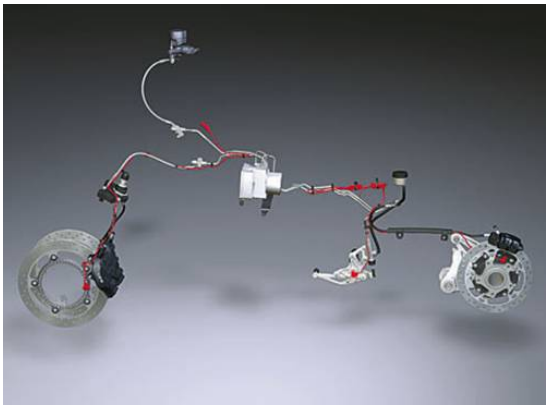
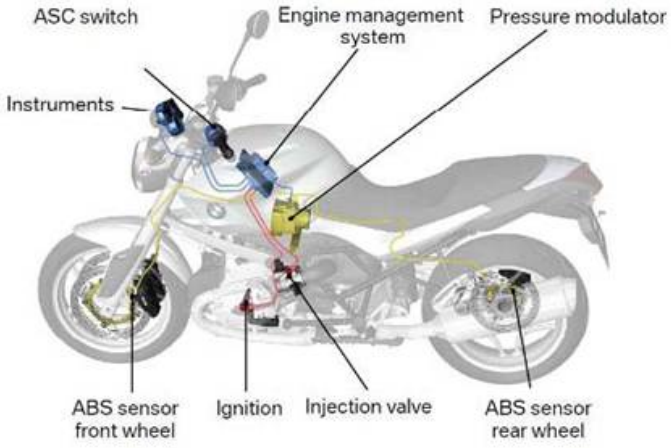
## BP5: PTW Design and Protective Equipment

| Reference: BP5 017 | Title of Project: | **Automatic Stability Control / Traction Control** |
|---|---|---|
| **Version: 1** | **Website:** | http://www.saferider-eu.org/benchmark/stability-control-bmw.html |
| **Brief Description of Project:** | Automatic Stability Control (traction control) prevents the rear wheel from spinning uncontrollably when accelerating hard and thus avoids any loss of side forces and stability which otherwise would make the rear wheel swerve out of control.<br>  <br>Honda introduced a basic Traction Control System on Pan European models in the 1990s but recently manufacturers have developed advanced road bike systems based on race technology.<br><br>On the BMW system, lift-off detection and intervention prevents the front wheel from breaking contact with the ground (wheelie) when accelerating under full power.<br><br>Acting together, these two functions enhance riding stability and thus help to ensure a higher standard of safety on the road. On this system, the rider is able to deactivate ASC at any time.<br><br>ASC is not able to override the physical limits to the stability of a motorcycle when leaning over in a bend.<br><br>Wheel sensors determine the speed at which the wheels are turning, registering any sudden change in the difference in speed front-to-rear. The electronic control unit is able to detect any risk of spinning. The system responds immediately by retarding the ignition to take reduce engine power. | |

| | |
|---|---|
| | With the BMW system, should this not be sufficient, fuel injection will be cancelled out to further reduce power. Ducati have systems in production which use either ignition or fuel injection control. Ducati's systems are developed from their Moto GP bikes with the focus on managing acceleration to optimize performance rather than to improve safety.<br>  <br><br>In the past there has been resistance from some riders to Traction Control, arguing that it removes some of the feel and control from riding. The Ducati system has been more favourably received due to its emphasis on 'race-development'. |
| **Monitoring Data:** | There is no casualty based monitoring available. Performance testing does show successful prevention of loss of control in certain circumstances. |
| **Results:** | The systems developed so far do appear to increase control under hard acceleration. |
| **Key Effective Conclusions:** | ASC / Traction Control is an effective counter-measure to collisions caused by loss of control under acceleration. |
| **Projects for Comparison:** | ABS (BP5 003).<br>Advanced braking systems (BP5 004).<br>ISA (BP5 008). |
| **Justification:** | The BMW system is designed to prevent rear wheel spin and front wheel 'lift-off'. There is an apparent contribution to eSUM objectives although loss of control under acceleration is not a major cause of collisions in urban areas. |