

Component Procedures: Hydraulic System

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Component Procedures: Hydraulic System

Parts and Labor (itype_189)

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Remove & Replace	Front Brakes > Flex Hose, R&R > One Side	B	0.6	0.0
Remove & Replace	Front Brakes > Flex Hose, R&R > Both Sides	B	0.9	0.0
Remove & Replace	Hydraulic System > Fluid Level Sensor, R&R	B	0.3	0.0
Remove & Replace	Hydraulic System > Master Cylinder Reservoir,?	B	0.3	0.2
Remove & Replace	Hydraulic System > Master Cylinder, R&R	B	1.3	0.9
Remove & Replace	Rear Brakes > Flex Hose, R&R > One Side	B	0.6	0.0
Remove & Replace	Rear Brakes > Flex Hose, R&R > Both Sides	B	0.9	0.0
Bleed	Hydraulic System > System, Bleed	B	1.0	0.0
Overhaul	Hydraulic System > System, Overhaul	B	5.5	0.0

Specifications Quick Reference (itype_439)

Quick Specifications

- item

Hydraulic Brake System (Article 10642)

System Component Description

The hydraulic brake system consists of the following:

Contains supply of brake fluid for the hydraulic brake system.

Converts mechanical input force into hydraulic output pressure.

Hydraulic output pressure is distributed from the master cylinder through 2 hydraulic circuits, supplying diagonally opposed wheel apply circuits.

Regulates brake fluid pressure delivered to hydraulic brake wheel circuits, in order to control the distribution of braking force.

Pressure balance control is achieved through dynamic rear proportioning (DRP), which is a function of the ABS modulator . Refer to ABS Description and Operation for specific information on the operation of DRP.

Carries brake fluid to and from hydraulic brake system components.

Converts hydraulic input pressure into mechanical output force.

System Operation

Mechanical force is converted into hydraulic pressure by the master cylinder, regulated to meet braking system demands by the pressure balance control system, and delivered to the hydraulic brake wheel circuits by the pipes and flexible hoses. The wheel apply components then convert the hydraulic pressure back into mechanical force which presses linings against rotating brake system components.

Hydraulic Brake System Flushing (Article 10688)

- Inspect the brake fluid for the following conditions, indicating brake fluid contamination:

- Fluid separation, indicating 2 types of fluid are present; a substance other than the recommended brake fluid has been introduced into the brake hydraulic system

- Swirled appearance—oil-based substance

- Layered appearance— silicone-based substance

- Fluid discoloration, indicating the presence of moisture or particles that have been introduced into the brake hydraulic system

- Cloudy appearance – moisture

- Dark appearance/suspended particles in fluid—dirt, rust, corrosion, brake dust

- Inspect the master cylinder reservoir cap diaphragm and the reservoir-to- master cylinder grommets for swelling, indicating brake fluid contamination.

- If the brake fluid WAS contaminated with an oil-based or a silicone-based substance, indicated by fluid separation and/or a swollen master cylinder reservoir cap diaphragm and/or swollen reservoir-to-master cylinder grommets, perform the following:

- Remove ALL of the following components listed from the vehicle. Each component contains internal rubber seals/linings which have been contaminated by the contaminated brake fluid in the brake hydraulic system.

Refer to the procedures indicated:

- Brake Master Cylinder Replacement

- Front Brake Hose Replacement

- Rear Brake Hose Replacement
- Front Brake Caliper Replacement
- Rear Brake Caliper Replacement
- Brake Pressure Modulator Valve Replacement
- Clean out all the hydraulic brake pipes using denatured alcohol, or equivalent.
- Dry the brake pipes using non-lubricated, filtered air.
- Repair or replace ALL of the following components listed and install them to the vehicle. Each component contains internal rubber seals/linings which have been contaminated by the contaminated brake fluid in the brake hydraulic system. Refer to the procedures indicated:
 - Brake Master Cylinder Replacement —Also perform the following: Clean the brake master cylinder reservoir using denatured alcohol, or equivalent, then dry the reservoir using non-lubricated, filtered air. Inspect the reservoir for cracks and/or damage and replace if necessary. Refer to Brake Master Cylinder Reservoir Replacement . Replace the brake master cylinder reservoir cap diaphragm.
 - Front Brake Caliper Overhaul or Front Brake Caliper Replacement
 - Rear Brake Caliper Overhaul or Rear Brake Caliper Replacement
- If the brake fluid was NOT contaminated with an oil-based or a silicone-based substance, but WAS contaminated with water or dirt, rust, corrosion, and/or brake dust, replace the brake master cylinder reservoir cap diaphragm which may have allowed the moisture or particles to enter the hydraulic system.
- Fill the brake master cylinder reservoir to the maximum-fill level with GM approved brake fluid from a clean, sealed brake fluid container.
- Pressure bleed the hydraulic brake system; begin the procedure with the pressure bleeder reservoir filled to the maximum-fill level with the correct brake fluid as indicated. Refer to Hydraulic Brake System Bleeding .

Brake Component Specifications (Article 10703)

Application Specification

Metric English

Brake Caliper Bleeder Valve- Front (All) 10 Nm 89 lb in

Brake Caliper Bleeder Valve- Rear (All) 10 Nm 89 lb in

All New Technical Service Bulletins (itype_432)

Tsbs

- Staining/Discoloring to Brake Caliper Paint (16-NA-059, 2026/06/01)

All Technical Service Bulletins (itype_100)

Tsbs

- Brakes - Brake Fluid Seepage at Master Cylinder Cap (09-05-22-005C, 2013/07/29)
- Staining/Discoloring to Brake Caliper Paint (16-NA-059, 2026/06/01)
- Questions Regarding The Use Of High Performance / High Temperature Brake Fluid During Track Use (PIC6162D, 2021/01/19)

Customer Interest Bulletins (itype_109)

Tsbs

- Brakes - Brake Fluid Seepage at Master Cylinder Cap (09-05-22-005C, 2013/07/29)

Hydraulic Brake Component Operation Visual Inspection (Article 10674)

- With the tire and wheel assemblies removed and the brake rotors retained by wheel lug nuts, visually inspect the caliper piston dust boot (2) sealing area to ensure that there are no brake fluid leaks. Click for full-size image
- If any evidence of a brake fluid leak is present, the brake caliper requires overhaul or replacement.
- While the brake system is at rest (4), observe the position of the caliper piston (1) in relation to the caliper housing .
- Have an assistant apply and release the brake pedal several times while you observe the operation of the hydraulic brake caliper.
- Observe the caliper piston (1) for unrestricted and even movement during each apply of the brake system (5).
- Observe the caliper piston (1) for an unrestricted and even return motion during each release of the brake system (6).
- If the caliper piston (1) did not exhibit unrestricted and even movement during brake system apply and/or release, the piston square seal (3) may be worn or damaged and the caliper may require overhaul or replacement.

Hydraulic Brakes - Special Tools (Article 10702)

Illustration Tool Number/ Description

[Click for full-size image CH 28662 J 28662 Brake Pedal Effort Gauge](#)

[Click for full-size image CH 29532-B J 29532-B Pressure Brake Bleeder, or equivalent](#)

[Click for full-size image CH 35589-A J 35589-A Brake Pressure Bleeder Adapter](#)

[Click for full-size image CH 45405 J 45405 Brake Pipe Flaring Kit](#)

Leaks (itype_149)

Tsbs

- Brakes - Brake Fluid Seepage at Master Cylinder Cap (09-05-22-005C, 2013/07/29)

OEM Policies and Procedures (itype_120)

Tsbs

- Questions Regarding The Use Of High Performance / High Temperature Brake Fluid During Track Use (PIC6162D, 2021/01/19)