

180 Exhaust System

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GENERAL

The exhaust system is designed to be maintenance free, although regular inspection is warranted due to the harsh operating conditions. Under normal conditions, the catalytic converter does not require replacement unless it is damaged. The rear exhaust pipe assembly includes intermediate and primary mufflers and must be replaced as a unit.

The oxygen sensor monitors the exhaust and provides feedback about combustion efficiency to the DME control unit. The oxygen sensor should be replaced as a part of routine maintenance at a specified mileage interval. See **020 Maintenance** for replacement information. For information on testing the oxygen sensor see **130 Fuel Injection**.

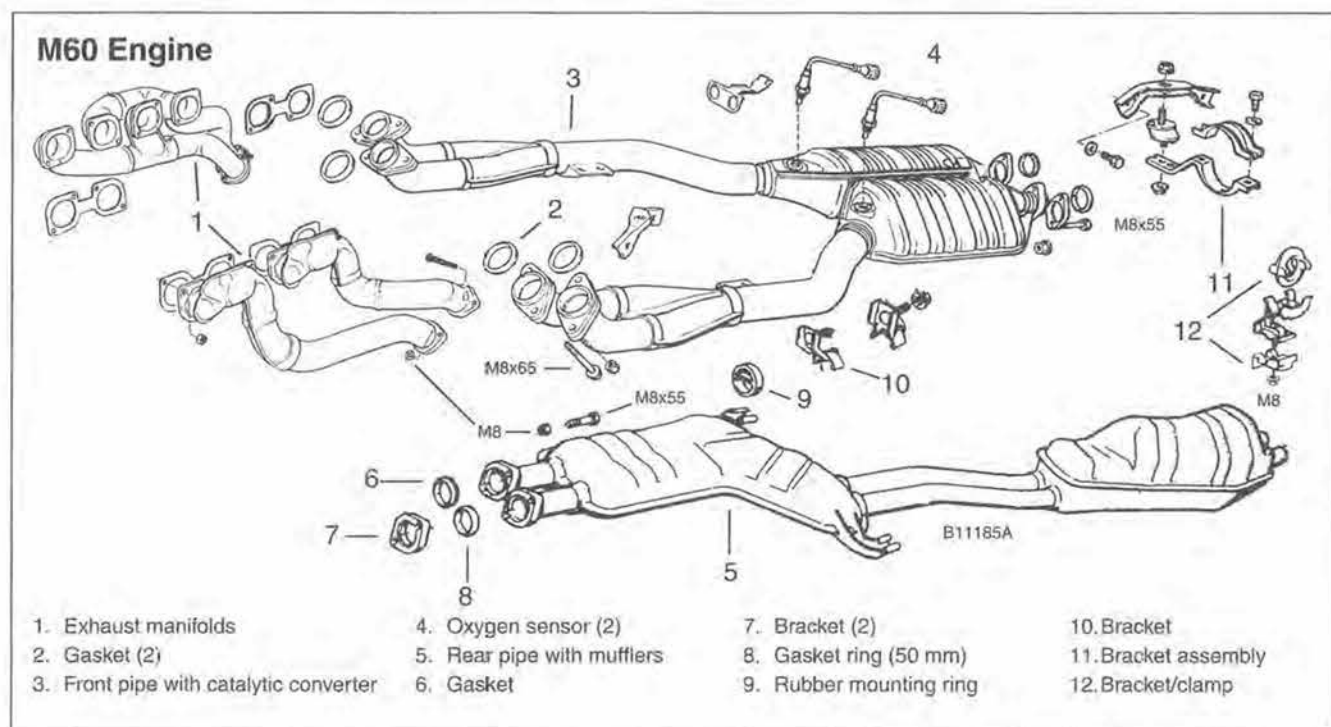
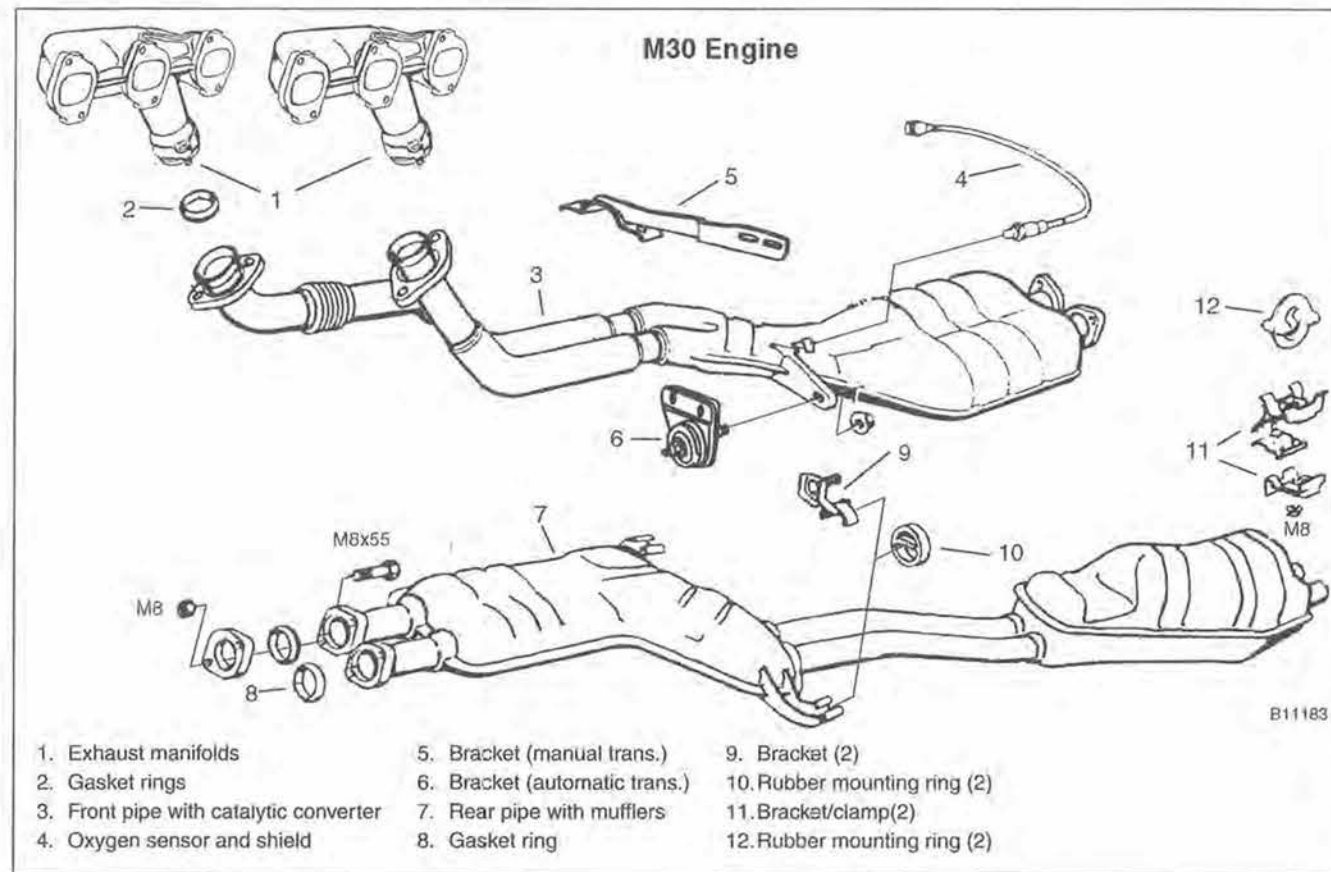
EXHAUST SYSTEM

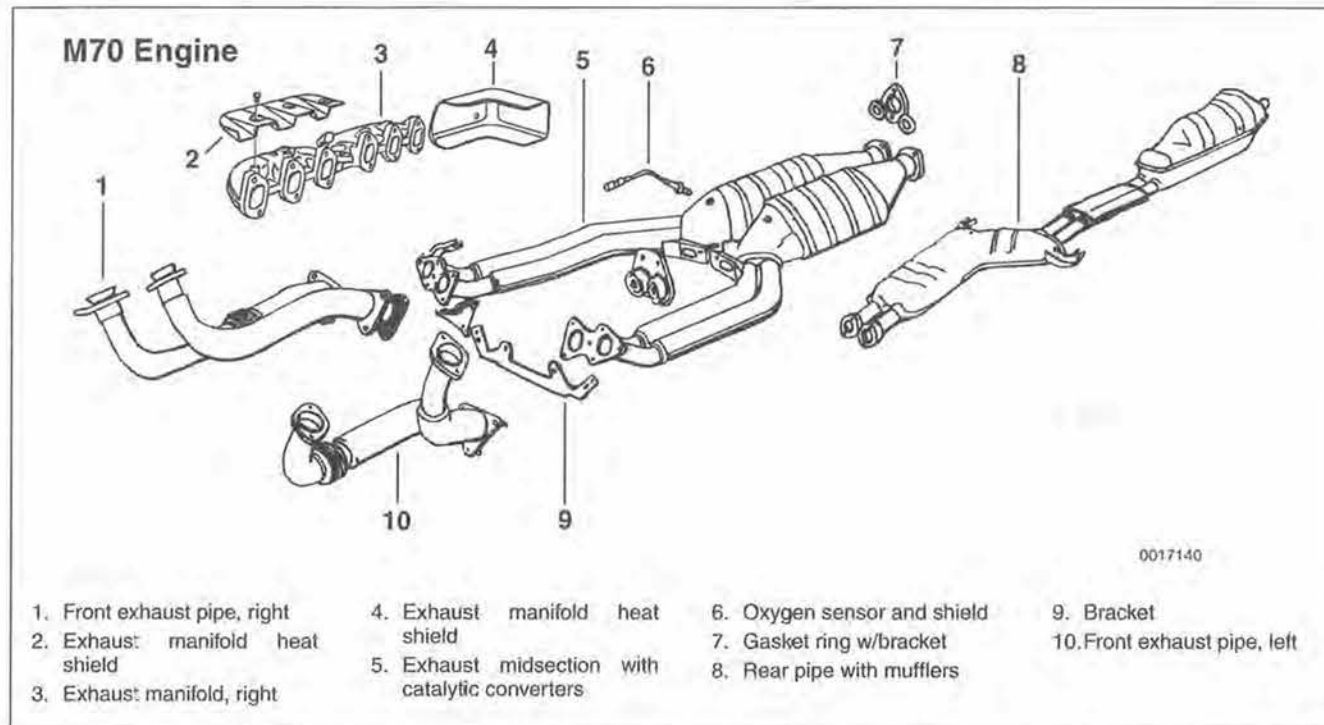
New fasteners, clamps, rubber mounts and gaskets should be used when replacing exhaust components. A liberal application of penetrating oil to the exhaust system nuts and bolts in advance may make removal easier.

WARNING—

- The exhaust system and catalytic converter operate at very high temperatures. Allow these components to cool before servicing. Wear protective clothing to prevent burns. Do not use flammable chemicals near a hot catalytic converter.
- Old, corroded exhaust system components crumble easily and often have exposed sharp edges. To avoid injury, wear eye protection and heavy gloves when working with old exhaust parts.

180-2 EXHAUST SYSTEM





Exhaust system, removing and installing

This section covers removing the exhaust system as a complete unit. Once the complete system is removed from the car, individual pipes and mufflers can be more easily replaced.

WARNING—

Exhaust gases are colorless, odorless, and very toxic. Run the engine only in a well-ventilated area. Immediately repair any leaks in the exhaust system or structural damage to the car body that might allow exhaust gases to enter the passenger compartment.

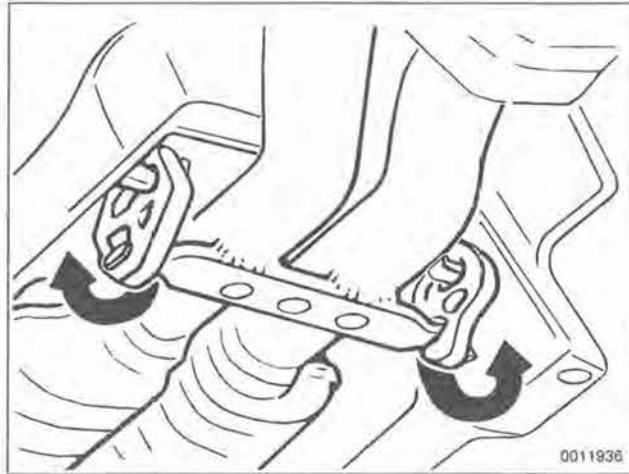
- With exhaust system fully cold, raise and support car for access to exhaust system.

WARNING—

Do not work under a lifted car unless it is solidly supported on jack stands designed for that purpose. Never work under a car that is supported solely by a jack.

- Disconnect oxygen sensor connector(s).
- Loosen and remove bolts holding front exhaust pipes to exhaust manifolds.

180-4 EXHAUST SYSTEM



NOTE—

On 750iL model: detach the exhaust midsection from front pipes. Front pipe removal is covered in Exhaust Manifolds.

- Support exhaust system
- Disconnect exhaust support bracket assembly from transmission.
- Rubber exhaust system hangers. Remove hanger by prying off bracket (**arrows**).
 - Detach rubber hangers, where applicable.
- Lower exhaust system to ground.

NOTE—

If the catalytic converter/front exhaust pipe assembly is to be replaced, transfer the oxygen sensor to the new pipe(s).

Tightening Torque

- Oxygen sensor to exhaust system . . . 55 Nm (41 ft-lb)

- Installation is reverse of removal.
 - Make sure there is at least 20 mm (¾ in.) clearance between exhaust system and car body at every point.
 - Loosely install all exhaust system mounting hardware and hangers before tightening fasteners to their final torque.
 - Coat manifold studs with copper paste before installing nuts.

NOTE—

• Where applicable, tighten front pipe with semi-flexible compensator (spring-loaded fasteners) last when installing front pipe to manifolds.

- Preload rear clamping bracket as specified to help prevent system rattling.

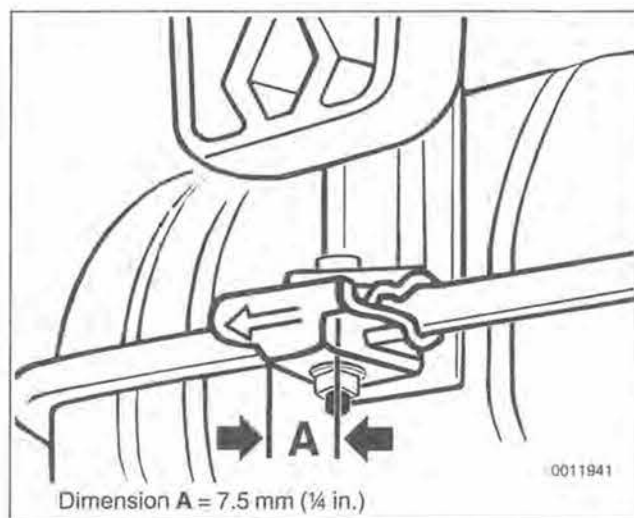
Tightening Torques (M30 engine)

- Front exhaust pipe to exhaust manifold
 - 1st stage 10 Nm (89 in-lb)
 - 2nd stage loosen nuts 1½ turns

To prevent exhaust system rattles and vibration, the system should be slightly preloaded by pushing the rear clamping brackets forward about 7 mm (¼ in.).

Tightening Torques

- Exhaust support bracket to transmission 24 Nm (17 ft-lb)
- Exhaust system mounting clamps . . . 22 Nm (16 ft-lb)



EXHAUST MANIFOLDS

Exhaust manifold removal procedures are organized according to engine code. If necessary, see **100 Engine-General** for engine code and application information.

NOTE—

When removing exhaust manifolds or front exhaust pipes on the M60 or M70 engine, it may be simpler to remove the engine, due to an extremely crowded engine compartment.

Exhaust manifolds, removing and installing (M30 engine)

- Disconnect negative (–) battery cable. See **020 Maintenance**.

CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.

- With exhaust system cold, raise and support car for access to exhaust system.

WARNING—

Do not work under a lifted car unless it is solidly supported on jack stands designed for that purpose. Never work under a car that is supported solely by a jack.

- Unbolt front exhaust pipes from exhaust manifolds.
- Remove exhaust support bracket from transmission.
- Loosen and remove nuts from exhaust manifolds and remove manifolds. Discard nuts and gaskets.
- Installation is reverse of removal.
 - Coat exhaust manifold mounting studs with copper paste before installing new nuts.
 - Install new manifold gaskets with arched side facing manifolds.

Tightening Torques

- Exhaust manifold to cylinder head (M8) 22 Nm (17 ft-lb)
- Exhaust pipe to exhaust manifold
 - 1st stage 10 Nm (89 in-lb)
 - 2nd stage loosen nuts 1½ turns

EXHAUST MANIFOLDS

**Exhaust manifolds, left side
removing and installing (M60 engine)**

- Disconnect negative (–) battery cable. See **020 Maintenance**.

CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.

- With exhaust system cold, raise and support car for access to exhaust system.
- Working beneath car, remove engine splash shield and then remove heat shields from left side of front suspension crossmember.
- Remove alternator if necessary. See **121 Battery, Starter, Alternator**.
- Unbolt exhaust pipe from left exhaust manifolds.
- Remove top engine plastic cover. See **113 Cylinder Head Removal and Installation**.
- Working from underside of front suspension crossmember, remove mounting bolts from left and right engine mounts. Disconnect ground strap from engine mount bracket, where applicable.
- Install engine lifting device to front and rear lifting points.
- Remove left side exhaust manifold mounting nuts (arrows) and remove exhaust manifolds.
- Raise engine just enough to facilitate removal of exhaust manifolds.

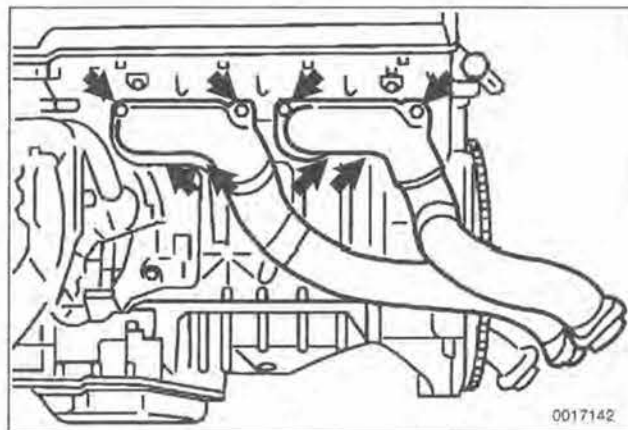
CAUTION—

Check that there is sufficient clearance at rear bulkhead when raising engine.

- Installation is reverse of removal.
 - Coat exhaust manifold mounting studs with copper paste before installing new nuts.
 - Install manifold gaskets with arched side facing manifolds.
 - Be sure to reinstall all ground straps.

Tightening Torque

- Exhaust manifold to cylinder head (M8) 22 Nm (17 ft-lb)



**Exhaust manifolds, right side
removing and installing (M60 engine)**

- Disconnect negative (–) battery cable. See 020 Maintenance.

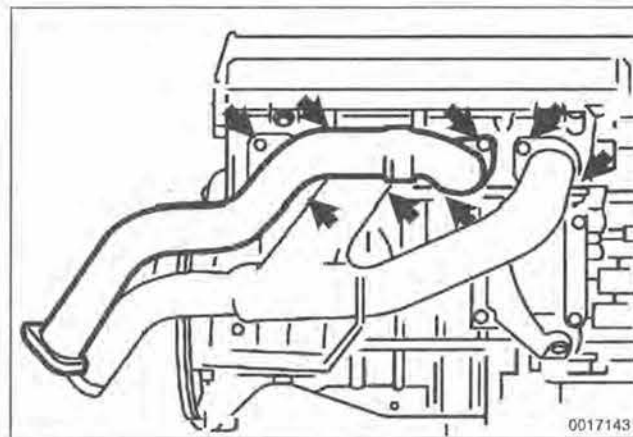
CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.

- With exhaust system cold, raise and support car for access to exhaust system.

WARNING—

Do not work under a lifted car unless it is solidly supported on jack stands designed for that purpose. Never work under a car that is supported solely by a jack.



- Working beneath car, remove engine splash shield and then remove heat shields from front suspension crossmember.
- Remove right side exhaust manifold mounting nuts (arrows) and remove manifolds.
- Remove windshield washer reservoir in front of right strut tower and set aside.
- Remove exhaust manifold mounting nuts. Remove manifolds from above, removing manifold for cylinders 2/4 first.
- Installation is reverse of removal.
 - Coat exhaust manifold mounting studs with copper paste before installing new nuts.
 - Install manifold gaskets with arched side facing manifolds.

Tightening Torque

- Exhaust manifold to cylinder head (M8) 22 Nm (17 ft-lb)

180-8 EXHAUST SYSTEM

Exhaust front pipes, removing and installing (M70 engine)

- Disconnect negative (–) battery cable. See **020 Maintenance**.

CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.

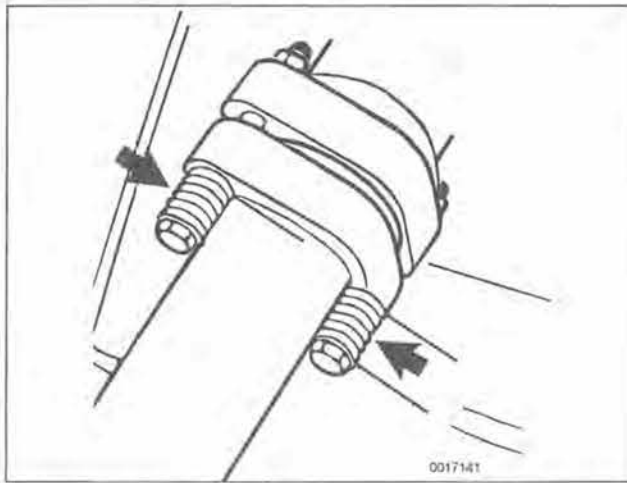
- With exhaust system cold, raise and support car for access to exhaust system.
- Working beneath car, remove engine splash shield and then remove heat shields from front suspension crossmember.
- While supporting exhaust system, detach exhaust midsection from front exhaust pipes.
- Unbolt and remove front pipes from exhaust manifolds.

NOTE—

- Remove the windshield washer reservoir(s) to gain access to the right side exhaust manifolds.
- Remove the oil filter housing and the brake booster fluid reservoir to gain access to the left side manifolds.

- Installation is reverse of removal.
 - Replace sealing rings and gaskets.
 - Replace mounting hardware as necessary.
 - Coat mounting bolts with copper paste before installing new nuts.

- Tighten exhaust mounting hardware to compress springs (**arrows**), then back off 1½ turns. Exhaust flanges should end up parallel to each other.



Tightening Torque

- Exhaust pipe to exhaust manifold
 - 1st stage 10 Nm (89 in-lb)
 - 2nd stage loosen nuts 1½ turns

Exhaust manifolds, left side removing and installing (M70 engine)

- Disconnect negative (–) battery cable. See 020 Maintenance.

CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.

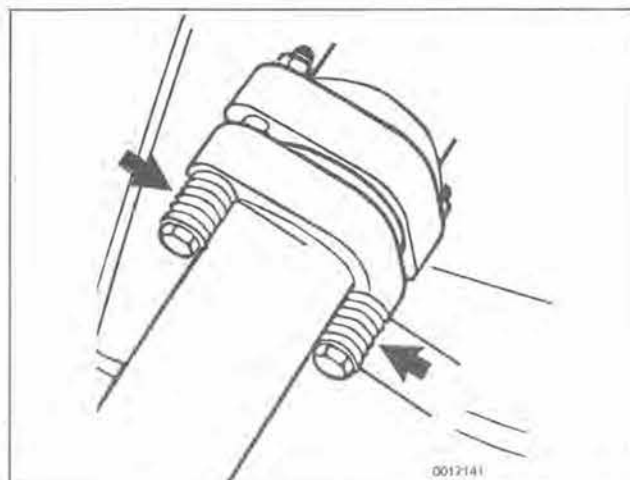
- With exhaust system cold, raise and support car for access to exhaust system.
- Remove front exhaust pipe(s) as described earlier.

NOTE—

- Remove the windshield washer reservoir(s) to gain access to the right side exhaust manifolds.
- Remove the oil filter housing and the brake booster fluid reservoir to gain access to the left side manifolds.

- Remove left front exhaust manifold nuts and remove front manifold.
- Detach vacuum hose to brake booster from cylinder head.
- Detach heater hoses leading to heater valve. Detach heater valve and set aside.
- Remove left rear exhaust manifold top nuts and remove rear manifold heat shield.
- Remove lower manifold nuts and remove manifold.
- Installation is reverse of removal.
 - Replace gaskets and self-locking nuts.
 - Install manifold gaskets with smooth side toward cylinder head.
 - Coat mounting bolts with copper paste before installing new nuts.

- ⚠ Tighten exhaust mounting hardware to compress springs (arrows), then back off 1½ turns. Exhaust flanges should end up parallel to each other.



Tightening Torques

- Exhaust manifold to cylinder head (M8) 24 Nm (17 ft-lb)
- Exhaust pipe to exhaust manifold
 - 1st stage 10 Nm (89 in-lb)
 - 2nd stage loosen nuts 1½ turns

180-10 EXHAUST SYSTEM

Exhaust manifolds, right side removing and installing (M70 engine)

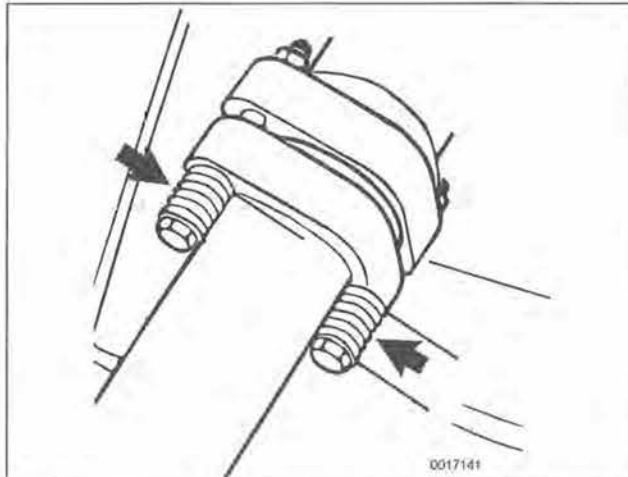
- Disconnect negative (–) battery cable. See **020 Maintenance**.

CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.

- With exhaust system cold, raise and support car for access to exhaust system.
- Remove front exhaust pipe(s) as described earlier.
- Remove right front exhaust manifold nuts and remove front manifold.
- Remove heat shield on starter motor.
- Remove right rear exhaust manifold top nuts and remove rear manifold heat shield.
- Remove lower manifold nuts and remove manifold.
- Installation is reverse of removal.
 - Replace gaskets and self-locking nuts.
 - Install manifold gaskets with smooth side toward cylinder head.
 - Coat mounting bolts with copper paste before installing new nuts.

- ◀ Tighten exhaust mounting hardware to compress springs (**arrows**), then back off 1½ turns. Exhaust flanges should end up parallel to each other.



Tightening Torques

- Exhaust manifold to cylinder head (M8) 24 Nm (17 ft-lb)
- Exhaust pipe to exhaust manifold
 - 1st stage 10 Nm (89 in-lb)
 - 2nd stage loosen nuts 1½ turns

