

Integrated Wheel End Disconnect (eIWE)

| Title | Country | Application Number | Patent Number | Filing Date |
|--|---------|--------------------|---------------|-------------|
| INTEGRATED WHEEL END SHIFT FORK COMPLIANT STOP | US | 13/958042 | 9205738 | 08/02/2013 |
| HUB ASSEMBLY HAVING A CLUTCH RING TRAVEL LIMITER | KR | 10-2005-0122957 | 10-1191291 | 12/14/2005 |
| HUB ASSEMBLY HAVING A CLUTCH RING TRAVEL LIMITER | US | 11/013105 | 7143883 | 12/15/2004 |

Front Axle Disconnect

| Title | Country | Application Number | Patent Number | Filing Date |
|---|---------|--------------------|---------------|-------------|
| FOUR-WHEEL DRIVE VEHICLE CONTROL SYSTEMS AND METHODS | US | 15/419611 | 10,144,284 | 1/30/2017 |
| DIFFERENTIAL LOCK ASSEMBLY | US | 16/280,853 | 11105406 | 2/20/2019 |
| FOUR-WHEEL DRIVE CENTER DISCONNECT ELECTRIC ACTUATOR | US | 11/150575 | 7,316,304 | 06/10/2005 |
| FOUR-WHEEL DRIVE CENTER DISCONNECT ELECTRIC ACTUATOR | KR | 10-2006-0030721 | 10-1147668 | 04/04/2006 |
| FOUR-WHEEL DRIVE CENTER DISCONNECT ELECTRIC ACTUATOR | US | 11/760817 | 7793767 | 06/11/2007 |
| 4-WHEEL DRIVE CENTER INTERMITTENT ELECTRIC ACTUATOR | JP | 2008-148085 | 5529396 | 06/05/2008 |
| FOUR-WHEEL DRIVE VEHICLE CONTROL SYSTEMS AND METHODS | CN | 201780007769.8 | 108698511 | 1/30/2017 |



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|--|---------|--------------------|---------------|-------------|
| MOTORIZED DISCONNECT SYSTEM AND OPERATION METHODS | US | 14/678245 | 9656548 | 04/03/2015 |
| MOTORIZED DISCONNECT SYSTEM AND OPERATION METHODS | US | 15/488255 | 10228026 | 04/14/2017 |
| MOTORIZED DISCONNECT SYSTEM AND OPERATION METHODS | US | 16/247376 | 10,801,553 | 1/14/2019 |
| MOTORIZED DISCONNECT SYSTEM AND OPERATION METHODS | US | 16/584507 | 10,724,580 | 9/26/2019 |
| MOTORIZED DISCONNECT ASSEMBLY | US | 29/715,477 | D971,089 | 12/2/2019 |
| MOTORIZED DISCONNECT ASSEMBLY | US | 29/715,469 | D971,088 | 12/2/2019 |
| Motorization disconnects system and operating method | CN | 2015101820820 | 104999910 | 4/16/2015 |
| A MOTORIZED DISCONNECT ASSEMBLY, A MOTORIZED DISCONNECT SYSTEM, AND A METHOD FOR SELECTIVELY ENGAGING TWO SHAFTS | KR | 10-2015-0052419 | 101699734 | 4/14/2015 |

Hub Locking Systems

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|--|----|-----------------|------------|------------|
| COMPACT PULSE VACUUM LIVE SPINDLE HUB LOCK | KR | 10-2014-0023910 | 10-1604181 | 02/28/2014 |
| Locking hub system | US | 14/479117 | 9,382,951 | 9/5/2014 |
| Electric hub lock with manual override | US | 16/014709 | 10,844,913 | 6/21/2018 |
| Compact pulse Vacuum gyroaxis hublock | CN | 2014100592428 | 104029562 | 2/21/2014 |
| VACUUM LOCKING HUB CARTRIDGE FOR FOUR WHEEL DRIVE VEHICLE | US | 10/745241 | 7000750 | 12/22/2003 |
| VACUUM ACTUATED WHEEL HUB | US | 10/842019 | 7055667 | 05/07/2004 |
| COMPACT PULSE VACUUM LIVE SPINDLE HUB LOCK | US | 14/156774 | 9091307 | 01/16/2014 |

Electromagnetic Pulse Disconnect

| Title | Country | Application Number | Patent Number | Filing Date |
|---|---------|--------------------|---------------|-------------|
| ARMATURE CAM | US | 29/671,844 | D979603 | 11/30/2018 |
| CAM FOLLOWER | US | 29/671,981 | D890,237 | 11/30/2018 |
| COIL UNIT | US | 29/671846 | D963719 | 11/30/2018 |
| LATCH RING | US | 29/671,987 | D881,767 | 11/30/2018 |
| Compact electromagnetic pulse disconnecting component and application method thereof | CN | 2019112065601 | 111255820 | 11/29/2019 |
| COIL UNIT | CN | 201930275427.6 | 305527136 | 5/30/2019 |



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|---|----|-----------------|----------------|------------|
| LATCH RING | CN | 201930275417.2 | 305695262 | 5/30/2019 |
| CAM FOLLOWER | CN | 2019302754153 | 201930275415.3 | 5/30/2019 |
| GROOVED GUIDE CAGE | CN | 2019302759496 | 201930275949.6 | 5/30/2019 |
| ARMATURE CAM | CN | 2019302754261 | 201930275426.1 | 5/30/2019 |
| Electromagnetic pulse disconnect system and methods | US | 14/686057 | 9,915,298 | 4/14/2015 |
| Electromagnetic pulse disconnect system and methods | US | 15/668,875 | 10,221,900 | 8/4/2017 |
| Electromagnetic pulse disconnect system and methods | US | 15/668889 | 10,731,715 | 8/4/2017 |
| Electromagnetic pulse disconnects system and method | CN | 2015101945224 | 105034796 | 4/22/2015 |
| A METHOD OF OPERATING A DISCONNECT ASSEMBLY OF A SHAFT, AN ELECTROMAGNETIC PULSE DISCONNECT | KR | 10-2015-0057003 | 101697124 | 4/23/2015 |
| Electromagnetic coil system and methods | US | 14/845167 | 9,812,238 | 9/3/2015 |
| Electromagnetic coil system and methods | US | 15/685300 | 10,535,458 | 8/24/2017 |
| Compact electromagnetic pulse disconnect system | US | 16/206791 | 10,955,013 | 11/30/2018 |
| COMPACT ELECTROMAGNETIC PULSE DISCONNECT SYSTEM | US | 17/087,301 | 11,506,247 | 11/2/2020 |
| COMPACT ELECTROMAGNETIC PULSE DISCONNECT SYSTEM | US | 17/087,315 | 11,624,409 | 11/2/2020 |
| GROOVED GUIDE CAGE | US | 29/671,975 | D974,969 | 11/30/2018 |

