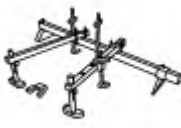


SECTION 303-01A: Engine — 3.5L GTDI
IN-VEHICLE REPAIR

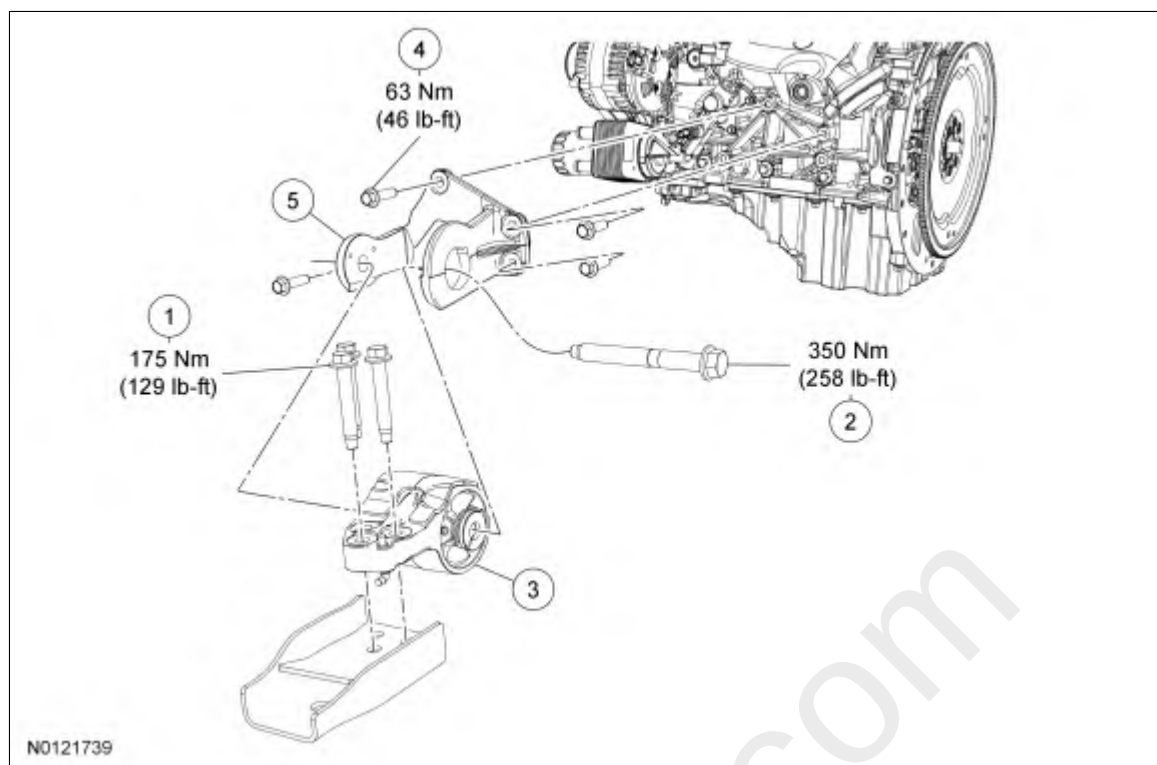
2014 F-150 Workshop Manual
Procedure revision date: 10/25/2013

Engine Support Insulators

Special Tool(s)

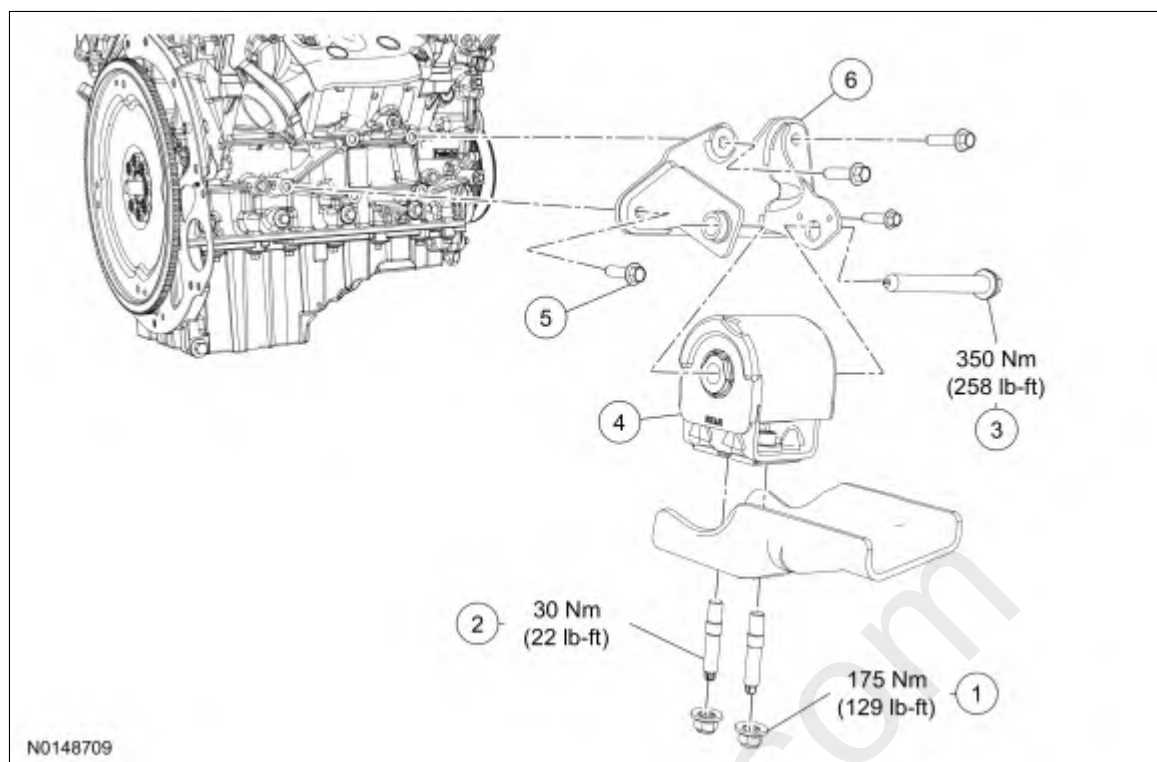
 ST3101-A	Bar, Engine Spreader 303-1454
 ST3265-A	Lift Eye, Right Front 303-1566
 ST2176-A	Support Bar, Engine 303-F070

Engine Support Insulator — LH



Item	Part Number	Description
1	W713244	LH engine support insulator bolt (3 required)
2	W715211	LH engine support insulator through bolt
3	6038	LH engine support insulator
4	W714735	LH engine support insulator bracket bolt (3 required)
5	6038	LH engine support insulator bracket

Engine Support Insulator — RH



Item	Part Number	Description
1	W707251	RH engine support insulator nut (2 required)
2	—	RH engine support insulator stud (part of 6038) (2 required)
3	—	RH engine support insulator through bolt (part of 6038)
4	6038	RH engine support insulator
5	W714735	RH engine support insulator bracket bolt (4 required)
6	—	RH engine support insulator bracket (part of 6038)

Removal

NOTICE: Use care when positioning the front axle housing or the vacuum lines to the axle solenoid may become disconnected or damaged.

NOTE: Discard all engine support insulator fasteners and install new fasteners.

All vehicles

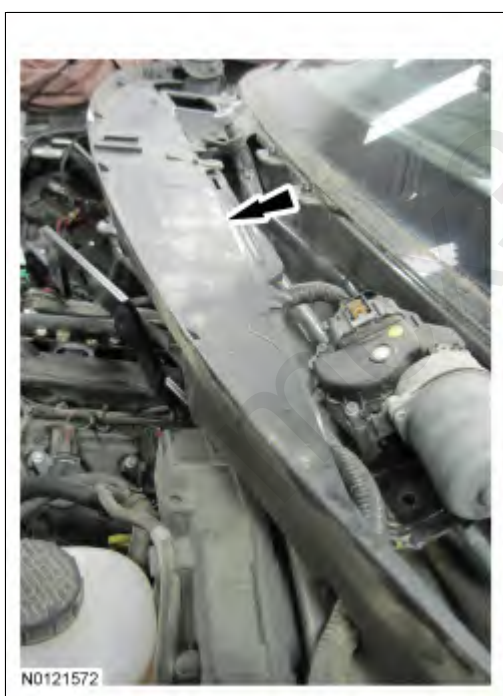
1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02](#).
2. **NOTE:** Index-mark the hood hinge location to aid in hood installation.

NOTE: RH shown, LH similar.

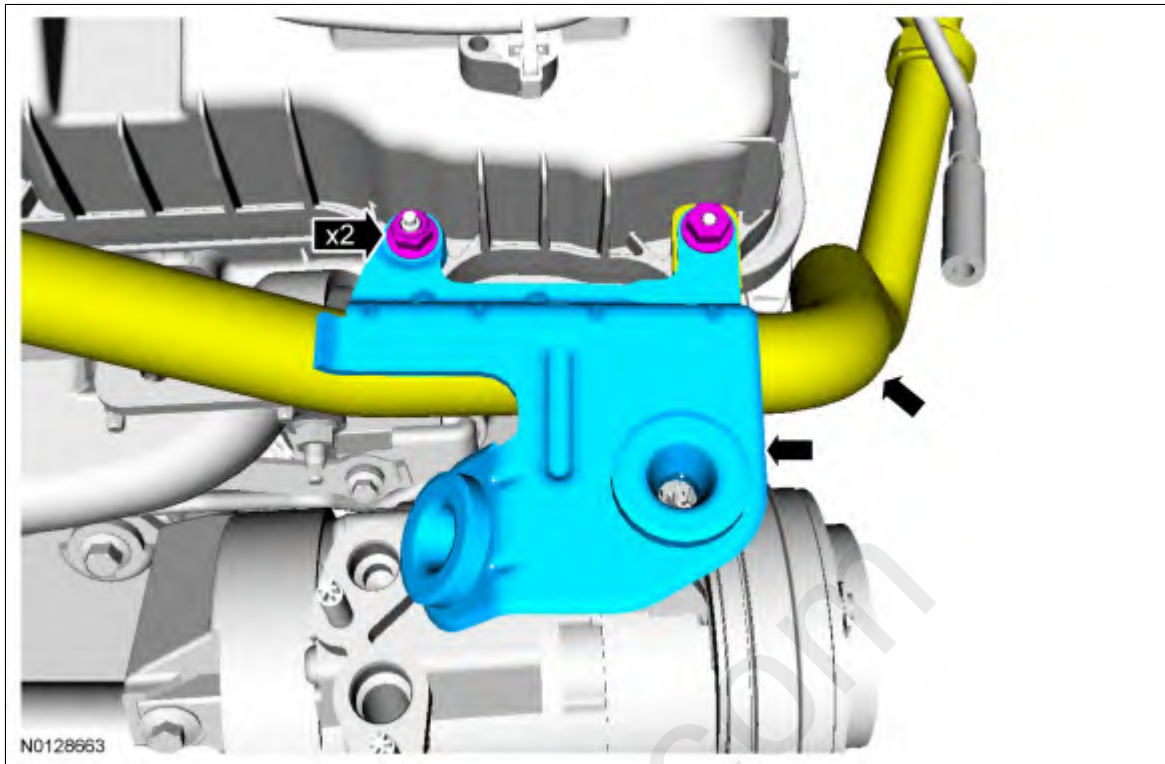
Remove the 4 bolts (2 shown) and the hood.



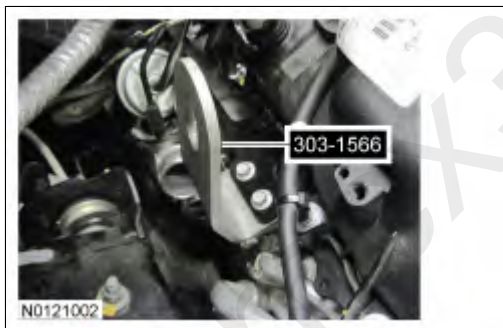
3. Remove the Air Cleaner (ACL) outlet pipe, ACL pipe-to-turbocharger pipes, turbocharger bypass hoses and the turbocharger-to- Charge Air Cooler (CAC) pipes. For additional information, refer to Intake Air System Components — Exploded View, 3.5L in [Section 303-12](#).
4. Remove the intake manifold. For additional information, refer to [Intake Manifold](#) in this section.
5. Remove the high-pressure fuel pump. For addition information, refer to [Section 303-04A](#).
6. Remove the cowl panel grille. For additional information, refer to [Section 501-02](#).
7. Remove the 6 screws and release the 2 cowl panel clips and remove the cowl panel.



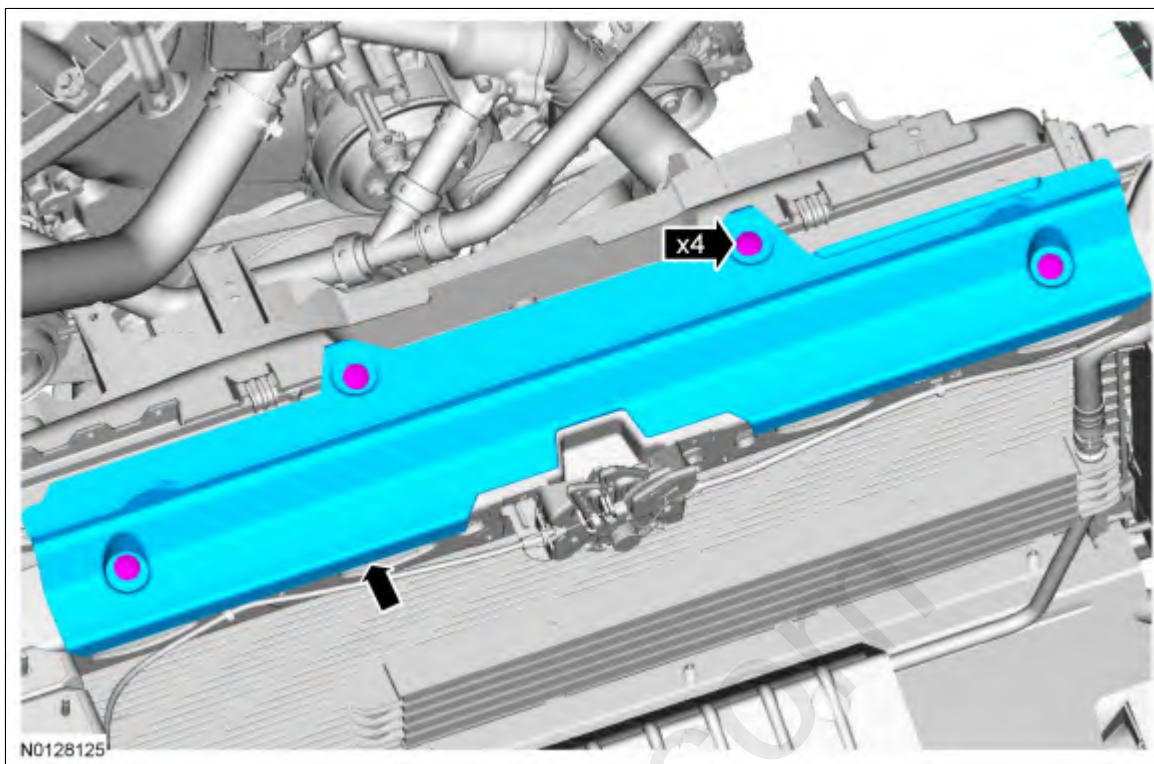
8. Remove the 2 nuts and the Charge Air Cooler (CAC) tube bracket.
 - Disconnect the coolant hose from the valve cover stud.



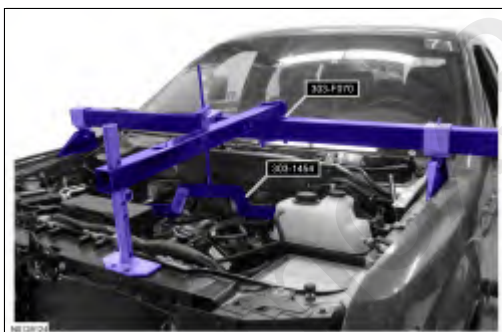
9. Install the Right Front Lift Eye and 2 bolts.



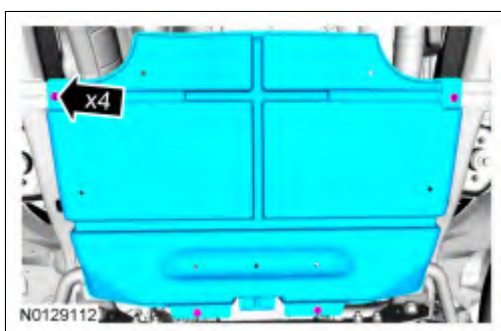
10. Remove the 4 pushpins and the upper radiator air deflector.



11. Install the Engine Support Bar.



12. Release the 4 fasteners and remove the splash shield.

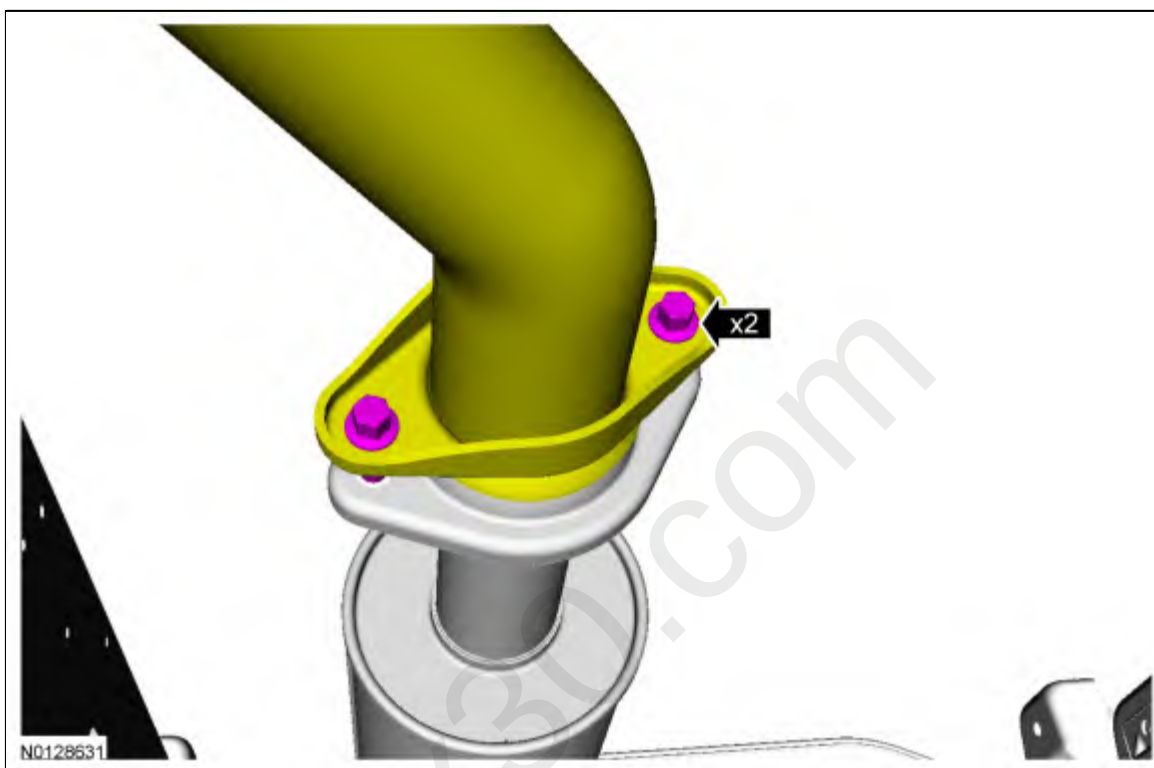


13. Remove the 4 bolts and the skid plate.
14. If equipped, remove the front driveshaft. For additional information, refer to [Section 205-01](#).

15. **NOTICE:** Support the exhaust intermediate pipe prior to removing the bolts or damage to the flex pipe may occur.

Remove the 2 exhaust Y-pipe dual catalytic converter-to-exhaust intermediate pipe bolts and separate.

- Discard the 2 bolts.



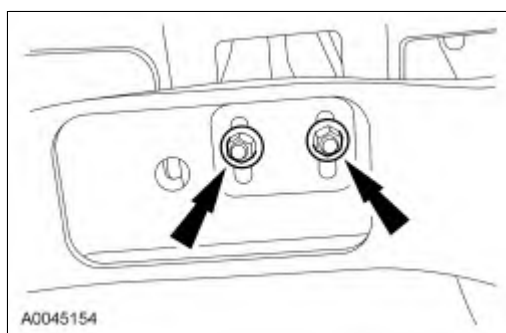
16. **NOTE:** LH shown, RH similar.

Remove and discard the 2 LH and the 2 RH catalytic converter-to-turbocharger nuts.



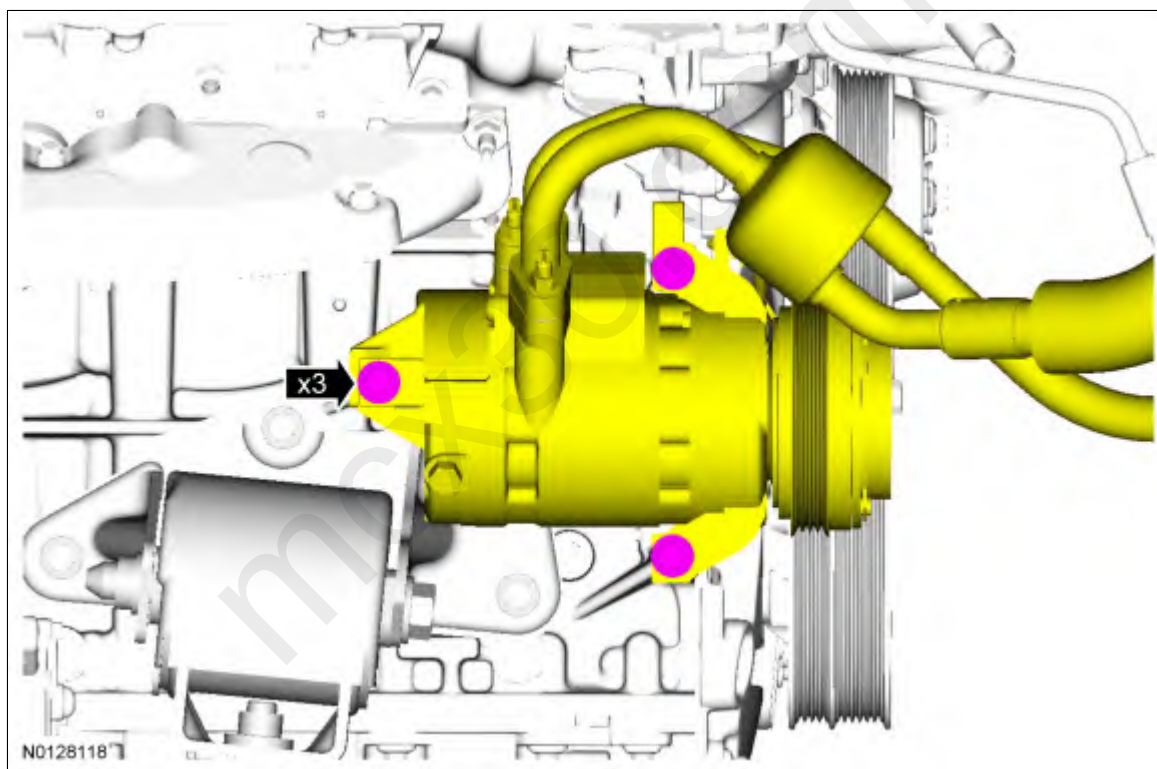
17. **NOTICE:** Only use hand tools when removing the transmission mount-to-crossmember nuts or damage to the transmission mount can occur.

Loosen the 2 transmission mount-to-crossmember nuts.



RH engine support insulator

18. Remove the Air Conditioning (A/C) compressor belt . For additional information, refer to [Section 303-05](#).
19. Remove the 3 bolts and position the A/C compressor aside.



20. Remove the starter. For additional information, refer to [Section 303-06](#).
21. **NOTICE:** Only use hand tools when loosening or tightening the engine support insulator through bolts or damage to the engine support insulator-to-cylinder block bracket can occur.
Remove and discard the RH and LH engine support insulator through bolts.
22. Remove and discard the 2 RH engine support insulator nuts and the 2 studs.



23. Raise the engine approximately 30 mm (1.18 in).
24. Remove the 4 bolts and the RH engine support insulator-to-cylinder block bracket.
 - Discard the bolts.
25. Remove the RH engine support insulator.

LH engine support insulator

26. **NOTICE:** Only use hand tools when loosening or tightening the engine support insulator through bolts or damage to the engine support insulator-to-cylinder block bracket can occur.

Remove and discard the LH and RH engine support insulator through bolts.

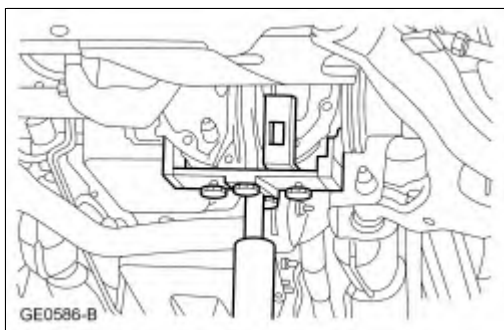
27. Raise the engine approximately 30 mm (1.18 in).
28. **NOTICE:** Only use hand tools when removing or installing the engine support insulator-to-frame bolts or damage to the engine support insulator-to-frame nut plate can occur.

Remove and discard the 3 LH engine support insulator-to-frame bolts.

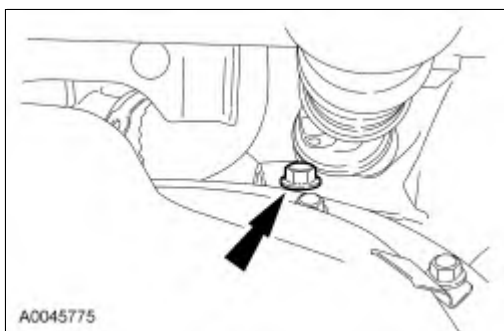


Four-Wheel Drive (4WD) — LH engine support insulator

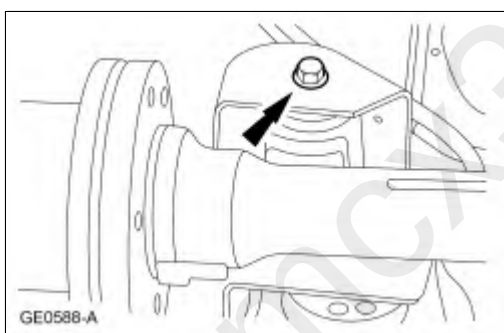
29. Position a suitable hydraulic jack under the front axle. Securely strap the axle to the jack.



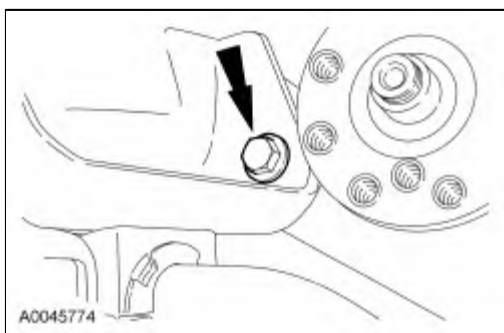
30. Remove the upper front axle carrier mounting bushing bolt.



31. Remove the axle shaft housing carrier bushing bolt.



32. Remove the lower front axle carrier mounting bushing bolt.



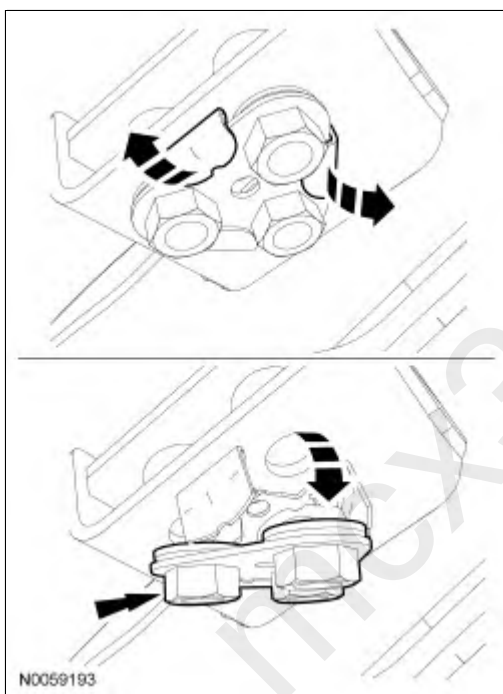
33. Lower the front axle to allow clearance to the LH engine support insulator.

LH engine support insulator

34. Remove the LH engine support insulator.



35. Inspect the engine support insulator-to-frame nut plate for thread damage. If the nut plate is damaged, bend 2 tabs back and remove the nut plate. Replace the nut plate with service part number 56190 and bend the 2 tabs back to the original position.



NOTE: If necessary, the following 3 steps are to remove the LH engine support insulator-to-cylinder block bracket.

36. Detach the generator wiring harness from the engine front cover.
- Detach the generator wiring harness retainer from the oil filter adapter.



37. Detach the generator wiring harness retainer from the lower LH side of the engine block.



38. Remove the 4 bolts and the LH engine support insulator-to-cylinder block bracket.
- Discard the bolts.

Installation

LH engine support insulator

1. Clean the engine support insulator-to-cylinder block and engine support insulator-to-frame mating surfaces of any dirt or foreign material prior to installation.

NOTE: If removed, the following 3 steps are to install the LH engine support insulator-to-cylinder block bracket.

2. Install the LH engine support insulator-to-cylinder block bracket and install the 4 new bolts.
 - Tighten to 63 Nm (46 lb-ft).
3. Attach the generator wiring harness retainer to the lower LH side of the engine block.



4. Attach the generator wiring harness to the engine front cover.
 - Attach the generator wiring harness retainer to the oil filter adapter.

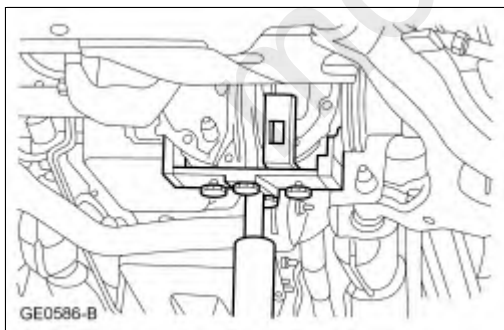


5. Position the LH engine support insulator and hand start the 3 new engine support insulator-to-frame bolts.
 - Do not torque at this time.

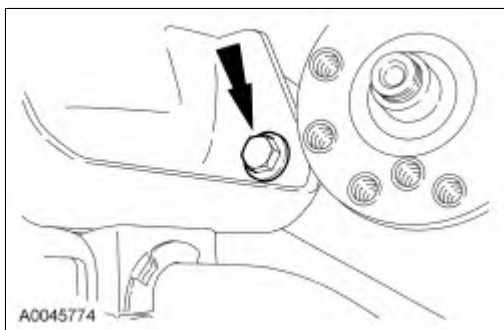


4WD — LH engine support insulator

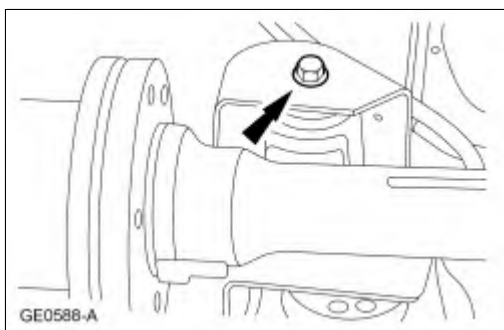
6. Raise the front axle carrier into position.



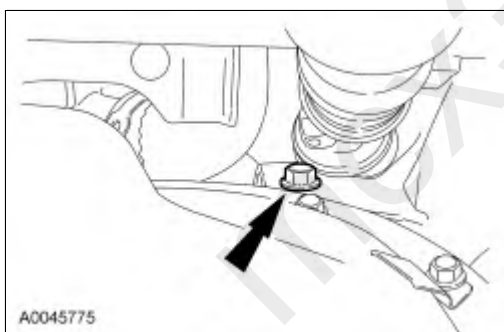
7. Install the lower front axle carrier mounting bushing bolt.
 - Tighten to 115 Nm (85 lb-ft).



8. Install the axle shaft housing carrier bushing bolt.
 - Tighten to 115 Nm (85 lb-ft).



9. Install the upper front axle carrier mounting bushing bolt.
 - Tighten to 115 Nm (85 lb-ft).



LH engine support insulator

10. **NOTICE:** Only use hand tools when removing or installing the engine support insulator-to-frame bolts or damage to the engine support insulator-to-frame nut plate can occur.

Tighten the 3 LH engine support insulator-to-frame bolts to 175 Nm (129 lb-ft).



11. Lower the engine to the installed position.
12. **NOTICE: Only use hand tools when loosening or tightening the engine support insulator through bolts or damage to the engine support insulator-to-cylinder block bracket can occur.**

Install the new RH and LH engine support insulator through bolts.

- Tighten to 350 Nm (258 lb-ft).

RH engine support insulator

13. Clean the engine support insulator-to-cylinder block and engine support insulator-to-frame mating surfaces of any dirt or foreign material prior to installation.
14. Position the RH engine support insulator into the vehicle
15. Position the RH engine support insulator-to-cylinder block bracket and install the 4 new bolts.
 - For standard payload package, tighten to 63 Nm (46 lb-ft).
 - For heavy duty payload package, tighten to 77 Nm (57 lb-ft).
16. **NOTICE: Only use hand tools when installing the engine support insulator stud bolts or damage to the engine support insulator can occur.**

Install the 2 new RH engine support insulator studs.

- Tighten to 30 Nm (22 lb-ft).

17. **NOTICE: Only use hand tools when installing the RH engine support insulator nuts or damage to the engine support insulator can occur.**

Install the 2 new RH engine support insulator nuts.

- Tighten to 175 Nm (129 lb-ft).

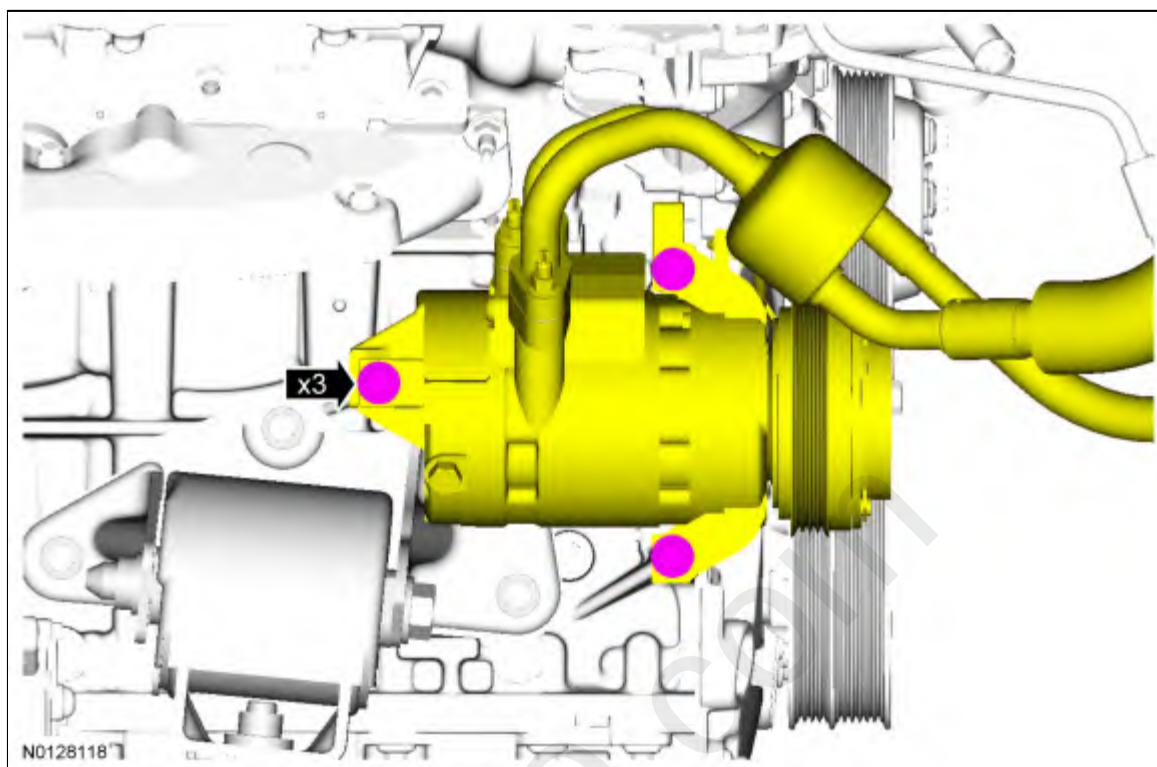
18. Lower the engine to the installed position.
19. **NOTICE: Only use hand tools when loosening or tightening the engine support insulator through bolts or damage to the engine support insulator-to-cylinder block bracket can occur.**

Install the new RH and LH engine support insulator through bolts.

- Tighten to 350 Nm (258 lb-ft).

20. Install the starter. For additional information, refer to [Section 303-06](#).
21. Position the A/C compressor and install the 3 bolts.

- Tighten to 25 Nm (18 lb-ft).



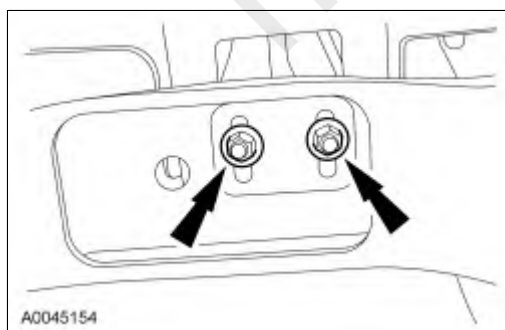
22. Install the A/C compressor belt. For additional information, refer to [Section 303-05](#).

All vehicles

23. **NOTICE:** Only use hand tools when installing the transmission mount-to-crossmember nuts or damage to the transmission mount can occur.

Tighten the 2 transmission mount-to-crossmember nuts.

- Tighten to 103 Nm (76 lb-ft).



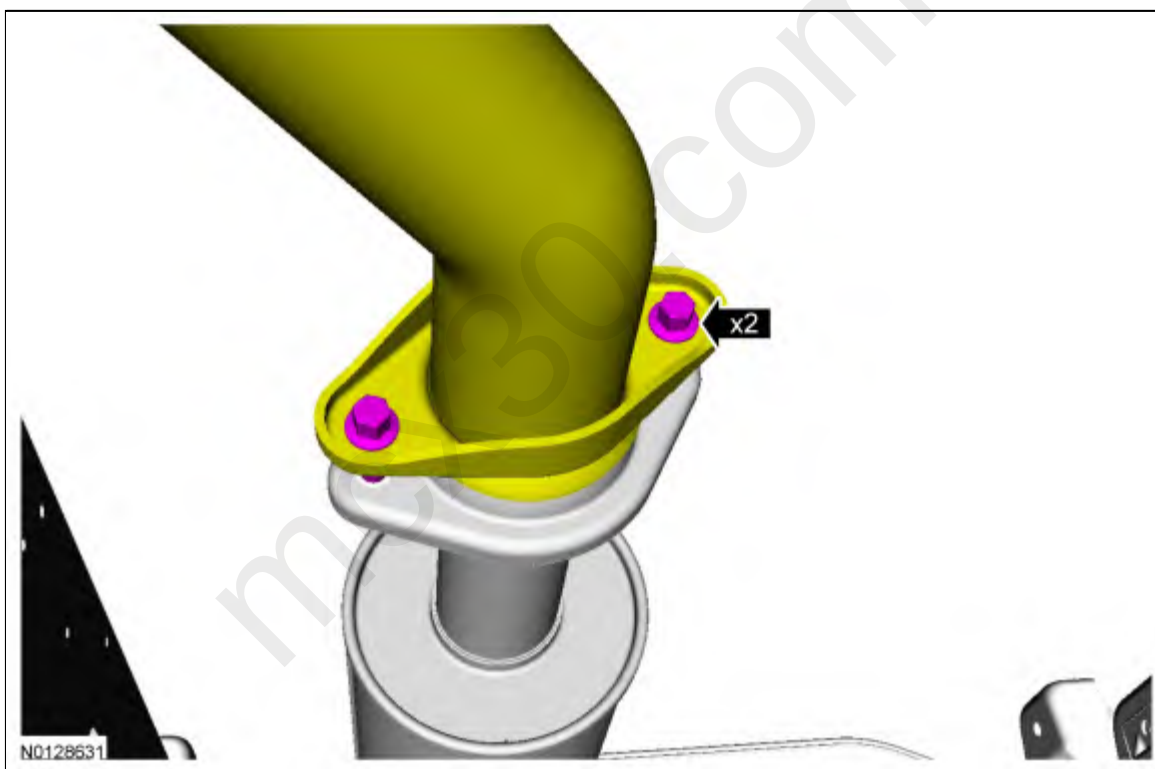
24. **NOTE:** LH shown, RH similar.

Install the 2 new LH and the 2 new RH catalytic converter-to-turbocharger nuts.

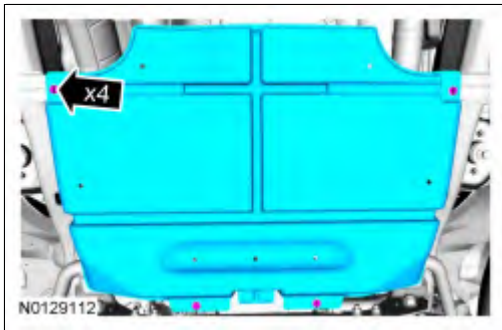
- Tighten to 45 Nm (35 lb-ft).



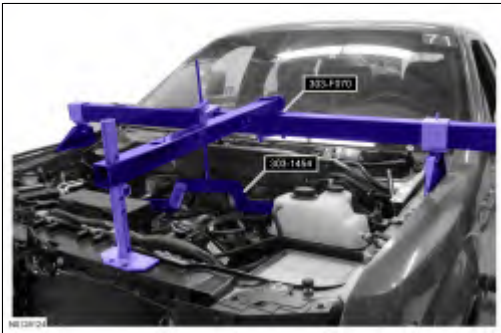
25. Position the exhaust Y-pipe dual catalytic converter-to-exhaust intermediate pipe and install the 2 new bolts.
- Tighten the inner exhaust Y-pipe dual catalytic converter-to-exhaust intermediate pipe bolt to 63 Nm (46 lb-ft).
 - Tighten the outer exhaust Y-pipe dual catalytic converter-to-exhaust intermediate pipe bolt to 63 Nm (46 lb-ft).



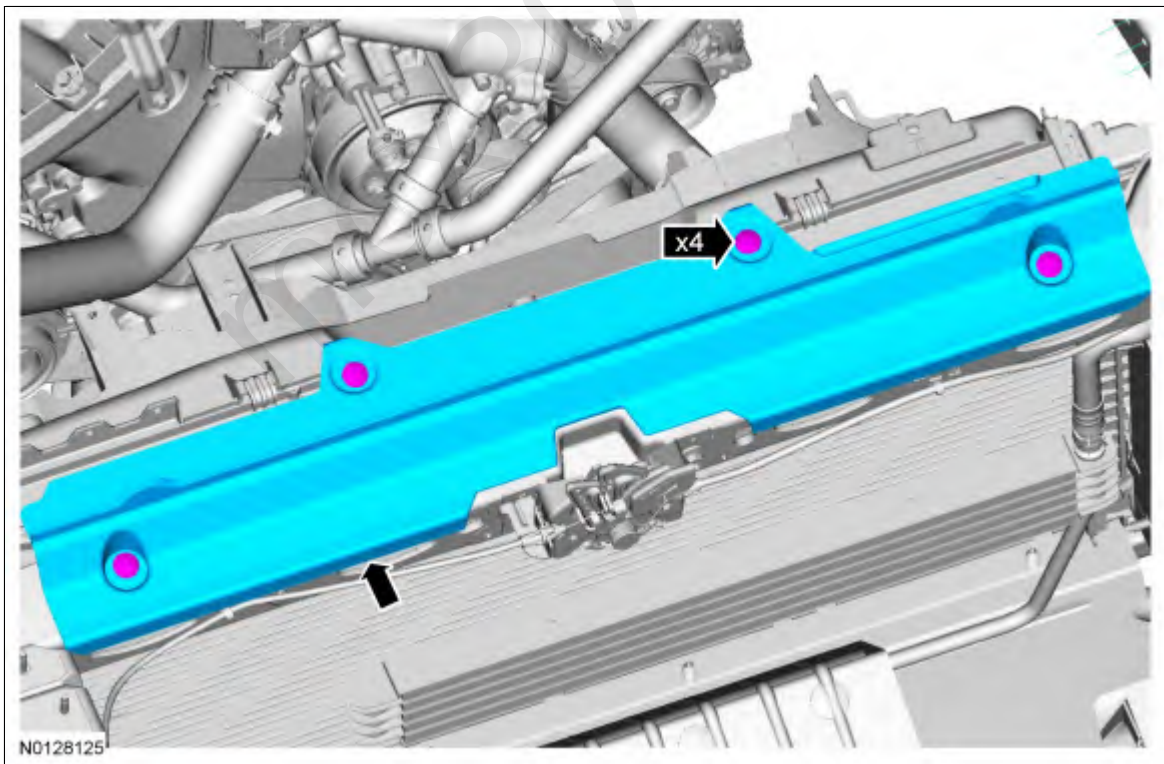
26. If equipped, install the front driveshaft. For additional information, refer to [Section 205-01](#).
27. Install the skid plate and the 4 bolts.
- Tighten to 48 Nm (35 lb-ft).
28. Install the splash shield and the 4 retainers.



29. Remove the Engine Support Bar.



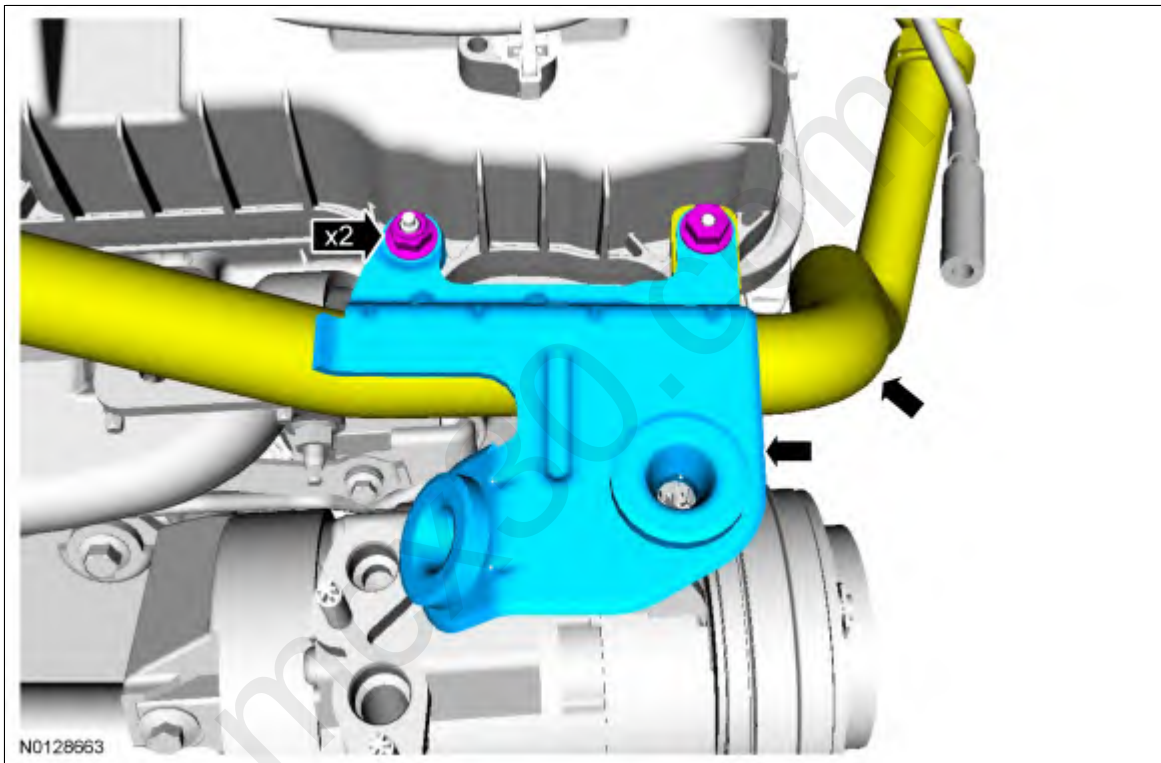
30. Install the upper radiator air deflector and the 4 pushpins.



31. Remove the 2 bolts and the Right Front Lift Eye.



32. Position back the coolant hose to the valve cover stud. Install the CAC tube bracket and the 2 nuts.
- Tighten to 6 Nm (53 lb-in).



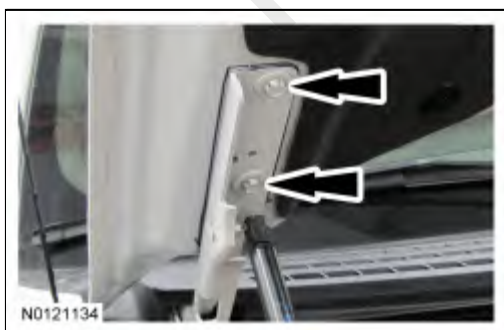
33. Install the cowl panel and attach the 2 clips and install the 6 screws.



34. Install the cowl panel grille. For additional information, refer to [Section 501-02](#).
35. Install the high-pressure fuel pump. For addition information, refer to [Section 303-04A](#).
36. Install the intake manifold. For additional information, refer to [Intake Manifold](#) in this section.
37. Install the Air Cleaner (ACL) outlet pipe, [ACL](#) pipe-to-turbocharger pipes, turbocharger bypass hoses and the turbocharger-to- Charge Air Cooler (CAC) pipes. For additional information, refer to Intake Air System Components — Exploded View, 3.5L in [Section 303-12](#).
38. **NOTE:** RH shown, LH similar.

Position the hood and install the 4 bolts.

- Tighten to 12 Nm (106 lb-in).



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