Q-Shift is a high performance low cost gear change technology. It uses simple dog clutch components to pass the driving torque directly from one gear to the next, without passing through a neutral state. Its sequential shift event is controlled mechanically via a simple barrel arrangement. Additional patents in the portfolio take this concept further, including a version which seamlessly multiplies the number of ratios.

QinetiQ is a leading science and engineering company operating primarily in the defence, security and critical infrastructure markets. We are an information, knowledge and technology based company with the breadth and depth of over 6,000 people, including more than 3,000 scientists and engineers.

Partnering Overview
- Licensing opportunity
- Patent acquisition opportunity

Benefits
- Rapid seamless up-shifting under full load and seamless down-shifting under engine braking
- High efficiency, no de-clutching or loss of torque during shifts
- Reduced part count and complexity compared to a manual synchronesh transmission
- Smaller, lighter and significantly cheaper than Automatics and Dual Clutch Transmissions
- Scalable from 2-15 ratios for light or heavy duty use
The 'torque hand over' process used in the Q-Shift gearbox provides the ultimate shift performance as achieved by current Formula 1 'suicide shift' gearboxes. However the separation of forward and reverse engagement, combined with a simple mechanically shift mechanism protects the gearbox and provides reliable shifts, allowing manual operation without electronic control. This technology is highly applicable to motorsport as well as road use.

Q-Shift – Core gearbox for high performance low cost automated transmissions.
A Q-Shift gearbox combined with low cost shift and clutch actuators, plus electronic control can provide a high performance alternative to automated manual transmissions (AMT). This provides a low cost fully automatic solution applicable to passenger cars and commercial vehicles. The Q-Shift torque handover function provides rapid power maintained shifts in comparison with the long shift times of most AMTs. A determined amount of clutch slip is controlled as shifts occur to absorb impulse from engine speed changes, optimising shift quality at varying speeds and power. The shift mechanism allows for rapid power on down shifts with simple clutch control.

Q-Shift – High number of ratios achievable in a compact package
A multi shaft, range changing version of Q-Shift can provide high numbers of ratios with increased spread in a compact package. The unique configuration allows torque handover shifts even for range change shifts. This technology offers solutions for low power to weight vehicles, for example a 4 x 2, 8 speed gearbox for low cost passenger cars and light commercial vehicles, up to 3 x 5, 15 speed transmission for heavy trucks.

Patent List

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<tr>
<th>QinetiQ Ref.</th>
<th>Patent Title</th>
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<td>10/10/2014</td>
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Collaborating with QinetiQ
At QinetiQ we bring organisations and people together to provide innovative solutions to real world problems, creating customer advantage.

Working with our partners and customers, we collaborate widely, working in partnership, listening hard and thinking through what customers need. Building trusted partnerships, we are helping customers anticipate and shape future requirements, adding value and future advantage.

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