

Superduty 6.0L Powerstroke Engine

*Removal/Installation
Service Tips*

May 2004

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TABLE OF CONTENTS

- **Shop Manual Procedure**

The procedure steps must be followed in a specific order.

- **Turbo Marmon Clamp**

• Saves time during assembly to reposition the clamp for better accessibility.

- **Turbo Adapter Tube**

Saves time by using a half moon wrench to better access the fasteners from the adapter tube to the exhaust.

- **Factory Lifting Eye**

Must be removed because it does not have the correct angle to work with the engine lift bracket.

- **Torque Converter Nuts**

Saves time by not having to raise and lower the vehicle to remove or install the torque converter nuts.

- **Engine Removal/Installation from Vehicle Chassis**

Calls out the desired tools that will save time by not having to remove the vehicle's hood.

- **Engine Mounted to Stand**

It is not necessary to remove the starter motor, which will save time.

- **Bell Housing Bolts**

How to torque the 9 bell housing bolts.

Shop Manual Procedure *(Page 1 of 2)*

**Follow the Shop Manual for
the correct order to
REMOVE
the engine sub-assemblies.**

Note:

Not following the workshop manual procedure may result in removing the engine sub-assemblies out of the correct order. This can result in extra time to complete the procedure.

SECTION 303-01D: Engine — 6.0L Diesel
REMOVAL

2003 F-Super Duty/Excursion Workshop Manual
Procedure revision date: 10/02/2002

Engine [Printable View \(1009 KB\)](#)

Special Tool(s)

 ST1963-A	Diesel Engine Lifting Bracket (D83T-6000-B) 303-D043
 ST1399-A	Fuel Line Tool (T90T-9550-S) 310-5039
 ST1341-A	Heavy Duty Floor Crane 014-00071
 ST2727-A	Adapter For 303-D043 303-D043-02
 ST2728-A	Adapter For 303-D043 303-D043-01
 ST2175-A	Wrench, Fan Clutch Nut 303-591

Removal

All vehicles

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02](#).
2. Disconnect the LH and RH battery ground cables. For additional information, refer to [Section 414-01](#).


Vehicles with manual transmission

3. **NOTE:** On vehicles equipped with manual transmissions, the transmission must be removed before the engine can be removed.
Remove the transmission. For additional information, refer to [Section 308-03](#).



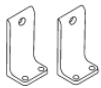


Shop Manual Procedure *(Page 2 of 2)*

SECTION 303-01D: Engine — 6.0L Diesel
REMOVAL

2003 F-Super Duty/Excursion Workshop Manual
Procedure revision date: 10/02/2002

Engine  [Printable View \(1009 KB\)](#)

Special Tool(s)

 ST1663-A	Diesel Engine Lifting Bracket (D83T-6000-B) 303-D043
 ST2727-A	Adapter For 303-D043 303-D043-02
 ST2728-A	Adapter For 303-D043 303-D043-01
 ST1341-A	Heavy Duty Floor Crane 014-00071
 ST2175-A	Wrench, Fan Clutch Nut 303-591

Material

Item	Specification
Super Duty SAE 15W-40 Motor Oil XC-15W40-QSD or equivalent	WSS-M2C171-C
Premium Engine Coolant E2FZ-19549-AA	ESE-M97B44-A
R-134a Refrigerant YN-19	WSH-M17B19-A

Installation

All vehicles

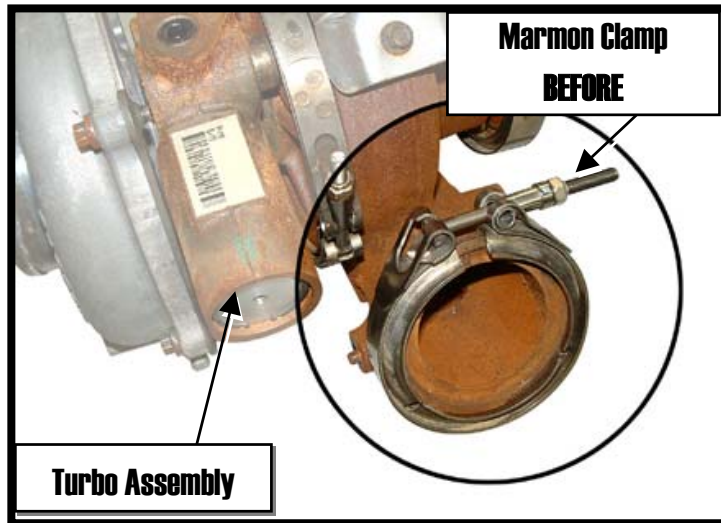
1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02](#).
2. Raise the engine high enough to clear the No. 1 crossmember, then position the engine into the vehicle.

**Follow the Shop Manual for
the correct order to
INSTALL
the engine sub-assemblies.**

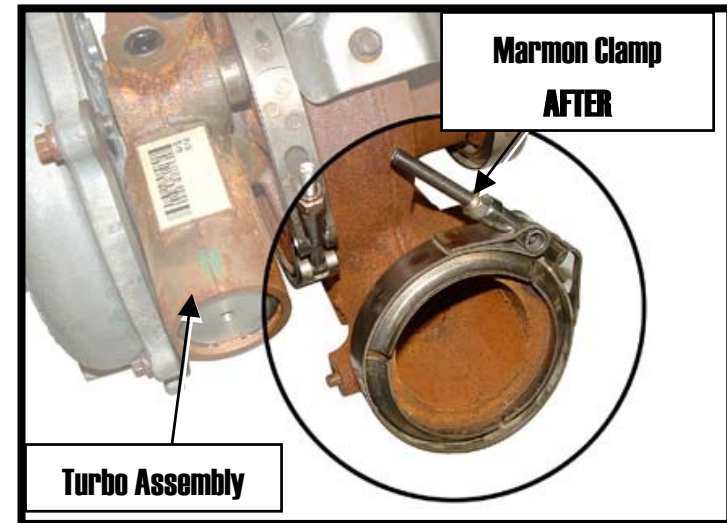
Note:

Not following the workshop manual procedure may result in installing engine sub-assemblies out of the correct order. This can result in extra time to complete the procedure.

Turbo Marmon Clamp *Service Tip* (Page 1 of 2)



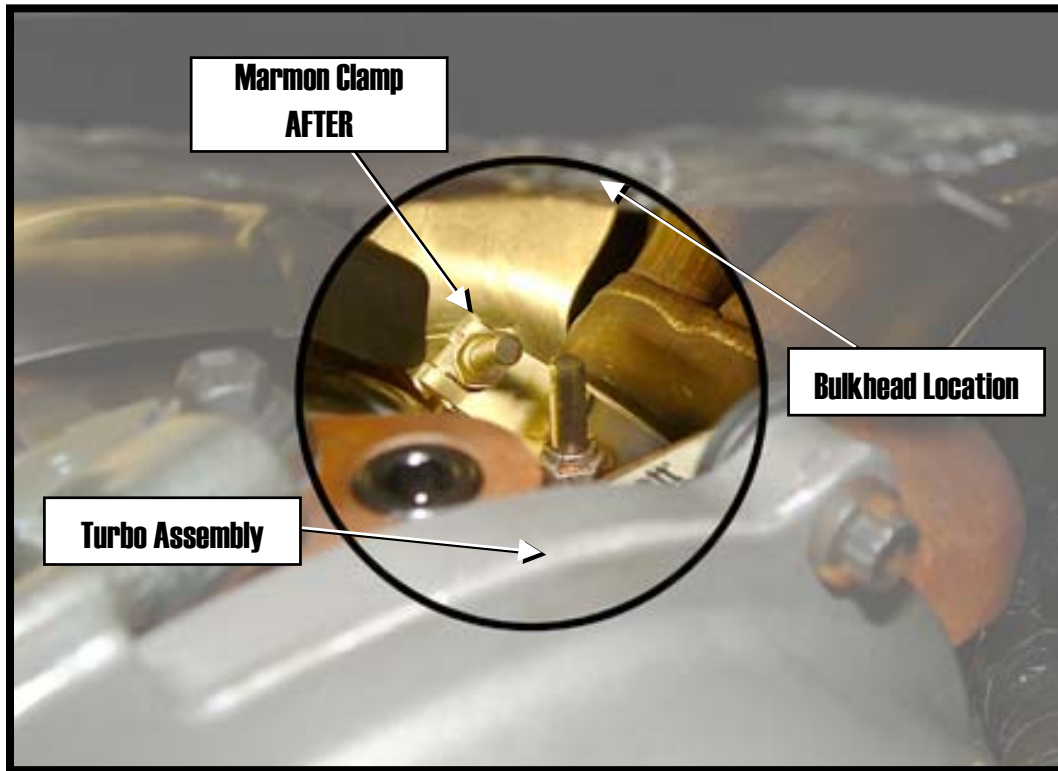
Factory installed position of the marmon clamp.



To ease reassembly, reverse clamp and position as shown.

- Turbo shown removed from vehicle for clarity

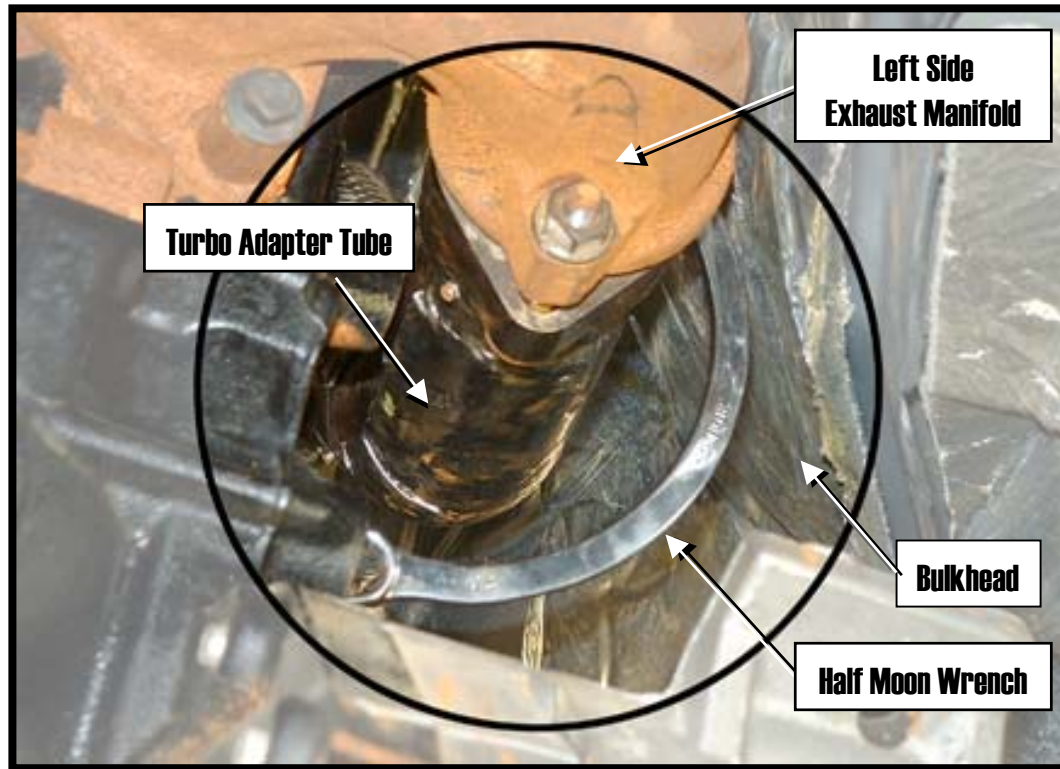
Turbo Marmon Clamp *Service Tip* (Page 2 of 2)



Recommended position of the turbo marmon clamp.

- This is the “in-vehicle” view as the Technician will see it.
- Not having the turbo marmon clamp positioned as shown makes it very difficult to see, access or torque the nut on the clamp during re-assembly.

Turbo Adapter Tube *Service Tip* (Page 1 of 3)



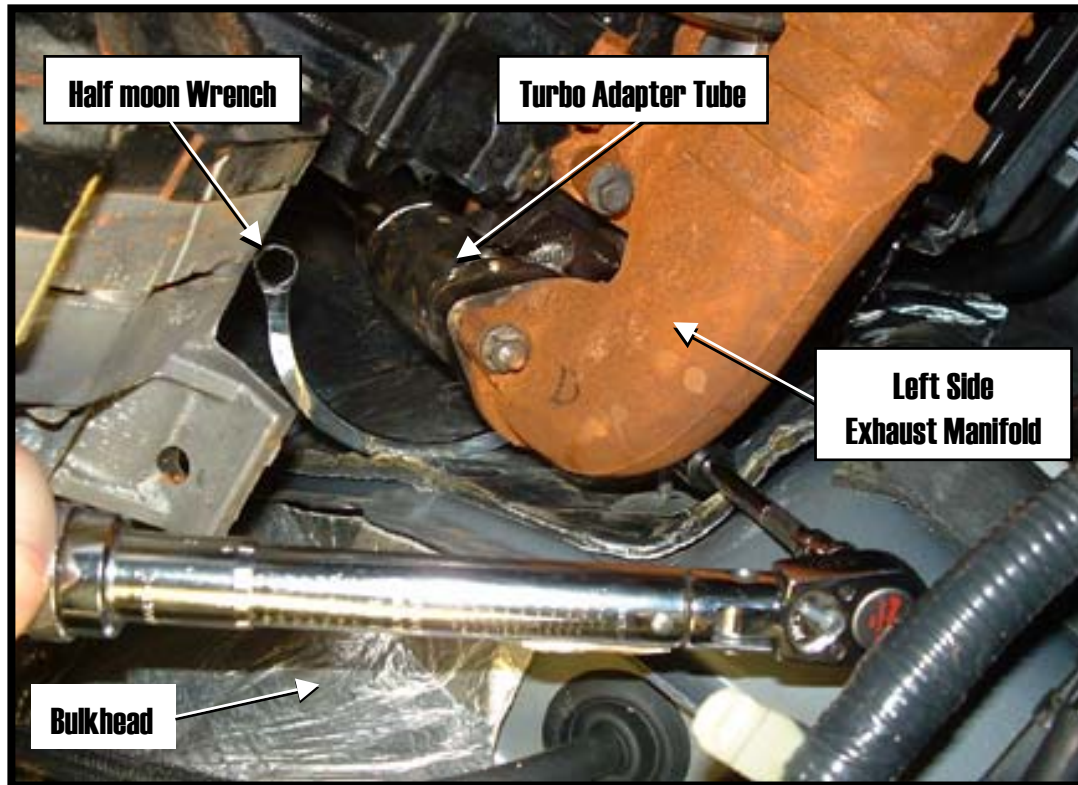
View shown from underneath the vehicle raised on a hoist.

- A 13mm half-moon wrench is the best way to access and hold the left outer bolt while removing and installing the nut shown. It saves time because of the curved shape of the tool.

Note: This wrench was not used to determine the labor operation time.

- The curve wrench aids in gaining access to the turbo adapter tube bolt. Access is possible with a regular straight wrench, but more difficult.

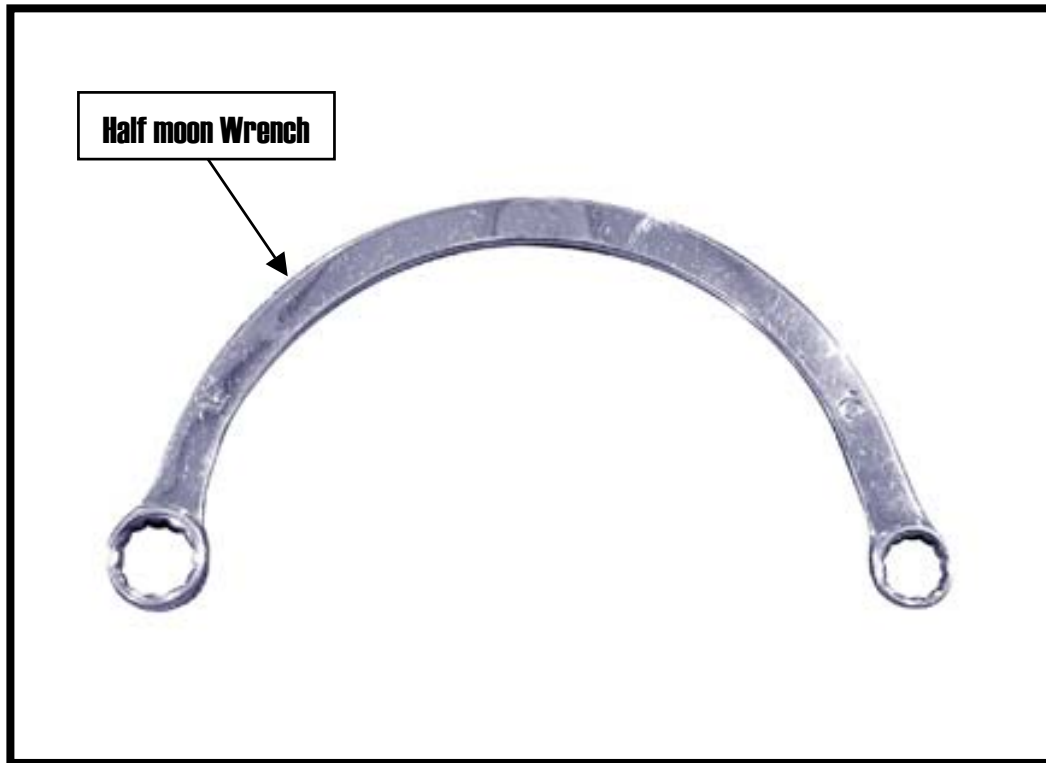
Turbo Adapter Tube *Service Tip* (Page 2 of 3)



Recommended tool to torque the outer left nut and bolt to the turbo adapter tube.

- The half moon wrench is used to prevent the bolt from turning while using the torque wrench to torque the nut.
- The half moon wrench saves time because the curve of the tool makes access to the bolt easier.

Turbo Adapter Tube *Service Tip* (Page 3 of 3)

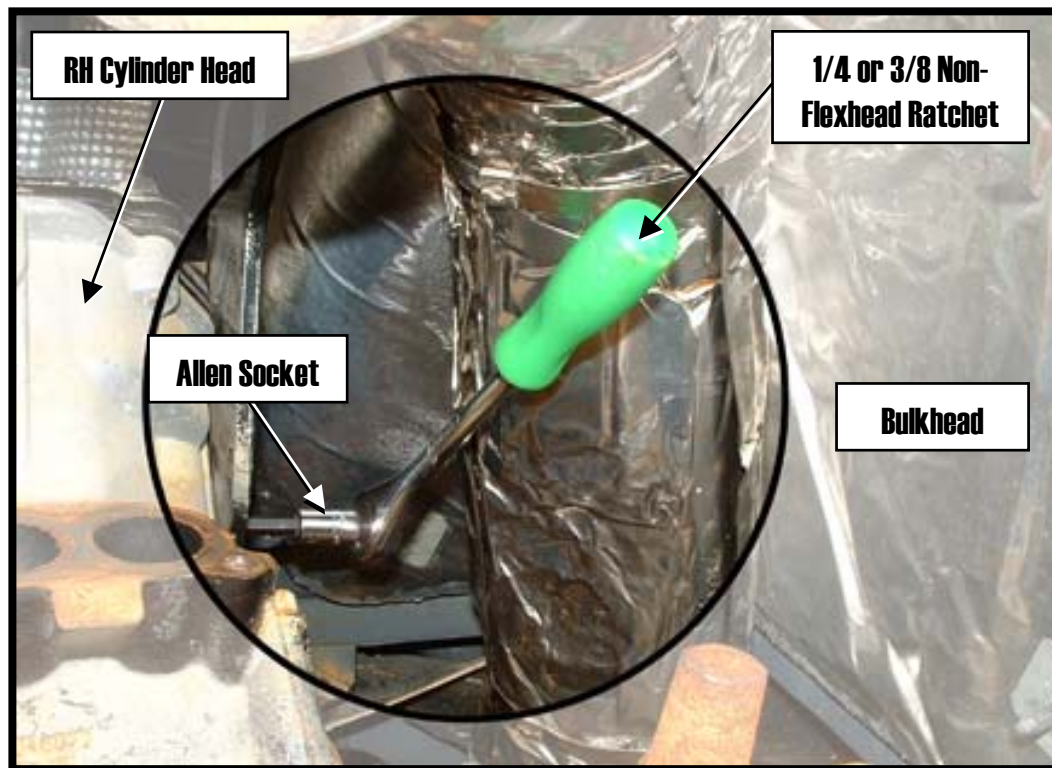


Recommended tool to remove/install the nut and bolt to the turbo adapter tube.

Available thru:

- Snap-On
- Matco
- MAC
- Craftsman

Factory Lifting Eye *Service Tip* (Page 1 of 2)

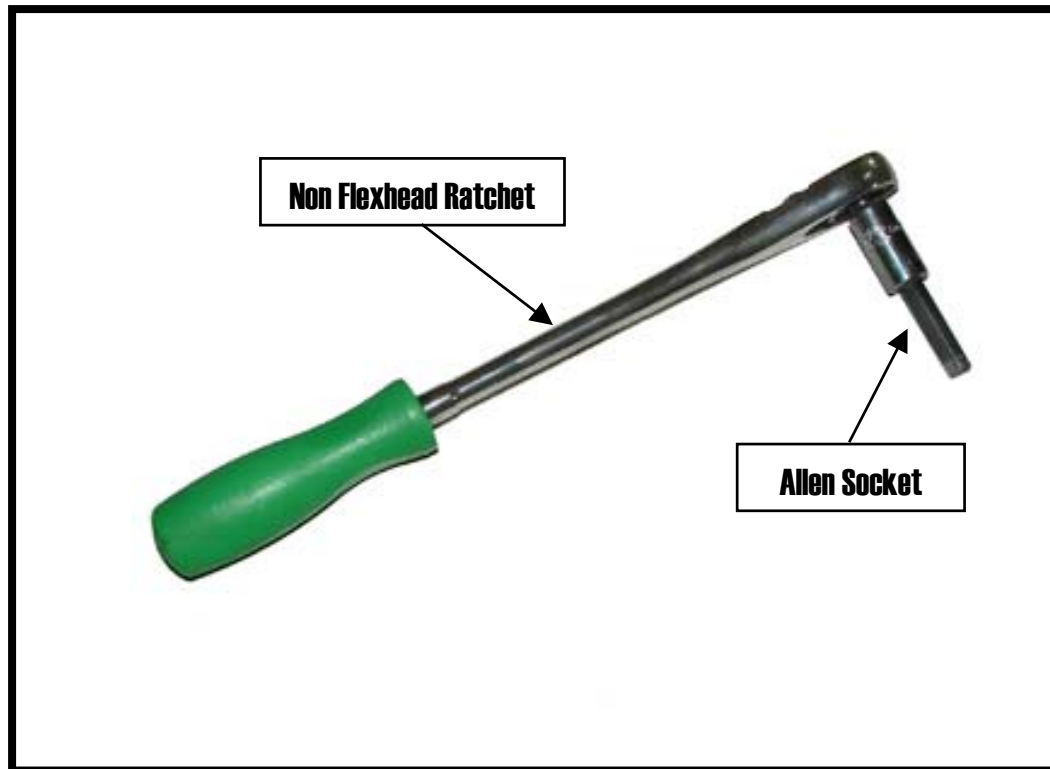


Recommended tool for removing the two bolts for the factory lifting eye.

- Factory lifting eye is located on the back side of the right cylinder head. Using a straight ratchet helps keep the ratchet and allen socket lined up properly to break the bolts loose. A flex ratchet may not keep a straight-on angle, and can possibly cause damage to the bolt heads or allen socket.
- The factory lifting eye does not have the correct angle to work with the engine lift bracket, therefore, it must be removed.

Note: The installation procedure recommends reinstalling the factory lifting eye.

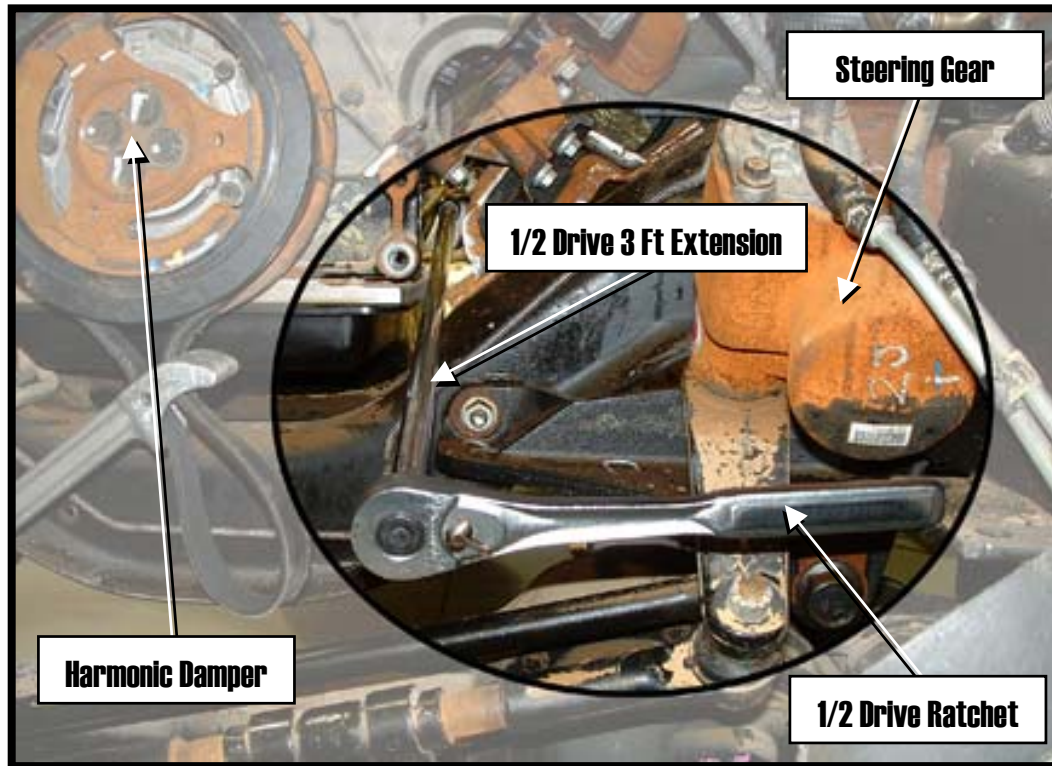
Factory Lifting Eye *Service Tip* (Page 2 of 2)



Recommended tool for removing loose the two bolts for the factory lifting eye.

- Tool is a long 1/4 or 3/8 inch ratchet without a flexhead.

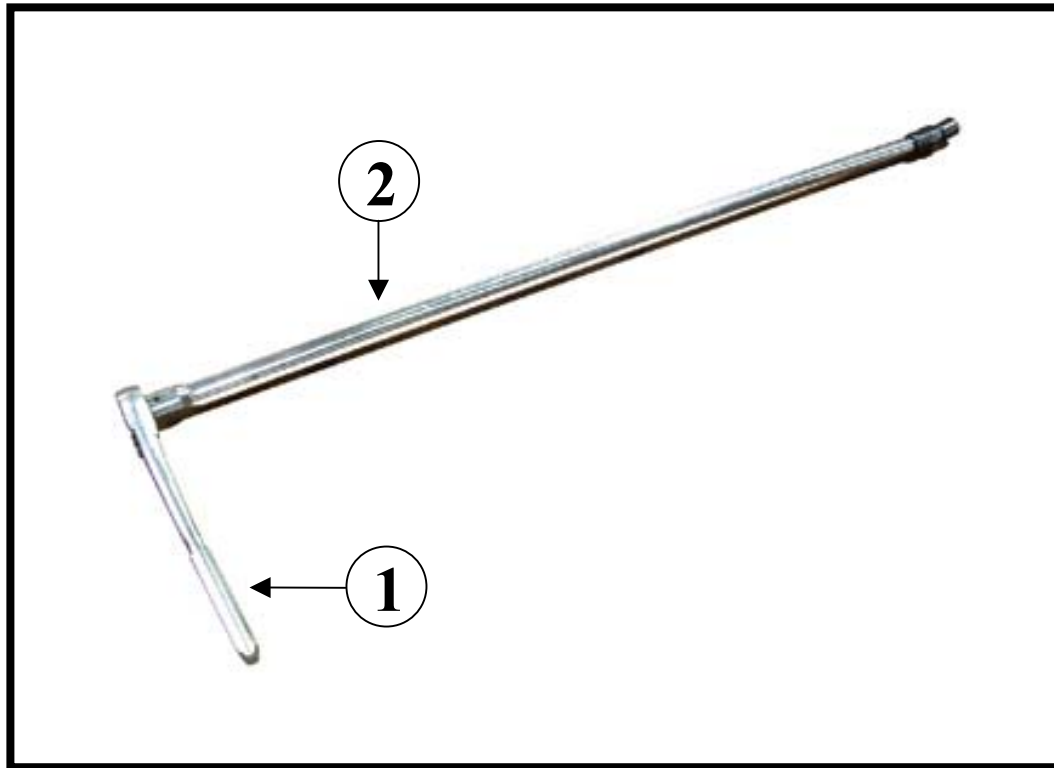
Torque Converter Nuts *Service Tip* (Page 1 of 2)



Recommended tool to remove or install the torque converter attaching nuts.

- Using this tool combination allows you to remove the torque converter nuts from the front of the vehicle without raising it on a hoist.
- This step helps save time by not having to raise and lower the vehicle to remove the torque converter attaching nuts.

Torque Converter Nuts *Service Tip* (Page 2 of 2)

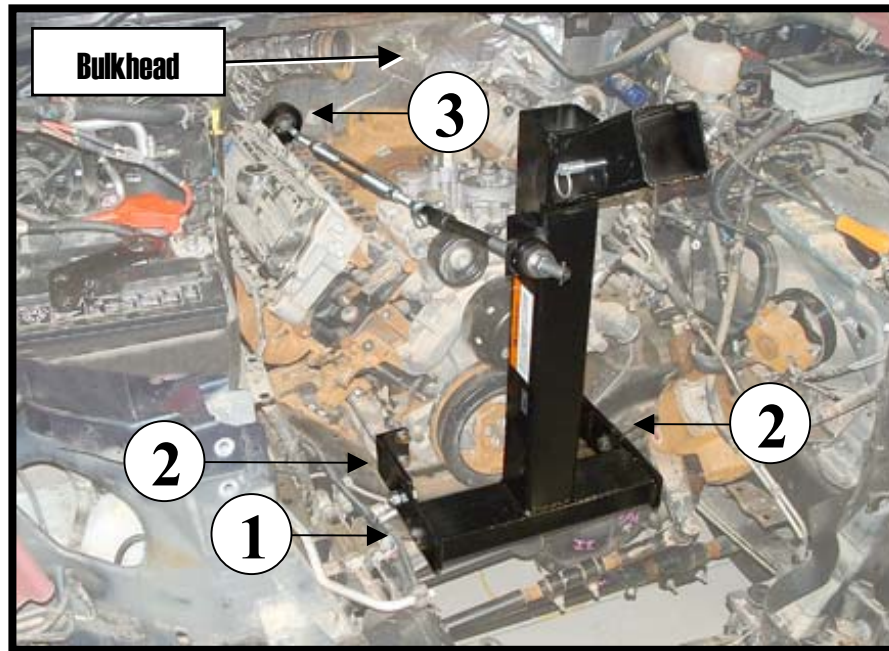


Recommended tool to remove/install torque converter nuts:

- ①** 1/2 inch drive ratchet
- ②** 1/2 inch drive extension (Approx. 3 feet in length)

Engine Removal/Install from Vehicle Chassis *Service Tip*

(Page 1 of 2)



Desired tools for removing the engine from the chassis:

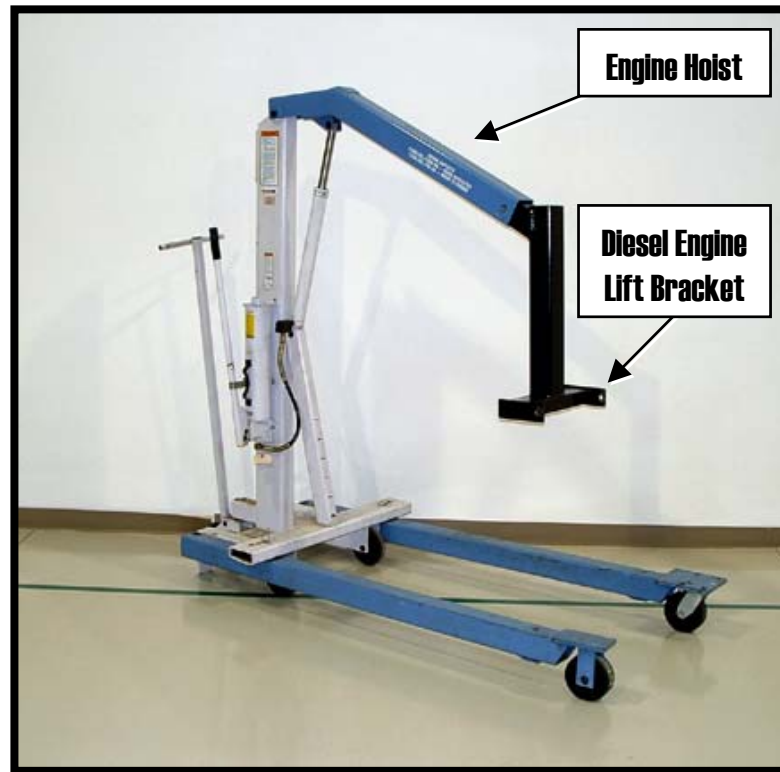
- 1) Diesel Engine Lifting Bracket (D83T-6000-B)**
- 2) Adapter for 303-D043 (303-D043-02)**
- 3) Adapter for 303-D043 (303-D043-01)**

•Using the desired tools allows the Technician to lift the engine straight up and out with no side-to-side movement. A conventional spreader bar and chain requires hood removal and allows more uncontrolled movement that the Technician can struggle to control.

•Using the desired tools will save time when performing the engine removal and install steps.

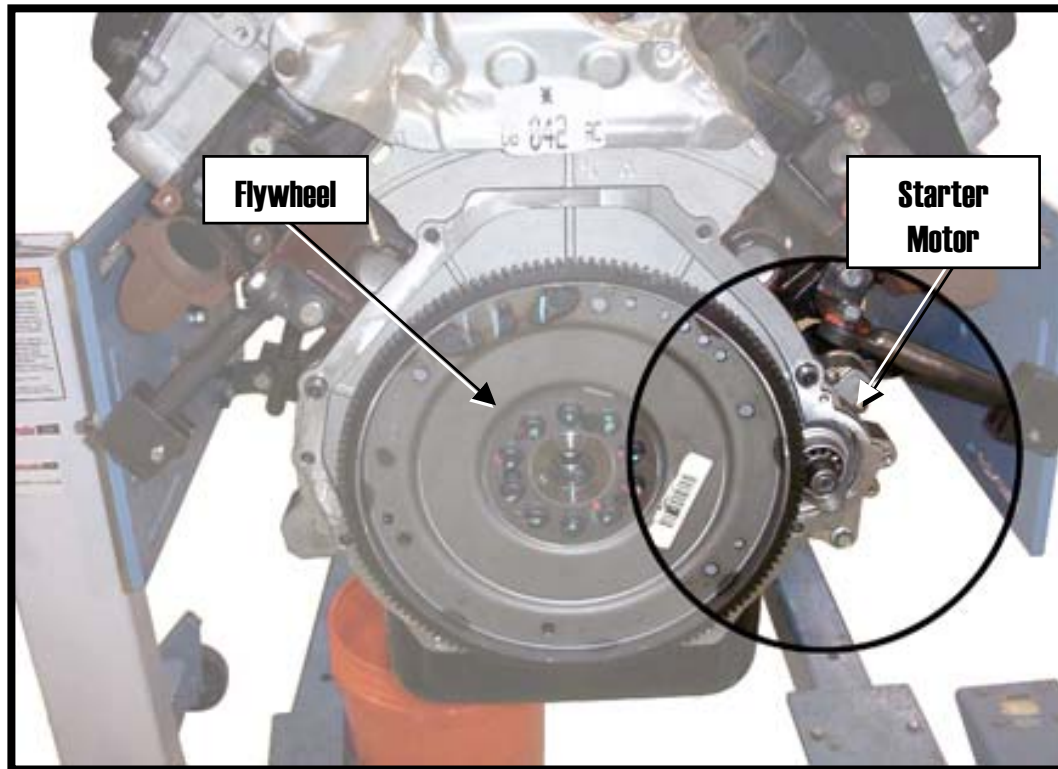
Engine Removal/Install from Vehicle Chassis *Service Tip*

(Page 2 of 2)



Shows how engine lift bracket attaches to the engine hoist.

Engine Mounted to Stand *Service Tip* (Page 1 of 1)



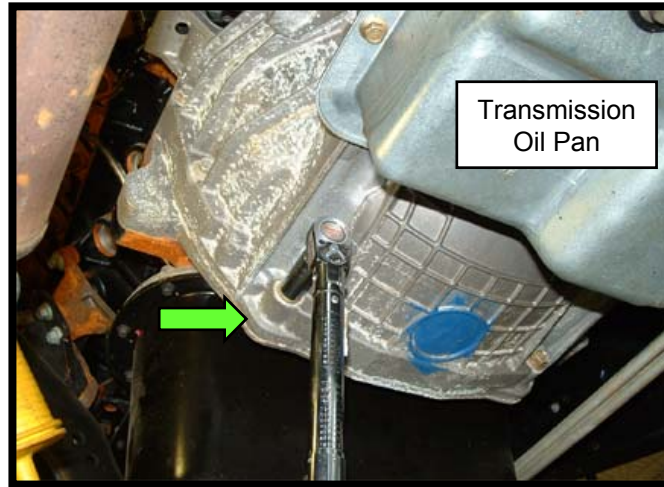
Removal procedure calls for removal of the battery cable from the starter motor. Removal of the starter motor is not necessary to remove the engine from the chassis.

•The removal of the starter motor is only necessary if additional repairs need to be performed. (Example: If coolant is found in the combustion chambers, new injector sleeves may need to be installed. If engine disassembly is necessary, drain the engine block. The starter needs to be removed to remove RH block drain).

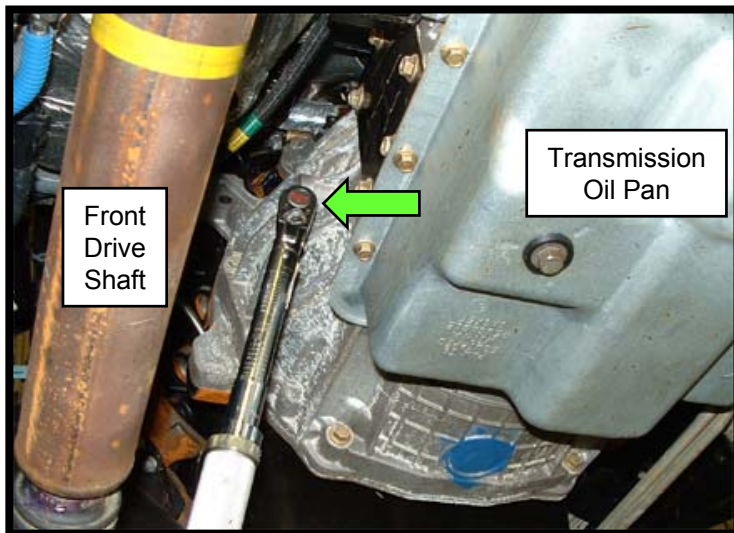
Bell Housing Bolts *Service Tip* (Page 1 of 5)

The question has been raised, “How do you torque the transmission bell housing bolts?” The following pages show how to torque each transmission bell housing bolt and the tools that are used.

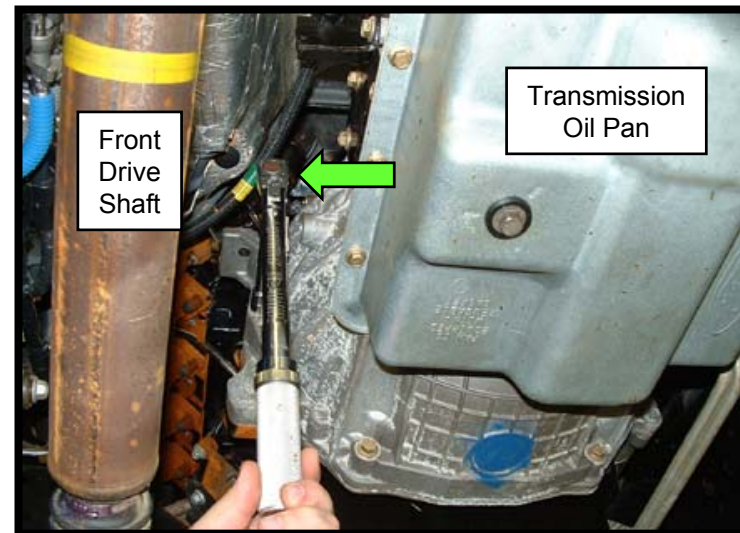
Bell Housing Bolts 1-3 *Service Tip* (Page 2 of 5)



Torquing left side lowest bell housing bolt.

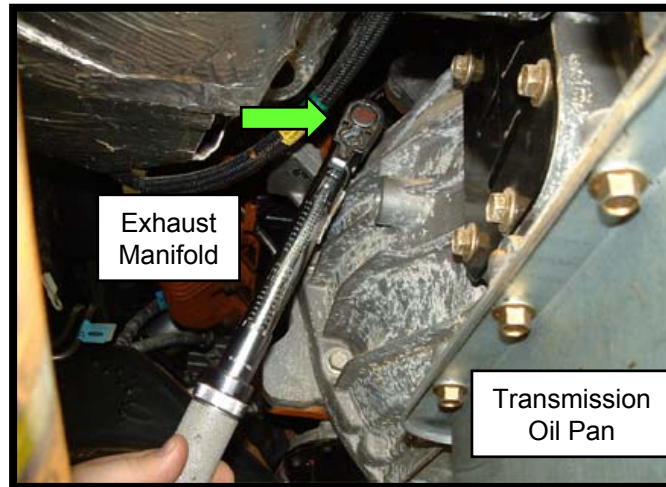


Torquing left side 2nd lowest bell housing bolt.

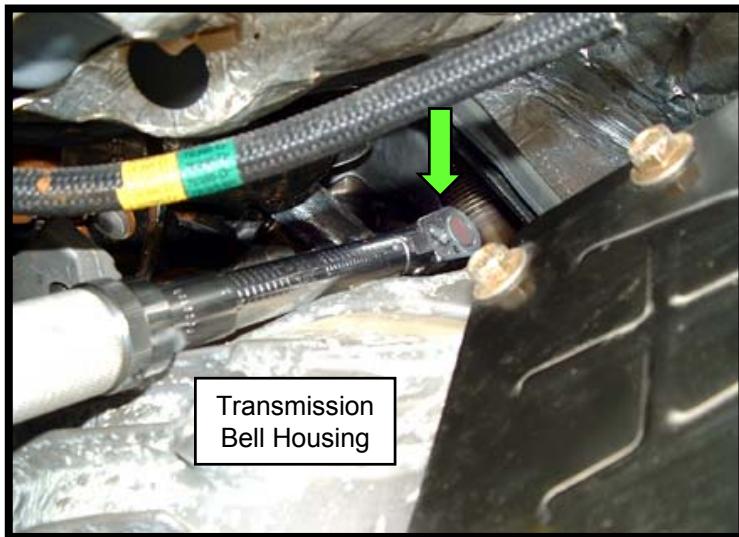


Torquing left side middle bell housing bolt.

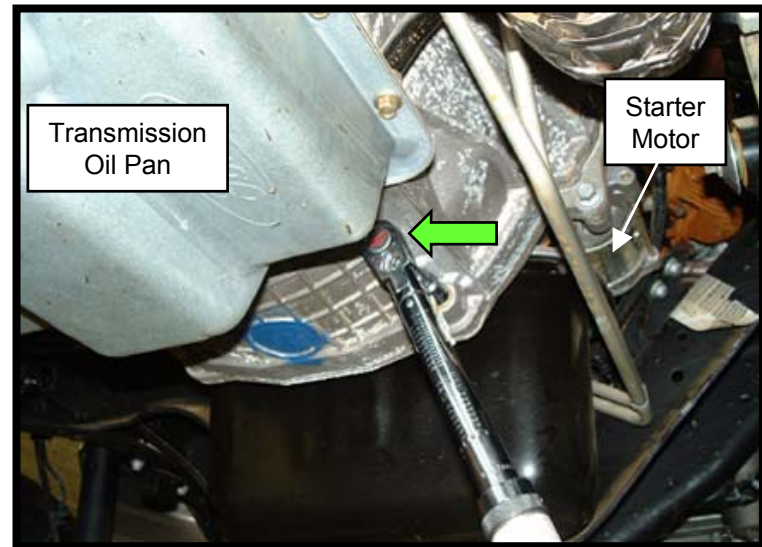
Bell Housing Bolts 4-6 *Service Tip* (Page 3 of 5)



Torquing left side upper bell housing bolt.

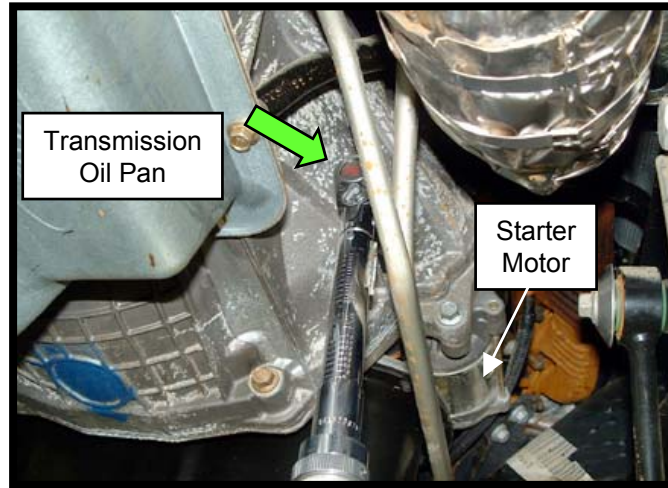


Torquing left side top bell housing bolt.

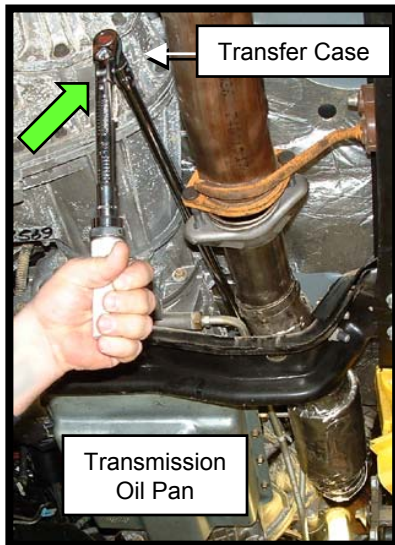


Torquing right side lowest bell housing bolt.

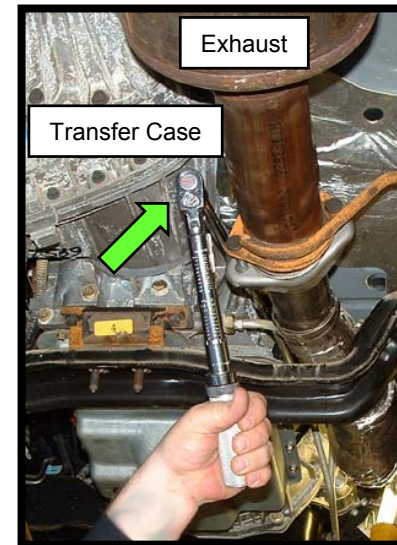
Bell Housing Bolts 7-9 *Service Tip* (Page 4 of 5)



Torquing right side 2nd lowest bell housing bolt.

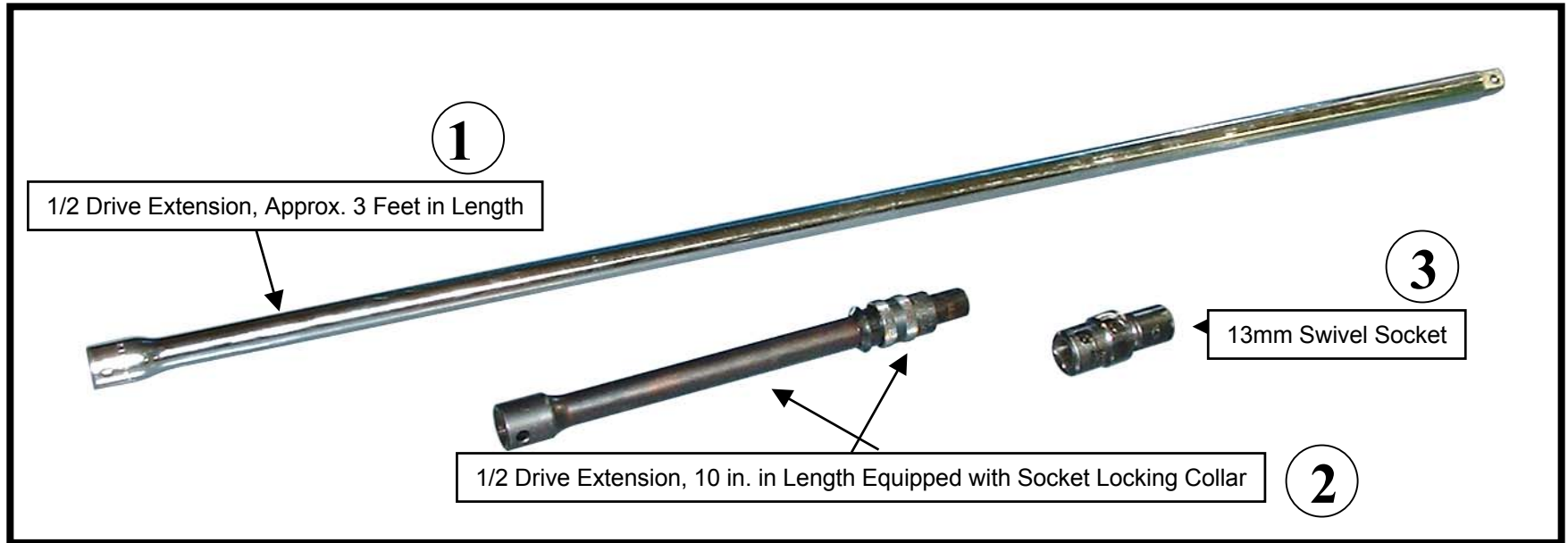


Torquing right side upper bell housing bolt.



Torquing right side top bell housing bolt.

Bell Housing Bolts *Service Tip* (Page 5 of 5)



Recommended tools to torque the Bell Housing bolts:

- 1) 1/2 inch Drive Extension, Approx. 3 Feet in Length
- 2) 1/2 Drive Extension, 10 in. in Length Equipped with Socket Locking Collar
- 3) 13mm Swivel Socket

Note: An Impact Swivel Socket may be used to torque fasteners but CANNOT exceed a 15 degree working angle.