainly a "special", or at least a non-standard valve as most hydrocarbon process users would know it, but yet it's a pretty normal valve in some other industries.

## How do I know what to ask for?

Now, we're getting to the heart of the decision-making process. You first have to know what the problem REALLY is, not just "these valves fail too fast". Is it a body corrosion problem? Seat leakage? How exactly does it leak? Does it do okay for a year, and then slowly start leaking? Is the valve hard to operate? Has it always been that way? Knowing the symptoms, you can specify something to take care of each problem. Now comes the complicated part. Let's say you have determined that you need a more corrosion-resistant body material. Let's also say that the existing valve is a wedge gate. It would be easy to specify the exact same valve in a high alloy body material, but it might not be all that easy to get such a valve and it may be quite a bit more expensive than you expected. If you change the design to a ball or plug valve, or if it's fairly large, to a butterfly valve, then you can get a high alloy valve with a lot less metal mass, and thus a lot less cost, than by leaving the design alone. Another point to consider for high alloy valves is the fact that many of these alloys are not easy to cast. If you can choose a valve type that can easily be made from forgings or as a weldment, you'll probably see some cost savings and, perhaps more importantly, you may be able to get the valve in one-third the delivery time that cast valves might require.

## Can I get into trouble doing this?

Sure, you can, if you haven't established exactly what your problems are and also taken the time to evaluate your proposed solution in light of your

current problems. For instance, a corrosive fluid can be shut off better with a resilient-seated valve—unless the fluid also happens to attack the elastomer you (or the manufacturer) have selected as a sealing element. Then you have a worse problem.

## How can I keep out of trouble?

There's no question that experience is a good teacher—provided that you figure out what happened each time that something went wrong with what you did. It's perfectly okay to learn from someone else's mistakes also. However, there are lots of good sources of advice available to you. When you have a special valve application problem, one of the best resources available are the manufacturers who might make the valves you want. As long as you ask the right questions, and think carefully about the answers you get back, a reliable manufacturer can be your best ally in the quest for valve improvements. One of the obvious reasons for this is that the manufacturer is putting his reputation on the line at least as much as you are when valves go into a new set of service conditions, so a reputable manufacturer is likely to put some thought into new designs. When you find these manufacturers asking you some detailed questions, it's evidence that they already have some pretty good ideas about how to solve your problems, and are checking to see that they're on the right track. In fact, you should feel more comfortable with a manufacturer who does ask questions than one who doesn't ask anything or tell you anything about what he proposes to furnish. □

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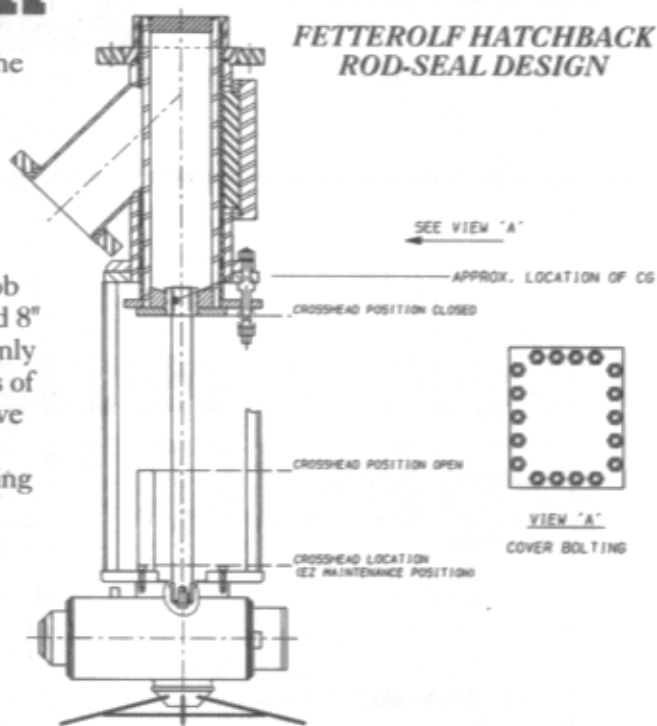
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# Easy Maintenance "Hatchback" Design

consuming task whose difficulty increases with valve size and pressure rating. Also there is frequently little access room under the vessel for valve removal, particularly when a heavy electric or pneumatic actuator with gearbox is involved.

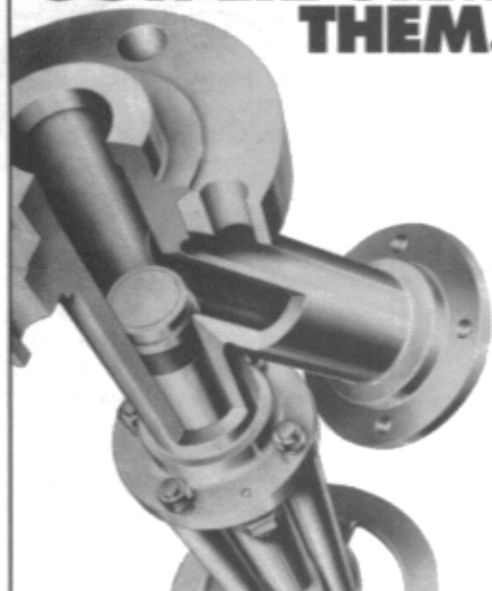
The requirement of removing the valve and actuator from the vessel to replace seal rings and packing is now a thing of the past—ancient history in today's modern world. The Fetterolf "HatchBack" design allows in-situ replacement of seal rings. This greatly reduces the number of man hours required to maintain a valve in first class, no leak condition. In this patented design, the plunger is withdrawn to the "EZ

Maintenance" position, the bolted hatchback cover detached, and internals removed and replaced while the valve remains in position on the vessel. What was formerly a 48 man-hour maintenance job on an electrically operated 8" valve is now reduced to only 3 man-hours. Installations of the hatch-back design have proven that the savings realized on the first seal ring replacement more than justify the slight cost increase for this unique feature. □



## FETTEROLF. WORLD'S LARGEST SELLING RAM VALVE:

**WE OUTSELL  
THEM  
BECAUSE WE  
OUTPERFORM  
THEM.**



### FEATURES

- No dogs... No leaks. Full Opening, Free Flow.
- Using extended body, the body and plunger are flush with the I.D. of the vessel or pipeline.
- During installation, the valve body can be rotated within the loose bolting ring for ease in alignment.
- Seal ring: TFE to 500°F; other materials for temperatures from -350°F to 1200°F provide drop-tight shut-off from 100 micron vacuum to 6000 psi (ANSI 150 to 2500).
- Fail-safe options and controls.

### OPTIONS

- Tested API Fire-safe designs
- Valves in: stainless and carbon steel; titanium; alloy 20; nickel; monel; Hastelloy™; Inconel™; and zirconium.
- Special custom designed valves and piping assemblies with integral welded jackets.
- 'Standard' drain and sampling valves can be modified to fit your needs.

## FETTEROLF

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