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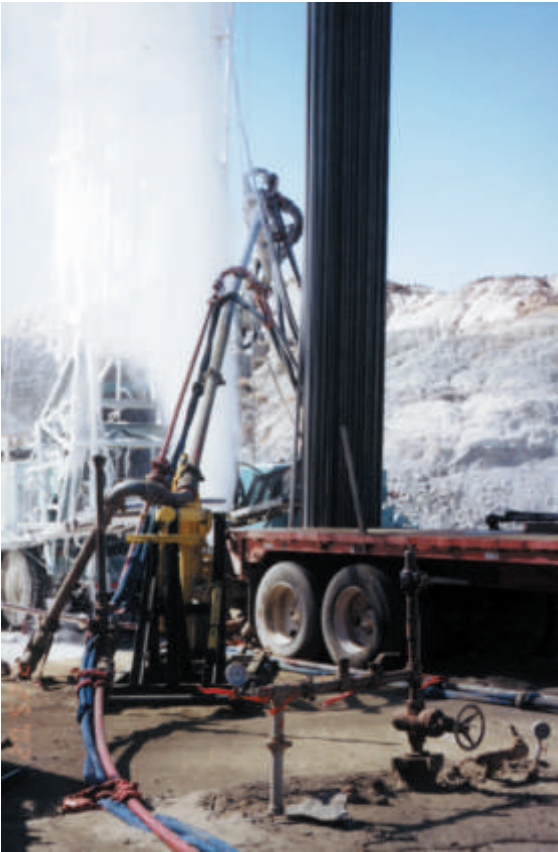


## Flow Line Safety Restraint System

**The Flow Line Safety Restraint System (FSR) is designed to help provide damage control for line failures during high pressure pumping operations. Service providers increase the risk of costly damage, injury and death by not securing their flow lines with the Flow Line Safety Restraint System.**

U. S. Patent No. 6,481,457





The force of a flow line rupture can be catastrophic, as seen by the bend in this high strength steel piping. Notice how the FSR contained this rupture, keeping the pipe from striking an active well next to the flow line.

### One Time Is All It Takes!

The Flow Line Safety Restraint System is designed to help provide damage control for line failures during high pressure pumping. All it takes is one instance in which a line not utilizing the FSR System ruptures to see the costly and life threatening effects. Companies have a duty to create the safest work environment possible to protect their employees and assets, and the FSR System is a vital part of creating a safe work site during drilling and well service applications.

FSR configurations can be customized for the customer to fit any operation. Though Weir SPM suggests the FSR to be utilized during all high pressure pumping operations, it is particularly important that the FSR system be utilized during nitrogen and energized fluid pumping operations.

The FSR Rental Fleet undergoes thorough inspection, as well as regular recertification and testing to insure components perform as expected. Each component features an identification badge so customers can verify their items are in compliance.



Weir SPM maintains a fleet of rental FSR units around the globe. Upon order, Weir SPM technicians will train customer employees on the proper installation of the system as well as verify all components are in compliance. Full service, including installation and dismantle, is also available in many locations.

The FSR System adds peace of mind for producers and well service providers seeking to create a safe well site. The FSR System has been credited with saving several lives since its inception five years ago and was honored for its groundbreaking design winning the "Best Mechanical Engineering Innovation" Award from the American Society of Mechanical Engineering in 2002.



# Weir SPM offers FSR Rental Units for maximum convenience and flexibility in meeting the operator's demands for safety on site.

Weir SPM's FSR System is the perfect tool for customers to meet their requirements for flow line restraint during energized fluid services. No other system is currently available that has the proven track record and history of thorough testing to ensure increased safety on your site.

### Did you know?

- Typical frac operations run between 2,000 to 14,000 psi with flow lines up to 125 ft long.
- The destructive force of an unrestrained flow line rupture can send heavy duty components airborne for over 300 feet.
- FSR is suitable for energized fluid, CO2 and Nitrogen operations.

### Benefits of the Weir SPM FSR System:

- Extreme High Strength and Reliability
- Flexible & Lightweight
- Relatively Inexpensive
- Easy to Install
- Corrosion Resistant
- Ongoing Weir SPM Support
- Available Full-Service Assistance in the Field

The FSR System is easy to install, and Weir SPM can provide on site installation service, or training to ensure employees install all components properly.

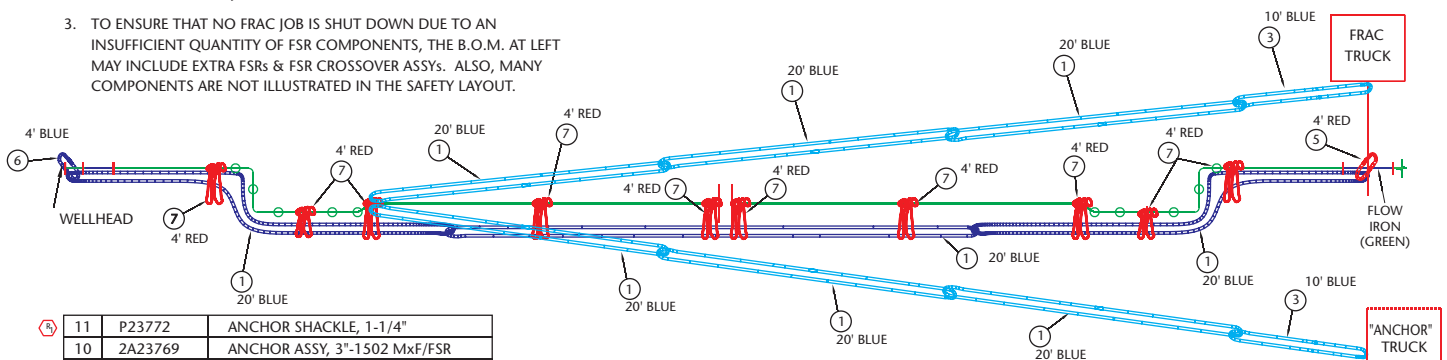
The Restraint System can be equipped throughout an entire flow line, including swivel joints and valves.



### NOTES:

1. THIS LAYOUT DOES NOT SPECIFICALLY SHOW LOCATION OF ANCHOR CROSSOVERS
2. SAFETY RESTRAINTS SHOWN IN A RECOMMENDED ARRANGEMENT. THIS IS ALWAYS SUBJECT TO CHANGE.
3. TO ENSURE THAT NO FRAC JOB IS SHUT DOWN DUE TO AN INSUFFICIENT QUANTITY OF FSR COMPONENTS, THE B.O.M. AT LEFT MAY INCLUDE EXTRA FSRs & FSR CROSSOVER ASSYS. ALSO, MANY COMPONENTS ARE NOT ILLUSTRATED IN THE SAFETY LAYOUT.

## Typical Restraint System Layout



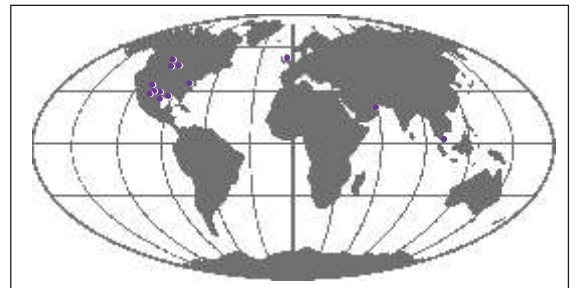
ITEM	PART NO	DESCRIPTION
11	P23772	ANCHOR SHACKLE, 1-1/4"
10	2A23769	ANCHOR ASSY, 3"-1502 MxF/FSR
9	2A23845	ANCHOR ASSY, 2"-1502 MxF/FSR
8	2A23847	ANCHOR ASSY, 1-1/2"-1502 MxF/FSR
7	P23626-04	FSR RIB X 4FT. LG. (RED)
6	P23625-04	FSR SPINE X 4FT. LG. (BLUE)
5	P23625-06	FSR SPINE X 6FT. LG. (BLUE)
4	P23625-08	FSR SPINE X 8FT. LG. (BLUE)
3	P23625-10	FSR SPINE X 10FT. LG. (BLUE)
2	P23625-15	FSR SPINE X 15FT. LG. (BLUE)
1	P23625-20	FSR SPINE X 20FT. LG. (BLUE)

**Weir SPM**

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