CLS - CAR LIFT SYSTEM

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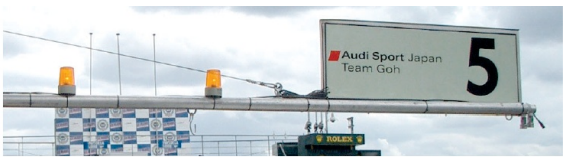

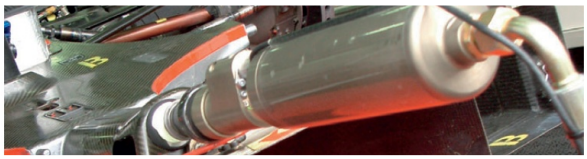

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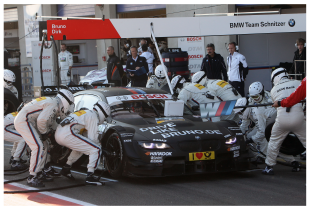
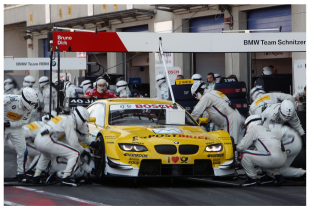
Basic info

The Car Lift System type CLS V2 was created to reduce the tyre change time at pit stops. In many races the smallest advantage during a pit stop can produce the winner. The CLS gives teams the possibility to increase the speed without loss of safety and to supply the driver with additional information. The system has been used for many years now by teams competing in the DTM, Deutsche Touring Car Masters. The winning teams from Audi Sport in 2011 and BMW Motorsport in 2012 exploited the advantages of CLS.





Description / features

The CLS is adapted to suit the car, while the majority of the standard parts on the car remain. To reduce time loss, every wheel gun is equipped with a 'ready' button. This information, along with other parameters, is transferred to a computer controlled unit. The computer controls all the actions as well as storing all the data in a separate data logger. Evaluation of the data helps to increase the performance of the tyre change crew. Additional information can be transferred to the driver. To speed up lifting the car, a special air lance has been developed. This air lance can be connected with very little force to the car despite it being powered by high pressure air. When the tyre change is complete, the air lance is automatically ejected and the car drops down immediately.

Pneumatic pressure 3.5 Mpa (= 35 bar = 500 PSI).

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Parts

The CLS V2 kit consists of the following parts:

- Electronic box
- Air lance with nozzle
- 'Ready' buttons on the wheel guns
- Main loom
- Optional in-car sensor
- Optional signal lights (4 wheel guns, 1 driver info)

Electronic box

The electronic box is the heart of the CLS system. A detailed front panel makes operation without an external computer interface possible, and gives an overview of all current major signals.

The unit supports up to 4 wheel guns, an air lance, an ultrasonic sensor, 4 signal lights for each wheel gun and driver info light as well as an optional electric lollipop. All operations are logged by an internal data logger.

A signal for overall timing can trigger external timing. For online analysis a data stream via USB interface to an external host computer is also available. System adaptation to the customer's car is easily implemented via USB and the Mega Application Tool MAT software.

Electronic box

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Air lance with nozzle

The air lance contains all the necessary parts to achieve simple handling in combination with optimised timing. A specially designed nozzle to optimise the operation and reduce wear to a minimum is mounted on the car. As soon as all four tyres are changed the electronic box activates a valve inside the air lance which is then ejected immediately from the car.

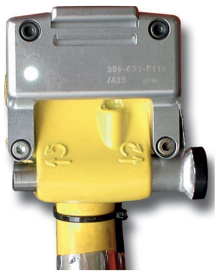
A pressure sensor is included for data recording; a counter gives feedback about the number of lifts. This helps to define accurate service intervals.

Air lance

Wheel gun switch

The current CLS version of the wheel gun switch is adapted to suit the Paoli DP4000 wheel gun; versions for DP2000S are still available. The toggle switch must be pressed by the mechanic when the tyre change is complete. The signal is transmitted to the electronic box and the mechanic gets feedback via an LED inside the wheel gun switch.

DP4000



DP2000S

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Main loom

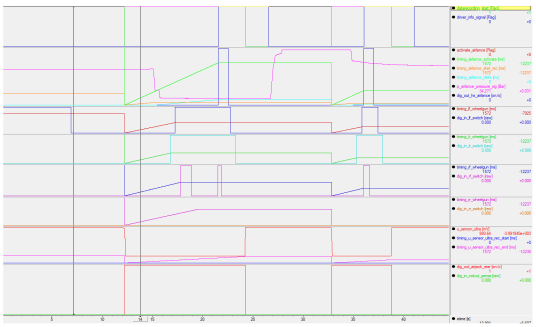
The main loom is the first component between the electronic box and gantry. The team must supply the subsequent wiring looms to connect the wheel guns, air lance and signals lights.

Optional in-car sensor

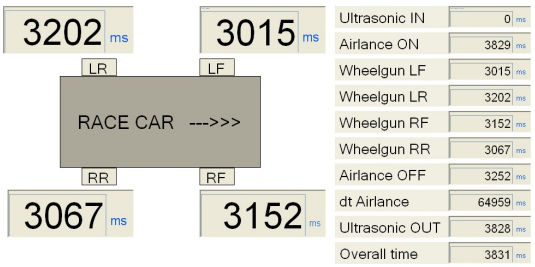
The car sensor detects the arrival of the car and also its departure. This is used specifically for data logging to monitor the quality of the tyre change but also the time to 'stop and go'.

Optional signal lights

The electronic box supports outputs for each wheel gun and additional driver info. It is an optical signal for the pit stop crew and driver indicating which tyre is completed and a 'ready to start' signal.



Data diagramm



Timing diagramm

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System requirements

Electronic box supply:	100 ... 240V AC, internal 13.5V DC, additional backup power to bypass supply interruption is integrated in the system
Pneumatic pressure:	3.5 Mpa (= 35bar = 500 PSI)
Host computer:	Windows XP or higher, 1 USB port