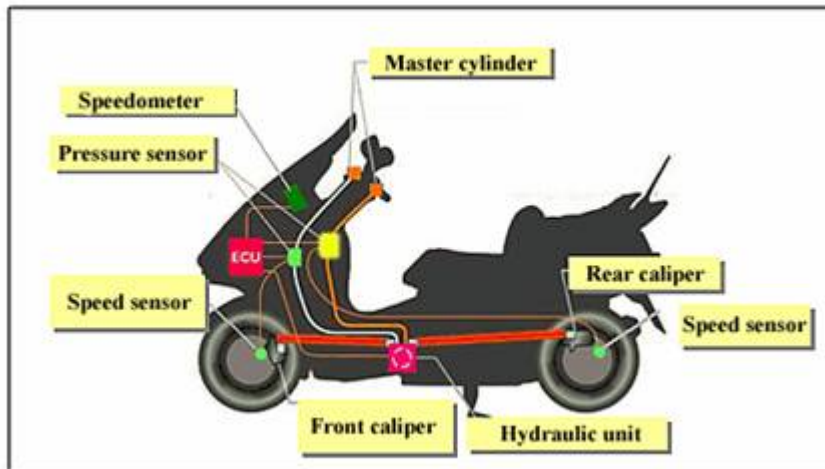




BP5: PTW Design and Protective Equipment

Reference: BP5 004	Title of Project:	Advanced Braking Systems
Version: 1	Website:	http://monash.edu.au/muarc/reports/muarc260.pdf
Brief Description of Project:	<p>In the 1970s a number of manufacturers developed linked braking systems in an attempt to improve stopping performance. These were essentially mechanical systems and insufficiently responsive for most riders.</p> <p>Advanced Braking Systems such as Honda’s Electronic ABS, Yamaha’s Brake Assist System and BMW’s Integral ABS combine features of conventional ABS, linked brakes and traction control.</p> <p>The systems use an ECU linked to sensors and telematics to control and enhance braking to produce optimum performance.</p> <p>Honda’s EABS is at the production stage and should be installed on CB900 and CB600 models from 2009.</p> <p>The Yamaha BAS is under development on their ASV test vehicle. The system supplements the braking force in emergency situations and works in combination with an ABS system. A sensor that detects changes in brake fluid pressure is used to sense the characteristics of the braking force being applied by the rider.</p> <p>The assist requirement is determined separately for the front and rear brakes and even if the rider is applying force to only one of the brakes, if the braking characteristics indicate to the ECU that it is an emergency braking situation, the system functions to automatically apply braking force to both the front and rear brakes in a way that makes full use of the machine's braking potential.</p>	



BMW's Integral ABS maintains the semi-integral function, which is automatic activation of the rear brake when operating the front brake. Pressing the rear brake alone, however, the rider, as in the case of a conventional system, activates only the brake at the rear.



Monitoring Data:

The 3 systems described have undergone significant testing to monitor performance.

Results:

Braking distance/ collision avoidance tests independently undertaken (motorcycle magazines) indicate much improved emergency braking with retention of control.

With good tyres on a dry surface with an expected incident, an experienced rider could, with practice, marginally outperform the Honda system. However, in emergency or wet conditions the Honda EABS consistently outperformed the unassisted motorcycle.

Key Effective Conclusions:	Testing has consistently shown that ABS and especially advanced braking systems provide much improved braking and collision avoidance performance in emergency situations. In the most common types of urban motorcycle collisions (MAIDS), these systems would reduce the risk of impact and injury.
Projects for Comparison:	Standard ABS (BP5 003).
Justification:	<p>Although there is no collision/casualty based evaluation available, the empirical performance data clearly shows improved braking and collision avoidance performance.</p> <p>The measure appears to meet the eSUM objective for WP3, BP5 in offering the potential for reduction in risk of collision through technological improvement in PTW design.</p>