

## The Lawson AWD Motorcycle - an all-terrain motorcycle uniquely suited for the recreational/utility market

*Background:* Motorcycles are useful for operating in narrow confines where a four wheeled vehicle cannot fit. However, to successfully operate in difficult conditions, like sand, mud, rock trails, riverbeds, and especially on steep hills, the rear wheel drive design requires even an expert rider to use gymnastics to guide and control the motorcycle, and often the environment is damaged excessively because of the rear wheel spin required. The average rider with a conventional rear wheel drive motorcycle may not even be able to drive through such difficult conditions.

An obvious solution is to provide all wheel drive, and several all wheel drive motorcycles do already exist. However, for various reasons, these designs have not been very successful in improving the average rider's ability to travel over difficult terrain at the speed of the conventional four wheel drive ATV. The reasons include not having enough torque to the front wheel, the front wheel not being driven until substantial slippage of the rear wheel happens, being excessively expensive, or having virtually no suspension so the ride in rough terrain at anything above walking speed is impossible.

*The answer:* the Lawson all wheel drive design. It provides the same advantages that an all wheel drive ATV has over a rear wheel drive ATV. Its all wheel drive and suspension system provides as much torque to the front wheel as necessary, rotates the front wheel at basically the same speed as the rear wheel thus excessive rear wheel slip is not required and obstacles are surmounted by traction not digging trenches, and provides the quality suspension and ride available from a conventional rear wheel drive motorcycle.

The Lawson AWD motorcycle combines a unique dual A-arm suspension with a very simple high power drive using two chains and a universal joint to transmit as much power to the front wheel as needed under all circumstances. The basic suspension system is the duo lever design proven on the large BMW road motorcycles which Norman Hossack invented and patented years ago. It provides a full range of travel with excellent suspension characteristics. The combination of this suspension system and the unique drive configuration is what is covered under the Lawson patent.

The Lawson AWD system, when combined with an automatic clutch like the recluse system, provides a motorcycle that is very easy for an inexperienced rider to use. With one control for speed, one control for braking, and the traction of the Lawson AWD, the rider can, under virtually all conditions, concentrate on guiding the motorcycle through obstacles, not on the gymnastics required by a conventional rear wheel drive motorcycle in these difficult situations.

The basic concept for the front wheel drive system was invented by Martin Lawson and designed using Solid Works with the FEA package and Tony Foale's suspension analysis software. Bill Lawson and Martin Lawson have jointly designed, built, and tested three functional prototypes to verify the design and prove its capabilities. The third prototype is now being successfully raced by an experienced competitive motorcycle rider to prove its durability and capability to perform as a conventional motorcycle in normal conditions as well as to exceed the capabilities of a conventional motorcycle in difficult off-road conditions.

The Lawson AWD motorcycle system is patented in the US and international patents are in progress. Additional drive system patents are in progress.

### **The advantages of the Lawson AWD as an all-terrain motorcycle, especially for the average rider**

#### Simple to drive

Steers under all difficult conditions  
Can slowly "walk" the bike if necessary under power  
No need to coordinate the clutch and gear shifting because of an automatic clutch

#### Simple to brake

One brake lever controls the front and rear brake simultaneously

#### Easier to

Ride gnarly trails  
Climb steep rocky hills  
Steer in sand, mud, snow, loose rocks

#### Greener

Surmounts obstacles by traction, not by digging trenches

#### Safer

Anti-dive, coordinated braking: both wheels brake together  
Controlled by front brake lever  
Minimal front wheel lockup in emergencies  
Great descending steep hills  
No torque or bump steer

#### Proven design

Uses the proven Hossack dual A-arm suspension  
Same suspension travel and steering lock as in stock forks

### **The Lawson AWD motorcycle is the only system to have**

Full time all-wheel-drive  
Full power to the front wheel  
Race proven, full travel suspension  
Steering that feels "right" with no bump steer or torque steer  
A drive system utilizing high strength, simple, low cost components

Pictures, copy of the patent, etc., attached.

Information on the patents submitted on proprietary drive systems, etc., can be obtained if necessary from Bill Lawson.

More information at [www.lawsonAWD.com](http://www.lawsonAWD.com).

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