Component Procedures: Brake Bleeding

Table of Contents

Component Procedures: Brake Bleeding

Specifications Quick Reference (itype_439)

Quick Specifications
- item

Hydraulic Brake System Bleeding (Manual) (Article 10686)

- Place a clean shop cloth beneath the brake master cylinder to prevent brake fluid spills.
- With the ignition OFF and the brakes cool, apply the brakes 3–5 times, or until the brake pedal effort increases significantly, in order to deplete the brake booster power reserve.
- If you have performed a brake master cylinder bench bleeding on this vehicle, or if you disconnected the brake pipes from the master cylinder, you must perform the following steps:
- Ensure that the brake master cylinder reservoir is full to the maximum-fill level. If necessary, add GM approved brake fluid from a clean, sealed brake fluid container. If removal of the reservoir cap and diaphragm is necessary, clean the outside of the reservoir on and around the cap prior to removal.
- With the rear brake pipe installed securely to the master cylinder, loosen and separate the front brake pipe from the front port of the brake master cylinder.
- Allow a small amount of brake fluid to gravity bleed from the open port of the master cylinder.
- Reconnect the brake pipe to the master cylinder port and tighten securely.
- Have an assistant slowly depress the brake pedal fully and maintain steady pressure on the pedal.
- Loosen the same brake pipe to purge air from the open port of the master cylinder.
- Tighten the brake pipe, then have the assistant slowly release the brake pedal.
- Wait 15 seconds, then repeat steps 3.3–3.7 until all air is purged from the same port of the master cylinder.
- With the front brake pipe installed securely to the master cylinder, after all air has been purged from the front port of the master cylinder, loosen and separate the rear brake pipe from the master cylinder, then repeat steps 3.3–3.8.
- After completing the final master cylinder port bleeding procedure, ensure that both of the brake pipe-to-master cylinder fittings are properly tightened.
- Fill the brake master cylinder reservoir with GM approved brake fluid from a clean, sealed brake fluid container. Ensure that the brake master cylinder reservoir remains at least half-full during this bleeding procedure. Add fluid as needed to maintain the proper level. Clean the outside of the reservoir on and around the reservoir cap prior to removing the cap and diaphragm.
- Install a proper box-end wrench onto the RIGHT REAR wheel hydraulic circuit, inboard (fixed caliper), bleeder valve.
- Install a transparent hose over the end of the bleeder valve.
- Submerge the open end of the transparent hose into a transparent container partially filled with GM approved brake fluid from a clean, sealed brake fluid container.
- Loosen the bleeder valve to purge air from the wheel hydraulic circuit.
- Tighten the bleeder valve, then have the assistant slowly release the brake pedal.
- Wait 15 seconds, then repeat steps 8–10 until all air is purged from the same wheel hydraulic circuit.
- For fixed caliper models, repeat steps 5–11 for the outboard bleeder valve.
- With the right rear wheel hydraulic circuit bleeder valve, or valves (fixed caliper), tightened securely – after all air has been purged from the right rear hydraulic circuit – install a proper box-end wrench onto the LEFT FRONT wheel hydraulic circuit, inner (fixed caliper), bleeder valve.
- Install a transparent hose over the end of the bleeder valve, then repeat steps 7–11.
- With the left front wheel hydraulic circuit bleeder valve, or valves (fixed caliper), tightened securely, after all air has been purged from the left front hydraulic circuit, install a proper box-end wrench onto the LEFT REAR wheel hydraulic circuit, inner (fixed caliper), bleeder valve.
- With the left rear wheel hydraulic circuit bleeder valve, or valves (fixed caliper), tightened securely, after all air has been purged from the left rear hydraulic circuit, install a proper box-end wrench onto the RIGHT FRONT wheel hydraulic circuit, inner (fixed caliper), bleeder valve.
- After completing the final wheel hydraulic circuit bleeding procedure, ensure that each of the 4 wheel hydraulic circuit bleeder valves, or 8 bleeder valves (fixed caliper), are properly tightened.
- Fill the brake master cylinder reservoir to the maximum-fill level with GM approved brake fluid from a clean, sealed brake fluid container.
- Slowly depress and release the brake pedal. Observe the feel of the brake pedal.
- If the brake pedal feels spongy, repeat the bleeding procedure again. If the brake pedal still feels spongy after repeating the bleeding procedure, perform the following steps:
- Inspect the brake system for external leaks. Refer to Brake System External Leak Inspection .

- Pressure bleed the hydraulic brake system in order to purge any air that may still be trapped in the system.
- Turn the ignition key ON, with the engine OFF. Check to see if the brake system warning lamp remains illuminated.
- If the brake system warning lamp remains illuminated. Refer to Symptoms - Hydraulic Brakes .

Hydraulic Brake System Bleeding (Pressure) (Article 10687)

Special Tools
- J-29532 - Diaphragm Type Brake Pressure Bleeder, or equivalent
- J-35589-A - Master Cylinder Bleeder Adapter
- Place a clean shop cloth beneath the brake master cylinder to prevent brake fluid spills.
- With the ignition OFF and the brakes cool, apply the brakes 3–5 times, or until the brake pedal effort increases significantly, in order to deplete the brake booster power reserve.
- If you have performed a brake master cylinder bench bleeding on this vehicle, or if you disconnected the brake pipes from the master cylinder, you must perform the following steps:
- Ensure that the brake master cylinder reservoir is full to the maximum-fill level. If necessary, add GM approved brake fluid from a clean, sealed brake fluid container. If removal of the reservoir cap and diaphragm is necessary, clean the outside of the reservoir on and around the cap prior to removal.
- With the rear brake pipe installed securely to the master cylinder, loosen and separate the front brake pipe from the front port of the brake master cylinder.
- Allow a small amount of brake fluid to gravity bleed from the open port of the master cylinder.
- Reconnect the brake pipe to the master cylinder port and tighten securely.
- Have an assistant slowly depress the brake pedal fully and maintain steady pressure on the pedal.
- Loosen the same brake pipe to purge air from the open port of the master cylinder.
- Tighten the brake pipe, then have the assistant slowly release the brake pedal.
- Wait 15 seconds, then repeat steps 3.3–3.7 until all air is purged from the same port of the master cylinder.
- With the front brake pipe installed securely to the master cylinder, after all air has been purged from the front port of the master cylinder, loosen and separate the rear brake pipe from the master cylinder, then repeat steps 3.3–3.8.
- After completing the final master cylinder port bleeding procedure, ensure that both of the brake pipe-to-master cylinder fittings are properly tightened.
- Fill the brake master cylinder reservoir to the maximum-fill level with GM approved brake fluid from a clean, sealed brake fluid container. Clean the outside of the reservoir on and around the reservoir cap prior to removing the cap and diaphragm.
- Install the J-35589-A - Master Cylinder Bleeder Adapter to the brake master cylinder reservoir.
- Check the brake fluid level in the J-29532 - Diaphragm Type Brake Pressure Bleeder, or equivalent . Add GM approved brake fluid from a clean, sealed brake fluid container as necessary to bring the level to approximately the half-full point.
- Connect the J-29532 - Diaphragm Type Brake Pressure Bleeder, or equivalent , to the J-35589-A - Master Cylinder Bleeder Adapter .
- Charge the J-29532 - Diaphragm Type Brake Pressure Bleeder, or equivalent , air tank to 175–205 kPa (25–30 psi).
- Open the J-29532 - Diaphragm Type Brake Pressure Bleeder, or equivalent , fluid tank valve to allow pressurized brake fluid to enter the brake system.
- Wait approximately 30 seconds, then inspect the entire hydraulic brake system in order to ensure that there are no existing external brake fluid leaks. Any brake fluid leaks identified require repair prior to completing this procedure.
- Install a proper box-end wrench onto the RIGHT REAR wheel hydraulic circuit, inboard (fixed caliper), bleeder valve.
- Install a transparent hose over the end of the bleeder valve.
- Submerge the open end of the transparent hose into a transparent container partially filled with GM approved brake fluid from a clean, sealed brake fluid container.
- Loosen the bleeder valve to purge air from the wheel hydraulic circuit. Allow fluid to flow until air bubbles stop flowing from the bleeder, then tighten the bleeder valve.
- For fixed caliper models, repeat steps 11–14 for the outboard bleeder valve.
- With the right rear wheel hydraulic circuit bleeder valve, or valves (fixed caliper), tightened securely, after all air has been purged from the right rear hydraulic circuit, install a proper box-end wrench onto the LEFT FRONT wheel hydraulic circuit, inboard (fixed caliper), bleeder valve.
- Install a transparent hose over the end of the bleeder valve, then repeat steps 13–14.
- With the left front wheel hydraulic circuit bleeder valve, or valves (fixed caliper), tightened securely,

after all air has been purged from the left front hydraulic circuit, install a proper box-end wrench onto the LEFT REAR wheel hydraulic circuit, inner (fixed caliper), bleeder valve.
- With the left rear wheel hydraulic circuit bleeder valve, or valves (fixed caliper), tightened securely, after all air has been purged from the left rear hydraulic circuit, install a proper box-end wrench onto the RIGHT FRONT wheel hydraulic circuit, inner (fixed caliper), bleeder valve.
- After completing the final wheel hydraulic circuit bleeding procedure, ensure that each of the 4 wheel hydraulic circuit bleeder valves, or 8 bleeder valves (fixed caliper), are properly tightened.
- Close the J-29532 - Diaphragm Type Brake Pressure Bleeder, or equivalent , fluid tank valve, then disconnect the J-29532 - Diaphragm Type Brake Pressure Bleeder, or equivalent , from the J-35589-A - Master Cylinder Bleeder Adapter .
- Remove the J-35589-A - Master Cylinder Bleeder Adapter from the brake master cylinder reservoir.
- Fill the brake master cylinder reservoir to the maximum-fill level with GM approved brake fluid from a clean, sealed brake fluid container.
- Slowly depress and release the brake pedal. Observe the feel of the brake pedal.
- If the brake pedal feels spongy perform the following steps:
- Inspect the brake system for external leaks. Refer to Brake System External Leak Inspection .
- Using a scan tool, perform the antilock brake system automated bleeding procedure to remove any air that may have been trapped in the BPMV . Refer to Antilock Brake System Automated Bleed .
- Turn the ignition key ON, with the engine OFF. Check to see if the brake system warning lamp remains illuminated.
- If the brake system warning lamp remains illuminated. Refer to Symptoms - Hydraulic Brakes .

Antilock Brake System Automated Bleed (Article 10570)

- Base brake system bleeding does not achieve the desired pedal height or feel
- Extreme loss of brake fluid has occurred
- Air ingestion is suspected in the secondary circuits of the brake modulator assembly

The ABS Automated Bleed Procedure uses a scan tool to cycle the system solenoid valves and run the pump in order to purge any air from the secondary circuits. These circuits are normally closed off, and are only opened during system initialization at vehicle start up and during ABS operation. The automated bleed procedure opens these secondary circuits and allows any air trapped in these circuits to flow out toward the brake corners.

Performing the Automated Bleed Procedure

- Raise and support the vehicle. Lifting and Jacking the Vehicle
- Remove all four tire and wheel assemblies. Tire and Wheel Removal and Installation
- Inspect the brake system for leaks and visual damage. Symptoms - Hydraulic Brakes Repair or replace components as needed.
- Lower the vehicle.
- Inspect the battery state of charge. Battery Inspection/Test
- Install a scan tool.
- Turn the ignition ON, with the engine OFF.
- With the scan tool, establish communications with the ABS system. Select Special Functions. Select Automated Bleed from the Special Functions menu.
- Following the directions given on the scan tool, pressure bleed the base brake system. Hydraulic Brake System Bleeding
- Follow the scan tool directions until the desired brake pedal height is achieved.
- If the bleed procedure is aborted, a malfunction exists. Perform the following steps before resuming the bleed procedure:
- If a DTC is detected, refer to Diagnostic Trouble Code (DTC) List - Vehicle , and diagnose the appropriate DTC.
- If the brake pedal feels spongy, perform the conventional brake bleed procedure again. Hydraulic Brake System Bleeding
- When the desired pedal height is achieved, press the brake pedal to inspect for firmness.
- Remove the scan tool.
- Install the tire and wheel assemblies. Tire and Wheel Removal and Installation
- Inspect the brake fluid level. Brake Master Cylinder Reservoir Filling
- Road test the vehicle while inspecting that the pedal remains high and firm.