MECHBRAKE

3500kg Mechanical Brake System

Installation Guide

FULL MECHANICAL BRAKING SYSTEM

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Innovative Trailer Solutions

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This is what happens when New Zealand companies develop products specifically to benefit local industry – "best of" easy to comply EU brake systems, coupled with "best of" off the shelf New Zealand components.

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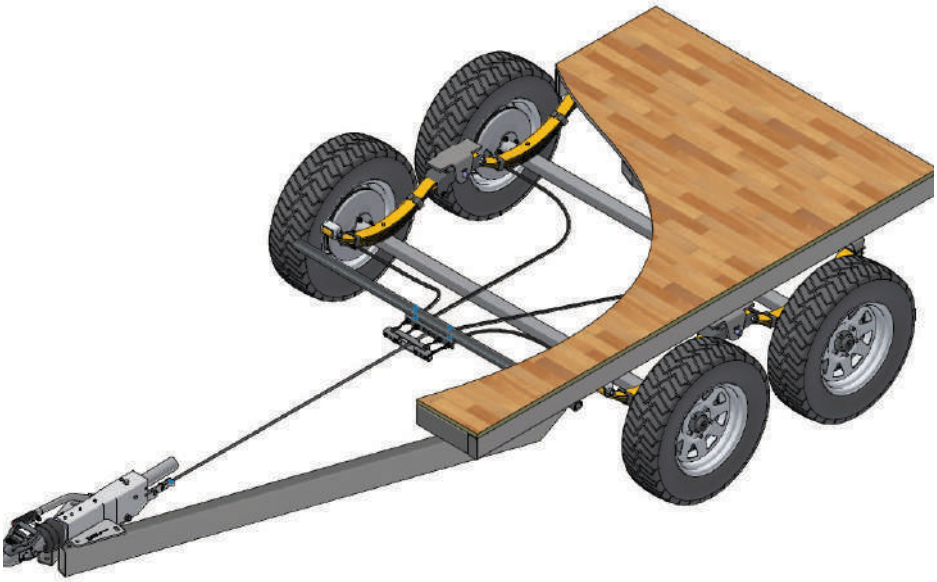
Physical feature: Static friction

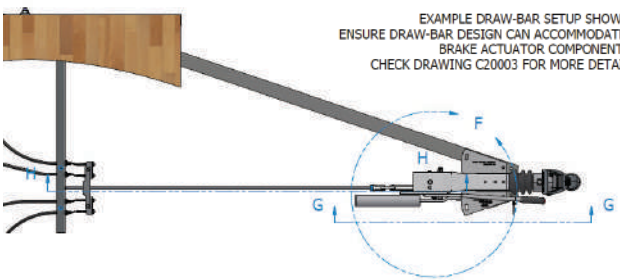
It's important to note that according to regulations, the handbrake must have the ability to hold 18% of the permitted gross weight. This requirement is based on the principle of static friction. When the trailer is stationary, the static friction is strong enough to prevent it from rolling away on its own.

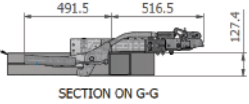
However, once the trailer starts moving and is pulled, the static friction transitions into dynamic friction. At this point, the handbrake may not be sufficient to completely prevent movement. Despite the handbrake being engaged, it is still possible for the trailer to move due to the conversion of static friction to dynamic friction..

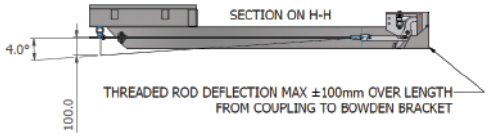
⚠ ATTENTION!

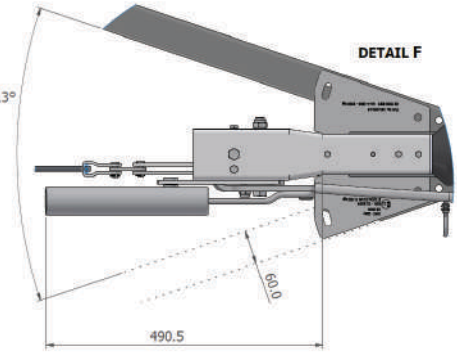
Brake adjustments should be carried out as frequently as necessary, without a specific time or distance limit. Prior to each journey, users should inspect the slack in the system and make readjustments as needed. A simple way to check the slack is by engaging the hand brake. If the hand brake moves over centre without the trailer moving, it is advisable to readjust the brakes.











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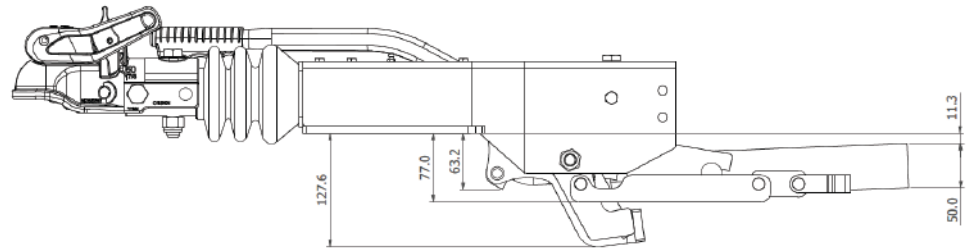
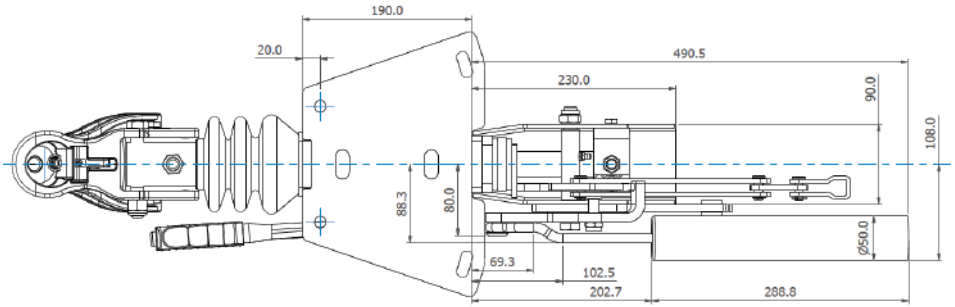
MECHBRAKE COUPLING

⚠ **The coupling and handbrake lever are critical safety items, the mounting instructions below must be followed completely.**





The Mechbrake coupling can be used as a structural member, and bolted directly to the top of the drawbar using the dimensions / pattern shown above.

- Crush tubes that are a neat ID fit must be used inside the drawbar tube.
- Grade 8.8 or higher M12 bolts must be used in all 6 x mounting holes. These should be torqued to 130Nm.
- Plate washers >6mm must be used under the bolt heads in the four rear slotted coupling mount holes.

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OPERATION - HANDBRAKE

HANDBRAKE ENERGY STORE

SAFE OPERATION & REMOVAL

Caution: The coupling handbrake lever is equipped with a damper that doubles as a pressurized energy store, and if not connected to the brake cables when lifted, will open aggressively. Avoid operating the handbrake until cables are attached, and stand clear when doing so for the first time.

Locking Bolt: The handbrake is equipped with a red locking bolt to secure the lever and prevent the energy store from releasing during transport. Once the coupling and brake installation is complete, it is safe to remove the locking bolt.

⚠ **ATTENTION! Risk of damage and/or accident due to handbrake not being released!**

Driving with the handbrake engaged will immediately damage the trailer brakes so that they don't work effectively. It will also generate heat that will damage hubs, bearings, and the axle itself, and will quickly lead to catastrophic failure and an increased accident risk.

It is crucial to ensure that the handbrake is fully released before starting every journey.

OPERATION - AUTO REVERSE

The distinction between overrun braking and braking during reversing lies solely in the wheel's rotation direction. The brake shoes are retracted when braking is initiated in reverse.

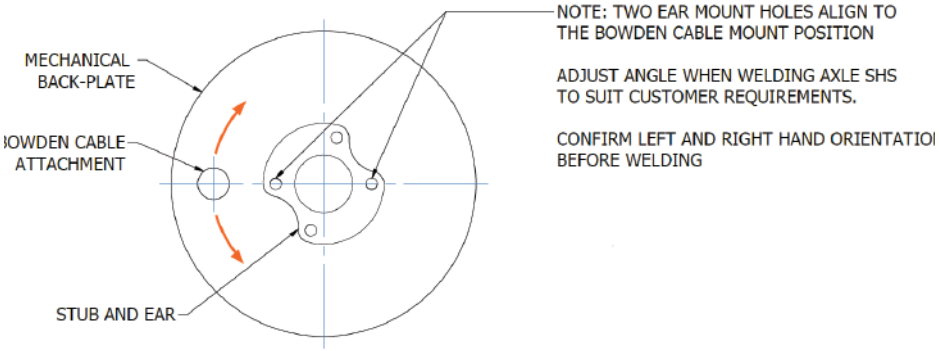
When reversing there is still an approximate residual braking force of 8%. This allows the trailer to be maneuvered in reverse with minimal hindrance.

⚠ **ATTENTION!**

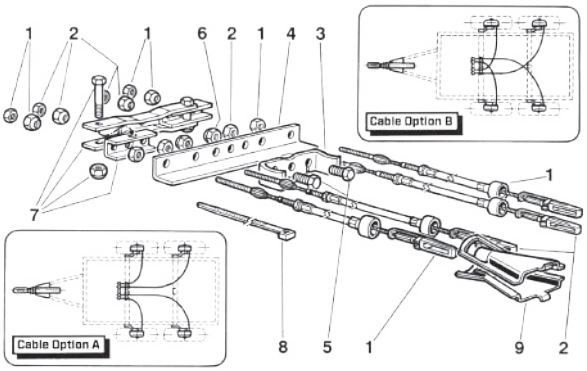
To allow the backplates to transition smoothly to the automatic reverse position, start gently to avoiding a sudden and forceful overrun shock.

HUB / AXLE ANGLE SPECS

The rotational position of the backplate bowden cable connector relative to the axle should be taken into account. This angle can be specified for Trailparts pre-assembled axles. Any angle / rotational position is okay, refer to the below diagram for details.



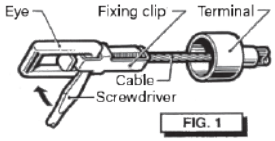
BRAKE CABLE COMPONENTS



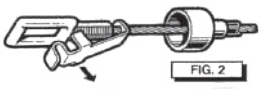
ITEM	DESCRIPTION
1	Front axle brake
2	Rear axle brake
3	Chassis support bracket
4	Second support bracket
5	Screw M12 x 25mm
6	Self locking nut M12
7	Double swing set
8	Hose clamps / Zip ties
9	Half cone

⚠ Support brackets must be mounted at least 150mm in front of first axle

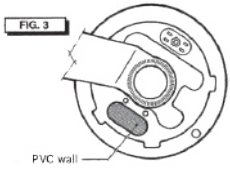
BRAKE CABLE INSTALLATION



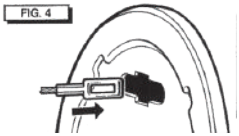
1 Using a screwdriver, detatch the fixing clip.



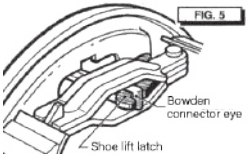
2 Fixing clip should be as shown above.



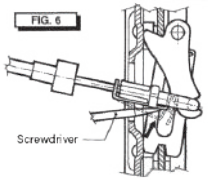
3 Remove the plastic cover that covers the hole in the anchor plate of the shoes.



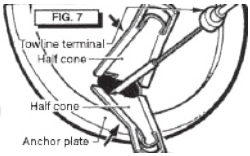
4 Insert the cable head through the hole in the anchor plate.



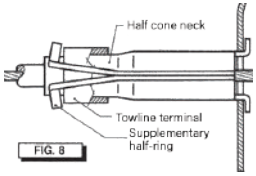
5 Close the head cable in the shoe lift bolt.



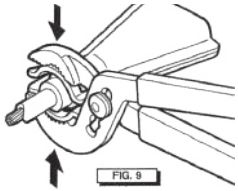
6 With the aid of a screwdriver, insert the fixing clip into the eye of the brake cable.
The fastening clip should be as shown in fig 1.



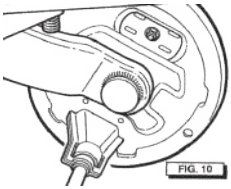
7 Insert the half cone into the anchor plate and close them in the direction of the arrows.



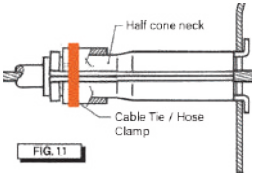
8 Insert the neck of the half cone into the tow terminal.



9 Close the extra rings in the direction of the arrows, on the smaller diameter area of the tow terminal, with a suitable tool.

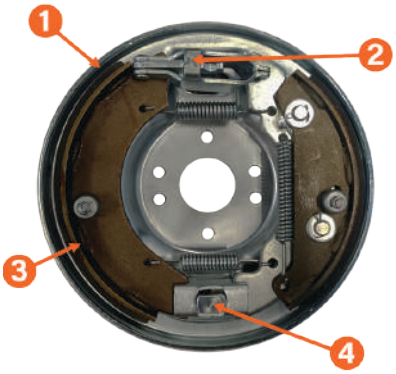


10 This whole set should remain as shown above.



8 Secure neck of the half cone using a cable tie or hose clamp.

DRUM BRAKE COMPONENTS - BACKPLATE



ITEM	DESCRIPTION
1	Brake backplate - holds all the brake components
2	Expanding joint lock - opens when Bowden cable is pulled, pushing brake shoes apart.
3	Brake shoes - generate the braking when pushed against brake drum.
4	Adjuster nut (rear) - use to adjust the distance the brake shoes sit from the drum.

ADJUSTMENT / SETUP INSTRUCTIONS

Preparation

- Jack up the trailer with the tyres clear of the ground and make sure that trailer is secured on jack stands or a lift.
- Release the park brake and ensure the coupling draw tube is fully extended.

General Process Requirements

- Always begin with adjusting the brakes
- During setup only rotate the wheels forwards, backwards rotation can move the reversing shoes from the normal braking position and cause errors with set up adjustments.
- If a wheel is rotated backwards at any point slacken the adjustment on the drum brake shoe assembly and rotate forwards to reset.
- **IMPORTANT:** Only adjust the wear of the brakes with the adjuster nut. Adjusting the brake rod is only for the initial set up on the trailer and never needs to be adjusted again.
- **Brake maintenance for normal brake wear is covered by this process.**

⚠ ATTENTION!

Replace the drum if the maximum internal diameter of 252mm is reached or exceeded, otherwise brake failure may occur!

MAXIMUM INTERNAL DIAMETER = 252mmØ

INITIAL SETUP INSTRUCTIONS

1. Adjust the Drum Assembly wear adjustment

a. Tighten the adjusting bolt in a clockwise direction until the wheel will not turn. (Only rotate the wheel forwards)

b. Slacken off the adjusting bolt in an anticlockwise direction (approx. ½ of a revolution) until the wheel turns freely in the forward direction. (Some minor grinding noises that do not impede the motion of the wheel are normal)

c. Repeat for each wheel of the trailer.

2. Adjust the Brake Cable Balance Bar

a. The brake cable balance bar must be positioned parallel to the axle.

b. Adjust the position of the balance bar on the bowden cable thread to the centre of the thread.

c. Lock the balance bar into position with the provided lock nuts on the bowden cables.

3. Adjust the Brake Connection Rod

a. Tighten the brake connection rod at the balance bar until all play is removed from the connection from the actuator to the balance bar.

b. Check for bowden cable play at the half cone connection to a drum brake. There should be 2-4mm of play before the brake engages. (Note: there will be tension of the return spring on the drum brake. Pull on the outer sheath of the bowden cable with enough force to overcome the return spring and the end of the outside of the bowden should move 2-4mm before the internal cable stops the movement. If the movement is more than 2-4mm shorten the brake connection rod.)

c. Tighten the locknuts on the brake connection rod.

4. Hand brake Lever

a. Apply the handbrake lever repeatedly to seat the braking components.

b. Check the balance bar is still parallel with the axle.

c. Check the brakes engage on all wheels.

d. Check the handbrake lever does not go past top dead centre when engaged. (Note the hand brake lever will travel further when the trailer is pushed backwards with the hand brake applied. This is because it is overcoming the shoes moving into the reversing position)

5. Final Check

a. Check all fastenings and adjustment bolts are locked off or tight.

b. Under normal braking a maximum of 2/3 of the overall draw tube travel should be used.

6. Road test

a. Test the brakes with a short on road test.

b. The trailer should be able to be reversed with minimum effort.

c. Recheck the adjustment on the brake rod.

d. Check the operation of the handbrake in forward and reverse directions.

BEDDING IN & TESTING PROCEDURE

1. Perform a full application of the brake lever five or six times, and then check the tension on the rods and cables. This process helps identify any potential constrictions in the system. If necessary, make further adjustments to the system as instructed on the previous page.
2. When conducting road tests, ensure that any testing on public or private roads is carried out with consideration for other road users.
    a. Begin by driving in a straight line at a speed of 30-35 km/h. Gradually and firmly apply the brakes to achieve a smooth stop. Observe the trailer's behavior during braking, which can be easier if a passenger in the tow vehicle assists. If the trailer pulls to one side or if the wheels on one side lock up during braking, it is essential to check and reset the system before proceeding. Once smooth braking is achieved at this speed, move on to the next step.
    b. Drive in a straight line at a speed of 55-65 km/h (if within the speed limits). Apply the brakes firmly and steadily, making sure not to lock up the trailer wheels. Once again, observe the trailer's behavior and handling during braking. If braking is uneven on either side, readjust the system accordingly.
    c. Finally, drive at a speed of 80 km/h (if within the speed limits) and apply the brakes to reduce speed to 50 km/h. Then accelerate back to 80 km/h. Repeat this maneuver three or four times. If you are satisfied that the trailer brakes evenly and steadily throughout this maneuver, it indicates successful adjustment.

PLEASE NOTE: Maintain a gradual and controlled approach during braking, avoiding sudden or aggressive actions. This ensures a safe evaluation of the brakes and promotes optimal bedding in of the linings. The linings will naturally wear and conform to the drum's shape, improving performance. Heat generated during this process enhances friction coefficient and overall braking efficiency. Note that it may take up to 800 km for brakes to reach optimal efficiency, depending on driving style. Stop-and-start driving accelerates bedding-in compared to highway driving with less brake usage..

IMPORTANT: If the handbrake lever is left engaged while the trailer is parked, there is a chance that the brake shoes may stick to the surface of the brake drum, particularly in damp or humid conditions. To prevent this from happening during long periods of parking, it is advisable to use wheel chocks and release the handbrake lever. Additionally, when reversing the trailer into position, it is recommended to pull the trailer forward slightly afterward. This action helps ensure that the brake shoes have returned to their regular positions.

NOTES:

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