



# Make It RC MA10 Axle Assembly

## General Information

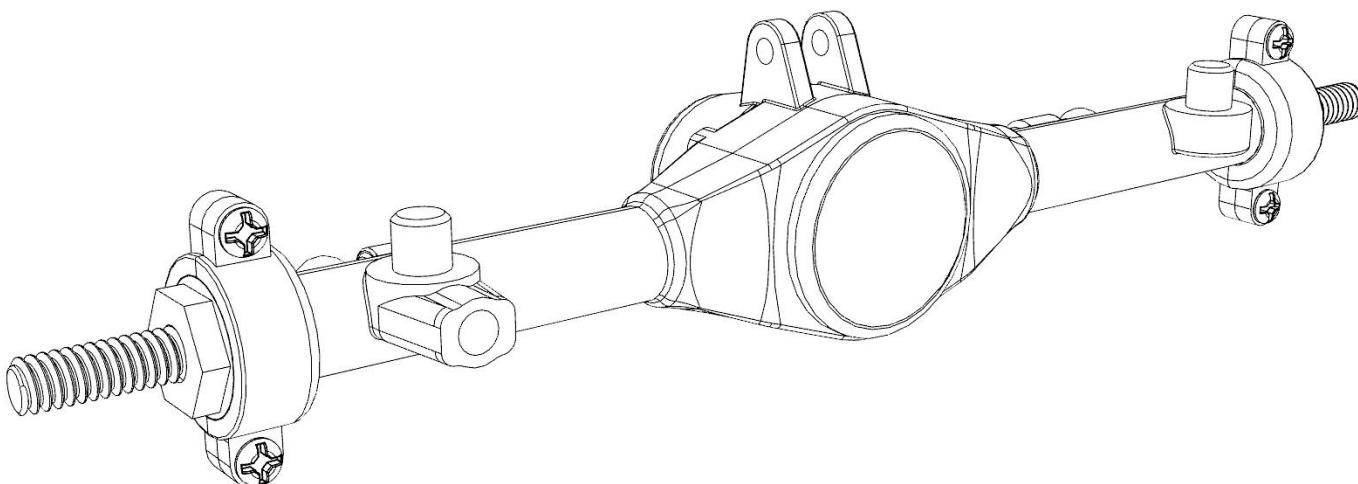
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Thank you for choosing the Make It RC MA10 Series Axle Assembly. This documentation includes important information about the operation, assembly, and maintenance of your MA10 axle. **It is important that you thoroughly read and understand all of the information presented in order to get the most out of this product. Do not begin working on your MA10 or installing it onto your project until you have read all of the documentation provided.**

The MA10 is a 1/25 scale axle assembly designed for lighter weight radio controlled vehicles of a similar scale, most commonly built around a typical plastic model car or truck kit. It may be installed onto a Make It RC chassis designed specifically for this axle assembly to be mounted to it, or it can be mounted to a custom built chassis you have created. Additionally this axle can even be fitted directly to the chassis piece that is included in certain plastic model vehicle kits, though this will likely require extensive custom work, and is generally not recommended for inexperienced builders.

The versatility of this series of axle assemblies is one of the main advantages of the MA10. The MA10 can be ordered in different sizes, different wheel mounts, several unique differential set ups, and in a variety of suspension configurations. Another key advantage is the overall size and realistic scale appearance of the MA10 axle housing, which is designed to replicate the general appearance of full size axle assemblies you would commonly find under vehicles utilizing a straight axle rear suspension, such as a muscle car, hot rod, or pickup truck.

The MA10 is simple in design, uses high quality components and is hand assembled to tight tolerances. With proper installation, usage, and maintenance this axle can deliver exceptional performance for countless hours of use. However due to the small size and fragile nature of this component, misuse and improper or insufficient maintenance, can quickly lead to poor performance and wear resulting in repairs being necessary.



## **Safety**

**This product contains many small parts, adhesives, and lubricants that can be extremely dangerous if swallowed. Therefore all parts of this product, as well as the packaging it came in must be kept away from small children at all times.**

This product is designed for hobbyists 16 years of age and older. This product is not designed to be assembled or used by small children.

This product contains lubricants that can be harmful if swallowed or when coming in to contact with the eyes. In certain individuals it may cause minor skin irritation. Take care when applying the lubricants and avoid contact with skin. Wash hands after handling parts and applying lubricant.

This product may contain adhesives to be used during the assembly process. Avoid having these adhesives come in contact with the skin. If your skin comes in contact with the adhesive, wash area thoroughly.

Some of the lubricants, adhesives, and parts of this product are flammable. Do not expose to flames or extreme heat.

During the assembly of this product, sharp tools such as knives and cutters may be used. Such tools can cause injure if used improperly. Always ensure that you are using tools correctly and with caution.

## **Important Information**

A few important things to remember when working on your MA10 axle assembly:

- **Study the specific diagram included with your axle assembly before disassembly**
- **Do not overtighten any of the fasteners or wheel nuts.** The MA10 contains small fasteners that take minimal force to get tight. Overtightening can causing parts to crack, and damage to internal threads.
- **Use the correct tools.** Only use drivers designed specifically for small screw heads and nuts like those found on the MA10. **No power tools should ever be used to screw or unscrew fasteners.** Using power tools or incorrect sized drives will result in part damage and the heads of the fasteners to become stripped.

Choosing a work environment and keeping organized:

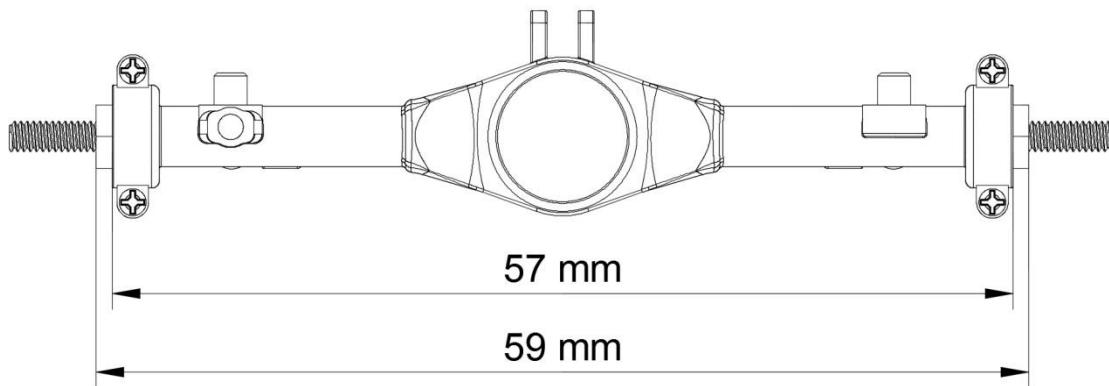
Make sure you have a clean well-lit area to work on your vehicle. You may want to use a shop/pit towel or magnetic work mat which will help prevent parts from rolling and becoming disorganized.

While building or disassembling your MA10, be sure you are keeping track of all parts and screws. Because of their small size, it can be easy to lose track of these pieces.

## Measurements and choosing wheels:

Different applications will require different lengths of axle and wheel assemblies. Understanding how to measure the axle and wheels is necessary in order to select the correct components to fit your specific vehicle. Additionally understanding the different kinds of wheel mounts that are available on the MA10 and how to select the correct wheel for the mount on your axle is very important.

The MA10 is available in different lengths to fit different size vehicles. The length of the axle is measured from one end of the housing to another as can be seen in the reference image below of a 57mm MA10 axle assembly.



It is important to note that the axle length is not measured from the outer wheel mounting surfaces but instead just the plastic axle housing (displayed as 57 mm above). This is because a variety of different size and style wheel mounts can be used with this axle assembly. When you purchase an axle assembly or individual components such as just the axle shaft or wheel mounts, the width of the wheel mounts is always indicated separately. The image above shows a 57mm MA10 axle assembly with 4x1mm wheel hex mounts, one on each side for both wheels. The width of a 4x1mm hex mount is 1mm, therefore the length between each wheel mounting surface is 59mm (as shown above). If larger 4x2mm wheel mounts were installed instead, the length between each wheel mounting surface would be 61mm.

Different axle shafts and wheel mounting options are available. It is important to know what kind of axles and wheel mounts (sometimes also referred to as wheel hex or hub) your axle is equipped with so you can select wheels that are compatible. The easiest way to know what axles and wheel mounts your axle is equipped with is to look for the section named: *Axle Type/Length/Wheel Mount* on the specification sheet included with your axle assembly. This information will help when selecting compatible wheels.

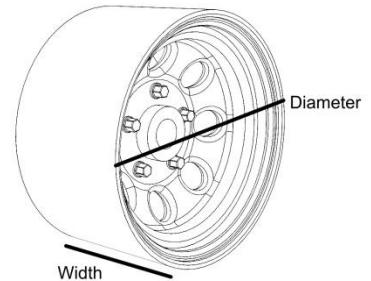
For more information about MA10 axles and wheel mounts, visit this web page: [Link Needed](#)

Wheel measurements for our selection of scale wheels are indicated similarly to how they are on full size cars and trucks.

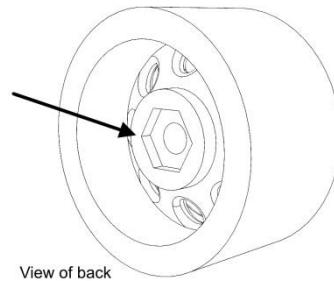
For example, a Make It RC wheel will have its measurements listed like this:

Diameter & Width	Compatible Axle Type/ Wheel Mount	Offset	Backspacing
18x10mm	M2 Threaded Axle Shaft/4x1mm Hex	-2mm	3mm

Diameter & Width: The diameter is the distance across the front of the wheel and determines how large the wheel is. Width is measured from the front of the wheel to the back. You will need to know both of these measurements when selecting tires that will fit the wheel.



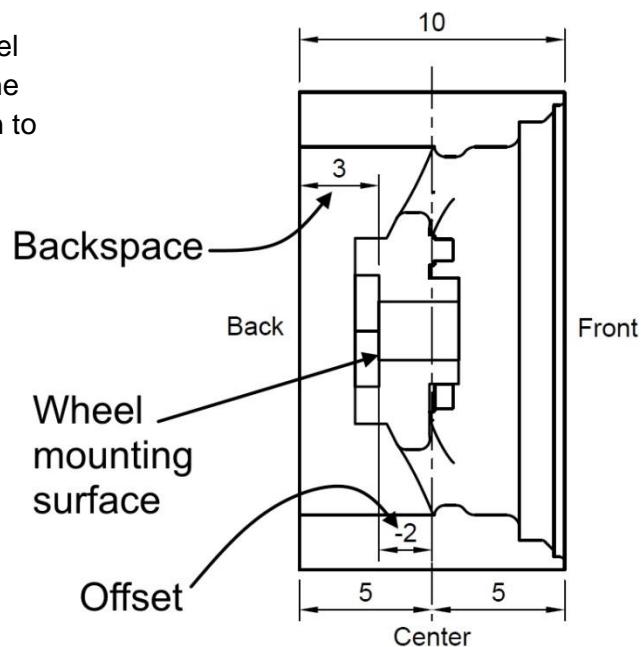
Compatible Axle Type/ Wheel Mount: This indicates what kinds of axle shafts and wheel mounts the wheel can be mounted to. It is important to know what kind of axle and wheel mount your MA10 axle assembly has when choosing a wheel so you can be sure the wheel is compatible. This information can be seen on the specification sheet included with all MA10 axle assemblies. If this information is not available, please visit the following web page for more information about different axles and wheel mounts which will help you to identify which type your axle assembly has: [Link Needed](#)



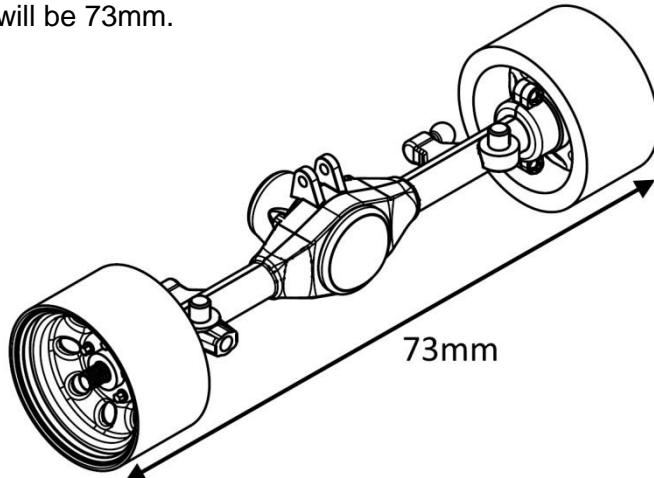
Offset: Wheel offset is the distance from the center of the wheel's width to the mounting surface. If the number is negative the mounting surface is closer to the back of the wheel, If the number is positive the mounting surface will be closer to the front.

Backspacing: Wheel backspacing is the distance from the wheel mounting surface to the back edge of the wheel. The greater the backspacing, the more inward the back wheel will be in relation to the mounting surface.

Keep the size, offset, and backspacing in mind when choosing wheels for your vehicle. You'll want to insure you are not selecting wheels that are too large, too small, or are set too far back or outward for the body and chassis that you are building. Also remember to take into account the front wheels by ensuring there will be enough clearance for them to turn.



With the axle, wheel mount, and wheels from the previous pages used as examples, the total length of this axle and wheel assembly can be calculated. As mentioned previously a 57mm MA10 axle assembly with 4x1mm wheel hex mounts makes the distance between the wheel mounting surfaces 59mm. The width of the wheels used as an example previously is 10mm. Subtracting the backspacing (3mm) means from the mounting surface to the front of the wheel is a distance of 7mm ( $10 - 3 = 7$ ). Taking 7 and multiplying it by 2 (because there are two wheels, one on each side) equals 14. Adding 14 to 59 means the total length of this axle and wheel assembly will be 73mm.



Selecting different combinations of MA10 axle assemblies, wheel mounts, and wheels can produce many different lengths of axle and wheel assemblies which can fit many different applications. This also allows you to fit a wide variety of different size wheels that best fit the appearance and performance that you desire from your vehicle. For example if you want to build a car set up for drag racing and wish to fit larger width rear wheels for ample traction, you would select a shorter length axle assembly so the total length of the axle and wheel assembly will be able to be fitted under your car. If you decided you wanted to build a car with much shorter width wheels, such as to closely replicate the appearance of how the full size vehicle would have looked from the factory, you would want to choose a longer axle assembly and more likely wheels with more backspacing and a positive offset.

Although this can seem overwhelming to a new hobbyist, once you have an understanding of what all of the measurements mean, the large and growing variety of different size components available becomes a great asset which allows for the MA10 and compatible wheels to be fitted to a vast variety of 1/24 and 1/25 scale vehicles, expanding the variety of what can be built.

**Important:**

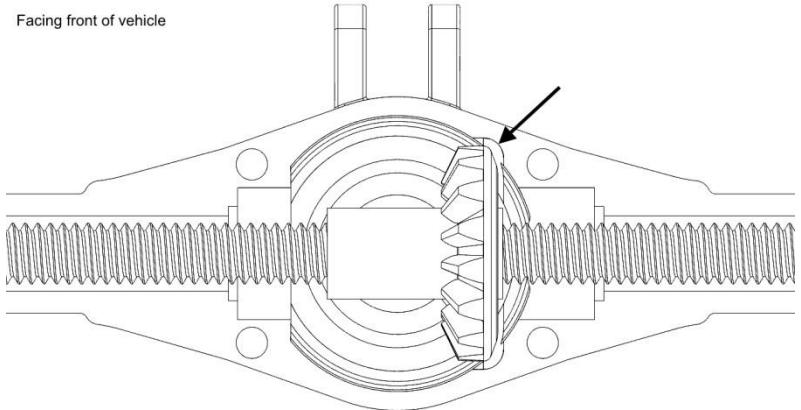
**Please remember that all measurements for the MA10 and compatible wheels are metric as opposed to imperial measurements often used on full size vehicles** (for example inches used to measure the diameter of wheels or length of axle housing). In other words a 1/24 scale Make It RC 16x8mm wheel is not a 1/24 scale representation of a 16x8in wheel on a full size car, likewise a 1/25 scale 57mm MA10 axle housing is not a 1/25 scale representation of a 57in axle housing.

If you want to select a 1/24 scale Make It RC wheel that is an accurate 1/24 scale representation of a 16x8in wheel, you will need to divide 16in by 24 and 8in by 24 which will equal 0.666in and 0.333in. Then you will need to convert from inches to millimeters (0.666in multiplied by 25.4 = 16.9mm and 0.333in multiplied by 25.4 = 8.4mm). Therefore a 16x8 in wheel is equal to about 16.9x8.4mm in 1/24 scale, so you would want to select a wheel that is around the size of these dimensions.

### Ring gear position:

Different MA10 axle housings allow for the ring gear (larger gear connected to the axles) to be located on the left side and others allow for the ring gear to be located on the right side of the housing. Additionally some MA10 axle housings allow for the ring gear to be located on either the left or right side, but these axle housings cannot have differentials installed. You can easily identify whether your axle is designed for a left ring gear, right ring gear, or both by looking at one half of the axle housing and seeing which side there is a cut out for the gear and the position of where the differential bearings (if equipped) are mounted. You can also simply look at the last letter of the axle code on the specification sheet. If it is L than your axle has a left mounted ring gear, if it is R than your axle has a right mounted ring gear. If there is neither an L or R than the axle can accommodate both a left or right mounted ring gear.

The image on the right shows a right mounted ring gear. Note the location of the notch in the axle housing and the location of where the differential bearings would be located.



When purchasing a MA10 axle assembly you can specify which side you want the ring gear to be on. For most applications the side the gear is located does not matter as nearly all transmitters allow the throttle/reverse/brake position to be reversed if needed, so if you find that your vehicle is going in reverse when you apply throttle, simple reverse the throttle/reverse/brake settings on your transmitter. For those with more specific requirements, you can choose the ring gear position when purchasing your axle assembly.

### Choosing a motor:

Most variants of the MA10 are designed for lower power and lower speed motors, especially axles equipped with resin gears. For a complete and updated list of motors we recommend using with the MA10, you can visit this page: <https://shop.makeitrc.com/products/make-it-rc-1-25-scale-ma10-axle-assembly>

Look for the section in the description that says: Recommended motors to use with this axle.

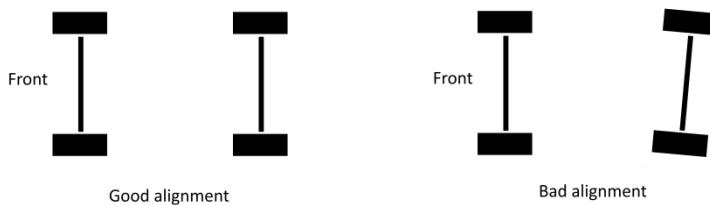
## Mounting the MA10 to a chassis:

The procedure for mounting the MA10 to a chassis will vary greatly depending on your specific application and what suspension set up your axle is designed for. If you are mounting this axle to a Make It RC chassis designed specifically to fit the MA10 axle assembly you have chosen, than the installation should be very straight forward. Simply follow the instructions included with the specific Make It RC chassis.

If you are going to be installing the MA10 onto your own custom made chassis, more planning and consideration will be necessary.

A few general things to consider when mounting the axle to a custom chassis:

- Make sure there is sufficient clearance for the axle to articulate
- Ensure that the drive shaft will be at a good angle (not too steep). The more straight and level the better.
- Make sure there is plenty of room around the wheels
- Make sure that the mounts for all of the suspension links are aligned properly and securely mounted to the chassis
- When cutting the steel rods for the suspension linkage, be sure you are cutting them to the correct length and test fit before gluing
- It is important that the axle alignment is straight and parallel with the front wheels. Also make sure that the rear wheels are well aligned with the front wheels.



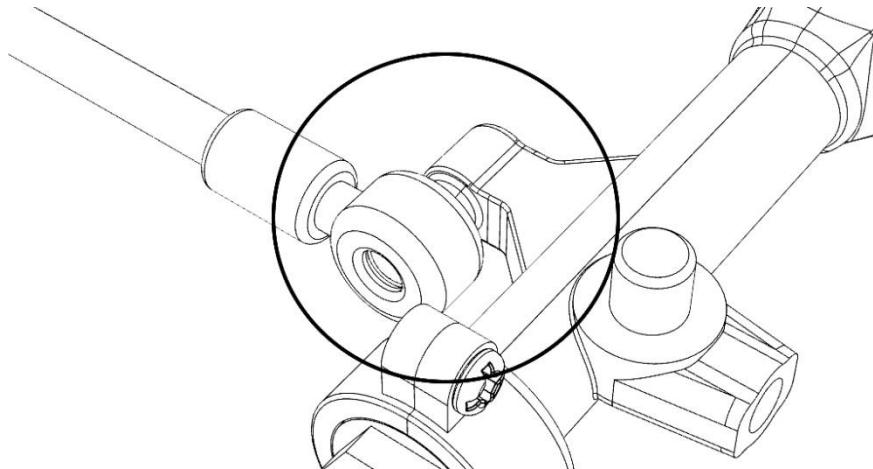
## Painting the axle housing:

If you choose to paint the axle housing pieces you will either need to disassemble your axle or carefully mask around the bearings, axle threads, and areas where suspension links mount to the axle to prevent paint from getting on them. You can use any model paint that is designed for use on plastics, often the same paints you would use to paint model car parts.

If you decide not to paint your axle assembly, please keep in mind that age and prolonged exposure to sunlight may gradually fade the color of the housing. This will not affect the durability or performance just the appearance.

### Trailing arm ball and socket mount:

If your axle is equipped with a ball and socket connection for the lower trailing arms like this:



We recommend that once the sockets have been mounted to the axle housing you avoid removing them. The sockets are designed to have a snug fit and due to the small size of the ball mount located on the axle housing, there is a chance for them to break. Because of this we highly suggest not removing them unless you need to. If you need to remove them do so carefully.

### First test drive:

Once you have assembled your vehicle equipped with your MA10 axle, be sure to thoroughly inspect the vehicle to ensure everything has been assembled properly and that there are no loose wires that may get tangled.

Next hold the vehicle or place it on a stand and run the vehicle slowly to ensure everything is functioning properly.

If everything is functioning as it should find a large, clean, flat area to drive your vehicle. Make sure that you are driving in an area where the risk of sustaining damage from colliding with a hard object or falling down steps or from a table top is minimal.

Begin by slow driving in circles and figure eights and make any adjustments to the suspension, steering, or motor as necessary. Please note that an on-road vehicle equipped with a solid axle rear suspension will handle differently than other more conventional RC chassis' with four wheel independent suspensions. After you begin to get a feel for how the vehicle drives and you have the vehicle well aligned, you can begin increasing the speed.

When operating a vehicle equipped with a MA10 axle, the following should be avoided:

- **Driving in water or in wet environments**
- **Driving in an area with large bumps, cracks, stones, or anything similar.** Remember even small surface imperfections like cracks on concrete can be huge in comparison to a tiny 1/25 scale vehicle. Hitting something like a crack or stone at high speed can result in damage to the vehicle.
- **Sandy or dusty environments**
- **Environments with a large amount of pet fur or hair.** Hair and fur can get spun around small moving parts causing wear, friction and can at times be difficult to remove. In such an environment cleaning/vacuuming prior to driving your vehicle is highly recommended.
- **Driving on carpet**
- **Driving in mud**
- **Driving on hot surfaces**
- **Driving in very hot or cold climates.** The closer to room temperature (70°F/21°C) the better.
- **Jumping, driving off ramps, or similar rough driving**
- **Dropping vehicle**
- **Storing in humid environments**
- **Operating without proper lubrication**
- **Stationary burnouts and sanding tires while mounted to vehicle.** Never apply the throttle while holding the vehicle stationary with the driving wheels on the ground or over sandpaper/sanding block. This puts tremendous strain on the entire driveline and motor, especially on more intricate components such as the transmission and the differential if equipped. Always remove tires prior to sanding them.

## **Maintenance**

When being used as designed, all variants of the MA10 axle assembly require minimal routine maintenance. One exception however is if the axle is being used off road. If this is the case, the three outer bearings that are visible from the outside of the axle assembly (one on each side behind the wheel mounts and one facing the drive shaft) need to be oiled regularly to prolong the life of these bearings. A small amount of thin oil designed for use on steel ball bearings should be applied. Do not use a thick grease for these bearings, since a thicker grease will collect dirt.

If you begin to notice that the axle is no longer spinning smoothly, you will need to disassemble the axle housing by removing the eight M1 screws that hold each half together. Once you have opened up the axle housing, check to see if all the bearings are rotating smoothly and replace any if needed (note some axles have to be replaced as an assembly not just the individual bearings). While the axle housing is opened up inspect the gears (and differential components if equipped), and ensure that the grease on the ring and pinion gears is clean and free of debris. If this is not the case, wipe away all of the grease that is on the gears and apply fresh grease. The specific type of grease to use on the gears inside of your axle will depend on what type of gears and differential you have. Every MA10 axle and every kit or ready to run vehicle containing an MA10 axle includes specific information such as what type of grease to use on an included sheet of paper. It is important that you use the correct grease for the specific gears you are using especially for gears made from specific types of resin, as using the incorrect grease can result in the gears becoming soft then warping and prematurely failing. If you are unsure as to what type of grease to use, you can send an email to [support@makeitrc.com](mailto:support@makeitrc.com) for assistance.

We recommend that you operate your vehicle at least once every six months. Simply holding the vehicle or placing it on a stand with a moderate amount of throttle applied for a minute or two is sufficient. Also gently articulate the suspension.

## **Support and Joining the Community**

If you encounter issues or have questions you can contact us at [support@makeitrc.com](mailto:support@makeitrc.com)

We encourage all of our customers to join the official Make It RC forum at [forum.makeitrc.com](http://forum.makeitrc.com). The forum is a great place to interact with us at Make It RC and other hobbyists, show off your work, get updated information, and get help with issues you may experience. We look forward to seeing you there.