



AXLE, BRAKE AND SUSPENSION USA SERVICE AND MAINTENANCE MANUAL

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QUALITY POLICY OF MEHER USA INC.

Since the start of the Meher Group of companies in 1995, Meher has believed that innovation is key. From its origins, the entire team, from production, to research and development, to sales, and admin, we must all work together to ensure we improve the trailering industry by providing "Safety through Innovation".

The entire team at Meher work together to ensure this vision, *"Safety through Innovation"* is followed, and in order to do so effectively, one of the prime goals is to manufacture and build products which have a high level of quality control.

Every team member is trained to understand the product, its usage, assembly, and eventual use. At each stage of the production, systems are put in place to ensure quality and safety for the consumer and staff is maintained. To ensure a quality product, we ask all members of the team, if you were the customer, would you buy this product? If the answer is yes, we know, we have built a quality product.

As customers, you are the primary user of our product. You are the ones who are using our creation regularly, and as such, have first-hand experience of what improvements you would like to see. At Meher, we welcome feedback from our valued customers so that we can continue with our vision of providing *"Safety through Innovation"* and further improve our quality.



Introduction

Thank you for purchasing a product designed and manufactured by the team at Meher. To support our product, this user manual outlines the working, service and maintenance of our suspension systems. To develop these systems, we have worked closely with a number of customers to understand their requirements and needs. All products have been tested to ensure utmost quality, durability, and where applicable, meet or exceed "Standards Requirements".

Initial Use And Regular Maintenance*

Prior its first use and at regular intervals, your trailer must be checked to ensure it meets the below specifications to ensure a safe and comfortable journey. Use the below as a guide amongst other precautionary measures before starting your journey.

Check Tire Pressure*

- 1. Refer to tire manufacturer's instructions and check the recommended pressure is being maintained in the tire.
- 2. If required adjust the pressure to the recommended value.

Check Brakes*

- 1. Visually inspect the condition of the brakes, looking for excessive and/or dangerous wear and tear.
- 2. Based on the brake system being used, refer to the relevant section in this user manual to understand and check the minimum allowable wear.
- 3. Although Meher has worked to incorporate self-adjusting systems, it is still the responsibility of the user to conduct regular maintenance and checks to ensure a safe and comfortable journey.



* SAFETY WARNING All service and maintenance to be carried out as specified in the User Manual.

Initial Use And Regular Maintenance*

Check Lug Nuts*

- 1. Visually inspect the condition of the lug nuts, looking for excessive and/or dangerous wear and tear.
- 2. Ensure torque tightness is being maintained after travelling 10 miles, 25 miles, 50 miles, 250 miles, and periodically thereafter.
- 3. The below and corresponding diagrams illustrate the correct procedure to torque the wheels nuts to your Meher suspension system. Each nut should be tightened 3 times at the specified values mentioned in the table below.

Torque Values for Lug nuts*

Wheel Type	Wheel Stud Size	First Round	Second Round	Third Round
Steel wheel	½" inch	20 to 25 ft / lbs	50 to 60 ft / lbs	85 to 95 ft / lbs
Alloy wheel	½" inch	20 to 25 ft / lbs	70 to 80 ft / lbs	105 to 115 ft / lbs



* SAFETY WARNING

Always start lug nuts by hand. DO NOT use an impact wrench.



4 Stud



5 Stud



6 Stud



8 Stud

Dismantling A Meher Suspension Assembly

Prior to dismantling, ensure you read the user manual of your trailer manufacturer to ensure safe handling of your trailer. It is advised this process be carried out by an authorized representative of your trailer manufacturer and/or Meher representative.

- 1. Ensure your trailer is empty and as light as possible. Make sure the environment in which you are working is safe for all.
- 2. Jack your trailer such that the wheel is clear from the ground. It is recommended that you refer to the user manual of your trailer manufacturer to ensure this is done correctly and safely.
- 3. Unfasten the lug nuts and remove the tire and wheel assembly.
- 4. Remove the bearing protector cap.
- 5. Remove the cotter pin.
- 6. Unfasten the axle nut and remove the flat washer.
- 7. Carefully remove the hub, brake drum or rotor by pulling them off the spindle. Be mindful that it is usual for the front bearing to come off.
- 8. All parts and components must be kept in a neat and clean environment free from dust, water, and other debris.

Inspecting A Meher Suspension Assembly

- 1. Check all components for wear and tear; in particular, areas which are subjected to be in contact with other componentry.
- 2. Check the wear on brakes, if applicable. This is the thickness of the brake pads and the brake surface on which the brake pads rub against on the metal.
- 3. For electric brakes check the area where the electromagnet runs on the armature face.

Inspecting A Meher Drum Brake Assembly*

Electric and Hydraulic Brake Drums need to be inspected for wear and tear at regular intervals.

- 1. Brakes where the brake shoes are in contact with the Brake Drum. Check for excessive wear or deep scoring.
- In electric brakes where the electromagnet is in contact with the drum face. This area is called the Armature Face. The contact area may have excessive wear and deep scoring. These surfaces can be rectified by turning. If the brake drum is being replaced, then the electromagnet must be replaced.



Inspecting A Meher Disc Rotor Assembly*

Disc Rotors need to be inspected for wear and tear at regular intervals.

1. The surface areas where the brake pads contact the rotor face are to be inspected regularly. If excessive wear or heavy scoring is present replace rotor with a Genuine Meher Part.



HUBS, BRAKE DRUMS, ROTOR AND BEARINGS

Servicing A Meher Suspension Assembly

- 1. It is recommended any servicing be conducted by an authorised repairer of Meher and/or your trailer manufacturer to ensure servicing is carried out safely and correctly.
- 2. If the wear exceeds manufacturers recommended, then replace with a Genuine Meher USA Inc. part.
- 3. Replace the Electromagnet if the wear out exceeds the manufacturers recommended with a Genuine Meher USA Inc. part.

In event of excessive wear on any component of the suspension assembly, it is strongly recommended the suspension assembly is fully replaced with genuine Meher parts.



SERVICING MEHER BEARING AND SEALS

- 1. The seal must be installed flush on the hub.
- 2. If bearings are being replaced, cones must also be replaced. If cones are being replaced, bearings must also be replaced.
- 3. Do not reuse oil seals. Once removed, replace with new ones.

Removal And Servicing Of Bearings And Seals

- 1. Ensure the work environment is clean around you before starting.
- 2. Carefully remove the outer bearing.
- 3. Remove the oil seal using a suitable tool from Meher. Do not use the bearing to push out the oil seal.
- 4. Carefully remove the inner bearing.
- 5. Check bearings, seals, cones for;
 - Excessive wear,
 - Any damage to the cage holding the rollers,
 - Pitting, corrosion, foreign matter, damage, or similar.

Replacing Bearings And Oil Seals*

Bearing Cones*

If bearings are being replaced, the cones must also be replaced. If the cones are being replaced, the bearings must also be replaced. Always use genuine parts from Meher.

- 1. Using a small chisel and a hammer, carefully tap out the bearing cones. Once removed, the surface of the hub must be checked to ensure it is free from any burrs or nicks. If any burrs and nicks are prevalent, they must be cleared, and the surface of the hub cleaned.
- 2. It is strongly recommended a press is used with a special tool fitting to ensure the cones are correctly installed in the hub. The cones must be installed flush and in the correct position. If a press is unavailable, then use a hammer to carefully tap the cones into position.

Oil Seals*

Every time an oil seal is removed, it should be replaced with genuine parts from Meher. Once you have your genuine Meher replacement oil seal:

- 1. Insert the inner bearing into position
- 2. Position the oil seal on the hub
- 3. It is strongly recommended a press is used with a flat surface to press the seal flat into the hub. If a press is unavailable, place a flat surface steel plate or a block on top of the oil seal, and use a hammer to tap the oil seal in place. The oil seal must be flush against the surface of the hub.

Replacing The Hub On Spindle*

- 1. Insert the outer bearing onto the spindle.
- 2. Insert the flat washer.
- 3. Mount the axle nut on the threads of the spindle and hand tight.
- 4. Using a torque spanner, tighten the axle nut to 60 ft/lb. This will ensure the bearing cones have properly been seated and installed in the hub.
- 5. Slacken the axle nut.
- 6. Using a torque spanner, tighten the axle nut to approximately 15 ft/lb.
- 7. Align the axle nut such that you can see the cotter pin hole.
- 8. Insert the cotter pin and bend it to lock the axle nut in place.
- 9. Turn the hub by hand to ensure it is turning freely on the spindle in both directions.



* SAFETY WARNING If the hub is not installed correctly and the axle nut is not tightened as per the recommended tightness, serious failure could occur. The table below outlines the specification of the grease used on your Meher Suspension System when manufactured. In event your bearings require to be re-greased, they should meet the below specifications.

Typical Tests	ASTM Method	Lithplex TAC EP2
NLGI Grade	-	2
Soap Туре	-	Lithium Complex
Colour	-	Blue
Texture	-	Smooth, Tacky
Penetration at 212° Fahrenheit Unworked	D.217	270
Worked 60 Strokes	D.217	275
Dropping Point, Degrees in Fahrenheit	D.2265	527° Fahrenheit
Roll Stability, Penetration Change %	D.1831	+10
Leakage, wheel bearing 65g – Packed at 325° Fahrenheit	D.1263	1.5
Water Washout at 176° Fahrenheit, %	D.1264	3.5
Oil Separation 24 Hours at 77° Fahrenheit kPa	D.1742	2
Rust Prevention Rating	D.1743	Pass
Timken, OK Load, Kg	D.2509	23
4 Ball Weld Kg/f	D.2596	400
4 Ball Wear Scar mm	D.2266	0.43
Base Oil cSt at 104° Fahrenheit	D.445	220
Base Oil cSt at 212° Fahrenheit	D.445	18.5

Recommendations for usage and applications

Use Lithplex Tac EP2 Grease

Marine or Automotive Grade equivalent

Grease Specifications

Physical Characteristics - Typical Tests as per ASTM Method Lithplex TAC EP2

Lithplex TAC EP2 Grease

Is the prime recommendation for use in applications where high thermal resistance is required. These applications include industrial, automotive, earth moving and marine applications such as wheel bearings, chassis, boat trailer wheel bearings and other applications requiring grease lubrication. Prime choice for electric motors. It is recommended for ball joints which demand characteristics will ensure minimum wear and minimum torque with complete protection against rust.

Frequency Of Grease Replacement

It is recommended new grease should be pumped into your axles every 6 months or 3,000 miles (whichever comes first). At this time, approximately 1.5 to 3 ounces of grease should be replenished. In doing a complete renewal of grease in your hub, it should consume approximately 5 to 7 ounces.

Replacing Grease In Your Suspensions System

Your suspension system will either have a spindle fitted with a grease zerk or have no grease zerk. If your system has a grease zerk, you can replace your grease easily using the procedure outlined below. A spindle fitted with a grease zerk allows for the old grease to be pushed out of the hub cavity, and new grease to be pumped in while in an assembled condition. The diagram below illustrates how this system works.



Procedure To Replace Grease If Spindle Has A Grease Zerk*

- 1. Remove the rubber plug on the dust to expose the grease zerk.
- 2. Connect the grease gun hose to the grease zerk.
- 3. Pump grease into the grease zerk. After a few pumps, turn the hubs 90 degrees and continue to pump. Doing this will prevent any air pockets.
- 4. Repeat Step 3 till the new grease being pumped oozes out from the outer bearing.



* SAFETY WARNING Do not use power-driven grease pumps when inserting grease into the spindle. Always use a hand pump.

Procedure To Replace Grease If Spindle Does Not Have A Grease Zerk

- 1. Remove the hub off from the spindle (following the procedures outlined previous in this user manual).
- 2. Remove the oil seal and bearing from the hub (following the procedures outlined previous in this user manual).
- 3. Clean the bearing and cavity of the hub (following the procedures outlined previous in this user manual).
- 4. Fill the cavity of the hub with new grease.
- 5. Smear the bearings with new grease by turning the bearings in a pool of grease.
- 6. Replace the bearings and seals (following the procedures outlined previous in this user manual).
- 7. Replace hub back on the spindle (following the procedures outlined previous in this user manual).
- 8. Install the bearing protector cap.

HYDRAULIC BRAKE CALLIPER AND DRUM SYSTEM

In a hydraulic brake system, pressure generated by the hydraulic oil in the system is utilised to activate the brakes. To correctly operate any closed-circuit hydraulic oil system, it must be completely purged and free from any air.

Procedure For Purging And Bleeding Hydraulic Calliper System

- 1. Position the actuator which houses the master cylinder at a lower position compared to the hydraulic callipers. This is to allow the oil to fill up in the calliper, whilst pushing the air out.
- 2. Ensure the bleed screw on the calliper is higher than that of the hydraulic oil inlet, and ensure all fitting are tight and secure before starting work.
- 3. Oil will then be filled into the system by filing the reservoir in the master cylinder which is housed in the actuator. Refer to the user manual of the actuator to ensure this is done correctly.
- 4. It is recommended that the brakes are tried and tested before the trailer is used.



A typical calliper assembly mounting on the disc.



Procedure For Purging And Bleeding Of Hydraulic Brake Backing Plate And Drum System

- 1. Position the actuator which houses the master cylinder at a lower position compared to the hydraulic callipers. This is to allow the oil to fill up in the calliper, whilst pushing the air out.
- 2. Ensure the bleed screw on the hydraulic brake backing plate is higher than that of the hydraulic oil inlet, and ensure all fitting are tight and secure before starting work.
- 3. Oil will then be filled into the system by filing the reservoir in the master cylinder which is housed in the actuator. Refer to the user manual of the hydraulic brake backing plate & drum system to ensure this is done correctly.
- 4. It is recommended that the brakes are tried and tested before the trailer is used.





Typical Brake Line Routing



In an electric brake system, electric current passes through an electromagnet, incorporated within the electric brake backing plate. When a current is passed through, the electromagnet gets attracted to the face of the hub drum pushing the brake pads to apply the brake. The hub drum is mounted over the electric backing plate's brake shoes.



Mounting The Electric Brake Backing Plate

The electric brake backing plate is mounted as illustrated above. The primary/smaller brake shoe must be installed such that it faces the front of the trailer. Mount the electric backing plate on the respective flange welded to the axle and tighten the locking nuts to secure.

Maintenance

To ensure maintenance has been carried out correctly, it is recommended that you refer to your vehicle brake controller's user manual.

Synchronising Trailer To Prime Mover Towing Vehicle

To ensure a smooth braking experience, both the trailer and towing vehicle brakes must be synchronised. To achieve the optimal braking performance, the brakes on the trailer should engage just slightly before that of the towing vehicle.

An electric braking system consists of an adjustable brake controller (this is usually fitted in the towing vehicle). The adjustable brake controller controls the amount of electric current that is sent to electromagnet. The greater the current the stronger the effects of the braking. The amount of electric current is controlled by the amount of pressure applied on the brake pedal of the towing vehicle. In general, when the brake pedal is initially pressed, 2 volts are produced and when fully pressed can reach about 12 volts.

To achieve smooth braking operation, proper adjustment will be required, and this would involve road testing. The adjustments which would need to be reviewed include:

- 1. System Resistor Limits and controls maximum braking power on the trailer brakes.
- 2. Adjustable Brake Controller Located in the towing vehicle, this regulates the amount of electric current sent to the trailer brakes when the brake pedal is pressed.
- 3. **Road Test** It is recommended that at least 10 to 12 complete stops are performed from a speed of 20 mph. This ensure the system has been broken in to, providing initial wear to the brake shoes, electromagnets and brake drum.
- 4. **Final Test** Make a few hard stops from 20 to 25mph to verify all setting are correct. The Trailer Brakes should not lock up before the Towing Vehicle.

ELECTRIC BRAKE AND DRUM SYSTEM

Tips For Adjusting The Brake Controller



PREPARATION AND REMOVAL FROM THE TRAILER

- 1. Follow all safety requirements as per the Trailer Manufacturer's instructions.
- 2. Proper equipment and lifting arrangements are to be used. Do not rely only on the wheel jack.

Step 1

The settings of the system resistor and the adjustable brake controller, should be set at their mid-position.

Step 2

When on a dry, paved road with no sand and gravel at a maximum speed of 20 mph;

- 1. Tow the trailer and check the effect of braking. If an adjustment is required, adjust the system resistor as below;
 - If the trailer wheel is locking and sliding, then increase the resistance with the system resistor,
 - If the trailer wheel is not locking and not sliding, then reduce the resistance with the system resistor to a point when the brake just locks up and the wheel skids.
- 2. Tow the trailer and make hard stops from a speed of 25 to 30 mph. Check the effects of braking, and if adjustments are required, then adjust the adjustable brake controller as per below;
 - If the trailer wheel brakes are lagging with respect to the towing vehicle, then adjust the controller such that a greater brake force is applied,
 - If the trailer wheel brakes are engaging before that of the towing vehicle, then adjust the controller such that a lesser brake force is applied.

Adjusting The Brake Shoe Clearances With The Hub Drum

- 1. Remove the adjusting hole cover from the brake backing plate.
- 2. Using a suitable tool or a suitable screwdriver, turn the star wheel of the brake shoe adjuster such that the brake shoes expand and do not allow the wheel to turn by hand. This is the maximum setting position.
- 3. Slowly turn the star wheel of the brake shoe adjuster in the opposite direction to release the brake shoe such that the wheel just starts to turn freely and has a slight drag.





It is recommended service and maintenance should be carried out every 5000 miles or 1 (one) year, whichever comes first. If any replacement parts are required, use only original parts from Meher. When replacing any parts, note:



* SAFETY WARNING

Brake Shoe – If one shoe is being replaced, then all must be replaced at the same time.

Electromagnets – If one of the electromagnets are being replaced, then all must be replaced at the same time.

Inspection Procedure*

- 1. Clean all parts.
- 2. Do not mix any parts between any brake backing plates assemblies.
- 3. Check brake shoes for excessive wear.
- 4. Check electromagnet for excessive wear. Take extra care with this, as this component is critical for engaging the brakes.
- 5. Check any mechanical parts for excessive wear and tear.
- 6. Check magnet arm to see if any parts are lose or have excessive wear.
- 7. Check all springs if they are over stretched or deformed.

Assembly Procedure*

Apply a light film of grease at the following areas;

- 1. Brake anchor pin.
- 2. Electromagnet actuating mechanical arm bushing and pin.
- 3. Areas where the brake shoe rests on the backing plate and magnetic lever arm.
- 4. NO Lubrication is to be applied on brake shoe surface which make contact with the brake drum.



LEAF SPRING SUSPENSION SYSTEM – INSPECTION AND MAINTENANCE

It is recommended that the suspension system is inspected every 5000 miles or 1 year whichever comes first.



What To Look Out For During Inspection And Maintenance

- 1. Any deformed parts.
- 2. Wear and tear at places where parts are connected and moving.
- 3. Bolts and nuts.
- 4. Bushes of the leaf spring.
- 5. Camber of the leaf spring.
- 6. Any rust that is prevalent or areas where wear is visible.
- 7. All hardware, including U-bolts, hangers, plates etc.

Procedure For Conducting Inspection And Maintenance

- 1. Jack the trailer such that the wheel and suspension are elevated for ease of servicing. Where required supporting blocks may be used. Refer to the trailer manufacturers manual to ensure this is done safely.
- 2. Dismantle all components: wheels, nuts, plates, U-bolts, springs.
- 3. If the spring bush has to be replaced;
 - Remove the existing bush with a correct size pilot punch or similar tool,
 - Insert new spring bush,
 - After installation, insert the spring bolt to check if the internal diameter is correct.
- 4. Assemble back all components after inspection and checking. Hardware, such as U-bolts, nuts and washers should be replaced prior to assembly.

TORSION AXLE SUSPENSION SYSTEM – INSPECTION AND MAINTENANCE

It is recommended that the suspension system is inspected every 5000 miles or 1 year whichever comes first.

No load or state of rest No weight on the axle, before the axle is mounted under load.

Half load Position when axle is loaded to minimum or near full capacity.

Heavy load Position when axle is under heavy or overload.









TORSION AXLE SUSPENSION SYSTEM – INSPECTION AND MAINTENANCE

What To Look Out For During Inspection And Maintenance

- 1. Any deformed parts.
- 2. Wear and tear at places where parts are connected and moving.
- 3. Bolts and nuts.
- 4. Remove the hub if viewing the rubber cords is in the way.
- 5. Inspect the Rubber Cords as much as possible for any wear and tear or deformation.
- 6. Hollow tube deformation.
- 7. Any rust that is prevalent or areas where wear is visible.
- 8. All hardware, including U-bolts, hangers, plates etc.

Procedure For Conducting Inspection And Maintenance

- 1. Jack the trailer such that the wheel and suspension are elevated for ease of servicing. Where required supporting blocks may be used. Refer to the trailer manufacturers manual to ensure this is done safely.
- 2. Dismantle all components: wheels, nuts, plates, U-bolts to be able to visually see the rubber rods.
- 3. Always use genuine Meher parts when replacing any components. Refer to the respective user manual of the part for any detailed assembly requirements.
- 4. Assemble back all components after inspection and checking. Hardware, such as U-bolts, nuts and washers should be replaced prior to assembly.

WARRANTY PROCESS

Refer to our website – www.themehergroup.com to learn more about our warranty policy and procedure for claims.



WORKSHEET OR NOTES

AXLE, BRAKE AND SUSPENSION SERVICE AND MAINTENANCE MANUAL 23



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