



# Your Guide to A Complete Overview of a Speedway Bike



Presented by the  
Canadian Speedway Racing  
Association

# Introduction..

The bikes look like your old pedal bike with an engine? No, I don't think so!!!!

These bikes will grab you and spit you out at the drop of a hat! They are vicious beasts that will throw you, smash you, bounce you and leave you shaking from being physically and mentally drained.

Speedway riders are a different breed; and as history has shown, the attitude of 'this looks easy' is not at all what you see, when you turn that throttle for the first time.

The biggest thing that you must have is, RESPECT! Respect for anything that will go from 0-70mph in 3 seconds! With no brakes or gears to use. Phenomenal raw power that is transmitted through the riders skill, knowledge and use of the throttle and clutch, is the key to any success on these bikes.

Reactions to riding a speedway bike for the first time is to close the throttle when trouble is looming, WRONG!!! Do this and the bike will give you a nice memory! The design of these bikes is for the rear wheel to spin at high speeds let off this speed and the rear wheel will grip and throw you around and a speedway track is not forgiving in its surface!

Speedway bikes are a totally different type of motorcycle that you will see.

Their design to turn left in a power slide at amazing speeds is not only exciting, but the skill needed to control these bikes is also amazing.

The engines run on pure 100% methanol and the engines are all air-cooled 500cc, running on either synthetic or mineral based oils.

They have no brakes and they also have no gears.

Gearing is done through the ratio displacement between the front two sprockets and the rear wheel sprocket. One of the front sprockets is attached directly to the crankshaft for drive, which is in turn, connected to the rear sprocket by a drive chain. The outer sprocket is also linked to the crankshaft, but is in front of the inner sprocket and also is chain driven that connects the clutch assembly.

Depending on rider choice and track conditions, the bike will be set up with a ratio for the rear and front sprockets. These are connected to the bike for quick release as they often get changed as the meeting progresses.

Speedway tracks are all individual in their set-up, as is every rider. The key is to maintain the optimum gearing to ride the track with maximum drive.

The style of the bikes has changed over the years due to engineering and manufacturing changes. The engines up to about 1990 were all what is commonly known as 'upright'. This means exactly what it says. The engine is placed in an upright position in the frame. The post 1990 bikes have what is known as a 'Laydown' engine. This means that the engine has been physically laid down in the frame giving a lower centre of gravity. The power ratio has also increased with this change as well.

The original engines began with a 'total loss' oil system, which meant that the actual motorcycle frame was used as the oil tank and before every race, this was filled and the oil that wasn't burnt in the mechanical process, was pumped out onto the track surface. The later uprights and the newer style laydown engines, were designed to have a recirculating oil system that needed changing after each meeting. Currently, a professional rider will change this oil after 2-3 heats depending upon his set-up.

Many manufacturers have attempted to compete in the speedway engine world, but only two remain competitive. Jawa (JRM) from the Czech Republic, and GM from Italy. Other names that will be heard from the past would be JAP, Weslake, Godden, ESO, Datzmann etc....

The bikes are all clutch driven and they have also been privy to technological improvement. The clutches used are a 'dry' clutch. It is built from layers of carbon or fibre drive plates that ride against metal or rubber plates.

The clutch spins at an amazing rate and warms up quickly. The key to any speedway start is the launch from the start line. The clutches play a highly important role in this to give optimum drive. The clutch is held on the crankshaft with special headed screws and specially designed holders. The outer plate is required to have a raised edge cover that protects the rider from the immense spinning action.

Tree screws held the older clutches in place, whereas the newer style are 6 screws which allow more control over the set-ups. These screws are tightened to ensure that the rear wheel will be released at the drop of the clutch. Depending on the rider's gating style. The clutch will need to be set up for slip and drive. A rider will not let go of the clutch fully upon the start, if they are in need of more grip to the back wheel. They will what is known as 'slip' the clutch, which means that using the two middle fingers of the left hand, you hold the clutch and physically tweak it until optimum power is found, then the clutch is released fully by the time you are in the first corner. Many hours of practice is needed to really understand the effects it has on the bike, and its consequences between winning and losing a race from the start line.

# Overview..



## 1 - SEAT

The seat on a speedway bike is hard and not very comfortable.

The seat is not used too much while racing, as the riders are in a forward position during the corner slide and only use going for seconds down the straight.





## 2 - EXHAUST

The exhaust system on a speedway bike produces 102db.

All exhaust systems are very important to the engine performance and must be safety wired in place to prevent it coming off the bike due to any breakage.

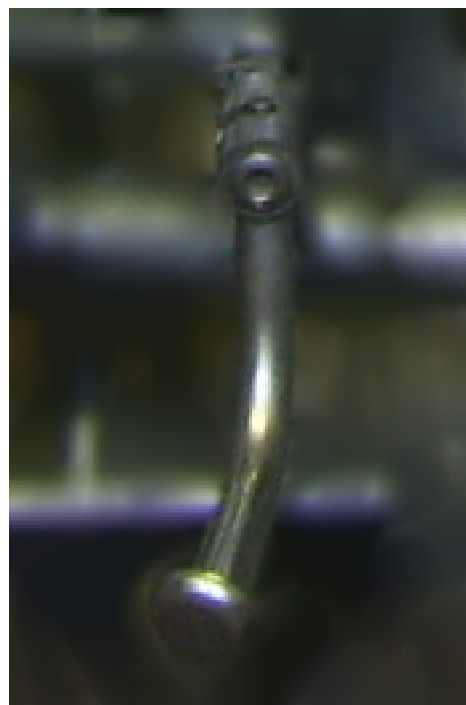




### 3 - FOOT REST

The footrest is on the right hand side of the bike only!

It is used to help support the rider while in a slide allowing the Centrifugal forces to work through the weight distribution of the bike.





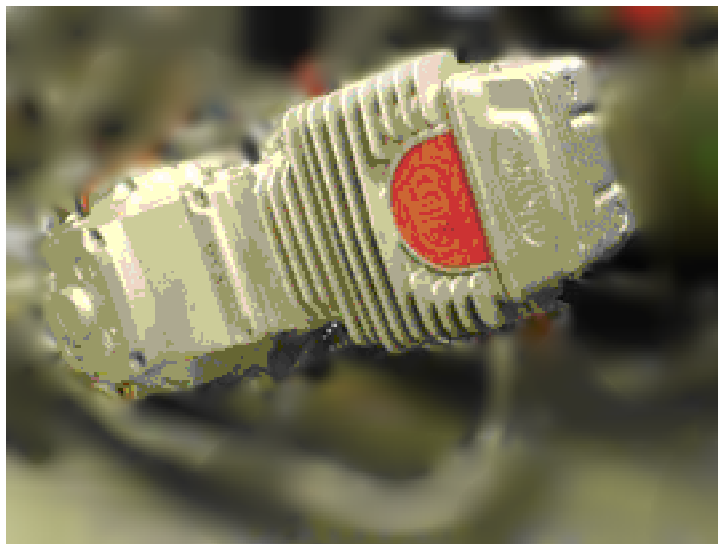
#### 4 - ENGINE

A methanol fuelled 500cc engine, producing around 85 BHP.

0- 60mph(100kph) - 3 seconds!!!!

Engines are made by Jawa of the Czech Republic or GM of Italy.

The engine makes up the major weight of the bike as there are few other parts to the machine. They are not allowed to weigh less than **80 kilogram's**.





## 5 - IGNITION

The ignition systems on speedway bikes have varied over the years, but still maintain the basic fundamentals of a magneto based spark.

Some have a separate rechargeable battery system supplied by Interspan. As well as providing a more powerful spark than traditional systems, there is a theory that the power required to turn a magneto (the Jawa's ignition system) is wasted energy. Therefore, the separate battery box supplied both low and high-tension power, with a simple trigger on the motor (contact breaker points) used to time the spark.

Many top riders of today still opt for the Interspan system, believing this theory holds true, although nowadays the points have been replaced with Hall effect solid-state electronic triggers.







## 6 - CARBURETTOR

Pre 1982- Jawa machines are with off set carburetors ( fitted on the right side)

Post 1982 Jawa introduced the so called central carbs frames ( carburettor straight behind the engines)

Today all carbs are 34 mm.

In the past Jawa used 34 mm; 35 mm; 36 mm and even 38 mm carbs (sometimes with restrictors) on their engines.

All carburetors must correspond to FIM regulations.

Adjustment and jetting is made for methanol fuel.

The air filter is upright on the model shown and is cleanable. It also comes with a protective dust cover over the filter, which allows for the filter to breathe cleaner.





## 7 - FUEL

Speedway bikes run on pure methanol fuel. This is mixed together with mineral based oils such as Castrol 'R'. Synthetic and blended oils are now more common in laydown machines.

The fuel tank holds enough fuel for four / five laps with a little in reserve for a delayed start.





## 8 - CUT OFF SAFETY SWITCH

All speedway bikes must have a kill switch that if triggered while the engine is running, will cut off the electrical circuit and the engine will stop.

This is done through a cord attached to the riders right wrist directly to the kill switch located next to the throttle. The switch is spring loaded and when the cord is pulled away, this closes the signal to the ignition and the engine immediately stops.





## 9 - PUSH BAR

Attached to the rear mudguard is the curved push bar that allows the machine to physically started through a 'bump' start.

The bikes are required to have the engine at a certain power stroke to allow for maximum compression when firing.

Speedway bikes have no manual starting switch.





## 10 - REAR WHEEL ADJUSTMENT

To allow a rider adjustment of the slide and traction while racing, two rear wheel adjustable nuts are attached to the centre wheel bolt. This helps align the rear wheel on the bike with equal tension either side and also allows the rider to adjust the distance that the wheel sits in the frame.

The rule of thumb is that the further back the wheel sits in the frame, the easier it is to slide the back wheel. This location is used for beginners and novices.

Experienced riders will have the wheel further forward to have less slip and have more grip and traction on the back wheel.





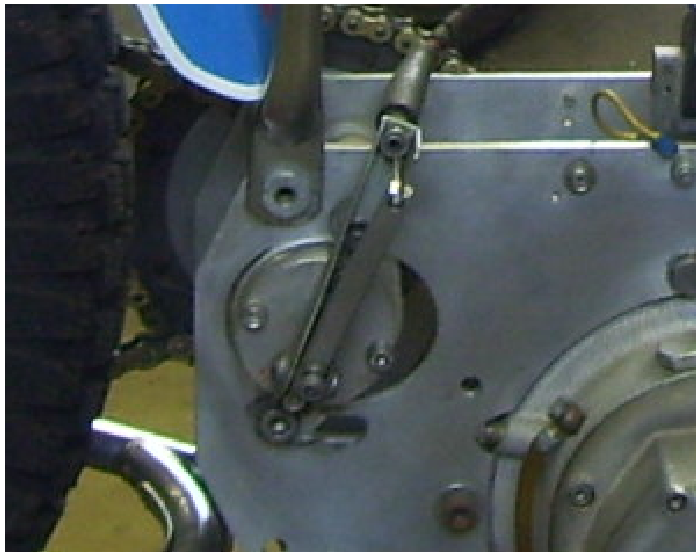
## 11 - CLUTCH ADJUSTMENT

A cable attached to clutch handle, on the left side of the handlebars, activates the clutch.

The cable is directly linked to the clutch mechanism with a spring load arm that releases the clutch plates upon final drive.

A cover is placed over this to reduce dust and contamination during racing.

The importance of this adjustment is crucial to getting the optimum start. Many wins are lost due to these bad starts.





## 12 - LEADING LINK FRONT FORKS

Modern day speedway bikes have adjustable front forks.

Rubber bands are used to give different sensitivity depending upon the riders choosing, and a shock absorber is also implemented into the system.

They have replaced the old style telescopic style forks that were very sensitive and bent easily upon any impact.





### **13 - FRONT MUDGUARD**

All speedway bikes are required to have a full mudguard in place.

The mudguards as are many of the 'body' parts, are constructed of plastic or glass fibre. They are moulded and are normally custom painted to sponsor or rider's colours.

A simple two-bolt system allows for quick changes if damaged.







#### **14 - FRONT HANDBAR COVER**

One of the most seen parts of a speedway bike is the front handlebar cover. This cover works not only to cover the handlebar and frame joints, but it also give some protection for the riders hands from the air-borne dirt.

Many events will use these covers to advertise the main sponsor for all to see!





## 15 - THROTTLE

Speedway bikes have a sprung loaded throttle that is linked to the carburetor through a cable.

The throttle is one of the most important features of a speedway bike for maximum performance. Trust and knowledge of the reactions that this throttle has, is like no other motorcycle ridden.

Shut this down during a slide and you can seriously hurt yourself!





## 16 - SEAT BRACKETS

The seat of a speedway bike is not used too much, but the importance of the seat height is very critical to the riders safety and comfort.

The brackets have several holes in them, which allow for the seat to be raised or lowered depending on the rider.

The seat bracket at the front of the seat is welded to the frame. The seat has a thick metal bracket which slots into the welded bracket to stop it moving forward.





## 17 - FUEL TAPS

The tank has two outlets with on and off taps that release a flood of fuel to the fuel hungry carb.

The rider will have only one tap on until they reach the start line, and then you will see them open up the second tap to allow maximum flow while racing.

When the race is over you will see them turning one of the taps off also.

These taps must be closed after the race when parked, to avoid internal damage of the carb.





## 18 - REAR WHEEL

The rear wheel is very important for the drive and control of any speedway bike.

A knobby tire is used designed specifically for speedway racing only!

The tire is screwed to the rear wheel to stop it moving on the rim , which is very easy considering the power that is directly given to it.

The wheel is identical both sides, this allows for the gearing to be placed either side and give the tire a 'clean' edge.

It is a very simple undoing of some nuts on the studs, and you can flip the wheel and place the gearing on the other side without removing the tire!





## 19 - FRONT WHEEL

In conjunction with the rear wheel, the front wheel is also held in place with one long through bolt. The wheel can be turned around as well.

The wheels on a speedway bike look like a pedal bike design and are actually very similar in their make-up. Finely tuned spokes keep the wheels straight and aligned.

The spokes as on pedal bike, come through the wheel and are tightened to the required torque to align it. It sounds easy, but an experienced wheel expert only produces a true wheel!





## 20 - REAR WHEEL SPOILER

The rear wheel spoiler does have an actual and beneficial reason for being there, it produces "down force" as the bike is thrown sideways, it gives resistance to the air flow and pushes the rear wheel into the shale, just like the rear wing on a car, therefore giving more drive and higher speeds in the corner.

It also stops you getting your fingers in the spokes in the event of a crash! just like Barry Briggs did in 1972, losing a finger. (information courtesy of Kevin Lyth)

The cover is also used by rider to advertise their sponsors.





## 21 - CLUTCH LEVER

The clutch lever is located on the left hand side of the handlebars.

It is fully adjustable at the lever with a long brass-adjusting nut, which is between the lever and the cable.

At the start of many races, you will see riders pull down the rubber protective cover and while the bike is tipped sideways, they will manually adjust the clutch sensitivity for optimum release.

The clutch levers however, do suffer badly upon any accident due to breakage in track impact. With the bike naturally going down on the left side, the handlebar grip and clutch lever always come out losers!

Many riders will carry a few needy extras in their tool kit!

