HRA SULKY and SULKY WHEEL STANDARD

THE 'SULKY STANDARD' - HRA Standard for Safety and Performance of Sulkies and Sulky Wheels

1. OBJECT

1.1 The aim of this Standard is to regulate the design and manufacture of the harness racing sulky so that it will conform to the following principles when used in competitive racing conditions -

1.1.1 The sulky shall be inherently sound and safe for its driver and horse when used in races.

1.1.2 The sulky shall not create either by its design or manufacture any interference or hazard to any driver or horse in a race.

2. SCOPE

2.1 This standard stipulates the material characteristics, design and manufacturing requirements and testing procedures required to obtain approval from Harness Racing Australia and its Members for harness racing sulkies to be used in Australia and shall come into force as from the official adoption by the Controlling Body and official publication of such adoption. The Testing Procedures shall form part of the Sulky Standard.

2.2 This standard stipulates only those design and material requirements considered relevant to the safety of both horses and drivers and to fair competition in races as they are conducted according to the Australian Rules of Harness Racing.

2.3 Any variation to this standard shall require the approval of HRA and its Members. Advanced sulky design, which develops the "state of the art", is not discouraged but new development needs to be technically evaluated particularly for safety. This may involve evaluation in a way, which this present standard does not contemplate.

3. DESIGN - GENERAL

3.1 Lists of approved sulkies, materials and components are referred to in this Standard. These lists are updated from time to time and are available from HRA.

3.2 The sulky shall contain:

- **3.2.1** Two wheels,
- **3.2.2** Undercarriage,
- **3.2.3** Two shafts for attachment to the horse,
- **3.2.4** A driver's seat, and
- **3.2.5** Driver's footrests.

3.3 All components of the sulky shall be attached to one another in such a way that they remain attached during normal use and testing.

- **3.3.1** Any detaching of the components shall require a deliberate action.

4. SYMMETRY AND WEIGHT DISTRIBUTION

4.1 The sulky shall be designed so that it is symmetrical about a vertical fore-and-aft plane so that the weight of the sulky shall be distributed evenly between the two wheels when the sulky is stationary and on level ground without an occupant.

4.2 Up to 1/9/2015 it was permitted for manufacturers to have the seat displaced to the near side by up to 6% of the overall width of the sulky. This was referred to as being “offset”.

4.3 Existing sulkies manufactured and distributed prior to 1/9/2015 that are “offset” are permitted to be used in racing and official trials until 1/9/2020.

5. DIMENSIONS

5.1 Until 1/9/95 the sulky shall have an overall width not exceeding 1.3 metres, and from 1/9/95 shall have an overall width of between 1.2 metres and 1.3 metres.

> **5.1.1** Pending that Members of HRA may permit sulkies less than 1.2 metres to be continued to be used in races after 1/9/95 provided such individual sulkies are specifically inspected and approved by Stewards for continued use after application which shall be accompanied by such proof of purchase date that the Controlling Body concerned shall demand thereafter and such sulky shall be regularly inspected thereafter as to safety aspects of such sulkies. *(Amended 18/10/2010)*

5.2 No part of the sulky shall hinder the horse in its normal position and general movement.

5.3 The overall length of a sulky shall not exceed 3.1 metres unless special approval is granted by the Controlling Body to lengthen a particular sulky for a particular horse.

5.4 The height above the ground of the sulky seat shall be within the range of 660mm to 810mm. This height will be measured from the ground up to the interface of the seat and the driver's buttocks when a driver of 95kg is seated in the sulky. *(Amended 18/10//2010)*

6. ATTACHMENT TO HORSE

6.1 The means of attachment shall be as approved by the Controlling Body.

6.2 The forward ends of the sulky shafts shall not project further forward than the chest of the horse and shall not be higher than the withers of the horse.

7. WHEELS

7.1 The wheel diameter shall be in the range of 600mm to 645mm. *(Amended 18/10/2010)*

7.2 The wheel shall be attached to the sulky via a conventional T-bar axle or other approved axles.

7.3 If the wheels are spoked, each wheel shall be covered on both sides by a disc of approved brand.

7.4 The tyres shall be an approved type and be no more than **50mm** in width. *(Amended 28/10/93)*

7.5 Wheels shall be manufactured from approved materials only. Wooden wheels are not permitted.

For further information on HRA's Sulky Wheel Approval Policy - click here.

8. FOOT RESTS (STIRRUPS)

8.1 The foot rests shall be positioned inboard of the shafts.

9. FABRICATION

9.1 Tube shapes shall not be distorted in such a way as may result in loss of strength or loosening of rivets or other fixing means.

9.2 If welding is used, the particular instructions of the material manufacturer (or recognised material reference handbook) regarding stress relieving of welds, choice of electrodes, specific welding wire/rod and gas-shield welding must be obeyed. *(Amended 18/10/2010)* Appropriate welding techniques must be identified and used so that the resulting welds are free of defects. Welds must be along the whole circumference of a tube. *(Amended 18/10/2010)* Specific inspection procedures may be required in some instances.

10. MATERIALS

10.1 The sulky shafts, frame and undercarriage shall be manufactured from steel or another material if approved by HRA. Accepted steels are mild steel, low carbon alloy steel, low alloy steel (including chrome-molybdenum alloys, chrome-manganese alloys, etc) and structural stainless steel alloys with a minimum tensile strength of 350MPa and a minimum elongation at break of 20%. The sulky manufacturer must provide a declaration from the material provider indicating its composition, yield strength, tensile strength and elongation. (Note: It is recommended that annealed stainless steel not be used). *(Amended 18/10/2010)*

10.2 Wooden and Wooden Shafted Sulkies are to be discontinued from 1st September 2002 in Races. (*Amended 19/10/2001)*.
(**Note:** By Definition under the Australian Rules of Harness Racing this also includes Official Trials).

11. MARKING

11.1 Sulky shafts on new sulkies shall be clearly and durably marked with the manufacturer's serial number, year of manufacture and type of material. The markings shall be applied to a position on the shaft, which is not loaded, in bending or tension during racing.

12. WARRANTY

12.1 The approval of a sulky by the Controlling Body does not warrant the safety of such sulky for use in a race or otherwise.

13. PERFORMANCE REQUIREMENTS

13.1 Track Test

When a sulky is tested in accordance with Appendix A it shall exhibit stable handling characteristics without difficulty of operation, and there shall be no fracture, cracking, looseness, detachment, permanent deformation or any other type of failure of any member, joint or component of the sulky.

13.2 Static Load Test

When a sulky is tested in accordance with Appendix B there shall be no fracture, cracking, looseness, detachment, permanent deformation or any other type of failure of any member, joint or component of the sulky.

13.3 Dynamic Load Test

When a sulky is tested in accordance with Appendix C there shall be no fracture, cracking, looseness, detachment, permanent deformation or any other type of failure of any member, joint or component of the sulky.

13.4 Testing Order *(Amended 18/10/2010)*

Testing of the sulkies will be carried out in the following sequence:

1. Dynamic Load Test (Appendix C)
2. Static Load Test (Appendix B)
3. Track Test (Appendix A)

Appendix A - Track Test

A1 Scope

This appendix sets out a method of testing the strength, constructional integrity and handling characteristics of a sulky under track conditions.

A2 Procedure

The test shall be conducted on a Harness Racing track approved by the Controlling Body. The sulky shall be carrying a driver of at least 75 kg.

The test procedure shall be as follows:

a. The tyres shall be inflated to the maximum recommended pressure.

b. The sulky shall be driven over the track in a series of test runs for a total distance of at least 6 miles (9.7 km) while maintaining an average speed for each test run of at least 1 mile (1.61 km) in 2 minutes 20 seconds, i.e. at least 11.50 m/s. Each test run shall be over a distance of at least 1 mile. Once testing has commenced, no adjustment, modification, repair or maintenance shall be

effected on the sulky prior to the examination of the sulky at the completion of the series of test runs.

3. Report

The report shall state whether or not there was:

- **a.** any difficulty in obtaining stable handling characteristics; or
- **b.** failure of any part of the sulky.

Appendix B - Static Load Test

B1 Scope

This appendix sets out a method of testing the strength and constructional integrity of the sulky by means of the application of static loads. Aspects of the method are illustrated in Figure B1 (below).

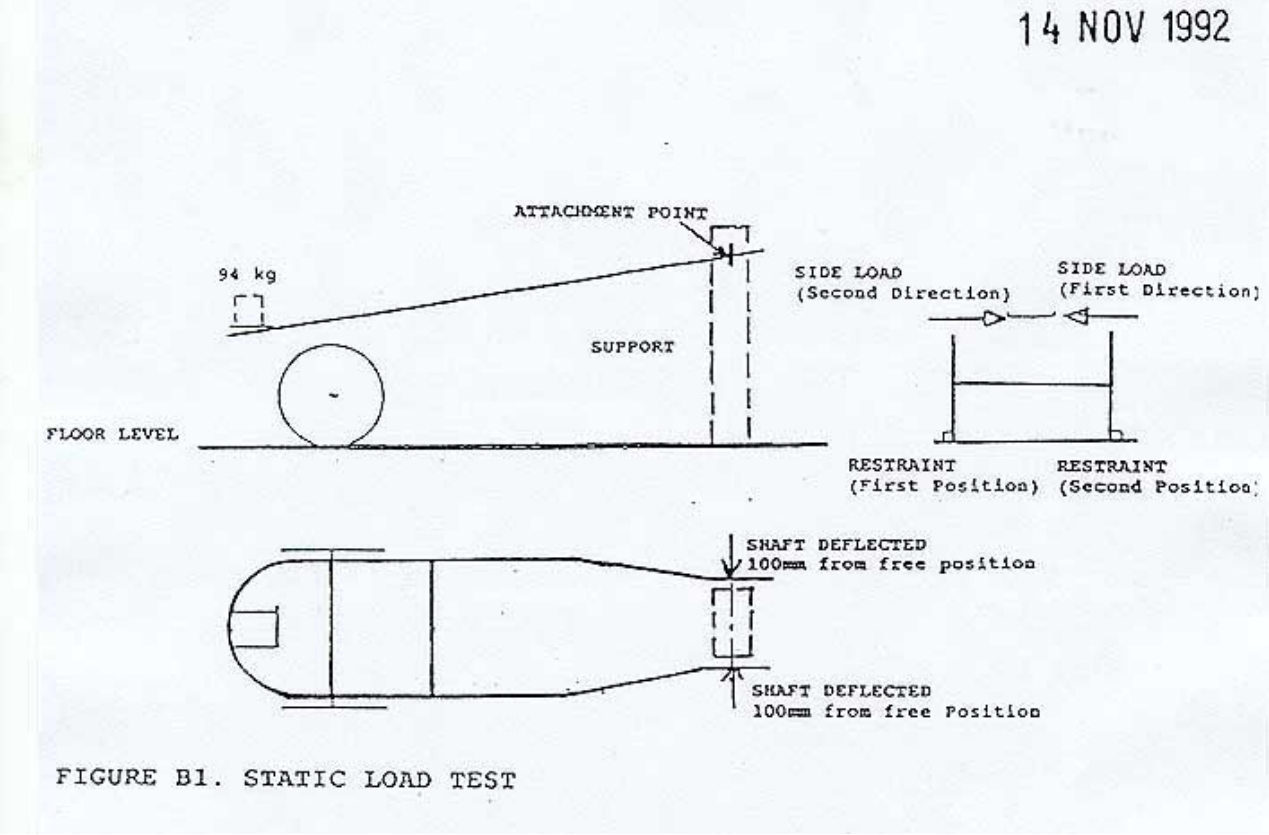

FIGURE B1. STATIC LOAD TEST

B2 Procedure

The test procedure shall be as follows:

a. The tyres shall be inflated to 50 psi. *(Amended 18/10/2010)*

b. The sulky shall be placed on a hard, flat, horizontal floor or test surface. The shafts shall be attached to a fixed support so that the point of attachment is 1420mm vertically above floor level. The method of attachment of shafts to the support shall be, as closely as possible, the method used between shafts and horse. The method of attachment of shafts to the support shall include an inward, horizontal deflection of 100mm from the free position, for each shaft, at the point of attachment, i.e. the horizontal distance between the shafts at this point is decreased by 200mm.

c. A restraint shall be fastened to the floor or test surface to prevent side movement of the wheels. The height of the restraint shall ensure that contact with the restraint is made only by the tyre of a wheel.

d. A weight of 95kg shall be placed centrally on the seat and secured in position. *(Amended 18/10/2010)* The centre of gravity of the weight shall be 200mm above the central region of the seat.

e. A side force of 540N shall be applied gradually in a horizontal direction, which passes through the centre of the seat and is perpendicular to the vertical central plane of the sulky. This force shall be maintained for a period of 15 seconds.

f. The side force application shall be performed a total of 10 times.

g. The position of the restraint shall be changed so that it is in contact with the tyre of the other wheel, the direction of the side force on the seat shall be reversed, and the sequence of the force application shall be repeated.

B3 Report

The report shall state whether or not there was failure of any part of the sulky.

Appendix C - Dynamic Load Test

C1 Scope

This appendix sets out a method of testing the strength and constructional integrity of the sulky under dynamic load conditions over a prolonged period of time. Aspects of the method are illustrated in - see figure C1 (below)

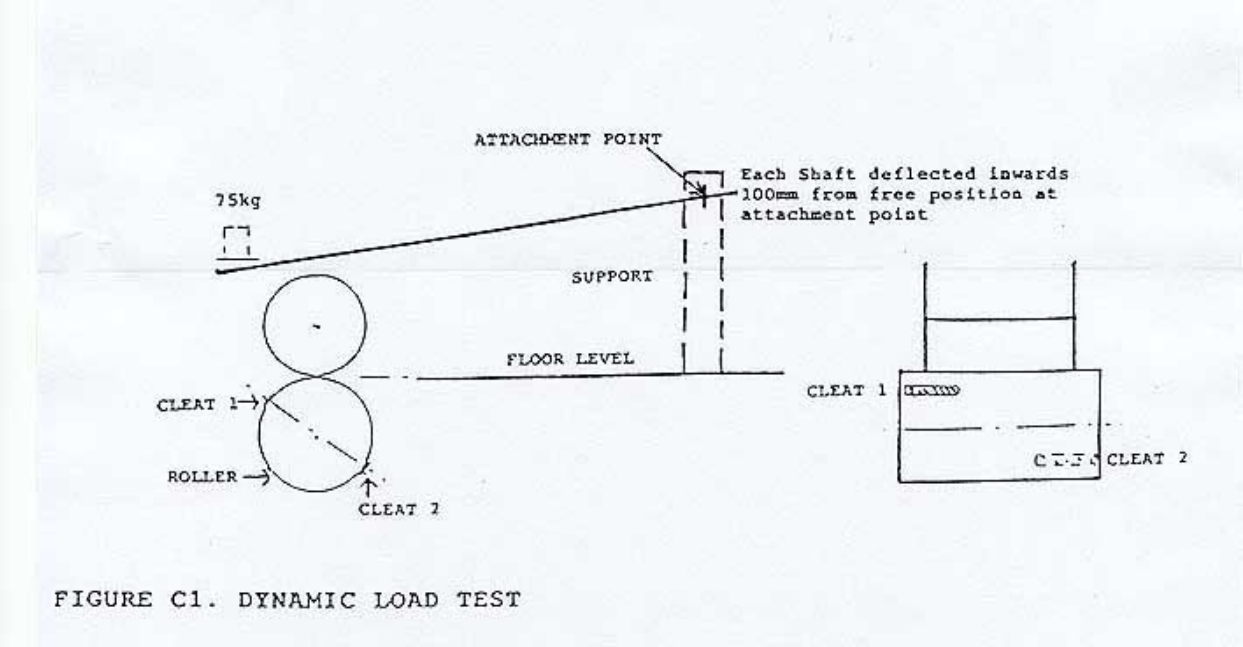

FIGURE C1. DYNAMIC LOAD TEST

C2 Procedure

The test procedure shall be as follows:

a. The tyres shall be inflated to the 50 psi. *(Amended 18/10/2010).*
Should wheels supplied by manufacturer of sulky fail, testing will continue on a standardised set of wheels, a heavy duty StarFire reinforced nylon wheel. If tyre/wheel failure occurs, StarFire wheels are to be inflated to 36-38 psi. *(Amended 18/10/2010)*

b. The right hand sulky wheel shall be placed on a motor driven steel cleated roller mounted on a horizontal axis. *(Amended 18/10/2010)* The sulky axle shall be parallel to the roller axis and vertically above it. The outer diameter of the

roller shall be 400mm and provided with one cleat. *(Amended 18/10/2010)* The cleat shall be set parallel to the roller axis. *(Amended 18/10/2010)* The length and position of the cleat shall ensure that it adequately spans the full width of tyre contact. *(Amended 18/10/2010)* The cleat shall be 17.5mm high by 25mm wide with a 6mm by 6mm chamfer to the edges contacting the tyre. *(Amended 18/10/2010)*

c. The sulky shafts shall be attached to a fixed support so that the point of attachment is 1420mm vertically the height of the test rig drum. *(Amended 18/10/10)* The method of attachment of shafts to support shall be, as closely as possible, the method used between shafts and horse. The method of attachment of shafts to support shall include an inward, horizontal deflection of 100mm from the free position, for each shaft, at the point of attachment, i.e. the horizontal distance between the shafts at this point is decreased by 200mm.

d. Provide a guidance system, which will prevent any significant side movement of the sulky during test.

e. A weight of 95kg shall be placed centrally on the seat and secured in position. The centre of gravity of the weight shall be 200mm above the central region of the seat. *(Amended 18/10/2010)*

f. The roller shall be rotated so that the sulky wheel is turning in the same direction as for forward motion of the sulky. The surface speed of rotation of the roller shall correspond to a sulky speed of 1 mile (1.61km) in 1 minute 36 seconds, i.e. to a speed of 16.67 m/s, which is achieved by a rotational speed of 755 rev/min of the roller. The test shall run continually for a period of 10 hours on one wheel of the sulky only. *(Amended 18/10/2010)*

C3 Report

The report shall state whether or not there was failure of any part of the sulky.

14. DEFINITIONS

14.1 "Sulky" means a dual wheeled carriage attached to a horse during a race or trial containing a seat for a driver during such race or trial. "Cart", "Gig", or "Spider" shall have the same meaning.

14.2 "T-bar Axle" means the part of the undercarriage, which supports the wheels using T-shaped members.

14.3 "Undercarriage" means the frame, which supports the shafts, wheels, seat and footrests.

15. REFERENCED DOCUMENTS

15.1 Rules of Australian Harness Racing

15.2 Lists of Approved Sulkies, Materials and Components

16. SUBMISSIONS FOR APPROVAL – HRA Sulky Approval Policy

(Amended 29/06/2023)

Sulkies which have been submitted for approval must be supplied with:

1. New Sulky Design Submission Form completed and signed;

2. Declaration of material specifications as per Section 10.1 of this standard.

For further information, also see HRA's Sulky Approval Policy.

Effective Date of Implementation: 14th June 1992, and various dated amendments up to and including 18 October 2010