

Installation Process of the Gulion Automatic Slack Adjuster



(1) Preparations for Installing the Automatic Slack Adjuster

1. Ensure the air pressure in the braking system is above 6 bar.
2. Release the brake to ensure the spring brake chamber push rod is in its initial position.
3. Follow safety guidelines to ensure the safety of both personnel and vehicles while installing the automatic slack adjuster.
4. Do not use pneumatic or electric wrenches during installation, and avoid striking the adjuster heavily.

(2) Steps to Install the Automatic Slack Adjuster

1. Remove the threaded fork and rack from the automatic slack adjuster, taking care to note the installation direction of the threaded fork (especially for straight threaded forks). Clean the camshaft, apply a small amount of grease, install the washer on the camshaft, and screw the threaded fork of the automatic slack adjuster onto the push rod of the brake chamber. The lock nut of the push rod should not tighten the threaded fork at this point.
2. The maximum installation position of the push rod should be flush with the inner end face of the threaded fork, with a maximum of one thread extending beyond the inner end face if necessary to provide enough movement space for the automatic slack adjuster.
3. Install the automatic slack adjuster onto the camshaft, ensuring the correct installation of the threaded fork. When the worm wheel of the adjuster is in contact with the camshaft washer, check the position of the adjuster and the alignment of the snap ring groove on the outer camshaft with the worm wheel of the adjuster. Adjust the thickness of the camshaft washer as needed. There should be a 0.5–1 mm gap between the worm wheel of the adjuster and the snap ring (or cover/stopper).
4. After securing the snap ring or tightening the nut, pull and release

the adjuster arm in the braking direction to ensure it returns to its initial position quickly. Difficulty in camshaft return can cause the brake shoes and brake drum to remain partially engaged, increasing wear and brake temperature. Adjust the camshaft bracket if necessary to ensure smooth camshaft return.

5. Use a 12mm open-end wrench to rotate the worm gear, aligning the adjuster arm with the threaded fork of the brake chamber until the two extensive pinholes coincide. The optimal initial installation angle of the automatic slack adjuster is when the line connecting the worm wheel center and the arm pinhole center forms a 90° angle with the push rod centerline, with an initial installation angle of 100°–105° for best braking performance.
6. Insert the large pin into the extensive pinholes of the threaded fork and adjuster's arm, install the washer and split pin, and bend the split pin. Insert the rack and rotate the worm gear with the wrench to align the small pinholes of the rack and threaded fork. Insert the tiny pin, install the washer and split pin, and bend the split pin.
7. Depending on the structure, install the snap ring, cover, or stopper for the axial positioning rod of the automatic slack adjuster, and tighten the lock nut on the push rod.

(3) Installation Tips

1. After installing the automatic slack adjuster on the entire vehicle, perform 30–50 brake applications in place under normal air pressure to reduce excessive initial clearance caused by the assembly.
2. When installing on a single axle, insert a 1mm feeler gauge between the shoe and drum, turn the worm gear shaft toward rack withdrawal to press the shoe against the feeler gauge lightly, then remove the gauge, leaving a 1mm gap. After installing the axle, the slack adjuster will automatically adjust the excessive clearance through 10–15 brake applications.
3. When installing on the entire vehicle, follow the same operation. After manual adjustment and automatic compensation, the brake clearance of the car will meet the set clearance. However, vehicles with new automatic slack adjusters or after replacing brake drums or shoes perform 10–15 emergency brake applications at speeds below 5 km/h to allow dynamic adjustment and further reduce brake clearance due to initial unevenness.
4. Vehicles with newly installed automatic slack adjusters or after replacing brake drums, shoes, or maintenance adjustments should

conduct a brake test before road use to ensure compliance with relevant standards.

Usage and Maintenance of the Automatic Slack Adjuster

(1) Lubrication

Lubricate the automatic slack adjuster and the vehicle chassis with a maximum interval of 10,000 kilometers.

(2) Maintenance

For buses or passenger vehicles, inspect the automatic slack adjuster every 20,000 kilometers; for trucks and trailers, inspect every 40,000 kilometers.

Inspection items include:

1. Check for damage to the automatic slack adjuster assembly.
2. Check if the push rod stroke of the brake chamber is excessive.
3. Ensure the brake clearance remains at the initial average clearance.
4. Inspect if the brake shoes are worn to the limit and need replacement.

(3) Inspection

Regularly check the wear status of the brake linings. Replace the linings when worn to the limit and inspect the automatic slack adjuster for damage,

repairing or replacing as necessary.

(4) Testing Process

Remove the automatic slack adjuster and threaded fork from the brake chamber when replacing brake linings. Reinstall the threaded fork on the adjuster correctly and install the pins and split pins. Fix the adjuster housing (using a vice to clamp the housing lightly) and follow these steps for testing:

1. Move the threaded fork to make the rack move up and down, checking the worm gear rotation direction. Continuous rotation toward rack withdrawal indicates regular operation; lack of rotation or back-and-forth movement with vibration indicates failure and the need for replacement.
2. Rotate the worm gear 24 turns toward rack withdrawal and record the maximum torque M1.
3. Rotate the worm gear toward rack insertion until the threaded fork reaches the limit position. Rotate the worm gear one more turn in the same direction and record the maximum torque M2.
4. Remove the small pin from the threaded fork, rotate the worm gear in the direction of rack withdrawal to remove the rack, and rotate the worm gear one turn in the opposite direction, recording the maximum torque M3.

Refer to the following table to determine if the automatic slack adjuster needs replacement based on torque values:

Serial No.	Torque	Limit (N·m)	Status of Slack Adjuster Exceeding Limit	Replace or Not
1	M1	<19.8	Excessive wear causes jamming	Yes
2	M2	<75		Yes
3	M2-M3	≥18	Excessive torque reduction of spring override clutch, loss of automatic adjustment function	Yes
4	M3-M1	>5		Yes

(5) Clearance Adjustment

1. For new vehicles and those undergoing secondary maintenance (monotonous brake drums, replacing brake linings), Enlarge the brake manually if clearance becomes too tiny due to:
 - a) Uneven clearance is caused by out-of-round brake drums and shoes, often smaller than the customarily reserved clearance.
 - b) Expansion of new linings during initial use, not retracting after cooling, reducing the reserved clearance by the automatic slack adjuster.
2. For vehicles frequently operating in mountainous areas or with frequent braking, thermal expansion of the brake drum increases

clearance, which the slack adjuster reduces.

3. When the drum cools, the clearance may become too small. Please consult with us to improve the clearance for reserved items. Ensure the brake system air pressure exceeds 4 bar, release the parking brake valve, and follow safety measures when enlarging the clearance. Multiple methods exist, but the following steps are recommended:

- a) Remove the large and small pins from the slack adjuster. Use a 12mm open-end wrench to rotate the worm gear toward the least resistance to remove the rack.
- b) Rotate the worm gear in the opposite direction to slightly enlarge the clearance between the brake shoes and drum, then reinstall the rack following the installation method.

(6) Recommended Procedure

Insert a 1mm feeler gauge between the brake shoes and drum, and rotate the worm gear in the direction indicated on the adjuster housing to adjust the clearance to 1mm. The slack adjuster will automatically adjust any excessive clearance during operation. If the clearance is too small to remove the rack, consider:

1. Lose the mounting nut of the brake chamber to move the slack adjuster closer to the chamber bracket, increasing the clearance and then reversing the rack removal method. This approach is more straightforward and causes less damage to the adjuster.
2. Removing the pin and split pin connecting the slack adjuster and threaded fork, removing the mounting nut of the brake chamber, detaching the fasteners, fixing the adjuster's axial position on the camshaft, removing the adjuster, reinstalling the brake chamber, and then reinstalling the adjuster. This method is more complex but causes minimal damage to the adjuster.
3. A wrench is used to rotate the worm gear toward rack insertion to enlarge the clearance directly. This method is simplest but may cause excessive adjustment torque and potential damage to the adjuster if not done correctly.

Note: During regular use, manual worm gear adjustment on the automatic slack adjuster is not required after the brake system has broken in.

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