

2013 Chevrolet Cruze

2013 TRANSMISSION Clutch - Cruze

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Clutch - Cruze

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Brake Pressure Modulator Valve Bracket Bolt	20 N.m	15 lb ft
Clutch Actuator Cylinder Bolt	6 N.m	53 lb in
Clutch Master Cylinder Nut	18 N.m	13 lb ft
Clutch Pedal Position Sensor Bolt	3 N.m	27 lb in
Clutch Pressure Plate Bolt	28 N.m	21 lb ft

GENERAL SPECIFICATIONS

General Specifications

Application	Specification	
	Metric	English
Fluid	DOT 3	
Inside Diameter	146 mm	5.75 in
Outside Diameter	216 mm	8.50 in
Thickness	7.2 mm (at 5 200 N load)	0.28 in (at 5 200 N load)
Type	Single Dry Plate	

DIAGNOSTIC INFORMATION AND PROCEDURES

SYMPTOMS - CLUTCH

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom.

- Clutch Does Not Disengage
- Clutch Slipping
- Clutch Grabbing
- Clutch Rattle
- Release Bearing Noisy with Clutch Engaged
- Clutch Noisy

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- Clutch Pedal Hard to Push
- Clutch Drag Hard Shifting
- Clutch Pedal Spongy Low Pedal Effort
- Clutch Vibration

CLUTCH DOES NOT DISENGAGE

Clutch Does Not Disengage

Cause	Actions
DEFINITION: When the pedal is pressed to the floor, the shift lever does not move freely in and out of reverse gear.	
Damaged clutch disc.	Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u> , <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Clutch disc hub binding on the input shaft splines.	Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u> , <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Warped or bent clutch disc.	Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u> , <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Pedal blocked from full travel.	1. Inspect for obstacles that will prevent the pedal from going to the floor. 2. Clear any obstacles from under the pedal area, such as floor mats or interior panels.
Too much free play between pedal and hydraulic clutch master cylinder.	1. Inspect the pedal for worn bushings. 2. Replace the pedal bushings if worn.
Hydraulic clutch master cylinder seized or binding.	1. Inspect the master cylinder for the piston being able to move freely and full range of travel. 2. Replace the clutch master cylinder as required. Refer to <u>Clutch Master Cylinder Replacement</u>.
Air in the hydraulic clutch system.	Bleed the hydraulic clutch system. Refer to <u>Hydraulic Clutch System Bleeding</u> .
Hydraulic clutch actuator cylinder seized or binding	1. Inspect the clutch actuator piston for moving freely. 2. Replace the clutch actuator cylinder if the piston is binding. Refer to <u>Clutch Actuator Cylinder Replacement</u>.
Hydraulic clutch master cylinder leaking internally.	NOTE: The clutch pedal reserve is the distance from the floor carpet up to the point when the clutch begins to engage. There should always be more than 13 mm (0.5 in) of clutch pedal reserve. 1. Inspect for proper pedal reserve.

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1. Let up halfway on pedal.
 2. Apply the pedal a few times.
 3. Inspect to ensure there is still the proper pedal reserve.
2. Replace the clutch master cylinder if it will not hold pedal reserve. Refer to **Clutch Master Cylinder Replacement**.

CLUTCH DRAG HARD SHIFTING

Clutch Drag Hard Shifting

Cause	Action
DEFINITION: The clutch does not disengage completely to allow smooth shift operations. It may cause gear clashing while the vehicle is not moving, at idle, and shifting out of neutral, or hard shifting in and out of gears while driving the vehicle. Review the <u>Symptoms - Clutch</u> and perform the necessary inspections.	
Pedal blocked from full travel	1. Inspect for obstacles that will prevent the pedal from going to the floor. 2. Clear any obstacles from under the pedal area, such as floor mats or interior panels.
Too much travel between pedal and clutch master cylinder	1. Inspect the pedal for worn bushings. 2. Replace the Clutch pedal if bushings are worn. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u> .
Clutch pedal mounting loose	1. Inspect the clutch pedal mounting bracket for loose or missing fasteners. 2. Replace or repair the fasteners. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u> .
Linkage at pedal worn or damaged	1. Inspect the linkage at the pedal for excessive wear. 2. Repair or replace the linkage as required. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u> .
Clutch master cylinder seized or binding	1. Inspect the master cylinder for the piston being able to move freely and full range of travel. 2. Repair or replace the clutch master cylinder as required. Refer to <u>Clutch Master Cylinder Replacement</u>.
Air in the clutch hydraulic system	Bleed the clutch hydraulic system. Refer to <u>Hydraulic Clutch System Bleeding</u> .
Clutch actuator cylinder seized or binding	1. Inspect the clutch actuator piston for moving freely. 2. Replace the clutch actuator cylinder if the piston is binding. Refer to <u>Clutch Actuator Cylinder Replacement</u>.
Clutch master cylinder leaking internally	1. Inspect for proper pedal reserve. 1. Let up halfway on pedal. 2. Apply the pedal a few times.

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	3. Inspect to ensure there is still the proper pedal reserve. 2. Replace the clutch master cylinder if it will not hold pedal reserve. Refer to <u>Clutch Master Cylinder Replacement</u>.
Damaged clutch assembly components	1. Remove the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>. 2. Inspect the following clutch assembly components for damage: • Damaged clutch disc hub splines • Bent clutch disc • Bent drive straps • Broken or warped pressure plate 3. Replace the clutch assembly if any of the above damage is found. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>.
Excessive side loading on the clutch actuator cylinder	1. Inspect the following clutch system components: • Excessive flywheel runout • Excessive engine to transmission misalignment • Clutch actuator cylinder to transaxle misalignment 2. Repair or replace any faulty components.
Transaxle input shaft splines worn or damaged	Replace the transmission (M32) if it is worn. Refer to <u>Transmission Replacement</u>
Tight or contaminated clutch disc splines	1. Clean the clutch disc and input shaft splines. 2. If the clutch disc will not clean, replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>.
Flywheel housing, engine block to clutch housing, or transaxle front case excessively misaligned	1. Inspect the clutch housing or the transmission front case for being faulty. 2. Replace the transmission if the clutch housing is faulty. Refer to <u>Transmission Replacement</u>.
Grease or oil contamination on the clutch discs facing	1. Repair the oil leak. 2. Repair the grease leak. 3. Clean the clutch disc facing and the other clutch assembly components. 4. Replace the clutch assembly if it will not clean. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement</u>

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(1.8L LUW and LWE).

CLUTCH SLIPPING

Clutch Slipping

Cause	Actions
DEFINITION: The clutch does not engage completely after the pedal is released, after shifting gears, or the clutch slips during maximum engine loads, such as climbing hills or high vehicle speeds. Clutch slipping is identified by increase in engine RPM without increase in vehicle speed. Review the <u>Symptoms - Clutch</u> and perform the necessary inspections.	
Incorrect clutch pedal height, not allowing the clutch master cylinder to return.	Adjust the clutch pedal position switch. Refer to <u>Clutch Pedal Position Sensor Replacement</u> .
The clutch pedal return spring is broken or missing.	Replace the clutch pedal return spring, if equipped. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u> .
The clutch pedal is binding or sticking.	1. Clear away any items that may be contacting the pedal. 2. Inspect the pedal bushings for ease of movement. 3. Replace the clutch pedal if it is faulty. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u>.
Clutch master cylinder binding or seized.	Replace the clutch master cylinder. Refer to <u>Clutch Master Cylinder Replacement</u> .
Clutch actuator cylinder binding or seized.	Replace the clutch actuator cylinder. Refer to <u>Clutch Actuator Cylinder Replacement</u> .
Kinked or damaged clutch actuator cylinder front pipe.	1. Inspect for the correct routing of the clutch actuator cylinder front pipe. 2. Route the clutch actuator cylinder front pipe properly. 3. Inspect for loose or faulty engine mounts that may allow the clutch actuator cylinder front pipe to be kinked or pinched. 4. Repair or replace faulty engine mounts. 5. Replace the clutch actuator cylinder front pipe if it is damaged. Refer to <u>Clutch Actuator Cylinder Front Pipe Replacement</u>.
Grease or oil contamination of the clutch disc.	1. Repair the source of the oil leak. 2. Repair the source of the grease leak. 3. Clean the contamination from the clutch components. 4. If contaminants cannot be removed, replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u>, <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>.
Oil-soaked clutch disc.	Correct the leak at its source and install a new clutch disc.
Weak diaphragm spring.	Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u> , <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .

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Driven plate that is not seated.	Start the engine 30 - 40 times. Do not overheat the engine.
Driven plate is overheated.	Allow the driven plate to cool.
Worn or damaged flywheel.	Replace the engine flywheel. For 1.4L (LDD, LUH, LUJ), refer to <u>Engine Flywheel Replacement</u> . For 1.8L (LUW), refer to <u>Engine Flywheel Replacement</u> .
Worn clutch disc facing.	Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Burnt or glazed clutch discs.	Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Input shaft splines worn.	Replace the transmission for M32 (MF3, MZ0) <u>Transmission Replacement</u> .
Improper resurfacing of the flywheel.	Replace the flywheel if it has been improperly resurfaced, allowing contact of the clutch disc hub or insufficient clamping load of the pressure plate. For 1.4L (LDD, LUH, LUJ), refer to <u>Engine Flywheel Replacement</u> . For 1.8L (LUW), refer to <u>Engine Flywheel Replacement</u> .

CLUTCH GRABBING

Clutch Grabbing

Cause	Action
DEFINITION: The clutch grabs, or chatters, or the clutch is unable to release without the vehicle jerking. An abrupt engagement of the clutch. Review the <u>Symptoms - Clutch</u> and perform the necessary inspections.	
Grease or oil contamination on the clutch facings	1. Repair the cause of the oil leak or grease contamination. 2. Clean the clutch facings. 3. Replace the clutch components if they will not clean. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>.
Loose or faulty engine mounts	1. Inspect the engine mounts for being loose or faulty. Refer to <u>Engine Mount Inspection</u> . 2. Repair or replace the engine/transmission mounts as required. Refer to: • 1.4 L LUJ <u>Engine Mount Replacement - Right Side</u> • 1.8L LUW <u>Engine Mount Replacement - Right Side</u> • <u>Transmission Mount Replacement - Left Side</u>
Clutch pedal sticking	1. Inspect the clutch pedal for correct operation. 2. Replace the clutch pedal if it is faulty. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u>.

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Clutch actuator binding	1. Inspect the clutch actuator for the piston seals binding or sticking on the hub. 2. Replace the clutch actuator if it is binding. Refer to <u>Clutch Actuator Cylinder Replacement</u>.
Clutch master cylinder binding	1. Inspect the clutch master cylinder for the piston binding or sticking in the cylinder. 2. Replace the master cylinder if it is faulty. Refer to <u>Clutch Master Cylinder Replacement</u>.
Warped clutch cover	1. Inspect the clutch cover for distortion caused by improperly tightening the clutch cover bolts. 2. Replace the clutch cover if it is distorted. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>.
Improper clutch installation	1. Inspect the pressure plate for distortion caused by improperly tightening the pressure plate bolts. 2. Inspect the clutch disc for a bent hub caused by forcing the installation of the transmission. 3. Inspect for the correct clutch disc. 4. Inspect the clutch disc for being installed backwards. 5. Replace the clutch assembly if it is damaged or the wrong components were installed. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>.
Clutch disc binding on the input shaft	1. Inspect the input shaft for rust dirt or debris. NOTE: Do not use mineral or paraffin based oil to lubricate the splines. 2. Clean and lubricate the input shaft. 3. Inspect the clutch disc for a bent hub. 4. Replace the clutch assembly if the clutch disc is faulty. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>. 5. Inspect the input shaft for excessive wear on the splines, causing the clutch disc to bind. 6. Replace the transmission if input shaft is worn. Refer to <u>Transmission Replacement</u> .
Clutch pressure plate damaged	1. Inspect the pressure plate for bent drive straps caused by improper vehicle use.

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	2. Replace the clutch assembly if the clutch pressure plate is damaged. Inform the customer. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u>, <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>.
Flywheel improperly machined	1. Inspect the flywheel for being improperly machined, and causing interference with the clutch disc. 2. Replace the flywheel if it has been improperly machined. Refer to: • 1.4L LUJ <u>Engine Flywheel Replacement</u> • 1.8L LUW <u>Engine Flywheel Replacement</u>
Flywheel uneven	1. Inspect the flywheel surface for being warped or uneven. 2. Replace the flywheel if it is faulty. Refer to: • 1.4L LUJ <u>Engine Flywheel Replacement</u> • 1.8L LUW <u>Engine Flywheel Replacement</u>

CLUTCH RATTLE

Clutch Rattle

Cause	Actions
DEFINITION: A rattle noise coming from the clutch components with the clutch disengaged or engaged. Review the <u>Symptoms - Clutch</u> and perform the necessary inspections.	
Idle rattle clutch engaged	Replace the clutch disc, due to faulty damper springs. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u> , <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Clutch is improperly installed	Remove the clutch and install it correctly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u> , <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Clutch disc damper worn or damaged	1. Inspect the clutch disc for a broken or worn damper. 2. Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u>, <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>.
Oil in the driven plate damper	Correct the cause of the oil leak and replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u> , <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Clutch disc splines and input shaft splines worn	1. Inspect the clutch disc hub to input shaft splines for excessive clearance. 2. Replace the clutch assembly if the clutch splines are worn. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV)</u>, <u>Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u>.

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3. Replace the transmission (M32) if it is worn. Refer to **Transmission Replacement** for M32 transmission.

RELEASE BEARING NOISY WITH CLUTCH ENGAGED

Release Bearing Noisy with Clutch Engaged

Checks	Actions
Check for a binding clutch actuator cylinder.	Clean and re-lubricate the clutch actuator cylinder. Inspect the clutch actuator cylinder for burrs and nicks.

CLUTCH NOISY

Clutch Noisy

Cause	Actions
Clutch actuator cylinder damaged or worn.	Replace the clutch actuator cylinder. Refer to <u>Clutch Actuator Cylinder Replacement</u> .

CLUTCH PEDAL SPONGY LOW PEDAL EFFORT

Clutch Pedal Spongy Low Pedal Effort

Cause	Action
DEFINITION: The clutch pedal may feel spongy, or it requires very little effort to operate. Review <u>Symptoms - Clutch</u> and perform the necessary inspections.	
Air in the hydraulic system	Bleed the clutch hydraulic system. Refer to <u>Hydraulic Clutch System Bleeding</u> .
Master cylinder fluid level low	1. Inspect for leakage in the clutch master cylinder, hose connections, and the clutch actuator. 2. Repair or replace any faulty components.
Incomplete pedal return	1. Inspect the pedal for full return. 2. Clear any obstacles that may interfere with the pedal operation. 3. Replace the clutch pedal return spring, if equipped. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u>. 4. Adjust the clutch pedal position switch. Refer to <u>Clutch Pedal Position Sensor Replacement</u>.
Clutch incorrectly installed	Remove the clutch and install it correctly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Clutch mounting bolts loose or broken	1. Remove the broken bolts. 2. Replace the broken or loose bolts, and tighten. Refer to <u>Clutch Pressure and Driven Plate Replacement</u>.

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	<u>(1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE).</u>
Clutch actuator cylinder worn or damaged	Replace the release bearing. Refer to <u>Clutch Actuator Cylinder Replacement</u> .
Contaminated hydraulic fluid	1. Inspect the clutch hydraulic fluid for contamination of water. 2. Inspect the reservoir cap for being faulty if water is present. 3. Inspect the clutch hydraulic fluid for dirt or debris. 4. Inspect the clutch hydraulic fluid for contamination of mineral oil. If contaminated, replace the clutch master cylinder and the clutch actuator cylinder. Refer to <u>Clutch Master Cylinder Replacement</u>, and <u>Clutch Actuator Cylinder Replacement</u>. 5. Flush and bleed the clutch hydraulic system if the above conditions are found. Refer to <u>Hydraulic Clutch System Bleeding</u>.

CLUTCH PEDAL HARD TO PUSH

Clutch Pedal Hard to Push

Cause	Actions
DEFINITION: The clutch pedal requires high effort to operate. Review the <u>Symptoms - Clutch</u> and perform the necessary inspections.	
Incorrect hydraulic fluid.	1. Inspect for the correct fluid in the master cylinder. Refer to <u>Hydraulic Clutch System Bleeding</u>. 2. If mineral oil is found, replace the clutch master cylinder, the clutch actuator cylinder, and flush the hydraulic system and fill with the correct fluid. Refer to <u>Clutch Master Cylinder Replacement</u>, and <u>Hydraulic Clutch System Bleeding</u>.
Contaminated hydraulic fluid.	1. Inspect the hydraulic fluid for water. 2. Inspect the hydraulic fluid for dirt or debris. 3. Inspect the clutch hydraulic fluid for contamination of mineral oil. If contaminated, replace the clutch master cylinder and the clutch actuator cylinder. Refer to <u>Clutch Master Cylinder Replacement</u>. 4. Flush the hydraulic system and fill with the correct fluid. Refer to <u>Hydraulic Clutch System Bleeding</u>.
Clutch pedal binding.	1. Inspect the pedal for binding. 2. Replace the pedal. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u>.
Clutch pedal spring worn.	1. Inspect the clutch pedal spring for wear.

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	2. Replace the clutch pedal. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u> .
Kinked or damaged clutch actuator cylinder front pipe.	1. Inspect for a kinked or damaged clutch actuator cylinder front pipe. 2. Replace the clutch actuator cylinder front pipe. Refer to <u>Clutch Actuator Cylinder Front Pipe Replacement</u> .
Clutch disc worn too thin.	Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .

CLUTCH VIBRATION

Clutch Vibration

Cause	Action
DEFINITION: Vibration from the clutch components during disengagement or engagement. Review the <u>Symptoms - Clutch</u> and perform the necessary inspections.	
Clutch incorrectly installed	Remove the clutch and install it correctly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Transmission input splines worn or damaged	1. Inspect the clutch disc to input splines for wear or damage. 2. Replace the Transmission for M32. Refer to <u>Transmission Replacement</u> .
Clutch disc facings damaged	Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .
Flywheel housing to clutch housing excessively misaligned	Replace the Transmission. Refer to <u>Transmission Replacement</u> .
Clutch out of balance	Replace the clutch assembly. Refer to <u>Clutch Pressure and Driven Plate Replacement (1.4L LUV), Clutch Pressure and Driven Plate Replacement (1.8L LUW and LWE)</u> .

REPAIR INSTRUCTIONS

BRAKE, ACCELERATOR, AND CLUTCH PEDAL REPLACEMENT

NOTE: The clutch pedal is part of the brake, accelerator, and clutch pedal assembly and cannot be serviced separately.

To replace the brake, accelerator and clutch pedal assembly, refer to **Brake, Accelerator, and Clutch Pedal Replacement** .

CLUTCH PEDAL RETURN SPRING REPLACEMENT (COIL SPRING)

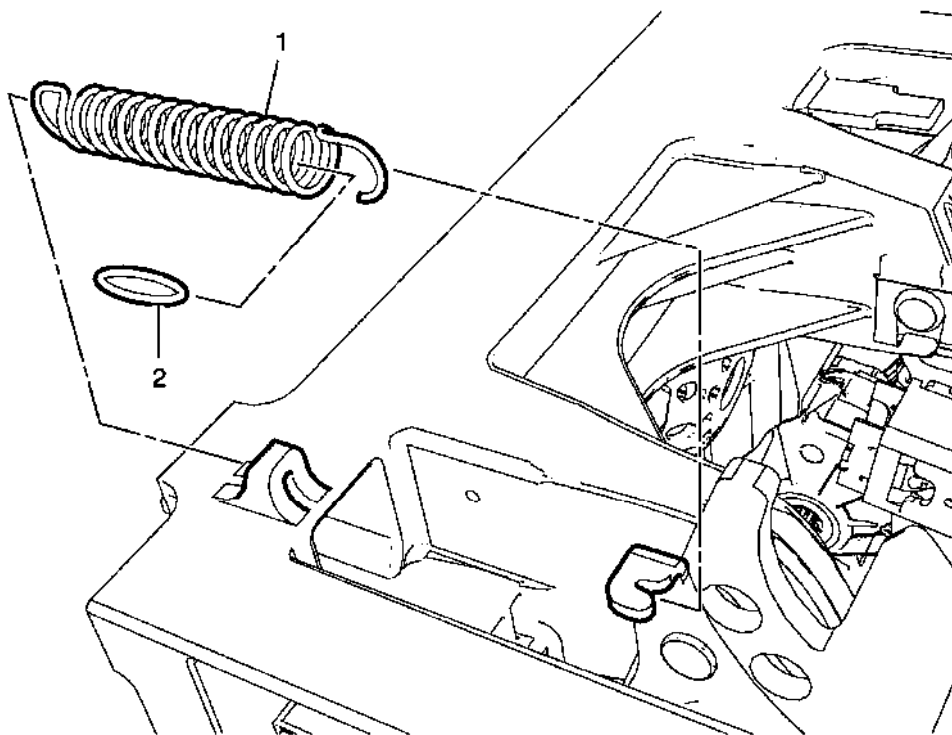


Fig. 1: Clutch Pedal Return Spring (Coil Spring)

Courtesy of GENERAL MOTORS COMPANY

Clutch Pedal Return Spring Replacement (Coil Spring)

Callout	Component Name
Preliminary Procedures	
Remove the brake, accelerator and clutch pedal assembly. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u> .	
1	Clutch Pedal Return Spring
2	Clutch Pedal Return Spring Bracket

CLUTCH PEDAL RETURN SPRING REPLACEMENT (TENSION SPRING)

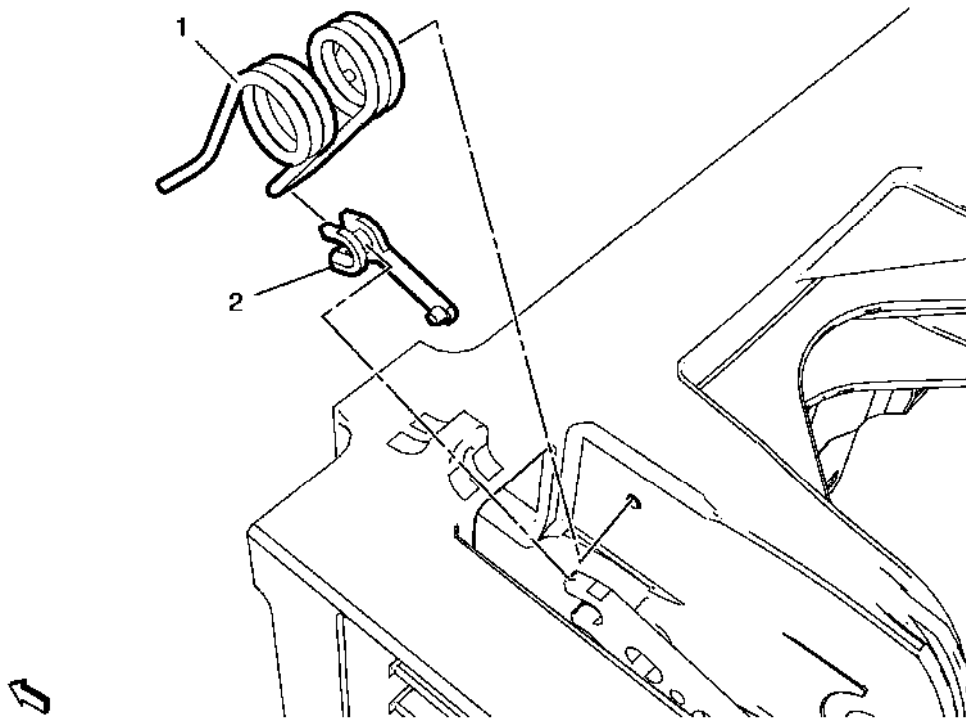


Fig. 2: Clutch Pedal Return Spring (Tension Spring)

Courtesy of GENERAL MOTORS COMPANY

Clutch Pedal Return Spring Replacement (Tension Spring)

Callout	Component Name
Preliminary Procedures	
Remove the brake, accelerator and clutch pedal assembly. Refer to <u>Brake, Accelerator, and Clutch Pedal Replacement</u> .	
1	Clutch Pedal Return Spring
2	Clutch Return Pedal Spring Bracket

CLUTCH MASTER CYLINDER RESERVOIR HOSE REPLACEMENT

Removal Procedure

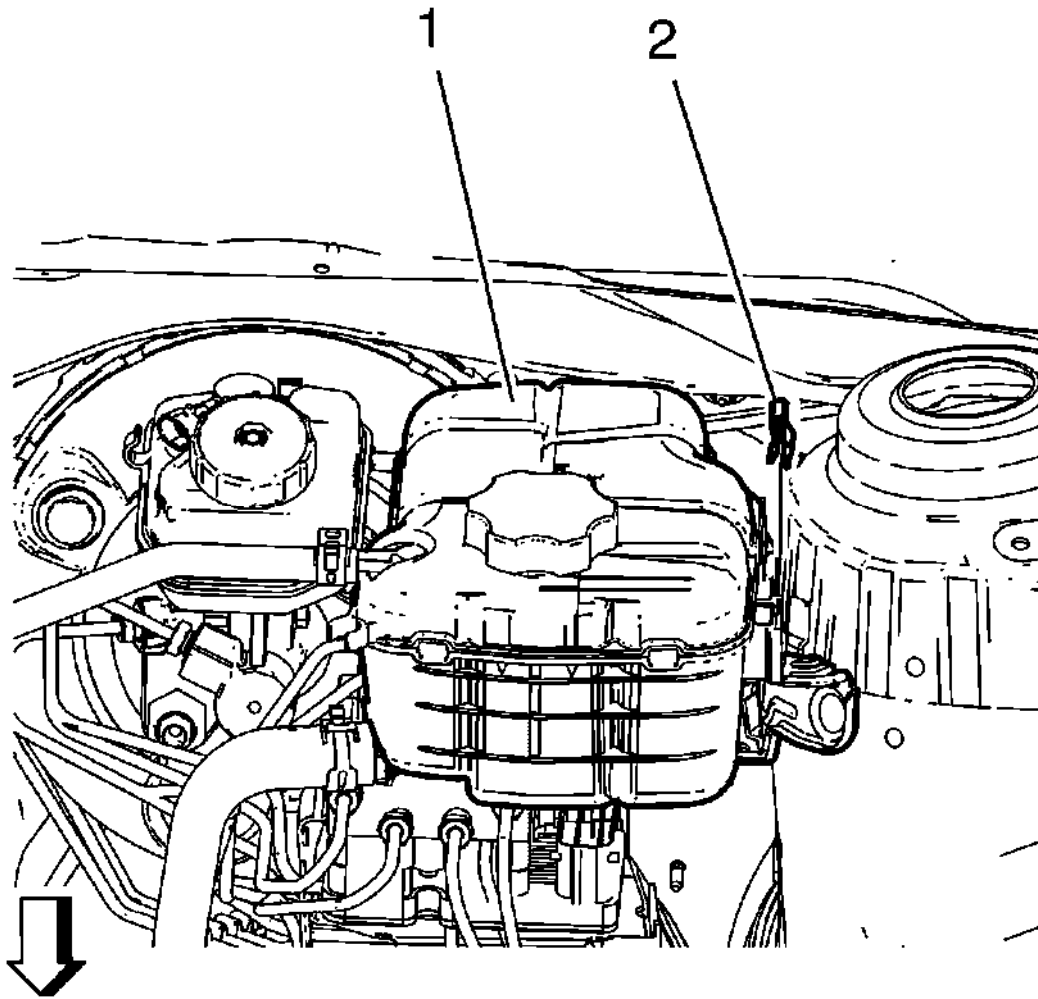


Fig. 3: View Of Radiator Surge Tank And Radiator Surge Tank Clip
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do NOT disconnect engine coolant hoses.

1. Remove the radiator surge tank clip (2).
2. Remove the radiator surge tank (1).
3. Position the radiator surge tank (1) aside.

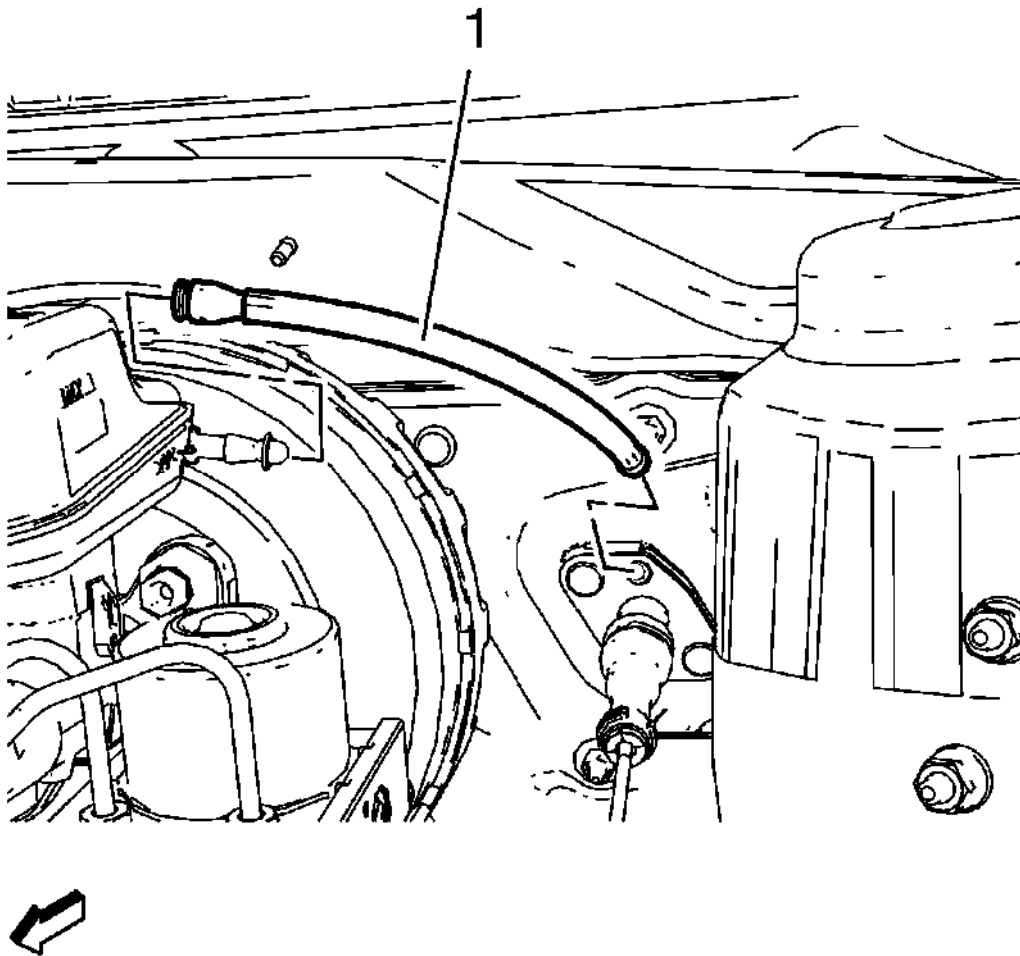


Fig. 4: Clutch Master Cylinder Reservoir Hose
Courtesy of GENERAL MOTORS COMPANY

NOTE: Before disconnecting the reservoir tank hose, remove the clutch/brake fluid from the reservoir tank.

4. Remove the clutch master cylinder reservoir hose (1) from the reservoir tank and the master cylinder.

Installation Procedure

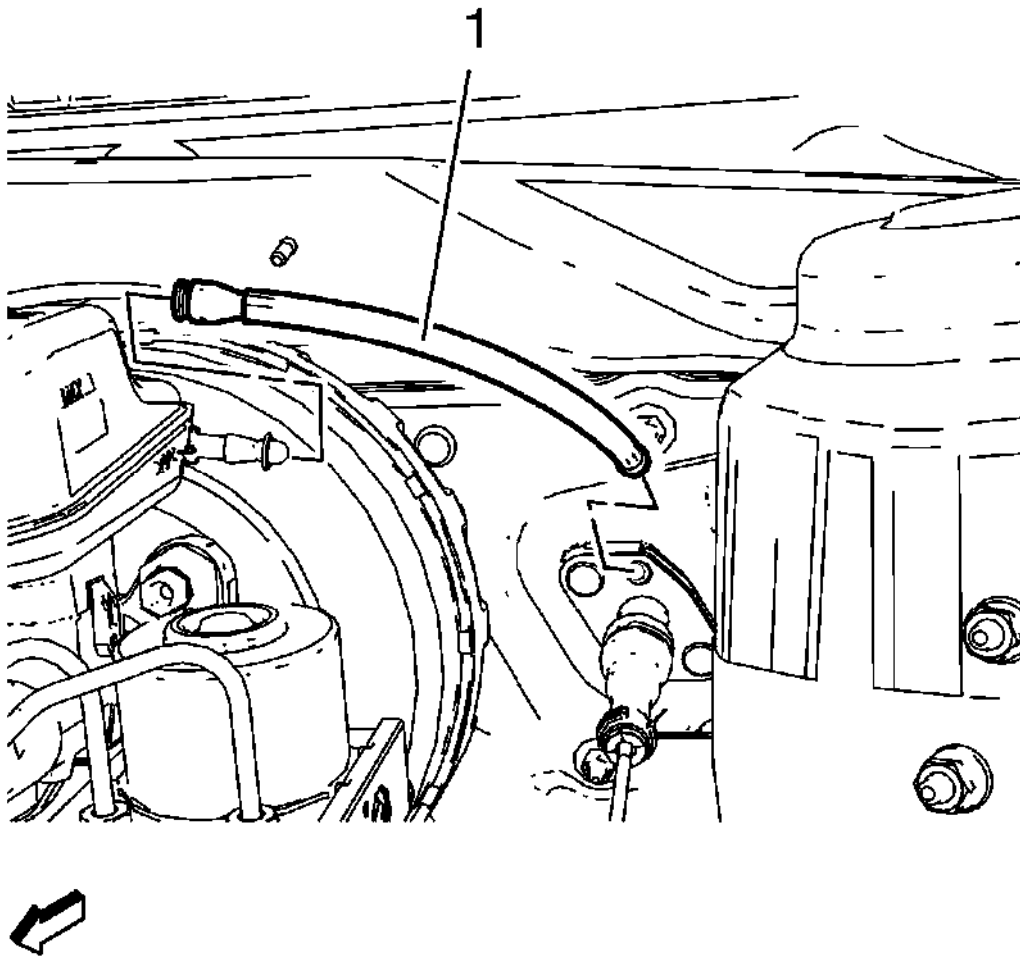


Fig. 5: Clutch Master Cylinder Reservoir Hose
Courtesy of GENERAL MOTORS COMPANY

1. Install the clutch master cylinder reservoir hose (1) to the reservoir tank and the master cylinder.
2. Fill the reservoir with clutch/brake fluid up to the MAX level.

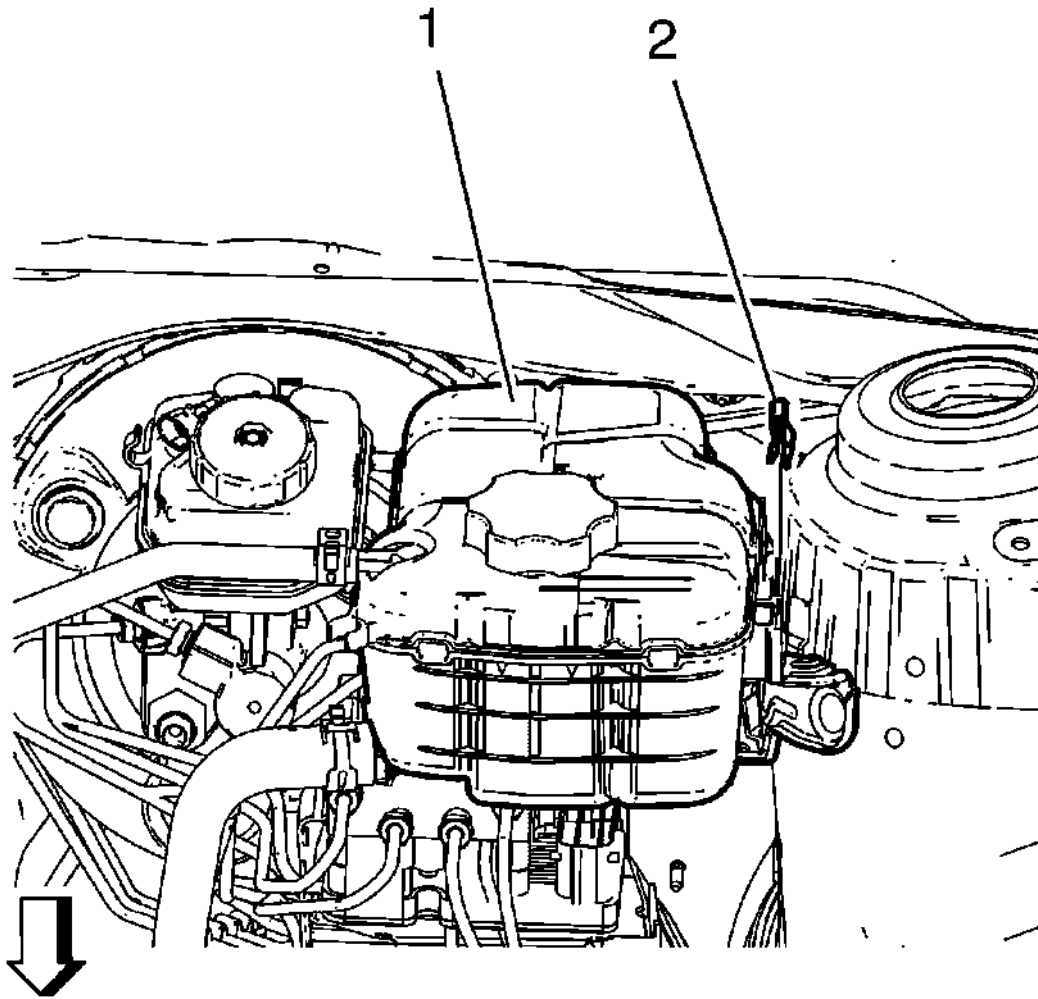


Fig. 6: View Of Radiator Surge Tank And Radiator Surge Tank Clip
Courtesy of GENERAL MOTORS COMPANY

3. Install the radiator surge tank (1).
4. Install the radiator surge tank clip (2).

CLUTCH MASTER CYLINDER REPLACEMENT

Special Tools

- **DT-6202-A** Pliers
- **DT-6202-B** Pliers
- **DT-6202-20** Adapter to DT-6202-A
- **DT-50894** Remover

For equivalent regional tools, refer to **Special Tools**.

Removal Procedure

1. Remove the battery tray. Refer to **Battery Tray Replacement** .

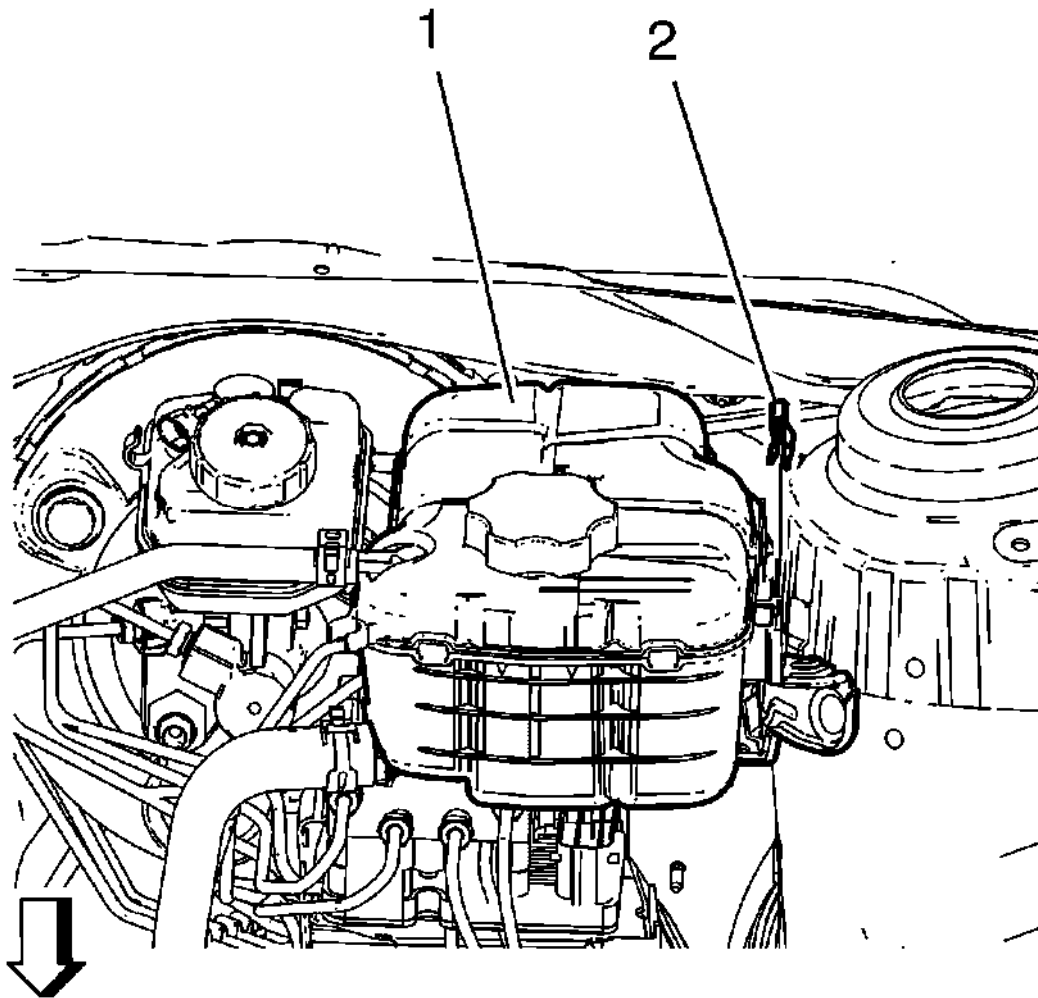


Fig. 7: View Of Radiator Surge Tank And Radiator Surge Tank Clip
Courtesy of GENERAL MOTORS COMPANY

2. Remove the radiator surge tank clip (2).
3. Remove the radiator surge tank (1) and lay aside.
4. Place a basin underneath.
5. Extract as much brake fluid out of the brake fluid reservoir as possible.

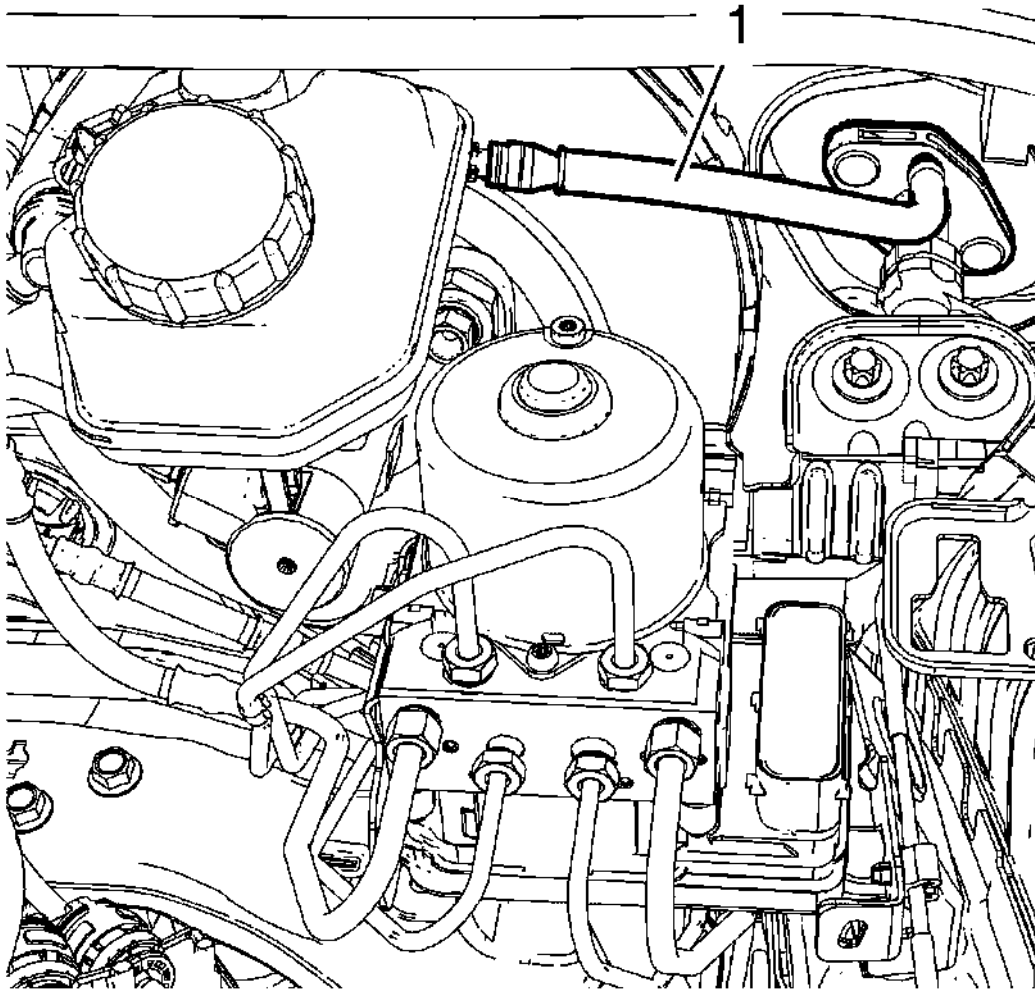


Fig. 8: Clutch Master Cylinder Reservoir Hose
Courtesy of GENERAL MOTORS COMPANY

6. Remove the clutch master cylinder reservoir hose (1) from the clutch master cylinder.

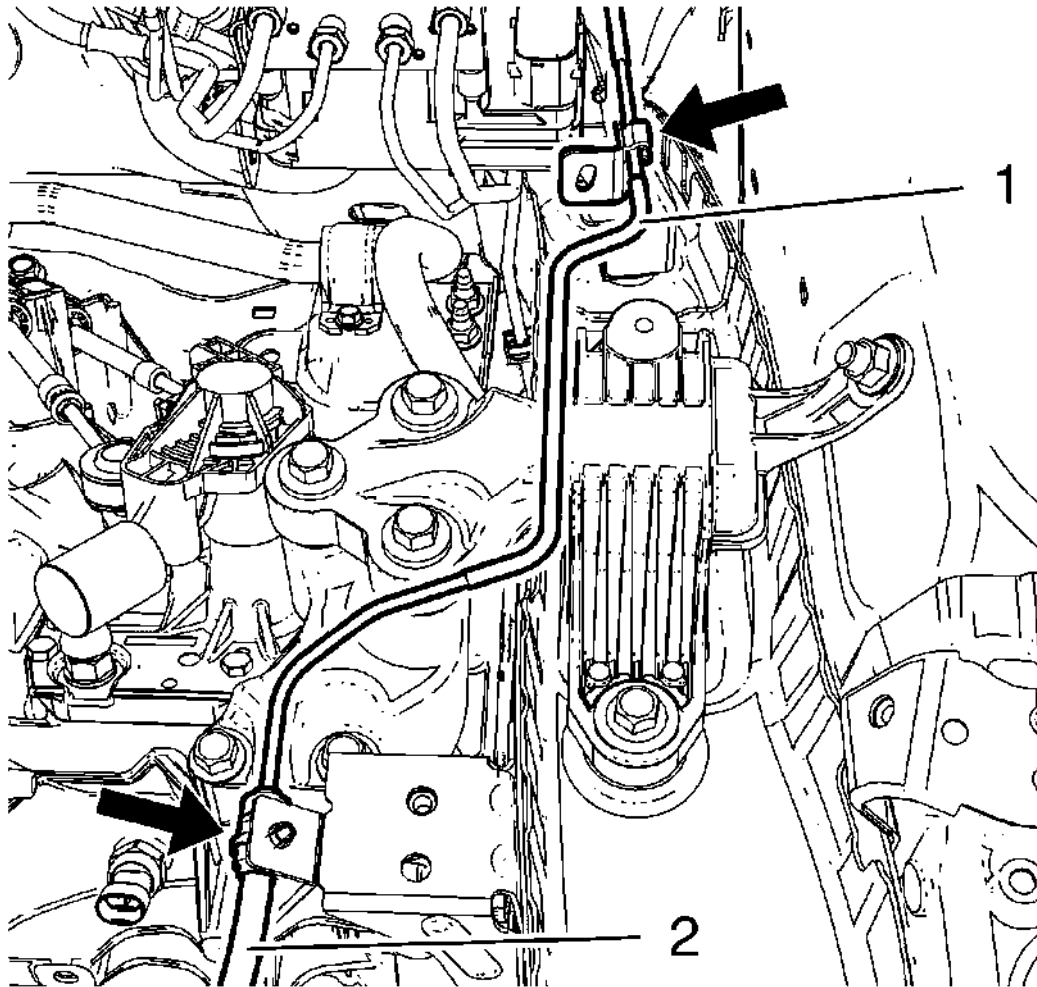


Fig. 9: Clutch Actuator Cylinder Front Pipe And Retainers
Courtesy of GENERAL MOTORS COMPANY

7. Clip the clutch actuator cylinder front pipe (1) out of the 2 retainers (arrows).

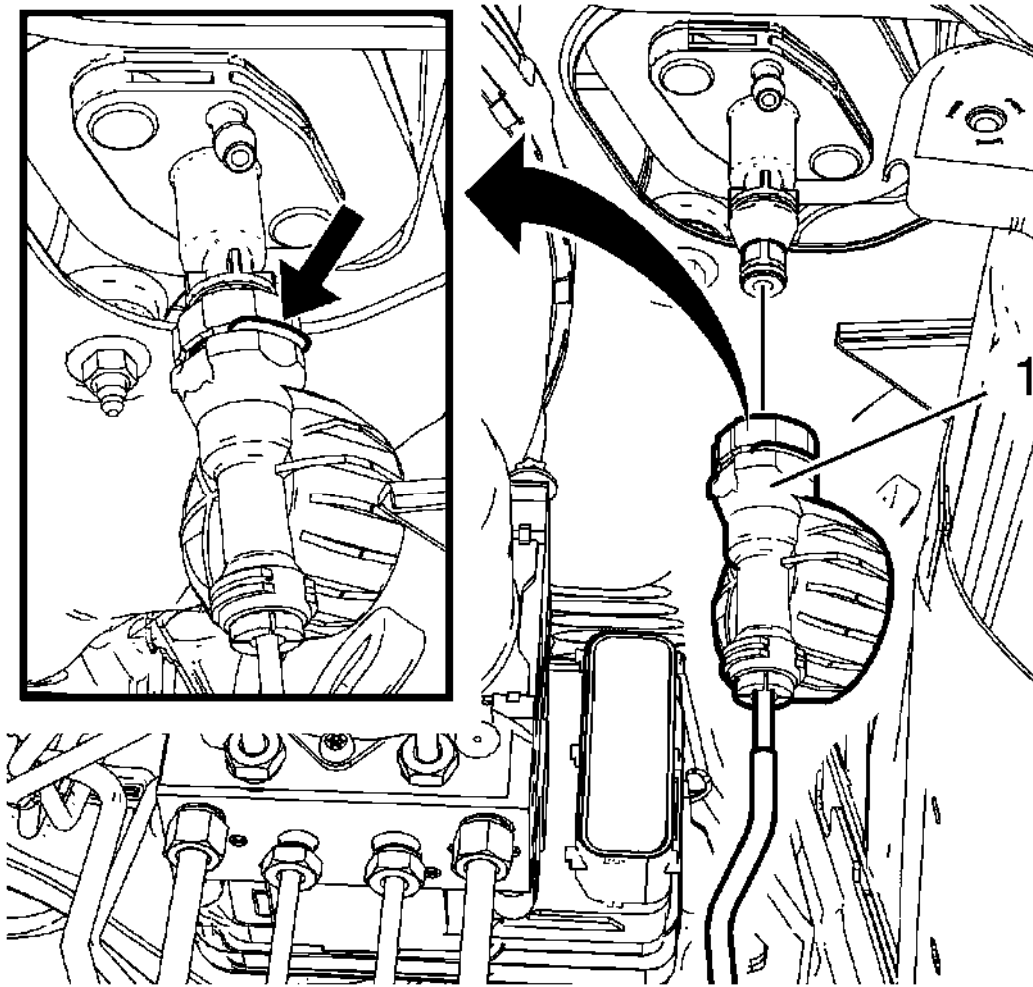


Fig. 10: Clutch Actuator Cylinder Front Pipe And Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

8. Open the retaining clip (arrow).
9. Disconnect the clutch actuator cylinder front pipe (1) from the clutch master cylinder.

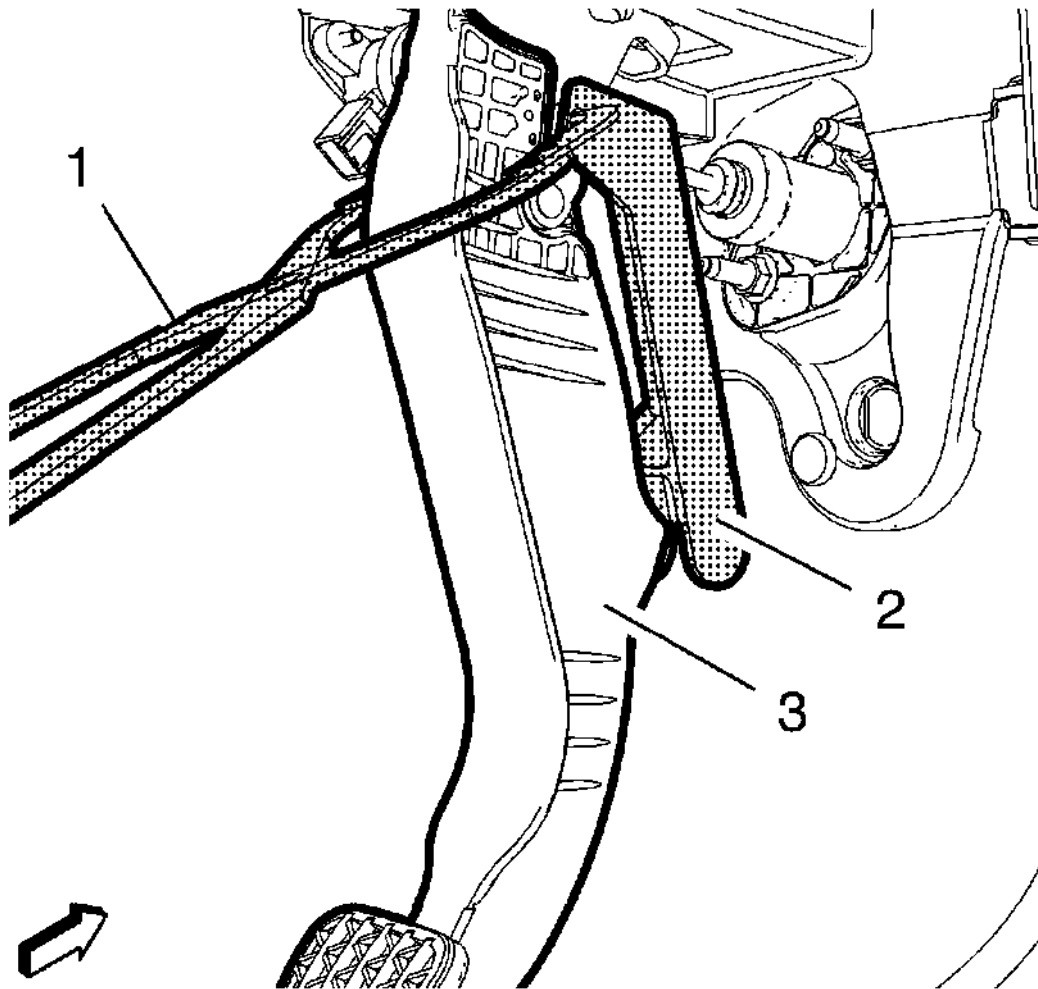


Fig. 11: Clutch Pedal And Push Rod Removal Tools

Courtesy of GENERAL MOTORS COMPANY

10. Disconnect the clutch master cylinder push rod from the clutch pedal (3), using the **DT-6202-A** pliers and the **DT-6202-20** adapters in conjunction with the **DT-50894** remover (2), or the **DT-6202-B** pliers (1) in conjunction with the **DT-50894** remover (2).

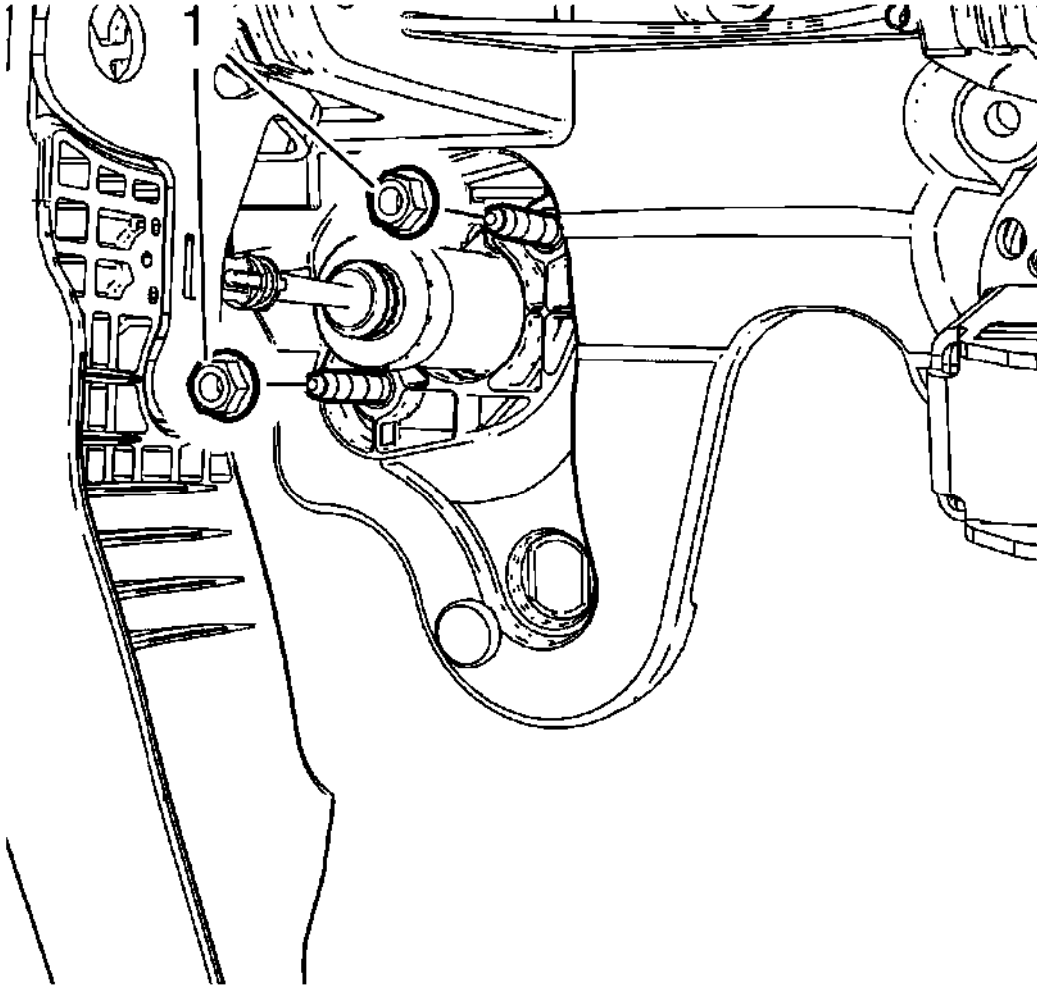


Fig. 12: Clutch Master Cylinder Nuts
Courtesy of GENERAL MOTORS COMPANY

11. Remove the 2 clutch master cylinder nuts (1).

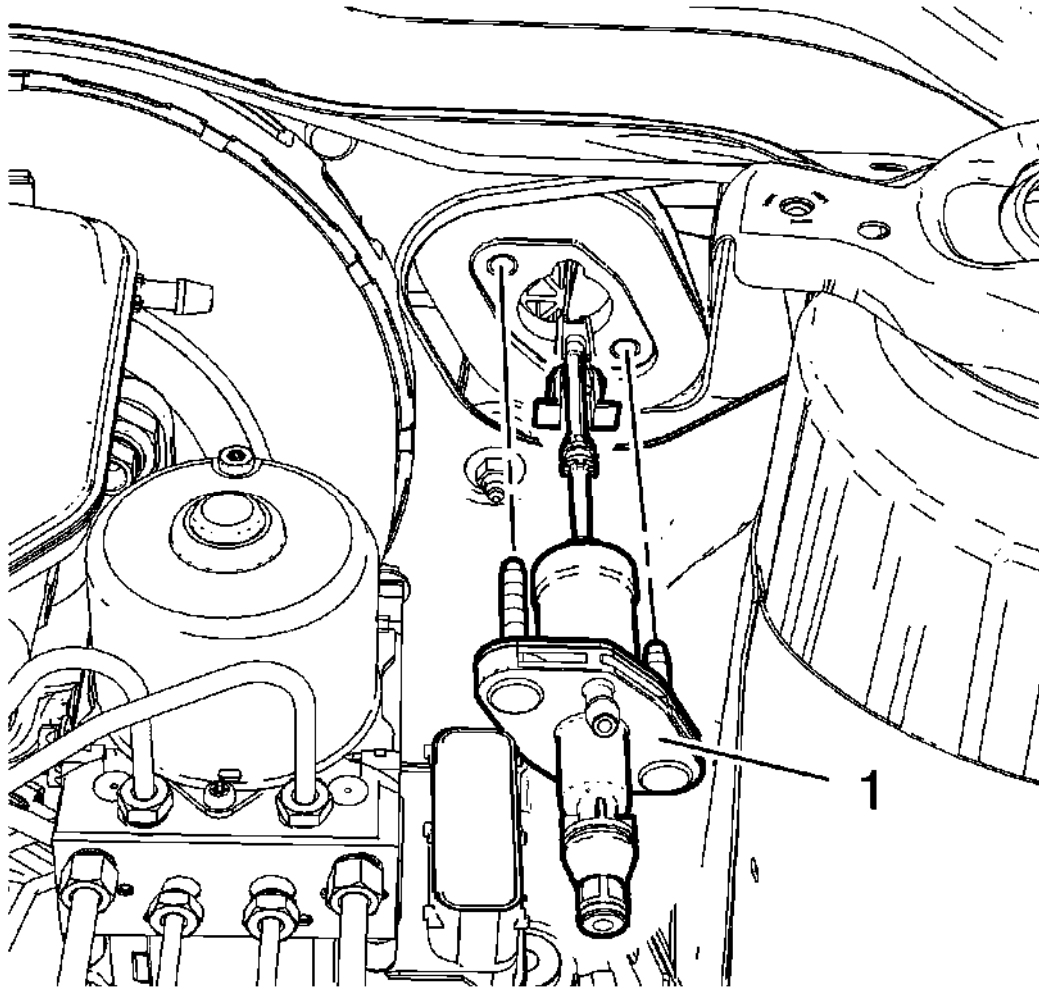


Fig. 13: Clutch Master Cylinder

Courtesy of GENERAL MOTORS COMPANY

12. Remove the clutch master cylinder (1).

Installation Procedure

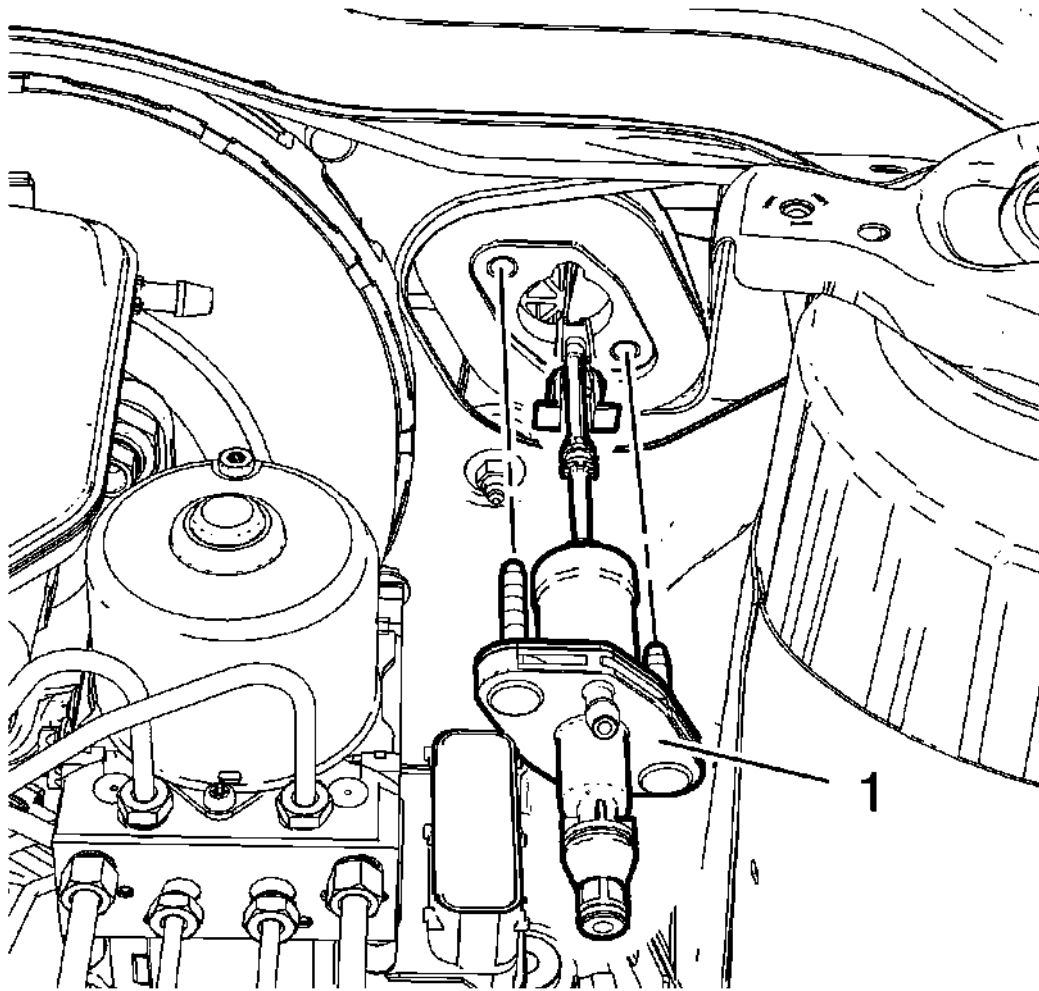


Fig. 14: Clutch Master Cylinder

Courtesy of GENERAL MOTORS COMPANY

1. Install the clutch master cylinder (1).

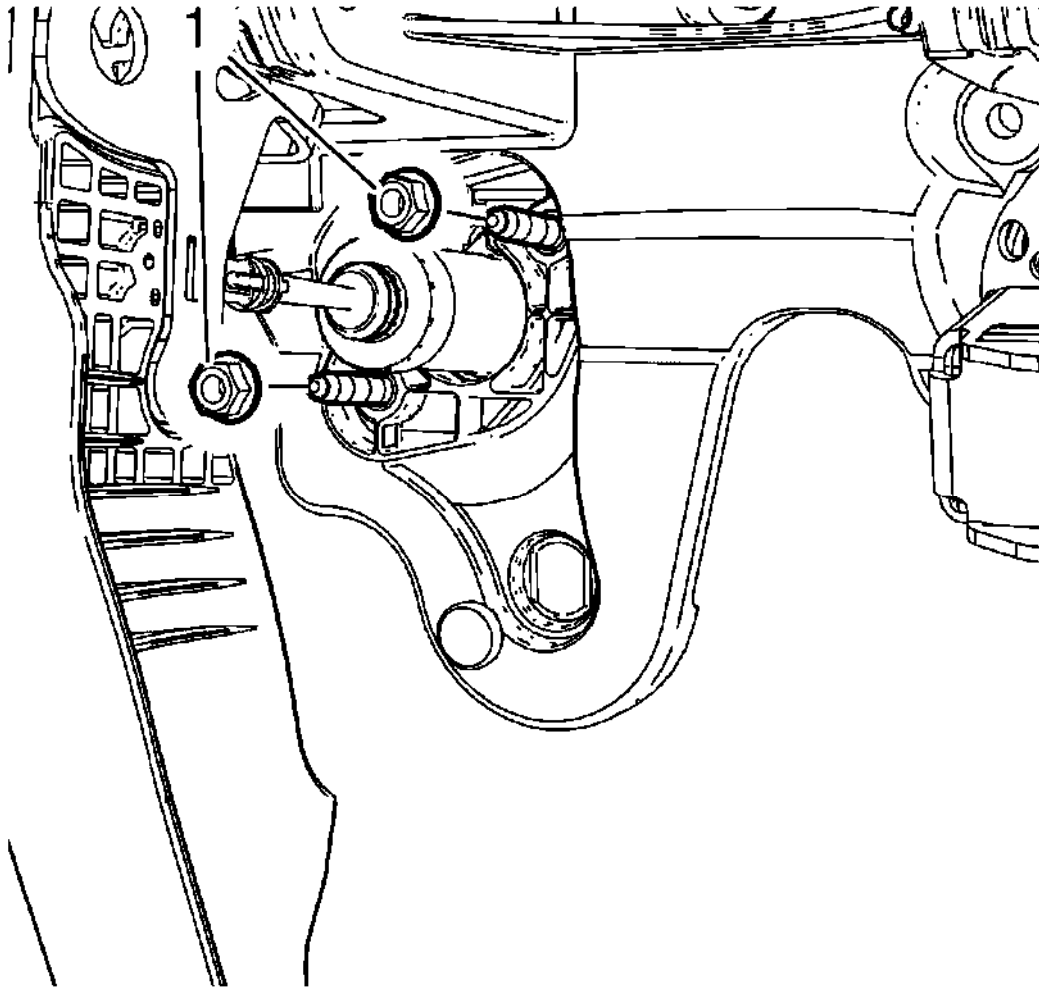


Fig. 15: Clutch Master Cylinder Nuts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

2. Install the 2 clutch master cylinder nuts (1) and tighten to 18 N.m (13 lb ft).

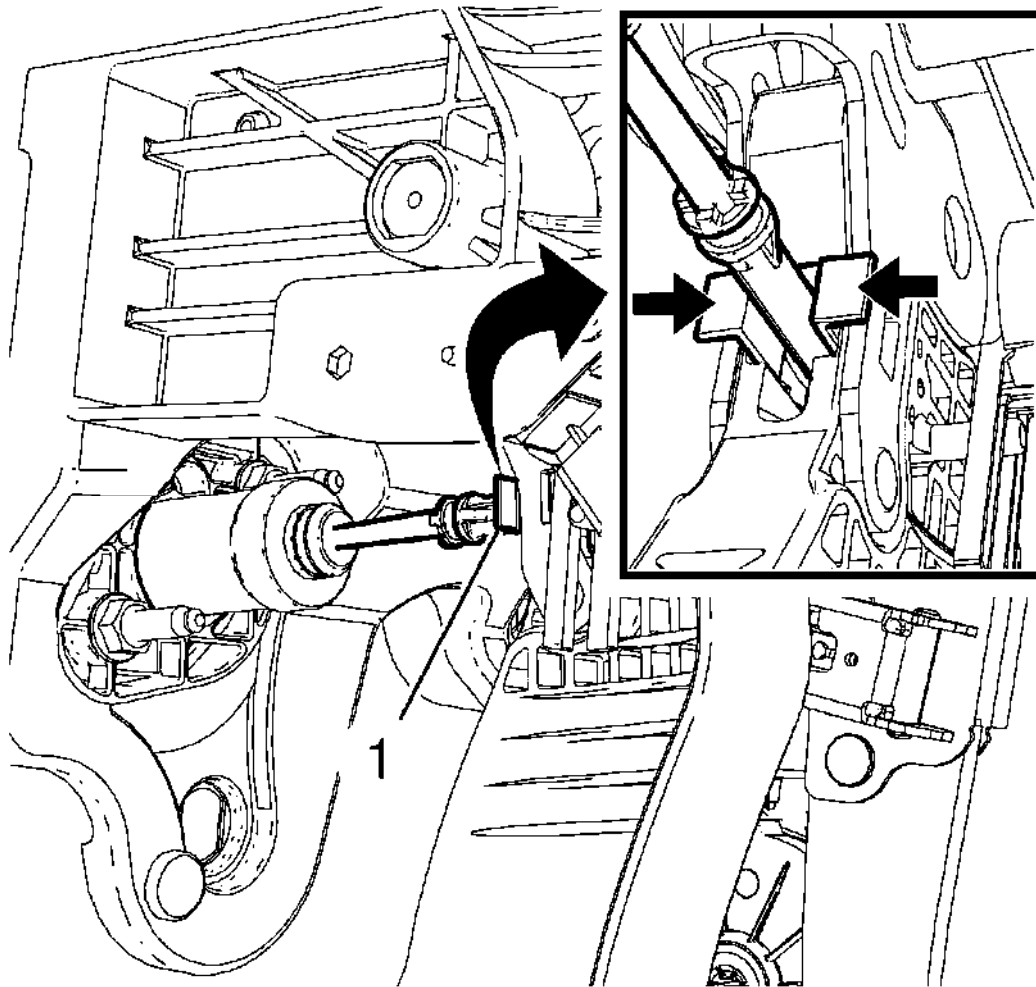


Fig. 16: Clutch Pedal Push Rod Retainer And Latches

Courtesy of GENERAL MOTORS COMPANY

NOTE: The retaining clip (arrows) has to engage audibly.

3. Connect the push rod retainer (1) to the clutch pedal.

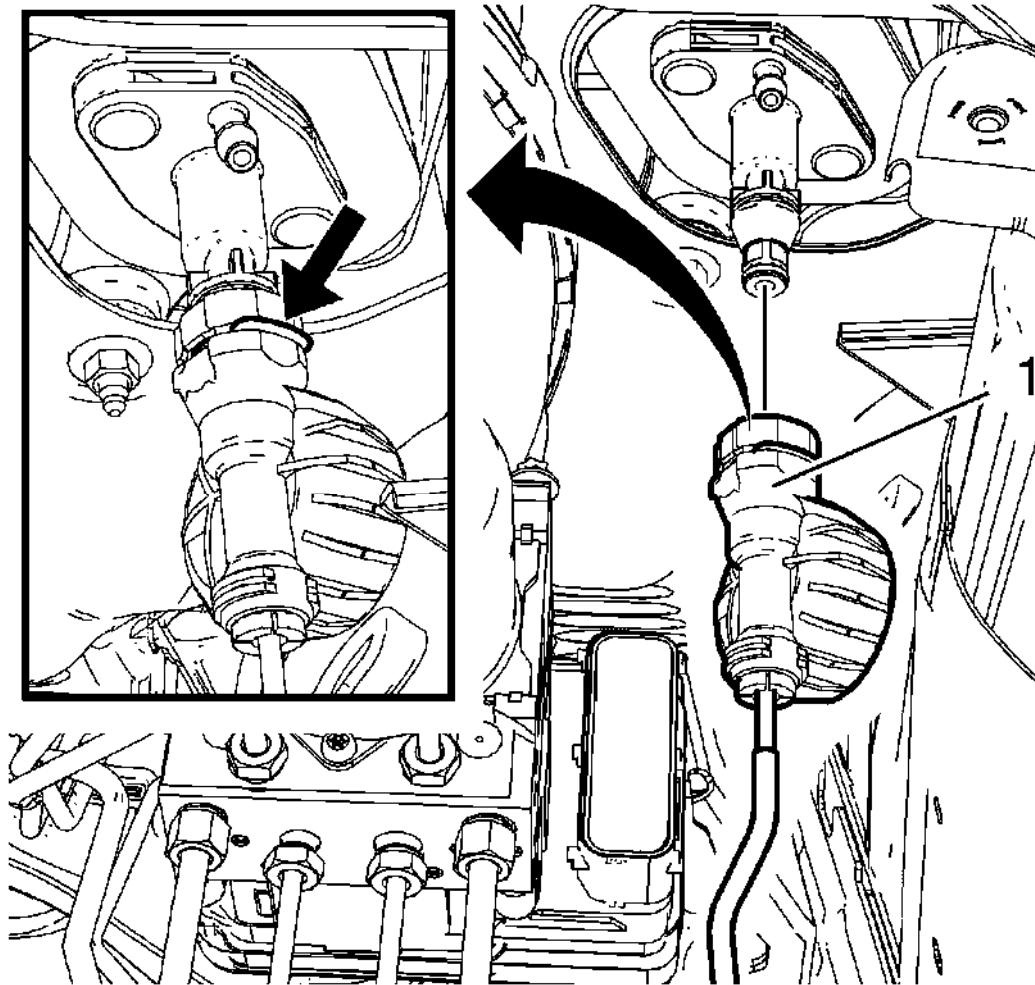


Fig. 17: Clutch Actuator Cylinder Front Pipe And Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

4. Connect the clutch actuator cylinder front pipe (1) to the clutch master cylinder.
5. Close the retaining clip (arrow).

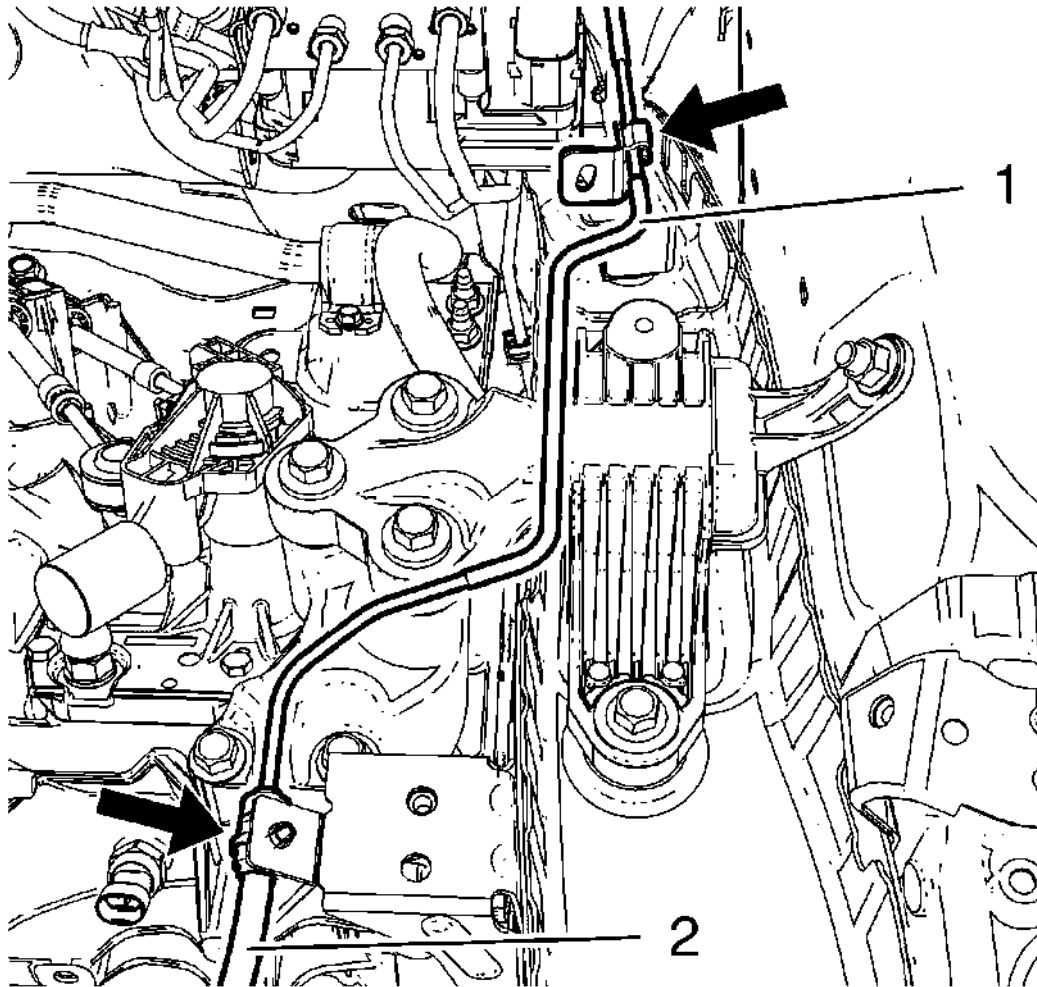


Fig. 18: Clutch Actuator Cylinder Front Pipe And Retainers
Courtesy of GENERAL MOTORS COMPANY

6. Clip the clutch actuator cylinder front pipe (1) into the 2 retainers (arrows).

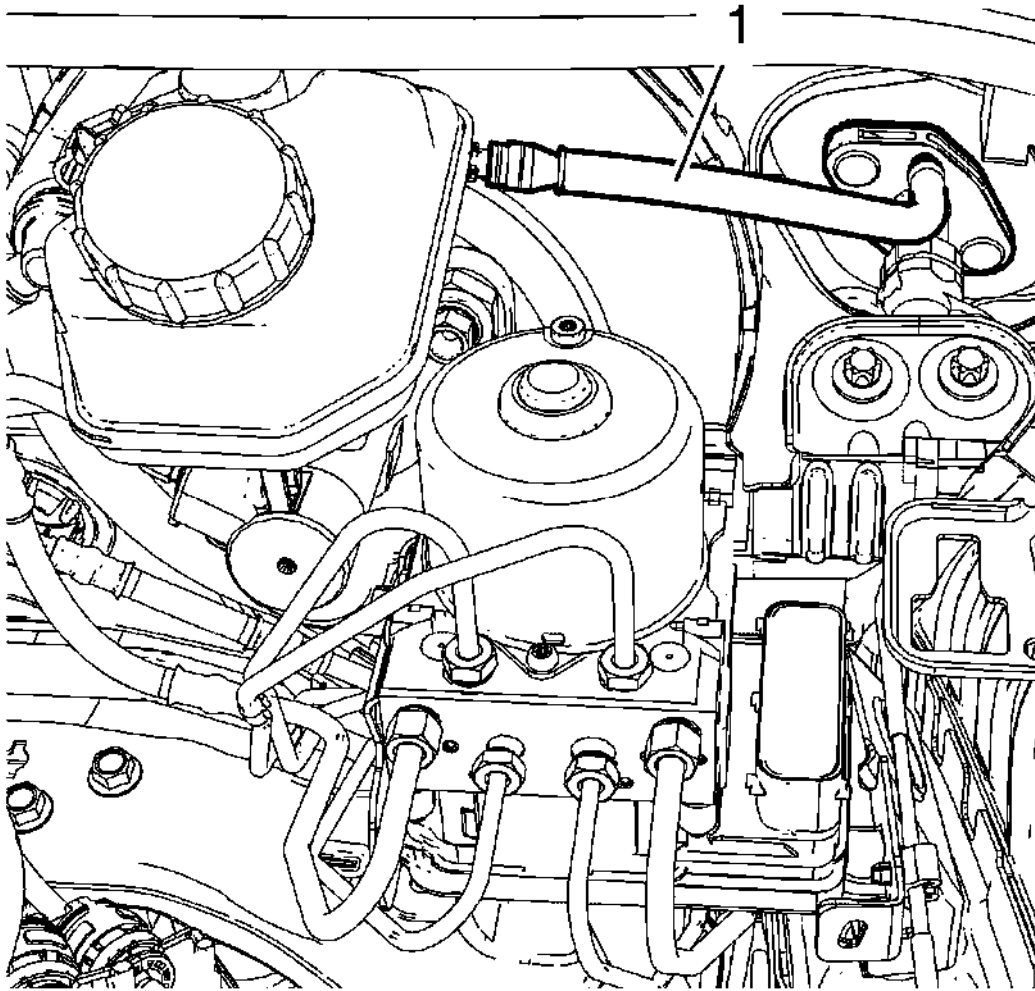


Fig. 19: Clutch Master Cylinder Reservoir Hose
Courtesy of GENERAL MOTORS COMPANY

7. Install the clutch master cylinder reservoir hose (1) to the clutch master cylinder.

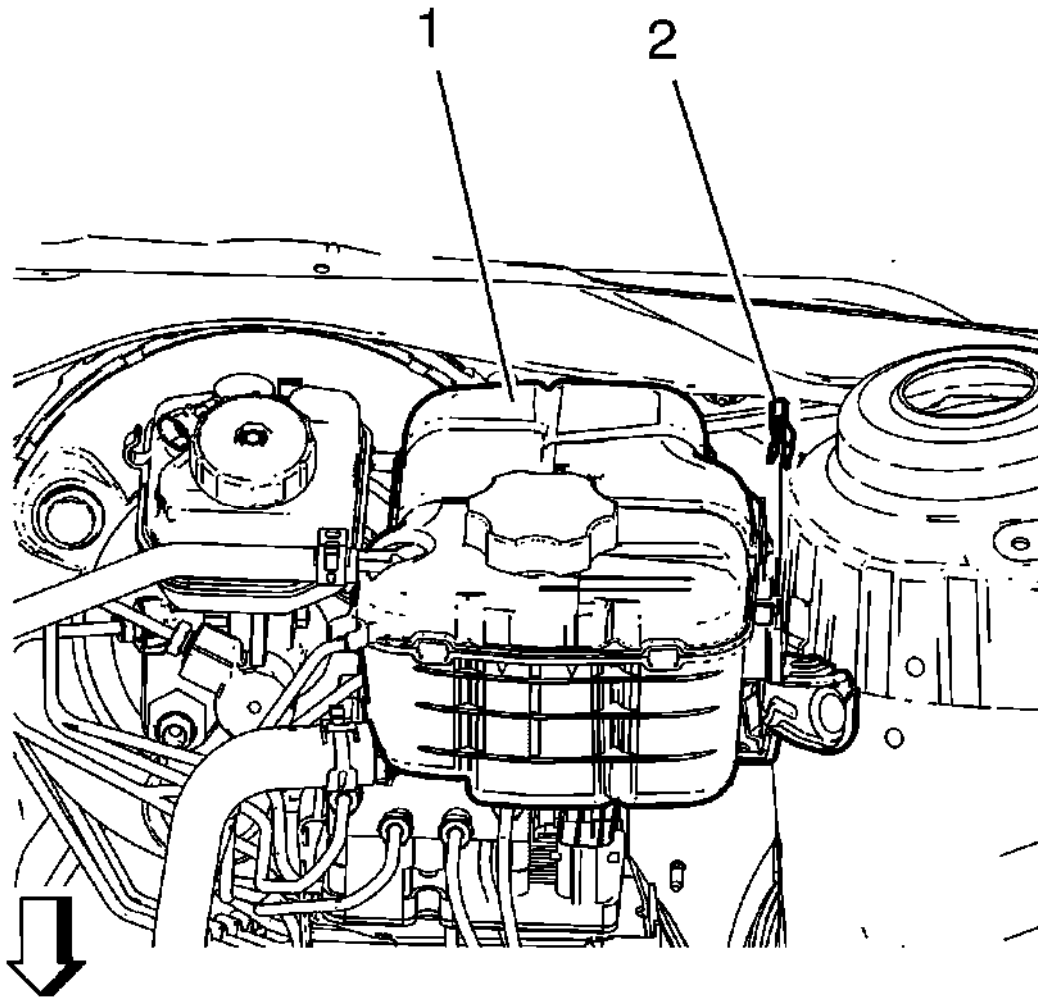


Fig. 20: View Of Radiator Surge Tank And Radiator Surge Tank Clip
Courtesy of GENERAL MOTORS COMPANY

8. Install the radiator surge tank (1).
9. Install the radiator surge tank clip (2).
10. Bleed the hydraulic clutch system. Refer to **Hydraulic Clutch System Bleeding**.
11. Install the battery tray. Refer to **Battery Tray Replacement** .

CLUTCH ACTUATOR CYLINDER FRONT PIPE REPLACEMENT

Removal Procedure

1. Remove battery tray. Refer to **Battery Tray Replacement** .

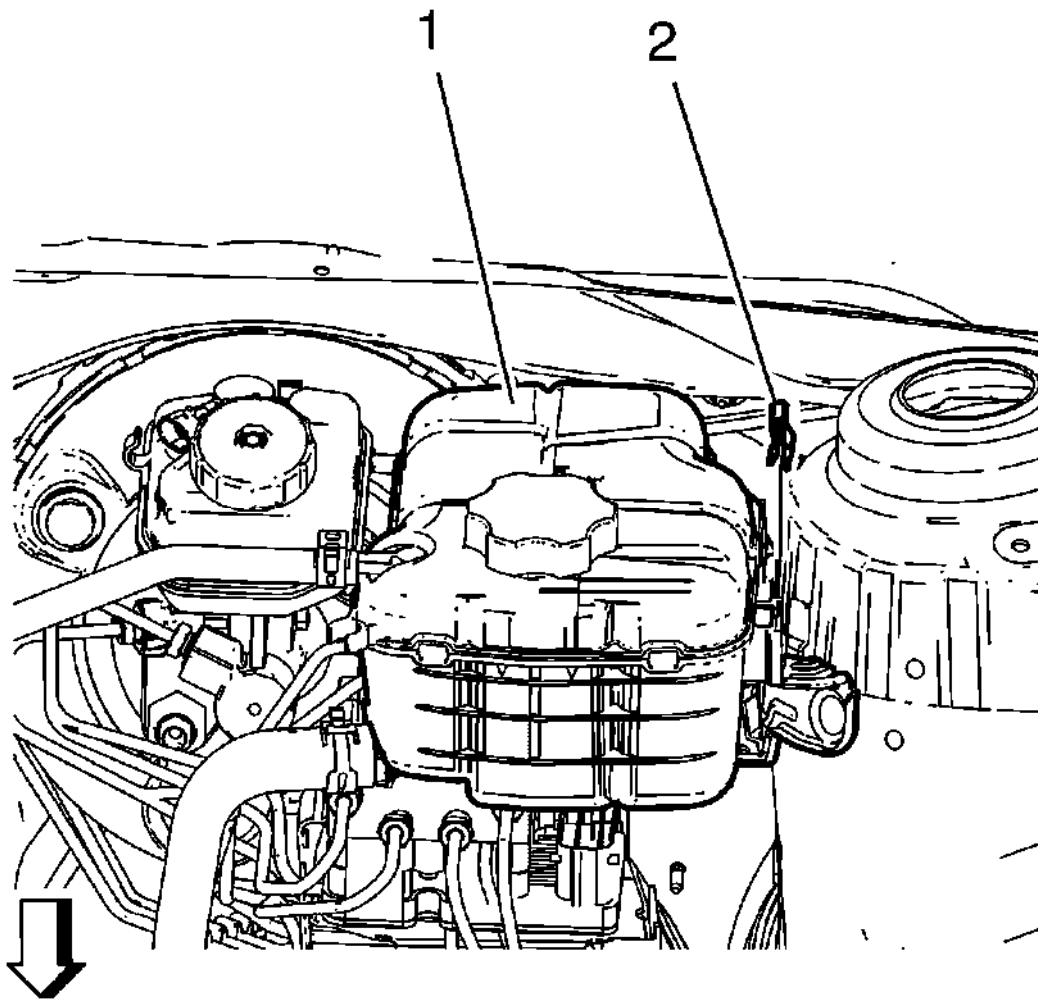


Fig. 21: View Of Radiator Surge Tank And Radiator Surge Tank Clip
Courtesy of GENERAL MOTORS COMPANY

2. Remove radiator surge tank clip (2).
3. Remove radiator surge tank (1) and lay aside.
4. Place basin underneath.

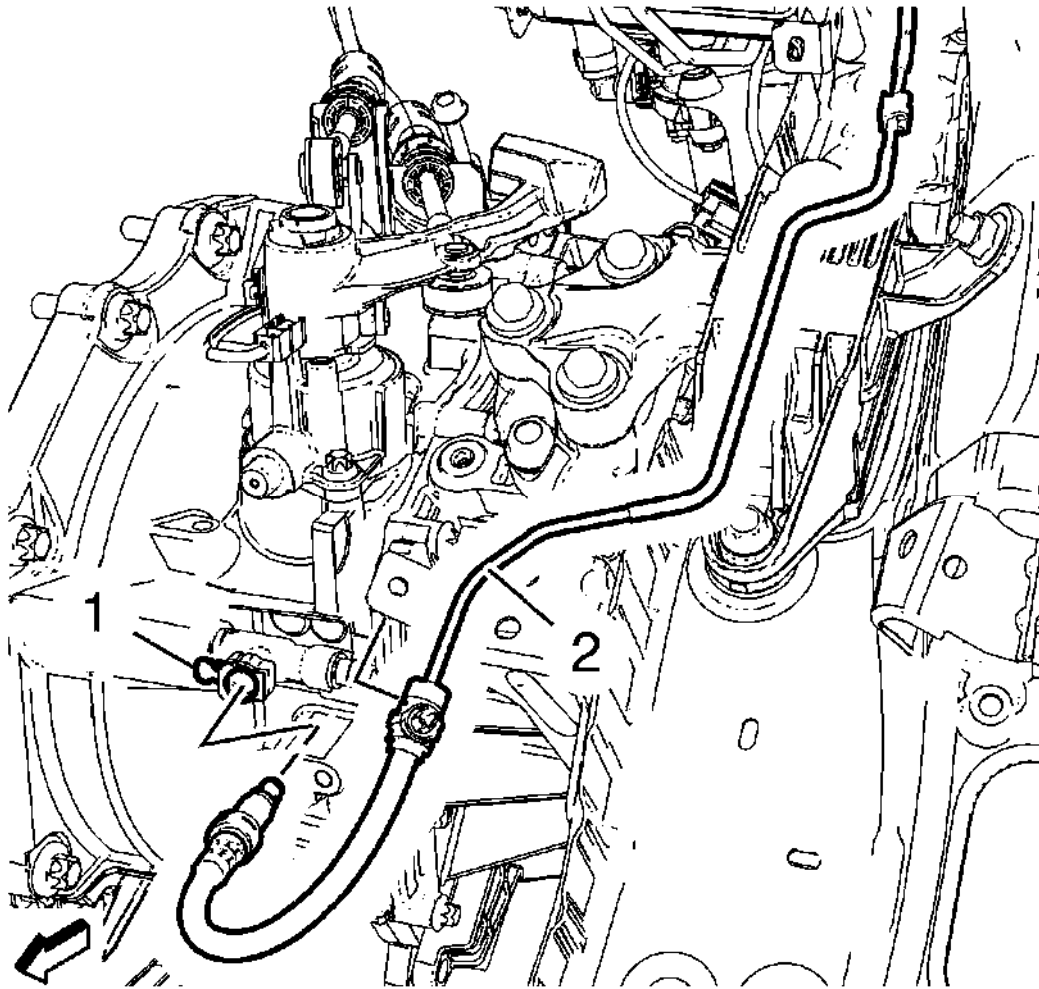


Fig. 22: Clutch Actuator Cylinder Front Pipe And Retainers

Courtesy of GENERAL MOTORS COMPANY

5. Clip clutch actuator cylinder front pipe (2) out of 2 retainers.
6. Open retaining clip (1).
7. Disconnect clutch actuator cylinder front pipe from clutch actuator cylinder pipe elbow.

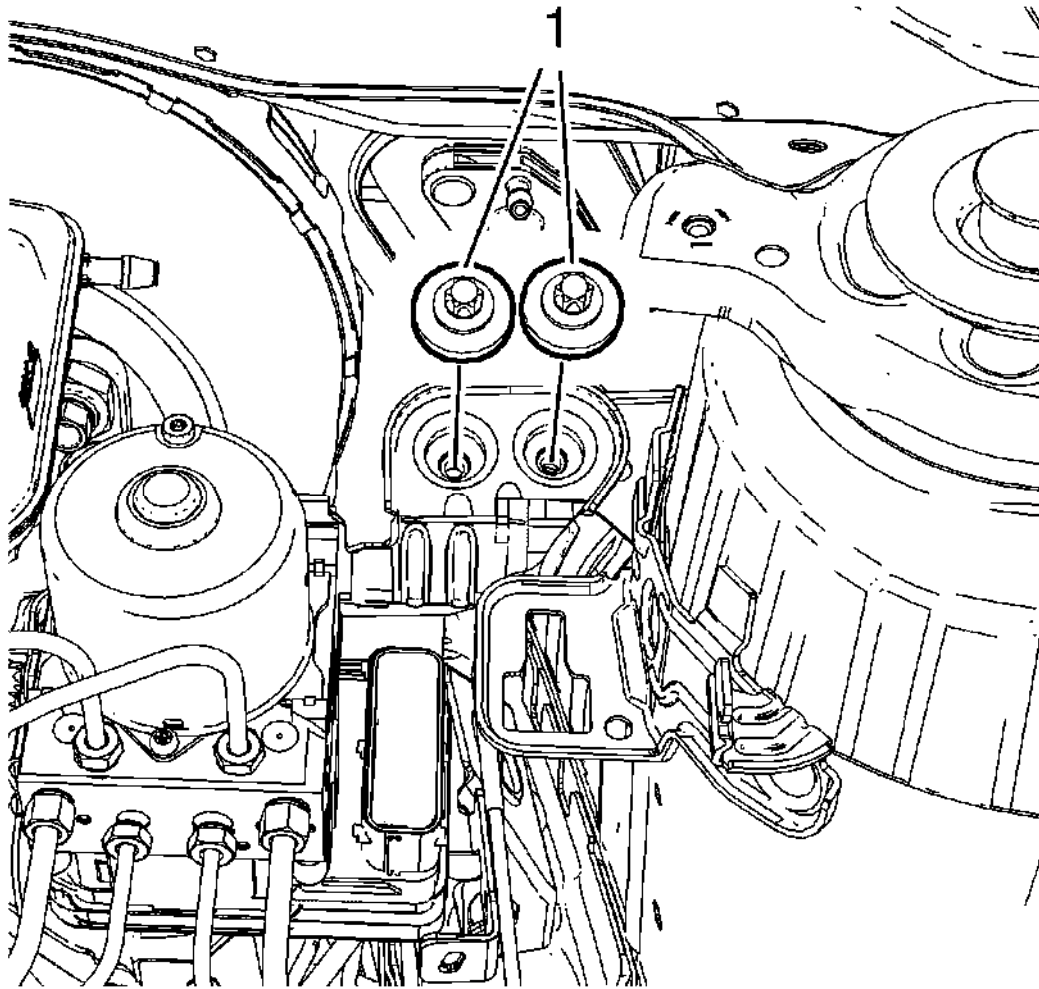


Fig. 23: Brake Pressure Modulator Valve Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

8. Remove 2 brake pressure modulator valve bracket bolts (1).

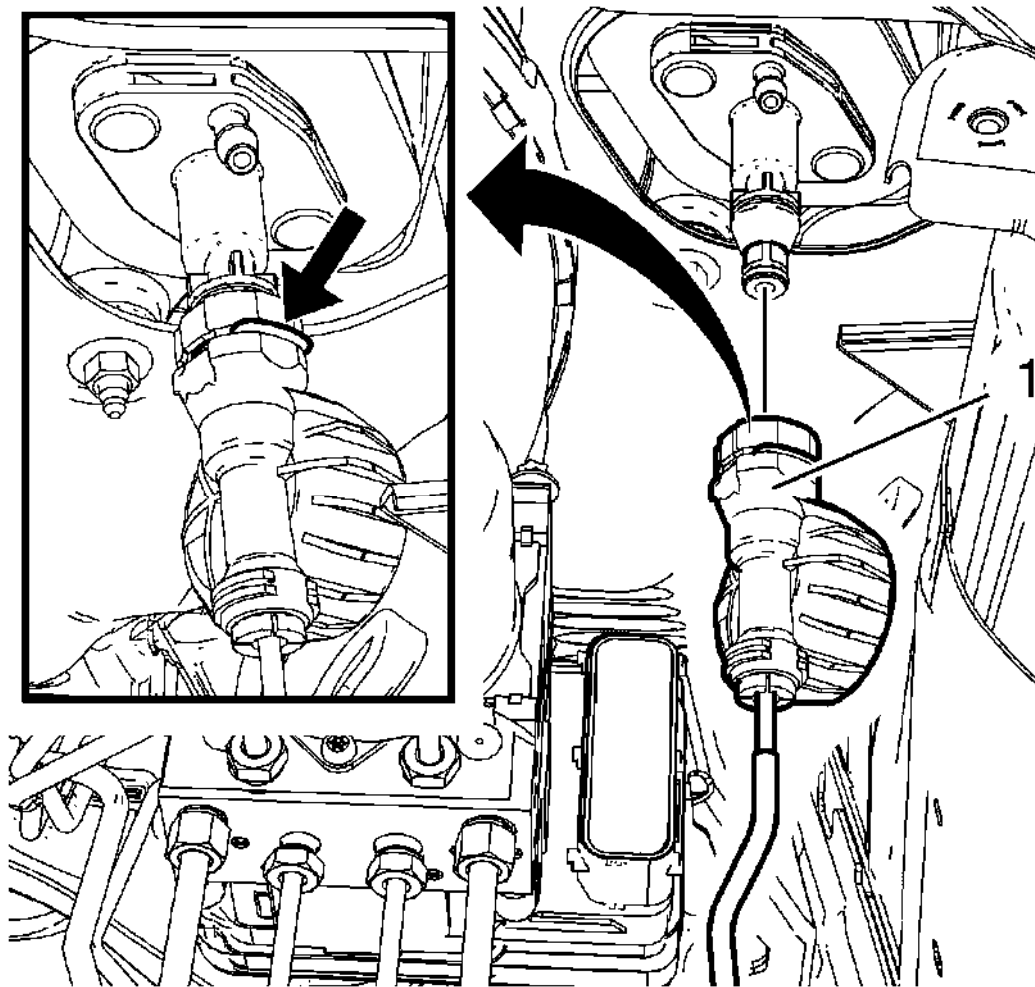


Fig. 24: Clutch Actuator Cylinder Front Pipe And Retaining Clip

Courtesy of GENERAL MOTORS COMPANY

9. Open retaining clip (arrow).
10. Disconnect clutch actuator cylinder front pipe (1) from clutch master cylinder.

NOTE: For removal of clutch actuator cylinder front pipe lift brake pressure modulator valve bracket carefully.

11. Remove clutch actuator cylinder front pipe.

Installation Procedure

NOTE: For installation of clutch actuator cylinder front pipe lift brake pressure modulator valve bracket carefully.

1. Install clutch actuator cylinder front pipe.

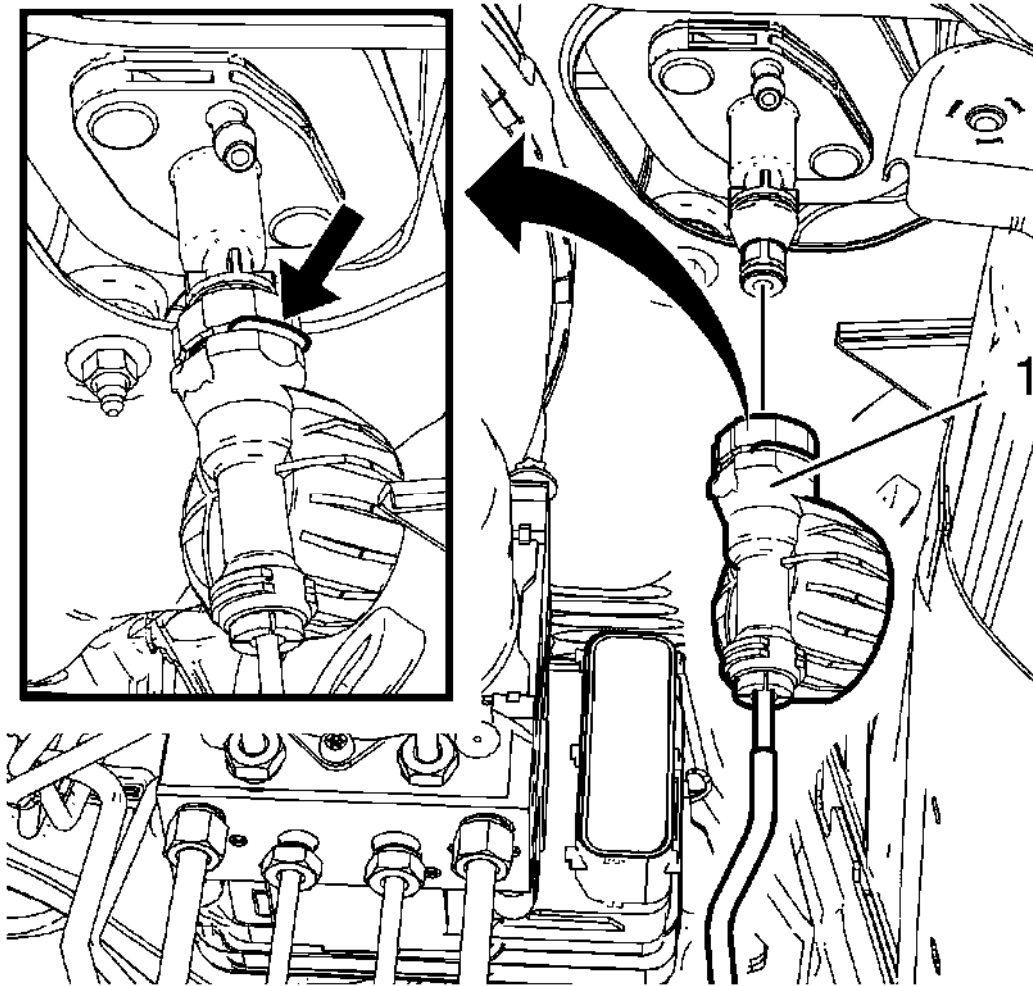


Fig. 25: Clutch Actuator Cylinder Front Pipe And Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

2. Connect clutch actuator cylinder front pipe (1) to clutch master cylinder.
3. Close retaining clip (arrow).

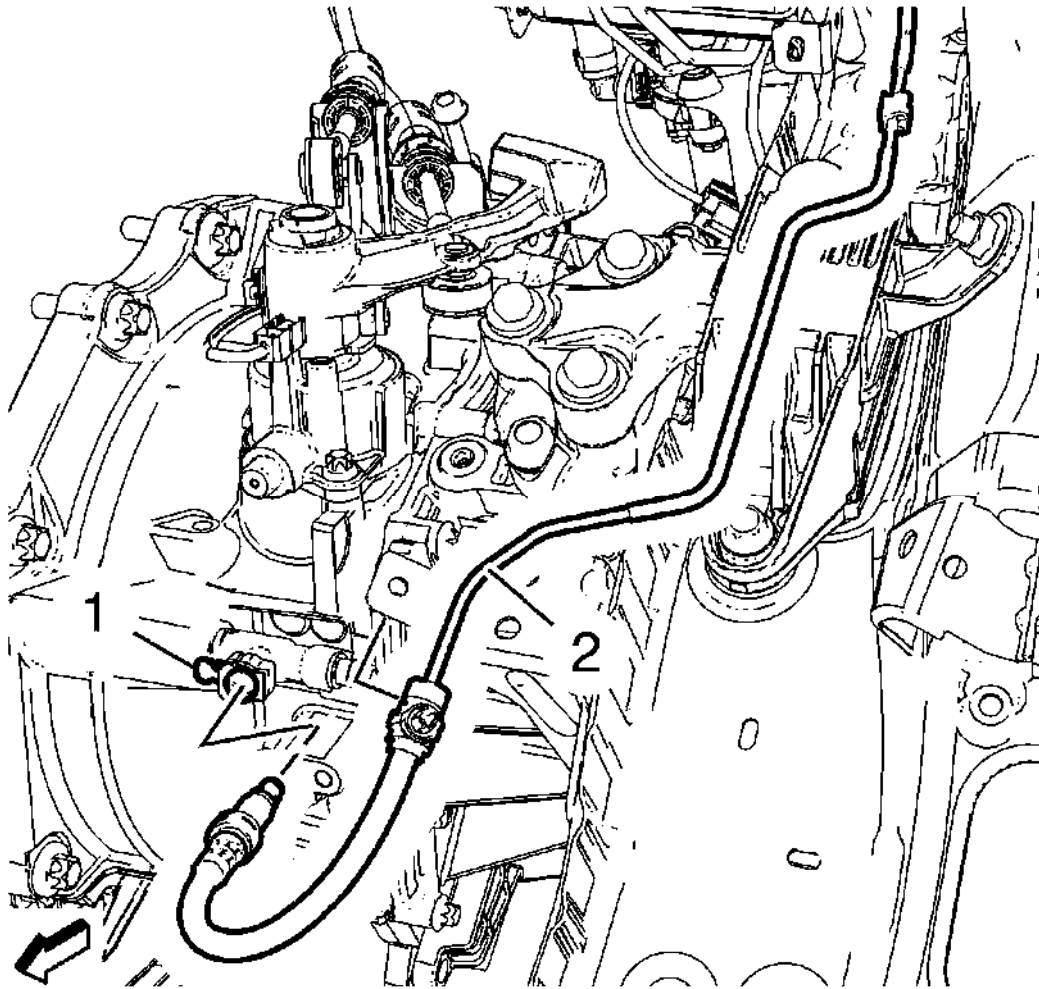


Fig. 26: Clutch Actuator Cylinder Front Pipe And Retainers

Courtesy of GENERAL MOTORS COMPANY

4. Connect clutch actuator cylinder front pipe (2) to clutch actuator cylinder pipe elbow.
5. Close retaining clip (1).
6. Clip clutch actuator cylinder front pipe into 2 retainers.

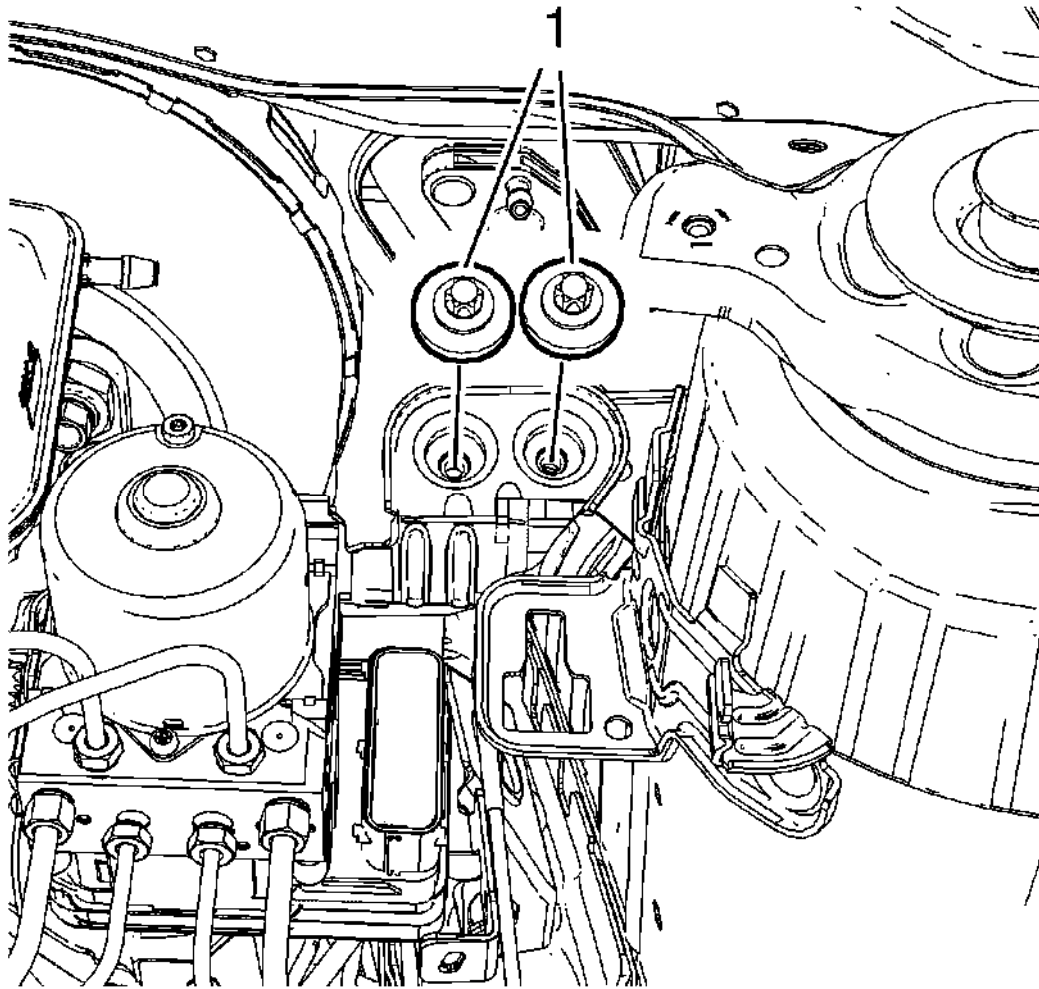


Fig. 27: Brake Pressure Modulator Valve Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

7. Install 2 brake pressure modulator valve bracket bolts (1) and tighten to 20 N.m (15 lb ft).

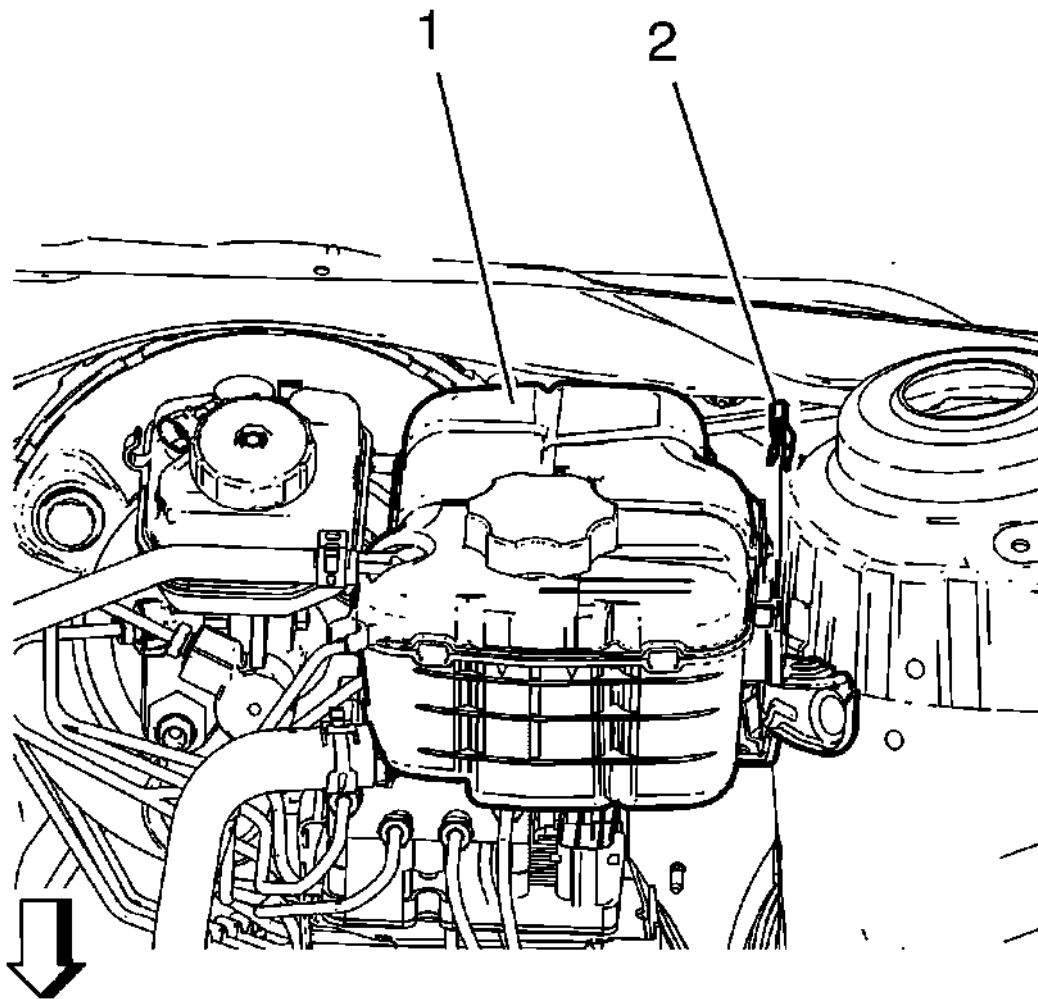


Fig. 28: View Of Radiator Surge Tank And Radiator Surge Tank Clip
Courtesy of GENERAL MOTORS COMPANY

8. Install radiator surge tank (1).
9. Install radiator surge tank clip (2).
10. Bleed hydraulic clutch system. Refer to **Hydraulic Clutch System Bleeding**.
11. Install battery tray. Refer to **Battery Tray Replacement** .

HYDRAULIC CLUTCH SYSTEM BLEEDING

Procedure

WARNING: Refer to **Brake Fluid Irritant Warning** .

CAUTION: Refer to **Brake Fluid Effects on Paint and Electrical Components Caution** .

NOTE: Only use brake fluid DOT 3. The hydraulic clutch actuation must now only be bled from "below", i.e. from the bleeder valve. A brake bleeder must be used for this purpose - see " Workshop Equipment" catalogue. Manual bleeding is no longer permissible. Observe manufacturer's instructions before using brake bleeder. The brake bleeder must be set to an operating pressure of approximately 2 bar.

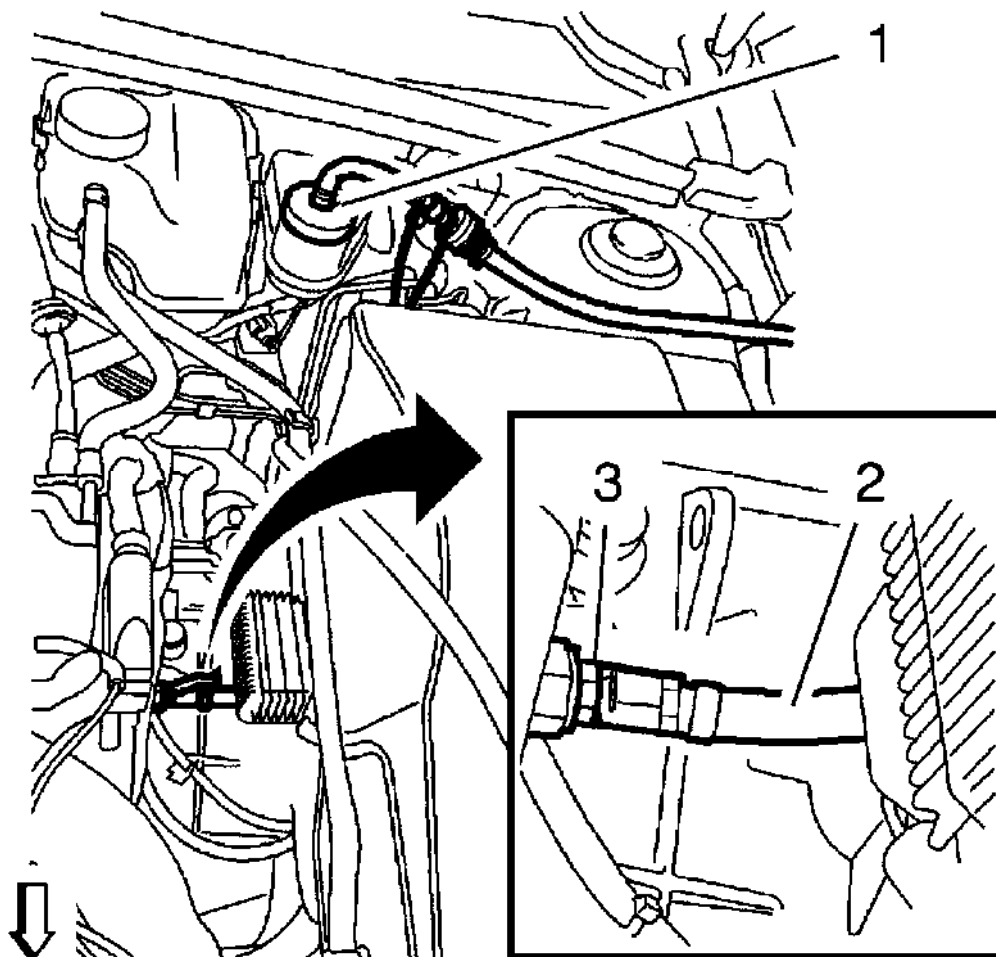


Fig. 29: Brake Bleeder And Brake Fluid Reservoir
Courtesy of GENERAL MOTORS COMPANY

1. Attach brake bleeder.
 - Screw adapter (1) for corresponding brake bleeder onto brake fluid reservoir.

NOTE: Insert hose end in suitable brake fluid collecting basin.

- - Disconnect valve cap from bleeder valve.
 - Connect bleeder hose (2) to bleeder valve (3).
2. Bleed clutch.
 - Switch on brake bleeder.
 - Open bleeder valve 2-3 turns.
 - Bleed until brake fluid escapes without bubbles at hose.
 - Close bleeder valve hand tight.
 3. Detach brake bleeder.
 - Detach adapter from brake fluid reservoir.
 - Push valve cap onto bleeder valve to protect the bleeder valve.

NOTE: **The following operational stages must be undertaken to fill the pressure line between the transmission housing and the central release. When bleeding, ensure that the brake fluid reservoir is always filled up sufficiently and does not run dry.**

-
4. Bleed pressure line between transmission housing and central release.
 - Press and hold clutch pedal.
 - Open bleeder valve until air or air/brake fluid mixture emerges.
 - Close bleeder valve hand tight.

NOTE: **Do not close the bleeder valve too fast.**

- Release clutch pedal as far as the stop at normal speed.
 - Wait approximately 5 seconds.
 - Repeat this bleeding process 4 times.
 - Tighten bleeder valve.
 - Detach bleeder hose.
 - Push valve cap on to bleeder valve to protect the bleeder valve.
5. Connect bleeder hose to bleeder valve, place free end in a suitable connecting container.
 6. Top up brake fluid reservoir.
 - Fill brake fluid reservoir up to "MAX" marking.
 - Install brake fluid reservoir.
 7. Check the actuation pressure of the clutch pedal. Ensure that the clutch pedal is not spongy and that there is sufficient clutch pedal reserve (more than 13 mm (0.5 in)).
 8. Check shifting for ease of movement with vehicle stationary, with engine running and with clutch disengaged.
 9. Road test the vehicle to ensure proper operation.

Undertake road test using varying RPM ranges and frequent gear changes, bring vehicle to operating temperature during this process. Ensure the brake and clutch system is operating correctly.

CLUTCH PEDAL POSITION SENSOR REPLACEMENT

Removal Procedure

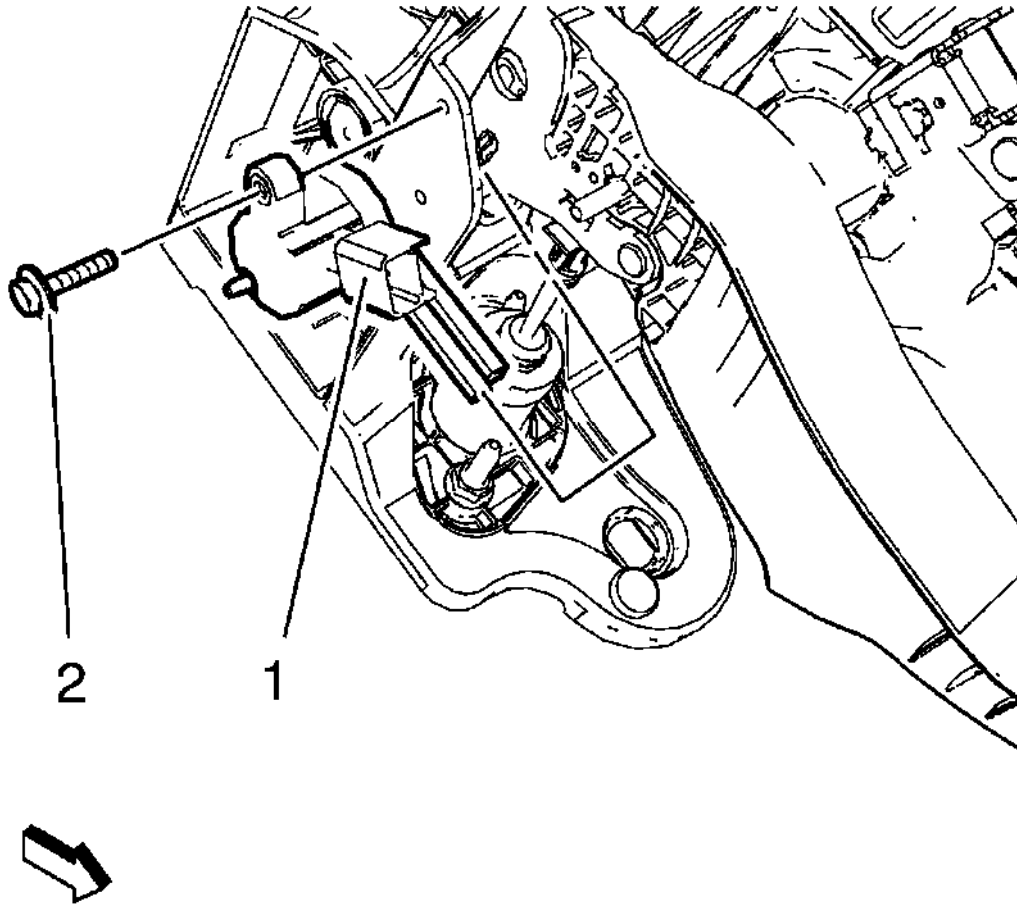


Fig. 30: Clutch Pedal Position Sensor And Bolt
Courtesy of GENERAL MOTORS COMPANY

1. Disconnect the clutch pedal position sensor wiring harness plug.
2. Remove the clutch pedal position sensor bolt (2).
3. Remove the clutch pedal position sensor (1).

Installation Procedure

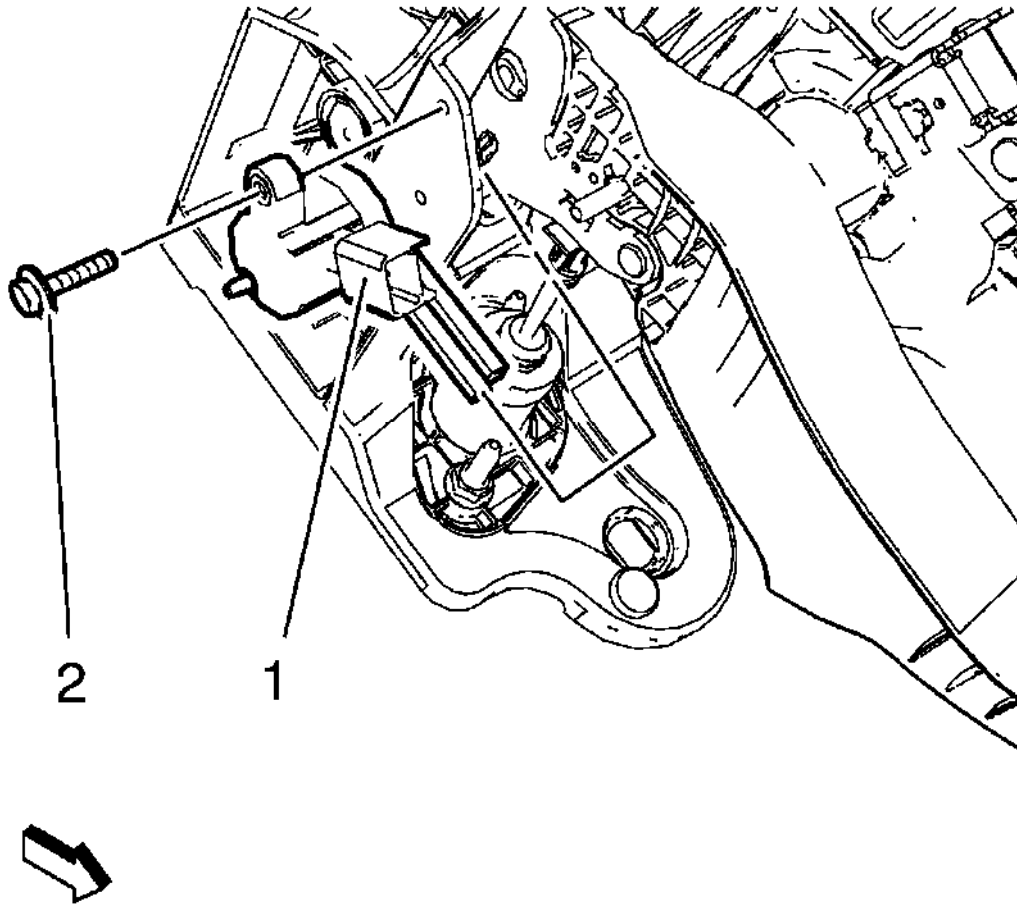


Fig. 31: Clutch Pedal Position Sensor And Bolt
Courtesy of GENERAL MOTORS COMPANY

1. Install the clutch pedal position sensor (1).

CAUTION: Refer to **Fastener Caution** .

2. Install the clutch pedal position sensor bolt (2) and tighten to 3 N.m(27 lb in).
3. Connect the clutch pedal position sensor wiring harness plug.
4. Learn clutch pedal position sensor, refer to **Clutch Pedal Position Sensor Learn** .

CLUTCH PRESSURE AND DRIVEN PLATE REPLACEMENT (1.4L LUV)

Special Tools

- DT-6263 Remover / Installer
- DT-6263-27 Clutch Center Guide
- EN-652 Flywheel Holder

For equivalent tools, refer to **Special Tools**.

Removal Procedure

NOTE:

- To prevent damage to the spring fangs of pressure plate use DT-6263 remover / installer to remove and install clutch pressure plate.
- Note the different lengths of the brackets for attaching DT-6263 remover / installer to lower engine block.

1. Remove the transmission. Refer to **Transmission Replacement** .

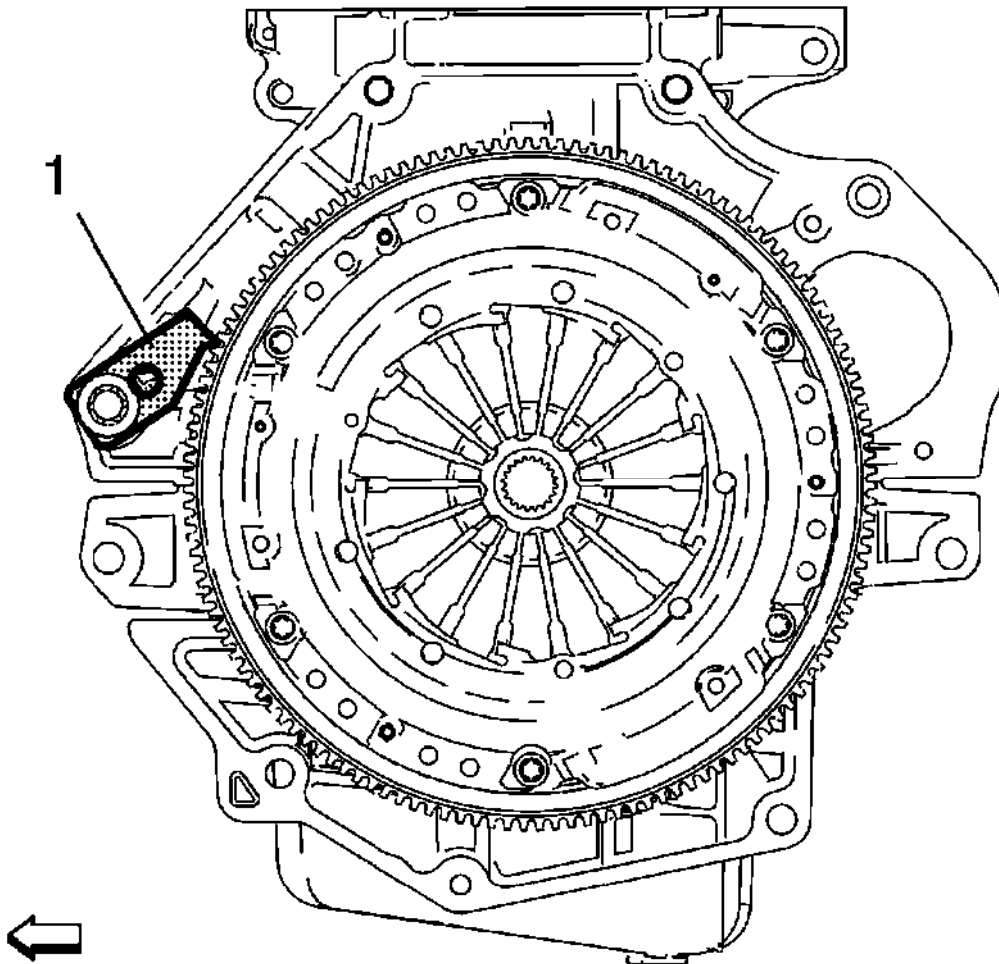


Fig. 32: Flywheel Holder Tool

Courtesy of GENERAL MOTORS COMPANY

2. Install the EN-652 holder (1) to the engine block.

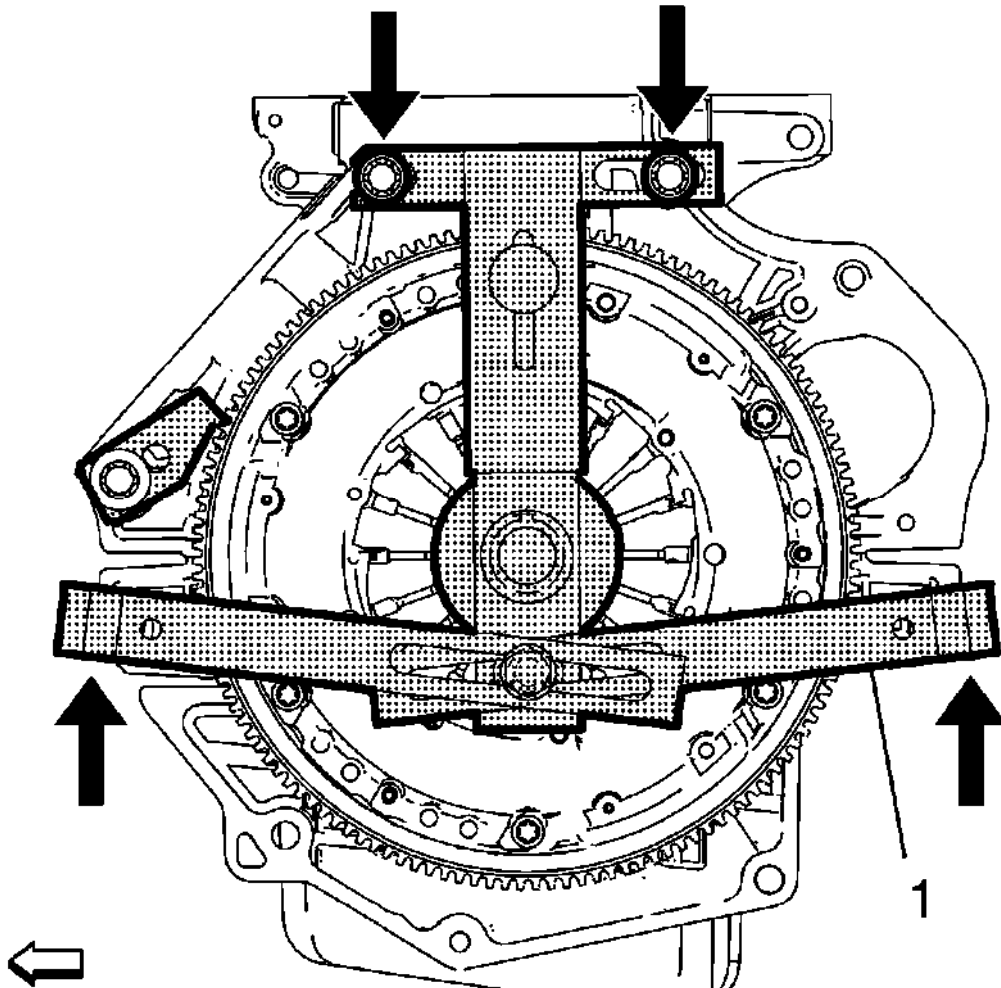


Fig. 33: Special Engine Block Brace Tool

Courtesy of GENERAL MOTORS COMPANY

3. Attach the DT-6263 remover / installer (1) in conjunction with the DT-6263-1 brace to the engine block.
4. Install the 4 bolts (arrows) to the engine block, but do not tighten yet.

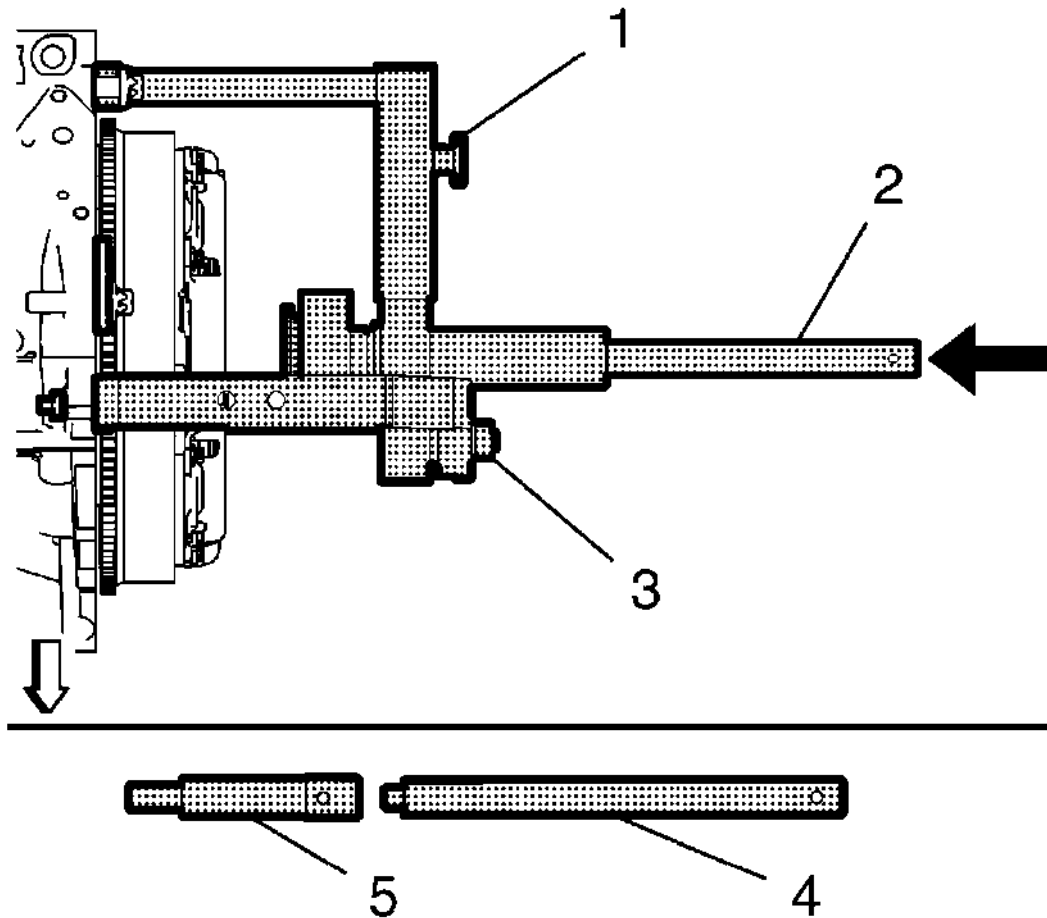


Fig. 34: Special Tools

Courtesy of GENERAL MOTORS COMPANY

5. Attach the **DT-6263-27** guide to the **DT-6263-30** drift (4).
6. Fasten the **DT-6263** remover / installer.
 1. Align the **DT-6263-30** centering drift (2) in conjunction with the clutch center guide through the **DT-6263** remover / installer into the clutch driven plate and crankshaft center (arrow).
 2. Tighten the knurled wheel (1).
 3. Tighten the bolt (3).
 4. Tighten the 4 bolts installing the **DT-6263** remover / installer to the engine block.

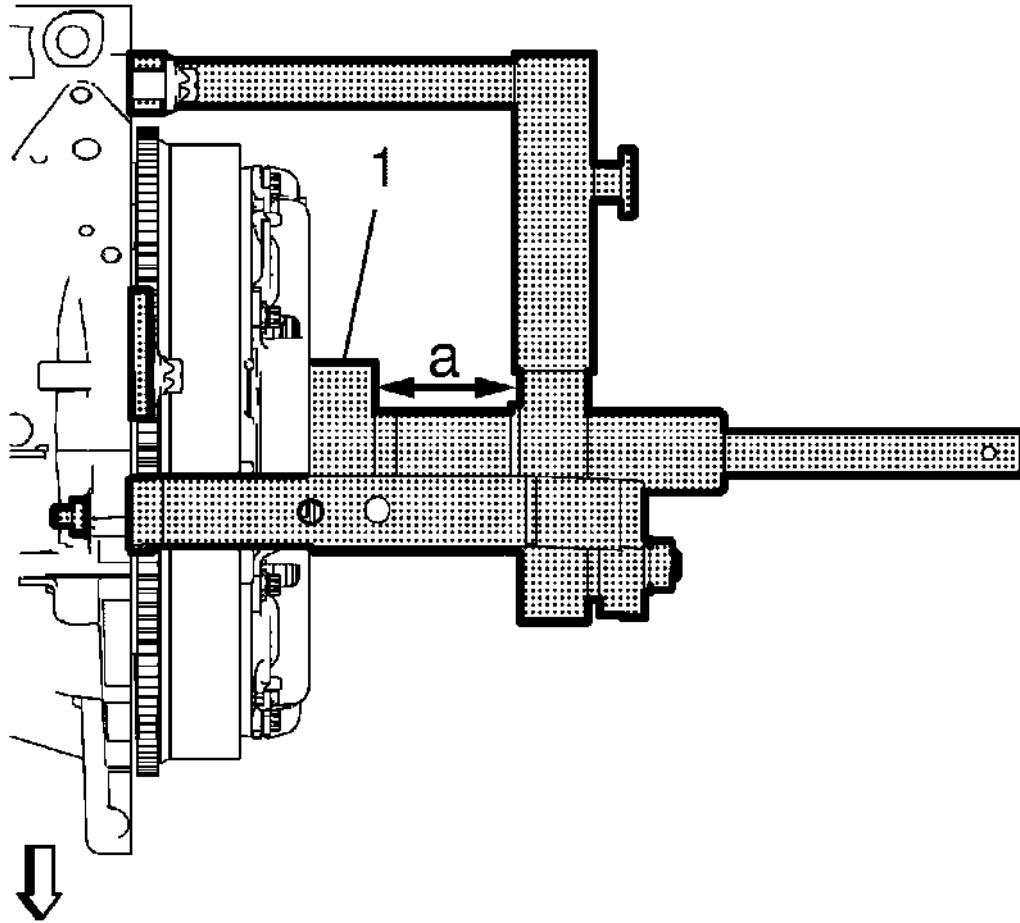


Fig. 35: Clutch Removal/Installation Tool

Courtesy of GENERAL MOTORS COMPANY

7. Preload the clutch springs, using the **DT-6263** remover / installer.
 1. Turn the threaded rod (1) until it rests against the spring tangs of the clutch pressure plate.
 2. Measure the distance a.

NOTE: Do NOT turn further than necessary to gain free movement of the clutch disc.

3. Turn the threaded rod clockwise until the distance a is extended by approximate 8 mm (0.31 in).
4. Check for free movement of the clutch disc.

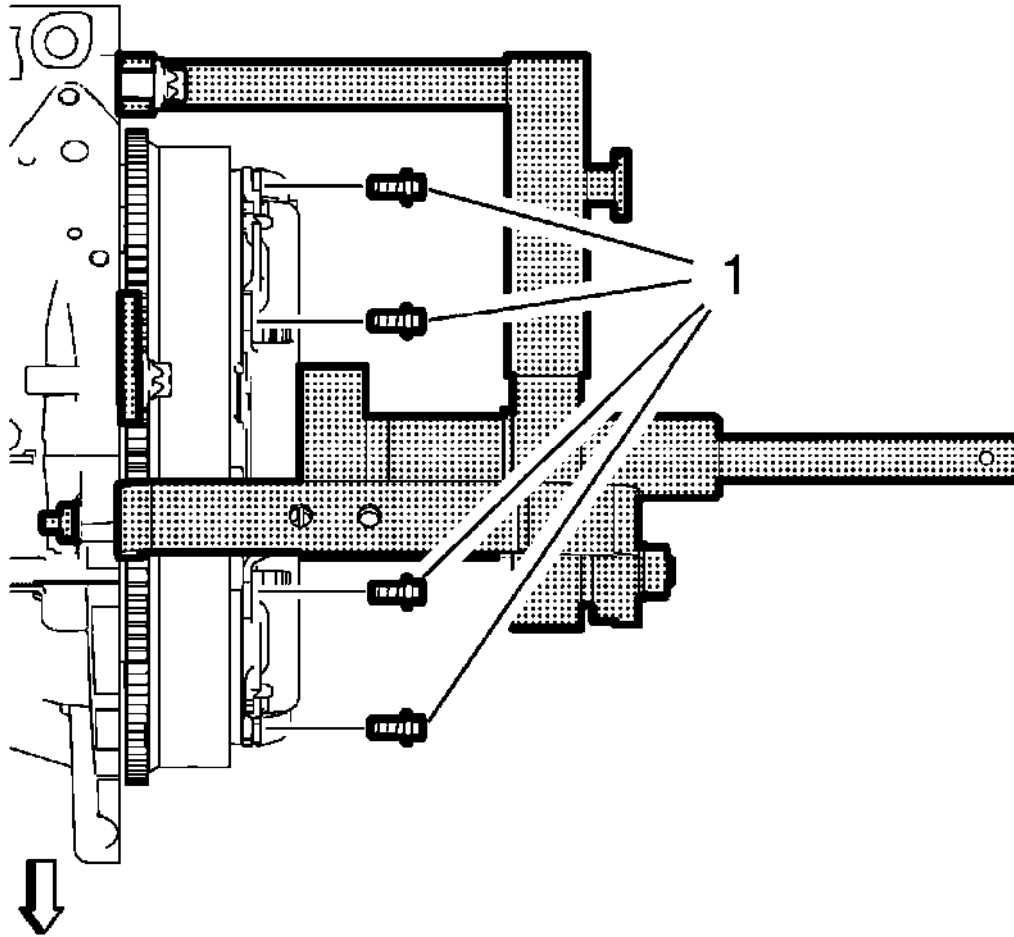


Fig. 36: Clutch Pressure Plate Bolts

Courtesy of GENERAL MOTORS COMPANY

NOTE: Ascertain if bolt was assembled with thread lock agent.

8. Remove and DISCARD the 6 clutch pressure plate bolts (1).

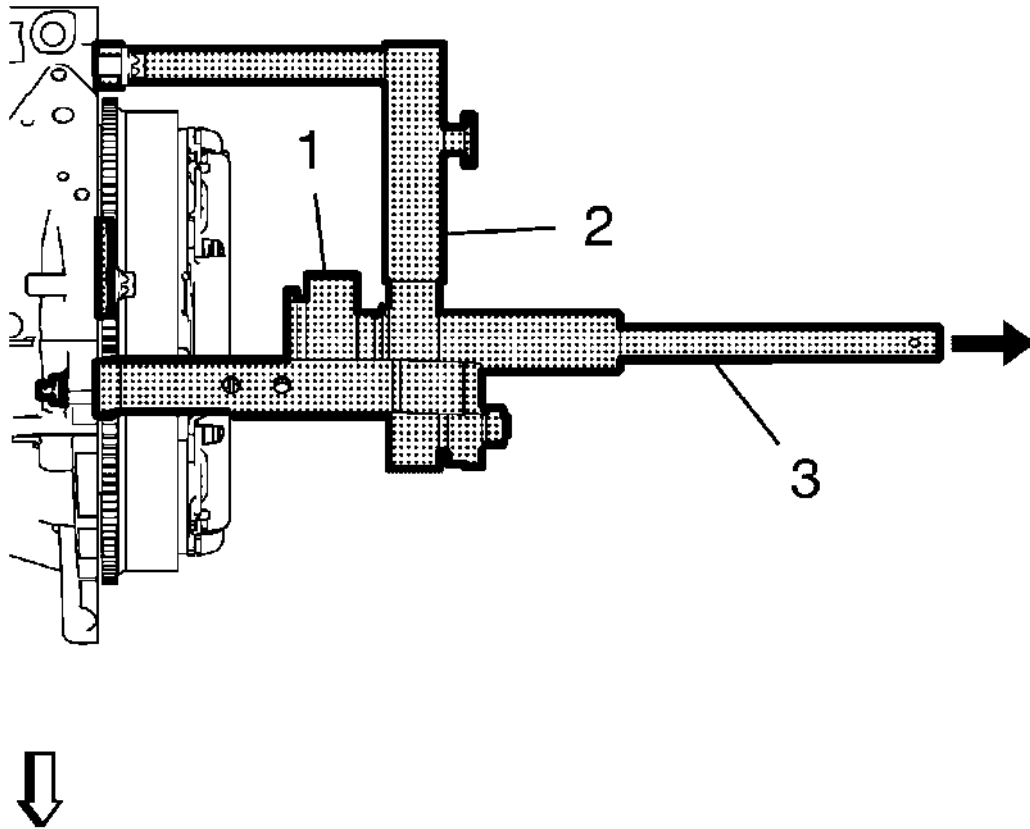


Fig. 37: Special Remover/Installer Tools
Courtesy of GENERAL MOTORS COMPANY

9. Release the **DT-6263** remover / installer (2).
 1. Turn the threaded rod (1) of the **DT-6263** remover / installer counterclockwise to the stop.
 2. Remove the **DT-6263-30** centering drift (3) in conjunction with the clutch center guide (arrow).

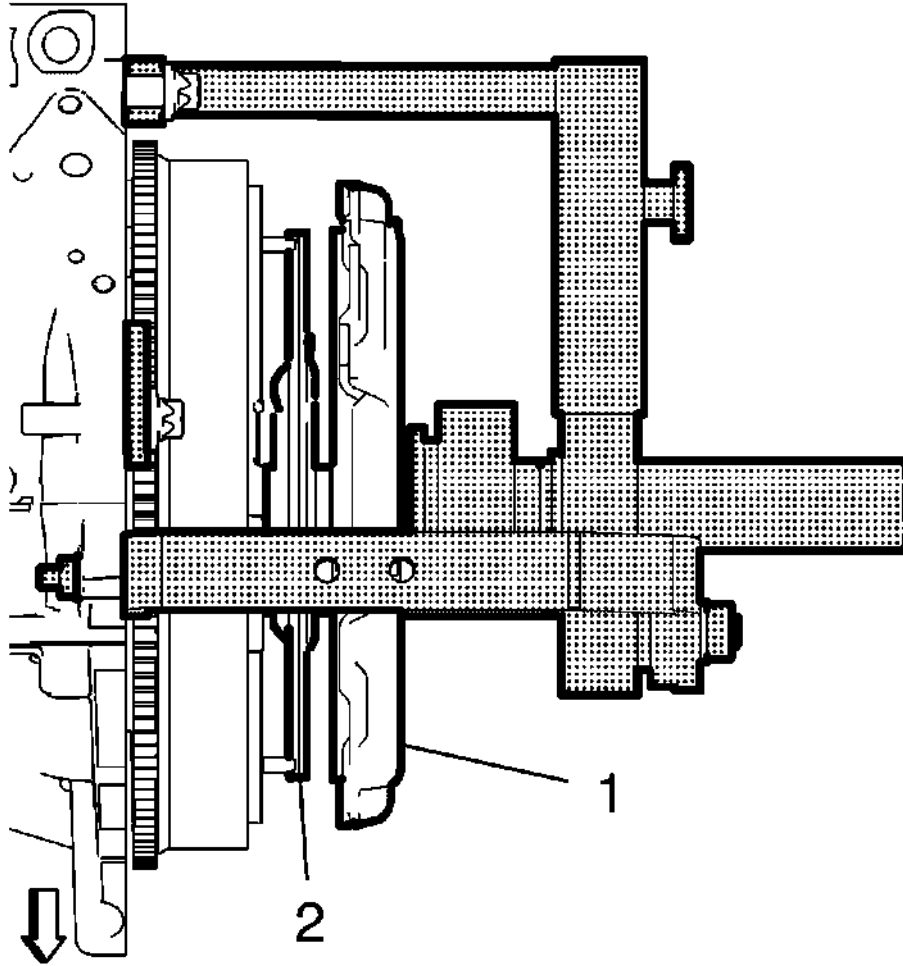


Fig. 38: Clutch Pressure Plate And Driven Plate
Courtesy of GENERAL MOTORS COMPANY

10. Remove the clutch pressure plate (1) and the driven plate (2).

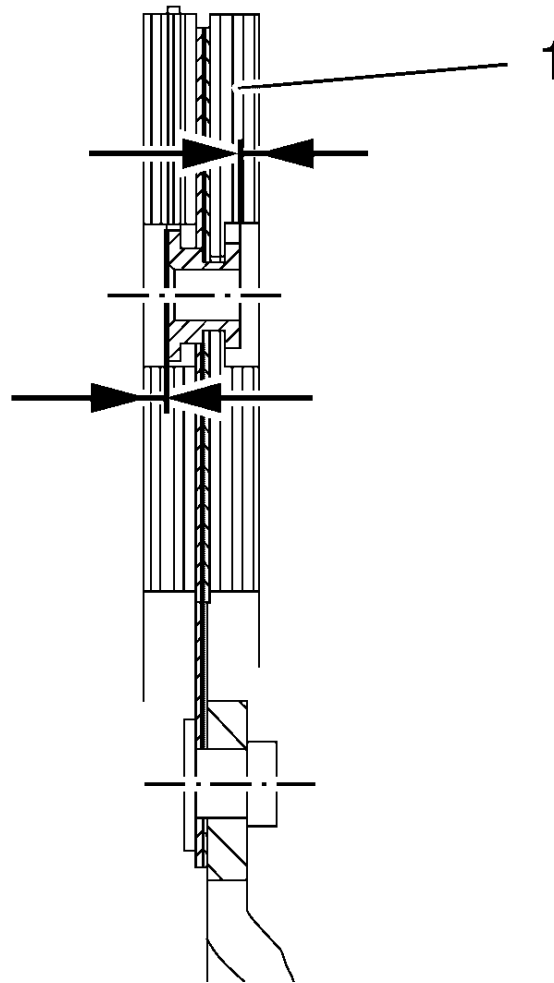


Fig. 39: Clutch Pressure Plate And Driven Plate Inspection Points

Courtesy of GENERAL MOTORS COMPANY

NOTE: Clutch pressure plate and driven plate contaminated by foreign bodies (oil, cleaning agent etc.) have to be replaced. Check clutch driven plate for damage and friction rust in the hub profile and replace if necessary. Do not clean clutch pressure plate and driven plate with a high pressure cleaner or component washing machine.

11. Inspect the clutch pressure plate and the driven plate (1) and replace, if necessary.

Inspect for:

- Excessive wear
- Burned friction surface
- Oil on friction surface

- Damaged spline hub
- Damaged springs

NOTE: The clutch driven plate has to be replaced if the lining projection is less than 0.5 mm (0.020 in) (arrows).

12. Inspect the projection of lining at the clutch lining rivets.
13. Slide the clutch pressure plate onto the transmission input shaft and check for easy movement.

Installation Procedure

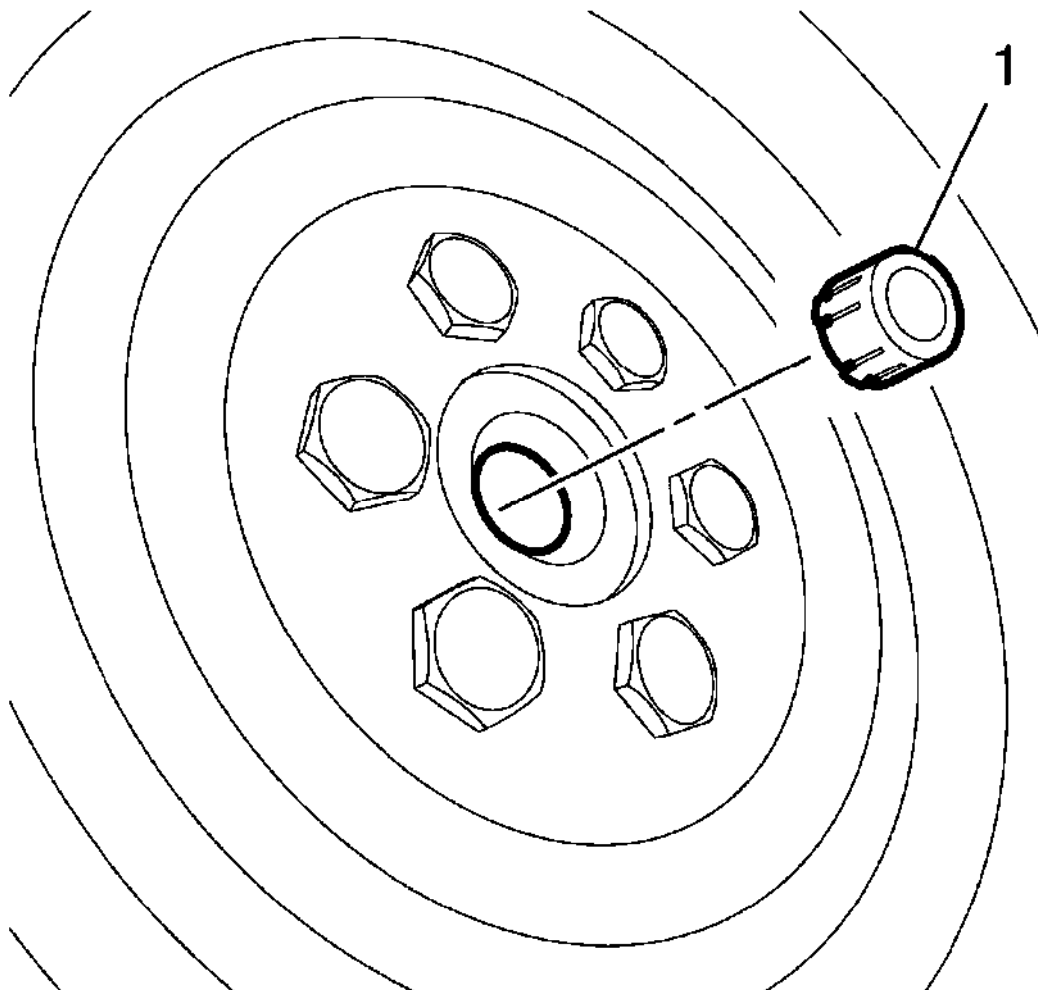


Fig. 40: Clutch Bolt Bushing

Courtesy of GENERAL MOTORS COMPANY

1. Install the bushing (1) to the crankshaft. The bushing stays in the crankshaft. For the correct bushing refer to the electronic parts catalog.

2. Re-cut the 6 clutch pressure plate bolt threads.

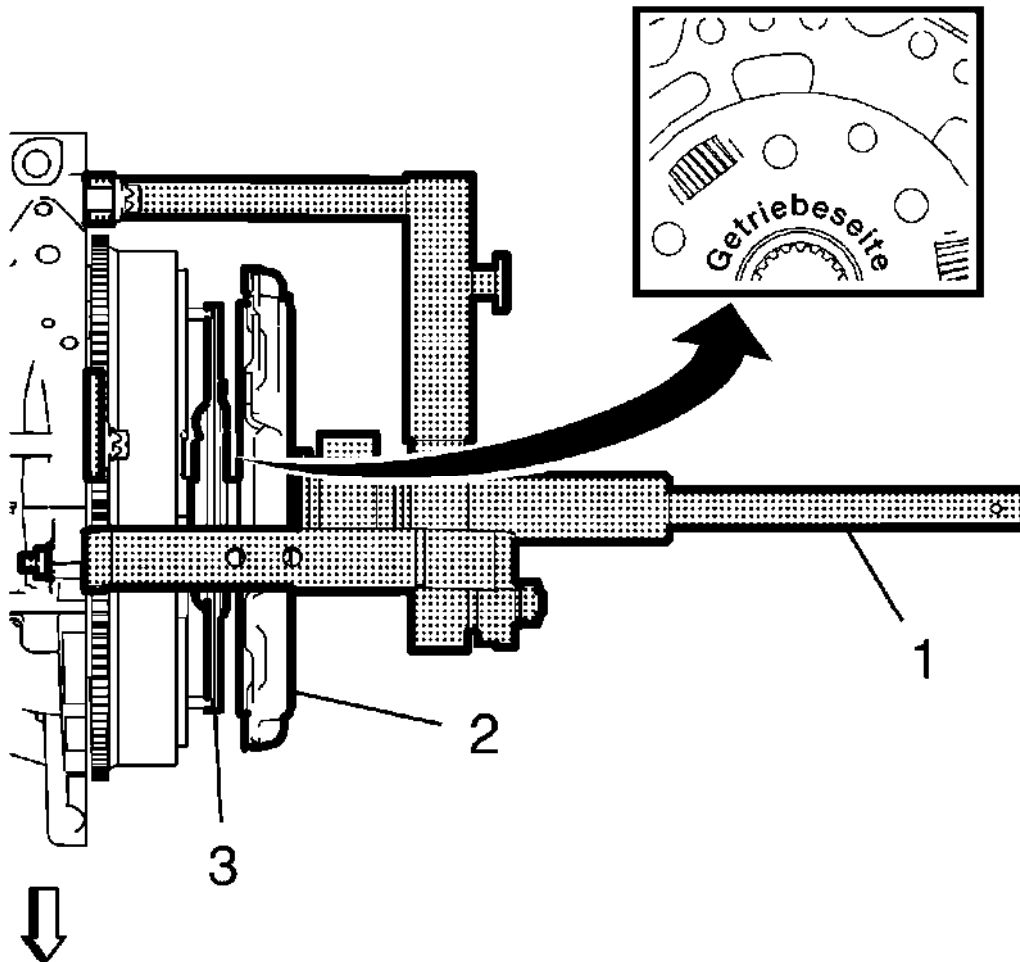


Fig. 41: Clutch Drive Plate

Courtesy of GENERAL MOTORS COMPANY

NOTE: The clutch drive plate must be installed so that the German lettering "Getriebe-seite" (means Gearbox-side) on the plate is orientated towards the transmission.

3. Install the clutch driven plate (3) and the clutch pressure plate (2).

Center the clutch driven plate, using the **DT-6263-30** centering drift (1) in conjunction with the clutch center guide.

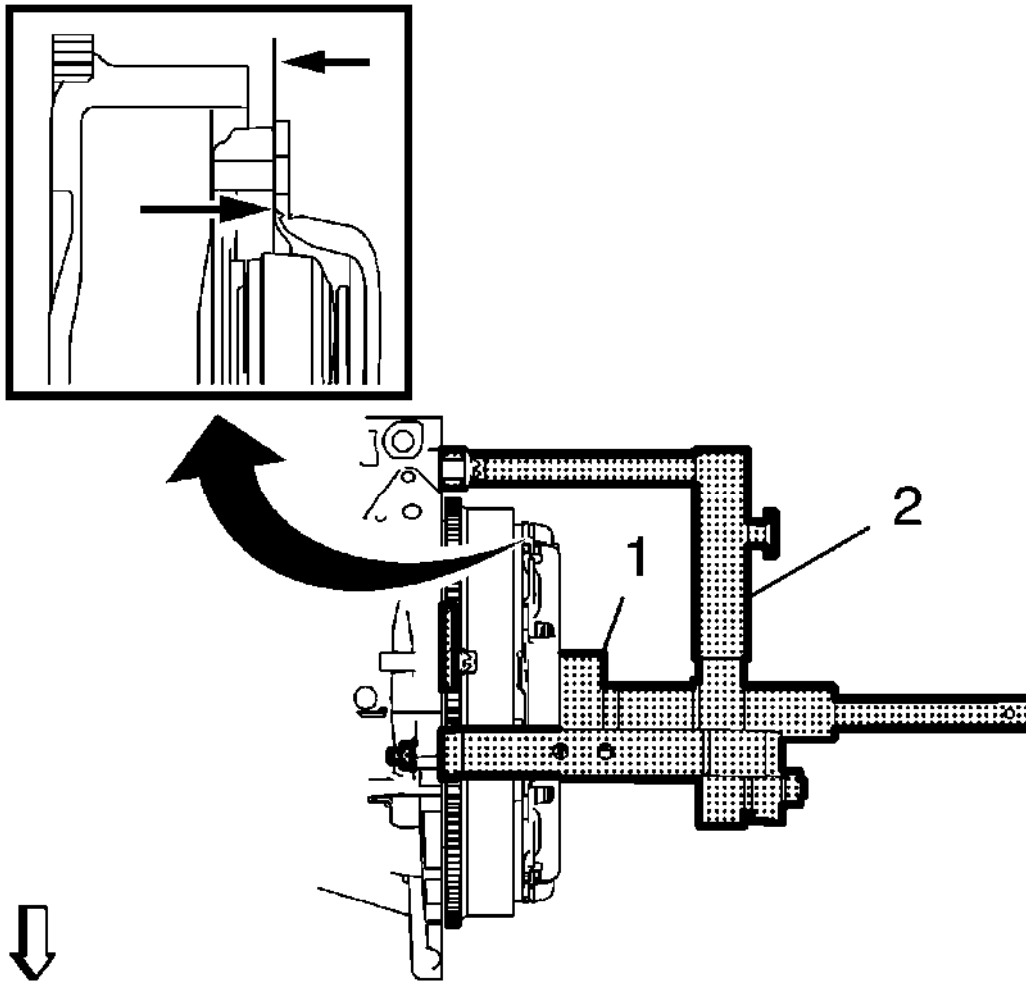


Fig. 42: Preload The Clutch Springs Using Special Tools
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do NOT turn further than necessary.

4. Preload the clutch springs, using the **DT-6263** remover / installer (2).

Turn the threaded rod (1) clockwise until the pressure plate contacts the flywheel (arrows).

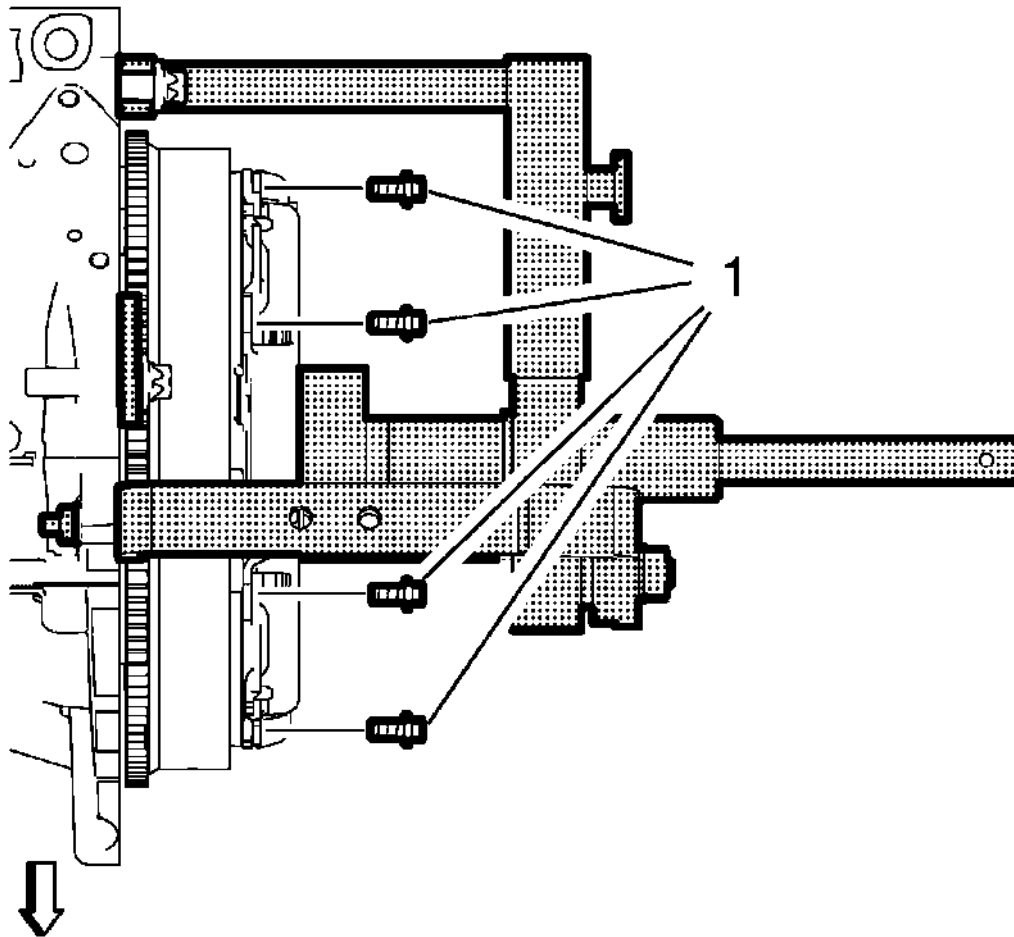


Fig. 43: Clutch Pressure Plate Bolts

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

NOTE: In the case that the clutch pressure plate bolts were assembled with thread lock agent: Service may offer bolts that are not microencapsulated. If this is the case apply thread lock agent to the bolt. If fastener is microencapsulated, install NEW clutch pressure plate bolts. DO NOT reuse the old bolt.

5. Install the 6 NEW clutch pressure plate bolts (1). For the correct bolts refer to the electronic parts catalog.
6. Tighten the clutch pressure plate bolts to 28 (21 lb ft).

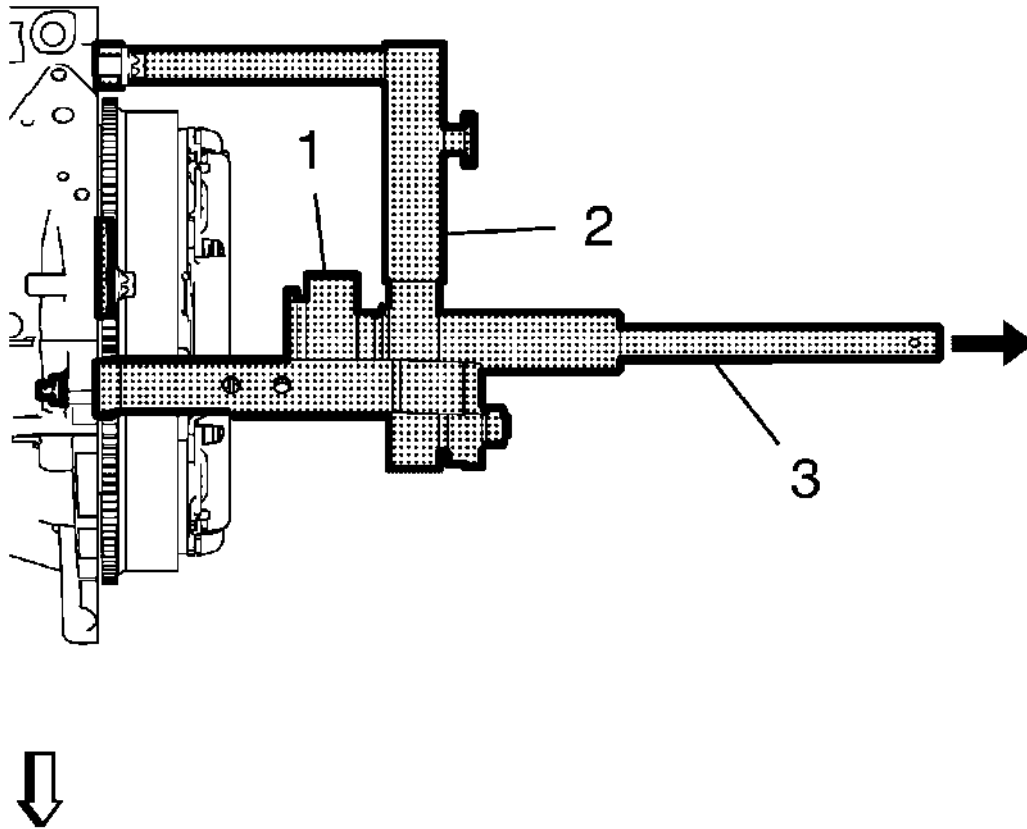


Fig. 44: Special Remover/Installer Tools

Courtesy of GENERAL MOTORS COMPANY

7. Remove the **DT-6263** remover / installer (2) from the engine block.
 1. Turn the threaded rod (1) of the **DT-6263** remover / installer counterclockwise to the stop.
 2. Remove the **DT-6263-30** centering drift (3) in conjunction with the clutch center guide (arrow).
 3. Remove the 4 bolts installing the **DT-6263** remover / installer to the engine block.

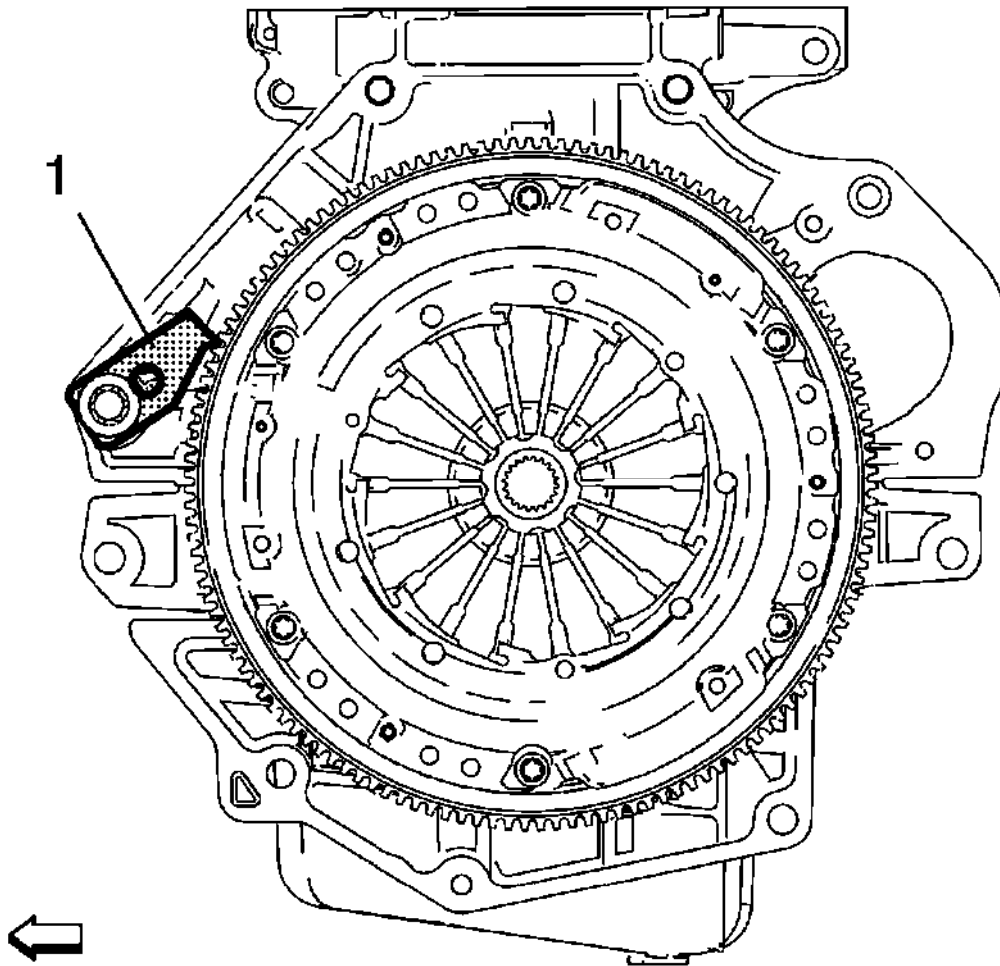


Fig. 45: Flywheel Holder Tool

Courtesy of GENERAL MOTORS COMPANY

8. Remove the **EN-652** holder (1) from the engine block.
9. Install the transmission. Refer to **Transmission Replacement** .

CLUTCH PRESSURE AND DRIVEN PLATE REPLACEMENT (1.8L LUW AND LWE)

Special Tools

- **DT-6263** Remover/Installer
- **DT-6263-27** Clutch Center Guide
- **EN-652** Flywheel Holder

For equivalent regional tools, refer to **Special Tools**.

Removal Procedure

NOTE:

- To prevent damage to the spring fangs of pressure plate use the DT-6263 remover/installer to remove and install the clutch pressure plate.
- Note the different lengths of the brackets for attaching the DT-6263 remover/installer to the lower engine block.

1. Remove the transmission. Refer to Transmission Replacement .

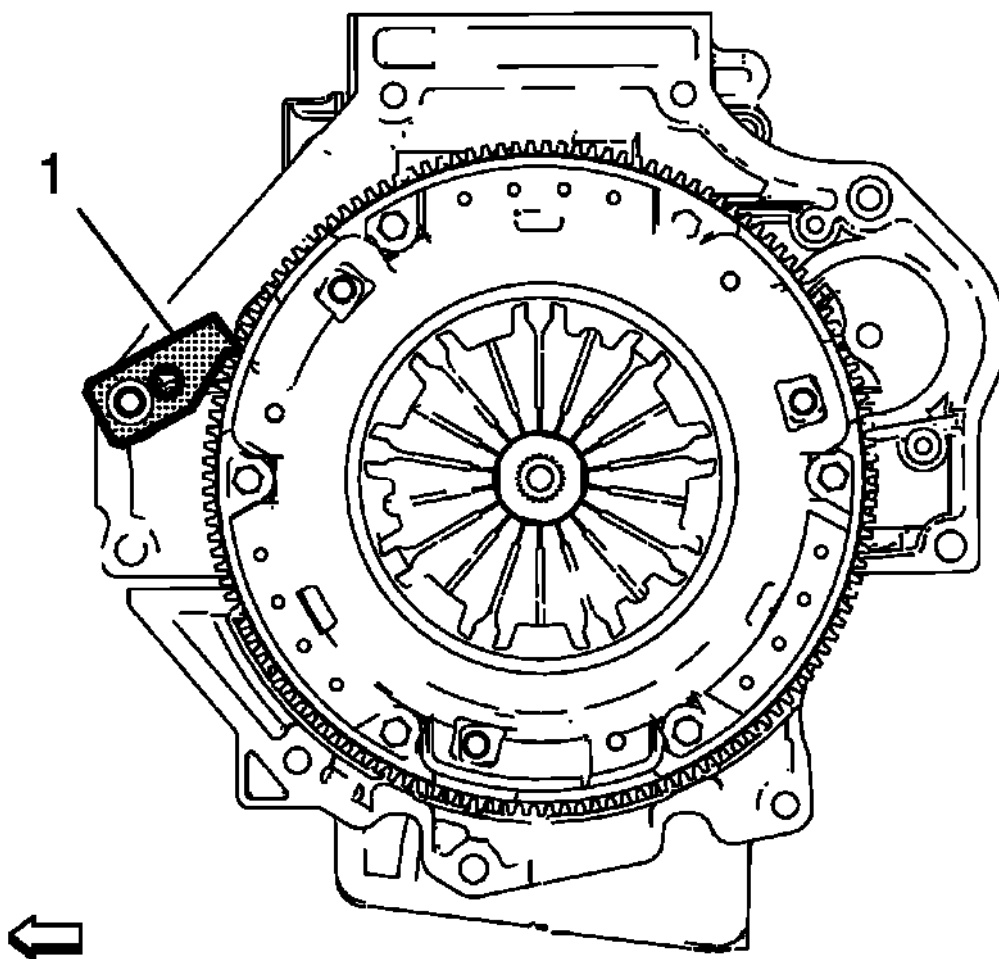


Fig. 46: Flywheel Holding Tool

Courtesy of GENERAL MOTORS COMPANY

2. Install the EN-652 holder (1) to the engine block.

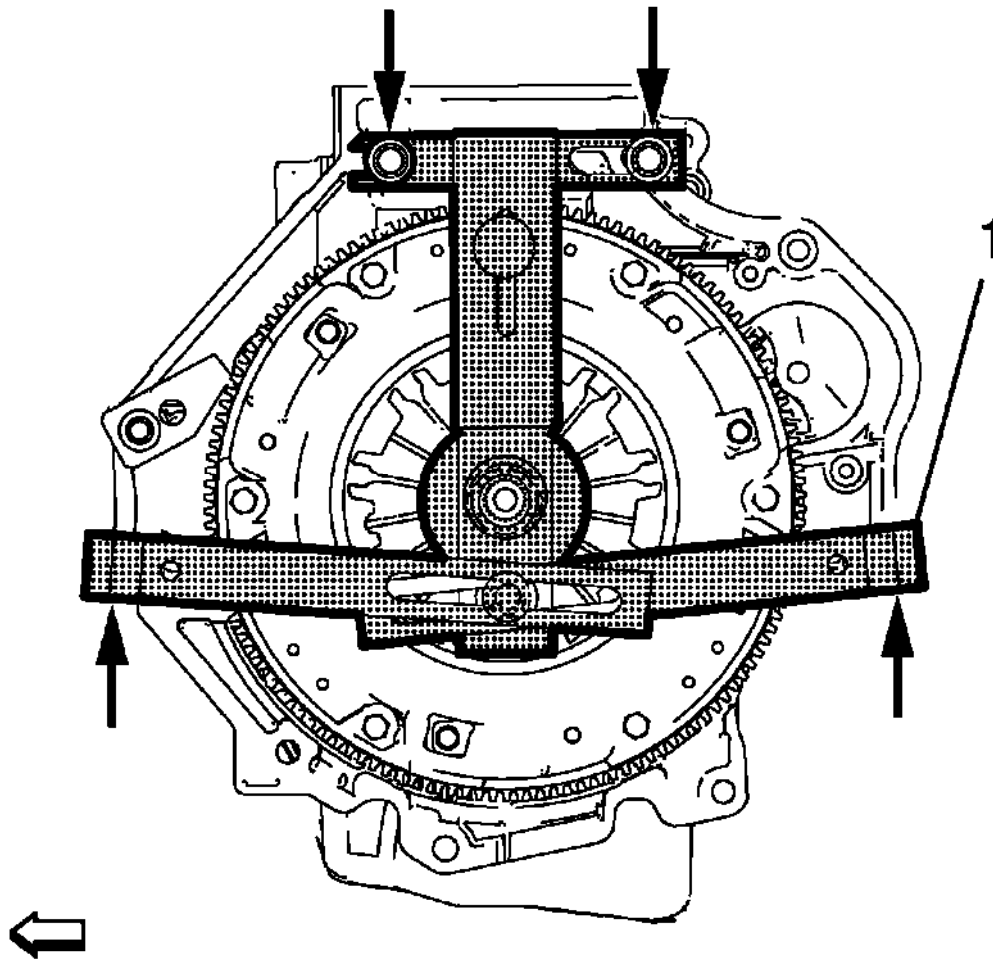


Fig. 47: Engine Support Brace

Courtesy of GENERAL MOTORS COMPANY

3. Install the **DT-6263** remover/installer (1) along with the **DT-6263-1** brace to the engine block.
4. Install the 4 bolts (arrows) to the engine block, but do not tighten yet.

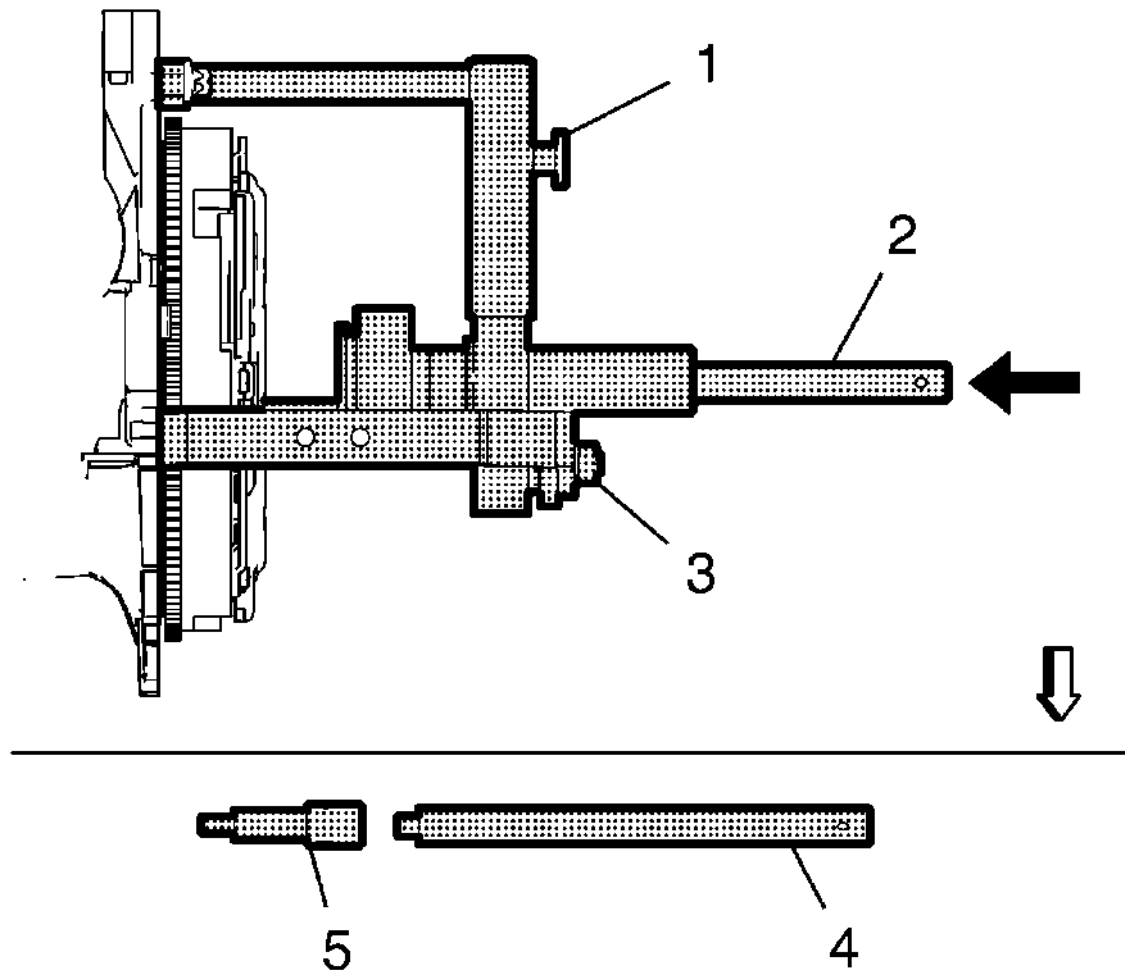


Fig. 48: Center Guide And Drift

Courtesy of GENERAL MOTORS COMPANY

5. Install the **DT-6263-27** center guide (5) to the **DT-6263-30** centering drift (4).
6. Tighten the **DT-6263** remover/installer.
 1. Align the **DT-6263-30** centering drift (2) along with the clutch center guide through the **DT-6263** remover/installer into the clutch driven plate and the crankshaft center (arrow).
 2. Tighten the knurled wheel (1).
 3. Tighten the bolt (3).
 4. Tighten the 4 bolts installing the **DT-6263** remover/installer to the engine block.

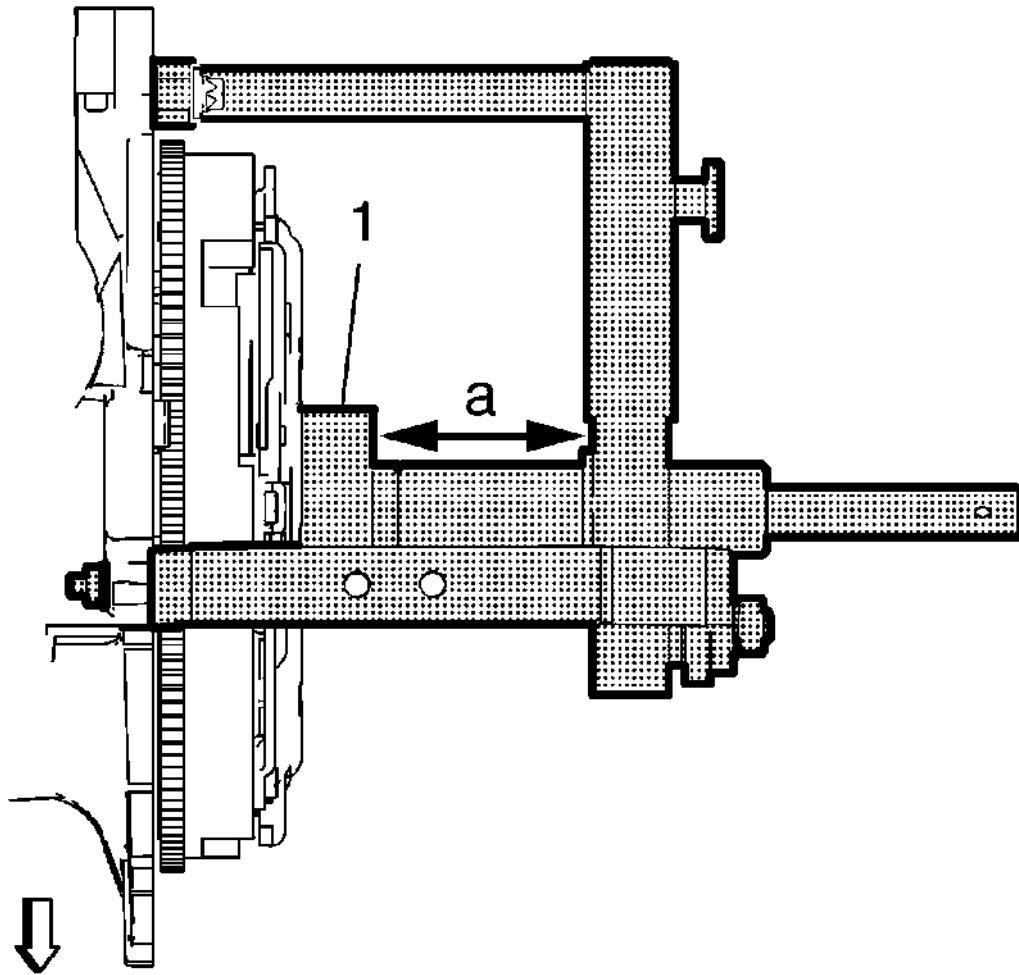


Fig. 49: Measuring Distance "a"

Courtesy of GENERAL MOTORS COMPANY

7. Preload the clutch springs, using the **DT-6263** remover/installer.
 1. Turn the threaded rod (1) until it rests against the spring tangs of the clutch pressure plate.
 2. Measure the distance a.

NOTE: **DO NOT** turn further than necessary to gain free movement of the clutch disc.

- 3.
4. Turn the threaded rod clockwise until the distance a is extended by approximate 8 mm (0.31 lb in).
5. Check for free movement of the clutch disc.

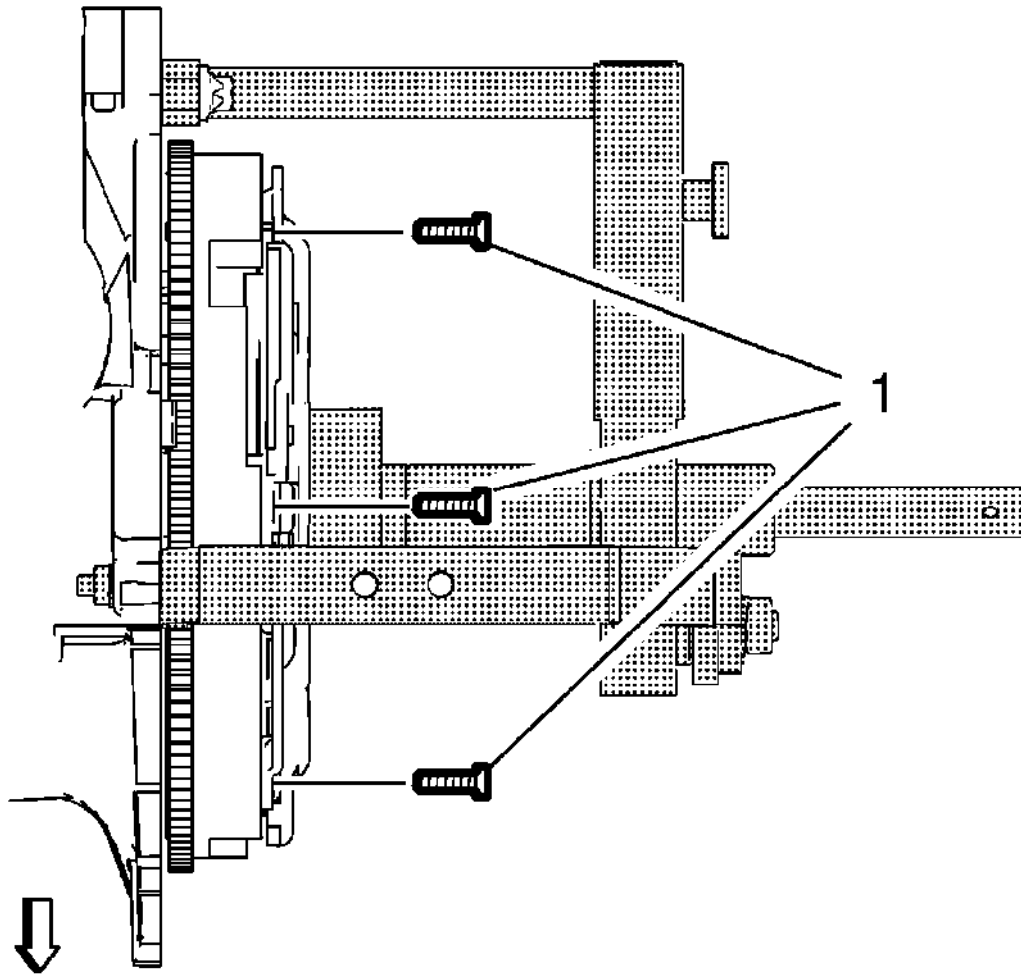


Fig. 50: Clutch Pressure Plate Bolts

Courtesy of GENERAL MOTORS COMPANY

NOTE: Check if bolt was installed with thread lock agent.

8. Remove and DISCARD the 6 clutch pressure plate bolts (1).

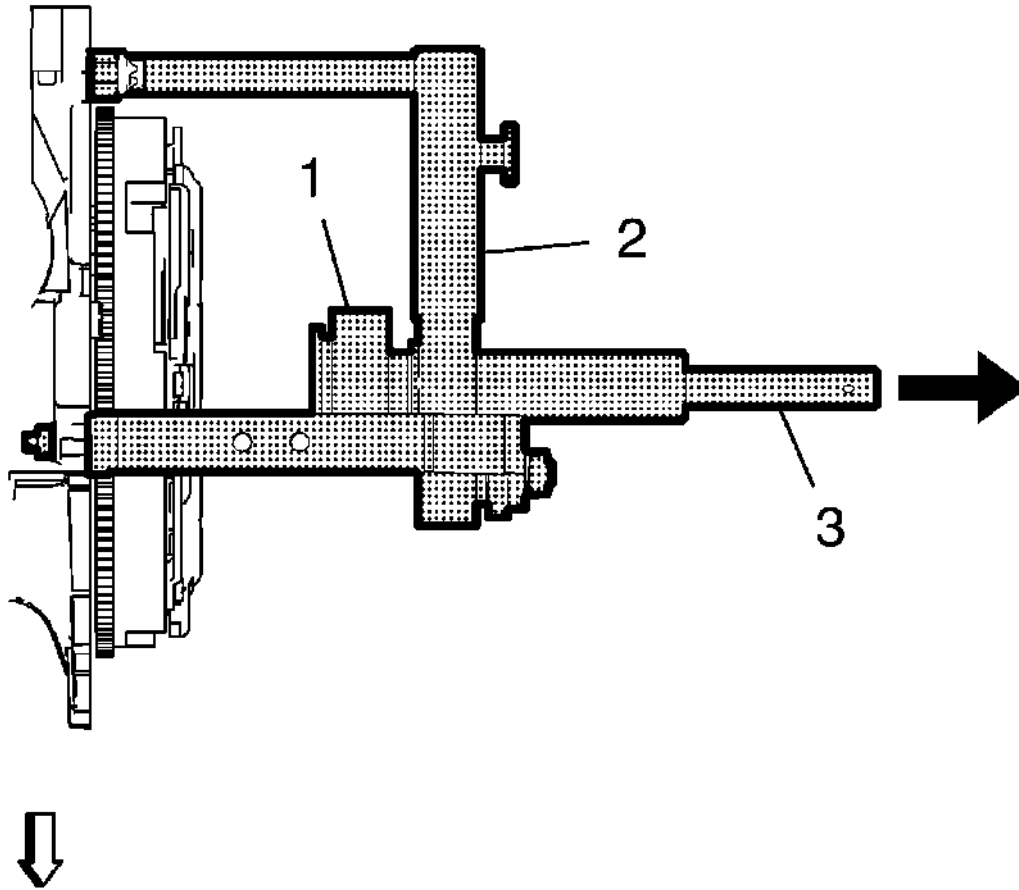


Fig. 51: Centering Drift And Clutch Center Guide
Courtesy of GENERAL MOTORS COMPANY

9. Release the **DT-6263** remover/installer (2).
 1. Turn the threaded rod (1) of the **DT-6263** remover/installer counter clockwise to the stop.
 2. Remove the **DT-6263-30** centering drift (3) along with the clutch center guide (arrow).

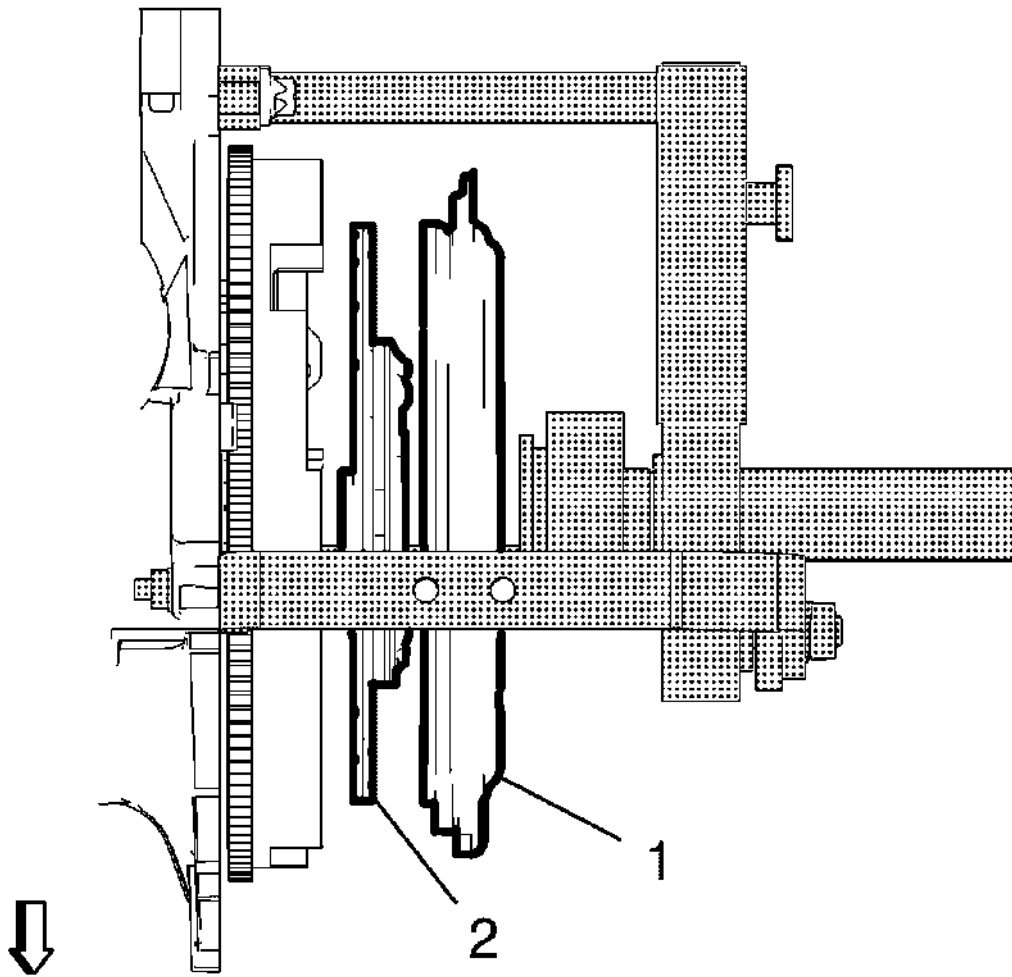


Fig. 52: Clutch Pressure Plate And Driven Plate
Courtesy of GENERAL MOTORS COMPANY

10. Remove the clutch pressure plate (1) and the driven plate (2).

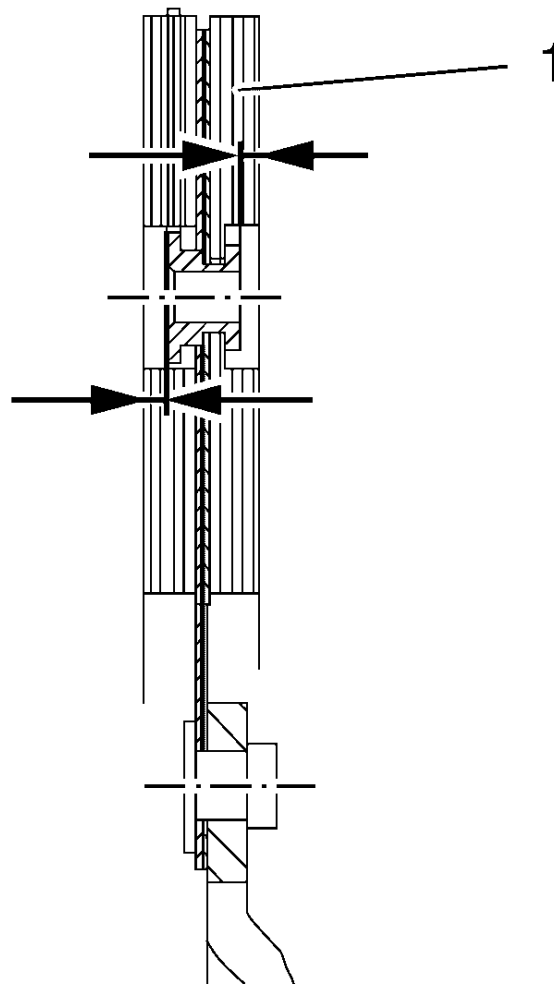


Fig. 53: Clutch Pressure Plate And Driven Plate Inspection Points

Courtesy of GENERAL MOTORS COMPANY

NOTE: Clutch pressure plate and driven plate contaminated by foreign bodies (oil, cleaning agent etc.) have to be replaced. Check the clutch driven plate for damage and friction rust in the hub profile and replace it if necessary. **DO NOT** clean the clutch pressure plate and the driven plate with a high pressure cleaner or component washing machine.

11. Inspect the clutch pressure plate and the driven plate (1) and replace it, if necessary.

- Excessive wear
- Burned friction surface
- Oil on friction surface
- Damaged spline hub
- Damaged springs

NOTE: The clutch driven plate has to be replaced if the lining projection is less than 0.5 mm (0.020 in) (arrows).

12. Inspect the projection of the lining at the clutch lining rivets.
13. Slide the clutch pressure plate onto the transmission input shaft and check for easy movement.

Installation Procedure

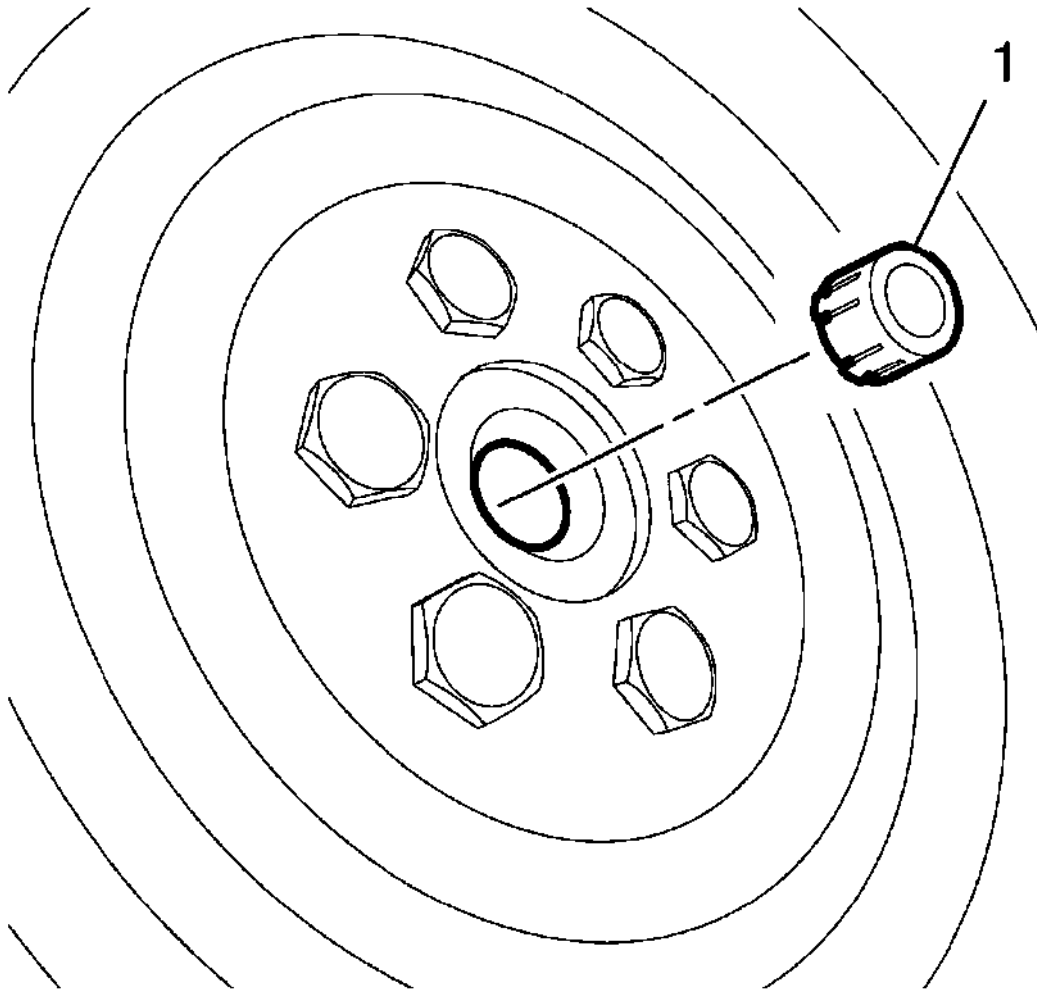


Fig. 54: Clutch Bolt Bushing

Courtesy of GENERAL MOTORS COMPANY

1. Install the bushing (1) to the crankshaft. The bushing stays in the crankshaft. For the correct bushing refer to the electronic parts catalog.

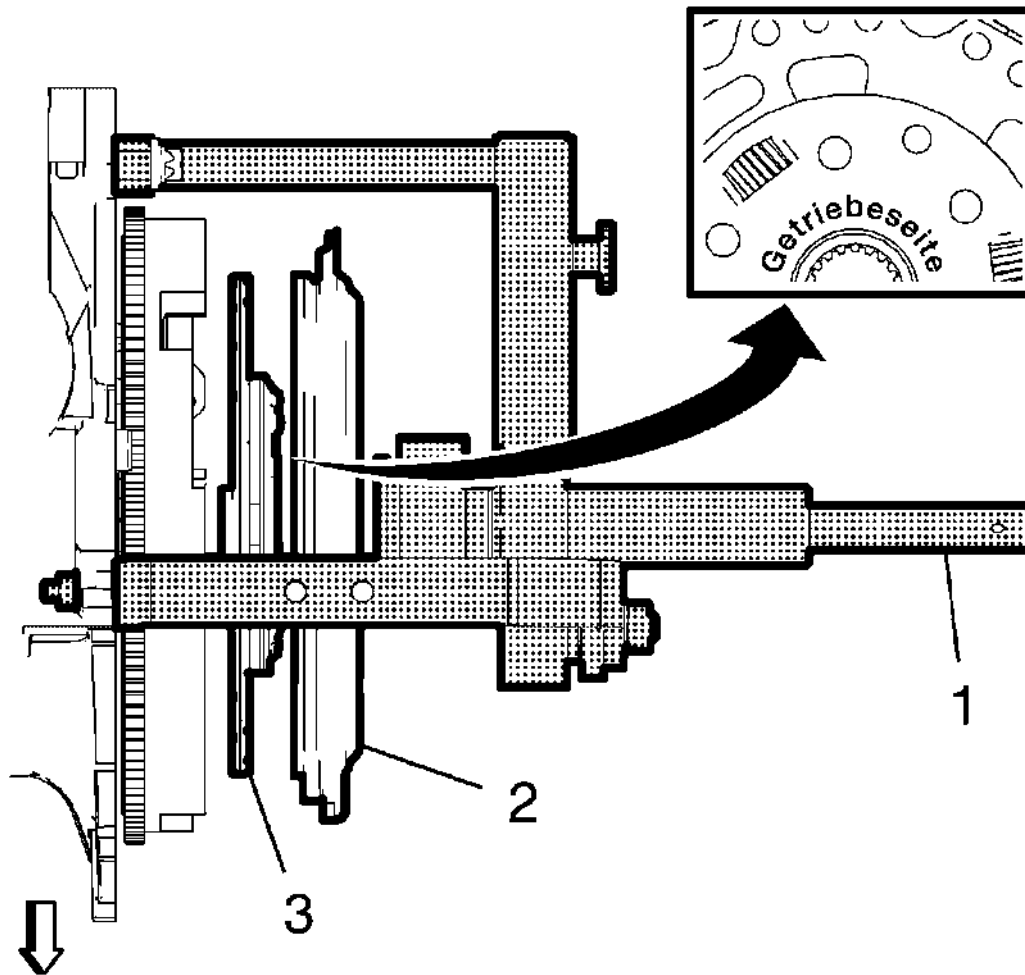


Fig. 55: Installing Bolts To Correct Site

Courtesy of GENERAL MOTORS COMPANY

2. Re-cut the 6 clutch pressure plate bolt threads.

NOTE: The clutch driven plate must be installed so that the German lettering "Getriebe-seite" (means Gearbox-side) on the plate is orientated toward the transmission.

3. Install the clutch driven plate (3) and the clutch pressure plate (2).
4. Center the clutch driven plate, using the **DT-6263-30** centering drift (1) along with the clutch center guide.

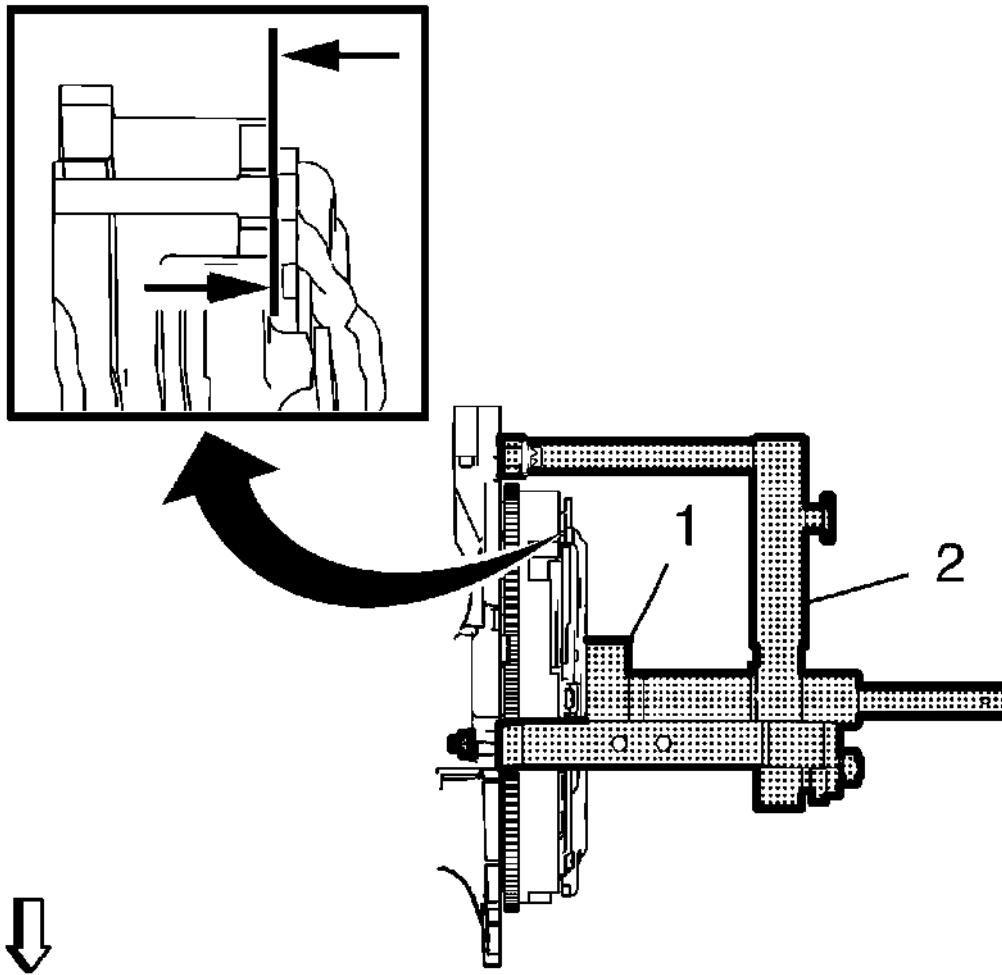


Fig. 56: Preloading Clutch Springs Using Special Tool

Courtesy of GENERAL MOTORS COMPANY

NOTE: DO NOT turn further than necessary.

5. Preload the clutch springs, using the **DT-6263** remover/installer (2).
6. Turn the threaded rod (1) clockwise until the pressure plate contacts the flywheel (arrows).

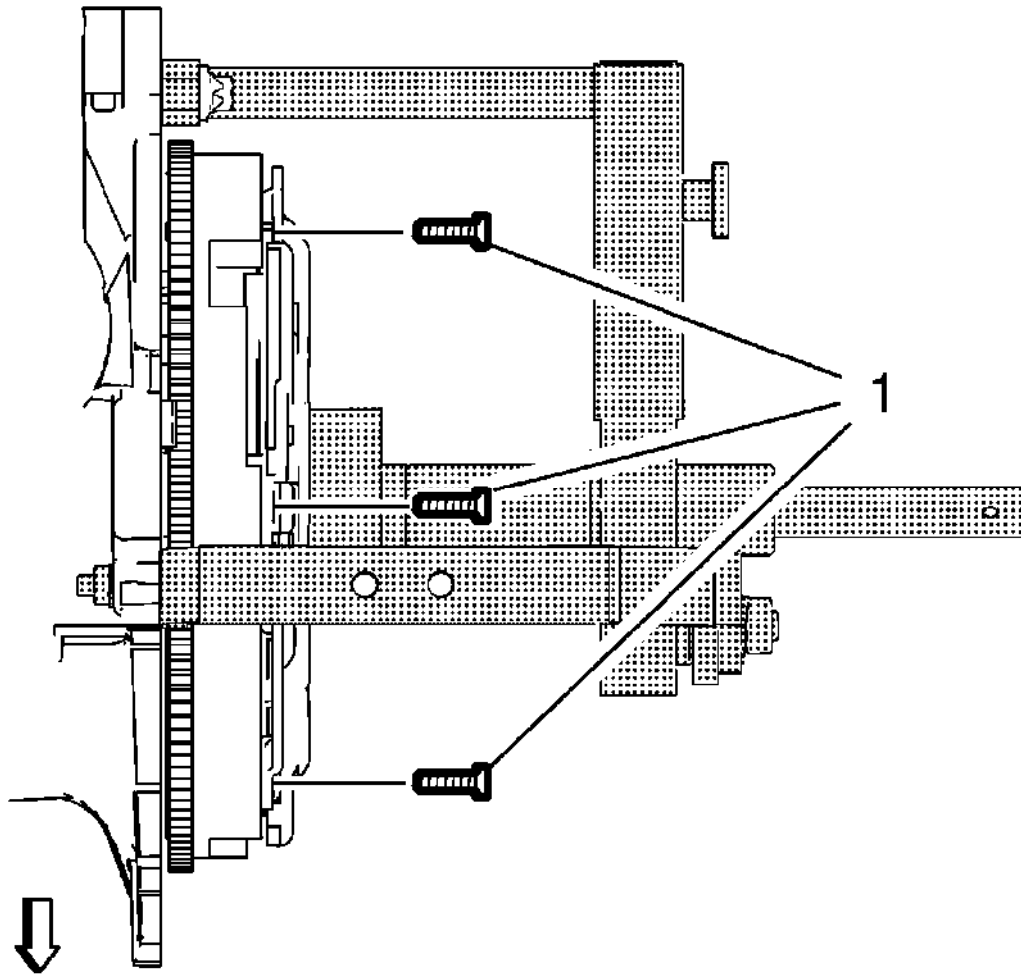


Fig. 57: Clutch Pressure Plate Bolts

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

NOTE: In the case that the clutch pressure plate bolts were assembled with thread lock agent: Service may offer bolts that are not microencapsulated. If this is the case apply thread lock agent to the bolt. If the fastener is microencapsulated, install NEW clutch pressure plate bolts. DO NOT reuse the old bolts.

7. Install the 6 NEW clutch pressure plate bolts (1). For the correct bolts refer to the electronic parts catalog.
8. Tighten the clutch pressure plate bolts to 28 (21 lb ft).

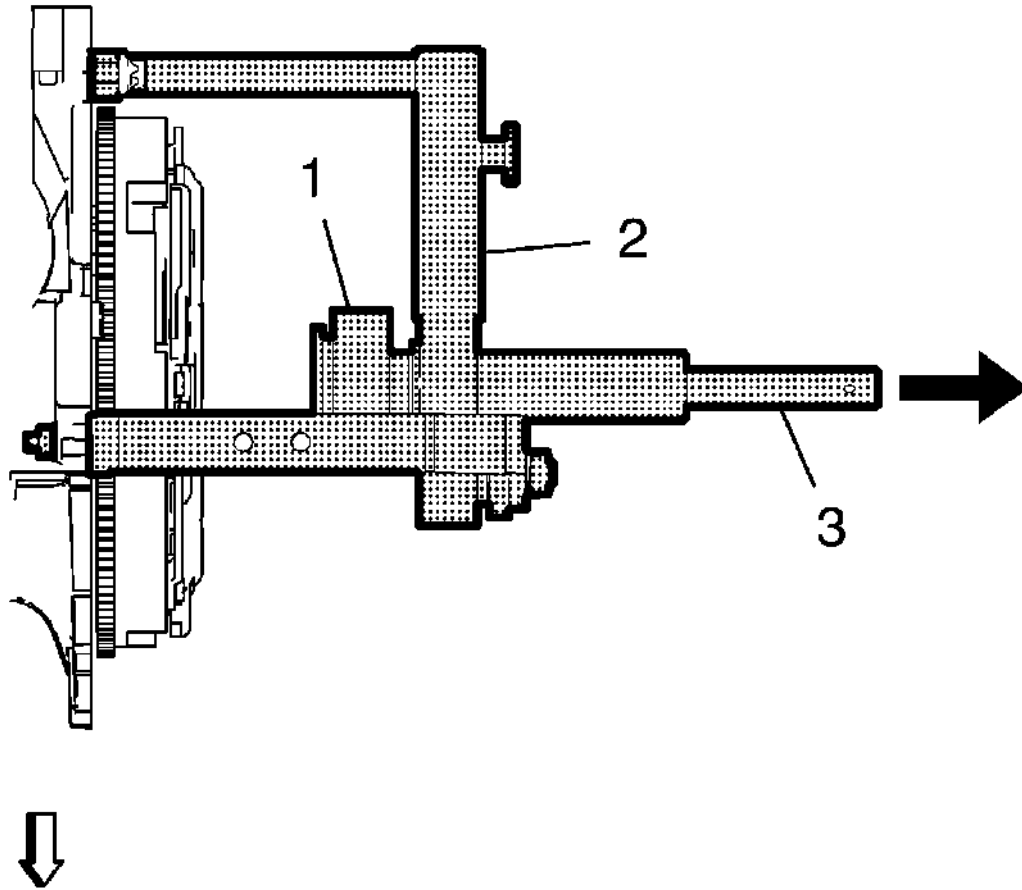


Fig. 58: Centering Drift And Clutch Center Guide

Courtesy of GENERAL MOTORS COMPANY

9. Remove the **DT-6263** remover/installer (2) from the engine block.
 1. Turn the threaded rod (1) of the **DT-6263** remover/installer counterclockwise to the stop.
 2. Remove the **DT-6263-30** centering drift (3) along with the clutch center guide (arrow).
 3. Remove the 4 bolts installing the **DT-6263** remover/installer to the engine block.

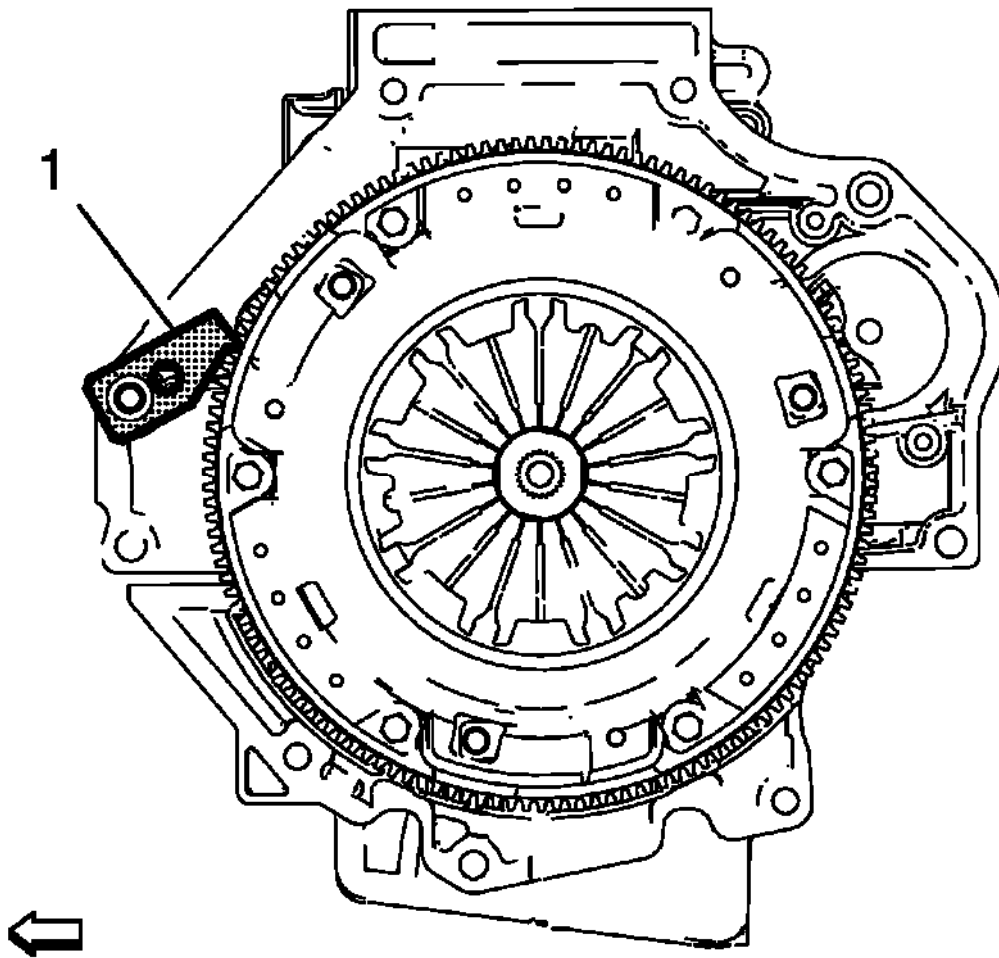


Fig. 59: Flywheel Holding Tool

Courtesy of GENERAL MOTORS COMPANY

10. Remove the EN-652 holder (1) from the engine block.
11. Install the transmission. Refer to **Transmission Replacement**.

CLUTCH ACTUATOR CYLINDER REPLACEMENT

Removal Procedure

1. Remove the transmission. Refer to **Transmission Replacement**.

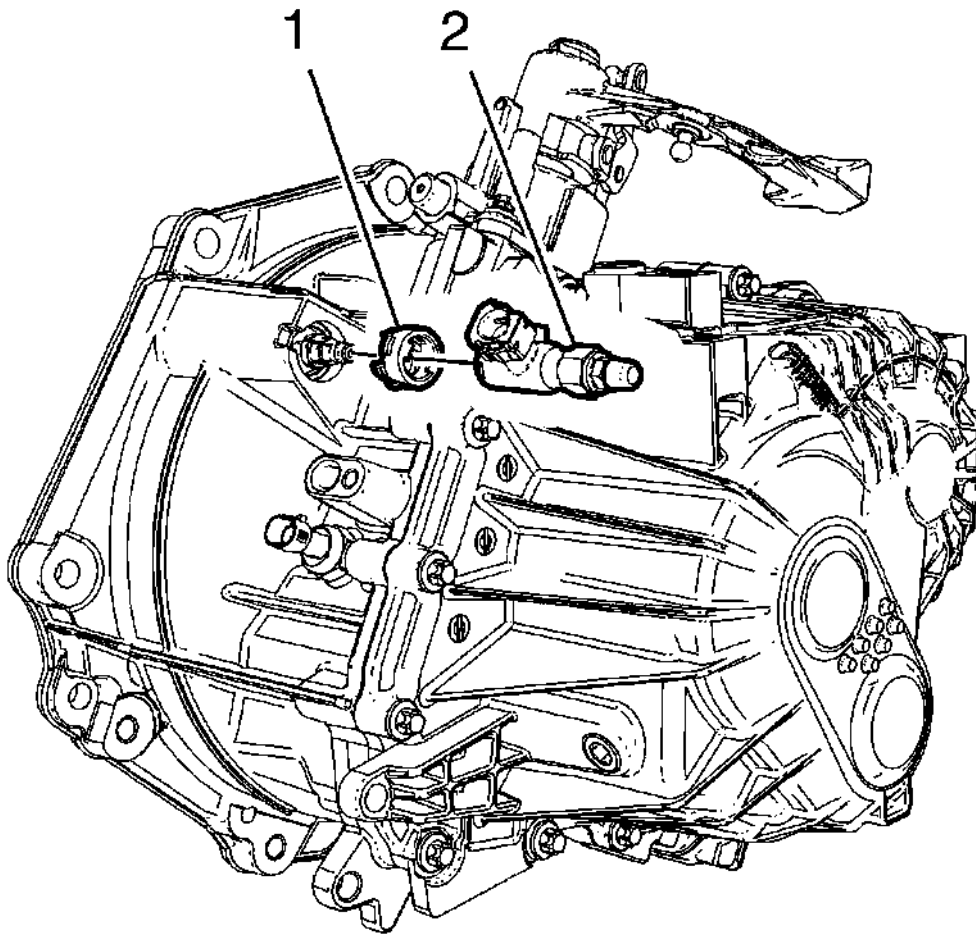


Fig. 60: Clutch Actuator Cylinder Pipe Sleeve And Elbow

Courtesy of GENERAL MOTORS COMPANY

WARNING: Use only Delco Supreme 11, GM P/N 12377967 (Canadian P/N 992667), or equivalent DOT 3 brake fluid from a clean, sealed container. Do not use fluid from an open container that may be contaminated with water. Improper or contaminated fluid could result in damage to components, or loss of braking, with possible injury.

2. Remove the clutch actuator cylinder pipe elbow (2) and the clutch actuator cylinder pipe sleeve (1). The clutch actuator pipe seal must not stick in the elbow pipe.

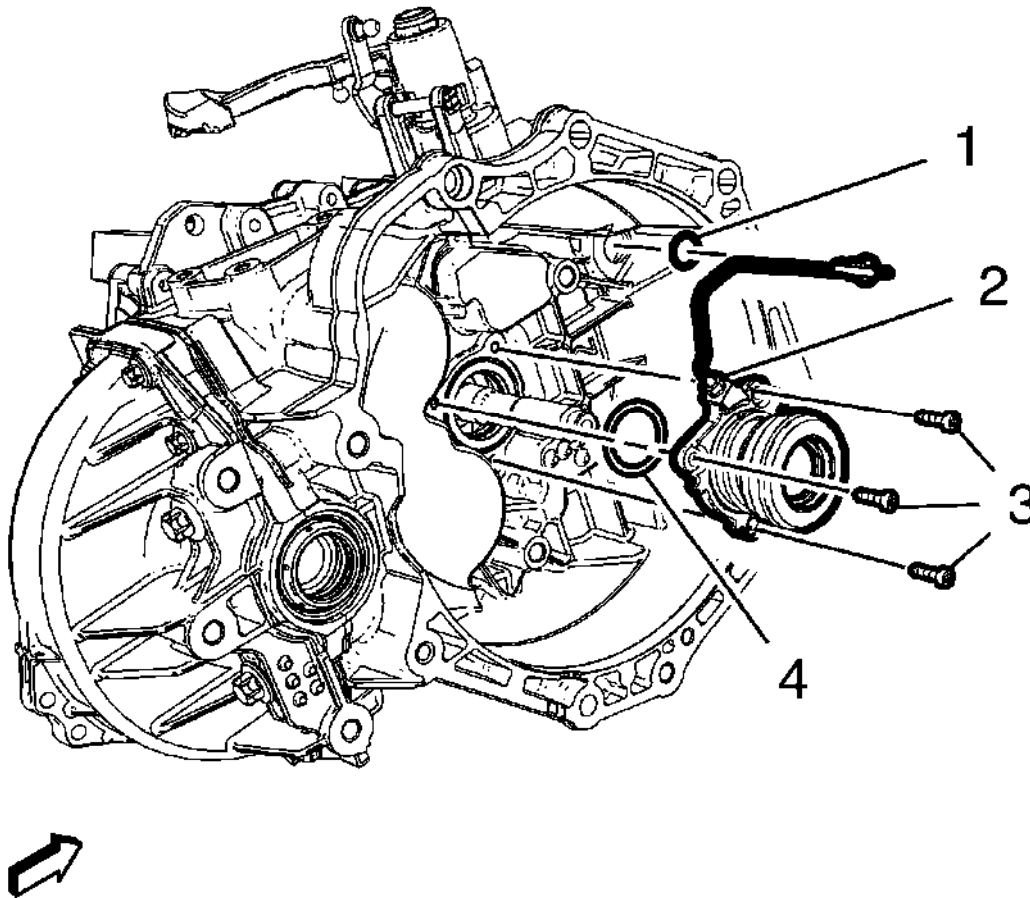


Fig. 61: Clutch Actuator Cylinder, Bolts And Seal
Courtesy of GENERAL MOTORS COMPANY

3. Remove the 3 clutch actuator cylinder bolts (3).
4. Remove the clutch actuator cylinder (2).
5. Remove and DISCARD the clutch actuator cylinder seal (4).
6. Remove and DISCARD the clutch actuator cylinder pipe seal (1)

Installation Procedure

1. Clean the 3 clutch actuator cylinder threads in clutch housing.

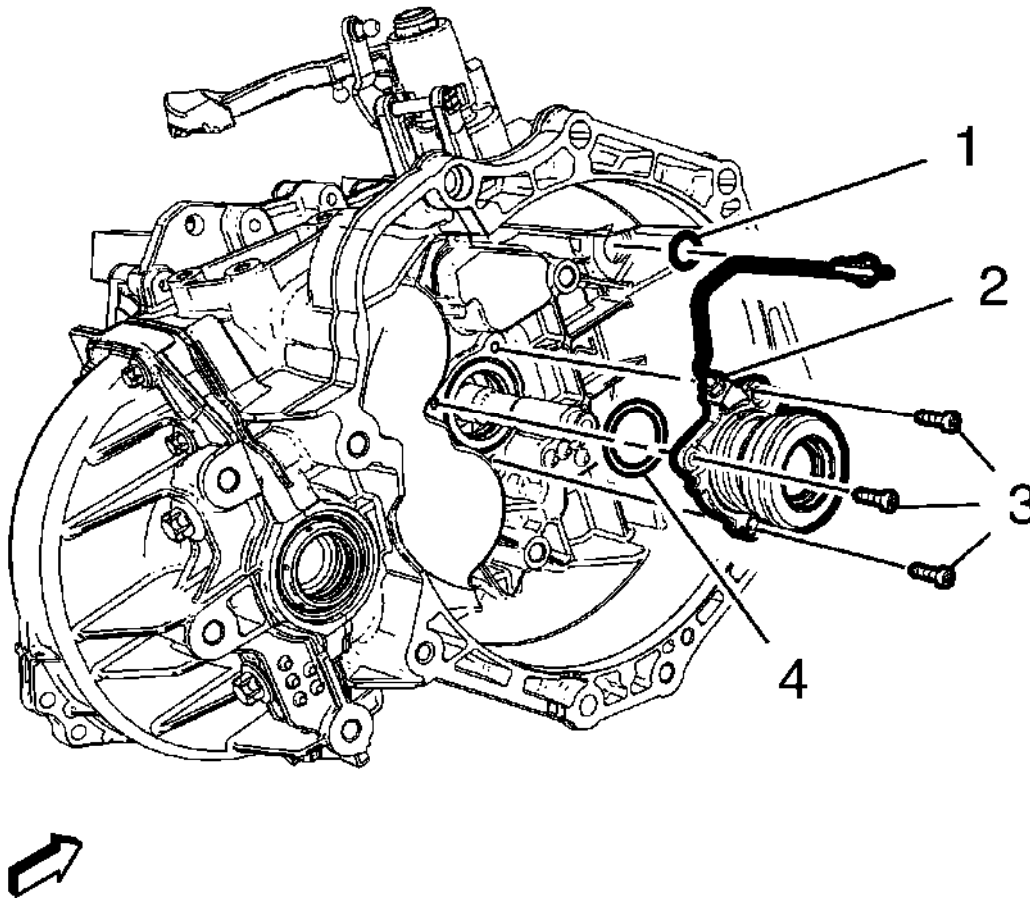


Fig. 62: Clutch Actuator Cylinder, Bolts And Seal
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Clutch Actuator Cylinder and Seal Caution .

CAUTION: Refer to Clutch Actuator Cylinder Mounting Sleeve Caution .

2. Install the NEW clutch actuator cylinder pipe seal (1).
3. Install the NEW clutch actuator cylinder seal (4).

WARNING: Refer to Clutch Actuator Cylinder Warning .

4. Install the clutch actuator cylinder (2).

CAUTION: Refer to Fastener Caution .

NOTE: Service may offer bolts that are not coated with thread lock agent. If this is the case apply thread lock agent to the bolt.

5. Install 3 NEW clutch actuator cylinder bolts (3) and handtighten them equally.
6. Tighten the 3 clutch actuator cylinder bolts to 6 N.m (53 lb in).

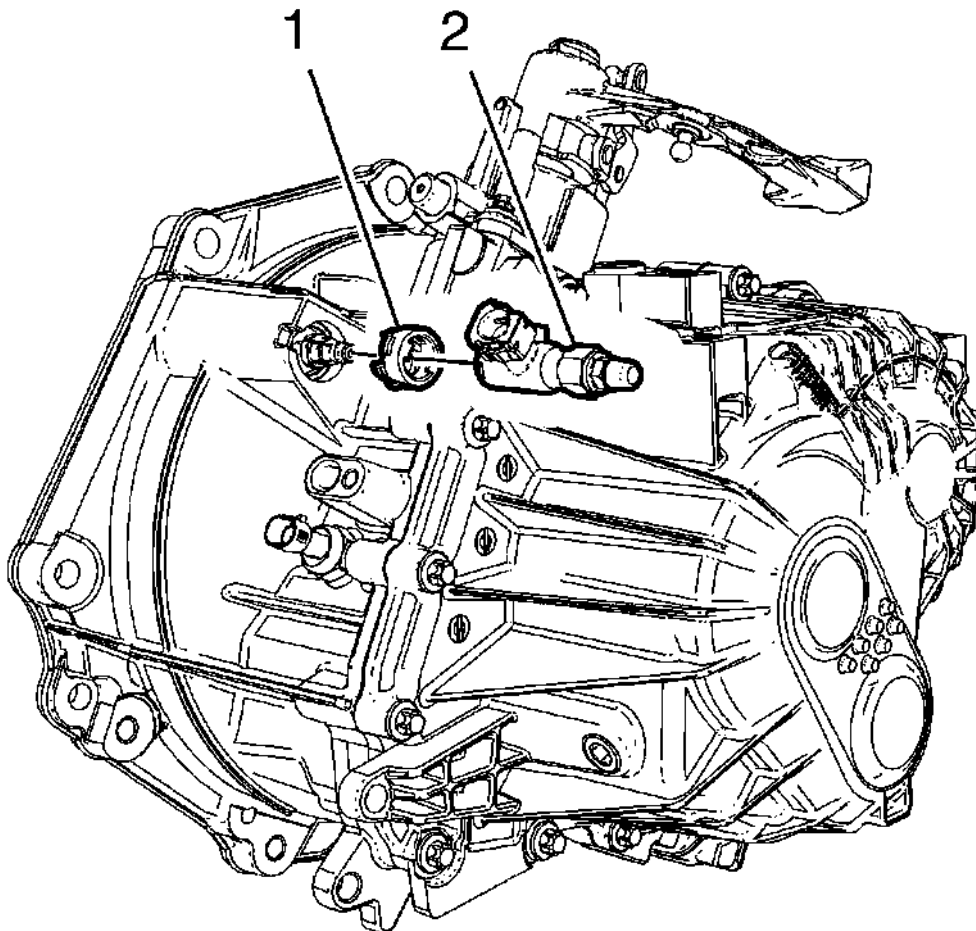


Fig. 63: Clutch Actuator Cylinder Pipe Sleeve And Elbow
Courtesy of GENERAL MOTORS COMPANY

7. Install clutch actuator cylinder pipe sleeve (1) and clutch actuator cylinder pipe elbow (2).

8. Install transmission. Refer to **Transmission Replacement** .

DESCRIPTION AND OPERATION

CLUTCH SYSTEM DESCRIPTION AND OPERATION

Clutch Spin Down Time

Inspect the clutch spin down time as follows:

1. Apply the parking brake and block the vehicle wheels.
2. Shift the manual transmission into NEUTRAL.
3. Start the engine. Run the engine at idle speed.
4. Engage the clutch.
5. Disengage the clutch. Wait 9 seconds.
6. Shift the transmission into REVERSE.

Clutch Driving Members

The clutch driving members are 2 flat surfaces machined to a smooth finish. They include the following:

- The rear face of the engine flywheel
- The front face of the clutch pressure plate

Clutch Driven Members

The driven member is the clutch driven plate. The clutch driven plate has a splined hub. The splined hub slides lengthwise along the splines of the input shaft. The splined hub drives the input shaft through these same splines. The driving and driven members are held together with a spring pressure. This pressure is exerted by a diaphragm spring in the clutch cover.

Hydraulic Clutch Fluid

CAUTION: Do not use mineral or paraffin-base oil in the clutch hydraulic system. These fluids may damage the rubber parts in the cylinders.

The hydraulic clutch fluid transmits the force from the clutch master cylinder to the clutch actuator cylinder.

Hydraulic Clutch Operating Members

The clutch system consists of the following components:

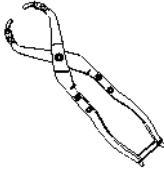
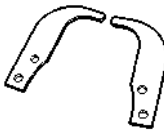
- A master cylinder with a remote reservoir and with the clutch actuator cylinder front pipe
- A clutch pedal position sensor

- An clutch actuator cylinder
- The clutch pressure plate
- The clutch cover
- The diaphragm spring
- The clutch driven plate
- The torsional springs

With the depression of the clutch pedal, the clutch master cylinder becomes pressurized from the force of the push rod into the master cylinder. This push rod motion forces hydraulic fluid through the hose assembly from the master cylinder to the clutch actuator cylinder. The clutch actuator cylinder then pushes the release bearing into the diaphragm spring to disengage the clutch. A hole in the bulkhead accommodates the master cylinder. A quick connect coupling attaches the clutch actuator cylinder front pipe assembly to the actuator cylinder. The actuator cylinder is inside the transmission and on the input bearing retainer. The master cylinder and clutch actuator cylinder front pipe assembly can be replaced without having to gain access to the clutch system internal components; simply disengage/engage the quick connect coupling mounted through the transmission housing. No adjustments to the clutch system are necessary. As the clutch wears, the fluid level in the clutch reservoir changes to compensate for clutch wear. A new system has fluid in the reservoir. The clutch pedal position sensor on the clutch pedal/bracket assembly has 2 functions. One function is a clutch interlock, ensuring the engine does not start unless the clutch pedal is positioned on the floor. The second function is to cut off the cruise control system, if equipped, when the clutch pedal is pushed downward.

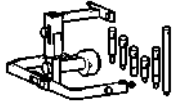
SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

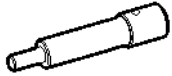
Illustration	Tool Number/ Description
	DT-6202-A Pliers
	DT-6202-B Pliers
	DT-6202-20 Adapter to DT-6202-A
	DT-6263

2013 Chevrolet Cruze

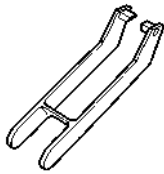
2013 TRANSMISSION Clutch - Cruze



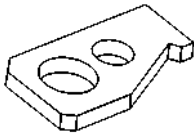
KM-6263
Remover/Installer



DT-6263-27
KM-6263-27
Center Guide



DT-50894
Remover



EN-652
KM-652
Flywheel Holder