

Engine Exhaust

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Description and Operation

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2. ENGINE EXHAUST
3. DESCRIPTION AND OPERATION
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### Exhaust System Description

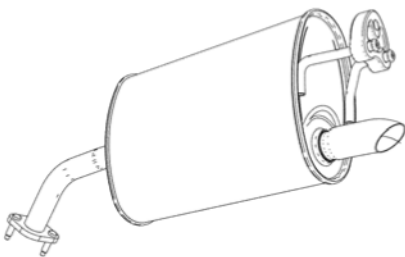
#### Catalytic Converter



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The catalytic converter is an emission control device added to the engine exhaust system in order to reduce hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) pollutants from the exhaust gas. The catalytic converter is comprised of a ceramic monolith substrate, supported in insulation and housed within a sheet metal shell. The substrate may be washcoated with 3 noble metals, Platinum (Pt), Palladium (Pd) and Rhodium (Rh).

### **Exhaust Rear Muffler**



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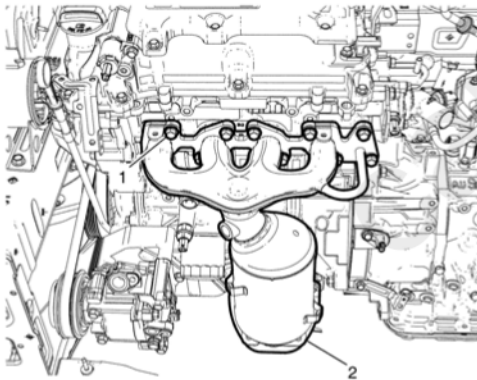
The rear muffler is to reduce broad band engine exhaust noise. It is comprised of a series of perforated tubes and baffles to break up the sound waves and reflect them. It is made of stainless steel to protect the front muffler from corrosion.

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## Exhaust System Description (LKY)

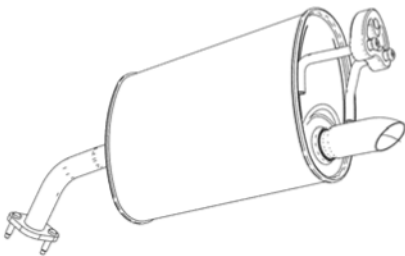
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### Exhaust Rear Muffler



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Diagnostic Information and Procedures

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## **Symptoms - Engine Exhaust**

### **Diagnostic Starting Point – Engine Exhaust**

Begin the system diagnosis by reviewing the exhaust system description and operation. Reviewing the information will help you determine the correct symptom diagnostic procedure when a malfunction exists.

It will also help you determine if the condition described by the customer is normal operation. To identify the correct procedure for diagnosing the system, refer to [Exhaust System Description](#).

### **Visual/Physical Inspection**

- Inspect for aftermarket or non-OEM devices. These could affect the operation and performance of the exhaust system.
- Verify the exact operating conditions under which the concern exists. Note factors such as engine RPM, engine temperature, engine load, and frequency of concern.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause any symptom.

### **Intermittent Conditions**

Test the vehicle under the same conditions that the customer reported in order to verify the system is operating as designed.

### **Symptom List**

For the following symptoms, refer to [Restricted Exhaust](#).

- Loss of power
- Poor fuel economy
- Poor acceleration

For the following symptoms, refer to [Exhaust Leakage](#).

- Exhaust hissing
- Exhaust popping

For the following symptoms, refer to [Exhaust Noise](#).

- Exhaust rattle
- Loud exhaust
- Exhaust buzz, groan or hum

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## Restricted Exhaust

### Test Description

The numbers below refer to the step numbers on the diagnostic table.

3. The exhaust system has very low back pressure under normal conditions. If the exhaust system is restricted, a significant increase in the exhaust pressure is noticed on the *J-35314-A* exhaust back pressure gauge. Removing the heated oxygen sensor may set a DTC. When finishing this diagnostic table all codes must be cleared.
4. This step will isolate the catalytic converter from the remainder of the exhaust system.

| Step                                         | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Value(s) | Yes                             | No                                                |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------|---------------------------------------------------|
| Special Tools                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |                                 |                                                   |
| <i>J-35314-A</i> Exhaust Back Pressure Gauge |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |                                 |                                                   |
| 1                                            | Did you verify the customers complaint?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | â€”      | Go to <a href="#">Stepâ€™%2</a> | â€”                                               |
| 2                                            | Did you review the exhaust symptoms diagnostic information and perform the necessary inspections?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | â€”      | Go to <a href="#">Stepâ€™%3</a> | Go to <a href="#">Symptoms - Engine Exhaust</a> . |
| 3                                            | <ol style="list-style-type: none"> <li>1. Remove the heated oxygen sensorâ€™%1. Refer to <a href="#">Heated Oxygen Sensor Replacement - Sensor 1</a>.</li> <li>2. Install the <i>EN-35314-A</i> exhaust back pressure gauge in place of the heated oxygen sensorâ€™%1.</li> <li>3. Start the engine.</li> <li>4. Increase and monitor the engine speed at 2,000â€™%RPM.</li> <li>5. Observe the exhaust system back pressure reading on the gauge.</li> <li>6. Check the value.</li> </ol>                                                                                                                                                                                                                                                                                                                      | â€”      | Go to <a href="#">Stepâ€™%4</a> | Go to <a href="#">Stepâ€™%4</a>                   |
| 4                                            | <ol style="list-style-type: none"> <li>1. Turn the engine off and place the ignition in the lock position.</li> <li>2. Remove the <i>EN-35314-A</i> exhaust back pressure gauge.</li> <li>3. Install the heated oxygen sensorâ€™%1. Refer to <a href="#">Heated Oxygen Sensor Replacement - Sensor 1</a>.</li> <li>4. Remove the heated oxygen sensorâ€™%2. Refer to <a href="#">Heated Oxygen Sensor Replacement - Sensor 2</a>.</li> <li>5. Install the <i>EN-35314-A</i> exhaust back pressure gauge in place of the heated oxygen sensorâ€™%2.</li> <li>6. Start the engine.</li> <li>7. Increase and monitor the engine speed at 2,000â€™%RPM.</li> <li>8. Observe the exhaust system back pressure reading on the gauge.</li> </ol> <p>Compare the reading with the above value. The values are same?</p> | â€”      | Go to <a href="#">Stepâ€™%5</a> | Go to <a href="#">Stepâ€™%6</a>                   |

| Step | Action                                                                                                                                                                                                                                                                                                                                                                  | Value(s) | Yes                          | No                           |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------|------------------------------|
| 5    | <p>Inspect the exhaust system for the following conditions:</p> <ul style="list-style-type: none"> <li>• Damage in the exhaust pipe</li> <li>• Debris in the exhaust pipe</li> <li>• Muffler or resonator internal failure</li> <li>• Two-layer exhaust pipe separation</li> </ul> <p>Did you find and correct the condition?</p>                                       | â€”      | Go to <a href="#">Step 7</a> | â€”                          |
| 6    | <p>Replace the catalytic converter. Refer to <a href="#">Catalytic Converter Replacement</a> or <a href="#">Exhaust Manifold Replacement</a>.</p> <p>Did you find and correct the condition?</p>                                                                                                                                                                        | â€”      | Go to <a href="#">Step 7</a> | â€”                          |
| 7    | <ol style="list-style-type: none"> <li>1. Remove the <i>EN-35314-A</i> exhaust back pressure gauge.</li> <li>2. Install the heated oxygen sensor 2. Refer to <a href="#">Heated Oxygen Sensor Replacement - Sensor 2</a>.</li> <li>3. Clear any DTCs.</li> <li>4. Road test the vehicle in order to verify the repair.</li> </ol> <p>Did you correct the condition?</p> | â€”      | System OK                    | Go to <a href="#">Step 2</a> |

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**Exhaust Leakage**

| Condition                                                                                                                                                                                                                                                                                         | Action                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEFINITION: An exhaust leak may show stains at the area of the leak. The leak may be felt by holding a hand close to the suspected areas or using a smoke pencil. The leak may make a popping or hissing noise. Refer to <a href="#">Symptoms - Engine Exhaust</a> prior to beginning this table. |                                                                                                                                                                                                                      |
| Misaligned or incorrectly installed exhaust system components                                                                                                                                                                                                                                     | <ul style="list-style-type: none"><li>• Align and tighten the exhaust system components to the required specifications.</li><li>• Make sure the exhaust hangers are in the proper locations and not loose.</li></ul> |
| Exhaust leaks at the following connections: <ul style="list-style-type: none"><li>• Exhaust manifold to pipe</li><li>• Flange</li></ul>                                                                                                                                                           | Tighten the affected components to the required specifications.                                                                                                                                                      |
| Seals or gaskets leaking <ul style="list-style-type: none"><li>• Exhaust manifold to cylinder head</li><li>• Exhaust pipes to exhaust manifold</li><li>• Catalytic converter connection</li></ul>                                                                                                 | Replace the leaking seal or gasket.                                                                                                                                                                                  |
| Irregularities at the mating surfaces on the flange connections                                                                                                                                                                                                                                   | Repair as required or replace the affected component.                                                                                                                                                                |
| Exhaust manifold cracked or broken                                                                                                                                                                                                                                                                | Replace the exhaust manifold. Refer to <a href="#">Exhaust Manifold Replacement</a> .                                                                                                                                |
| Exhaust system component connection welds leaking                                                                                                                                                                                                                                                 | Replace the leaking component.                                                                                                                                                                                       |
| Muffler or resonator, if equipped, damaged or leaking at the seams                                                                                                                                                                                                                                | Replace the affected muffler. Refer to <a href="#">Exhaust Muffler Replacement</a> .                                                                                                                                 |

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**Exhaust Noise**

| Condition                                                                                                                                                                                                                            | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEFINITION: An audible or physical noise due to a faulty component or damaged components causing a loose or misaligned exhaust system resulting in a rattle or vibration noise. Refer to <a href="#">Symptoms - Engine Exhaust</a> . |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Popping or hissing noise                                                                                                                                                                                                             | Exhaust leak. Refer to <a href="#">Exhaust Leakage</a> .                                                                                                                                                                                                                                                                                                                                                                                                      |
| Loud exhaust                                                                                                                                                                                                                         | <ol style="list-style-type: none"><li>1. Compare to a known good vehicle.</li><li>2. Inspect for a damaged or failed muffler.</li><li>3. Replace the faulty muffler. Refer to <a href="#">Exhaust Muffler Replacement</a>.</li></ol>                                                                                                                                                                                                                          |
| External rattle or vibration noise                                                                                                                                                                                                   | <ol style="list-style-type: none"><li>1. Inspect for a bent or loose hanger, loose heat shield, or loose clamp.</li><li>2. Inspect for an exhaust pipe causing interference.</li><li>3. Repair or replace the affected component.</li></ol>                                                                                                                                                                                                                   |
| Internal rattle                                                                                                                                                                                                                      | <ol style="list-style-type: none"><li>1. Test the components by tapping with a rubber mallet to confirm a rattle.</li><li>2. Replace the faulty catalytic converter, or muffler. Refer to one of the following procedures:</li><li>3.<ul style="list-style-type: none"><li>◦ <a href="#">Catalytic Converter Replacement</a></li><li>◦ <a href="#">Exhaust Manifold Replacement</a></li><li>◦ <a href="#">Exhaust Muffler Replacement</a></li></ul></li></ol> |

Repair Instructions

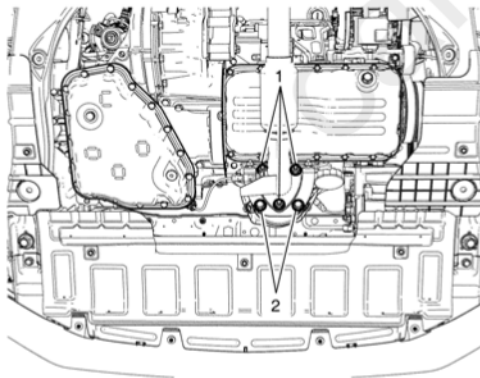
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## **Exhaust Manifold Replacement (LKY)**

### **Removal Procedure**

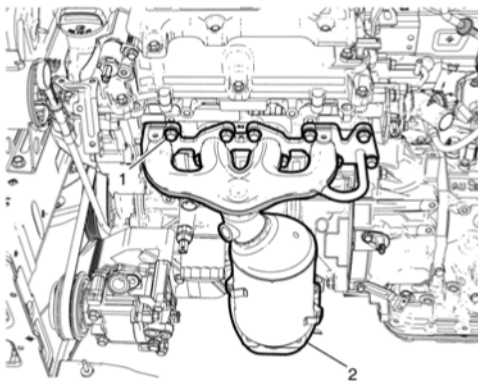
1. Remove the exhaust manifold heat shield. Refer to [Exhaust Manifold Heat Shield Replacement](#).
2. Raise the vehicle by its full height. Refer to [Lifting and Jacking the Vehicle](#).



3.

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4. Remove the exhaust manifold pipe nut(1).
5. Remove the exhaust manifold bracket bolts(2).
6. Remove the exhaust manifold pipe gasket.



7.

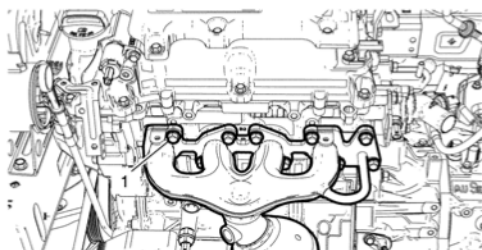
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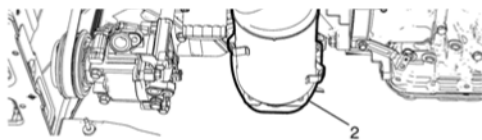
8. Remove the 10 exhaust manifold bolt(1).

9. Remove the exhaust manifold(2) and gasket.

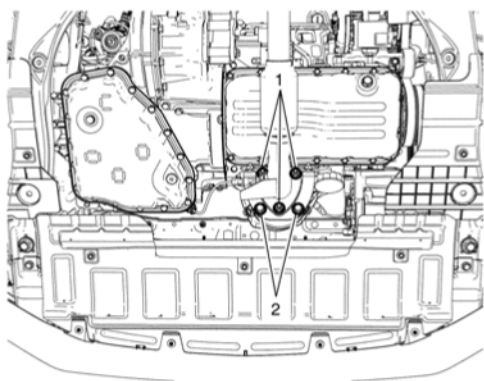
10. Transfer parts as necessary.

### Installation Procedure





1. [Click here for full size](#)
2. Install the exhaust manifold(2) and gasket.
3. Caution:  
Refer to [Fastener Caution](#).
4. Install the 10 exhaust manifold bolt(1) and tighten to 20N-m (15lbft).
5. Raise the vehicle by its full height. Refer to [Lifting and Jacking the Vehicle](#).



6. [Click here for full size](#)
7. Install the exhaust manifold pipe gasket.
8. Install the exhaust manifold pipe nut (1) and tighten to 46 N-m (34 lb-ft).
9. Install the exhaust manifold bracket bolts (2) and tighten to 20 N-m (15 lb-ft).
10. Install the exhaust manifold heat shield. Refer to [Exhaust Manifold Heat Shield Replacement](#).

## Related Part Information

| Part Name        | Catalog Name                            | Part Code |
|------------------|-----------------------------------------|-----------|
| Exhaust Manifold | MANIFOLD,EXH(W/TURBO)                   | 0024A     |
| Exhaust Manifold | MANIFOLD,EXH                            | 0025A     |
| Exhaust Manifold | MANIFOLD,EXH(W/H/SHLD)                  | 0025B     |
| Exhaust Manifold | MANIFOLD,EXH(W/C/OVR PIPE & H/SHLD)     | 0025C     |
| Exhaust Manifold | MANIFOLD,EXH(W/C/OVR PIPE)              | 0025D     |
| Exhaust Manifold | MANIFOLD,EXH(W/CTLTC CONV)              | 0025H     |
| Exhaust Manifold | MANIFOLD,EXH(W/OXIDN CTLTC CONV)        | 0025J     |
| Exhaust Manifold | MANIFOLD,EXH(W/3WAY + OXIDN CTLTC CONV) | 0025K     |

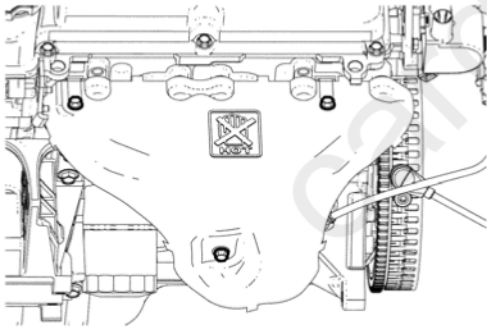
| <b>Part Name</b> | <b>Catalog Name</b>                   | <b>Part Code</b> |
|------------------|---------------------------------------|------------------|
| Exhaust Manifold | MANIFOLD,EXH(W/3WAY CTLTC CONV)       | 0025L            |
| Exhaust Manifold | MANIFOLD,EXH(W/W/UP OXIDN CTLTC CONV) | 0025M            |
| Exhaust Manifold | MANIFOLD,EXH(W/W/UP 3WAY CTLTC CONV)  | 0025N            |
| Exhaust Manifold | MANIFOLD,EXH                          | X0005            |
| Exhaust Manifold | MANIFOLD,EXH(CSTG)                    | X0010            |
| Exhaust Manifold | MANIFOLD,EXH                          | X0013            |
| Exhaust Manifold | MANIFOLD,EXH                          | X0014            |
| Exhaust Manifold | MANIFOLD,EXH (BLANK)                  | X0025            |
| Exhaust Manifold | MANIFOLD,EXH (MCHG)                   | X0048            |
| Exhaust Manifold | MANIFOLD KIT,EXH                      | X0049            |
| Exhaust Manifold | MANIFOLD,EXH (LH PROC) (RPR)          | X0050            |
| Exhaust Manifold | MANIFOLD,EXH (RH PROC) (RPR)          | X0051            |
| Exhaust Manifold | MANIFOLD,EXH                          | SJ564            |

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## Exhaust Manifold Replacement (1.0L LMT, 1.19L LC5, and 1.2L LMU)

### Removal Procedure



1.

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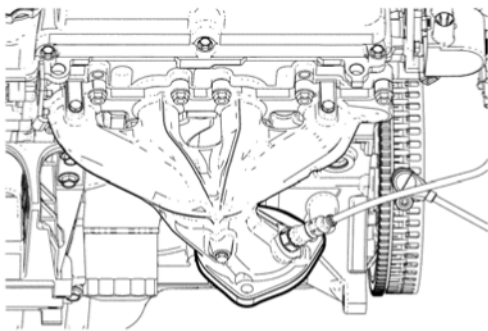
2. Note:

Make sure to perform the procedure while the engine is cold.

3. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

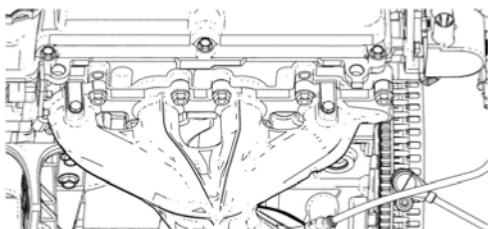
4. Remove the exhaust manifold heat shield. Refer to [Exhaust Manifold Heat Shield Replacement](#).

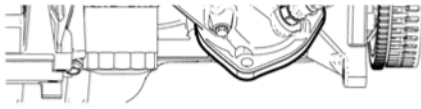
5. Disconnect the heated oxygen sensor (HO2S) electrical connectors.



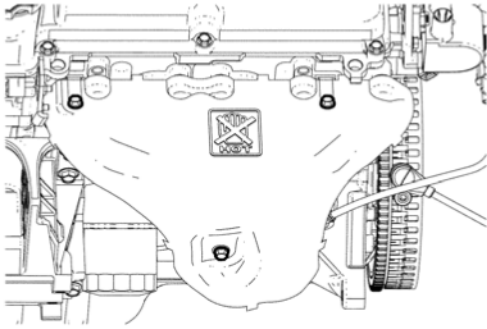
6. [Click here for full size](#)
7. Remove the catalytic converter. Refer to [Catalytic Converter Replacement](#).
8. Remove the power steering pump bracket retaining bolt to access for removal of exhaust manifold. Refer to [Power Steering Pump Bracket Replacement](#).
9. Remove the exhaust manifold.

### Installation Procedure





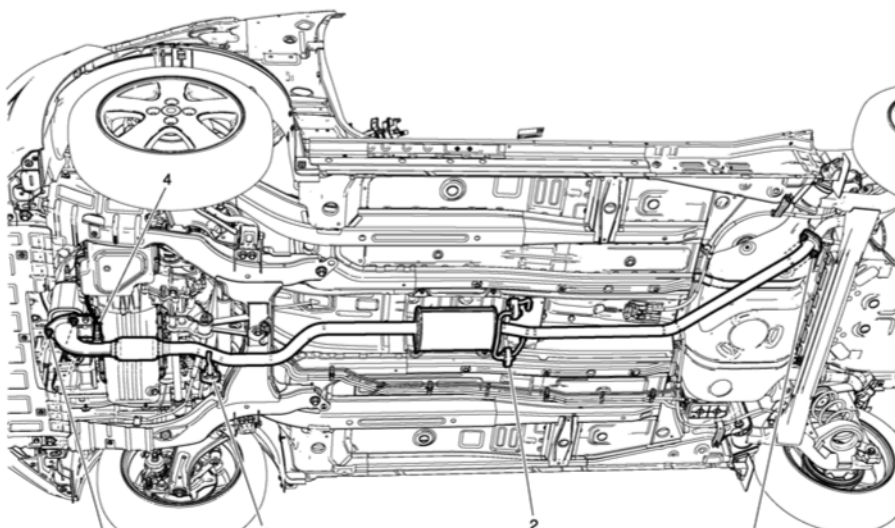
1. [Click here for full size](#)
2. Caution:  
Refer to [Fastener Caution](#).
3. Install the exhaust manifold mounting bolts/nuts.
4.
  - Exhaust manifold stud bolt to 25â€%N-m (18â€%lbâ€%ft).
  - Exhaust manifold mounting nut to 25â€%N-m (18â€%lbâ€%ft).
5. Install the power steering pump bracket retaining bolt. Refer to [Power Steering Pump Bracket Replacement](#).
6. Install the catalytic converter. Refer to [Catalytic Converter Replacement](#).



7. [Click here for full size](#)
8. Connect the HO2S electrical connectors.
9. Install the exhaust manifold heat shield and tighten to 10â€%N-m (89â€%lbâ€%in).
10. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

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## Exhaust Pipe Replacement (LC5, LMU)



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| Callout                                                                                                                                                                                                              | Component Name                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preliminary Procedure<br><br>1. Raise the vehicle. Refer to <a href="#">Lifting and Jacking the Vehicle</a> .<br><br>2. { If equipped } <a href="#">Drivetrain and Front Suspension Frame Skid Plate Replacement</a> |                                                                                                                                                                        |
| 1                                                                                                                                                                                                                    | Exhaust Pipe Hanger (Qty:â€™%01)                                                                                                                                       |
| 2                                                                                                                                                                                                                    | Exhaust Pipe Front Muffler Hanger (Qty:â€™%02)                                                                                                                         |
| 3                                                                                                                                                                                                                    | Exhaust Pipe â€™“ Rear Muffler Nut (Qty:â€™%02)<br><br>Caution:<br><br>Refer to <a href="#">Fastener Caution</a> .<br><br>Tighten<br><br>46â€™%0N-m (34â€™%0lbâ€™%0ft) |

| Callout | Component Name                                                                                                                                     |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 4       | Oxygen Sensor â€” Sensorâ€™2<br>Caution:<br>Refer to <a href="#">Component Fastener Tightening Caution</a> .<br>Tighten<br>41â€™N-m (30â€™lbâ€™ft) |
| 5       | Catalytic Converter â€” Exhaust Pipe Nut (Qty:â€™3)<br>Tighten<br>46â€™N-m (34â€™lbâ€™ft)                                                          |

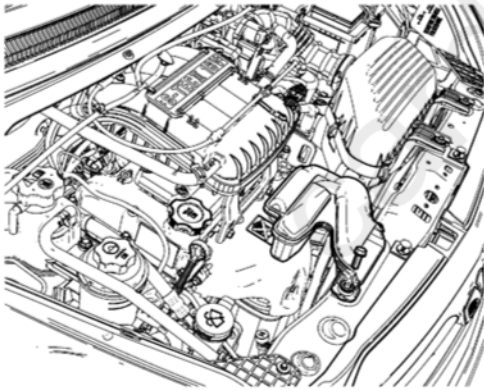
## Related Part Information

| Part Name    | Catalog Name                     | Part Code |
|--------------|----------------------------------|-----------|
| Exhaust Pipe | PIPE,EXH                         | SJ466     |
| Exhaust Pipe | PIPE PKG,EXH                     | SJ588     |
| Exhaust Pipe | PIPE PKG,EXHAUST (W/O CONVERTER) | SJ040     |
| Exhaust Pipe | PIPE KIT,EXH                     | 1319Z     |
| Exhaust Pipe | PIPE,EXH                         | 1320A     |
| Exhaust Pipe | PIPE,EXH                         | 1330A     |

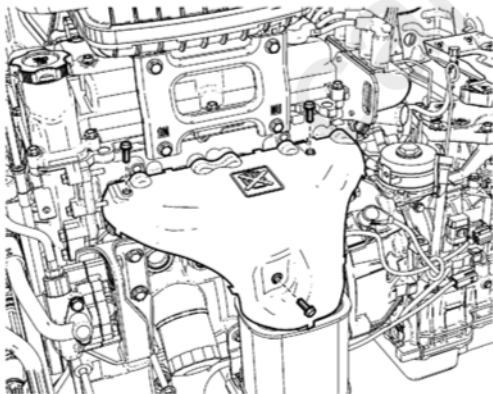
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## Catalytic Converter Replacement (1.0L LMT, 1.19L LC5, and 1.2L LMU)

### Removal Procedure



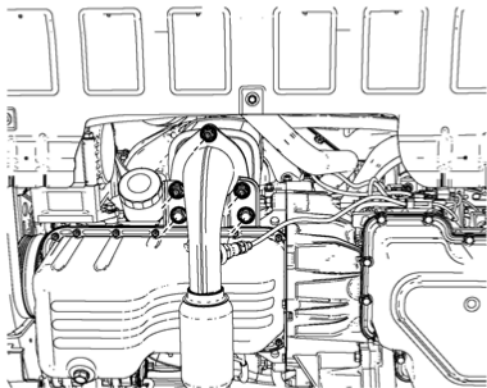
1. [Click here for full size](#)
2. Remove the air cleaner assembly. Refer to [Air Cleaner Assembly Replacement](#).



3.

[Click here for full size](#)

4. Remove the exhaust manifold heat shield. Refer to [Exhaust Manifold Heat Shield Replacement](#).
5. Remove the front heated oxygen sensor. Refer to [Heated Oxygen Sensor Replacement - Sensor 1](#).
6. Remove the catalytic converter upper flange nut.

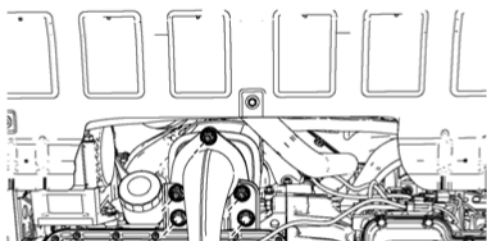


7.

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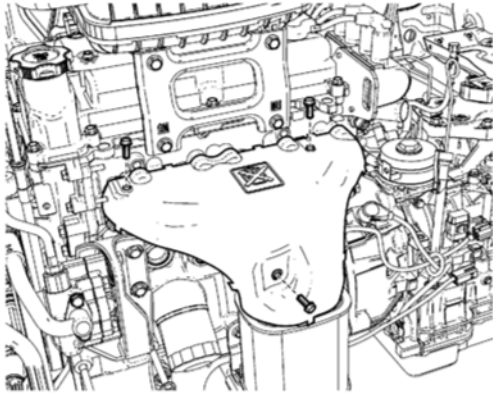
8. Remove the front exhaust pipe mounting bracket retaining bolt.
9. Remove the catalytic converter lower flange nut.
10. Remove the catalytic converter and gasket.

### Installation Procedure

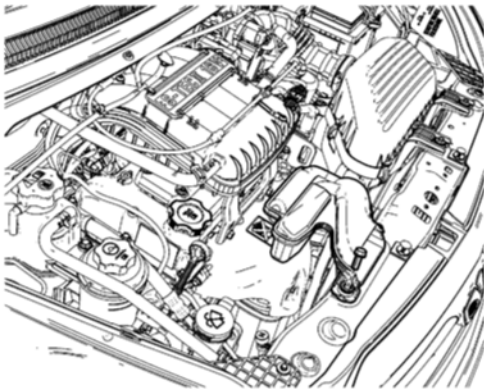




1. [Click here for full size](#)
2. Install the catalytic converter and gasket.
3. Caution:  
Refer to [Fastener Caution](#).
4. Install the front exhaust pipe mounting bracket bolt and tighten to 46 N-m (34 lb-ft).
5. Install the catalytic converter lower flange nut and tighten to 46 N-m (34 lb-ft).



6. [Click here for full size](#)
7. Install the catalytic converter upper flange nut and tighten to 46â€%N-m (34â€%lbâ€%ft).
8. Caution:  
Refer to [Component Fastener Tightening Caution](#).
9. Install the front headed oxygen sensorâ€%1 and tighten to 41â€%N-m (30â€%lbâ€%ft). Refer to [Heated Oxygen Sensor Replacement - Sensor 1](#).
10. Install the exhaust manifold heat shield and tighten bolt to 10â€% N-m (89â€%lbâ€%in). Refer to [Exhaust Manifold Heat Shield Replacement](#).



11.

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12. Install the air cleaner assembly. Refer to [Air Cleaner Assembly Replacement](#).

## Related Part Information

| Part Name                     | Catalog Name                            | Part Code |
|-------------------------------|-----------------------------------------|-----------|
| Catalytic Converter           | CONVERTER,CTLTC (W/EXH MANIF PIPE)      | 0744A     |
| Oxidation Catalytic Converter | CONVERTER,OXIDN CTLTC(W/EXH MANIF PIPE) | 0744B     |

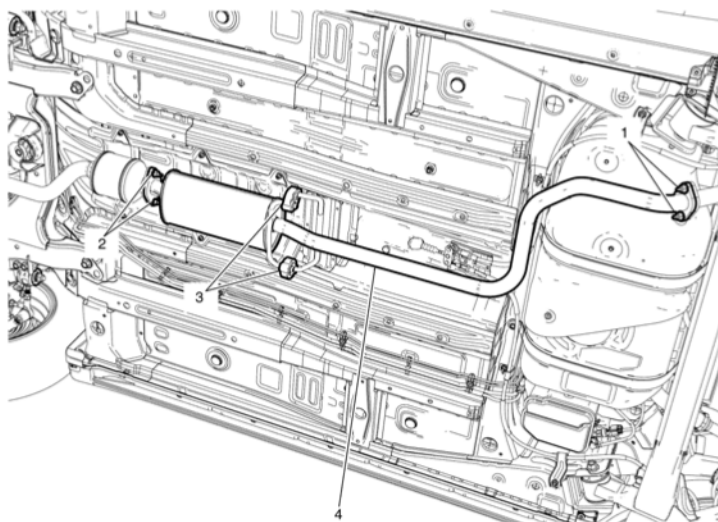
| Part Name                                 | Catalog Name                                       | Part Code |
|-------------------------------------------|----------------------------------------------------|-----------|
| Three-Way + Oxidation Catalytic Converter | CONVERTER,3WAY + OXIDN CTLTC(W/EXH MANIF PIPE)     | 0744C     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC(W/EXH MANIF PIPE)             | 0744D     |
| Warm Up Oxidation Catalytic Converter     | CONVERTER,W/UP OXIDN CTLTC(W/EXH MANIF PIPE)       | 0744E     |
| Warm Up Three-Way Catalytic Converter     | CONVERTER,W/UP 3WAY CTLTC(W/EXH MANIF PIPE)        | 0744F     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC(W/EXH MANIF PIPE & RESO)      | 0744G     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC (W/EXH RR MANIF PIPE)         | 0744H     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC (W/EXH FRT MANIF PIPE)        | 0744J     |
| Catalytic Converter                       | CONVERTER,CTLTC (W/EXH PIPE)                       | 0745A     |
| Oxidation Catalytic Converter             | CONVERTER,OXIDN CTLTC(W/EXH PIPE)                  | 0745B     |
| Three-Way + Oxidation Catalytic Converter | CONVERTER,3WAY + OXIDN CTLTC(W/EXH PIPE)           | 0745C     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC (W/EXH PIPE)                  | 0745D     |
| Warm Up Oxidation Catalytic Converter     | CONVERTER,W/UP OXIDN CTLTC (W/EXH PIPE)            | 0745E     |
| Warm Up Three-Way Catalytic Converter     | CONVERTER,W/UP 3WAY CTLTC(W/EXH PIPE)              | 0745F     |
| Oxidation Catalytic Converter             | CONVERTER,OXIDN CTLTC(W/EXH FRT PIPE)              | 0745G     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC(W/EXH FRT PIPE)               | 0745H     |
| Three-Way Catalytic Converter             | CONVERTER PKG,3WAY CTLTC (W/EXH FRT PIPE)          | 0745J     |
| Catalytic Converter                       | CONVERTER,CTLTC(W/EXH TAIL PIPE)                   | 0746A     |
| Oxidation Catalytic Converter             | CONVERTER,OXIDN CTLTC(W/EXH TAIL PIPE)             | 0746B     |
| Three-Way + Oxidation Catalytic Converter | CONVERTER,3WAY + OXIDN CTLTC(W/EXH TAIL PIPE)      | 0746C     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC(W/EXH TAIL PIPE)              | 0746D     |
| Warm Up Oxidation Catalytic Converter     | CONVERTER,W/UP OXIDN CTLTC(W/EXH TAIL PIPE)        | 0746E     |
| Warm Up Three-Way Catalytic Converter     | CONVERTER,W/UP 3WAY CTLTC(W/EXH TAIL PIPE)         | 0746F     |
| Oxidation Catalytic Converter             | CONVERTER KIT,OXIDN CTLTC                          | 0747A     |
| Three-Way + Oxidation Catalytic Converter | CONVERTER KIT,3WAY + OXIDN CTLTC                   | 0747B     |
| Three-Way Catalytic Converter             | CONVERTER KIT,3WAY CTLTC                           | 0747C     |
| Warm Up Oxidation Catalytic Converter     | CONVERTER KIT,W/UP OXIDN CTLTC                     | 0747D     |
| Warm Up Three-Way Catalytic Converter     | CONVERTER KIT,W/UP 3WAY CTLTC                      | 0747E     |
| Oxidation Catalytic Converter             | CONVERTER,OXIDN CTLTC                              | 0747R     |
| Warm Up Oxidation Catalytic Converter     | CONVERTER,W/UP OXIDN CTLTC                         | 0747S     |
| Warm Up Three-Way Catalytic Converter     | CONVERTER,W/UP 3WAY CTLTC                          | 0747T     |
| Three-Way + Oxidation Catalytic Converter | CONVERTER,3WAY + OXIDN CTLTC                       | 0747U     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC                               | 0747V     |
| Catalytic Converter                       | CONVERTER,CTLTC (NON-FUNCTIONAL)                   | 0749A     |
| Nitrogen Oxides Catalytic Converter       | CONVERTER,NOX CTLTC (W/FLTR)                       | 0749B     |
| Catalytic Converter                       | CONVERTER,CTLTC(W/INTEGRAL MUFF)                   | 0749M     |
| Catalytic Converter                       | CONVERTER,CTLTC(W/INTEGRAL RESO)                   | 0749N     |
| Catalytic Converter                       | CONVERTER,CTLTC(W/COOLER)                          | 0749P     |
| Catalytic Converter                       | CONVERTER,CTLTC(W/FLTR & EXH PIPE)                 | 0749R     |
| Oxidation Catalytic Converter             | CONVERTER,OXIDN CTLTC(W/FLTR & EXH PIPE)           | 0749S     |
| Catalytic Converter                       | CONVERTER,CTLTC                                    | 0750A     |
| Oxidation Catalytic Converter             | CONVERTER,OXIDN CTLTC                              | 0750B     |
| Three-Way + Oxidation Catalytic Converter | CONVERTER,3WAY + OXIDN CTLTC                       | 0750C     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC                               | 0750D     |
| Warm Up Oxidation Catalytic Converter     | CONVERTER,W/UP OXIDN CTLTC                         | 0750E     |
| Warm Up Three-Way Catalytic Converter     | CONVERTER,W/UP 3WAY CTLTC                          | 0750F     |
| Catalytic Converter                       | CONVERTER KIT,CTLTC                                | 0750G     |
| Oxidation Catalytic Converter             | CONVERTER,OXIDN CTLTC(W/FLTR)                      | 0750H     |
| Three-Way Catalytic Converter             | CONVERTER,3WAY CTLTC (W/EXH FRT PIPE & W/UP CTLTC) | 0750J     |
| Nitrogen Oxides Catalytic Converter       | CONVERTER,NOX CTLTC (W/EXH PIPE)                   | 0750M     |
| Nitrogen Oxides Catalytic Converter       | CONVERTER,NOX CTLTC                                | 0750N     |
| Nitrogen Oxides Catalytic Converter       | CONVERTER,NOX CTLTC (W/EXH FRT PIPE & COOLER)      | 0750P     |
| Nitrogen Oxides Catalytic Converter       | CONVERTER,NOX CTLTC (W/ COOLER)                    | 0750Q     |

| Part Name                                   | Catalog Name                             | Part Code |
|---------------------------------------------|------------------------------------------|-----------|
| Catalytic Converter                         | CONVERTER PKG,CTLTC                      | 0750R     |
| Warm Up Nitrogen Oxides Catalytic Converter | CONVERTER,W/UP NOX CTLTC (W/ FLTR)       | 0750S     |
| Heated Three-Way Catalytic Converter        | CONVERTER,HTD 3WAY CTLTC                 | 0750U     |
| Catalytic Converter                         | CONVERTER,CTLTC(INCOMPLETE)              | X0083     |
| Oxidation Catalytic Converter               | CONVERTER,OXIDN CTLTC(GOODWRENCH)        | X0232     |
| Three-Way + Oxidation Catalytic Converter   | CONVERTER,3WAY + OXIDN CTLTC(GOODWRENCH) | X0233     |
| Three-Way Catalytic Converter               | CONVERTER,3WAY CTLTC(GOODWRENCH)         | X0234     |

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## Exhaust Muffler Replacement - Front





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| Callout                                                                       | Component Name                                                                                                                                                                              |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preliminary Procedure                                                         |                                                                                                                                                                                             |
| Raise the vehicle. Refer to <a href="#">Lifting and Jacking the Vehicle</a> . |                                                                                                                                                                                             |
| 1                                                                             | <p>Exhaust Front Muffler to Exhaust Muffler Nut (Qty: 2)</p> <p>Caution:</p> <p>Refer to <a href="#">Component Fastener Tightening Caution</a>.</p> <p>Tighten</p> <p>46 N-m (34 lb-ft)</p> |
|                                                                               |                                                                                                                                                                                             |

| Callout | Component Name                                                                                                        |
|---------|-----------------------------------------------------------------------------------------------------------------------|
|         | Exhaust Front Pipe to Exhaust Muffler Nut (Qty:â€™%2)                                                                 |
| 2       | Caution:<br>Refer to <a href="#">Component Fastener Tightening Caution</a> .<br>Tighten<br>46â€™%N-m (34â€™%lbâ€™%ft) |
| 3       | Exhaust Muffler Hanger (Qty:â€™%2)                                                                                    |
| 4       | Exhaust Muffler (Front)                                                                                               |

## Related Part Information

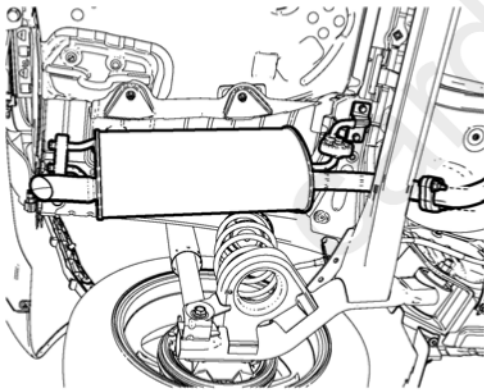
| Part Name       | Catalog Name      | Part Code |
|-----------------|-------------------|-----------|
| Exhaust Muffler | MUFFLER,EXH 1795A |           |

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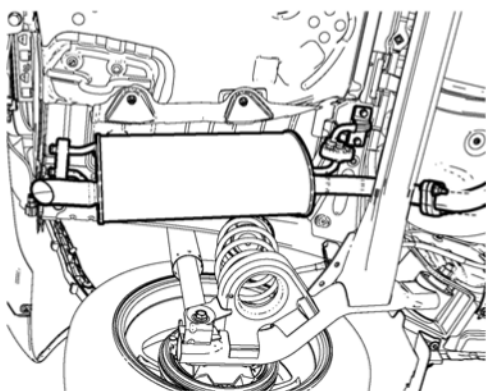
## Exhaust Muffler Replacement

### Removal Procedure



1. [Click here for full size](#)
2. Remove the exhaust pipe "rear muffler nut."
3. Disconnect the exhaust rear muffler assembly from the rubber hanger and remove it.

## Installation Procedure



1. [Click here for full size](#)
2. Connect the exhaust rear muffler assembly to the rubber hanger and install.
3. Caution:  
Refer to [Fastener Caution](#).
4. Install the exhaust pipe rear muffler nut and tighten to 46 N-m (34 lb-ft).

## Related Part Information

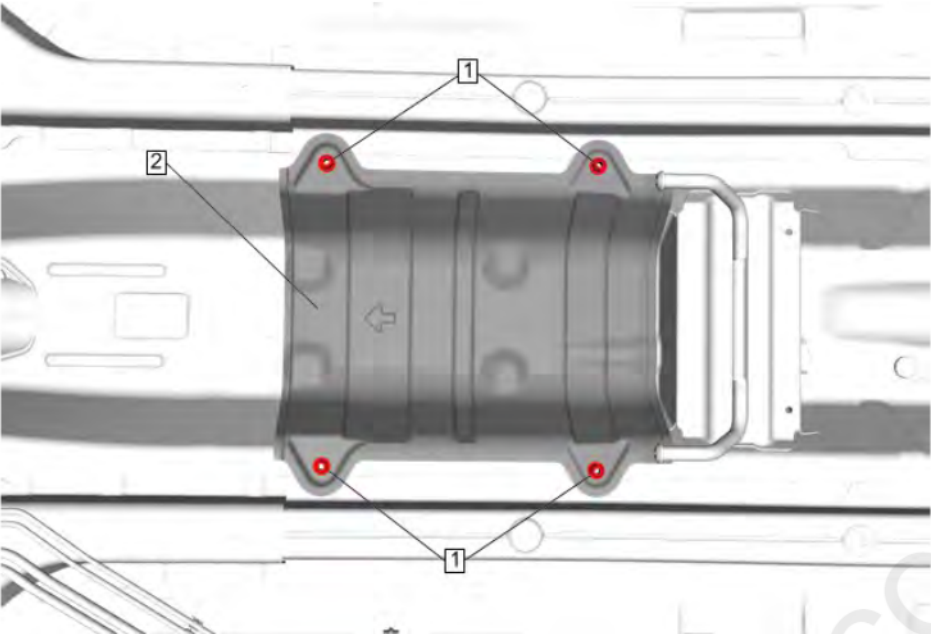
| Part Name       | Catalog Name                                               | Part Code |
|-----------------|------------------------------------------------------------|-----------|
| Exhaust Muffler | MUFFLER KIT,EXH                                            | SJ087     |
| Exhaust Muffler | MUFFLER,EXH                                                | SJ088     |
| Exhaust Muffler | MUFFLER,EXH                                                | SJ357     |
| Exhaust Muffler | MUFFLER PKG,EXH                                            | SJ361     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH PIPE & TAIL PIPE)                        | 1760A     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH PIPE & TAIL PIPE)(TMPRY)                 | 1761A     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH MANIF PIPE)                              | 1765A     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH MANIF PIPE,CTLTC CONV,EXH & TAIL PIPE)   | 1770A     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF,EXH,TAIL PIPE & OXIDN CTLTC CONV)      | 1770B     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF,EXH,TAIL PIPE & 3 WAY + OXIDN CTLTC)   | 1770C     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF,EXH,TAIL PIPE & 3 WAY CTLTC CONV)      | 1770D     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF,EXH,TAIL PIPE & W/UP OXIDN CTLTC CONV) | 1770E     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF,EXH,TAIL PIPE & W/UP 3 WAY CTLTC CONV) | 1770F     |
| Exhaust Muffler | MUFFLER,EXH (W/ CTLTC CONV OTLT & EXH MUFF C/OVR PIPE)     | 1771A     |
| Exhaust Muffler | MUFFLER,EXH(W/CLTC CONV,EXH & TAIL PIPE)                   | 1772A     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH & TAIL PIPE & OXIDN CTLTC CONV)          | 1772B     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH & TAIL PIPE & 3 WAY + OXIDN CTLTC CONV)  | 1772C     |
| Exhaust Muffler | MUFFLER,EXH (W/EXH & TAIL PIPE & 3 WAY CTLTC CONV)         | 1772D     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH & TAIL PIPE & W/UP OXIDN CTLTC CONV)     | 1772E     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH & TAIL PIPE & W/UP 3 WAY CTLTC CONV)     | 1772F     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH MANIF PIPE,CTLTC CONV & EXH PIPE)        | 1775A     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF & EXH PIPE & OXIDN CTLTC CONV)         | 1775B     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF & EXH PIPE & 3 WAY + OXIDN CTLTC CONV) | 1775C     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF & EXH PIPE & 3 WAY CTLTC CONV)         | 1775D     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF & EXH PIPE & W/UP OXIDN CTLTC CONV)    | 1775E     |
| Exhaust Muffler | MUFFLER,EXH(W/MANIF & EXH PIPE & W/UP 3 WAY CTLTC CONV)    | 1775F     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH MANIF PIPE,RESO,EXH & TAIL PIPE)         | 1778A     |
| Exhaust Muffler | MUFFLER,EXH(W/RESO,EXH & TAIL PIPE)                        | 1779A     |
| Exhaust Muffler | MUFFLER,EXH(W/EXH PIPE)                                    | 1780A     |

| <b>Part Name</b> | <b>Catalog Name</b>                                    | <b>Part Code</b> |
|------------------|--------------------------------------------------------|------------------|
| Exhaust Muffler  | MUFFLER,EXH(W/EXH PIPE & 3WAY CTLTC CONV)              | 1780B            |
| Exhaust Muffler  | MUFFLER,EXH(W/EXH PIPE & RESO)                         | 1781A            |
| Exhaust Muffler  | MUFFLER,EXH (W/ EXH PIPE & OXIDN CTLTC CONV)           | 1782A            |
| Exhaust Muffler  | MUFFLER,EXH(W/ H/SHLD)                                 | 1785A            |
| Exhaust Muffler  | MUFFLER,EXH (W/ EXH PIPES & PART FLTR & EXH CLR)       | 1787A            |
| Exhaust Muffler  | MUFFLER,EXH (W/ EXH PIPES & EXH CLR)                   | 1788A            |
| Exhaust Muffler  | MUFFLER,EXH(W/TAIL PIPE)                               | 1790A            |
| Exhaust Muffler  | MUFFLER,EXH(W/TAIL PIPE)                               | 1790B            |
| Exhaust Muffler  | MUFFLER,EXH (W/ EXH PIPE & OXIDN CTLTC CONV & RR MUFF) | 1792A            |
| Exhaust Muffler  | MUFFLER,EXH (W/ EXH PIPE & RR MUFF)                    | 1793A            |
| Exhaust Muffler  | MUFFLER,EXH (W/ EXH PIPE & RR MUFF & TAIL PIPE)        | 1794A            |
| Exhaust Muffler  | MUFFLER PKG,EXH                                        | 1794Y            |
| Exhaust Muffler  | MUFFLER,EXH                                            | 1795A            |
| Exhaust Muffler  | MUFFLER,EXH(W/INL PIPE & TAIL PIPE)                    | SA006            |
| Exhaust Muffler  | MUFFLER KIT,EXH(W/INTER RR EXH & TAIL PIPE)            | SG032            |

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Exhaust Front Underbody Heat Shield Replacement (LMU)



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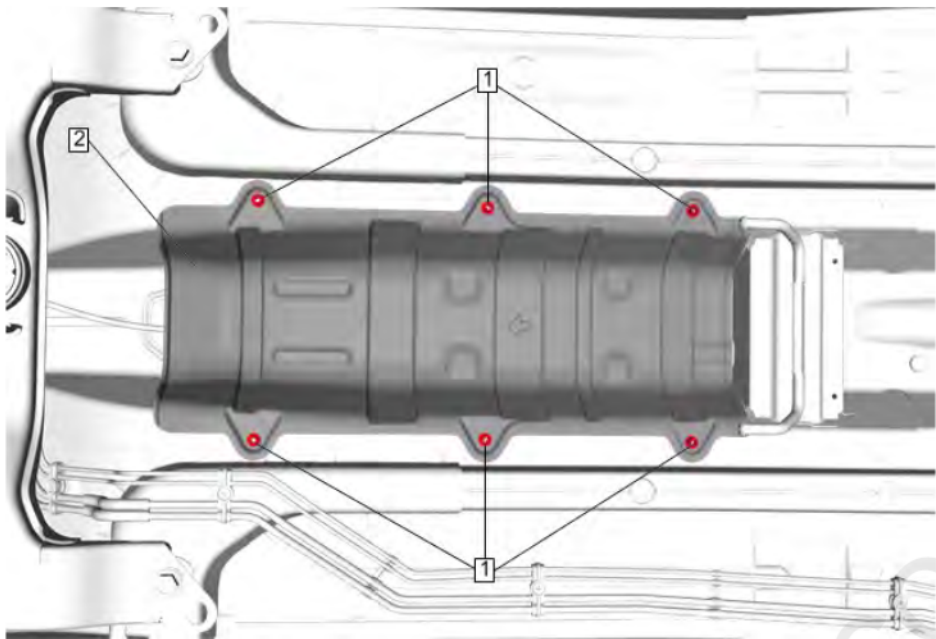
| Callout                                  | Component Name                                     |
|------------------------------------------|----------------------------------------------------|
| Preliminary Procedure                    |                                                    |
| <a href="#">Exhaust Pipe Replacement</a> |                                                    |
| 1                                        | Exhaust Front Underbody Heat Shield Retainer [3>x] |
|                                          | Caution:                                           |
|                                          | Refer to <a href="#">Fastener Caution</a> .        |
|                                          | Tighten                                            |
| 2                                        | 1.2â€%N-mâ€% (11â€%lbâ€%in)                        |
|                                          | Exhaust Front Underbody Heat Shield                |

Related Part Information

| Part Name                           | Catalog Name                | Part Code |
|-------------------------------------|-----------------------------|-----------|
| Exhaust Front Underbody Heat Shield | SHIELD,EXH FRT U/B HT 2892B |           |

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Exhaust Front Underbody Heat Shield Replacement (LKY)



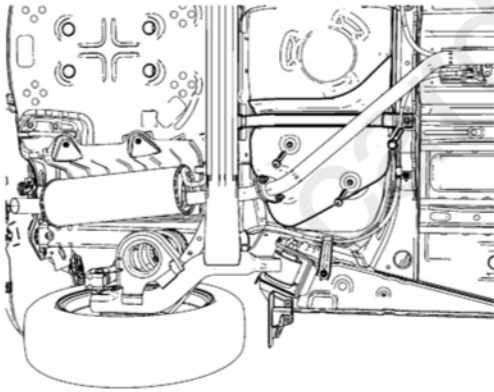
[Click here for full size](#)

| Callout                                  | Component Name                                     |
|------------------------------------------|----------------------------------------------------|
| Preliminary Procedure                    |                                                    |
| <a href="#">Exhaust Pipe Replacement</a> |                                                    |
| 1                                        | Exhaust Front Underbody Heat Shield Retainer [6>x] |
|                                          | Caution:                                           |
|                                          | Refer to <a href="#">Fastener Caution</a> .        |
|                                          | Tighten                                            |
| 2                                        | 1.2â€%N-mâ€% (11â€%lbâ€%in)                        |
|                                          | Exhaust Front Underbody Heat Shield                |

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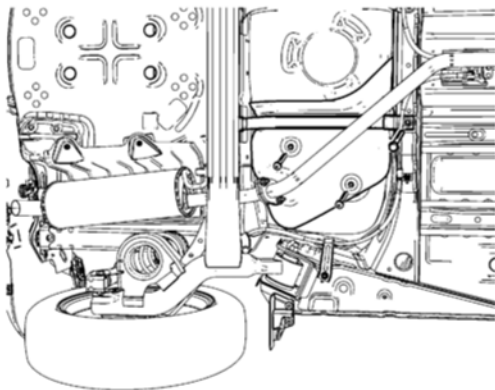
## **Fuel Tank Heat Shield Replacement**

### **Removal Procedure**



1. [Click here for full size](#)
2. Remove the exhaust pipe " rear muffler nut. Refer to [Exhaust Pipe Replacement](#).
3. Remove the fuel tank strap retaining bolt.
4. Remove the fuel tank heat shield retaining screw bolt.

## Installation Procedure



1. [Click here for full size](#)
2. Install the fuel tank heat shield retaining screw bolt.
3. Caution:  
Refer to [Fastener Caution](#).
4. Install the fuel tank strap retaining bolt and tighten to 20â€”N-m (15â€”lbâ€”ft).
5. Install the exhaust pipe â€” rear muffler nut and tighten to 46â€”N-m (34â€”lbâ€”ft).

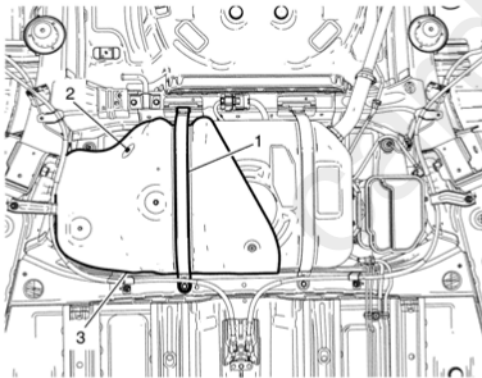
### Related Part Information

| Part Name                                   | Catalog Name | Part Code |
|---------------------------------------------|--------------|-----------|
| Fuel Tank Heat Shield SHIELD,F/TNK HT 4530A |              |           |
| Fuel Tank Heat Shield SHIELD,F/TNK HT 4530B |              |           |

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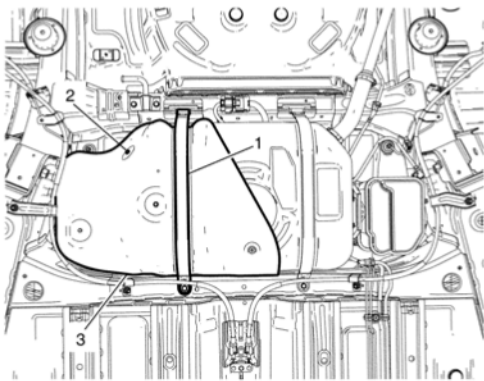
## Fuel Tank Heat Shield Replacement (LKY)

### Removal Procedure



1. [Click here for full size](#)
2. Remove the front exhaust muffler assembly. Refer to [Exhaust Muffler Replacement - Front](#).
3. Remove the fuel tank strap retaining bolt and band (1) left side only.
4. Remove the fuel tank heat shield retaining screw bolt (2).
5. Remove the fuel tank heat shield (3).

### Installation Procedure



1.

[Click here for full size](#)

2. Install the fuel tank heat shield(3).

3. Caution:

Refer to [Fastener Caution](#).

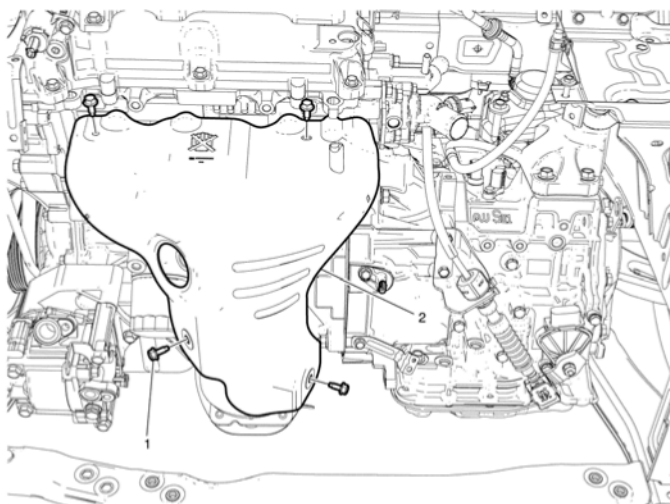
4. Install the fuel tank heat shield retaining screw bolt(2) and tighten to 6N-m (53lb-in).

5. Install the fuel tank strap(1) retaining bolt and tighten to 20N-m (15lb-ft).

6. Install the front exhaust muffler assembly. Refer to [Exhaust Muffler Replacement - Front](#).

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### Exhaust Manifold Heat Shield Replacement (LKY)



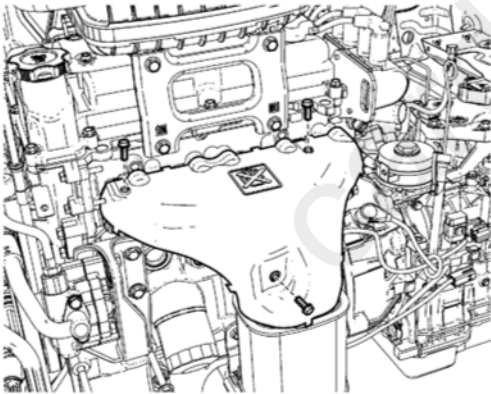
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| Callout                                                                                                          | Component Name                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preliminary Procedures                                                                                           |                                                                                                                                                              |
| 1. Remove the air cleaner assembly. Refer to <a href="#">Air Cleaner Assembly Replacement</a> .                  |                                                                                                                                                              |
| 2. Remove the front headed oxygen sensor. Refer to <a href="#">Heated Oxygen Sensor Replacement - Sensor 1</a> . |                                                                                                                                                              |
| 1                                                                                                                | Exhaust Manifold Heat Shield Retaining Bolt (Qty:4)<br><br>Caution:<br><br>Refer to <a href="#">Fastener Caution</a> .<br><br>Tighten<br><br>10N-m (89lb-in) |
| 2                                                                                                                | Exhaust Manifold Heat Shield                                                                                                                                 |

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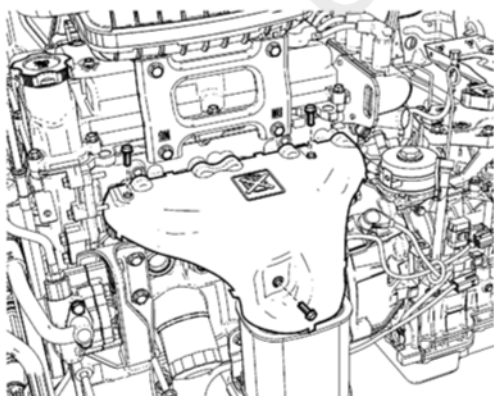
## Exhaust Manifold Heat Shield Replacement

### Removal Procedure



1. [Click here for full size](#)
2. Remove the 3 exhaust manifold heat shield retaining bolts.
3. Remove the exhaust manifold heat shield.

## Installation Procedure



1.

[Click here for full size](#)

2. Install the exhaust manifold heat shield.

3. Caution:

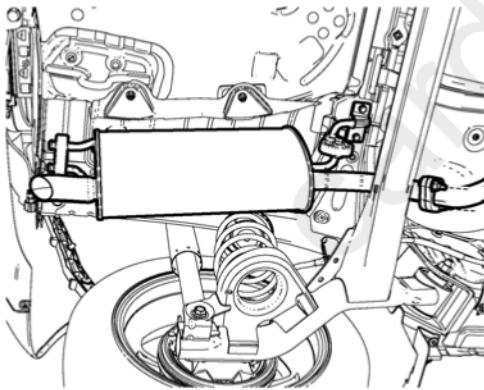
Refer to [Fastener Caution](#).

4. Install the 3 exhaust manifold heat shield retaining bolts and tighten to 10 N-m (89 lb-in).

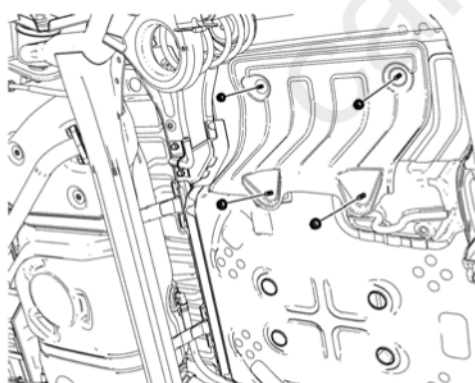
1. ENGINE/PROPULSION
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## Exhaust Rear Muffler Heat Shield Replacement

### Removal Procedure



1. [Click here for full size](#)
2. Remove the exhaust rear muffler. Refer to [Exhaust Muffler Replacement](#).

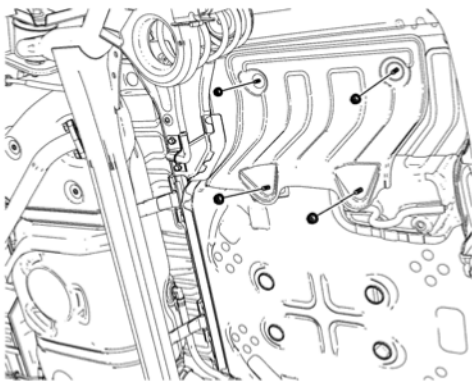


3.

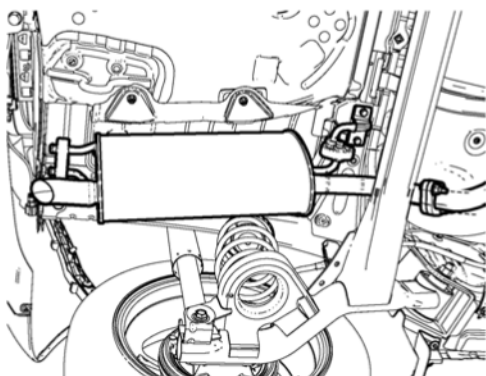
[Click here for full size](#)

4. Remove the 4‰exhaust rear muffler heat shield retaining nuts.

### Installation Procedure



1. [Click here for full size](#)
2. Caution:  
Refer to [Fastener Caution](#).
3. Install the 4 exhaust rear muffler heat shield retaining nuts and tighten to 1.2 N-m (11 lb-in).



4. [Click here for full size](#)
5. Install the exhaust rear muffler. Refer to [Exhaust Muffler Replacement](#).

#### Related Part Information

| Part Name                        | Catalog Name                | Part Code |
|----------------------------------|-----------------------------|-----------|
| Exhaust Rear Muffler Heat Shield | SHIELD,EXH RR MUFF HT 4039A |           |
| Exhaust Rear Muffler Heat Shield | SHIELD,EXH RR MUFF HT 4039B |           |

Specifications

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**Fastener Specifications (LKY)**

Reusable Threaded Fastener Tightening Specifications

| Application                                                     | Specification     |
|-----------------------------------------------------------------|-------------------|
|                                                                 | Metric (English)  |
| Note:                                                           |                   |
| All fasteners listed in this table can be reused after removal. |                   |
| Exhaust Front Muffler to Exhaust Muffler Nut                    | 46N-m (34 lb ft)  |
| Exhaust Front Pipe to Exhaust Manifold Nut                      | 46N-m (34 lb ft)  |
| Exhaust Front Pipe to Exhaust Muffler Nut                       | 46N-m (34 lb ft)  |
| Exhaust Manifold Bolt                                           | 20N-m (15 lb ft)  |
| Exhaust Manifold Bracket Bolt                                   | 20N-m (15 lb ft)  |
| Exhaust Manifold Heat Shield Retaining Bolt                     | 10N-m (89 lb in)  |
| Exhaust Pipe to Rear Muffler Nut                                | 46N-m (34 lb ft)  |
| Exhaust Rear Muffler Heat Shield Retaining Nut                  | 1.2N-m (11 lb in) |
| Fuel Tank Heat Shield Retaining Screw                           | 6N-m (53 lb in)   |
| Fuel Tank Strap Retaining Bolt                                  | 20N-m (15 lb ft)  |

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**Fastener Specifications (LC5, LMU)**

## Reusable Threaded Fastener Tightening Specifications

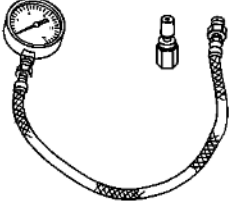
| Application                                                     | Specification     |
|-----------------------------------------------------------------|-------------------|
|                                                                 | Metric (English)  |
| Note:                                                           |                   |
| All fasteners listed in this table can be reused after removal. |                   |
| Catalytic Converterâ€” Exhaust Pipe Nut                         | 46N-m (34 lb ft)  |
| Catalytic Converter Nut (Exhaust Manifold)                      | 46N-m (34 lb ft)  |
| Exhaust Manifold Heat Shield Retaining Bolt                     | 10N-m (89 lb in)  |
| Exhaust Manifold Heat Shield Retaining Nut                      | 1.2N-m (11 lb in) |
| Exhaust Manifold Retaining Bolt                                 | 25N-m (18 lb ft)  |
| Exhaust Manifold Retaining Nut                                  | 25N-m (18 lb ft)  |
| Exhaust Pipeâ€” Rear Muffler Nut                                | 46N-m (34 lb ft)  |
| Exhaust Rear Muffler Heat Shield Mounting Nut                   | 1.2N-m (11 lb in) |
| Front Exhaust Pipe Bracket Bolt                                 | 46N-m (34 lb ft)  |
| Fuel Tank Strap Retaining Bolt                                  | 20N-m (15 lb ft)  |
| Oxygen Sensorâ€” Sensor 1                                       | 41N-m (30 lb ft)  |
| Oxygen Sensorâ€” Sensor 2                                       | 41N-m (30 lb ft)  |

Special Tools and Equipment

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1. ENGINE/PROPULSION
2. ENGINE EXHAUST
3. SPECIAL TOOLS AND EQUIPMENT
- 4.

### Special Tools

| Illustration                                                                                                                                                                                                                                                                                              | Tool Number/ Description                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
|  A line drawing of an exhaust back pressure gauge. It features a circular gauge face with a needle, connected to a flexible hose. A small, separate component, likely a check valve or adapter, is shown above the hose. | EN-35314 A<br>J 35314 A<br>Exhaust Back Pressure Gauge |

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