

## OUR OFFER

The support we offer our clients, starting from the very first contacts to the vehicle homologation, includes many different activities:

- Analysis of client's specific needs
- Analysis of vehicle features
- Definition of the optimal technical solution
- Brake performance calculation by means of a proprietary software
- Definition of brake system components
- Training for hydraulic system installers
- Vehicle set up and pre-homologation tests
- Full support for homologation tests
- Issue of complete documentation to support homologation activity (brake calculation, brake system scheme, bill of material, homologation test reports)

## OUR TESTING DEVICES

We avail of all technical tools and devices necessary to give a full support to the activities leading to the homologation. Some of them:

- Tractor simulator for static tests
- Data acquisition device for static tests
- Tractor simulator for dynamic tests
- GPS system to evaluate the dynamic performances of the vehicle
- Trailer simulator for instruments calibration



SAFIM S.P.A.

Our main target is leading the way on a worldwide scale for design and production of off-highway vehicle components by always more and more effective and efficient systems able to promote environmental protection.

Creating always safer conditions for the operators is our commitment. Not the least is the environmental theme along with the impact of our products on it; this is why, starting from design, we pay as much attention as possible to reduce particles emissions, manufacturing always more and more efficient and effective systems promoting the reduction of polluting particles.

Since 1977, our team focuses on manufacturing high quality and reliable products complying with the toughest rules and specifically tailored on customers' requests.

We achieved different certifications: The UNI EN ISO 14001:2015 and UNI EN ISO 9001:2015 concerning processes; both standards underline the commitment of our management towards environmental and quality themes. During 2018 as one of the first companies in Europe, the company reached another important target by reaching the UNI EN ISO: 45001 certification, the most important regarding safety at work.

## OUR SYSTEM

Since the new regulation has come into force, it is compulsory to install dual line braking system on towed vehicles.

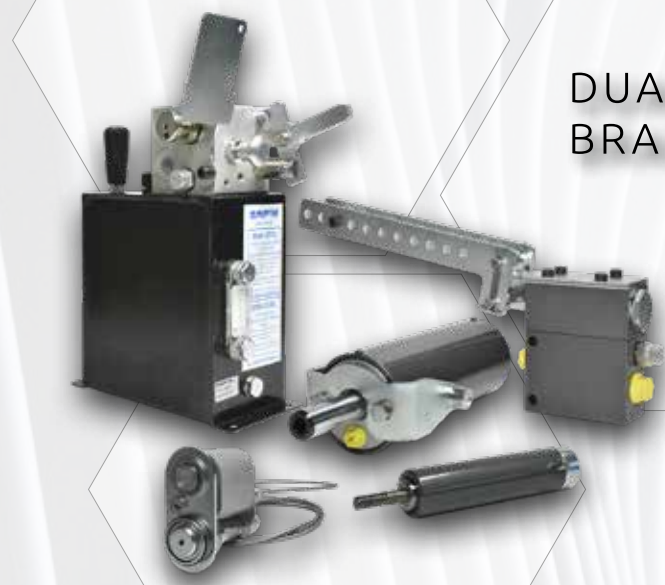
Safim developed several solutions in order to satisfy all customers' needs to have systems compliant with the new rule.

The technical team investigates the solution that most suites all specific needs of the client; this means a tailored approach aimed to supply an effective turnkey solution, covering technical and functional aspects, starting from design until the final tests of homologation.

### DUAL LINE BRAKING SYSTEM



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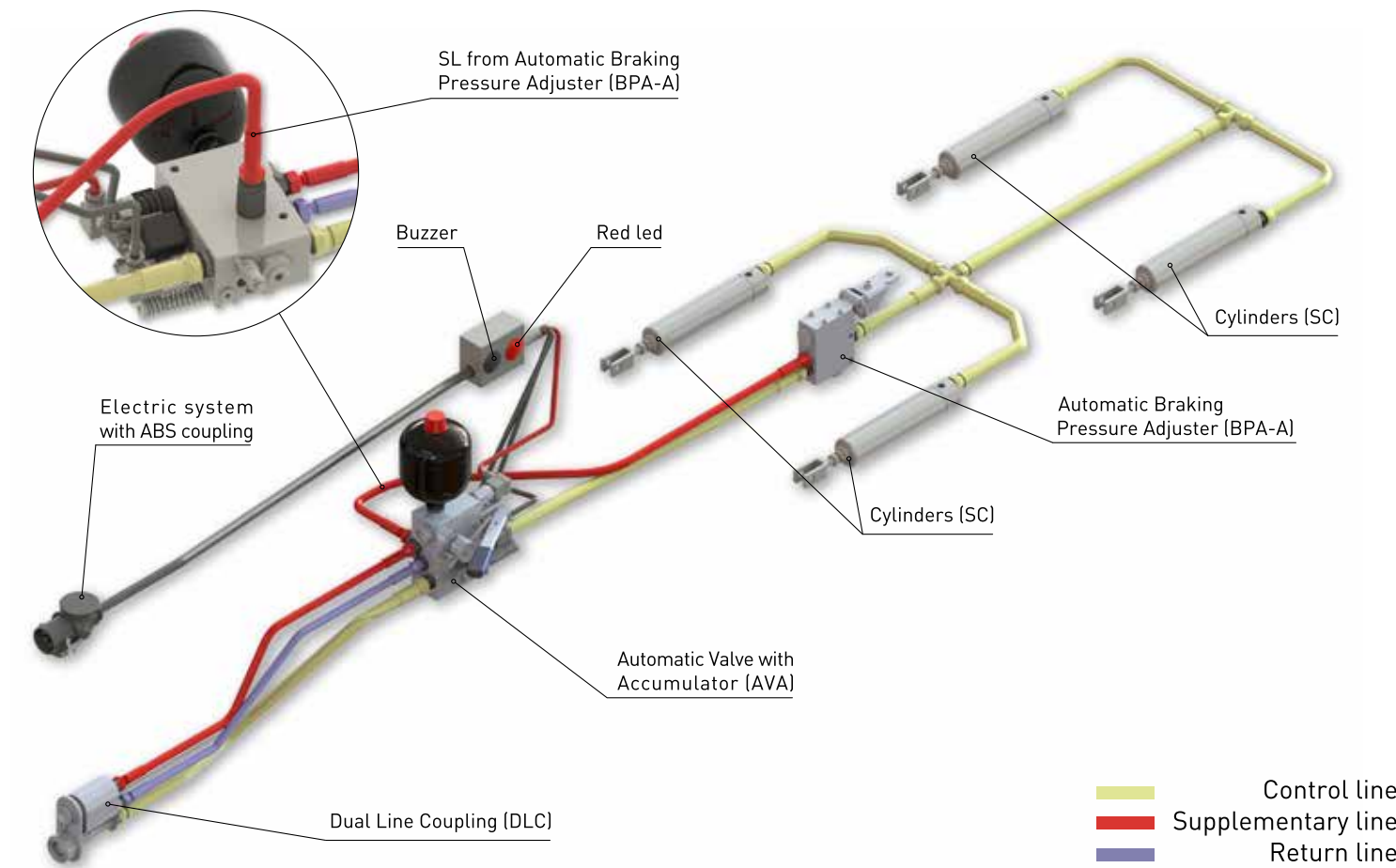


## AS - ACCUMULATOR SYSTEM

In event of emergency, the automatic braking function uses the pressurized oil stored in the accumulator.

The benefit of this system is the compactness of the brake actuators, which can be located on trailers having limited room. This system can be used with the hydraulic brakes integrated on the hub too.

Further to the standard two hydraulic lines, the system needs an electrical connection to the tractor (ISO 7638 – ABS plug).



Each Safim brake system allows a "single line" working mode, which permits to connect the trailer to a single line tractor (using, if necessary, specific adaptors for the connection). If the system is correctly installed, the emergency brake function is granted, in case of mechanical disconnection, even under this working mode.

## CTS - CYLINDER & TANK SYSTEM

A CTS system uses a merely mechanical energy source to actuate the automatic emergency brake function.

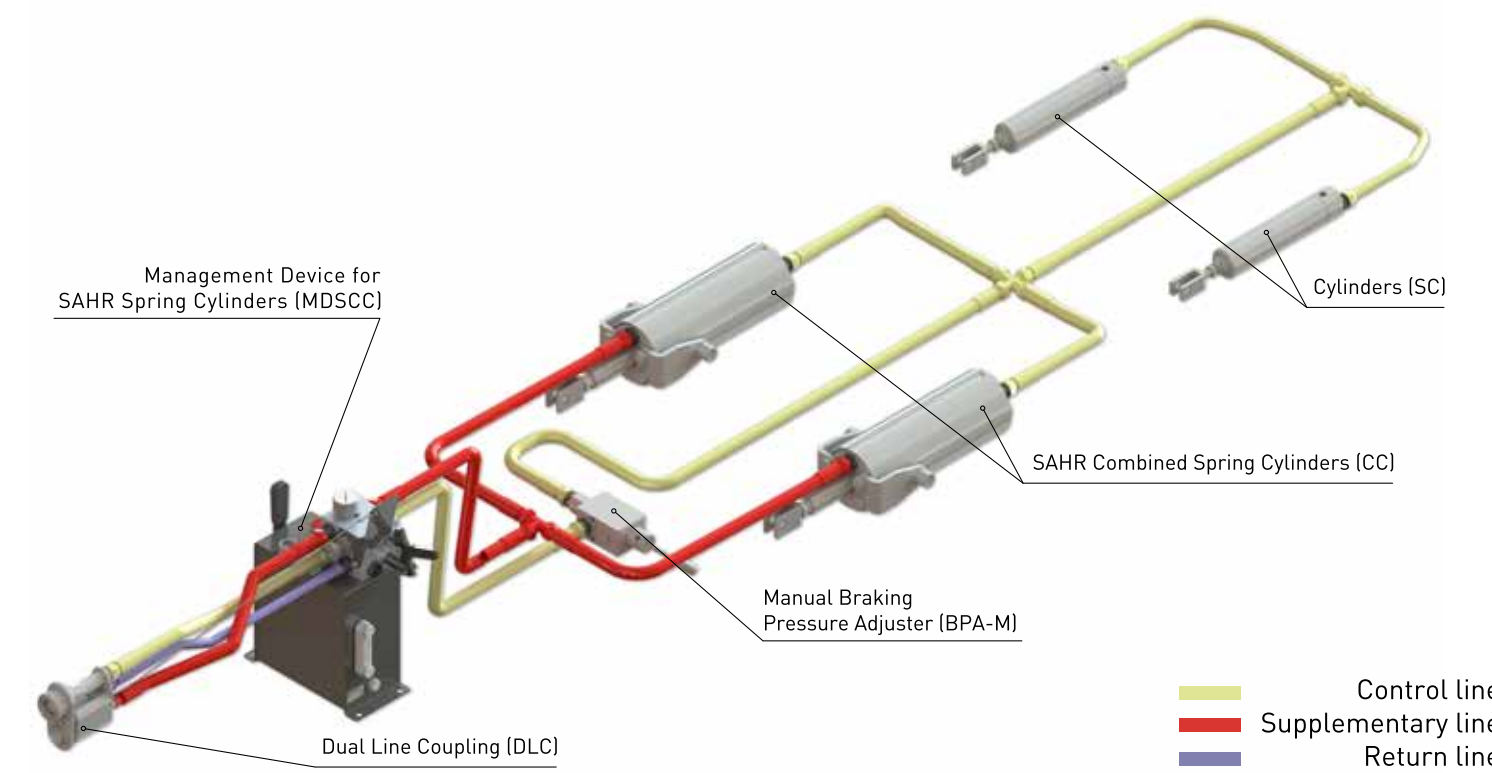
The compressed springs, located in one of the two cylinder sections of a combined cylinder, provide the energy.

The Supplementary Line oil in pressure keeps the springs compressed, and releases them when the coupling disconnects from the tractor.

This system does not need any electrical connection, because is connected to the tractor only via hydraulic hoses.

Brake actuators are combined cylinders, made up of two sections, one for service brake function, the other for automatic brake and parking brake function.

A separated tank collects the oil used to release the spring brakes. If it is necessary to remove the automatic braking function, a manual pump conveys the oil to the cylinders compressing again the springs.



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## ECS - EQUAL CHAMBER SYSTEM

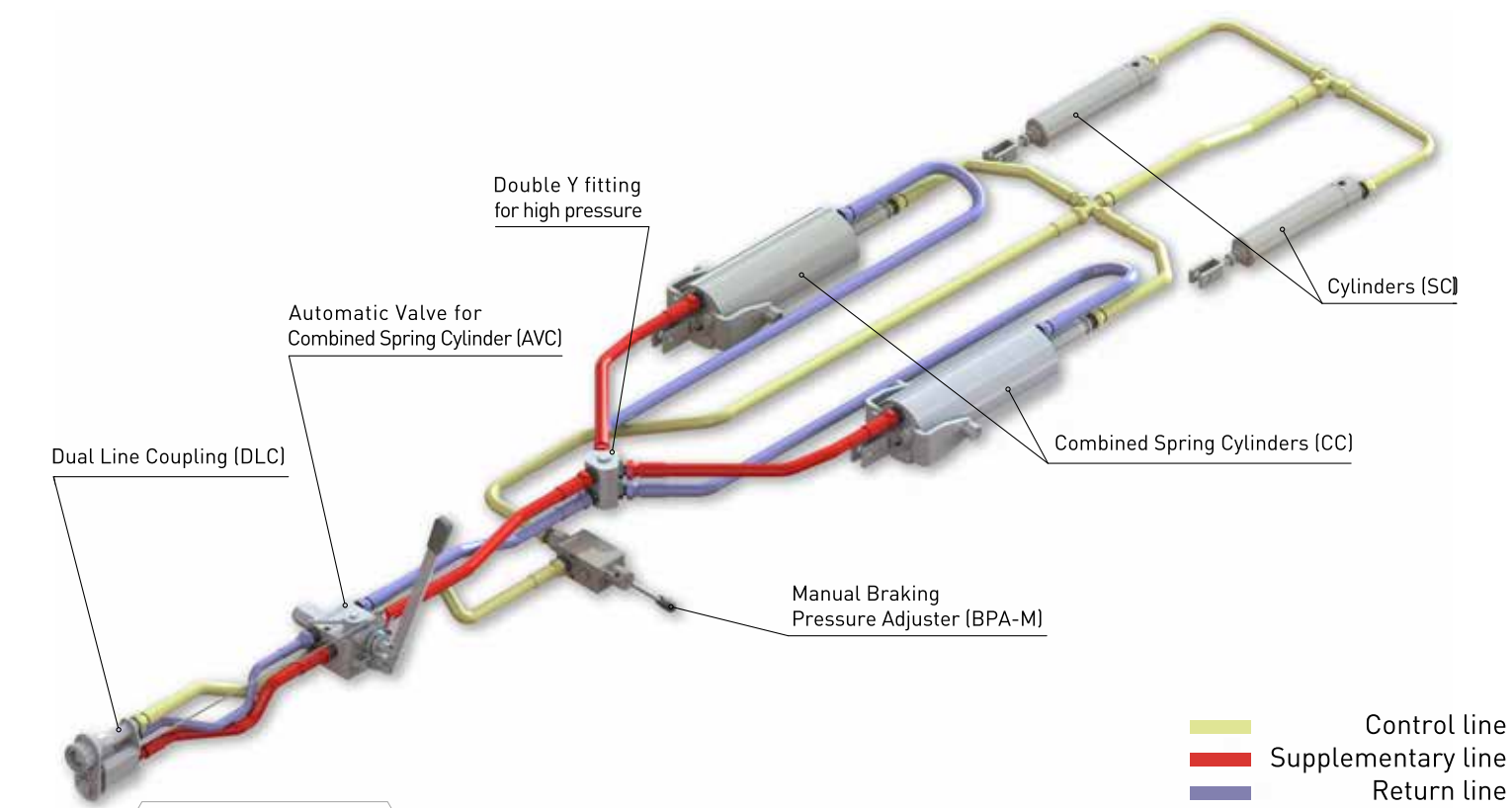
As the CTS system, the ECS solution includes combined cylinders.

The main difference stands in the different discharge of oil. In the ECS solution, the oil used to release the springs discharges inside the rear part of the spring-brake, which works as a tank.

The event occurs in case of disconnection of the trailer from the tractor.

The ECS system is intrinsically safe too, because it uses a merely mechanical energy source to actuate the automatic emergency brake function. Moreover, like the CTS system, the ECS connects to the tractor only via hydraulic hoses, with no need of electrical connection.

The absence of an external tank makes this system an easy-fitting one for trailers having small room available for brake system components.



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## ACCESSORIES

Safim offers a complete range of valves and components among its products, fitting every type of trailer, making the braking system perfectly safe and complying with the new "RVBR" - (EU) 2015/68 rule.

The valve range produced by Safim enables a correct definition of the braking system working pressures in any condition, thanks to the availability of automatic and manual load sensing valves, as well as pressure limiters and adjustable rate pressure reducers.

The availability of combined and simple effect brake cylinders, with robust design and efficient performances, completes the valves functionality, meeting all the requirements of the various vehicles.

Furthermore, a range of adaptors enables dual VS single line braking system connection.



Main valves and components for dual line hydraulic braking systems, according to the European "RVBR" - (EU) 2015/68 Regulation.