



## Installation Instructions

### 18SP589\* – Series 60<sup>®</sup> Right Side EGR Bolt-Together System with Hydraulic Actuator Valve

\*Revision: 1/6/05

#### Introduction

There are two new kits for different orientations of the hot pipe assemblies with a hydraulic actuator valve. Table 1 shows the correct kit part number for its corresponding engine type.

Kit Part No.	Description	
23533972	Mid-Setback Exhaust Manifold Center Section	Hot Pipe Hydraulic Valve
23533973	High-Mount Exhaust Manifold Center Section	Hot Pipe Hydraulic Valve

**Table 1 Hydraulic Actuator Service Kits**

#### Installation

Before assembly, ensure that the exhaust manifold center section is the correct type for engine. Two types, a high-mount and a mid-setback mount, are available.

**NOTE:**

The bellows assembly is a one-time use component. Once removed, the bellows must be replaced.

**NOTE:**

When a tube and shell style cooler is used to replace the bar fin and plate type, the ECM software must be DDEC IV Rel. 37.00 or higher. If it is not, then the ECM must be reprogrammed to have Rel. 37.00 software or higher.

#### Pre-Assembly

Pre-assemble the exhaust manifold as follows:

1. Install two M8 studs into exhaust center section manifold and three M8 studs into the EGR cooler. Torque to 20-24 N·m (15-18 lb·ft).
2. Thread four M10 turbo mounting studs into exhaust center section and torque to 20-24 N·m (15-18 lb·ft).

3. Install upper hot pipe gasket and upper hot pipe to exhaust center section manifold and torque nuts to 22-26 N·m (16-19 lb·ft).

### EGR Cooler Installation

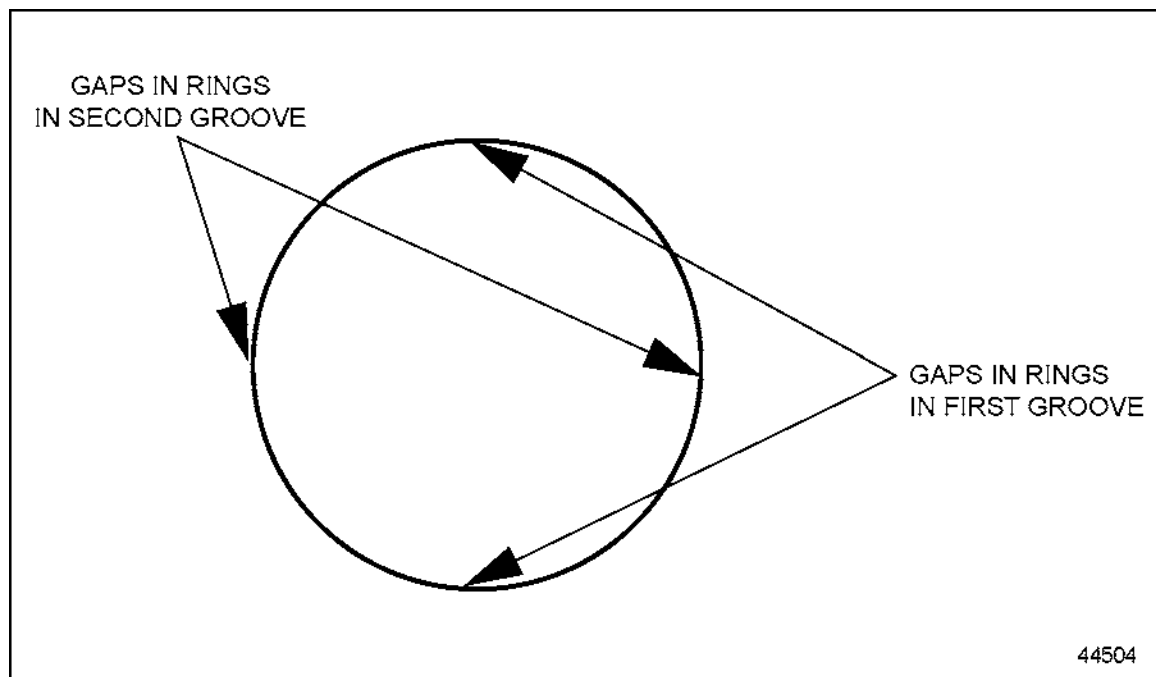
Install the EGR cooler as follows:

1. Insert EGR cooler water outlet into hose on oil cooler inlet.
2. Align EGR cooler back plate holes with four bosses on cylinder block.
3. Thread four M10 bolts through back plate of cooler and into cylinder block and tighten bolts to 46-52 N·m (34-38 lb·ft).
4. Install hose and clamps onto EGR cooler water inlet.
5. Insert water pump outlet elbow into hose on EGR cooler water inlet.
6. Install the seal ring and water pump elbow on water pump using two M10 bolts. Torque bolts to 58-73 N·m (43-54 lb·ft).

### Exhaust Manifold Installation

Install the exhaust manifold as follows:

1. Ensure that the seal rings (total of eight) are installed in the four grooves on the exhaust manifold center section.
2. Ensure that the gaps on the sealing rings in each groove are 180 degrees from each other, and turn the set of rings in the neighboring groove 90 degrees so that the net effect is a gap every 90 degrees. See Figure 1.

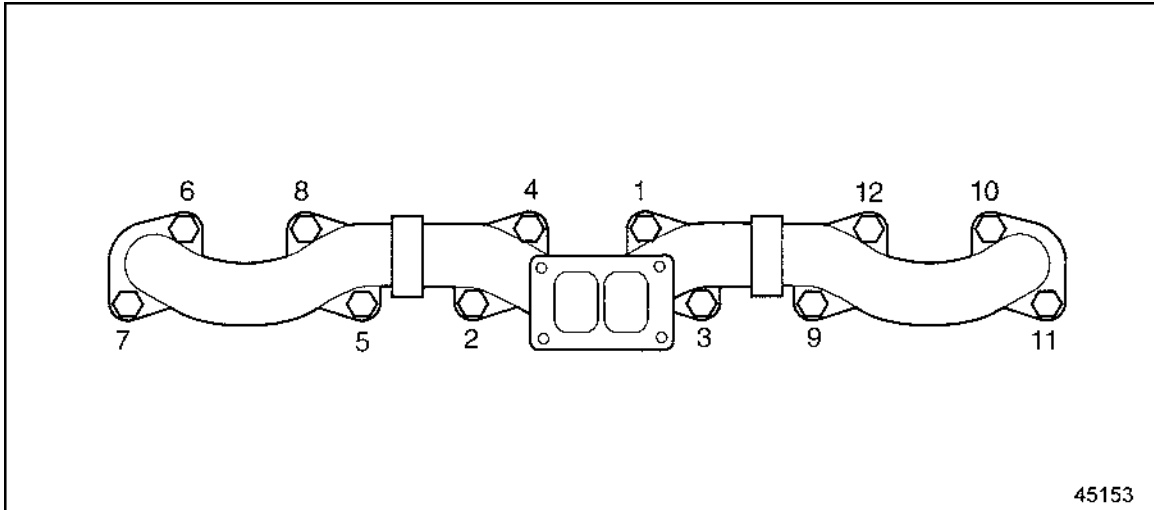


**Figure 1 Sealing Ring Gaps**

3. Install six exhaust manifold guide studs, J 36107, into the cylinder head in locations 6, 8, 4, 1, 9, and 11 to hold the three exhaust manifold gaskets in the correct position and facilitate manifold installation. See Figure 2.

**NOTE:**

The exhaust gasket can be positioned either way. Ensure the guide studs and gaskets are positioned correctly for the manifold being installed.



**Figure 2 Torque Sequence for Exhaust Manifolds**

4. Install the exhaust gaskets to the guide studs.
5. Install the assembled manifold to the guide studs.
6. Install and slightly tighten the mounting bolts and spacers in locations 7, 5, 2, 3, 12, and 10. The load should be enough to hold the exhaust manifold assembly in place when the guide studs are removed. See Figure 2.
7. Remove the guide studs, making sure the exhaust manifold has not moved.

**NOTE:**

If the manifolds move while removing the guide studs, loosen all bolts and go back to Step 6.

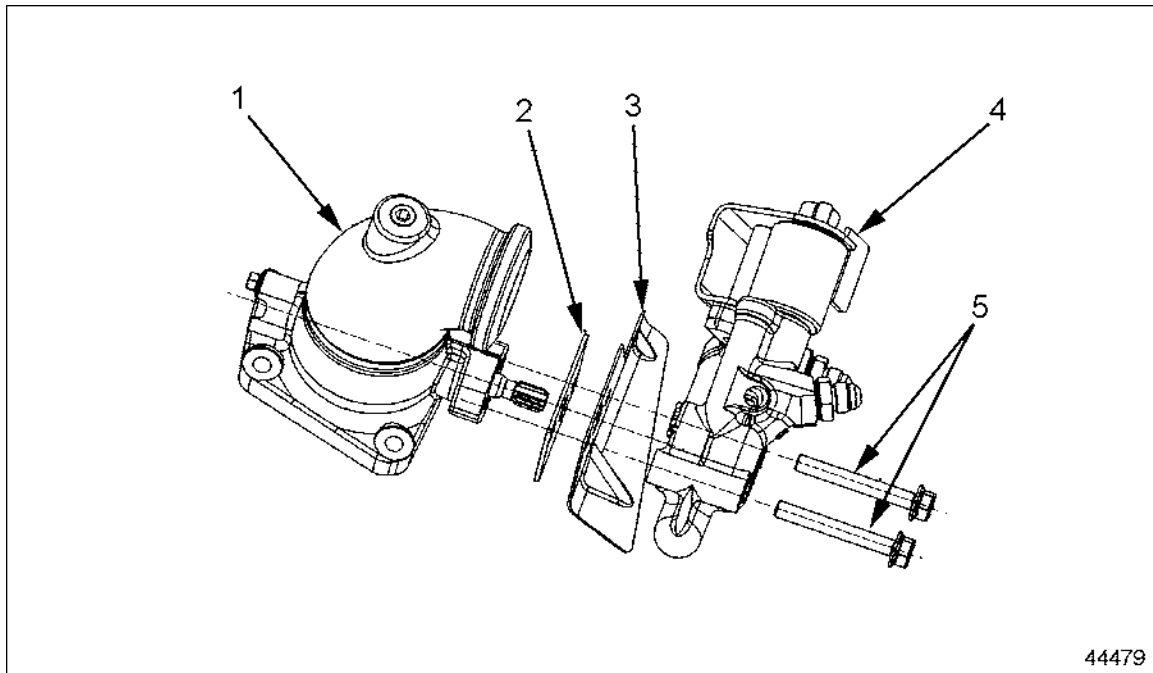
8. Install the remaining manifold bolts and spacers to the holes from which the studs were removed. Torque all bolts to 58-73 N·m (43-54 lb·ft) using the proper tightening sequence. See Figure 2.

### Hydraulic Actuator-to-EGR Valve Assembly Installation

To assemble the hydraulic valve assembly, P/N: 23533539, perform the following steps before installing this assembly to the bellows: (See Figure 3.)

1. Remove the old EGR valve assembly from the engine. This will not be reused.
2. Remove the reusable hydraulic actuator, P/N: 23533139.

3. Remove heat shields.
4. Attach the hydraulic actuator to the EGR valve assembly using a new shield, P/N: 23529735, and tighten bolts, P/N: 11509515, to 30-35 N·m (22-26 lb·ft).



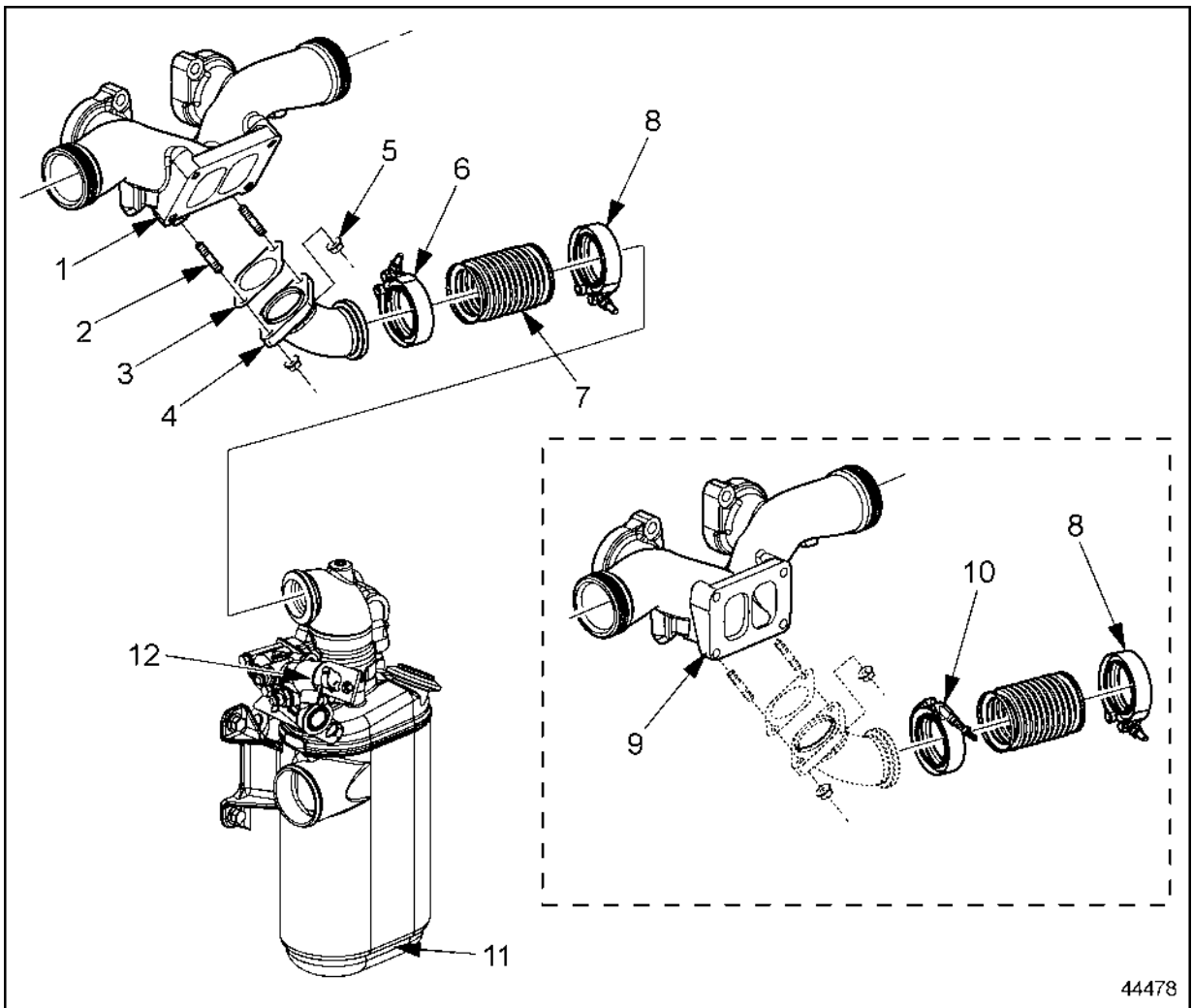
1. EGR Valve Assembly, P/N: 23533538
2. Shield, P/N: 23529735
3. Shield, P/N: 23532673
4. Hydraulic Actuator Assembly, P/N: 23533139
5. M8 Bolts, P/N: 11509515

**Figure 3 Hydraulic Actuator EGR Valve Assembly**

### **EGR Bellows and Valve Body Installation**

Install the EGR bellows to the valve assembly as follows:

1. Loosely install bellows to EGR valve assembly using a bellows clamp.
2. Slip the remaining bellows clamp over the flange of the upper hot pipe.
3. Install EGR cooler gasket.
4. Align the bellows with the upper hot pipe and while pressing against the upper hot pipe, lower the EGR valve assembly over the EGR cooler studs.
5. Tighten the EGR cooler nuts to 22-26 N·m (16-19 lb·ft).
6. Position bellows clamps as indicated in Figure 4 and tighten to 12 N·m (106 lb·in.).



1. Exhaust Manifold Mid-Setback Center Section
2. Stud
3. Gasket
4. Upper Hot Pipe
5. Nut
6. Upper Hot Pipe-to-Bellows Clamp Orientation for a Mid-Setback Center Section
7. Bellows
8. EGR Valve-to-Bellows Clamp Orientation for all Engines
9. Exhaust Manifold High-Mount Center Section
10. Upper Hot Pipe-to-Bellows Clamp Orientation for a High-Mount Center Section
11. EGR Cooler with EGR Hydraulic Valve
12. Hydraulic Actuator Valve

**Figure 4 Exhaust Manifold Bellows Clamps Orientation**

Table 2 is a description of kit parts, part numbers, and quantities required per hydraulic kit.

P/N:	Description	KIT 23533972 HYDRAULIC VALVE MID-SETBACK (Quantity)	KIT 23533973 HYDRAULIC VALVE HIGH-MOUNT (Quantity)
8929529	GASKET, TURBO MOUNTING	1	1
23533949	MAN. ASSY. EXHAUST CENTER SECTION (MID-SETBACK)	1	–
23533950	MAN. ASSY. EXHAUST CENTER SECTION (HIGH-MOUNT)	–	1
23533821	MAN. EXHAUST END SECTION FRT	1	1
23533822	MAN. EXHAUST END SECTION RR	1	1
23533707	STUD M8 X 1.25 NIMONIC	5	5
23531424	STUD, TURBO MOUNTING	4	4
23533210	UPPER HOT PIPE GASKET	1	1
23533221	UPPER HOT PIPE	1	1
23534432	M8 NUT	5	5
23534003	V-CLAMP	2	2
23533220	BELLOWS	1	1
23533538	EGR VALVE ASSY.	1	1
23529735	EGR VALVE ACTUATOR SHIELD	1	1
23533534	LOWER EGR COOLER GASKET	1	1
23533180	EGR COOLER	1	1
23533983	EXHAUST MANIFOLD GASKET	3	3
23527385	ELBOW-TO-WATER PUMP SEAL RING	1	1
23531401	NUT	4	4
8929169	WASHER	4	4

**Table 2 Description of Parts Hot Pipe Hydraulic Valve Service Kits**

**DETROIT DIESEL**



13400 Outer Drive, West, Detroit, Michigan 48239-4001  
 Telephone: 313-592-5000  
 www.detroitdiesel.com

Copyright© 2004 Detroit Diesel Corporation. Detroit Diesel®, DDC®, and the spinning arrows design are registered trademarks of Detroit Diesel Corporation. All other trademarks are the property of their respective owners.

**18SP589 (Rev. 1/6/05) 0501 As technical advances continue, specifications will change. All rights reserved. Printed in U.S.A.**