

# Queensland Ride On Mower Racing Association

Inc 1A40194

## Guidelines for Building a Racing Mower

(v4.2 June 2017)

### (To be read in conjunction with the latest Mower Rules and Regulations)

This is a basic guideline on how to build your racing mower and is not model specific. Using your own ideas and ingenuity is a must to suit the type of mower you wish to modify. If you need any more info or need to discuss anything, don't hesitate to contact us or speak to your local club delegate and they can put you in touch with the appropriate person.

#### **Food for Thought before you start building your Racing Mower.**

One of the first questions we are usually asked is, can I modify the engine and make it go faster. Most newcomers seem to think you need the fastest and most powerful engine to win races. Wrong... You need to step back a bit and re-think the whole scenario of Racing Ride on Mowers, because until you have driven one of these beasts, you can't appreciate just how fast they really are with standard motors. It's no good going fast if you can't get it to steer, handle or stop. All forms of motor sport are dangerous and Mower Racing is probably more so, as you don't have the protection of a roll cage and a car body to protect you if something goes wrong at around 85kph. Please put a lot of thought and work into your mower to ensure that it's built properly for your own safety.

The secret to going fast is in building a good competitive machine,  
Learning to drive it competitively and then honing your racing skills.

#### **Why do we have Rules and Regulations???**

##### **We want to keep Mower Racing Safe and Good Cheap Family Fun.**

Most other forms of motor sport have become unrestricted and racers spend a fortune on engine and chassis modifications and that puts it out of reach of many people. We are trying to keep Mower Racing as cheap as possible and stop it becoming cheque book racing where the teams with the biggest budget always win.

It's all about keeping it as safe as possible and Good Clean Fun :) These beasts may not look that fast when you're watching them, but they really are quick and it's awesome doing around 85kph with your bum only a few inches off the dirt.

#### **General Rules :**

Ensure you have the latest copy of the Rules and Regulations to refer to.

It is your responsibility to keep up to date with the Rules. All clubs are notified when changes and / or amendments are made by the QROMRA Inc, the Queensland Association governing body..

#### **Building Your Racing Mower**

- \* Strip mower down to bare chassis and prepare for modifications and paintwork etc.
- \* You can strengthen the mower chassis with angle bar or box section steel if you wish, however please note that these machines don't work too well if they are too ridged, some flex in the chassis is advisable
- \* You can modify your mower bodywork to whatever you feel is suitable for the model of mower. It is compulsory to make sure that any exposed edges are protected by the use of a clip on product similar to the product that is used around the edges of car doors or pinch weld etc,
- \* Side intrusion / nerf bars between the front and rear wheels are compulsory to protect your lower leg area and feet. (Refer Rules and Regulations)
- \* You can turn the front body work into a full tilt front assembly to allow for easy access to your engine bay for easy repairs etc, just make sure that when its back in its closed position that it is held down with straps or clips of some description

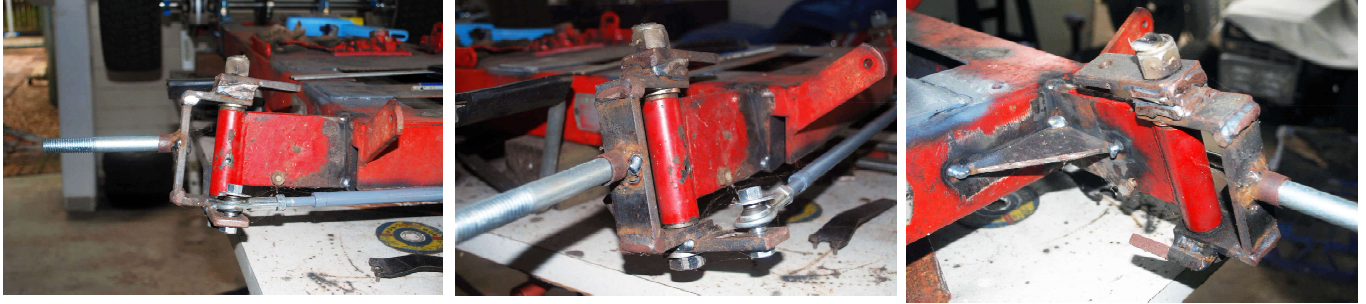
- \* Remove front axle assembly from underneath the mower chassis and rebuild a new upgraded Front End and Steering assembly.
- \* It is strongly recommended that you make your own front axle assembly out of stronger materials. The standard uprights should be rebuilt as they are generally not strong enough for the rigours of racing.
- \* Do Not use any worn parts in the steering assembly, from the steering wheel down to the C Section upright mount for your front stub axles as this area can be extremely dangerous if not built correctly and will be scrutineered by race officials at all races.
- \* All moving parts must be in good condition and ALL nuts must be new Nylocks nuts and preferably secured by split pins, where possible.
- \* To find the best KPI, camber and caster angles we suggest that you do some research on steering geometry including the Ackerman Steering Principle, which will assist you in setting up the front end of your racer. If in any doubt, please contact your local club as they will assist in any way that they can and discuss your mower build and explain what ever you need to know. This, along with balanced tyres, will enable you to drive through left and right hand corners at speed with minimal understeer or oversteer.
- \* Remove rear axle assembly and modify rear chassis mounting points to allow for pillow block or flange type mounts and bearings. This is very important as it allows you to lower the ride height and Centre of Gravity.
- \* Fabricate a solid rear axle out of 25-30mm (1" - 1-1/4") axle steel, complete with keyways cut in for your rear sprocket and brake disc mounting positions. You may also be required to have keyways cut into each end of the axle to securely mount your rear wheels.
- \* The maximum length of your rear axle is 1 metre long, you can make this narrower if it's more suited to your type of mower
- \* Maximum mower width including wheel track width is 1200mm.
- \* The wheel track should be similar front and rear for example ... a 1 meter axle with wheels attached is approximately 1200 or less outside of wheel to outside of wheel, so then that dictates that the front wheels overall measurement should be 1mt-1050mm – out side to outside, to assist in creating the correct cornering stability at high speeds.
- \* When making the rear axle, try and work out the position of the rear sprocket and brake disc assembly so that it is off centre so you can set your seating position as low as possible to the rear axle i.e. in between your rear tyres, so you are sitting on top of the centre of the rear axle or as near as possible to it, the reason for this is to create the correct weight distribution and ultimately create a balanced racer. The lower you sit, the lower the centre of gravity and less chance of rolling the mower.
- \* The best solution is to fit an extended jackshaft to the Right Angled Box which allows you to have the drive gear and rear sprocket running outboard of the chassis.
- \* Disc or drum brakes must lock up both rear wheels. Best choice here is to use a hydraulic disc brake from a motorbike or a good quality mechanical caliper..
- \* When building your racing mower, always try to get the ride height, seat height and Centre of Gravity as low as possible. Mowers that are built with too much ground clearance too high a seat level will roll too easily and besides being out of the race with damage to your mower, you could quite possibly get injured.. Think handling and safety at all times.

### **Some Examples of Front Ends and Rear Axles:**

This is the Rover Rancher chassis, but the design and fabrication principles can be applied to any make of mower.

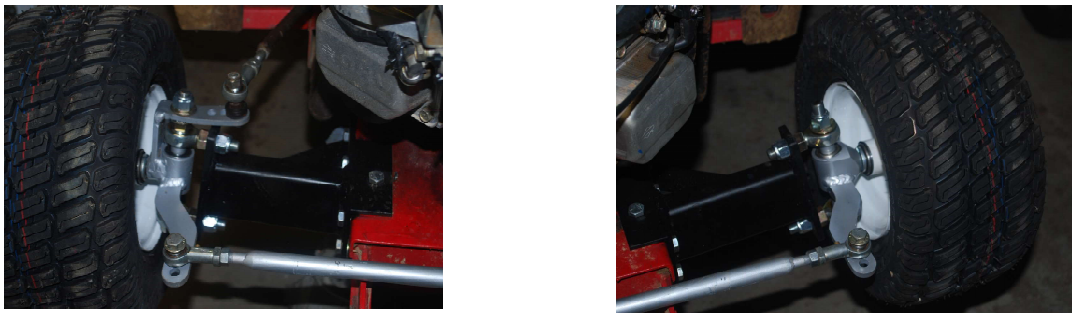
#### **Example of Fixed Front End and Stub Axles**

Caster, Camber, KPI and Ackerman Principles are critical to a good handling balanced mower.



#### **Example of Fully Adjustable Front End with Rose Joints**

Caster, Camber and KPI angles are fully adjustable to suite track, driver skills and preferences.

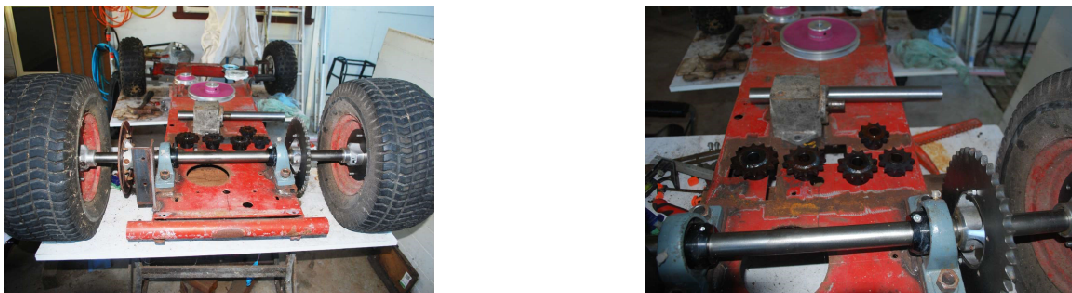


#### **Rear Axle with Drive Gear and Sprocket mounted Inboard**

Restricts how low your seat can be and should only be done as a last resort



#### **Highly Recommended for lower Seat levels and Centre of Gravity Rear Axle with Outboard Drive Gear, Sprocket and Brake Disc.**



If unsure about any technical issues, contact your local club President who can put you in touch with someone that can explain in great detail any technical and build issues and arrange for you to view and take photos of local competitive racing mowers that comply with the rules.

## **Engines**

- \* Refer to latest Rules and Regulations

## **Exhaust Systems :**

- \* It's recommended that mower engines have a minimal 800mm length of exhaust pipe prior to the hot dog muffler to create the correct back pressure for the engine to reduce the risk of burning out valves
- \* For the motorbike engines, any type of expansion chamber or standard system used on the engine that you are using is advised to enable you to achieve the correct performance from your engine

## **Driveline :**

- \* If you use a mower engine, it is suggested that you run your drive through a 90 degree single speed gear box, so that the power from your engine is via a pulley and B-Section belt assembly from the engine to the input shaft on the 90 degree box. Then via a sprocket and chain assembly from the output shaft of the 90 degree box to the main rear axle sprocket, with your clutch system mounted under the chassis on the drive belt from the engine to the box .
- \* If you use a motorbike engine, it is suggested that you use the correct sized rear sprocket so that you only use 3 out of the 5 gears available to reduce the amount of time required in changing up and down in gears

## **Rims and Tyres :**

- \* Refer to latest Rules and Regulations

## **Prior to Racing :**

- \* Before you can race your mower at any club track in Australia, it will need to be scrutineered to ensure it complies with the Rules and Regulations and meets the safety requirements. If you roll up at a race meeting for the first time and you are NOT permitted to race due to a deficiency, you will be very dissatisfied. We suggest you contact your local club scrutineer as soon as your mower is ready and organise a pre-race scrutineering check along with your safety gear.
- \* Any major faults will be noted and should be fixed immediately. Minor deficiencies in your mower will be noted in the scrutineering diary and must be fixed before, during or after the meeting depending on the severity of the fault. It will also be re-checked by the scrutineers and if approved, will be given a green pass initialled sticker which will enable you to continue racing

## **and Finally**

Get as much information as you can and look at as many competitive mowers as possible before you even start your build. Don't try and re-invent the wheel as the seasoned and "A" Grade mowers have already been there and done that and have learnt from their mistakes. Take their advice and save yourself a lot of money and heartache.

Just like building a house, you need to have good foundations to build a solid house. Research, research and more research before you get in too deep.

If there is anything you are not sure of, please contact the President of your local club by either email or phone for clarification

Take care and pride in building your racing mower and do your best to make sure you and your machine are well presented. As we are now getting more TV and Newspaper coverage, our clubs want to present a professional looking motor sport that will in turn, help to attract new members and general public interest.

**Always refer to the latest Rules and Regulations for Safety and Compulsory items.**

**Please keep in mind:**

**It must still look like a Ride on Mower that the public can relate with.**

**The Spirit of Fun and Friendly Competition is to be Maintained at all Times.**

**Bending or Breaking the rules makes it awkward for everyone involved  
Futhermore, you end up with the embarrassment of disqualification and loss of points.**

**PLEASE DON'T DO IT :)**

**Mow On, Race Hard and Have a Ball !!!**

**It's all about having Good Clean, Enjoyable Family Fun.**

**Always remember, we're not racing to win Cattle Stations**

**We're racing for the enjoyment of competing in a Fun, Friendly Family Sport.**

**QROMRA**

President : Jeff Wehlow

Technical : Ken Booy

Treasurer : Julie Sanderson

0428 349 631

0418 959 916

0409 594 635

[info@cqmrc.com.au](mailto:info@cqmrc.com.au)

[hmow@bigpond.com](mailto:hmow@bigpond.com)