



# AIDE-MEMOIRE for MACHINE EXAMINERS

edited by

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for  
**The Speedway Control Bureau**

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# Introduction

Speedway racing is probably one of the most exciting forms of motorcycle racing in the world where 4 Riders compete within an enclosed arena on a confined track. Races are over just 4 laps and completed within 60 seconds. Spectators are able to see the complete race and all the Riders from start to finish. Riders master the powerful machinery on loose shale as they broad slide and hold the Motorcycles that can throw a Rider onto the track or into the safety fence at high speed. Although Riders have to be physically fit their equipment has to be strictly checked and pass inspection to aid the safety of the Riders.

Speedway motorbikes are 500cc\*\*, fuelled by methanol, weigh a minimum of 77kg without fuel, and can develop over 80 horsepower. They have a power to weight ratio similar to that of a Formula One racing car, can accelerate from zero to 60mph in less than 3 seconds with a top speed of over 100mph, but have no brakes or gears.

\*\* there is also a 250cc version that must weigh a minimum of 75kg without fuel.

It is essential therefore that these Motorcycles are inspected prior to a meeting, to confirm they comply to the stringent regulations, which are formulated to best ensure the safety for riders and officials alike. It is therefore essential Machine Examiners understand the importance of this role and the diligence required to carry it out.

Whilst serious accidents are fairly rare, it is a fact that should there be a fatality, the Machine Examiner will be summoned to give evidence and be cross-examined in a Coroner's Court, hence the need to be thorough when carrying out your duties.

A current Machine Examiner who had to attend a Coroners Court described it as "the scariest day of my life". Be warned and prepared but providing you carry out inspections in an approved manner a Coroner will be satisfied, as indeed will all the Riders and Officials.

Whilst it is not essential for Machine Examiners to be technical wizards, they do have to be responsible people, who understand what needs to be checked and how to examine the equipment. Having said that, this is not a role ticking boxes and quick glances but a serious function of safety checks. Equipment can't just be passed with the attitude of *"it will be all right, nothing will happen"* or *"The Machine Examiner at the next track will deal with the problem"*; DEFECTS MUST NOT BE IGNORED. If you are in any doubt or need further advice consult with your colleague. If you need further support the Clerk of the Course in the 1<sup>st</sup> instance and should the matter not be resolved the Referee must be informed.

Machine Examiners are there to aid the Riders and the Rider's Pit Crew to ensure that all Motorcycles and equipment being used is safe. It involves a degree of "Man Management", therefore conduct yourselves in a polite, courteous manner and always be firm and decisive and act within the bounds of the Regulations. Riders and Pit Crew will generally be unhappy at faults being detected but Motorcycles and equipment must be in accordance with Regulations and above all safe for use.

# Inspection of Motorcycles and Equipment

## Motorcycle

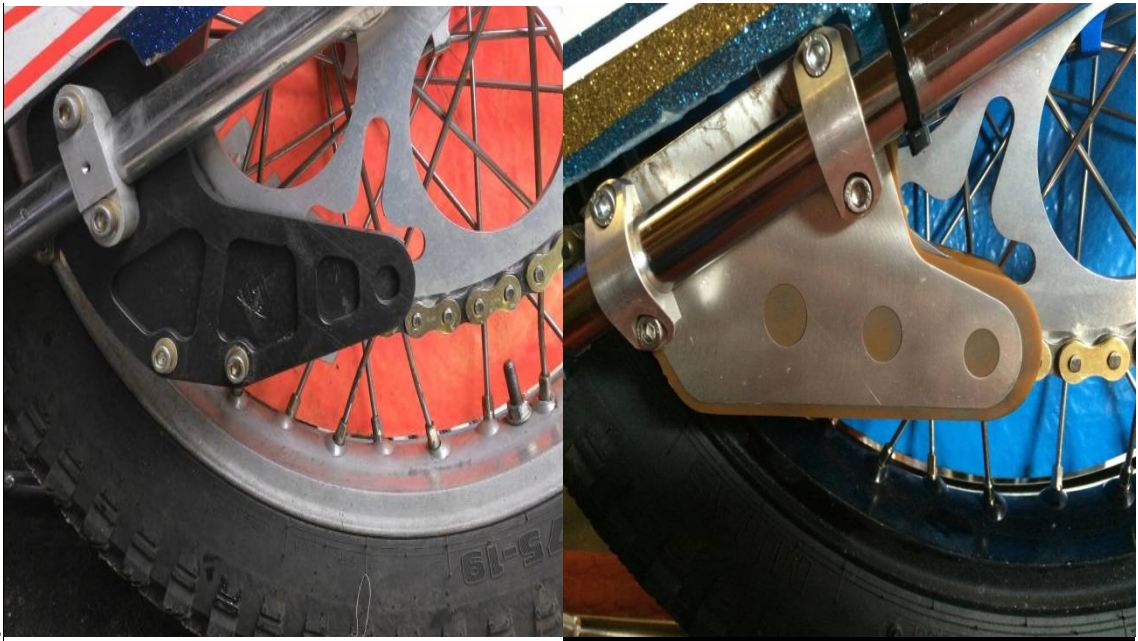
- 1 Start at the front of the bike, check that all front wheel spokes are tight and in good condition. Playing the spokes like a harp you will hear a change in sound if a spoke is loose.
- 2 Move the front wheel back and forwards to check the fork bearings are not worn and that the fixings are tight. Move the wheel from side to side to check that wheel bearings and front spindle are tight
- 3 Check the front mudguard is in good condition, there are no sharp edges and it complies with the regulations. If the front mudguard is broken in a crash, and the rider is in the re-run he is allowed to run without one, but it has to be replaced for his next race.
- 4 Check all welded joints on the frame to ensure there are no cracks (rust on the welds is usually a sign that cracks may be present).
- 5 Check that the Cut-Out is wired properly with the earth connected to the frame or engine plates. The earth connection must not be to the handlebars or their mountings. Check that the Cut-Out plunger can move freely and returns in its housing. Check lanyard at the Cut-Out end to make sure that it is not frayed.
- 6 Twist the throttle to ensure that it does not stick and returns freely to its original position. Check the whole throttle is secure to the handlebars.
- 7 Check the handlebars are not open ended; if they are they must be plugged and all levers are ball-ended (16mm).
- 8 Check that all clamps are correctly fitted to the exhaust/silencer and are in good condition. A flexible coupling (steel cable 3mm thick or strong spring) is fitted and properly secured.
- 9 Check the condition and legality of the Silencer, ensuring that a Heat Shield is affixed to the Silencer, that has no sharp edges and where a Jubilee clip is used to secure it that the connection is at the top.
- 10 Check the chain guard condition and that any holes in the guard are no more than 10mm diameter.



- 11 Check to see that a primary chain bolt (10mm minimum thickness) is fitted, that it is long enough to reach beyond the chain and that it is solid in construction i.e. no

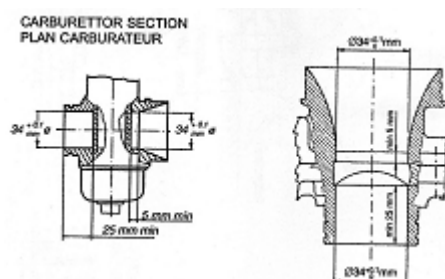
hole is permitted through the centre as this makes the bolt become a tube and weakens the bolt.

- 12 Check the rear wheel; that the spokes are tight and in good condition, moving the wheel from side to side to check the wheel bearings. Ensure a disc is correctly fitted on the right-hand (Silencer) side.
- 13 Check the rear mudguard is in good condition, there are no sharp edges and it complies with the regulations in that the gap above the tyre is no more than 35mm. If a Push Bar is fitted it must be made in one piece, of strong material which should not break under impact nor protrude higher than 35mm above the rear mudguard.
- 14 Ensure that a guard is fitted to provide protection where the rear chain enters into the rear wheel sprocket. A Chain Guide of the type that covers the bottom quadrant of the sprocket and neither the chain nor the sprocket's teeth are exposed. Examples of these include those below along with others that function in a similar manner.



- 15 Check all new tyres for the Meeting making sure they are marked appropriately and then release to the Riders. Only homologated rear tyres are permitted (Mitas 375-19 SW07 – British League)
- 16 Once a new tyre is fitted go back and check that it is fitted properly and that all retention screws are fitted. Once satisfied put your *“personal”* mark on the tyre on the opposite side to the meeting marks. A tyre can only be filled with air; nothing else. If a faulty tyre is fitted, the referee must be informed, and a replacement can be supplied.
- 17 Check the tyre on the spare bike to ensure that it is a used tyre on both sides and then put your *“personal”* mark on it: Team Managers or Captains may wish to be involved with this inspection.

- 18 Check engine oil catchers are in position and that the leak off pipe is in position for the catcher to collect any oils. Ensure a plug is fitted in the drain hole. NB. If the oil catcher is plastic make sure it does not have holes added to it.
- 19 During warm up, ensure that the person operating the throttle has the Cut-Out lanyard around their wrist. The requirement to wear a lanyard applies at all times that a bike is running whether in the Pits or on the Track.
- 20 Check that the Cut-Outs are working properly on all bikes that are being warmed up. If the spare bike is not warmed up prior to the start of the meeting the cut out must be checked before the bike can be used.
- 21 On the Referee's instruction carry out carburettor checks (top and bottom must be checked).



- 22 It is essential to check the effectiveness of the Dirt Deflector. Check the condition of the flap for excess movement of the arm and its height from the track surface (35mm). Also check the DD rubber to determine its strength and condition.
- 23 Check that all Competitors have the appropriate number of Environmental Mats in compliance to the Regulations. An Environmental Mat must be able to absorb at least 1 Litre of liquid.
- 24 In a Premiership League meeting ensure each motorcycle has a clearly legible number that relates to the Riders riding number. At all other meetings ensure numbers that do not correspond to the Rider's riding number are covered up. Numbers are compulsory in the Premiership, and optional in all other events.
- 25 Once all the Motorcycles & Equipment including the cut-outs of those competing in the Main Meeting have been checked to your satisfaction sign the Speedway Meeting Certificate and Technical Forms.
- 26 When all Riders participating in the Meeting (i.e. that which is under control of the SCB Referee, but not any After Meeting Training Session) complete the Technical Control Form, including any 2<sup>nd</sup> Half Competitors and forward to the Meeting Referee.

### ***Additional Notes (from experience or by notification)***

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## **Race Suits**

Carry out a visual check on Race Suits; and if possible both before a rider dresses and gain when being worn.

- Race Suits must be a one-piece suit or two pieces securely zipped together.
- They must be in sound condition and fit the Competitor that is wearing them. Zip fasteners have to be in working order on the complete length of the zip. There should be no splits, tears or holes and seams have to be holding; there should not be any undergarments showing through.
- Undergarments must not be made of synthetic material that may melt and cause damage to a rider's skin.
- Boots have to be whole and correctly fitted with zips and buckles in working order.
- Gloves have to be correctly fitted and whole giving proper protection.
- Back protectors must be worn. No material that can melt or may cause damage to a Competitor's skin may be used.
- Goggles or glasses must be made of shatter resistant material

## **Helmets**

- Helmet covers must be removed before inspection.
- One of the designated markings has to be totally visual.
- Nothing must be attached to the helmet (it must be as manufactured).
- Vinyl Wraps are not permitted as this does not permit a Helmet to be checked.
- Cameras must not be attached to a Helmet.
- The outer casing of the helmet must be inspected for cracks, abrasions and damage. Minor chipping, scrapes or marks of the outer casing is permitted providing there is no penetration to the next layer. Some helmets are subject to spidering on the outside casing and on the polystyrene inside.
- Any damaged or missing screws that attach the peak to the helmet, can only be replaced by the same type as supplied by the manufacturer, or plastic screws.
- If there are doubts regarding the condition of a helmet the removal of the inner cushions can determine if cracks or defects have come through.
- Straps and securing buckles have to be checked for cuts and that strap anchorages are secure. The face bar is a regular place for cracks. Tape should be removed for inspection.
- Should a rider goes to Hospital the helmet must accompany him.

## **Cameras & Recording Equipment**

Cameras may be attached only to the front forks or handlebars, but not to the body of a Rider. If attached to the handlebars or elsewhere on the motorcycle it must be safe and secure so as not to potentially cause injury to others.

## During the MEETING

1. A visual check should be carried out on all bikes prior to the rider being pushed off in all races. All bikes must be checked if involved in any accident, however minor.
2. Patrol the Pit Area throughout the Meeting to ensure any modifications carried out are in accordance with the Regulations.
3. Regular Follow-Up checks should be made, including those on Carburettors or Silencers.
4. Unless requested by the Referee to do so, or in the event of an incident, Machine Examiners should stay in the Pit / Paddock area during a Meeting, ideally one should be patrolling the Pits whilst the other remains in the vicinity of the Pit Gate / Access / Ingress to the Track.

**Machine Examiners should also carry a spare copy of Sections 10 & 12 of The Speedway Regulations. These can be shown to Riders (or Pit Crew) in the event of a dispute.**

## NOTES

[illegible]

## **Essential equipment for Machine Examiners at a Speedway Meeting**

1. Current edition of the SCB Speedway Regulations.
2. Technical Control Form.
3. A couple of Pens.
4. A Note Book
5. A Tape rule or measure.
6. A Carburettor measuring gauge.
7. A Tyre marker pen.
8. A Gauge (or tape measure) to check the height of Dirt Deflector.
9. A Gauge for testing the strength of the Dirt Deflector (eg. a Fishing Weigh Scale)
10. A small torch.
11. Equipment to test a Silencer.
12. Personal Protection Equipment (ie. Gloves and Ear defenders).
13. A Mirror for checking:
  - the underside of the frame for Weld cracks
  - holes in the bottom of the oil catcher
  - for defects on the underside of the Silencer and
  - the primary chain bolt