

# Torque Tables<sup>TM</sup>



**Complete Cylinder Head  
Torque Specifications  
for Domestic and  
Imported Passenger  
Cars and Light/  
Medium Duty Trucks**



**FELPRO<sup>®</sup>**  
**THE GASKETS PROFESSIONALS TRUST<sup>TM</sup>**

# 100% *PERCENT*

VEHICLE SEALING

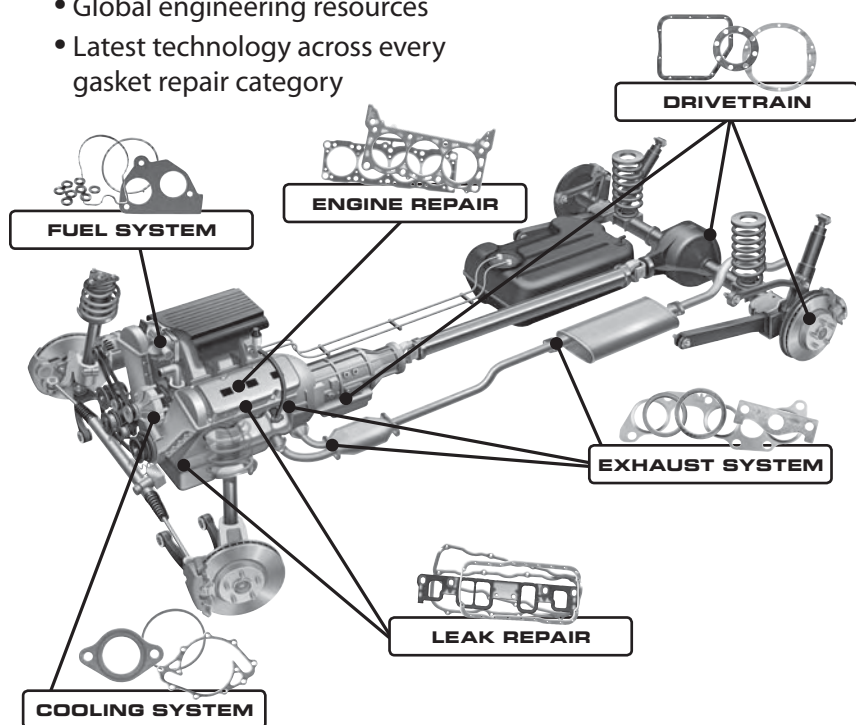
**When you consider** what can go wrong when even “minor” gaskets fail, you realize one thing:

**THERE ARE NO UNIMPORTANT GASKETS!**

Each one, no matter how small, plays a critical role in vehicle sealing. Each has to be the best. That's why you should be... **100% Fel-Pro®**

**Why trust Fel-Pro gaskets for ALL of your vehicle sealing needs?**

- The undisputed sealing technology leader
- Engineered for the repair environment
- Molded rubber chemistry and manufacturing expertise
- Global engineering resources
- Latest technology across every gasket repair category



**FEL-PRO®**  
**THE GASKETS PROFESSIONALS TRUST™**

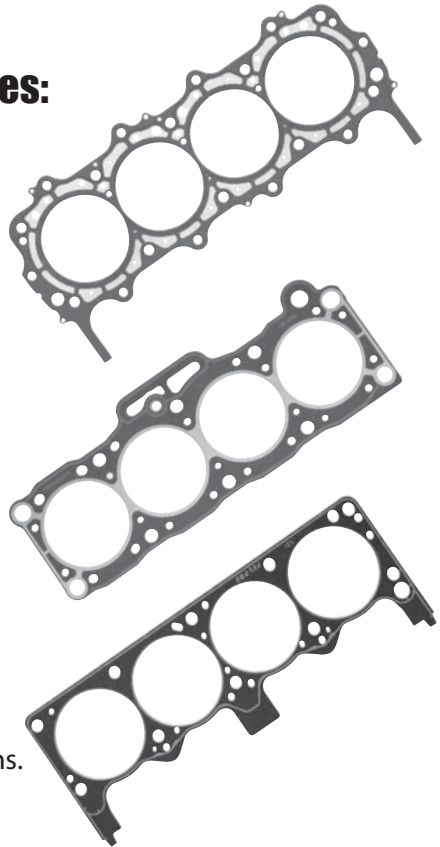
# Engine Repair

Fel-Pro® offers comprehensive coverage of virtually every engine repair opportunity, from complete rebuilds to the replacement of a single gasket or seal. In addition, Fel-Pro offers the best gasket material and design for each application to ensure a perfect seal the first time, every time.



## Engine Repair Technologies:

- **PermaTorqueMLS®** – These head gaskets provide the correct design for MLS-equipped vehicles and feature a unique aftermarket coating that accommodates less-than-perfect surface finishes.
- **PermaTorque®** – The industry standard for no-retorque head gaskets features premium coatings, facings and combustion armors.
- **PermaTorqueSD®** – Severe-duty head gaskets engineered for extra strength under punishing conditions.

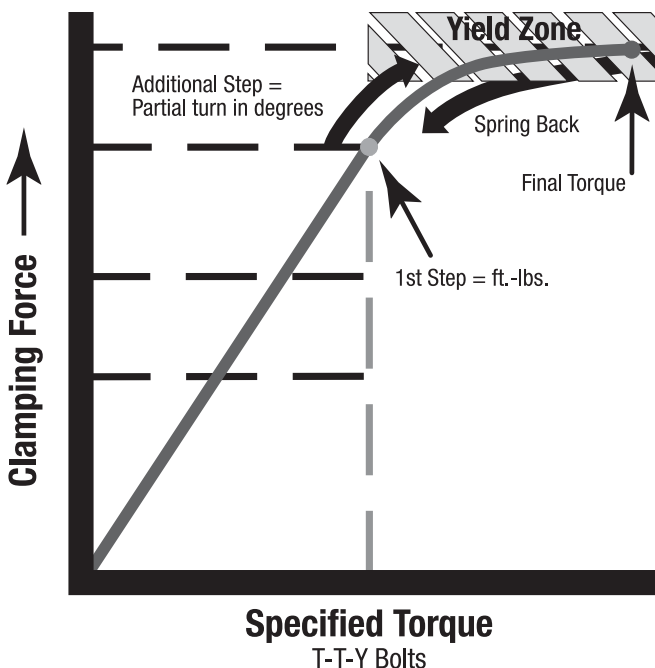


# Understanding Torque-to-Yield Head Bolts

T-T-Y head bolts are particularly common on engines using aluminum heads and/or multi-layer steel head gaskets. These bolts are engineered to stretch within a controlled “yield zone”. Once they reach this zone, they spring back to provide a precise level of clamping force over the entire area of the gasket.

It’s important to carefully follow the manufacturer’s tightening specification. Once T-T-Y bolts are stretched beyond their yield zone, they become useless. Typically, T-T-Y bolts are torqued to a specified limit, then again with an additional partial turn to reach the bolt’s yield zone.

It is recommend to never reuse a T-T-Y head bolt. Chances are too great that it has already exceeded its elasticity barrier and won’t spring back to properly seal the engine.

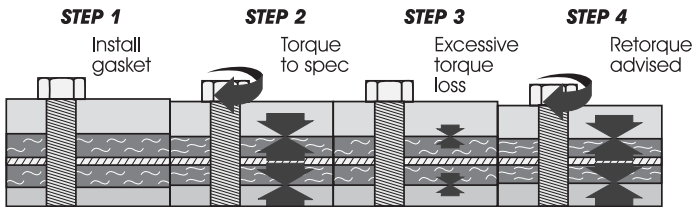


# Importance of Proper Torque

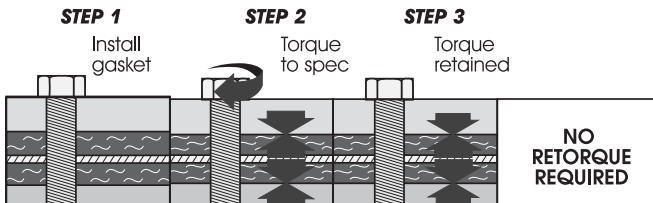
When a head gasket is installed between the cylinder head and engine block, tightening the head bolts compresses the gasket slightly, allowing the soft facing material on the gasket to conform to the small irregularities on the head and block deck surfaces. This allows the gasket to “cold seal” so it won’t leak coolant before the engine is started. The head gasket’s ability to achieve a positive cold seal, as well as to maintain a long-lasting, leak-free seal depends on two things: its own ability to retain torque over time (which depends on the design of the gasket and the materials used in its construction) and the clamping force applied by the head bolts.

PermaTorque® head gaskets are made with top-quality materials and designed to remain resilient so they retain torque, so no retorquing is necessary. (Some competitive head gaskets alleged to be “no retorque” can lose as much as 50 to 60% of their original torque after only 100 hours of service.)

## Competitive Head Gasket:



## PermaTorque® Head Gasket:



## Head Bolts

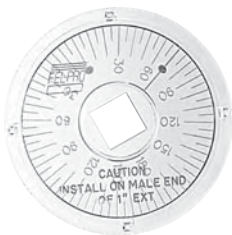
Previously installed Torque-to-Yield head bolts should never be reused. Damage to engine and cylinder heads can occur.

- Fel-Pro® Head Bolts provide the most consistent clamping force possible.
- Properly torque for best results.

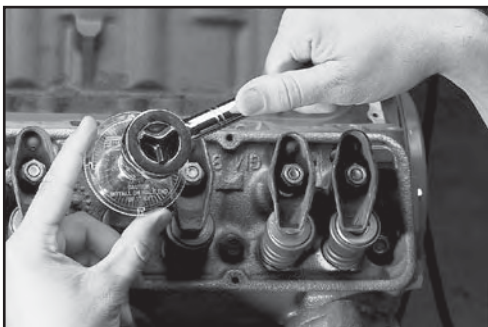


## Torque-to-Angle Indicator (Part Number TRQ-1)

With T-T-Y head bolts, the Torque-To-Angle Indicator (Part Number TRQ-1) should be used in conjunction with a torque wrench to achieve proper bolt loading. While the head bolts are being torqued to the specified value, the technician can use the TRQ-1 tool to accurately measure the degrees of additional rotation required. This eliminates guesswork and assures more consistent results.



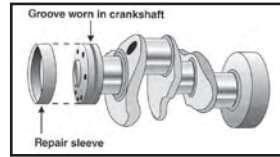
*Torque-To-Angle  
Indicator (Part Number TRQ-1)*



# Other Products from Fel-Pro® that aid in installation

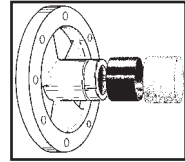
## Crankshaft Repair Sleeves

Repairs crankshaft grooves at the rear main bearing seal area.



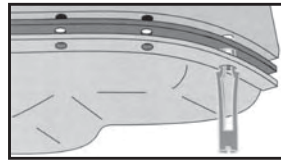
## Sleeve 'N' Seal®

Repairs harmonic balancer grooves at the timing cover seal area.



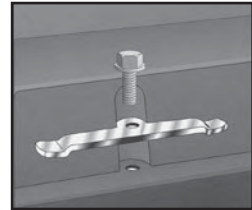
## Oil Pan SnapUps®

SnapUps® are designed to hold up the oil pan and gaskets, and allow for quick, convenient bolt installation. SnapUps are included with premium PermaDryPlus® oil pan gasket sets.



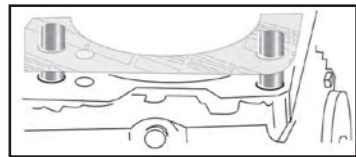
## Valve Cover Load Spreaders®

Load Spreaders distribute the clamping force more evenly on the valve cover flange. This results in a better seal between the valve cover and the head.



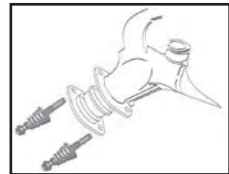
## Cylinder Head Dowel Pins

Cylinder head alignment dowel pins assure proper gasket and casting alignment for an accurate seal and trouble-free engine operation.



## Exhaust Flange Bolts/Springs

Exhaust Flange Bolt & Spring Kits ensure a tight exhaust flange seal at the pipe joint.



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BMW	18
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Cadillac	See GM Products
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DeLorean	26
DeSoto	See Chrysler Products
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TORQUE SPECIFICATIONS BY VEHICLE MANUFACTURER

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The torque specifications and sequences listed in this publication are considered accurate and reliable at the time of publication. However, since engine manufacturers may revise their specifications, FEL-PRO engineers suggest the installer consult the O.E. manufacturer for the latest information.

HOW TO USE THE FEL-PRO® Torque Tables™

- 1. Locate the vehicle manufacturer listing in the torque specification tables. All manufacturers are listed in alphabetical order. To save space in the listings, all Chrysler Products vehicles, all Ford Products vehicles, and all General Motors Products vehicles are each grouped together in a single section. Check the Table of Contents at the front of the book to find where each vehicle manufacturer is located. Each manufacturer section includes passenger cars, minivans, SUV's, light-duty and medium-duty trucks for that nameplate.
- 2. Within each vehicle manufacturer section, engines are arranged by number of cylinders (smallest to largest), then by engine size (CID or CC: smallest to largest), then by model years (newest year first). Check VIN codes carefully on domestic manufacturers, and engine codes carefully on imported manufacturers, to assure selecting the correct torquing information.
- 3. Special footnote symbols are included to show if a FEL-PRO PermaTorque® head gasket (●) or FEL-PRO head bolt set (○) is available for that engine application.
- 4. Locate the specific engine desired. Correct torque specifications are shown in foot-pounds in bold type.

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS 6 & V6 (CONT.)				
183 OHV (3.0L) 12 Valve Ford	2008-99 Truck ●○	1st <b>36-39</b> , 2nd loosen one turn, 3rd <b>20-24</b> , 4th turn 85-95 degrees, 5th turn 85-95 degrees	141	<b>ES 72136</b> <b>ES 72174</b>
183 OHV (3.0L) 12 Valve Ford	1998-91 Truck ●○	1st <b>59</b> , 2nd loosen one turn, 3rd <b>37</b> , 4th <b>68</b>	141	<b>ES 72136</b> <b>ES 72174</b>
183 OHV (3.0L) 12 Valve Ford	1990-86 Truck ●○	1st <b>33-41</b> , 2nd <b>63-73</b>	141	<b>ES 72136</b>

Torque specifications are shown either as an exact figure, or a specific range. Follow any special instructions or multi-step directions carefully to assure correct final torque. There may be different specifications for different size bolts, bolts in different positions, tightening bolts in several stages, or a cold engine vs. a warm engine. For example, in some cases bolts are first torqued to the figure for a cold engine and retorqued to the figure for a warm/hot engine. Remember that retorquing is NOT required when installing a FEL-PRO PermaTorque head gasket.

For torque-to-yield applications, head bolts are torqued additional partial turns (shown as “degrees” in the tables) after reaching a specified torque in foot-pounds. Please see the following Installation Tips for more information on torque-to-yield bolts.

- 5. The “Torque Sequence” column shows which diagram to use as the specific bolt torquing sequence for your engine. All diagrams can be found in numerical sequence at the back of this publication.

## FEL-PRO® PermaTorque® CYLINDER HEAD GASKETS

The FEL-PRO PermaTorque/Blue Stripe® and PermaTorque/Printoseal® cylinder head gaskets do not need retorquing. They combine the proper amount of compressibility with torque-retaining materials for a long-lasting seal.

FEL-PRO cylinder head gaskets use a variety of gasket constructions and materials, carefully chosen by our engineers for each specific engine application and thoroughly tested. All FEL-PRO PermaTorque cylinder head gaskets consist of four basic parts – the core, the facing material, the coating, and the armor. Other special enhancements, such as elastomeric sealing beads, may be added to improve sealing even further.

CORE

FACING

COATING

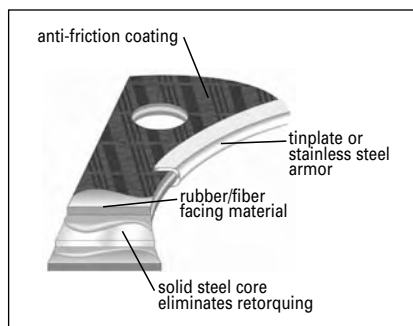
ARMOR

RELIABILITY

Coatings can be either PTFE rubber or silicone-based. They help seal minor surface imperfections, resist sticking, and help the gasket resist the shearing action that occurs in bi-metal engines. Aluminum cylinder heads and cast iron engine blocks expand and contract at different rates during engine heating/cooling cycles. The anti-friction coatings used on PermaTorque head gaskets allow both the head and block to “slip” over the gasket surface and still maintain a good seal.

Formed metal armors are added to protect the gasket body at cylinder openings. Each armor is precision stamped and then formed to the gasket body. Engineers specify different armor materials, ranging from tinplate to stainless steel, depending on the specific engine application.

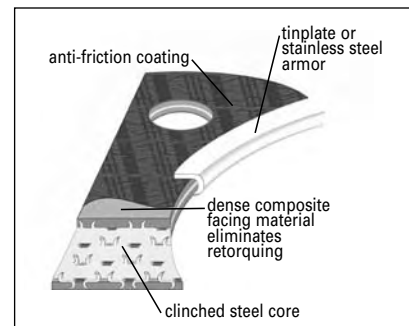
The most common PermaTorque/Blue Stripe design uses a solid steel core with rubber/fiber facing material. The solid steel core minimizes torque loss, while the soft facing conforms to seal minor surface irregularities.



**PermaTorque/Blue Stripe Solid Core Design**

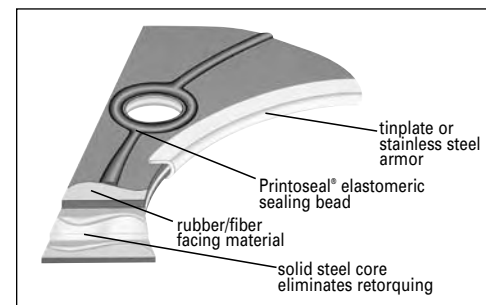
## FEL-PRO® PermaTorque® CYLINDER HEAD GASKETS

Another popular PermaTorque/Blue Stripe design uses a clinched steel core construction, combined with either expanded graphite or dense composite facing material. The “S” shaped protrusions of the clinched core allow more uniform loading of the gasket than competitive designs. High-density expanded graphite is used for high-temperature applications where required. The composite facing material uses rubber/fiber design that is densified during the production process. This material is dense enough to help maintain torque, yet compressible enough to conform to minor surface irregularities.



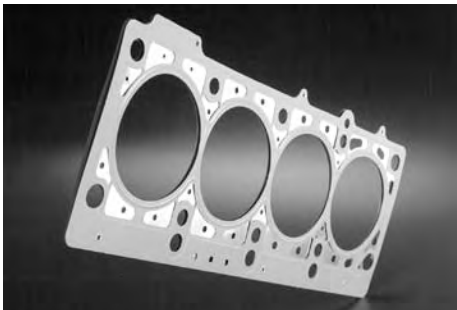
**PermaTorque/Blue Stripe Clinched Core Design**

When the engine requires additional sealability, Printoseal® elastomeric sealing beads are applied around critical openings such as coolant and oil ports, to prevent oil and coolant leakage. On many current lightweight engines, the beads also help seal aluminum castings that have uneven clamping force across the gasket surface.



**PermaTorque/Printoseal Solid Core Design**

The latest development in head gasket technology is the multi-layer steel (MLS) design. At first glance, these gaskets look like the old-style embossed steel shim gaskets, but they are radically different. First, a thin rubber coating is bonded to the stainless steel shim and, as required, multiple layers (up to five) of this rubber-coated steel shim are assembled into a single gasket. The high-temperature rubber coating provides excellent fluid sealability across the outer faces and between the individual layers, while also sealing minor head and block surface imperfections. MLS head gaskets provide the ultimate in torque retention and supply extra strength to support current lightweight aluminum casting designs. They are specified on most current domestic and imported engines in production.



Traditional original equipment manufacturer (OEM) type MLS head gaskets don't easily conform to surface irregularities, and require an incredibly smooth surface finish to provide a satisfactory seal. When the castings are new and the finish is fresh, most OEM-style MLS gaskets work quite well. But when the castings are old or resurfaced with a less than perfect finish, leaks usually result.

To seal under these adverse conditions, FEL-PRO® engineers have developed the exclusive PermaTorqueMLS® design. These newly redesigned MLS gaskets have many unique features that allow them to seal better than other MLS gaskets on the market today:

- Full-hard stainless steel maintains its shape despite thermal expansion, and resists the scrubbing action between head and block
- Precision-engineered embossed sealing beads placed at all critical sealing areas to eliminate leak paths
- An exclusive extra-strong "stopper" layer incorporated to provide a superior primary combustion seal
- Special rubber coating specifically formulated for the aftermarket repair environment, which is more forgiving of surface finish requirements

Remember that although PermaTorque MLS head gaskets are more forgiving than other designs, the finish on both the head and block must be flatter and smoother than what has been traditionally required for composite-type gaskets.

FEL-PRO® engineers determine which PermaTorque construction provides the best sealing for each individual engine design. Look for the "PT" suffix on the FEL-PRO part number for PermaTorque head gaskets, the most reliable no-retorque designs available on the market today.

### Remove Cylinder Heads Carefully

Loosen the head bolts in stages, in the reverse order of the tightening sequence. On engines with aluminum cylinder heads, remove the head only after the engine has cooled completely and reverse EXACTLY the recommended torquing procedure. Failure to do so may result in head warpage.

### Never Reuse Head Gaskets

When a new head gasket is installed, it conforms to the microscopic surface irregularities of the cylinder head and engine block. The gasket material is permanently compressed in that position. If you reuse the gasket, it is impossible to refit it in the exact same position and it will not have the "life" to readjust itself, so gasket failure may result.

### Clean Mating Surfaces

Thoroughly clean the cylinder head, engine block, head bolts, and bolt holes. A dirty bolt can alter torque readings by as much as 20 foot-pounds, and can form pockets in the gasket allowing leakage and eventual gasket failure.

### Check for Warpage and Distortion

Check for warpage of both head and block sealing surfaces with a straightedge and a feeler gauge. Out-of-flat along the length should not be more than 0.003" for three-cylinder applications, 0.004" for four-cylinder applications, and 0.006" for six-cylinder applications. Across the width should never exceed 0.002" out-of-flat. These are combined measurements for both the head and block together, and should not exceed the maximum amounts shown. There should be no sudden irregularities exceeding .001" and a maximum out-of-flat of  $\pm .001$ " in any 3" diameter should not be exceeded. When necessary, machine surfaces to return them to flat.

### Check Head and Block Finishes

Surface finish is critical for a good seal. FEL-PRO® engineers recommend a micro inch surface finish between 60 to 100 Ra (400 to 800 Rz) for cast iron heads and blocks, 50 to 60 Ra (200 to 600 Rz) for aluminum heads and blocks, and 10 to 30 Ra maximum (500 Rz maximum) for multi-layered steel (MLS) applications. Check the finishes with a profilometer or another type of surface finish comparator. Check for a preferred waviness height of .0004"/.0005" with a waviness peak spacing of .100" (these values are usually associated with milling machines). Always consult your manufacturer's service manual for surface finish requirements.

Use A Non-Hardening Gasket Sealer

Sealers are NOT required on FEL-PRO PermaTorque® head gaskets. However, embossed steel shim, copper-faced, or steel-faced gaskets should be coated with a non-hardening automotive gasket sealer as a supplemental seal.

Lightly coat bolt threads and the underside of the bolt heads with EP grease or similar lubricant. When they enter the water jackets of an engine, bolt threads should be coated with a non-hardening automotive sealer to prevent leakage. Refer to the manufacturer's service manual or examine the engine to determine where the bolt holes lead.

Watch Bolt Lengths and Sizes

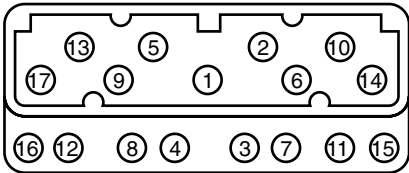
Head bolts on some engines may vary in length and size, and it is important that they be replaced in their original location. Either mark the bolts by position, or place them on a bench in the order you remove them.

Use A Torque Wrench

Uneven torque can cause block distortion and head warpage, resulting in coolant or combustion leaks. Use a good torque wrench, properly calibrated, and follow exact specifications for the proper torque. The basic tightening procedure is to first snug up bolts, then tighten in stages, and then complete with the final torque specified.

Follow Torquing Sequences

Each manufacturer has an approved torquing sequence to follow for each engine, to insure the best possible seal and eliminate chances of distortion and warpage. In general, the sequence starts at the center and spirals out to the ends of the head.



Warm Engine and Retorque Head

Run the engine to normal operating temperature after torquing head bolts. Heat expansion and contraction can radically change the torque readings. Retorque all head bolts to the correct settings while the engine is still warm. If working with aluminum components, let the engine cool completely first. Remember that FEL-PRO® PermaTorque® designs do NOT require retorquing.

Retorque After 300 to 500 Miles

If retorque-type head gaskets are used, retorque after 300 to 500 miles.

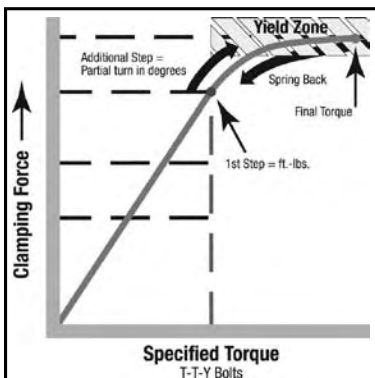
Torque-to-Yield Head Bolts

Torque-to-yeild is a method used by most current engine manufacturers to tighten head bolts. The head bolts are torqued to their yield point, which may permanently stretch the bolts. This results in a more even clamping force over the entire area of the gasket. Bolts should first be tightened to a specified torque (measured in foot-pounds), and then tightened an additional partial turn (measured in degrees) to the bolt yield point. The inexpensive FEL-PRO® Torque-to-Angle Indicator (part number TRQ-1) will help you accurately measure the required partial turn in degrees.

Because the head bolts may have stretched, the engine manufacturer may recommend against reusing them. Consult the OEM manual on head bolt reuse. Since you may not know how many times a T-T-Y bolt has been removed and reinstalled, FEL-PRO engineers suggest that it is always a good idea to use new bolts. FEL-PRO head bolt sets are available for many domestic and imported engines. The Torque Tables™ indicate which engines have bolt sets offered in the FEL-PRO product line.

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS 6 & V6 (CONT.)					
232 OHV (3.8L) 12 Valve Ford	2003-96 Truck	●○	1st 15, 2nd 29, 3rd 37, PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts 29-37; Short bolts 15-22, 3) turn 175-185 degrees	94	ES 72156 ES 72160
232 OHV (3.8L) 12 Valve Ford	1995 Truck	●○	1st 15, 2nd 30, 3rd 37, PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts 11-19; Short bolts 7-15, 3) turn 85-95 degrees	94	ES 72131
232 OHV (3.8L) 12 Valve Ford	2004-98 Car	●○	1st 15, 2nd 30, 3rd 37, PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts 29-37; Short bolts 15-22, 3) turn 180 degrees	94	ES 72160
232 OHV (3.8L) 12 Valve Ford	1997-96 Car	●○	1st 15, 2nd 30, 3rd 37, PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts 30-37; Short bolts 15-22, 3) turn 175-185 degrees	94	ES 72156 ES 72160
232 OHV (3.8L) 12 Valve Ford	1995-94 Car	●○	1st 15, 2nd 30, 3rd 37, PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts 11-19; Short bolts 10-15, 3) turn 85-95 degrees	94	ES 72131
232 OHV (3.8L) 12 Valve Ford	1993-91 Car	●○	1st 37, 2nd 45, 3rd 52, 4th 59, PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) 11-18, 3) Long bolts turn 85-105 degrees; Short bolts turn 65-85 degrees	94	ES 72131
232 OHV (3.8L) 12 Valve Ford	1990-84 Car	●○	Flanged Hex Head bolts: 1st 37, 2nd 45, 3rd 52, 4th 59, PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) 11-18, 3) Long bolts turn 85-105 degrees; Short bolts turn 65-85 degrees	82	ES 72129 ES 72131

## Understanding Torque-to-Yield Head Bolts



Although Torque-to-Yield (T-T-Y) head bolts are becoming more common, some people still don't fully understand how they work.

Bolts on T-T-Y applications are tightened to their yield point, creating a more even clamping force over the entire area of the gasket.

During engine assembly at the factory, precision machines tighten the bolts so they are just in the "yield zone." Technicians making repairs in the field do not have access to this type of equipment. Engineers have found that by tightening head bolts to specified torque and then tightening them an additional partial turn, technicians can reach the yield zone.

Fel-Pro® engineers suggest technicians use a gauge such as the inexpensive Fel-Pro® Torque-to-Angle Indicator (part number TRQ-1). It fits easily on the 1/2" drive of a torque wrench and eliminates uncertainty about the additional torquing required for T-T-Y head bolts.

**NOTE:** There is no way to visually tell if a bolt is the Torque-to-Yield design – the only way to tell is by its torque specifications.



## Are T-T-Y Head Bolts Reusable?

The torque-to-yeild procedure stretches the bolts into their elastic range. On some engines, this stretching approaches the bolts' elastic limit and the bolts are permanently stretched. If these bolts are removed and reused, it is likely that either the head gasket will fail due to false torque readings or that the bolts may break. Each engine manufacturer offers guidelines as to whether torque-to-yeild head bolts are reusable. Some guidelines allow limited reuse, while others recommend you never reuse the bolts. Since technicians may not know how many times a T-T-Y bolt has been removed and reinstalled, we recommend never reusing a T-T-Y head bolt.



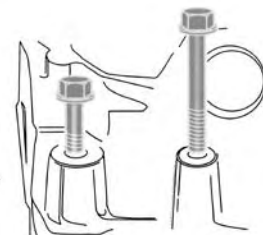
## Parts to Help Reduce Repair Costs

The FEL-PRO Engine\$aver Hardware line is a collection of "problem solvers" that provide cost-saving alternatives to engine component replacement. They bring engine components back to proper performance, at a fraction of their replacement cost.

### Engine\$aver Hardware Is Cost Efficiency Without Compromise

## Cylinder Head Bolts

Help avoid the risks that go with reuse of head bolts on torque-to-yeild applications.



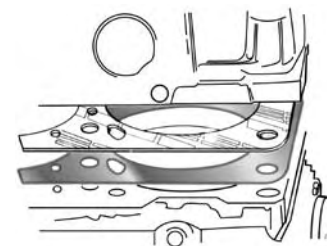
## Torque-to-Angle Indicator TRQ-1

Assures that proper installation procedures are followed when using torque-to-angle cylinder head bolts.



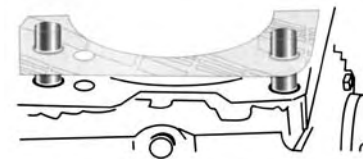
## HeadSaver® Spacer Shims

Compensates for excess metal removed during machining operations, so you don't have to replace costly cylinder heads.



## Cylinder Head Dowel Pins

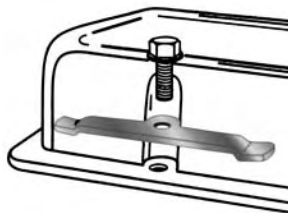
Assure proper gasket and casting alignment for an accurate seal and correct head-to-block assembly.





### Valve Cover Load Spreaders™

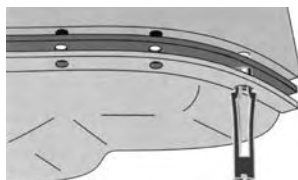
Evenly distribute the clamping force on the valve cover flange and allow a proper seal between the valve cover and the new gasket.



### Oil Pan SnapUps™

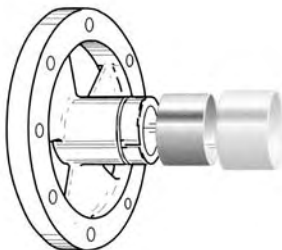
Save time and prevent frustration by holding the pan and the gasket in place for quick convenient bolt installation.

**ES 72863** for 5/16" applications  
**ES 72864** for 6mm applications  
**ES 72865** for 8mm applications



### Sleeve 'N' Seal®

Repairs worn sealing surfaces and helps avoid replacement of costly harmonic balancers.



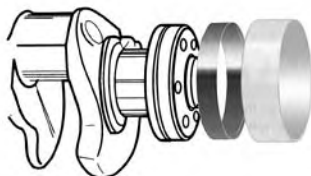
### Exhaust Flange Bolt & Spring Kits

Quickly connect the exhaust manifold and exhaust pipe on FWD vehicles and assure correct clamping force.



### Crankshaft Repair Sleeves

Repair worn sealing surfaces without costly crankshaft replacement.



Engine\$aver Hardware line products also appear in the FEL-PRO® Passenger Car/Light Truck and Heavy Duty master catalogs.



## TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>AC COBRA V8</b>					
260 Ford	1964-62	●	<b>65-70</b>	70	
289 Ford	1968-63	●	<b>65-70</b>	70	
427 Ford	1967-64	●	<b>100-105</b>	70	
428 Ford	1968-66	●	<b>80-90</b>	70	
<b>ACURA 4</b>					
1590cc DOHC (D16A1) 16 Valve	1989-86	●	1st <b>22</b> , 2nd <b>48</b>	106	
1678cc DOHC (B17A1) 16 Valve	1993-92		1st <b>22</b> , 2nd <b>61</b>	127	
1797cc DOHC (B18C1, B18C5) 16 Valve	2001-94	●	1st <b>22</b> , 2nd <b>63</b>	127	
1834cc DOHC (B18B1) 16 Valve	2001-94	●	1st <b>22</b> , 2nd <b>63</b>	128	
1834cc DOHC (B18A1) 16 Valve	1993-92	●	1st <b>22</b> , 2nd <b>63</b>	106	
1834cc DOHC (B18A1) 16 Valve	1991-90	●	1st <b>22</b> , 2nd <b>61</b>	106	
1998cc DOHC (K20A2, K20A3, K20Z1) 16 Valve	2006-02		1st <b>29</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	106	
2156cc SOHC (F22B1) 16 Valve	1997	●	1st <b>29</b> , 2nd <b>51</b> , 3rd <b>72.3</b>	108	
2254cc SOHC (F23A4) 16 Valve	2000-98	●	1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	108	
2301cc DOHC Turbo (K23A1) 16 Valve	2008-07		1st <b>29</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	106	
2354cc DOHC (K24A2) 16 Valve	2008-04		1st <b>29</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	106	
<b>ACURA 5</b>					
2451cc SOHC (G25A4) 20 Valve	1998-95		1st <b>29</b> , 2nd <b>51</b> , 3rd <b>72.3</b>	129	
2451cc SOHC (G25A1) 20 Valve	1994-92		<b>72</b> in three steps	78	
<b>ACURA V6</b>					
2494cc SOHC (C25A1) 24 Valve	1987-86	●	1st <b>29</b> , 2nd <b>56</b>	89	
2675cc SOHC (C27A1) 24 Valve	1990-87	●	1st <b>29</b> , 2nd <b>56</b>	107	
2977cc DOHC (C30A1) 24 Valve	2005-91		Automatic trans. <b>56</b> in three steps; Manual trans. <b>71</b> in three steps	130	
2997cc SOHC (J30A1) 24 Valve	2000-97	●	1st <b>29</b> , 2nd <b>51</b> , 3rd <b>72.3</b>	131	
3165cc SOHC (6VD1) 24 Valve Isuzu	1997-96	●	M11 bolts 1-8 <b>47</b> ; M8 bolts 9-11 <b>15</b>	132	
3179cc DOHC (C32B1) 24 Valve	2005-97		Automatic trans. <b>56</b> in three steps; Manual trans. <b>71</b> in three steps	130	
3206cc SOHC (C32A6) 24 Valve	1998-96	●	<b>56</b> in three steps	130	
3206cc SOHC (C32A1) 24 Valve	1995-91	●	<b>56</b> in three steps	130	
3210cc SOHC (J32A3) 24 Valve	2008-04	●	6 point bolts 1st <b>29</b> , 2nd <b>29</b> again, 3rd <b>51</b> , 4th <b>51</b> again, 5th <b>72.3</b> , 6th <b>72.3</b> again	131	
3210cc SOHC (J32A3) 24 Valve	2008-04	●	12 point bolts 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	131	
3210cc SOHC (J32A1, J32A2) 24 Valve	2003-99	●	1st <b>29</b> , 2nd <b>51</b> , 3rd <b>72.3</b>	131	
3471cc SOHC (J35A5, J35A8) 24 Valve	2008-04	●	6 point bolts 1st <b>29</b> , 2nd <b>29</b> again, 3rd <b>51</b> , 4th <b>51</b> again, 5th <b>72.3</b> , 6th <b>72.3</b> again	131	
3471cc SOHC (J35A5, J35A8) 24 Valve	2008-04	●	12 point bolts 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	131	
3471cc SOHC (J35A3, J35A5) 24 Valve	2003-01	●	1st <b>29</b> , 2nd <b>29</b> again, 3rd <b>51</b> , 4th <b>51</b> again, 5th <b>72.3</b> , 6th <b>72.3</b> again	131	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>ACURA V6 (CONT.)</b>					
3474cc SOHC (C35A1) 24 Valve	2004-96	●	56 in three steps	133	
3494cc DOHC (6VE1) 24 Valve Isuzu	2000-98	●	1st M11 Bolts 1-8 <b>21</b> , 2nd M11 Bolts 1-8 <b>47</b> , 3rd M8 Bolt 9 <b>15</b>	257	
3664cc SOHC (J37A1) 24 Valve	2008-07		1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	131	

<b>AM GENERAL 4</b>					
121 SOHC (2.0L) Audi	1979	●	1st <b>20</b> , 2nd <b>40</b> , 3rd <b>65</b> , 4th warm engine, 5th loosen 45 degrees, 6th <b>80</b>	60	
134F F-Head Jeep	1971-69		<b>65-70</b>	30	
150 (2.5L) AMC	1984-83	●	Bolts 1-7, 9-10 <b>85</b> ; Bolt 8 <b>75</b>	72	
151 (2.5L) Pontiac	1983-80	●	<b>92</b> in three steps	37	

<b>AM GENERAL 6</b>					
232 AMC	1978-73	●	<b>105</b> in three steps	2	
232 AMC	1972	●	<b>80-85</b>	2	
258 (4.2L) AMC	1979-74	●	<b>105</b> in three steps	2	

<b>AM GENERAL V8</b>					
350 (5.7L) Chevrolet Truck	1997 VIN D	●○	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	7	ES 72856
350 (5.7L) Chevrolet Truck	1996 VIN D	●○	1st <b>24</b> , 2nd <b>45</b> , 3rd <b>65</b>	7	ES 72856
350 (5.7L) Chevrolet Truck	1995-94 VIN D	●○	<b>65</b> in three steps	7	ES 72856
379 Diesel (6.2L) Chevrolet Truck	1994-92 VIN X	●○	1st <b>20</b> , 2nd <b>50</b> , 3rd turn 90 degrees	77	ES 72724
395 Diesel (6.5L) Chevrolet Truck	2000-94 VIN Y	●○	1st <b>20</b> , 2nd <b>55</b> , 3rd <b>55</b> again, 4th turn 90 degrees	77	ES 72724
395 Turbo Diesel (6.5L) Chevrolet Truck	2001-96 VIN Z	●○	1st <b>20</b> , 2nd <b>55</b> , 3rd <b>55</b> again, 4th turn 90 degrees	77	ES 72724

<b>AMC.....</b>	<b>SEE AMERICAN MOTORS</b>				
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<b>AMERICAN MOTORS 4</b>					
85.2 OHV (1.4L) Renault	1987-83	●	1st <b>41-44</b> , 2nd warm engine & allow to cool, 3rd loosen 180 degrees, 4th <b>41-44</b> again	149	
105.1 SOHC (1.7L) Renault	1987-85	●	1st <b>22</b> , 2nd <b>52</b> , 3rd loosen all bolts, 4th <b>15</b> , 5th turn 123 degrees	149	
120 SOHC (2.0L) Renault	1987	●	1st <b>22</b> , 2nd <b>52</b> , 3rd loosen all bolts, 4th <b>15</b> , 5th turn 123 degrees	149	
121 SOHC (2.0L) Audi	1979-77	●	1st <b>20</b> , 2nd <b>40</b> , 3rd <b>65</b> , 4th warm engine, 5th loosen 45 degrees, 6th <b>80</b>	60	
150 (2.5L) AMC	1988-83	●	Bolts 1-7, 9-10 <b>85</b> ; Bolt 8 <b>75</b>	72	
151 (2.5L) Pontiac	1983-80	●	<b>92</b> in three steps	37	

<b>AMERICAN MOTORS 6</b>					
184 L-Head Nash	1955-53	●	<b>60</b>	20	
195.6 L-Head	1965-53	●	<b>60</b>	20	
195.6 OHV Cast Iron	1965-56		<b>60</b>	21	
195.6 OHV Aluminum	1964-61		<b>50</b>	21	
199	1970-65	●	<b>80-85</b>	2	
232	1979-73	●	<b>105</b> in three steps	2	
232	1972-64	●	<b>80-85</b>	2	
258 (4.2L)	1988-81	●	<b>85</b> in three steps	2	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>AMERICAN MOTORS 6 (CONT.)</b>					
258 (4.2L)	1980-73	●	<b>105</b> in three steps	2	
258 (4.2L)	1972-71	●	<b>80-85</b>	2	
308 L-Head Hudson	1954-51		<b>70</b>	35	

<b>AMERICAN MOTORS V8</b>					
250	1962-56		<b>58-62</b>	22	
287	1966-63		<b>58-62</b>	22	
290	1969-66	●	<b>90-100</b>	1	
304	1979-70	●	1st <b>80</b> , 2nd <b>110</b>	1	
320 Packard	1955		<b>60-65</b>	22	
327	1966-56		<b>58-62</b>	22	
343	1969-67	●	<b>90-100</b>	1	
352 Packard	1956		<b>60-65</b>	22	
360	1978-70	●	1st <b>80</b> , 2nd <b>110</b>	1	
390	1970	●	1st <b>80</b> , 2nd <b>110</b>	1	
390	1969-68	●	<b>90-100</b>	1	
401	1976-71	●	1st <b>80</b> , 2nd <b>110</b>	1	

<b>AMPHICAR 4</b>					
1147cc OHV Triumph	1968-61		<b>42-46</b>	42	

<b>APOLLO V8</b>					
215 Buick	1963-62	●	<b>50-55</b>	24	
300 Buick	1965-64	●	<b>65-70</b>	4	

<b>ARO 4</b>					
140 SOHC (2.3L) Ford	1990	●○	1st <b>50-60</b> , 2nd <b>80-90</b>	17	ES 72137

<b>AUDI 4</b>					
1471cc SOHC (8 Valve)	1974-73		1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1588cc SOHC (8 Valve)	1980-75	●	12 point bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1588cc SOHC (8 Valve)	1980-75	●	6 point bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd <b>54</b> , 4th warm engine, 5th <b>61</b> , 6th retorque after 1000 miles	60	
1588cc SOHC Diesel (8 Valve)	1983-82	●○	12 point M12 bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees, 5th warm engine, 6th turn 90 degrees, 7th after 1000 miles turn 90 degrees	60	ES 74028
1588cc SOHC Diesel (8 Valve)	1983-82	●	6 point M11 bolts 1st <b>35</b> , 2nd <b>50</b> , 3rd <b>65</b> , 4th warm engine, 5th <b>65</b> again, 6th after 1000 miles turn 90 degrees	60	
1588cc SOHC Turbo Diesel (8 Valve)	1983-82	●○	12 point M12 bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees, 5th warm engine, 6th turn 90 degrees, 7th after 1000 miles turn 90 degrees	60	ES 74028
1715cc SOHC (8 Valve)	1983-81	●	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1760cc OHV (8 Valve)	1972-70		1st <b>29</b> , 2nd <b>43.5</b> , 3rd <b>58</b> , 4th <b>65</b>	12	
1780cc SOHC (8 Valve)	1987-84	●○	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	ES 74029
1780cc DOHC Turbo (20 Valve)	2006-04	●○	1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	ES 71172
1780cc DOHC Turbo (20 Valve)	2003-97	●○	1st <b>44</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	ES 71172



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
AUDI 4 (CONT.)				
1871cc OHV (8 Valve)	1977-72	1st <b>29</b> , 2nd <b>43.5</b> , 3rd <b>58</b> , 4th <b>65</b>	12	
1984cc SOHC (8 Valve)	1990-88 ●	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1984cc DOHC Turbo (20 Valve)	2008-05 ●	1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	
AUDI 5				
1986cc SOHC Diesel (10 Valve)	1982-81	12 point M12 bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees, 5th warm engine, 6th turn 90 degrees, 7th after 1000 miles turn 90 degrees	78	
1986cc SOHC Diesel (10 Valve)	1981-79	6 point M11 bolts 1st <b>35</b> , 2nd <b>50</b> , 3rd <b>65</b> , 4th warm engine, 5th <b>65</b> again, 6th after 1000 miles turn 90 degrees	78	
1986cc SOHC Turbo Diesel (10 Valve)	1985-82	12 point M12 bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees, 5th warm engine, 6th turn 90 degrees, 7th after 1000 miles turn 90 degrees	78	
2144cc SOHC (10 Valve)	1985-78 ●	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
2144cc SOHC Turbo (10 Valve)	1985-80 ●	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
2226cc SOHC (10 Valve)	1988-84 ●	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
2226cc SOHC Turbo (10 Valve)	1991-86 ●	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
2226cc DOHC Turbo (20 Valve)	1997-90	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
2309cc SOHC (10 Valve)	1992-87 ●	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
2309cc DOHC (20 Valve)	1992-89 ●	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
AUDI V6				
2671cc DOHC Turbo (30 Valve)	2005-00	1st <b>44</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	135	
2771cc SOHC (12 Valve)	1998-92	1st <b>44</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	135	
2771cc DOHC (30 Valve)	2001-97 ●	1st <b>44</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	135	
2976cc DOHC (30 Valve)	2006-02	1st <b>30</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	135	
3123cc DOHC (30 Valve)	2008-05	1st <b>30</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	135	
3189cc DOHC (24 Valve)	2008-04	1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	
3597cc DOHC (24 Valve)	2008-07	1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	
AUDI V8				
3562cc DOHC (32 Valve)	1991-90	1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	136	
3697cc DOHC (32 Valve)	1999-97	1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	136	
4163cc DOHC (40 Valve)	2008-04	1st <b>22</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	136	
4172cc DOHC (32 Valve)	2004-97	1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	136	
4172cc DOHC (32 Valve)	1994-92	1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	136	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
AUDI V8 (CONT.)				
4172cc DOHC (40 Valve)	2005-00	1st <b>26</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	136	
4172cc DOHC Turbo (40 Valve)	2003	1st <b>26</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	136	
AUDI V10				
5204cc DOHC (40 Valve)	2008-07	1st <b>22</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	226	
AUDI V12				
5998cc DOHC (48 Valve)	2008-05	1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	227	
AURORA V8				
302 (5.0L) Ford	1988-87 ●	Standard Hex Head bolts: Intake Side <b>80</b> , Exhaust Side <b>68</b>	70	
AUSTIN 4				
803cc OHV	1956-52	<b>40</b>	54	
848cc OHV	1974-59	<b>40</b>	54	
948cc OHV	1962-56	<b>40</b>	54	
997cc OHV	1969-61	<b>40</b>	54	
998cc OHV	1974-61	<b>40</b>	54	
1098cc OHV	1974-62	<b>46</b>	54	
1198cc OHV	1957-54	<b>45</b>	182	
1275cc OHV	1977-65	<b>46</b> in three steps	54	
1489cc OHV	1961-54	<b>45</b>	182	
1622cc OHV	1966-61	<b>45</b>	182	
1798cc OHV	1977-68	<b>45-50</b> in three steps	55	
AUSTIN-HEALEY 4				
948cc OHV	1962-58	<b>40</b>	54	
1098cc OHV	1967-62	<b>46</b>	54	
1275cc OHV	1971-66	<b>46</b> in three steps	54	
AVANTI II V6				
244 SOHC (4.0L) 12 Valve Ford	2007-06 ●○	1st M12 Bolts 1-8 <b>9</b> , 2nd M12 Bolts 1-8 <b>18</b> , 3rd M8 Bolts 9-10 <b>24</b> , 4th M12 Bolts 1-8 turn 90 degrees, 5th M12 Bolts 1-8 turn 90 degrees	218	ES 72171
AVANTI II V8				
281 SOHC (4.6L) 24 Valve Ford	2007-05 ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	144	ES 72798
305 (5.0L) Chevrolet	1991-81 ●○	<b>65</b> in three steps	7	ES 72856
327 Chevrolet	1969-65 ●○	<b>65</b>	7	ES 72856
346 OHV (5.7L) Chevrolet	2004 2nd Design Bolts ●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
346 OHV (5.7L) Chevrolet	2004-01 1st Design Bolts ●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-8 turn 90 degrees, 4th M11 Bolts 9-10 turn 50 degrees, 5th M8 Bolts 11-15 <b>22</b>	159	ES 72173
350 (5.7L) Chevrolet	1980-69 ●○	<b>65</b> in three steps	7	ES 72856
400 Chevrolet	1978-73 ●○	<b>65</b> in three steps	7	ES 72856





# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>BERTONE</b> .....					<b>SEE FIAT</b>
<b>BIZZARRINI V8</b>					
327 Chevrolet	1969-65	●○	65	7	ES 72856
<b>BMW 4</b>					
1766cc SOHC (M10B18) 8 Valve	1985-84		1st <b>25-29</b> , 2nd <b>42-44</b> , 3rd wait 15 minutes, 4th turn 30-36 degrees, 5th warm engine, 6th turn 20-30 degrees	65	
1766cc SOHC (M10B18) 8 Valve	1983-80		1st <b>25-32</b> , 2nd <b>49-52</b> , 3rd <b>56-59</b> , 4th warm engine, 5th <b>56-59</b> again, 6th retorque after 600 miles	65	
1796cc DOHC (M42B18) 16 Valve	1995-91	●	1st <b>24</b> , 2nd turn 90-95 degrees, 3rd turn 90-95 degrees	137	
1895cc DOHC (M44B19) 16 Valve	1999-96	●	1st <b>22.1</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	137	
1990cc SOHC (M10B20, 121) 8 Valve	1979-66		1st <b>25-32</b> , 2nd <b>49-52</b> , 3rd <b>56-59</b> , 4th warm engine, 5th <b>56-59</b> again, 6th retorque after 600 miles	65	
1990cc SOHC Turbo (121) 8 Valve	1974-73		1st <b>25-32</b> , 2nd <b>49-52</b> , 3rd <b>56-59</b> , 4th warm engine, 5th <b>56-59</b> again, 6th retorque after 600 miles	65	
2302cc DOHC (S14B23) 16 Valve	1991-88		1st <b>35-37</b> , 2nd <b>57-59</b> , 3rd wait 15 minutes, 4th <b>71-73</b>	137	
<b>BMW 6</b>					
2443cc SOHC Turbo Diesel (M21D24) 12 Valve	1986-85		1st <b>22-29</b> , 2nd <b>50-60</b> , 3rd wait 15 minutes, 4th <b>70-76</b> , 5th warm engine, 6th turn 85-95 degrees	90	
2494cc SOHC (M20B25) 12 Valve	1993-87		Hexagon bolts 1st <b>29-33</b> , 2nd wait 20 minutes, 3rd <b>43-47</b> , 4th warm engine, 5th turn 25-30 degrees; Torx bolts 1st <b>22.1</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	
2494cc DOHC (M54B25) 24 Valve	2006-01	●	1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	
2494cc DOHC (M52B25) 24 Valve	2000-98 Cast Iron block	●	1st <b>22.1</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	
2494cc DOHC (M52B25) 24 Valve	2000-98 Aluminum block	●	1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	
2494cc DOHC (M50B25) 24 Valve	1995-91	●	1st <b>24</b> , 2nd turn 90-95 degrees, 3rd turn 90-95 degrees	84	
2693cc SOHC (M20B27) 12 Valve	1988-82		1st <b>29-33</b> , 2nd wait 20 minutes, 3rd <b>43-47</b> , 4th warm engine, 5th turn 25-30 degrees	84	
2788cc SOHC (M30B28, 128) 12 Valve	1981-79		1st <b>25-32</b> , 2nd <b>49-52</b> , 3rd <b>56-59</b> , 4th warm engine, 5th <b>56-59</b> again, 6th retorque after 600 miles	87	
2793cc DOHC (M52B28) 24 Valve	2000-96 Cast Iron block	●	1st <b>22.1</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	
2793cc DOHC (M52B28) 24 Valve	2000-96 Aluminum block	●	1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	
2979cc DOHC (M54B30) 24 Valve	2006-01		1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	
2985cc SOHC (M30B30) 12 Valve	1978-75		1st <b>25-32</b> , 2nd <b>49-52</b> , 3rd <b>56-59</b> , 4th warm engine, 5th <b>56-59</b> again, 6th retorque after 600 miles	87	
2990cc DOHC (S50B30) 24 Valve	1995-94		1st <b>22.1</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>BMW 6 (CONT.)</b>					
2996cc DOHC (N52B30) 24 Valve	2008-06		1st Bolts 1-14 <b>22</b> , 2nd Bolts 1-14 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-14 turn 45 degrees, 5th Bolts 15-17 <b>5</b> , 6th Bolts 15-17 turn 90 degrees, 7th Bolt 18 <b>11</b> , 8th Bolt 18 turn 90 degrees	228	
2996cc DOHC Turbo (N54B30) 24 Valve	2008-07		1st Bolts 1-14 <b>22</b> , 2nd Bolts 1-14 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-14 turn 45 degrees, 5th Bolts 15-18 <b>16.2</b>	229	
3152cc DOHC (S52B32) 24 Valve	2000-96		1st <b>22.1</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	
3210cc SOHC (M30B32) 12 Valve	1984-83		1st <b>25-29</b> , 2nd <b>42-45</b> , 3rd wait 20 minutes, 4th <b>56-59</b> , 5th turn 20-30 degrees	87	
3210cc SOHC (M30B32) 12 Valve	1982-78		1st <b>25-32</b> , 2nd <b>49-52</b> , 3rd <b>56-59</b> , 4th warm engine, 5th <b>56-59</b> again, 6th retorque after 600 miles	87	
3245cc DOHC (S54B32) 24 Valve	2008-01		1st <b>22.1</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	84	
3430cc SOHC (M30B34) 12 Valve	1993-85	●	1st <b>25-29</b> , 2nd <b>42-44</b> , 3rd wait 20 minutes, 4th <b>57-59</b> , 5th warm engine, 6th turn 30-40 degrees	84	
3453cc DOHC (S38B35) 24 Valve	1988-87		1st <b>35-37</b> , 2nd <b>57-59</b> , 3rd wait 15 minutes, 4th <b>71-73</b>	84	
3535cc DOHC (S38B35) 24 Valve	1993-91		1st <b>43-46</b> , 2nd wait 20 minutes, 3rd <b>58-60</b> , 4th warm engine, 5th turn 30-40 degrees	84	
<b>BMW V8</b>					
2997cc DOHC (M60B30) 32 Valve	1995-94		1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	
3982cc DOHC (M60B40) 32 Valve	1995-93	●	1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	
4398cc DOHC (N62B44) 32 Valve	2007-02		1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	
4398cc DOHC (M62B44) 32 Valve	2003-96	●	1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	
4398cc DOHC Supercharged (N62B44S) 32 Valve	2008-07		1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	
4619cc DOHC (M62B46) 32 Valve	2003-02		1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	
4799cc DOHC (N62B48) 32 Valve	2008-04		1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	
4837cc DOHC (S62B48) 32 Valve	2004-03		1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	
4941cc DOHC (S62B50) 32 Valve	2003-00		1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	
<b>BMW V10</b>					
4999cc DOHC (S85B50) 40 Valve	2008-06		1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	155	
<b>BMW V12</b>					
4988cc SOHC (M70B50) 24 Valve	1994-88		1st <b>22.1</b> , 2nd wait 15 minutes, 3rd turn 60 degrees, 4th turn 60 degrees	84	
5379cc SOHC (M73B54) 24 Valve	2001-95		1st <b>22.1</b> , 2nd turn 60 degrees, 3rd turn 60 degrees	84	
5576cc SOHC (S70B56) 24 Valve	1995-94		1st <b>22.1</b> , 2nd turn 60 degrees, 3rd turn 60 degrees	84	
5972cc DOHC (N73B60) 48 Valve	2008-03		1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	84	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
BRICKLIN V8					
351 Modified Ford	1976-75	●	95-105	70	
351 Windsor Ford	1976-75	●	1st 85, 2nd 95, 3rd 105-112	70	
360 AMC	1974	●	1st 80, 2nd 110	1	
BUICK..... SEE GM PRODUCTS					
CADILLAC..... SEE GM PRODUCTS					
CALLAWAY V8					
346 OHV (5.7L) Chevrolet	1999	●○	1st M11 Bolts 1-10 22, 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-8 turn 90 degrees, 4th M11 Bolts 9-10 turn 50 degrees, 5th M8 Bolts 11-15 22	159	ES 72173
CHECKER 6 & V6					
226 OHV Continental	1964-59		70-75	193	
226L L-Head Continental	1964-47		30-35	18	
229 (3.8L) Chevrolet	1982-80	●	65 in three steps	64	
230 Chevrolet	1968-64	●	95	2	
250 Chevrolet	1979-74	●	Bolts 1-10, 12-14 95; Bolt 11 85	2	
250 Chevrolet	1973-69	●	95	2	
CHECKER V8					
267 (4.4L) Chevrolet	1982-80	●○	65 in three steps	7	ES 72856
283 Chevrolet	1967-64	●○	65	7	ES 72856
305 (5.0L) Chevrolet	1982-77	●○	65 in three steps	7	ES 72856
307 Chevrolet	1970-68	●○	65	7	ES 72856
318 Chrysler	1966-64	●	95	12	
318 Chrysler	1963-59	●	85	12	
327 Chevrolet	1969-64	●○	65	7	ES 72856
350 (5.7L) Chevrolet	1980-69	●○	65 in three steps	7	ES 72856
350 Diesel (5.7L) Oldsmobile	1982-80	●	1st 100, 2nd 130	3	
CHEVROLET..... SEE GM PRODUCTS					
CHRYSLER..... SEE CHRYSLER PRODUCTS					
CHRYSLER PRODUCTS 4					
86 SOHC (1.4L) 8 Valve Mitsubishi	1984-79	●	1st 25, 2nd 51-54	81	
89.5 SOHC (1.5L) 12 Valve Mitsubishi	1996-91	●○	1st 25, 2nd 51-54	71	ES 71206
89.5 SOHC (1.5L) 8 Valve Mitsubishi	1991-85	●	1st 25, 2nd 51-54	81	
97.1 OHV (1.6L) 8 Valve Peugeot	1986-83	●	52 in three steps	37	
97.3 DOHC (1.6L) 16 Valve Mitsubishi	1990-89	●	Cold 65-72, Warm 72-80	81	
97.3 DOHC Turbo (1.6L) 16 Valve Mitsubishi	1990-89	●	Cold 65-72, Warm 72-80	81	
97.5 SOHC (1.6L) 8 Valve Mitsubishi	1984-78	●	1st 25, 2nd 51-54	81	
97.5 SOHC (1.6L) 8 Valve Mitsubishi	1977-71	●	Bolts 1-10 1st 25, 2nd 51-54; Bolts 11 3rd 11-15	38	
97.5 SOHC Turbo (1.6L) 8 Valve Mitsubishi	1990-84	●	1st 25, 2nd 51-54	81	
105 SOHC (1.7L) 8 Valve Volkswagen	1983-78	●	1st 29, 2nd 43, 3rd 54, 4th turn 90 degrees	60	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
CHRYSLER PRODUCTS 4 (CONT.)					
107.1 SOHC (1.8L) 8 Valve Mitsubishi	1994-89	●○	1st 25, 2nd 51-54	81	ES 71174 ES 71175
109.7 DOHC (1.8L) 16 Valve Chrysler	2008 2nd Design Bolts		1st 25, 2nd 54, 3rd 54 again, 4th turn 90 degrees	71	
109.7 DOHC (1.8L) 16 Valve Chrysler	2008-07 1st Design Bolts		1st 25, 2nd 45, 3rd 45 again, 4th turn 90 degrees	71	
111.8 SOHC (1.8L) 16 Valve Mitsubishi	1996-92	●○	1st 54, 2nd loosen all bolts, 3rd 15, 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71209
121.7 SOHC (2.0L) 8 Valve Mitsubishi	1982-74	●	Bolts 1-10 Cold 65-72, Hot 73-79; Bolts 11 11-15	38	
122 SOHC (2.0L) 16 Valve Chrysler	2005-04	●○	1st Bolts 1-10 25, 2nd Bolts 1-6 50, 3rd Bolts 7-10 35, 4th Bolts 1-6 50 again, 5th Bolts 7-10 35 again, 6th Bolts 1-10 turn 90 degrees	37	ES 72157
122 SOHC (2.0L) 16 Valve Chrysler	2003-95	●○	1st 25, 2nd 50, 3rd 50 again, 4th turn 90 degrees	37	ES 72157
122 SOHC (2.0L) 16 Valve Mitsubishi	1993	●	1st 58, 2nd loosen all bolts, 3rd 15, 4th turn 90 degrees, 5th turn 90 degrees	71	
122 SOHC (2.0L) 8 Valve Mitsubishi	1992-83	●	Cold 65-72, Warm 73-79	71	
122 DOHC (2.0L) 16 Valve Chrysler	2008 2nd Design Bolts		1st 25, 2nd 54, 3rd 54 again, 4th turn 90 degrees	71	
122 DOHC (2.0L) 16 Valve Chrysler	2008-07 1st Design Bolts		1st 25, 2nd 45, 3rd 45 again, 4th turn 90 degrees	71	
122 DOHC (2.0L) 16 Valve Chrysler	2004-02	●○	1st Long bolts 25; Short bolts 20, 2nd Long bolts 50; Short bolts 20, 3rd Long bolts 50; Short bolts 20, 4th all bolts turn 90 degrees	37	ES 72166
122 DOHC (2.0L) 16 Valve Chrysler	1999-95	●○	1st Long bolts 25; Short bolts 20, 2nd Long bolts 50; Short bolts 20, 3rd Long bolts 50; Short bolts 20, 4th all bolts turn 90 degrees	37	ES 72166
122 DOHC (2.0L) 16 Valve Mitsubishi	1994-93	●○	1st 58, 2nd loosen all bolts, 3rd 15, 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71175
122 DOHC (2.0L) 16 Valve Mitsubishi	1992-89	●○	Cold 65-72 in three steps	81	ES 71175
122 DOHC Turbo (2.0L) 16 Valve Mitsubishi	1998-95	●○	1st 58, 2nd loosen all bolts, 3rd 15, 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71177
122 DOHC Turbo (2.0L) 16 Valve Mitsubishi	1994-93	●○	1st 58, 2nd loosen all bolts, 3rd 15, 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71175
122 DOHC Turbo (2.0L) 16 Valve Mitsubishi	1992-89	●○	Cold 65-72 in three steps	81	ES 71175
132 SOHC (2.2L) 8 Valve Renault	1989-88 Medallion		1st 37, 2nd 59, 3rd loosen all bolts, 4th 64-72	149	
135 SOHC (2.2L) 8 Valve Chrysler	1994-85 exc. Medallion	●○	M11 bolts: 1st 45, 2nd 65, 3rd 65 again, 4th turn 90 degrees	37	ES 72723 ES 72176
135 SOHC (2.2L) 8 Valve Chrysler	1985-81	●○	M10 bolts: 1st 30, 2nd 45, 3rd 45 again, 4th turn 90 degrees	37	ES 72118
135 DOHC (2.2L) 16 Valve Chrysler	1991-88		M11 bolts: 1st 45, 2nd 65, 3rd 65 again, 4th turn 90 degrees	100	
135 SOHC Turbo (2.2L) 8 Valve Chrysler	1990-85	●○	M11 bolts: 1st 45, 2nd 65, 3rd 65 again, 4th turn 90 degrees	37	ES 72723 ES 72176
135 SOHC Turbo (2.2L) 8 Valve Chrysler	1985-84	●○	M10 bolts: 1st 30, 2nd 45, 3rd 45 again, 4th turn 90 degrees	37	ES 72118
135 DOHC Turbo (2.2L) 16 Valve Chrysler	1993-89		M11 bolts: 1st 45, 2nd 65, 3rd 65 again, 4th turn 90 degrees	100	
143 SOHC Turbo Diesel (2.3L) 8 Valve Mitsubishi	1986-83	●	Cold 76-83, Warm 84-90	43	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
CHRYSLER PRODUCTS 4 (CONT.)					
143.4 SOHC (2.4L) 16 Valve Mitsubishi	2005-01 Car	●○	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71177
143.4 SOHC (2.4L) 16 Valve Mitsubishi	1996-93 Car	●	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	
143.4 SOHC (2.4L) 8 Valve Mitsubishi	1992 Car	●	Cold <b>65-72</b> , Warm <b>73-79</b>	71	
143.4 SOHC (2.4L) 8 Valve Mitsubishi	1993 Truck	●	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	
143.4 SOHC (2.4L) 8 Valve Mitsubishi	1992-90 Truck	●	Cold <b>65-72</b> , Warm <b>73-79</b>	71	
144 DOHC (2.4L) 16 Valve Chrysler	2008 2nd Design Bolts	●	1st <b>25</b> , 2nd <b>54</b> , 3rd <b>54</b> again, 4th turn 90 degrees	71	
144 DOHC (2.4L) 16 Valve Chrysler	2008-07 1st Design Bolts	●○	1st <b>25</b> , 2nd <b>45</b> , 3rd <b>45</b> again, 4th turn 90 degrees	71	ES 71028
144 DOHC Turbo (2.4L) 16 Valve Chrysler	2008 2nd Design Bolts	●	1st <b>25</b> , 2nd <b>54</b> , 3rd <b>54</b> again, 4th turn 90 degrees	71	
144 DOHC Turbo (2.4L) 16 Valve Chrysler	2008 1st Design Bolts	●○	1st <b>25</b> , 2nd <b>45</b> , 3rd <b>45</b> again, 4th turn 90 degrees	71	ES 71028
148 DOHC (2.4L) 16 Valve Chrysler	2008-05	●○	1st <b>25</b> , 2nd <b>60</b> , 3rd <b>60</b> again, 4th turn 90 degrees	37	ES 71028
148 DOHC (2.4L) 16 Valve Chrysler	2004-95	●○	1st <b>25</b> , 2nd <b>50</b> , 3rd <b>50</b> again, 4th turn 90 degrees	37	ES 71028
148 DOHC Turbo (2.4L) 16 Valve Chrysler	2008-05	●○	1st <b>25</b> , 2nd <b>60</b> , 3rd <b>60</b> again, 4th turn 90 degrees	37	ES 71028
148 DOHC Turbo (2.4L) 16 Valve Chrysler	2004-03	●○	1st <b>25</b> , 2nd <b>50</b> , 3rd <b>50</b> again, 4th turn 90 degrees	37	ES 71028
150 OHV (2.5L) 8 Valve Jeep	2002-97 Truck	●○	1st <b>22</b> , 2nd <b>45</b> , 3rd <b>45</b> again, 4th Bolts 1-6, 8-10 <b>110</b> ; Bolt 7 <b>100</b>	151	ES 72896
150 OHV (2.5L) 8 Valve Jeep	1996 Truck	●	1st <b>22</b> , 2nd <b>45</b> , 3rd <b>45</b> again, 4th Bolts 1-6, 8-10 <b>110</b> ; Bolt 7 <b>100</b>	151	
150 OHV (2.5L) 8 Valve AMC	1989-88 Premier	●	1st <b>22</b> , 2nd <b>45</b> , 3rd Bolts 1-7, 9-10 <b>110</b> ; Bolt 8 <b>100</b>	72	
153 SOHC (2.5L) 8 Valve Chrysler	1995-86	●○	1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees	37	ES 72723 ES 72176
153 SOHC Turbo (2.5L) 8 Valve Chrysler	1992-89	●○	1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees	37	ES 72723 ES 72176
156 SOHC (2.6L) 8 Valve Mitsubishi	1989-78	●○	Bolts 1-10 Cold <b>65-72</b> , Warm <b>73-79</b> ; Bolts 11 <b>11-15</b>	38	ES 72860
156 SOHC Turbo (2.6L) 8 Valve Mitsubishi	1989-84	●○	Bolts 1-10 Cold <b>65-72</b> , Warm <b>73-79</b> ; Bolts 11 <b>11-15</b>	38	ES 72860
CHRYSLER PRODUCTS 5					
164 DOHC Turbo Diesel (2.7L) 20 Valve Mercedes-Benz	2007-03 Sprinter VIN C, 4	●○	1st Bolts 1-12 <b>12</b> , 2nd Bolts 13-14 <b>15</b> , 3rd Bolts 1-12 <b>45</b> , 4th Bolts 13-14 <b>15</b> again, 5th Bolts 1-12 turn 90 degrees, 6th Bolts 1-12 turn 90 degrees	255	ES 71233
CHRYSLER PRODUCTS 6 & V6					
152.2 SOHC (2.5L) 24 Valve Mitsubishi	2000-98	●○	Cold <b>80</b> in three steps	154	ES 72859
152.2 SOHC (2.5L) 24 Valve Mitsubishi	1997-95	●	Cold <b>80</b> in three steps	154	
167 DOHC (2.7L) 24 Valve Chrysler	2008-98	●○	Bolts 1-8 1st <b>35</b> , 2nd <b>55</b> , 3rd <b>55</b> again, 4th turn 90 degrees; Bolts 9-11 5th <b>21</b>	138	ES 72897
170 OHV	1971-60	●	<b>65-70</b>	9	
181 SOHC (3.0L) 12 Valve Volvo	1992-90 Monaco, Premier		1st <b>44</b> , 2nd loosen all bolts, 3rd <b>30</b> , 4th turn 180 degrees	221	
181 SOHC (3.0L) 12 Valve Volvo	1989-88 Premier		1st <b>44</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 104-108 degrees, 5th warm engine & allow to cool, 6th turn 45 degrees	221	

● PermaTorque® Head Gasket available   ○ Head Bolt Set available



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
CHRYSLER PRODUCTS 6 & V6 (CONT.)					
181.1 SOHC (3.0L) 12 Valve Mitsubishi	2000-92 exc. Stealth, Monaco, Premier	●○	Cold <b>80</b> in three steps	154	ES 72859
181.1 SOHC (3.0L) 12 Valve Mitsubishi	1991-87 exc. Stealth, Monaco, Premier	●○	Cold <b>70</b> in three steps	154	ES 72859
181.1 SOHC (3.0L) 12 Valve Mitsubishi	1996-93 Stealth	●○	Cold <b>80</b> in three steps	154	ES 72859
181.1 SOHC (3.0L) 12 Valve Mitsubishi	1992-91 Stealth	●○	Cold <b>70</b> in three steps	154	ES 72859
181.1 SOHC (3.0L) 24 Valve Mitsubishi	2005-01	●○	1st <b>80</b> in three steps, 2nd loosen all bolts, 3rd <b>80</b> in three steps again	154	ES 72859
181.1 DOHC (3.0L) 24 Valve Mitsubishi	1996-91 Stealth	●○	Cold <b>80</b> in three steps	154	ES 72859
181.1 DOHC Turbo (3.0L) 24 Valve Mitsubishi	1996-91 Stealth	●○	Cold <b>90</b> in three steps	154	ES 72859
182 DOHC Turbo Diesel (3.0L) 24 Valve Mercedes-Benz	2008-07 Sprinter VIN 4, 5		1st Bolts 1-8 <b>44</b> , 2nd Bolts 9-10 <b>15</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 <b>15</b> again, 5th Bolts 1-8 turn 90 degrees	242	
195 SOHC (3.2L) 18 Valve Mercedes-Benz	2008-04 Crossfire		1st Bolts 1-8 7, 2nd Bolts 1-8 <b>22</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees, 5th Bolts 9-12 <b>15</b>	232	
195 SOHC Supercharged (3.2L) 18 Valve Mercedes-Benz	2006-05 Crossfire		1st Bolts 1-8 7, 2nd Bolts 1-8 <b>22</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees, 5th Bolts 9-12 <b>15</b>	232	
197 SOHC (3.2L) 24 Valve Chrysler	2001-98	●○	1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees	49	ES 72895
198 OHV	1974-70	●	<b>65-70</b>	9	
201 OHV (3.3L) 12 Valve Chrysler	2008-97	●○	M11 Bolts 1-8 1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees; M8 Bolt 9 5th <b>25</b> in three steps	215	ES 72163
201 OHV (3.3L) 12 Valve Chrysler	1996-90	●○	M11 Bolts 1-8 1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees; M8 Bolt 9 5th <b>25</b> in three steps	215	ES 72849 ES 72176-1
201.3 L-Head	1941-34		<b>70</b>	35	
213 DOHC (3.5L) 24 Valve Mercedes-Benz	2008-07 Sprinter VIN 6		1st Bolts 1-8 <b>15</b> , 2nd Bolts 1-8 <b>30</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>12</b> , 6th Bolts 9-12 turn 90 degrees	239	
215 SOHC (3.5L) 24 Valve Chrysler	2008-98	●○	1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees	49	ES 72895
215 SOHC (3.5L) 24 Valve Chrysler	1997-93	●○	1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees	49	ES 72138
217.8 L-Head	1954-34		<b>70</b>	35	
225 OHV (3.7L)	1987-60	●	<b>70</b> in three steps	9	
226 SOHC (3.7L) 12 Valve Dodge Truck	2008-02	●○	1st M11 Bolts 1-8 <b>20</b> , 2nd M11 Bolts 1-8 <b>20</b> again, 3rd M8 Bolts 9-12 <b>10</b> , 4th M11 Bolts 1-8 turn 90 degrees, 5th M11 Bolts 1-8 turn 90 degrees, 6th M8 Bolts 9-12 <b>19</b>	204	ES 71129-1
228.1 L-Head	1954-37		<b>70</b>	35	
230 L-Head	1960-42		<b>70</b>	35	
231 OHV (3.8L) 12 Valve Chrysler	2008-97	●○	M11 Bolts 1-8 1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees; M8 Bolt 9 5th <b>25</b> in three steps	215	ES 72163

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# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
CHRYSLER PRODUCTS 6 & V6 (CONT.)					
231 OHV (3.8L) 12 Valve Chrysler	1996-91	●○	M11 Bolts 1-8 1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees; M8 Bolt 9 5th <b>25</b> in three steps	215	ES 72849 ES 72176-1
236.6 L-Head	1953-42		<b>70</b>	35	
239 OHV (3.9L) 12 Valve Dodge Truck	2003-94	●○	1st <b>50</b> , 2nd <b>105</b> , 3rd <b>105</b> again	94	ES 71038
239 OHV (3.9L) 12 Valve Dodge Truck	1993-86	●	1st <b>50</b> , 2nd <b>105</b> , 3rd <b>105</b> again	94	
241 SOHC (4.0L) 24 Valve Dodge Truck	2008-07		1st <b>45</b> , 2nd <b>65</b> , 3rd <b>65</b> again, 4th turn 90 degrees	154	
241.5 L-Head	1941-38		<b>70</b>	35	
251 L-Head	1968-42		<b>70</b>	35	
265 L-Head	1960-52		<b>70</b>	35	
359 OHV Turbo Diesel (5.9L) 24 Valve Cummins	2008-03 VIN C, 6, 7	●○	1st <b>52</b> , 2nd loosen one turn, 3rd <b>77</b> , 4th <b>77</b> again, 5th turn 90 degrees	111	ES 72193
359 OHV Turbo Diesel (5.9L) 24 Valve Cummins	2002-98 VIN C, 6, 7	●○	1st <b>59</b> , 2nd <b>77</b> , 3rd <b>77</b> again, 4th turn 90 degrees	111	ES 72193
359 OHV Turbo Diesel (5.9L) 12 Valve Cummins	1999-91 VIN C, D	●	1st all bolts <b>66</b> , 2nd Long bolts <b>89</b> , 3rd all bolts turn 90 degrees	111	
359 OHV Turbo Diesel (5.9L) 12 Valve Cummins	1991-88 VIN 8	●	1st <b>29</b> , 2nd <b>62</b> , 3rd <b>93</b>	111	
408 OHV Turbo Diesel (6.7L) 24 Valve Cummins	2008-07 VIN A		1st <b>52</b> , 2nd loosen one turn, 3rd <b>77</b> , 4th <b>77</b> again, 5th turn 90 degrees	111	
CHRYSLER PRODUCTS L8 & V8					
241.4 Dodge, Plymouth	1956-53		<b>85</b>	12	
259.2 Dodge Truck	1956-55		<b>85</b>	12	
260 Plymouth	1955		<b>85</b>	12	
270 Dodge, Plymouth	1956-55	●	<b>85</b>	12	
273	1969-64	●	<b>85</b>	12	
276 DeSoto	1954-52		<b>85</b>	12	
277 Plymouth	1957-56	●	<b>85</b>	12	
287 SOHC (4.7L) 16 Valve Dodge Truck	2008	●○	1st M11 Bolts 1-10 <b>20</b> , 2nd M11 Bolts 1-10 <b>20</b> again, 3rd M8 Bolts 11-14 <b>10</b> , 4th M11 Bolts 1-10 turn 90 degrees, 5th M11 Bolts 1-10 turn 90 degrees, 6th M8 Bolts 11-14 <b>19</b>	163	ES 71129
287 SOHC (4.7L) 16 Valve Dodge Truck	2007-00	●○	1st M11 Bolts 1-10 <b>15</b> , 2nd M11 Bolts 1-10 <b>35</b> , 3rd M8 Bolts 11-14 <b>18</b> , 4th M11 Bolts 1-10 turn 90 degrees, 5th M8 Bolts 11-14 <b>22</b>	163	ES 71129
291 DeSoto	1955		<b>85</b>	12	
301 Plymouth	1957	●	<b>85</b>	12	
301 Chrysler	1955	●	<b>85</b>	12	
303 Plymouth	1957-56	●	<b>85</b>	12	
313 Plymouth	1964-57	●	<b>85</b>	12	
315 Dodge	1959-56	●	<b>85</b>	12	
318 (5.2L)	2003-94	●○	1st <b>50</b> , 2nd <b>105</b> , 3rd <b>105</b> again	12	ES 71038-1
318 (5.2L)	1993-85	●	1st <b>50</b> , 2nd <b>105</b> , 3rd <b>105</b> again	12	
318 (5.2L)	1984-80	●	<b>95</b>	12	
318 (5.2L)	1979-78	●	<b>105</b>	12	
318 (5.2L)	1977-64	●	<b>95</b>	12	
318 (5.2L)	1963-57	●	<b>85</b>	12	
323.5 L-Head Chrysler	1950-46		<b>65-70</b>	169	
325 Dodge	1958-57	●	<b>85</b>	12	
326 Dodge	1959	●	<b>85</b>	12	

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# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
CHRYSLER PRODUCTS L8 & V8 (CONT.)					
330 DeSoto	1956		<b>85</b>	12	
331 Chrysler	1956-51	●	<b>85</b>	12	
340	1973-68	●	<b>95</b>	12	
341 DeSoto	1957-56		<b>85</b>	12	
345 Hemi (5.7L) 16 Valve Chrysler	2008-03	●○	1st M12 Bolts 1-10 <b>25</b> , 2nd M8 Bolts 11-15 <b>15</b> , 3rd M12 Bolts 1-10 <b>40</b> , 4th M8 Bolts 11-15 <b>15</b> again, 5th M12 Bolts 1-10 turn 90 degrees, 6th M8 Bolts 11-15 <b>25</b>	216	ES 72200
345 DeSoto	1957		<b>85</b>	12	
350	1958	●	<b>70</b>	11	
353 Dodge Truck	1956-55	●	<b>85</b>	12	
354 Chrysler	1959-55	●	<b>85</b>	12	
360 (5.9L)	2003-94	●○	1st <b>50</b> , 2nd <b>105</b> , 3rd <b>105</b> again	12	ES 71038-1
360 (5.9L)	1993-85	●	1st <b>50</b> , 2nd <b>105</b> , 3rd <b>105</b> again	12	
360 (5.9L)	1984-78	●	<b>105</b>	12	
360 (5.9L)	1977-71	●	<b>95</b>	12	
361	1966-58 Car	●	<b>70</b>	11	
361	1977-69 Truck		<b>70</b>	11	
361	1968-60 Truck	●	<b>70</b>	11	
370 Hemi (6.1L) 16 Valve Chrysler	2008-05		1st M12 Bolts 1-10 <b>25</b> , 2nd M8 Bolts 11-15 <b>15</b> , 3rd M12 Bolts 1-10 <b>40</b> , 4th M8 Bolts 11-15 <b>15</b> again, 5th M12 Bolts 1-10 turn 90 degrees, 6th M8 Bolts 11-15 <b>25</b>	216	
383	1971-59	●	<b>70</b>	11	
392 Chrysler	1958-57	●	<b>85</b>	12	
400 (6.6L)	1980-71	●	<b>70</b>	11	
413	1965-59 Car	●	<b>70</b>	11	
413	1977-69 Truck		<b>70</b>	11	
413	1968-60 Truck	●	<b>70</b>	11	
426	1965-63 exc. Hemi	●	<b>70</b>	11	
426	1971-66 Hemi		<b>75</b>	10	
426	1965-64 Hemi		<b>70</b>	10	
440 (7.2L)	1980-66	●	<b>70</b>	11	
CHRYSLER PRODUCTS V10					
488 OHV (8.0L) 20 Valve Chrysler	2002-92 Car		Bolts 1-12 1st <b>35</b> , 2nd <b>90</b> ; Bolts 13-20 3rd <b>9</b>	201	
488 OHV (8.0L) 20 Valve Chrysler	2004-94 Truck	●○	1st <b>43</b> , 2nd <b>105</b>	155	ES 72894 ES 72904
505 OHV (8.3L) 20 Valve Chrysler	2007-03	●○	Bolts 1-12 1st <b>35</b> , 2nd <b>90</b> ; Bolts 13-20 3rd <b>9</b>	201	ES 72209
512 OHV (8.4L) 20 Valve Chrysler	2008		Bolts 1-12 1st <b>26</b> , 2nd <b>35</b> , 3rd turn 90 degrees; Bolts 13-20 4th <b>8</b>	201	
DAEWOO 4					
1598cc DOHC (A16DMS) 16 Valve Opel	2002-01		1st <b>18</b> , 2nd turn 70 degrees, 3rd turn 70 degrees, 4th turn 30 degrees	40	
1598cc DOHC (A16DMS) 16 Valve Opel	2000-98		1st <b>18</b> , 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th turn 10 degrees	40	
1998cc DOHC (A20DMS) 16 Valve Opel	2002-98	●	1st <b>18</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees	100	
2198cc DOHC (A22DMS) 16 Valve Opel	2002-98	●	1st <b>18</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees	100	

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# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
DAIHATSU 3				
993cc SOHC (CB) 6 Valve	1992-88	40-47 in three steps	214	
DAIHATSU 4				
1295cc SOHC (HCE) 16 Valve	1992-89	44-49 in three steps	147	
1589cc SOHC (HDC, HDE) 16 Valve	1992-90	44-49 in three steps	147	
DATSUN ..... SEE NISSAN				
DeLOREAN V6				
2849cc SOHC (B3) 12 Valve Volvo	1983-81	1st 7, 2nd 22, 3rd 44, 4th loosen all bolts, 5th 11-14, 6th turn 116-120 degrees, 7th warm engine & allow to cool, 8th loosen all bolts, 9th 11-14 again, 10th turn 113-117 degrees	52	
DeSOTO ..... SEE CHRYSLER PRODUCTS				
DeTOMASO V8				
281 DOHC (4.6L) 32 Valve Ford	2002-00	●○ 1st 27-32, 2nd turn 85-95 degrees, 3rd loosen one turn, 4th 27-32 again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	124	ES 72798
289 Ford	1967	● 65-70	70	
302 Ford	1972-67 exc. Boss	● Intake Side 80, Exhaust Side 68	70	
302 Ford	1971-69 Boss	● Upper 80; Lower 70	70	
351 Cleveland Ford	1974-71	● 95-105	70	
351 Windsor (5.8L) Ford	1989-81	● 1st 85, 2nd 95, 3rd 105-112	70	
DODGE ..... SEE CHRYSLER PRODUCTS				
EAGLE ..... SEE CHRYSLER PRODUCTS				
EDSEL .....SEE FORD PRODUCTS				
ELVA 4				
1489cc OHV MG	1961-58	45	182	
1588cc OHV MG	1961-58	45	182	
1622cc OHV MG	1966-62	45	182	
1798cc OHV MG	1966-62	45-50 in three steps	55	
EXCALIBUR V8				
289 Studebaker	1965	55-65	170	
305 (5.0L) Chevrolet	1990-80	●○ 65 in three steps	7	ES 72856
327 Chevrolet	1969-65	●○ 65	7	ES 72856
350 (5.7L) Chevrolet	1996	●○ 1st all bolts 22, 2nd Short bolts turn 67 degrees; 3rd Medium bolts & Long bolts turn 80 degrees	7	ES 72856
350 (5.7L) Chevrolet	1995-93	●○ 65 in three steps	7	ES 72856
350 (5.7L) Chevrolet	1990-70	●○ 65 in three steps	7	ES 72856
454 Chevrolet	1979-72	● 80 in three steps	8	
FACEL VEGA 4				
1780cc OHV (B18D) Volvo	1964-63	61-69	110	
FACEL VEGA V8				
276 DeSoto	1954	85	12	
277 Plymouth	1958	● 85	12	
291 DeSoto	1957-55	85	12	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FACEL VEGA V8 (CONT.)				
301 Plymouth	1958	● 85	12	
330 DeSoto	1957-56	85	12	
354 Chrysler	1958	● 85	12	
383 Chrysler	1964-59	● 70	11	
FAIRTHORPE 4				
948cc OHV Austin	1962-58	40	54	
998cc OHV Austin	1962-58	40	54	
FARGO ..... SEE CHRYSLER PRODUCTS				
FIAT 4				
817cc OHV	1971-68	29	41	
843cc OHV	1968-65	29	41	
903cc OHV	1973-67	36 in three steps	41	
1116cc SOHC	1973-71	69 in three steps	41	
1290cc SOHC	1979-72	● 69 in three steps	41	
1438cc OHV	1973-70	56	41	
1438cc DOHC	1971-68	54	41	
1498cc SOHC	1989-79	● M17 bolts 1st 15, 2nd 29, 3rd turn 90 degrees, 4th turn 90 degrees	41	
1498cc SOHC	1989-79	● M19 bolts 1st 29, 2nd 69, 3rd loosen 1/2 turn, 4th 29 again, 5th 69	41	
1592cc DOHC	1978-72	61 in three steps	41	
1608cc DOHC	1973-71	58 in three steps	41	
1756cc DOHC	1978-74	61 in three steps	41	
1995cc DOHC	1987-78	61 in three steps	41	
FORD .....SEE FORD PRODUCTS				
FORD PRODUCTS 4				
80.8 SOHC (1.3L) 8 Valve Mazda	1997-88	● 1st 35-40, 2nd 56-60	150	
97.5 SOHC (1.6L) 8 Valve Mazda	1989-87 Tracer	● 56-60 in three steps	150	
97.5 DOHC (1.6L) 16 Valve Mazda	1994-91 Capri	● 56-60 in three steps	150	
97.5 DOHC Turbo (1.6L) 16 Valve Mazda	1994-91 Capri	● 56-60 in three steps	150	
98 OHV (1.6L) 8 Valve Ford	1980-78	● 65-70	16	
98 OHV (1.6L) 8 Valve Ford	1973-71	● 65-70	16	
98 SOHC (1.6L) 8 Valve Ford	1985-81	●○ 1st 44, 2nd turn 90 degrees, 3rd turn 90 degrees	36	ES 72672
98 SOHC Turbo (1.6L) 8 Valve Ford	1985-84	●○ 1st 44, 2nd turn 90 degrees, 3rd turn 90 degrees	36	ES 72672
109.6 SOHC (1.8L) 8 Valve Mazda	1978-72 Courier	● Cold 63-68, Warm 69-73	150	
112.2 DOHC (1.8L) 16 Valve Mazda	1996-91	● 56-60 in three steps	150	
114 SOHC (1.9L) 8 Valve Ford	1996-85	●○ 1st 30, 2nd 44, 3rd loosen one turn, 4th 30 again, 5th 44, 6th turn 90 degrees, 7th turn 90 degrees	36	ES 72672
119.7 L-Head Ford	1942-41	Stud Nuts 50-55; Bolts 65-70	194	
120.2 SOHC (2.0L) 8 Valve Mazda	1982-79 Courier	● Cold 59-64, Warm 69-72	150	
121 SOHC (2.0L) 8 Valve Ford	2004-00 Focus	●○ 1st 37, 2nd loosen 1/2 turn, 3rd 37 again, 4th turn 90 degrees, 5th turn 90 degrees	36	ES 72672
121 SOHC (2.0L) 8 Valve Ford	2003-97 Escort, Tracer	●○ 1st 30-44, 2nd loosen 1/2 turn, 3rd 30-44 again, 4th turn 90 degrees, 5th turn 90 degrees	36	ES 72672



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS 4 (CONT.)				
121 DOHC (2.0L) 16 Valve Ford	2004-01 Zetec Escape	●○	1st 15, 2nd 30, 3rd turn 90 degrees	148 ES 72175
121 DOHC (2.0L) 16 Valve Ford	2004-00 Zetec Focus	●○	1st 15, 2nd 30, 3rd turn 90 degrees	148 ES 72175
121 DOHC (2.0L) 16 Valve Ford	2003-98 Zetec Escort, ZX2	●○	1st 12-18, 2nd 26-33, 3rd turn 105 degrees	148 ES 72175
121 DOHC (2.0L) 16 Valve Ford	2002-98 Zetec Contour, Cougar, Mystique	●○	1st 18, 2nd 33, 3rd turn 105 degrees	148 ES 72175
121 DOHC (2.0L) 16 Valve Ford	1997-95 Zetec	●○	1st 15-22, 2nd 30-37, 3rd turn 90 degrees	148 ES 72175
121.5 DOHC (2.0L) 16 Valve Mazda	1997-93 Probe	●○	1st 13-16, 2nd turn 90 degrees, 3rd turn 90 degrees	150 ES 74020
121.7 SOHC (2.0L) 8 Valve Ford	1974-71	●	1st 14-29, 2nd 36-50, 3rd 65-80	17
122 SOHC (2.0L) 8 Valve Ford	1988-83 Ranger	●	1st 50-60, 2nd 80-90	17
122 SOHC Diesel (2.0L) 8 Valve Mazda	1987-84		1st 21, 2nd turn 90 degrees, 3rd turn 90 degrees	150
122 DOHC (2.0L) 16 Valve Ford	2008-05 Duratec	●○	1st 4, 2nd 11, 3rd 33, 4th turn 90 degrees, 5th turn 90 degrees	150 ES 72207
133 SOHC (2.2L) 12 Valve Mazda	1992-89 Probe	●	1st 29-32, 2nd 59-64	37
133 SOHC Turbo (2.2L) 12 Valve Mazda	1992-89 Probe	●	1st 29-32, 2nd 59-64	37
134.8 OHV Diesel (2.2L) 8 Valve Mazda	1984-83	●	1st 25, 2nd 45, 3rd 80-85, 4th warm engine, 5th 80-85 again	6
138 DOHC (2.3L) 16 Valve Ford	2008-01 Duratec	●○	1st 4, 2nd 11, 3rd 33, 4th turn 90 degrees, 5th turn 90 degrees	150 ES 72207
138 DOHC (2.3L) 16 Valve Hybrid Ford	2008-05 Duratec	●○	1st 4, 2nd 11, 3rd 33, 4th turn 90 degrees, 5th turn 90 degrees	150 ES 72207
140 OHV (2.3L) 8 Valve Ford	1994-84 HSC	●	1st 52-59, 2nd 70-76	37
140 SOHC (2.3L) 8 Valve Ford	1997-93	●○	Bolts with 85mm long threads: 1st 51, 2nd 51 again, 3rd turn 90-100 degrees	17 ES 72137
140 SOHC (2.3L) 8 Valve Ford	1993-91	●○	Bolts with 44mm long threads: 1st 50-60, 2nd 80-90	17 ES 72137
140 SOHC (2.3L) 8 Valve Ford	1990-74	●○	1st 50-60, 2nd 80-90	17 ES 72137
140 SOHC Turbo (2.3L) 8 Valve Ford	1989-79	●○	1st 50-60, 2nd 80-90	17 ES 72137
143 SOHC Turbo Diesel (2.3L) 8 Valve Mitsubishi	1987-85	●	Cold 76-83, Warm 84-90	43
153 OHV (2.5L) 8 Valve Ford	1991-86 HSC	●	1st 52-59, 2nd 70-76	37
153 SOHC (2.5L) 8 Valve Ford	2001-98	●○	1st 51, 2nd 51 again, 3rd turn 90-100 degrees	17 ES 72137
177 L-Head Ford	1927-09 Model T		1st 50-55, 2nd warm engine, 3rd 60	195
200 L-Head Ford	1934-28 Models A, B		50	223
220 OHV Diesel (3.6L) Ford	1966-63 Dagenham		85-90	172

FORD PRODUCTS 6 & V6				
144 OHV	1966-60	●	70-75	13
149 SOHC Turbo Diesel (2.4L) 12 Valve BMW	1985-84		1st 22-29, 2nd 36-43, 3rd 65-69, 4th warm engine, 5th turn 85-95 degrees	90
152 DOHC (2.5L) 24 Valve Ford	2002-01 Duratec VIN G	●○	1st 28-31, 2nd turn 85-90 degrees, 3rd loosen one turn, 4th 28-31 again, 5th turn 85-90 degrees, 6th turn 85-90 degrees	139 ES 72159
152 DOHC (2.5L) 24 Valve Ford	2002-01 Duratec VIN L	●○	1st 29, 2nd turn 90 degrees, 3rd loosen one turn, 4th 29 again, 5th turn 90 degrees, 6th turn 90 degrees	140 ES 72159



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS 6 & V6 (CONT.)				
152.4 DOHC (2.5L) 24 Valve Mazda	1997-93 Probe	●	1st 17-19, 2nd turn 90 degrees, 3rd turn 90 degrees	123
155 DOHC (2.5L) 24 Valve Ford	2000-98 Duratec VIN G	●○	1st 28-31, 2nd turn 85-90 degrees, 3rd loosen one turn, 4th 28-31 again, 5th turn 85-90 degrees, 6th turn 85-90 degrees	139 ES 72159
155 DOHC (2.5L) 24 Valve Ford	2000-98 Duratec VIN L	●○	1st 29, 2nd turn 90 degrees, 3rd loosen one turn, 4th 29 again, 5th turn 90 degrees, 6th turn 90 degrees	140 ES 72159
155 DOHC (2.5L) 24 Valve Ford	1997 Duratec VIN L	●○	1st 28-31, 2nd turn 85-95 degrees, 3rd loosen one turn, 4th 28-31 again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	140 ES 72159
155 DOHC (2.5L) 24 Valve Ford	1996-95 Duratec VIN L	●○	1st 27-32, 2nd turn 85-95 degrees, 3rd loosen one turn, 4th 27-32 again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	140 ES 72159
155.6 OHV (2.6L)	1973-72		1st 29-40, 2nd 40-51, 3rd 65-80	31
170 OHV	1972-60	●	70-75	13
171 OHV (2.8L)	1986-83 Truck	●	1st 29-40, 2nd 40-51, 3rd 70-85	57
171 OHV (2.8L)	1979-75 Car	●	1st 29-40, 2nd 40-51, 3rd 65-80	57
171 OHV (2.8L)	1974 Car	●	1st 29-40, 2nd 40-51, 3rd 65-80	31
177 OHV (2.9L)	1992-86	●○	1st 22, 2nd 51-55, 3rd turn 90 degrees	97 ES 72794
181 SOHC (3.0L) 12 Valve Nissan	1998-93 Villager	●	1st 22, 2nd 43, 3rd loosen all bolts, 4th 22 again, 5th 40-47; OR turn 60-65 degrees	85
181 DOHC (3.0L) 24 Valve Ford	2008-01 Duratec VIN 1	●○	1st 30, 2nd turn 90 degrees, 3rd loosen one turn, 4th 30 again, 5th turn 90 degrees, 6th turn 90 degrees	140 ES 72159
181 DOHC (3.0L) 24 Valve Ford	2005-00 Duratec VIN S Lincoln LS	●○	1st 22, 2nd turn 90 degrees, 3rd loosen one turn, 4th 22 again, 5th turn 90 degrees, 6th turn 90 degrees	233 ES 72208
181 DOHC (3.0L) 24 Valve Ford	2005-97 Duratec VIN S Taurus, Sable	●○	1st 28-31, 2nd turn 85-95 degrees, 3rd loosen one turn, 4th 28-31 again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	139 ES 72159
181 DOHC (3.0L) 24 Valve Ford	1996 Duratec VIN S Taurus, Sable	●○	1st 27-32, 2nd turn 85-95 degrees, 3rd loosen one turn, 4th 27-32 again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	139 ES 72159
183 OHV (3.0L) 12 Valve Ford	2007-99 Car	●○	1st 36-39, 2nd loosen one turn, 3rd 20-24, 4th turn 85-95 degrees, 5th turn 85-95 degrees	96 ES 72136 ES 72174
183 OHV (3.0L) 12 Valve Ford	1998-91 Car	●○	1st 59, 2nd loosen one turn, 3rd 37, 4th 68	96 ES 72136 ES 72174
183 OHV (3.0L) 12 Valve Ford	1990-86 Car	●○	1st 33-41, 2nd 63-73	96 ES 72136
183 OHV (3.0L) 12 Valve Ford	2008-99 Truck	●○	1st 36-39, 2nd loosen one turn, 3rd 20-24, 4th turn 85-95 degrees, 5th turn 85-95 degrees	141 ES 72136 ES 72174
183 OHV (3.0L) 12 Valve Ford	1998-91 Truck	●○	1st 59, 2nd loosen one turn, 3rd 37, 4th 68	141 ES 72136 ES 72174
183 OHV (3.0L) 12 Valve Ford	1990-86 Truck	●○	1st 33-41, 2nd 63-73	141 ES 72136
183 DOHC (3.0L) 24 Valve Yamaha	1995-89 SHO	●○	1st 37-51, 2nd 62-69	101 ES 74030
195 DOHC (3.2L) 24 Valve Yamaha	1995-93 SHO	●○	1st 37-51, 2nd 62-69	101 ES 74030
199.8 SOHC (3.3L) 12 Valve Nissan	2002-99 Villager	●○	1st 22, 2nd 43, 3rd loosen all bolts, 4th 7, 5th 22, 6th 40-47; OR turn 60-65 degrees	162 ES 72194



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS 6 & V6 (CONT.)					
200 OHV (3.3L)	1983-78	●	1st <b>50-55</b> , 2nd <b>60-65</b> , 3rd <b>70-75</b>	51	
200 OHV (3.3L)	1977-63	●	1st <b>50-55</b> , 2nd <b>60-65</b> , 3rd <b>70-75</b>	13	
213 DOHC (3.5L) 24 Valve Ford	2008-07 Duratec VIN C, T, W		1st Bolts 1-8 <b>15</b> , 2nd Bolts 1-8 <b>26</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees, 5th Bolts 1-8 turn 90 degrees, 6th Bolt 9 <b>7.5</b>	234	
215 OHV	1953-51	●	<b>65-75</b>	28	
223 OHV	1964-61	●	<b>105-115</b>	28	
223 OHV	1960-54	●	<b>65-75</b>	28	
226 L-Head	1951-49 95 HP Series H		<b>65-75</b>	15	
226 L-Head	1948-47 95 HP Series H		<b>50-60</b>	15	
226 L-Head	1947-41 90 HP Series G, GA		<b>50-60</b>	15	
232 OHV (3.8L) 12 Valve Ford	2003-96 Truck	●○	1st <b>15</b> , 2nd <b>29</b> , 3rd <b>37</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts <b>29-37</b> ; Short bolts <b>15-22</b> , 3) turn 175-185 degrees	94	ES 72156 ES 72160
232 OHV (3.8L) 12 Valve Ford	1995 Truck	●○	1st <b>15</b> , 2nd <b>30</b> , 3rd <b>37</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts <b>11-19</b> ; Short bolts <b>7-15</b> , 3) turn 85-95 degrees	94	ES 72131
232 OHV (3.8L) 12 Valve Ford	2004-98 Car	●○	1st <b>15</b> , 2nd <b>30</b> , 3rd <b>37</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts <b>29-37</b> ; Short bolts <b>15-22</b> , 3) turn 180 degrees	94	ES 72160
232 OHV (3.8L) 12 Valve Ford	1997-96 Car	●○	1st <b>15</b> , 2nd <b>30</b> , 3rd <b>37</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts <b>30-37</b> ; Short bolts <b>15-22</b> , 3) turn 175-185 degrees	94	ES 72156 ES 72160
232 OHV (3.8L) 12 Valve Ford	1995-94 Car	●○	1st <b>15</b> , 2nd <b>30</b> , 3rd <b>37</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts <b>11-19</b> ; Short bolts <b>10-15</b> , 3) turn 85-95 degrees	94	ES 72131
232 OHV (3.8L) 12 Valve Ford	1993-91 Car	●○	1st <b>37</b> , 2nd <b>45</b> , 3rd <b>52</b> , 4th <b>59</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) <b>11-18</b> , 3) Long bolts turn 85-105 degrees; Short bolts turn 65-85 degrees	94	ES 72131
232 OHV (3.8L) 12 Valve Ford	1990-84 Car	●○	Flanged Hex Head bolts: 1st <b>37</b> , 2nd <b>45</b> , 3rd <b>52</b> , 4th <b>59</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) <b>11-18</b> , 3) Long bolts turn 85-105 degrees; Short bolts turn 65-85 degrees	82	ES 72129 ES 72131



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS 6 & V6 (CONT.)					
232 OHV (3.8L) 12 Valve Ford	1990-84 Car	●○	Standard Hex Head bolts: 1st <b>37</b> , 2nd <b>45</b> , 3rd <b>52</b> , 4th <b>59</b> , 5th loosen 2-3 turns, 6th repeat steps 1-4	82	ES 72129 ES 72131
232 OHV (3.8L) 12 Valve Ford	1983-82 Car, Truck	●○	1st <b>47</b> , 2nd <b>55</b> , 3rd <b>63</b> , 4th <b>74</b> , 5th loosen 2-3 turns, 6th repeat steps 1-4	82	ES 72129
232 OHV Supercharged (3.8L) 12 Valve Ford	1995-94 Car	●○	1st <b>37</b> , 2nd <b>45</b> , 3rd <b>52</b> , 4th <b>59</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) <b>11-19</b> , 3) turn 175-185 degrees	94	ES 72131
232 OHV Supercharged (3.8L) 12 Valve Ford	1993-89 Car	●○	1st <b>37</b> , 2nd <b>45</b> , 3rd <b>52</b> , 4th <b>59</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) <b>48-55</b> , 3) turn 90-110 degrees	94	ES 72131
238 OHV (3.9L) 12 Valve Ford	2007-04 Car, Truck	●○	1st <b>15</b> , 2nd <b>29</b> , 3rd <b>37</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts <b>29-37</b> ; Short bolts <b>15-22</b> , 3) turn 175-185 degrees	94	ES 72160
240 OHV (3.9L)	1976-65	●	<b>70-75</b>	14	
244 OHV (4.0L) 12 Valve Ford	2001-95 Truck	●○	1st <b>23</b> , 2nd <b>53</b> , 3rd turn 90 degrees	217	ES 72794
244 OHV (4.0L) 12 Valve Ford	1994-90 Truck	●○	INSTALL HEAD BOLTS AND LOWER INTAKE BOLTS TOGETHER (TORQUE ALTERNATELY): Head bolts 1st <b>44</b> , 2nd <b>59</b> , 3rd turn 80-85 degrees; Lower intake bolts 1st <b>3-6</b> , 2nd <b>6-11</b> , 3rd <b>11-15</b> , 4th <b>15-18</b>	102	ES 72794
244 SOHC (4.0L) 12 Valve Ford	2008-05 Car, Truck	●○	1st M12 Bolts 1-8 <b>9</b> , 2nd M12 Bolts 1-8 <b>18</b> , 3rd M8 Bolts 9-10 <b>24</b> , 4th M12 Bolts 1-8 turn 90 degrees, 5th M12 Bolts 1-8 turn 90 degrees	218	ES 72171
244 SOHC (4.0L) 12 Valve Ford	2004-02 Truck	●○	1st M12 Bolts 1-8 <b>24</b> , 2nd M8 Bolts 9-10 <b>24</b> , 3rd M12 Bolts 1-8 turn 80 degrees, 4th M12 Bolts 1-8 turn 80 degrees	218	ES 72171
244 SOHC (4.0L) 12 Valve Ford	2001-00 Truck	●○	1st M12 Bolts 1-8 <b>28</b> , 2nd M8 Bolts 9-10 <b>28</b> , 3rd M12 Bolts 1-8 turn 90 degrees, 4th M12 Bolts 1-8 turn 90 degrees	218	ES 72171
244 SOHC (4.0L) 12 Valve Ford	1999-97 Truck	●○	1st M12 Bolts 1-8 <b>26</b> , 2nd M8 Bolts 9-10 <b>26</b> , 3rd M12 Bolts 1-8 turn 90 degrees, 4th M12 Bolts 1-8 turn 90 degrees	218	ES 72171
250 OHV (4.1L)	1980-78	●	1st <b>50-55</b> , 2nd <b>60-65</b> , 3rd <b>70-75</b>	51	
250 OHV (4.1L)	1977-69	●	1st <b>50-55</b> , 2nd <b>60-65</b> , 3rd <b>70-75</b>	13	
254 L-Head	1953-49		<b>65-75</b>	15	
254 L-Head	1948		<b>50-60</b>	15	
256 OHV (4.2L) 12 Valve Ford	2008-97 Truck	●○	1st <b>14</b> , 2nd <b>29</b> , 3rd <b>36</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen 2-3 turns, 2) Long bolts <b>30-36</b> ; Short bolts <b>15-22</b> , 3) turn 175-185 degrees	94	ES 72160
262 OHV	1964-61	●	<b>105-115</b>	28	
300 OHV (4.9L)	1997-95	●	1st <b>45-55</b> , 2nd turn 90 degrees	14	
300 OHV (4.9L)	1994-75	●	1st <b>50-55</b> , 2nd <b>60-65</b> , 3rd <b>70-85</b>	14	
300 OHV (4.9L)	1974-65	●	<b>70-75</b>	14	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS 6 & V6 (CONT.)				
330 OHV Diesel (5.4L) Ford	1966-62 Dagenham	85-90	173	
359 OHV Turbo Diesel (5.9L) 12 Valve Cummins	1997-92 ●	1st all bolts <b>66</b> , 2nd Long bolts <b>89</b> , 3rd all bolts turn 90 degrees	111	
403 OHV Turbo Diesel (6.6L) Ford	1995-86 ●	1st <b>115</b> , 2nd <b>140</b> , 3rd <b>160</b>	103	
476 OHV Turbo Diesel (7.8L) Ford	1995-87 ●	1st <b>115</b> , 2nd <b>140</b> , 3rd <b>160</b>	103	
FORD PRODUCTS V8				
136 L-Head (60 HP 17 Stud head) Ford	1940-37 Cast Iron heads	50-60	32	
136 L-Head (60 HP 17 Stud head) Ford	1940-37 Aluminum heads	35-40	32	
207 DOHC (3.4L) 32 Valve Yamaha	1999-96 SHO	1st <b>20-23</b> , 2nd turn 85-95 degrees	143	
221 OHV	1963-62	65-70	70	
221 L-Head (85 HP 21 Stud head) Ford	1942-32 Car Cast Iron heads	50-60	32	
221 L-Head (85 HP 21 Stud head) Ford	1942-32 Car Aluminum heads	35-40	32	
221 L-Head (90 HP 24 Stud head) Ford	1947-38 Truck Cast Iron heads	50-60	32	
221 L-Head (90 HP 24 Stud head) Ford	1947-38 Truck Aluminum heads	35-40	32	
221 L-Head (85 HP 21 Stud head) Ford	1937-32 Truck Cast Iron heads	50-60	32	
221 L-Head (85 HP 21 Stud head) Ford	1937-32 Truck Aluminum heads	35-40	32	
239 OHV Ford	1955-54 Truck ●	70	70	
239 OHV Ford	1954 Car	70	70	
239.4 L-Head Ford	1953-48 Truck	65-70	33	
239.4 L-Head Ford	1953-49 Car	65-70	33	
239.4 L-Head (90, 95, 100 HP 24 Stud head) Ford, Mercury	1948-39 Cast Iron heads	50-60	32	
239.4 L-Head (90, 95, 100 HP 24 Stud head) Ford, Mercury	1948-39 Aluminum heads	35-40	32	
241 DOHC (3.9L) 32 Valve Jaguar	2006-00 Lincoln LS, Thunderbird	1st Bolts 1-10 <b>15</b> , 2nd Bolts 1-10 <b>26</b> , 3rd Bolts 1-10 <b>33</b> , 4th Bolts 1-10 turn 90 degrees, 5th Bolts 1-10 turn 90 degrees; 6th Bolts 11-12 <b>15</b> , 7th Bolts 11-12 turn 90 degrees	235	
255 OHV (4.2L)	1982-80 ●	65-72	70	
255.4 L-Head Mercury	1954-48	65-70	33	
256 OHV Mercury	1955-54 ●	75	70	
260	1965-62 ●	65-70	70	
272	1958-55 ●	70-75	70	
279	1955-52 Truck ●	Exc. Bolts marked “FT” <b>90</b> ; Bolts marked “FT” <b>110</b>	70	
281 SOHC (4.6L) 16 Valve Ford	2008-97 Truck Exc. Explorer, Mountaineer ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	144	ES 72798
281 SOHC (4.6L) 16 Valve Ford	2005-02 Truck Explorer, Mountaineer ●○	1st <b>30</b> , 2nd turn 85-95 degrees, 3rd loosen one turn, 4th <b>30</b> again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	144	ES 72798
281 SOHC (4.6L) 16 Valve Ford	2008-96 Car ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd loosen one turn, 4th <b>27-32</b> again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	124	ES 72798
281 SOHC (4.6L) 16 Valve Ford	1995-93 Car ●○	1st <b>25-30</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	124	ES 72798

● PermaTorque® Head Gasket available ○ Head Bolt Set available



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS V8 (CONT.)				
281 SOHC (4.6L) 16 Valve Ford	1992-91 Car ●○	1st <b>15-22</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	124	ES 72798
281 SOHC (4.6L) 24 Valve Ford	2008-05 Car, Truck ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	144	ES 72798
281 DOHC (4.6L) 32 Valve Ford	2005-03 Truck ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd loosen one turn, 4th <b>27-32</b> again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	124	ES 72798
281 DOHC (4.6L) 32 Valve Ford	2004-96 Car ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd loosen one turn, 4th <b>27-32</b> again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	124	ES 72798
281 DOHC (4.6L) 32 Valve Ford	1995-93 Car ●○	1st <b>25-30</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	124	ES 72798
281 DOHC Supercharged (4.6L) 32 Valve Ford	2004-03 Car ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd loosen one turn, 4th <b>27-32</b> again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	124	ES 71173
289	1968-63 ●	65-70	70	
292	1965-55 ●	70-75	70	
302 (5.0L)	2001-96 Truck VIN P ●○	Flanged Hex Head bolts: 1st <b>30</b> , 2nd <b>50</b> , 3rd turn 90 degrees	70	ES 72155
302 (5.0L)	1996-92 Truck VIN N ●○	Flanged Hex Head bolts: 1st <b>25-35</b> , 2nd <b>45-55</b> , 3rd turn 85-95 degrees	70	ES 72155
302 (5.0L)	1995-92 Car ●○	Flanged Hex Head bolts: 1st <b>25-35</b> , 2nd <b>45-55</b> , 3rd turn 85-95 degrees	70	ES 72155
302 (5.0L)	1992-86 ●	Standard Hex Head bolts: Intake Side <b>80</b> , Exhaust Side <b>68</b>	70	
302 (5.0L)	1985-68 exc. Boss ●	Intake Side <b>80</b> , Exhaust Side <b>68</b>	70	
302 (5.0L)	1971-69 Boss ●	Upper <b>80</b> ; Lower <b>70</b>	70	
302	1963-56 Truck ●	<b>100-110</b>	70	
312	1960-56 ●	<b>65-75</b>	70	
312 Supercharged	1957 ●	<b>65-75</b>	70	
317	1955-52 Truck ●	Exc. Bolts marked “FT” <b>90</b> ; Bolts marked “FT” <b>110</b>	70	
317.5 Lincoln	1954-52 Car ●	<b>80-90</b>	70	
330 OHV (5.4L)	1978-64 Truck ●	<b>80-90</b>	70	
330 SOHC (5.4L) 16 Valve Ford	2008-97 Truck ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	144	ES 72798
330 SOHC (5.4L) 24 Valve Ford	2008-04 Truck ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	144	ES 72798
330 DOHC (5.4L) 32 Valve Ford	2004-99 Truck ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	144	ES 72798
330 DOHC (5.4L) 32 Valve Ford	2001-99 Car	1st <b>30</b> , 2nd turn 90 degrees, 3rd loosen one turn, 4th <b>30</b> again, 5th turn 90 degrees, 6th turn 90 degrees	124	
330 SOHC Supercharged (5.4L) 16 Valve Ford	2004-99 Truck ●	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	144	
330 SOHC Supercharged (5.4L) 24 Valve Ford	2008 Truck ●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	144	ES 72798
330 DOHC Supercharged (5.4L) 32 Valve Ford	2008-07 Car	1st <b>15</b> , 2nd <b>37</b> , 3rd <b>59</b> , 4th turn 90 degrees, 5th turn 90 degrees	124	
330 DOHC Supercharged (5.4L) 32 Valve Ford	2006-05 Car	1st <b>30</b> , 2nd turn 90 degrees, 3rd loosen one turn, 4th <b>30</b> again, 5th turn 90 degrees, 6th turn 90 degrees	124	
332	1966-56 Truck ●	<b>100-110</b>	70	
332	1959-58 Car ●	<b>80-90</b>	70	

● PermaTorque® Head Gasket available ○ Head Bolt Set available





# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS V8 (CONT.)				
333 Canadian	1966-56 Truck	●	100-110	70
336.7 L-Head Lincoln	1951-49		Nuts 50-55; Cap screws 65-70	224
341 Lincoln	1955		80-90	70
351 Cleveland	1974-70	●	95-105	70
351 Modified (5.8L)	1982-75	●	95-105	70
351 Windsor (5.8L)	1998-73	●	1st 85, 2nd 95, 3rd 105-112	70
351 Windsor (5.8L)	1972-69	●	95-100	70
352	1967-57	●	80-90	70
359 (5.9L)	1978-73 Truck	●	90	70
360 (5.9L)	1977-68 Truck	●	90	70
361 (5.9L)	1978-64 Truck	●	90	70
361	1959-58 Car	●	80-90	70
365 OHV Turbo Diesel (6.0L) 32 Valve DI International	2008-03 PowerStroke	●○	1st Bolts 1-10 65, 2nd Bolts 1-10 85, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees, 5th Bolts 1-10 turn 90 degrees, 6th Bolts 11-15 18, 7th Bolts 11-15 23	256 ES 72229 ES 72242
368 Lincoln	1957-56		80-90	70
370 (6.1L)	1991-79 Truck	●	1st 80-90, 2nd 100-110, 3rd 130-140	70
383 Mercury	1960-58	●	85-105	70
389 (6.4L)	1978-73 Truck	●	90	70
390 (6.4L)	1977-61	●	90	70
390 OHV Turbo Diesel (6.4L) 32 Valve DI International	2008 PowerStroke		1st Bolts 1-10 70, 2nd loosen Bolts 1-10, 3rd Bolts 1-10 115, 4th Bolts 1-10 turn 90 degrees, 5th Bolts 1-10 turn 90 degrees, 6th Bolts 11-15 18, 7th Bolts 11-15 23	261
391 (6.4L)	1978-64 Truck	●	90	70
400 (6.6L)	1982-71	●	95-105	70
401	1978-64 Truck	●	170-180	70
401	1963-58 Truck	●	130-150	70
406	1963-62	●	100-105	70
410 Mercury	1967-66	●	80-90	70
410 Edsel	1958	●	85-105	70
420 OHV Diesel (6.9L) IDI International	1987-85	●	1st 40, 2nd 70, 3rd 80, 4th 87	95
420 OHV Diesel (6.9L) IDI International	1984-83	●	1st 40, 2nd 70, 3rd 80, 4th 80 again	95
427	1969-63	●	100-105	70
428	1970-66	●	80-90	70
429 (7.0L)	1999-87 Truck	●	1st 80-90, 2nd 100-110, 3rd 130-140	70
429 (7.0L)	1986-79 Truck	●	130-140	70
429 (7.0L)	1973-68	●	130-140	70
430	1965-64	●	125-135	70
430	1963-58	●	85-105	70
444 OHV Diesel (7.3L) IDI International	1995-91	●	1st 65, 2nd 90, 3rd 110, 4th 110 again	95
444 OHV Diesel (7.3L) IDI International	1990-88	●	1st 65, 2nd 90, 3rd 100	95
444 OHV Turbo Diesel (7.3L) DI International	2003-00 PowerStroke	●○	1st 65, 2nd 85, 3rd 95, 4th 95 again	156 ES 72161
444 OHV Turbo Diesel (7.3L) DI International	1999-94 PowerStroke	●○	1st 65, 2nd 85, 3rd 105, 4th 105 again	156 ES 72161
444 OHV Turbo Diesel (7.3L) IDI International	1994-92	●	1st 65, 2nd 90, 3rd 110, 4th 110 again	95
460 (7.5L)	1998-68	●	1st 80-90, 2nd 100-110, 3rd 130-140	70



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
FORD PRODUCTS V8 (CONT.)				
462 Lincoln	1968-66	●	135-145	70
475 (7.8L)	1979-72 Truck	●	170-180	70
477 (7.8L)	1981-64 Truck	●	170-180	70
477 (7.8L)	1963-58 Truck	●	130-150	70
534 (8.8L)	1981-64 Truck	●	170-180	70
534 (8.8L)	1963-58 Truck	●	130-150	70
FORD PRODUCTS V10				
415 SOHC (6.8L) 20 Valve Ford	2008-97 Truck	●○	1st 27-32, 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	145 ES 72798-1
415 SOHC (6.8L) 30 Valve Ford	2008-05 Truck	●	1st 27-32, 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	145
FORD PRODUCTS V12				
267.3 L-Head Lincoln	1939-36 Cast Iron heads		50	171
267.3 L-Head Lincoln	1939-36 Aluminum heads		40	171
292 L-Head Lincoln	1948-40 Cast Iron heads		50	171
292 L-Head Lincoln	1948-40 Aluminum heads		40	171
305 L-Head Lincoln	1942 Cast Iron heads		50	171
305 L-Head Lincoln	1942 Aluminum heads		40	171
FRAZER ..... SEE KAISER				
FREIGHTLINER ..... SEE MERCEDES-BENZ				
GEO..... SEE GM PRODUCTS				
GM PRODUCTS 3				
61 SOHC (1.0L) 6 Valve Suzuki	2001-89 Metro, Firefly VIN 6	●○	54 in three steps	142 ES 74021
61 SOHC (1.0L) 6 Valve Suzuki	1988-85 Sprint, Firefly VIN M, 5	●○	46-50 in three steps	142 ES 74015
61 SOHC Turbo (1.0L) 6 Valve Suzuki	1991-89 Metro, Firefly VIN 2	●○	54 in three steps	142 ES 74021
61 SOHC Turbo (1.0L) 6 Valve Suzuki	1988-87 Sprint, Firefly VIN 2	●○	46-50 in three steps	142 ES 74015
159 OHV Diesel (3-53) Detroit Diesel	1970-65		170-180	225
GM PRODUCTS 4				
81 SOHC (1.3L) 16 Valve Suzuki	2001-98 Metro, Firefly VIN 2	●	49 in three steps	110
81 SOHC (1.3L) 8 Valve Suzuki	1997-92 Metro, Firefly VIN 9	●	51-54 in three steps	59
85 SOHC (1.4L) 8 Valve Chevrolet	1977-76 Chevette, Acadian VIN I	●	75 in three steps	37
89.7 SOHC (1.5L) 8 Valve Isuzu	1989-85 Spectrum, Sunburst VIN K, 7	●	1st 29, 2nd 58	37
89.7 SOHC Turbo (1.5L) 8 Valve Isuzu	1989-87 Spectrum, Sunburst VIN 9	●	1st 29, 2nd 58	37



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS 4 (CONT.)				
96.8 SOHC (1.6L) 8 Valve Toyota	1988-85 Nova VIN 4	● 43 in three steps	71	
96.8 DOHC (1.6L) 16 Valve Toyota	1997-93 Prizm VIN 6	● 1st 22, 2nd turn 90 degrees, 3rd turn 90 degrees	71	
96.8 DOHC (1.6L) 16 Valve Toyota	1992-89 Prizm VIN 6	● 44 in three steps	99	
96.8 DOHC (1.6L) 16 Valve Toyota	1992-90 Prizm VIN 5	● 44 in three steps	121	
96.8 DOHC (1.6L) 16 Valve Toyota	1988 Nova VIN 5	● 1st 22, 2nd turn 90 degrees, 3rd turn 90 degrees	121	
96.9 SOHC (1.6L) 12 Valve Isuzu	1993-90 Storm VIN 6	● 1st 29, 2nd 58	37	
96.9 DOHC (1.6L) 16 Valve Isuzu	1991-90 Storm VIN 5	● 1st 29, 2nd 58	100	
97 SOHC (1.6L) 16 Valve Suzuki	2002-99 Tracker VIN 6	● 1st 26, 2nd 41, 3rd loosen all bolts, 4th 26 again, 5th 52	110	
97 SOHC (1.6L) 16 Valve Suzuki	1998-94 Tracker, SunRunner VIN 6	● 1st 26, 2nd 41, 3rd 52	110	
97 SOHC (1.6L) 8 Valve Suzuki	1995-89 Tracker, SunRunner VIN U	● 51-54 in three steps	59	
97.5 SOHC (1.6L) 8 Valve Opel	1993-88 LeMans, Optima VIN 6	● 1st 18, 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 30 degrees, 5th warm engine, 6th turn 30-50 degrees	151	
97.5 DOHC (1.6L) 16 Valve Opel	2008-04 Aveo, Optra, Wave VIN D, 6	1st 18, 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th turn 10 degrees	128	
98 SOHC (1.6L) 8 Valve Chevrolet	1987-76 Chevette, T1000, Acadian	● 75 in three steps	37	
107.5 DOHC (1.8L) 16 Valve Toyota	1997-93 Prizm VIN 8	● 1st 22, 2nd turn 90 degrees, 3rd turn 90 degrees	71	
109.4 DOHC (1.8L) 16 Valve Toyota	2008-03 Vibe VIN 8	●○ 1st 18, 2nd 36, 3rd 36 again, 4th turn 90 degrees	99	ES 71066-1
109.4 DOHC (1.8L) 16 Valve Toyota	2002-98 Prizm VIN 8	●○ 1st 18, 2nd 36, 3rd 36 again, 4th turn 90 degrees	99	ES 71066-1
109.5 SOHC (1.8L) 8 Valve Opel	1986-82 VIN 0	●○ 1st 18, 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th warm engine, 6th turn 30-50 degrees	151	ES 72728
109.5 SOHC Turbo (1.8L) 8 Valve Opel	1986-84 VIN J	●○ 1st 18, 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th warm engine, 6th turn 30-50 degrees	151	ES 72728
109.5 DOHC (1.8L) 16 Valve Toyota	2006-03 Vibe VIN L	●○ 1st 26, 2nd turn 90 degrees, 3rd turn 90 degrees	99	ES 71066-1
110.3 DOHC (1.8L) 16 Valve Isuzu	1993-92 Storm VIN 8	● 1st 29, 2nd 58	100	
110.8 SOHC (1.8L) 8 Valve Isuzu	1982-76 LUV	● 1st 61, 2nd 72	37	
110.8 SOHC (1.8L) 8 Valve Isuzu	1975-72 LUV	● 1st 43, 2nd loosen all bolts, 3rd Bolts 1, 2, 3, 6 70; Bolts 4, 5, 7, 8, 9, 10 60	44	
110.8 SOHC Diesel (1.8L) 8 Valve Isuzu	1986-81 VIN D	● 1st 21-36, 2nd New bolts 83-98; Used bolts 90-105	75	
112 OHV (1.8L) 8 Valve Chevrolet	1982 VIN G	● 65-75 in three steps	12	
118.9 SOHC (1.9L) 8 Valve Isuzu	1985-82 VIN A	● 72 in three steps	37	
121 OHV (2.0L) 8 Valve Chevrolet	1989-87 VIN 1	●○ Bolts 1, 4, 5, 8, 9 73-83; Bolts 2, 3, 6, 7, 10 62-70	149	ES 72158
121 OHV (2.0L) 8 Valve Chevrolet	1986-85 VIN P	●○ Long bolts 73-85; Short bolts 62-70	12	ES 72162
121 OHV (2.0L) 8 Valve Chevrolet	1984-83 VIN B, P (Car)	●○ 65-75 in three steps	12	ES 72162
121 OHV (2.0L) 8 Valve Chevrolet	1984-83 VIN Y (Truck)	● 65-75 in three steps	12	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS 4 (CONT.)				
121.7 DOHC (2.0L) 16 Valve Suzuki	2004-99 Tracker VIN C	●○ Bolts 1-10 1st 38.5, 2nd 61, 3rd loosen all bolts, 4th 38.5 again, 5th 76; Bolt 11 6th 8	207	ES 72206
122 SOHC (2.0L) 8 Valve Opel	1994-87 VIN H, K	●○ 1st 18, 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th warm engine, 6th turn 30-50 degrees	151	ES 72728
122 SOHC Turbo (2.0L) 8 Valve Opel	1990-87 VIN M	●○ 1st 18, 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th warm engine, 6th turn 30-50 degrees	151	ES 72728
122 DOHC (2.0L) 16 Valve Opel	2007-04 Optra VIN Z	● 1st 18, 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th turn 10 degrees	128	
122 DOHC Supercharged (2.0L) 16 Valve Opel	2007-05 Ecotec VIN P	Bolts 1-10 1st 22, 2nd turn 155 degrees; Bolts 11-14 3rd 26	231	
122 DOHC Turbo (2.0L) 16 Valve Opel	2008-07 Ecotec VIN X	Bolts 1-10 1st 22, 2nd turn 155 degrees; Bolts 11-14 3rd 26	231	
134 OHV (2.2L) 8 Valve Chevrolet	2003-95 VIN 4, 5	●○ 1st Long bolts 46; Short bolts 43, 2nd all bolts turn 90 degrees	149	ES 72170 ES 72172
134 OHV (2.2L) 8 Valve Chevrolet	1994-92 VIN 4	●○ 1st Long bolts 46; Short bolts 43, 2nd all bolts turn 90 degrees	149	ES 72164 ES 74016
134 OHV (2.2L) 8 Valve Chevrolet	1991 VIN G	●○ Bolts 1, 4, 5, 8, 9 73-83; Bolts 2, 3, 6, 7, 10 62-70	149	ES 72164
134 OHV (2.2L) 8 Valve Chevrolet	1990 VIN G	●○ 1st Long bolts 46; Short bolts 43, 2nd all bolts turn 90 degrees	149	ES 72164
134.1 DOHC (2.2L) 16 Valve Opel	2008-02 Ecotec VIN D, F, 6	●○ Bolts 1-10 1st 22, 2nd turn 155 degrees; Bolts 11-14 3rd 26	231	ES 72196
136.5 OHV Diesel (2.2L) 8 Valve Isuzu	1985-81 VIN S	● 1st 40-47, 2nd New bolts 54-61; Used bolts 61-69	76	
138 SOHC (2.3L) 8 Valve Oldsmobile	1994 VIN 3	●○ 1st Long bolts 30; Short bolts 26, 2nd all bolts turn 90 degrees	98	ES 72727
138 SOHC (2.3L) 8 Valve Oldsmobile	1993-92 VIN 3	●○ 1st Long bolts 30; Short bolts 26, 2nd all bolts turn 90 degrees	148	ES 72727
138 DOHC (2.3L) 16 Valve Oldsmobile	1996-94 VIN A, D, G	●○ 1st Long bolts 30; Short bolts 26, 2nd all bolts turn 90 degrees	98	ES 72727
138 DOHC (2.3L) 16 Valve Oldsmobile	1993-92 VIN A, D, G	●○ 1st Long bolts 30; Short bolts 26, 2nd all bolts turn 90 degrees	148	ES 72727
138 DOHC (2.3L) 16 Valve Oldsmobile	1991-90 VIN A, D	●○ 1st Long bolts 1-8 26, 2nd Long bolts 1-8 turn 110 degrees, 3rd Short bolts 9-10 26, 4th Short bolts 9-10 turn 100 degrees	98	ES 72727
138 DOHC (2.3L) 16 Valve Oldsmobile	1989-87 VIN A, D	●○ 1st Long bolts 1-8 26, 2nd Long bolts 1-8 turn 90 degrees, 3rd Short bolts 9-10 26, 4th Short bolts 9-10 turn 80 degrees	98	ES 72727
140 SOHC (2.3L) 8 Valve Chevrolet	1977-71	● 60 in three steps	37	
145 DOHC (2.4L) 16 Valve Opel	2008-06 Ecotec VIN B, P	Bolts 1-10 1st 22, 2nd turn 155 degrees; Bolts 11-14 3rd 26	231	
145 DOHC (2.4L) 16 Valve Hybrid Opel	2008 Ecotec VIN 5	Bolts 1-10 1st 22, 2nd turn 155 degrees; Bolts 11-14 3rd 26	231	
146 DOHC (2.4L) 16 Valve Oldsmobile	2002-96 VIN T	●○ 1st Long bolts 1-8 40; Short bolts 9-10 30, 2nd all bolts turn 90 degrees	98	ES 72165
151 OHV (2.5L) Pontiac	1993-88 VIN A, E (Truck)	●○ 1st all bolts 18, 2nd Bolts 1-8, 10 26; Bolt 9 18, 3rd all bolts turn 90 degrees	72	ES 72733
151 OHV (2.5L) Pontiac	1987 VIN E (Truck)	●○ 1st all bolts 18, 2nd Bolts 1-8, 10 26; Bolt 9 30, 3rd Bolts 1-8, 10 turn 120 degrees; Bolt 9 turn 90 degrees	72	ES 72733



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS 4 (CONT.)				
151 OHV (2.5L) Pontiac	1986-85 VIN E (Truck)	●○	90 in three steps	72 ES 72733
151 OHV (2.5L) Pontiac	1992-87 VIN R	●○	1st all bolts <b>18</b> , 2nd Bolts 1-8, 10 <b>26</b> ; Bolt 9 <b>18</b> , 3rd all bolts turn 90 degrees	72 ES 72733
151 OHV (2.5L) Pontiac	1986 VIN R, 2	●○	1st all bolts <b>18</b> , 2nd Bolts 1-8, 10 <b>22</b> ; Bolt 9 <b>29</b> , 3rd Bolts 1-8, 10 turn 120 degrees; Bolt 9 turn 90 degrees	72 ES 72733
151 OHV (2.5L) Pontiac	1985 VIN R, 2	●○	92 in three steps	72 ES 72733
151 OHV (2.5L) Pontiac	1991-87 VIN U	●○	1st all bolts <b>18</b> , 2nd Bolts 1-8, 10 <b>26</b> ; Bolt 9 <b>18</b> , 3rd all bolts turn 90 degrees	72 ES 72858
151 OHV (2.5L) Pontiac	1986 VIN U	●○	1st all bolts <b>18</b> , 2nd Bolts 1-8, 10 <b>22</b> ; Bolt 9 <b>29</b> , 3rd Bolts 1-8, 10 turn 120 degrees; Bolt 9 turn 90 degrees	72 ES 72858
151 OHV (2.5L) Pontiac	1985 VIN U	●○	92 in three steps	72 ES 72858
151 OHV (2.5L) Pontiac	1984	●	92 in three steps	72
151 OHV (2.5L) Pontiac	1983-80	●	85 in three steps	72
151 OHV (2.5L) Pontiac	1979-77	●	95 in three steps	72
153 OHV Chevrolet	1970-62	●	95	37
169 DOHC (2.8L) 16 Valve Chevrolet Truck	2006-04 VIN 8	●○	Bolts 1-10 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 11 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 12-13 6th <b>5.1</b> , 7th turn 60 degrees	253 ES 72195
178 DOHC (2.9L) 16 Valve Chevrolet Truck	2008-07 VIN 9		Bolts 1-10 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 11 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 12-13 6th <b>5.1</b> , 7th turn 60 degrees	253
195 OHV Pontiac	1963-61	●	95	40
235.3 OHV Diesel (3.9L) 8 Valve Isuzu	1988-87	●	1st <b>50</b> , 2nd <b>65</b> , 3rd turn 60-90 degrees	180
235.3 OHV Turbo Diesel (3.9L) 8 Valve Isuzu	1998-87	●	1st <b>50</b> , 2nd <b>65</b> , 3rd turn 60-90 degrees	180
GM PRODUCTS 5				
211 DOHC (3.5L) 20 Valve Chevrolet Truck	2006-04 VIN 6	●○	Bolts 1-12 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 13 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 14-15 6th <b>5.1</b> , 7th turn 60 degrees	254 ES 72195
223 DOHC (3.7L) 20 Valve Chevrolet Truck	2008-07 VIN E		Bolts 1-12 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 13 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 14-15 6th <b>5.1</b> , 7th turn 60 degrees	254
GM PRODUCTS 6 & H06 & V6				
140 OHV Chevrolet	1961-60 Corvair		27-33	27
145 OHV Chevrolet	1963-61 Corvair		27-33	27
145 OHV Turbo Chevrolet	1963-62 Corvair		27-33	27
152 DOHC (2.5L) 24 Valve Daewoo	2006-04 Epica VIN L		1st <b>15</b> , 2nd <b>18</b> , 3rd turn 70 degrees, 4th turn 70 degrees	39
152 DOHC (2.5L) 24 Valve Suzuki	2004-01 Tracker VIN 4		Bolts 1-8 1st <b>38.5</b> , 2nd <b>61</b> , 3rd loosen all bolts, 4th <b>38.5</b> again, 5th <b>61</b> , 6th <b>76</b> ; Bolt 9 7th <b>8</b>	212
164 OHV Chevrolet	1969-65 Corvair		40	27
164 OHV Chevrolet	1964 Corvair		27-33	27
164 OHV Turbo Chevrolet	1966-65 Corvair		40	27
164 OHV Turbo Chevrolet	1964 Corvair		27-33	27



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS 6 & H06 & V6 (CONT.)				
170 DOHC (2.8L) 24 Valve Opel	2007-05 VIN T		Right Head 1st <b>33</b> , 2nd turn 120 degrees; Left Head 1st Bolts 1-8 <b>33</b> , 2nd Bolts 1-8 turn 120 degrees, 3rd Bolts 9-10 <b>11</b> , 4th Bolts 9-10 turn 60 degrees	230
173 OHV (2.8L) 12 Valve Chevrolet	1993-88 VIN R (Truck)	●○	1st <b>40</b> , 2nd turn 90 degrees	49 ES 72857
173 OHV (2.8L) 12 Valve Chevrolet	1987-86 VIN R (Truck)	●○	70	49 ES 72857
173 OHV (2.8L) 12 Valve Chevrolet	1985-82 VIN B (Truck)	●○	65-75	49 ES 72857
173 OHV (2.8L) 12 Valve Chevrolet	1989-87 VIN W (FWD)	●○	1st <b>33</b> , 2nd turn 90 degrees	49 ES 74017 ES 74018
173 OHV (2.8L) 12 Valve Chevrolet	1989-87 VIN S (RWD)	●○	1st <b>40</b> , 2nd turn 90 degrees	49 ES 72857
173 OHV (2.8L) 12 Valve Chevrolet	1988-87 VIN 9 (Fiero)	●○	65-75	49 ES 72857
173 OHV (2.8L) 12 Valve Chevrolet	1986-80 Car	●○	65-75	49 ES 72857
181 OHV (3.0L) 12 Valve Buick	1988-86 VIN L	●○	1st <b>25</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	88 ES 72726
181 OHV (3.0L) 12 Valve Buick	1985 VIN L	●○	1st <b>25</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	88 ES 72725
181 OHV (3.0L) 12 Valve Buick	1985-84 VIN E	●	80 in three steps	88
181 OHV (3.0L) 12 Valve Buick	1983-82 VIN E	●	80 in three steps	69
181 DOHC (3.0L) 24 Valve Opel	2002-01 VIN R (Catera)	●○	1st <b>18.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees, 5th turn 15 degrees, 6th turn 15 degrees	49 ES 72906
181 DOHC (3.0L) 24 Valve Opel	2000-97 VIN R (Catera)	●○	1st <b>18.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees, 5th turn 15 degrees	49 ES 72906
189 OHV (3.1L) 12 Valve Chevrolet	2005-01 VIN J	●○	1st <b>44</b> , 2nd turn 95 degrees	196 ES 72892 ES 74017
189 OHV (3.1L) 12 Valve Chevrolet	2000-99 VIN J	●○	1st <b>37</b> , 2nd turn 90 degrees	49 ES 72892 ES 74017
189 OHV (3.1L) 12 Valve Chevrolet	1999-96 VIN M	●○	1st <b>33</b> , 2nd turn 90 degrees	49 ES 72892 ES 74017
189 OHV (3.1L) 12 Valve Chevrolet	1995-93 VIN M	●○	1st <b>33</b> , 2nd turn 90 degrees	49 ES 74019
189 OHV (3.1L) 12 Valve Chevrolet	1994-88 VIN T (FWD)	●○	1st <b>33</b> , 2nd turn 90 degrees	49 ES 74017 ES 74018
189 OHV (3.1L) 12 Valve Chevrolet	1992-90 VIN T (RWD)	●○	1st <b>40</b> , 2nd turn 90 degrees	49 ES 72857
189 OHV (3.1L) 12 Valve Chevrolet	1993 VIN W (FWD)	●○	1st <b>33</b> , 2nd turn 90 degrees	49 ES 74018
189 OHV (3.1L) 12 Valve Chevrolet	1995-90 VIN D (Truck)	●○	1st <b>40</b> , 2nd turn 90 degrees	49 ES 72901
189 OHV Turbo (3.1L) 12 Valve Chevrolet	1990-89 VIN V	●○	1st <b>33</b> , 2nd turn 90 degrees	49 ES 74018
194 OHV Chevrolet	1967-62	●	95	2
194 DOHC (3.2L) 24 Valve Opel	2005-03 VIN N		Right Head 1st <b>33</b> , 2nd turn 120 degrees; Left Head 1st Bolts 1-8 <b>33</b> , 2nd Bolts 1-8 turn 120 degrees, 3rd Bolts 9-10 <b>11</b> , 4th Bolts 9-10 turn 60 degrees	230
196 OHV (3.2L) Buick	1979-78 VIN C	●	80 in three steps	69
198 OHV Buick	1963-62	●	65-70	19
200 OHV (3.3L) Chevrolet	1979-78 VIN M	●	65 in three steps	64
204 OHV (3.3L) Buick	1993-89 VIN N	●○	1st <b>35</b> , 2nd turn 130 degrees, 3rd Bolts 1-4 turn 30 degrees	88 ES 74031
206.8 OHV Chevrolet	1936-35		75-80	61
207 OHV (3.4L) 12 Valve Chevrolet	2008-04 VIN F, 9	●○	1st <b>44</b> , 2nd turn 95 degrees	196 ES 72892



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS 6 & H06 & V6 (CONT.)					
207 OHV (3.4L) 12 Valve Chevrolet	2005-01 VIN E	●○	1st <b>44</b> , 2nd turn 95 degrees	196	ES 72892 ES 74017
207 OHV (3.4L) 12 Valve Chevrolet	2000-96 VIN E	●○	1st <b>37</b> , 2nd turn 90 degrees	49	ES 72892 ES 74017
207 OHV (3.4L) 12 Valve Chevrolet	1995-93 VIN S	●○	1st <b>41</b> , 2nd turn 90 degrees	49	ES 72857
207 DOHC (3.4L) 24 Valve Chevrolet	1997-93 VIN X	●○	1st <b>44</b> , 2nd turn 90 degrees	49	ES 72177
207 DOHC (3.4L) 24 Valve Chevrolet	1992-91 VIN X	●○	1st <b>37</b> , 2nd turn 90 degrees	49	ES 72177
208 L-Head Pontiac	1936-35		<b>60</b>	174	
213 OHV (3.5L) 12 Valve Chevrolet	2008-04 VIN L, 8	●	1st <b>44</b> , 2nd turn 95 degrees	196	
214 OHV (3.5L) 12 Valve Chevrolet	2008 VIN K, N	●○	1st <b>44</b> , 2nd turn 140 degrees	196	ES 72230
214 OHV (3.5L) 12 Valve Chevrolet	2007-06 VIN K, N	●○	1st <b>44</b> , 2nd turn 95 degrees	196	ES 72230
214 DOHC (3.5L) 24 Valve Oldsmobile	2002-01 VIN H	●○	1st M11 bolts <b>30</b> , 2nd M11 bolts turn 100 degrees, 3rd M11 bolts turn 100 degrees, 4th M6 long bolt <b>8.8</b> , 5th M6 short bolts <b>8.8</b>	157	ES 72191
214 DOHC (3.5L) 24 Valve Oldsmobile	2000-99 VIN H	●○	1st M11 bolts <b>30</b> , 2nd M11 bolts turn 60 degrees, 3rd M11 bolts turn 60 degrees, 4th M11 bolts turn 80 degrees, 5th M6 long bolt <b>8.8</b> , 6th M6 short bolts <b>8.8</b>	157	ES 72191
215 OHV Pontiac	1965-64	●	<b>90-95</b>	2	
216.5 OHV Chevrolet	1953-37		<b>75-80</b>	61	
217 DOHC (3.6L) 24 Valve Opel	2008-07 VIN V, 7		Right Head 1st Bolts 1-8 <b>22</b> , 2nd Bolts 1-8 turn 150 degrees, 3rd Bolt 9 <b>11</b> , 4th Bolt 9 turn 75 degrees; Left Head 1st Bolts 1-8 <b>22</b> , 2nd Bolts 1-8 turn 150 degrees, 3rd Bolts 9-10 <b>11</b> , 4th Bolts 9-10 turn 75 degrees	260	
217 DOHC (3.6L) 24 Valve Opel	2006-04 VIN 7		Right Head 1st <b>33</b> , 2nd turn 120 degrees; Left Head 1st Bolts 1-8 <b>33</b> , 2nd Bolts 1-8 turn 120 degrees, 3rd Bolts 9-10 <b>11</b> , 4th Bolts 9-10 turn 60 degrees	230	
219 L-Head Oldsmobile	1939-37		<b>60-70</b>	177	
222.7 L-Head Pontiac	1940-35		<b>60</b>	174	
225 OHV Buick	1967-64	●	<b>65-70</b>	19	
228 OHV GMC Truck	1953-39		<b>90-100</b>	61	
229 OHV (3.8L) Chevrolet	1984-80 VIN K, 9	●	<b>65</b> in three steps	64	
229.7 L-Head Oldsmobile	1940-37		<b>60-70</b>	177	
230 OHV Chevrolet	1970-63	●	<b>95</b>	2	
230 SOHC Pontiac	1967-66	●	<b>85-100</b>	2	
231 OHV (3.8L) 12 Valve Buick	2008-01 VIN K, 2 (FWD)	●○	1st <b>37</b> , 2nd turn 120 degrees	88	ES 74033
231 OHV (3.8L) 12 Valve Buick	2000-95 VIN K (FWD)	●○	1st <b>37</b> , 2nd turn 130 degrees, 3rd Bolts 1-4 turn 30 degrees	88	ES 74033
231 OHV (3.8L) 12 Valve Buick	2002-98 VIN K (RWD)	●○	1st <b>37</b> , 2nd turn 120 degrees	88	ES 74033
231 OHV (3.8L) 12 Valve Buick	1997-95 VIN K (RWD)	●○	1st <b>37</b> , 2nd turn 130 degrees, 3rd Bolts 1-4 turn 30 degrees	88	ES 74033
231 OHV (3.8L) 12 Valve Buick	1995-90 VIN L	●○	1st <b>35</b> , 2nd turn 130 degrees, 3rd Bolts 1-4 turn 30 degrees	88	ES 74031
231 OHV (3.8L) 12 Valve Buick	1991-88 VIN C	●○	1st <b>35</b> , 2nd turn 130 degrees, 3rd turn 30 degrees	88	ES 74031
231 OHV (3.8L) 12 Valve Buick	1988-86 VIN A, B, 3	●○	1st <b>25</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	88	ES 74022

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# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS 6 & H06 & V6 (CONT.)					
231 OHV (3.8L) 12 Valve Buick	1985-78	●	<b>80</b> in three steps	88	
231 OHV (3.8L) 12 Valve Buick	1977-75	●	<b>80</b> in three steps	69	
231 OHV Supercharged (3.8L) 12 Valve Buick	2007-01 VIN 1, 4	●○	1st <b>37</b> , 2nd turn 120 degrees	88	ES 74033
231 OHV Supercharged (3.8L) 12 Valve Buick	2000-96 VIN 1	●○	1st <b>37</b> , 2nd turn 130 degrees, 3rd Bolts 1-4 turn 30 degrees	88	ES 74033
231 OHV Supercharged (3.8L) 12 Valve Buick	1995-91 VIN 1	●○	1st <b>37</b> , 2nd turn 130 degrees, 3rd Bolts 1-4 turn 30 degrees	88	ES 72167
231 OHV Turbo (3.8L) 12 Valve Buick	1989 VIN 7	●○	1st <b>25</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	88	ES 74022
231 OHV Turbo (3.8L) 12 Valve Buick	1987-86 VIN 7	●○	1st <b>25</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	88	ES 74022
231 OHV Turbo (3.8L) 12 Valve Buick	1985-84	●	<b>80</b> in three steps	88	
231 OHV Turbo (3.8L) 12 Valve Buick	1983-78	●	<b>80</b> in three steps	69	
233 L-Head GMC Truck	1938-35		<b>60</b>	174	
235 OHV Chevrolet	1963-53		<b>90-95</b>	25	
235 OHV Chevrolet	1952-40		<b>75-80</b>	61	
236 OHV GMC Truck	1949-41		<b>90-100</b>	61	
238 L-Head Oldsmobile	1948-41		<b>60-70</b>	177	
239.2 L-Head Pontiac	1954-41		<b>60</b>	174	
242 OHV (3.9L) 12 Valve Chevrolet	2008 VIN R, W, 1, 3	●○	1st <b>44</b> , 2nd turn 140 degrees	196	ES 72230
242 OHV (3.9L) 12 Valve Chevrolet	2007-06 VIN R, W, 1, 3	●○	1st <b>44</b> , 2nd turn 95 degrees	196	ES 72230
248 OHV GMC Truck	1955-39		<b>90-100</b>	61	
250 OHV (4.1L) Chevrolet	1984-74 VIN D, Q	●	Bolts 1-10, 12-14 <b>95</b> ; Bolt 11 <b>85</b>	2	
250 OHV (4.1L) Chevrolet	1973-65	●	<b>95</b>	2	
250 SOHC Pontiac	1969-68	●	<b>85-100</b>	2	
252 OHV (4.1L) Buick	1985-84 VIN 4	●	<b>80</b> in three steps	88	
252 OHV (4.1L) Buick	1983-80 VIN 4	●	<b>80</b> in three steps	69	
254 DOHC (4.2L) 24 Valve Chevrolet Truck	2008-02 VIN S	●○	Bolts 1-14 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 15 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 16-17 6th <b>5.1</b> , 7th turn 60 degrees	211	ES 72195
261 OHV Chevrolet	1962-54		<b>90-95</b>	45	
262 OHV (4.3L) Chevrolet Truck	2008-02 VIN X	●○	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	64	ES 74034
262 OHV (4.3L) Chevrolet Truck	1999-96 VIN X	●○	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	64	ES 74034
262 OHV (4.3L) Chevrolet Truck	1996-94 VIN Z	●○	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	64	ES 74034
262 OHV (4.3L) Chevrolet Truck	1993-85 VIN B, N, Z	●○	<b>65</b> in three steps	64	ES 74034
262 OHV (4.3L) Chevrolet	1993-85 VIN Z	●○	<b>65</b> in three steps	64	ES 74034
262 H.O. OHV (4.3L) Chevrolet Truck	2003-96 VIN W	●○	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	64	ES 74034
262 H.O. OHV (4.3L) Chevrolet Truck	1995-92 VIN W	●○	<b>65</b> in three steps	64	ES 74034

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# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS 6 & H06 & V6 (CONT.)				
262 OHV Turbo (4.3L) Chevrolet Truck	1993-91 VIN Z	65 in three steps	64	
262 OHV Diesel (4.3L) Oldsmobile	1985-82 VIN T, V, 7	Bolts 1, 2, 3, 4, 7, 8, 9, 10 <b>142</b> ; Bolts 5, 6, 11, 12, 13, 14 <b>59</b>	73	
270 OHV GMC Truck	1962-39	90-100	61	
292 OHV (4.8L) Chevrolet Truck	1989-74 VIN T	Bolts 1-10, 12-14 <b>95</b> ; Bolt 11 <b>85</b>	2	
292 OHV (4.8L) Chevrolet Truck	1973-63	95	2	
302 OHV GMC Truck	1959-52	90-100	61	
305 OHV GMC Truck	1974-60	65-72	67	
351 OHV GMC Truck	1973-60	65-72	67	
D351 OHV Diesel GMC Truck	1969-64	125-135	67	
353 OHV Turbo Diesel (5.8L) 12 Valve Isuzu	1995-87	1st <b>50</b> , 2nd <b>65</b> , 3rd turn 60-90 degrees	181	
379 OHV GMC Truck	1974-73	7/16" bolts <b>60-65</b> ; 1/2" bolts <b>90-100</b>	67	
401 OHV GMC Truck	1973-60	65-72	67	
426 OHV GMC Truck	1955-49	80-90	192	
432 OHV GMC Truck	1974-73	7/16" bolts <b>60-65</b> ; 1/2" bolts <b>90-100</b>	67	
478 OHV GMC Truck	1974-62	65-72	67	
D478 OHV Diesel GMC Truck	1975-64	125-135	67	
DH478 OHV Diesel GMC Truck	1975-64	125-135	67	
503 OHV GMC Truck	1959-57	75-80	192	
503 OHV GMC Truck	1956-49	80-90	192	
GM PRODUCTS L8 & V8				
215 Buick, Pontiac	1963-61	50-55	24	
215 Oldsmobile	1963-61	45-55	176	
215 Turbo Oldsmobile	1963-62	45-55	176	
223.4 L-Head Pontiac	1935-33	60	175	
232.3 L-Head Pontiac	1936	60	175	
244 DOHC (4.0L) 32 Valve Oldsmobile	2003-01 VIN C	1st <b>30</b> , 2nd turn 70 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th M6 bolts <b>8.8</b>	198	ES 72187
244 DOHC (4.0L) 32 Valve Oldsmobile	1999-95 VIN C	1st <b>30</b> , 2nd turn 70 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th M6 bolts <b>8.8</b>	198	ES 72186
248 OHV Buick	1950-34	65-70	178	
248.9 L-Head Pontiac	1949-37	60	175	
250 OHV (4.1L) Cadillac	1988-82 VIN 7, 8	1st <b>38</b> , 2nd <b>74</b> , 3rd Bolts 1, 3, 4 <b>90</b>	74	
260 (4.3L) Oldsmobile	1982-75 VIN F, 8	1st <b>60</b> , 2nd <b>85</b>	3	
260 Diesel (4.3L) Oldsmobile	1979 VIN P	1st <b>100</b> , 2nd <b>130</b>	3	
262 Chevrolet	1976-75 VIN G	65 in three steps	7	ES 72856
263 OHV Buick	1953-50	65-70	178	
264 Buick	1955-54	65-75	34	
265 (4.3L) Chevrolet	1996-95 VIN W	1st all bolts <b>22</b> , 2nd Long bolts turn 80 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	7	ES 72856
265 (4.3L) Chevrolet	1994 VIN W	65 in three steps	7	ES 72856
265 (4.3L) Pontiac	1981-80 VIN S	95 in three steps	40	
265 Chevrolet	1957-55	65	7	ES 72856
267 OHV (4.4L) Chevrolet	1982-79 VIN J	65 in three steps	7	ES 72856
267 DOHC Supercharged (4.4L) 32 Valve Cadillac	2008-06 VIN D	1st M11 bolts <b>22</b> , 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th turn 40 degrees, 6th M6 bolts <b>8.8</b>	198	
268.2 L-Head Pontiac	1954-50	60	175	
273 OHV (4.5L) Cadillac	1992-88 VIN 3, 5, 8	1st <b>38</b> , 2nd <b>68</b> , 3rd Bolts 1, 3, 4 <b>90</b>	74	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS L8 & V8 (CONT.)				
281 DOHC (4.6L) 32 Valve Cadillac	2008-06 VIN A, Y, 9	1st M11 bolts <b>22</b> , 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th M6 bolts <b>8.8</b>	198	ES 72217
281 DOHC (4.6L) 32 Valve Cadillac	2005-04 VIN A, Y, 9	1st M11 bolts <b>22</b> , 2nd turn 60 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th M6 bolts <b>8.8</b>	198	ES 72187
281 DOHC (4.6L) 32 Valve Cadillac	2003-00 VIN Y, 9	1st M11 bolts <b>30</b> , 2nd turn 70 degrees, 3rd turn 60 degrees, 4th turn 45 degrees, 5th M6 bolts <b>8.8</b>	198	ES 72187
281 DOHC (4.6L) 32 Valve Cadillac	1999-93 VIN Y, 9	1st M11 bolts <b>30</b> , 2nd turn 70 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th M6 bolts <b>8.8</b>	198	ES 72186
283 Chevrolet	1967-57	65	7	ES 72856
287.2 Pontiac	1955	95	40	
288 GMC Truck	1955	95	40	
293 OHV (4.8L) Chevrolet Truck	2008-07 VIN C 2nd Design Bolts	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
293 OHV (4.8L) Chevrolet Truck	2008-04 VIN V 2nd Design Bolts	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
293 OHV (4.8L) Chevrolet Truck	2004-99 VIN V 1st Design Bolts	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-8 turn 90 degrees, 4th M11 Bolts 9-10 turn 50 degrees, 5th M8 Bolts 11-15 <b>22</b>	159	ES 72173
298 OHV (4.5L) Cadillac	1995-91 VIN B	1st <b>38</b> , 2nd <b>68</b> , 3rd Bolts 1, 3, 4 <b>90</b>	74	
300 Buick	1967-64	65-70	4	
301 (4.9L) Pontiac	1981-77 VIN W, Y	95 in three steps	40	
301 Turbo (4.9L) Pontiac	1981-80 VIN T	95 in three steps	40	
302 Chevrolet	1969-67	65	7	ES 72856
303 Oldsmobile	1953-49	65-70	29	
305 (5.0L) Chevrolet Truck	2002-97 VIN M	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	7	ES 72856
305 (5.0L) Chevrolet Truck	1996 VIN M	1st <b>24</b> , 2nd <b>45</b> , 3rd <b>65</b>	7	ES 72856
305 (5.0L) Chevrolet	1995-76	65 in three steps	7	ES 72856
307 (5.0L) Oldsmobile	1990-89 VIN Y, 9	1st <b>40</b> , 2nd Bolts 1-7, 9 turn 120 degrees, 3rd Bolts 8, 10 turn 95 degrees	3	
307 (5.0L) Oldsmobile	1988-80 VIN Y, 9	130 in three steps	3	
307 Chevrolet	1973-68	65	7	ES 72856
316 Pontiac	1956	95	40	
316 GMC Truck	1956-55	95	40	
320.2 OHV Buick	1952-36	65-70	178	
322 Buick	1956-53	65-75	34	
322 GMC Truck	1959-56	65-75	34	
324 Oldsmobile	1956-54	65-70	29	
324 GMC Truck	1956-55	65-70	29	
325 OHV (5.3L) Chevrolet	2008-05 VIN C 2nd Design Bolts	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
325 OHV (5.3L) Chevrolet Truck	2008-07 VIN J, L, O, 3 2nd Design Bolts	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS L8 & V8 (CONT.)					
325 OHV (5.3L) Chevrolet Truck	2008-04 VIN B, M, P, T, Z 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
325 OHV (5.3L) Chevrolet Truck	2004-99 VIN P, T, Z 1st Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-8 turn 90 degrees, 4th M11 Bolts 9-10 turn 50 degrees, 5th M8 Bolts 11-15 <b>22</b>	159	ES 72173
325 OHV (5.3L) Hybrid Chevrolet Truck	2007-05 VIN T 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
326 Pontiac	1967-63	●	<b>95</b>	40	
327 Chevrolet	1969-62	●○	<b>65</b>	7	ES 72856
330 Oldsmobile	1967-64	●	<b>80</b>	3	
331 Cadillac	1955-49	●	<b>65-70</b>	23	
336.9 GMC Truck	1959-58		<b>95</b>	40	
340 Buick	1967-66	●	<b>65-70</b>	4	
346 OHV (5.7L) Chevrolet	2005-04 VIN G, S 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
346 OHV (5.7L) Chevrolet	2004-98 VIN G, S 1st Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-8 turn 90 degrees, 4th M11 Bolts 9-10 turn 50 degrees, 5th M8 Bolts 11-15 <b>22</b>	159	ES 72173
346 OHV (5.7L) Chevrolet	1997 VIN G 1st Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 76 degrees, 3rd M11 Bolts 1-8 turn 76 degrees, 4th M11 Bolts 9-10 turn 34 degrees, 5th M8 Bolts 11-15 <b>22</b>	159	ES 72173
346 L-Head Cadillac	1948-37		<b>70-75</b>	179	
347 Pontiac	1957		<b>95</b>	40	
347 GMC Truck	1957		<b>95</b>	40	
348 Chevrolet	1965-58	●	<b>65</b>	26	
350 (5.7L) Buick	1981-75 VIN B, H, J, X	●	<b>80</b> in three steps	5	
350 (5.7L) Buick	1974-73	●	<b>80</b> in three steps	5	
350 (5.7L) Buick	1972-68	●	<b>65-75</b>	4	
350 (5.7L) Cadillac	1980-75 VIN B, R, 8	●	<b>130</b> in three steps	3	
350 (5.7L) Chevrolet Truck	2002-97 VIN R	●○	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	7	ES 72856
350 (5.7L) Chevrolet Truck	1996 VIN R	●○	1st <b>24</b> , 2nd <b>45</b> , 3rd <b>65</b>	7	ES 72856
350 (5.7L) Chevrolet	1997-96 VIN P, 5	●○	1st all bolts <b>22</b> , 2nd Short bolts turn 67 degrees, 3rd Medium bolts & Long bolts turn 80 degrees	7	ES 72856
350 (5.7L) Chevrolet	1995-92 VIN P	●○	<b>65</b> in three steps	7	ES 72856
350 (5.7L) Chevrolet	1995-67 Cast Iron heads exc. VIN P, 5	●○	<b>65</b> in three steps	7	ES 72856
350 (5.7L) Chevrolet	1991-86 Aluminum heads exc. VIN P	●○	Short Bolts <b>60</b> ; Medium Bolts <b>65</b> ; Long Bolts <b>65</b>	7	ES 72856
350 (5.7L) Oldsmobile	1980-77 VIN R	●	1st <b>100</b> , 2nd <b>130</b>	3	
350 (5.7L) Oldsmobile	1976-68	●	1st <b>60</b> , 2nd <b>85</b>	3	

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# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS L8 & V8 (CONT.)					
350 (5.7L) Pontiac	1977-76 VIN M, P	●	<b>95</b> in three steps	40	
350 (5.7L) Pontiac	1975-68	●	<b>95</b> in three steps	40	
350 DOHC (5.7L) 32 Valve Chevrolet	1995-90 VIN J		1st <b>45</b> , 2nd <b>74</b> , 3rd <b>118</b>	200	
350 Diesel (5.7L) Oldsmobile	1985-78 VIN N, Z	●	1st <b>100</b> , 2nd <b>130</b>	3	
364 OHV (6.0L) Chevrolet	2008 VIN Y 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
364 OHV (6.0L) Chevrolet	2007-05 VIN H, U 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
364 OHV (6.0L) Chevrolet Truck	2008-07 VIN K, Y 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
364 OHV (6.0L) Chevrolet Truck	2008-04 VIN H, N, U 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
364 OHV (6.0L) Chevrolet Truck	2004-99 VIN N, U 1st Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-8 turn 90 degrees, 4th M11 Bolts 9-10 turn 50 degrees, 5th M8 Bolts 11-15 <b>22</b>	159	ES 72173
364 OHV (6.0L) Hybrid Chevrolet Truck	2008 VIN 5 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
364 Buick	1961-57	●	<b>65-75</b>	34	
365 Cadillac	1958-56	●	<b>65-70</b>	23	
366 (6.0L) Chevrolet Truck	1998-66	●	<b>80</b>	8	
368 (6.0L) Cadillac	1984-80 VIN 6, 9	●	<b>95</b> in three steps	37	
370 Pontiac	1958	●	<b>95</b>	40	
370 GMC Truck	1959-57		<b>65-70</b>	29	
371 Oldsmobile	1960-59		<b>60-80</b>	29	
371 Oldsmobile	1958-57		<b>60-70</b>	29	
378 OHV (6.2L) Chevrolet	2008 VIN W 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
378 OHV (6.2L) Chevrolet Truck	2008-07 VIN 8 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
379 OHV Diesel (6.2L) Chevrolet Truck	1993-87 VIN C, J	●○	1st <b>20</b> , 2nd <b>50</b> , 3rd turn 90 degrees	77	ES 72724
379 OHV Diesel (6.2L) Chevrolet Truck	1986-82 VIN C, J	●○	<b>95-105</b> in three steps	77	ES 72724
389 Pontiac	1966-59	●	<b>95</b>	40	
390 Cadillac	1963	●	<b>75</b>	7	
390 Cadillac	1962-61	●	<b>75</b>	23	
390 Cadillac	1960-59	●	<b>65-70</b>	23	
394 Oldsmobile	1964-59	●	<b>60-80</b>	29	
395 OHV Diesel (6.5L) Chevrolet Truck	1999-94 VIN P, Y	●○	1st <b>20</b> , 2nd <b>55</b> , 3rd <b>55</b> again, 4th turn 90 degrees	77	ES 72724
395 OHV Turbo Diesel (6.5L) Chevrolet Truck	2005-92 VIN F, S, Z	●○	1st <b>20</b> , 2nd <b>55</b> , 3rd <b>55</b> again, 4th turn 90 degrees	77	ES 72724

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# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS L8 & V8 (CONT.)				
396 Chevrolet	1969-65	●	80	8
400 Buick	1969-68	●	100	4
400 Buick	1967	●	100-120	4
400 Buick	1966-65	●	65-80	24
400 (6.6L) Chevrolet	1980-70	●○	65 in three steps	7 ES 72856
400 Oldsmobile	1969-65	●	80	3
400 Pontiac	1979-67	●	95 in three steps	40
401 Buick	1966-62	●	65-80	24
401 Buick	1961-59	●	65-75	34
402 Chevrolet	1972-70	●	80	8
402 OHV Turbo Diesel (6.6L) 32 Valve Isuzu	2008-05 DuraMax VIN D, 1, 2, 3, 6	●○	1st M12 bolts 37, 2nd M12 bolts 59, 3rd M12 bolts turn 60 degrees, 4th M12 bolts turn 60 degrees, 5th M8 bolts 18	213 ES 72199
402 OHV Turbo Diesel (6.6L) 32 Valve Isuzu	2004-01 DuraMax VIN 1, 2 2nd Design Head Gasket	●○	1st M12 bolts 37, 2nd M12 bolts 59, 3rd M12 bolts turn 60 degrees, 4th M12 bolts turn 60 degrees, 5th M8 bolts 18	213 ES 72199
402 OHV Turbo Diesel (6.6L) 32 Valve Isuzu	2004-01 DuraMax VIN 1, 2 1st Design Head Gasket	●○	1st M12 bolts 37, 2nd M12 bolts 59, 3rd M12 bolts turn 90 degrees, 4th M12 bolts turn 75 degrees, 5th M8 bolts 18	213 ES 72199
403 Oldsmobile	1979-77 VIN K	●	1st 100, 2nd 130	3
409 Chevrolet	1965-61	●	65	26
421 Pontiac	1966-61	●	95	40
425 Buick	1966-63	●	65-80	24
425 Cadillac	1979-77 VIN S, T	●	95 in three steps	37
425 Oldsmobile	1967-65	●	80	3
427 OHV (7.0L) Chevrolet	2008-06 VIN E 2nd Design Bolts	●○	1st M11 Bolts 1-10 22, 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 22	159 ES 72220
427 (7.0L) Chevrolet Truck	1998-68	●	80	8
427 (7.0L) Chevrolet	1969-66 Cast Iron heads	●	80	8
427 (7.0L) Chevrolet	1969-67 Aluminum heads	●	Short bolts 65; Medium bolts 75; Long bolts 75	8
428 Pontiac	1969-67	●	95	40
429 Cadillac	1967-64	●	60	7
430 Buick	1969-68	●	100	4
430 Buick	1967	●	100-120	4
454 (7.4L) Chevrolet Truck	2000-98 VIN B, J	●	1st 37, 2nd Bolts 1, 2, 3, 6, 7, 8, 9, 12, 13, 14, 15, 16 turn 150 degrees, 3rd Bolts 4, 5, 10, 11 turn 90 degrees	8
454 (7.4L) Chevrolet Truck	1997-91 VIN J, N	●	1st 30, 2nd 60, 3rd 80	8
454 (7.4L) Chevrolet	1990-70 Cast Iron heads	●	80 in three steps	8
454 (7.4L) Chevrolet	1972-70 Aluminum heads	●	Short bolts 65; Medium bolts 75; Long bolts 75	8
455 Buick	1976-70	●	100	5
455 Oldsmobile	1976-68	●	85	3
455 Pontiac	1976-70	●	95	40
472 Cadillac	1974-68	●	115	37



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
GM PRODUCTS L8 & V8 (CONT.)				
496 OHV (8.1L) Chevrolet Truck	2007-01 VIN G	●○	1st 22, 2nd 22 again, 3rd turn 120 degrees, 4th Bolts 1, 2, 3, 6, 7, 8, 9, 10, 11, 14, 16, 17 turn 60 degrees, 5th Bolts 15, 18 turn 45 degrees, 6th Bolts 4, 5, 12, 13 turn 30 degrees	210 ES 72188
500 Cadillac	1976-70	●	115 in three steps	37
GM PRODUCTS V12				
702 OHV GMC Truck	1965-60		65-72	67
GMC ..... SEE GM PRODUCTS				
GRUMANN 4				
134 OHV (2.2L) Chevrolet	1995 VIN 4	●○	1st Long bolts 46; Short bolts 43, 2nd all bolts turn 90 degrees	149 ES 72172
134 OHV (2.2L) Chevrolet	1994 VIN 4	●○	1st Long bolts 46; Short bolts 43, 2nd all bolts turn 90 degrees	149 ES 74016
151 OHV (2.5L) Pontiac	1993-88 VIN A, E	●○	1st all bolts 18, 2nd Bolts 1-8, 10 26; Bolt 9 18, 3rd all bolts turn 90 degrees	72 ES 72733
151 OHV (2.5L) Pontiac	1987 VIN E	●○	1st all bolts 18, 2nd Bolts 1-8, 10 26; Bolt 9 30, 3rd Bolts 1-8, 10 turn 120 degrees; Bolt 9 turn 90 degrees	72 ES 72733
HENRY J ..... SEE KAISER				
HONDA 3				
995cc SOHC (ECA1) 12 Valve Hybrid	2006-00		Bolts 1-8 1st 29, 2nd turn 90 degrees; Bolts 9 3rd 8.7	202
HONDA 4				
1169cc SOHC (EB1) 8 Valve	1973	●	37-42 in two steps	153
1238cc SOHC (EB2, EB3) 8 Valve	1979-74	●	37-42 in two steps	153
1335cc SOHC (EJ1) 8 Valve	1983-80	●	1st 22, 2nd 43	60
1335cc SOHC (EN1) 8 Valve	1983-80	●	37-42 in two steps	153
1339cc SOHC (LDA1, LDA2) 16 Valve Hybrid	2008-03		1st 22, 2nd turn 130 degrees	60
1342cc SOHC (D13A1, D13A2) 8 Valve	1987	●	1st 22, 2nd 43	37
1342cc SOHC (EV1, EV2) 8 Valve	1986-84	●	1st 22, 2nd 43	37
1488cc SOHC (D15A1, D15A2, D15A3) 12 Valve	1987	●	1st 22, 2nd 43	37
1488cc SOHC (EW1, EW2) 12 Valve	1986-84	●	1st 22, 2nd 43	37
1488cc SOHC (EW3, EW4) 12 Valve	1986-85	●	1st 22, 2nd 43	37
1488cc SOHC (D15A2) 8 Valve	1987	●	1st 22, 2nd 43	37
1488cc SOHC (EW1) 8 Valve	1986-85	●	1st 22, 2nd 43	37
1488cc SOHC (EM1) 8 Valve	1983-80	●	1st 22, 2nd 43	60
1488cc SOHC (EC, ED1, ED2, ED3, ED4) 8 Valve	1979-75	●	44 in two steps	60
1493cc SOHC (D15B7) 16 Valve	1995-92	●	1st 14, 2nd 36, 3rd 49, 4th Bolts 1-2 49 again	108
1493cc SOHC (D15Z1) 16 Valve	1995-92	●	1st 14, 2nd 36, 3rd 49, 4th Bolts 1-2 49 again	108
1493cc SOHC (D15B1, D15B2) 16 Valve	1991-88	●	1st 22, 2nd 43	108
1493cc SOHC (D15B8) 8 Valve	1995-92	●	1st 14, 2nd 36, 3rd 49, 4th Bolts 1-2 49 again	108



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>HONDA 4 (CONT.)</b>					
1493cc SOHC (D15B6) 8 Valve	1991-88	●	1st <b>22</b> , 2nd <b>43</b>	108	
1496cc SOHC (L15A1) 16 Valve	2008-07		1st <b>22</b> , 2nd turn 130 degrees	153	
1590cc SOHC (D16B5) 16 Valve	2000-98		1st <b>13</b> , 2nd <b>36</b> , 3rd <b>49</b> , 4th Bolts 1-2 <b>49</b> again	152	
1590cc SOHC (D16Y5, D16Y7, D16Y8) 16 Valve	2000-96	●	1st <b>13</b> , 2nd <b>36</b> , 3rd <b>49</b> , 4th Bolts 1-2 <b>49</b> again	36	
1590cc SOHC (D16Z6) 16 Valve	1995-92	●	1st <b>14</b> , 2nd <b>36</b> , 3rd <b>49</b> , 4th Bolts 1-2 <b>49</b> again	108	
1590cc SOHC (D16A6) 16 Valve	1991-88	●	1st <b>22</b> , 2nd <b>43</b>	108	
1595cc DOHC (B16A2, B16A3) 16 Valve	2000-94	●	1st <b>22</b> , 2nd <b>61</b>	152	
1599cc SOHC (EF1, EF2, EG) 12 Valve	1979-76	●	<b>44</b> in two steps	60	
1601cc SOHC (EZ1) 12 Valve	1985-84	●	1st <b>22</b> , 2nd <b>49</b>	60	
1601cc SOHC (EL) 12 Valve	1983-79	●	1st <b>22</b> , 2nd <b>43</b>	60	
1668cc SOHC (D17A1, D17A2, D17A6, D17A7) 16 Valve	2005-01	●	1st <b>14</b> , 2nd <b>36</b> , 3rd <b>49</b>	108	
1751cc SOHC (EK1) 12 Valve	1983-79	●	1st <b>22</b> , 2nd <b>43</b>	60	
1799cc SOHC (R18A1, R18A4) 16 Valve	2008-06		1st <b>29</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 60 degrees	106	
1829cc SOHC (A18A1, A18A2) 12 Valve	1987	●	1st <b>22</b> , 2nd <b>49</b>	60	
1829cc SOHC (ET1, ET2) 12 Valve	1986-84	●	1st <b>22</b> , 2nd <b>49</b>	60	
1829cc SOHC (ES1, ES2, ES3) 12 Valve	1985-83	●	1st <b>22</b> , 2nd <b>49</b>	60	
1955cc SOHC (A20A1, A20A2, A20A3, A20A4) 12 Valve	1989-87	●	1st <b>22</b> , 2nd <b>49</b>	60	
1955cc SOHC (BS1, BS2) 12 Valve	1986	●	1st <b>22</b> , 2nd <b>49</b>	60	
1955cc SOHC (BT1, BT2) 12 Valve	1986-85	●	1st <b>22</b> , 2nd <b>49</b>	60	
1958cc SOHC (B20A3) 12 Valve	1990-88	●	1st <b>22</b> , 2nd <b>49</b>	108	
1958cc DOHC (B20A5) 16 Valve	1991-88	●	1st <b>22</b> , 2nd <b>49</b>	108	
1972cc DOHC (B20Z2) 16 Valve	2001-99	●	1st <b>22</b> , 2nd <b>63</b>	146	
1972cc DOHC (B20B4) 16 Valve	1998-97	●	1st <b>22</b> , 2nd <b>63</b>	146	
1997cc DOHC (F20C1) 16 Valve	2003-00		Bolts 1-10 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees; Bolts 11 4th <b>16</b>	222	
1998cc DOHC (K20A3, K20Z3) 16 Valve	2008-02		1st <b>29</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	106	
2056cc DOHC (B21A1) 16 Valve	1991-90	●	1st <b>22</b> , 2nd <b>49</b>	108	
2156cc SOHC (F22B1, F22B2, F22B6) 16 Valve	1997-94	●	1st <b>29</b> , 2nd <b>51</b> , 3rd <b>72.3</b>	108	
2156cc SOHC (F22A1, F22A6) 16 Valve	1996-92	●	1st <b>29</b> , 2nd <b>51</b> , 3rd <b>72.3</b>	108	
2156cc SOHC (F22A1, F22A4, F22A6) 16 Valve	1991-90	●	1st <b>29</b> , 2nd <b>51</b> , 3rd <b>78</b>	108	
2157cc DOHC (H22A4) 16 Valve	2001-97		1st <b>29</b> , 2nd <b>51</b> , 3rd <b>72.3</b>	152	
2157cc DOHC (H22A1) 16 Valve	1996-93		1st <b>29</b> , 2nd <b>51</b> , 3rd <b>78</b>	152	
2178cc DOHC (F22C1) 16 Valve	2008-04		Bolts 1-10 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees; Bolts 11 4th <b>16</b>	222	
2254cc SOHC (F23A1, F23A4, F23A5, F23A7) 16 Valve	2002-98	●	1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	108	
2259cc DOHC (H23A1) 16 Valve	1996-92	●	1st <b>29</b> , 2nd <b>51</b> , 3rd <b>78</b>	152	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>HONDA 4 (CONT.)</b>					
2354cc DOHC (K24A1, K24A4, K24A8, K24Z1) 16 Valve	2008-02	●	1st <b>29</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	106	
2559cc SOHC (4ZE1) 8 Valve Isuzu	1997-94	●	1st <b>58</b> , 2nd <b>72</b>	79	
<b>HONDA V6</b>					
2675cc SOHC (C27A4) 24 Valve	1997-95	●	1st <b>29</b> , 2nd <b>56</b>	107	
2997cc SOHC (J30A4, J30A5) 24 Valve	2007-04	●	6 point bolts 1st <b>29</b> , 2nd <b>29</b> again, 3rd <b>51</b> , 4th <b>51</b> again, 5th <b>72.3</b> , 6th <b>72.3</b> again	131	
2997cc SOHC (J30A4, J30A5) 24 Valve	2007-04	●	12 point bolts 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	131	
2997cc SOHC (J30A1, J30A4) 24 Valve	2003-98	●	1st <b>29</b> , 2nd <b>51</b> , 3rd <b>72.3</b>	131	
2997cc SOHC (JNA1) 24 Valve Hybrid	2007-05	●	6 point bolts 1st <b>29</b> , 2nd <b>29</b> again, 3rd <b>51</b> , 4th <b>51</b> again, 5th <b>72.3</b> , 6th <b>72.3</b> again	131	
2997cc SOHC (JNA1) 24 Valve Hybrid	2007-05	●	12 point bolts 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	131	
3165cc SOHC (6VD1) 24 Valve Isuzu	1997-96	●	M11 Bolts 1-8 <b>47</b> ; M8 Bolts 9-11 <b>15</b>	132	
3165cc SOHC (6VD1) 24 Valve Isuzu	1995-94	●	M11 Bolts 1-8 <b>47</b> ; M8 Bolts 9-10 <b>15</b>	160	
3165cc DOHC (6VD2) 24 Valve Isuzu	2002-98	●	1st <b>21</b> , 2nd <b>47</b>	134	
3471cc SOHC (J35A7, J35A8, J35A9, J35Z1) 24 Valve	2008-05	●	6 point bolts 1st <b>29</b> , 2nd <b>29</b> again, 3rd <b>51</b> , 4th <b>51</b> again, 5th <b>72.3</b> , 6th <b>72.3</b> again	131	
3471cc SOHC (J35A7, J35A8, J35A9, J35Z1) 24 Valve	2008-05	●	12 point bolts 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	131	
3471cc SOHC (J35A1, J35A4, J35A6) 24 Valve	2008-99	●	1st <b>29</b> , 2nd <b>29</b> again, 3rd <b>51</b> , 4th <b>51</b> again, 5th <b>72.3</b> , 6th <b>72.3</b> again	131	
<b>HUDSON.....SEE AMERICAN MOTORS</b>					
<b>HUMMER (1992-2001)..... SEE AM GENERAL</b>					
<b>HUMMER (2002-2008)..... SEE GM PRODUCTS</b>					
<b>HYUNDAI 4</b>					
1439cc SOHC (4G33) 8 Valve Mitsubishi	1987-83	●	Bolts 1-10 1st <b>25</b> , 2nd <b>51-54</b> ; Bolts 11 3rd <b>11-15</b>	38	
1468cc SOHC (G4AJ, G4DJ, G15B, 4G15) 8 Valve Mitsubishi	1994-86	●	Cold <b>51-54</b> , Hot <b>58-61</b>	81	
1494cc SOHC (G4EK) 12 Valve	2002-00	●○	1st <b>17-20</b> , 2nd turn 60-62 degrees, 3rd turn 60-62 degrees	147	<b>ES 71201</b>
1494cc SOHC (G4EK) 12 Valve	1999-93	●○	Cold <b>51-54</b> , Hot <b>58-61</b>	147	<b>ES 71201</b>
1494cc DOHC (G4FK) 16 Valve	1998-96	●○	Cold <b>51-54</b> , Hot <b>58-61</b>	147	<b>ES 71204</b>
1494cc SOHC Turbo (G4EK-T) 12 Valve	1995-93	●○	Cold <b>51-54</b> , Hot <b>58-61</b>	147	<b>ES 71201</b>
1595cc DOHC (G4CR) 16 Valve	1995-92	●	<b>76-83</b> in two steps	147	
1597cc SOHC (G32B, 4G32) 8 Valve Mitsubishi	1987-84	●	Bolts 1-10 1st <b>25</b> , 2nd <b>51-54</b> ; Bolts 11 3rd <b>11-15</b>	38	
1599cc DOHC (G4EC, G4ED) 16 Valve	2008-01	●○	1st <b>22</b> , 2nd turn 90 degrees, 3rd loosen all bolts, 4th <b>22</b> again, 5th turn 90 degrees	71	<b>ES 71203</b>





# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>HYUNDAI 4 (CONT.)</b>					
1796cc DOHC (G4GM) 16 Valve	1998-96	●	M10 bolts 1st <b>22</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees; M12 bolts 1st <b>26</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees	121	
1836cc DOHC (G4CN) 16 Valve	1995-93	●	<b>76-83</b> in two steps	147	
1975cc DOHC (G4GF) 16 Valve	2008-04	●	M10 bolts 1st <b>18</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees; M12 bolts 1st <b>22</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees	147	
1975cc DOHC (G4GF) 16 Valve	2003-99	●	M10 bolts 1st <b>22</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees; M12 bolts 1st <b>26</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees	121	
1975cc DOHC (G4GF) 16 Valve	1998-97	●	M10 bolts 1st <b>22</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees; M12 bolts 1st <b>26</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees	147	
1997cc SOHC (G63B) 8 Valve Mitsubishi	1988-87	●	Cold <b>65-72</b> , Warm <b>73-79</b>	71	
1997cc DOHC (G4CP) 16 Valve	1998-95	●○	Cold <b>65-72</b> in two steps	147	<b>ES 71177</b>
1997cc DOHC (G4CP) 16 Valve	1994-92	●○	<b>76-83</b> in two steps	147	<b>ES 71175</b>
2351cc SOHC (G4CS) 8 Valve Mitsubishi	1991-89	●	Cold <b>65-72</b> , Warm <b>73-79</b>	71	
2351cc DOHC (G4JS) 16 Valve	2006-99	●○	1st <b>46</b> , 2nd loosen all bolts, 3rd <b>14</b> , 4th turn 90 degrees, 5th turn 90 degrees	147	<b>ES 72211</b>
2359cc DOHC (G4KC) 16 Valve	2008-06	●	1st <b>25</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	147	

<b>HYUNDAI V6</b>					
2493cc DOHC (G6BV) 24 Valve	2001-99		Cold 1st <b>18</b> , 2nd turn 60-64 degrees, 3rd turn 45-49 degrees, 4th warm engine & allow to cool, 5th loosen all bolts, 6th <b>18</b> again, 7th turn 60-64 degrees, 8th turn 45-49 degrees	154	
2656cc DOHC (G6BA) 24 Valve	2008-04	●○	1st <b>18</b> , 2nd turn 60 degrees, 3rd turn 45 degrees	154	<b>ES 72205</b>
2656cc DOHC (G6BA) 24 Valve	2003-01	●○	Cold 1st <b>18</b> , 2nd turn 58-62 degrees, 3rd turn 43-47 degrees, 4th warm engine & allow to cool, 5th loosen all bolts, 6th <b>18</b> again, 7th turn 58-62 degrees, 8th turn 43-47 degrees	154	<b>ES 72205</b>
2972cc SOHC (G6AT) 12 Valve Mitsubishi	1998-93	●○	<b>76-83</b> in three steps	154	<b>ES 72859</b>
2972cc SOHC (G6AT) 12 Valve Mitsubishi	1992-90	●○	Cold <b>65-72</b> , Warm <b>72-80</b>	154	<b>ES 72859</b>
2972cc DOHC (G6CT) 24 Valve	2001		Cold 1st <b>75-82</b> in three steps, 2nd warm engine & allow to cool, 3rd loosen all bolts, 4th <b>75-82</b> in three steps again	154	
3342cc DOHC (G6DB) 24 Valve	2008-06		1st <b>29</b> , 2nd turn 120 degrees, 3rd turn 90 degrees, 4th single bolt <b>15</b>	154	
3497cc DOHC (G6CU) 24 Valve	2006-04	●○	<b>76-83</b> in three steps	154	<b>ES 72859</b>
3497cc DOHC (G6CU) 24 Valve	2003-02	●○	Cold 1st <b>75-82</b> in three steps, 2nd warm engine & allow to cool, 3rd loosen all bolts, 4th <b>75-82</b> in three steps again	154	<b>ES 72859</b>
3778cc DOHC (G6DA) 24 Valve	2008-06		1st <b>29</b> , 2nd turn 120 degrees, 3rd turn 90 degrees, 4th single bolt <b>15</b>	154	

● PermaTorque® Head Gasket available   ○ Head Bolt Set available



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>INFINITI 4</b>					
1998cc DOHC (SR20DE) 16 Valve	2002-99	●○	1st <b>29</b> , 2nd <b>58</b> , 3rd loosen all bolts, 4th <b>25-33</b> , 5th turn 90-95 degrees, 6th turn 90-95 degrees	109	<b>ES 72192</b>
1998cc DOHC (SR20DE) 16 Valve	1996-91	●○	1st <b>29</b> , 2nd <b>58</b> , 3rd loosen all bolts, 4th <b>25-33</b> , 5th turn 90-100 degrees, 6th turn 90-100 degrees	109	<b>ES 72192</b>
<b>INFINITI V6</b>					
2960cc SOHC (VG30E) 12 Valve	1992-90	●	1st <b>22</b> , 2nd <b>43</b> , 3rd loosen all bolts, 4th <b>22</b> again, 5th <b>40-47</b> ; <b>OR</b> turn 60-65 degrees	85	
2960cc DOHC (VG30DE) 24 Valve	1997-93	●	1st <b>29</b> , 2nd <b>90</b> , 3rd loosen all bolts, 4th <b>25-33</b> , 5th <b>90</b> ; <b>OR</b> turn 60-70 degrees	161	
2988cc DOHC (VQ30DE) 24 Valve	2001-96	●○	1st <b>72</b> , 2nd loosen all bolts, 3rd <b>25-33</b> , 4th turn 90-95 degrees, 5th turn 90-95 degrees	161	<b>ES 72900</b>
3274cc SOHC (VG33E) 12 Valve	2000-97	●○	1st <b>22</b> , 2nd <b>43</b> , 3rd loosen all bolts, 4th <b>7</b> , 5th <b>22</b> , 6th <b>40-47</b> ; <b>OR</b> turn 60-65 degrees	162	<b>ES 72194</b>
3498cc DOHC (VQ35HR) 24 Valve	2008-07		1st <b>77</b> , 2nd loosen all bolts, 3rd <b>29</b> , 4th turn 95 degrees, 5th turn 95 degrees	161	
3498cc DOHC (VQ35DE) 24 Valve	2008-01	●○	1st <b>72</b> , 2nd loosen all bolts, 3rd <b>25-33</b> , 4th turn 90-95 degrees, 5th turn 90-95 degrees	161	<b>ES 72900</b>
3696cc DOHC (VQ37VHR) 24 Valve	2008		1st <b>77</b> , 2nd loosen all bolts, 3rd <b>29</b> , 4th turn 95 degrees, 5th turn 95 degrees	161	

<b>INFINITI V8</b>					
4130cc DOHC (VH41DE) 32 Valve	2001-97		1st <b>22</b> , 2nd <b>69</b> , 3rd loosen all bolts, 4th <b>18-25</b> , 5th turn 90-95 degrees	110	
4494cc DOHC (VK45DE) 32 Valve	2008-02		1st <b>72</b> , 2nd loosen all bolts, 3rd <b>29-36</b> , 4th turn 60-65 degrees, 5th turn 60-65 degrees	203	
4494cc DOHC (VH45DE) 32 Valve	1996-90	●	1st <b>22</b> , 2nd <b>69</b> , 3rd loosen all bolts, 4th <b>18-25</b> , 5th <b>69-72</b> ; <b>OR</b> turn 90-95 degrees	110	
5552cc DOHC (VK56DE) 32 Valve	2008-04	●	1st <b>72</b> , 2nd loosen all bolts, 3rd <b>33</b> , 4th turn 60 degrees, 5th turn 60 degrees	203	

<b>INTERNATIONAL 4</b>					
90.8 (A55) Austin	1963-58		<b>45</b>	182	
152	1971-61	●	<b>90-100</b>	183	
152 Turbo	1967-65	●	<b>90-100</b>	183	
196 (3.2L)	1980-66	●	<b>90-100</b>	183	

<b>INTERNATIONAL 6</b>					
220	1968-50		<b>85-95</b>	184	
232 AMC	1972-69	●	<b>80-85</b>	2	
240	1970-56		<b>85-95</b>	184	
258 AMC	1974-73	●	<b>105</b> in three steps	2	
258 AMC	1972	●	<b>80-85</b>	2	
264	1970-58		<b>85-95</b>	184	

<b>INTERNATIONAL V8</b>					
266	1972-59	●	<b>90-100</b>	183	
304 (5.0L)	1980-60	●	<b>90-100</b>	183	
345 (5.6L)	1985-61	●	<b>90-100</b>	183	
392 (6.4L)	1985-66	●	<b>90-100</b>	183	
401 AMC	1974	●	1st <b>80</b> , 2nd <b>110</b>	1	
420 Diesel (6.9L) IDI	1990-85	●	1st <b>40</b> , 2nd <b>70</b> , 3rd <b>80</b> , 4th <b>87</b>	95	

● PermaTorque® Head Gasket available   ○ Head Bolt Set available



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
INTERNATIONAL V8 (CONT.)					
420 Diesel (6.9L) IDI	1984-80	●	1st <b>40</b> , 2nd <b>70</b> , 3rd <b>80</b> , 4th <b>80</b> again	95	
444 Diesel (7.3L) IDI	1993-91	●	1st <b>65</b> , 2nd <b>90</b> , 3rd <b>110</b> , 4th <b>110</b> again	95	
444 Diesel (7.3L) IDI	1990-88	●	1st <b>65</b> , 2nd <b>90</b> , 3rd <b>100</b>	95	
444 Turbo Diesel (7.3L) DI	1997-94	●○	1st <b>65</b> , 2nd <b>85</b> , 3rd <b>105</b> , 4th <b>105</b> again	156	ES 72161
444 Turbo Diesel (7.3L) IDI	1994-93	●	1st <b>65</b> , 2nd <b>90</b> , 3rd <b>110</b> , 4th <b>110</b> again	95	
ISO V8					
327 Chevrolet	1970-63	●○	<b>65</b>	7	ES 72856
ISUZU 4					
1471cc SOHC (4XC1) 8 Valve	1989-85	●	1st <b>29</b> , 2nd <b>58</b>	37	
1471cc SOHC Turbo (4XC1-T) 8 Valve	1989-87	●	1st <b>29</b> , 2nd <b>58</b>	37	
1588cc SOHC (4XE1V) 12 Valve	1993-90	●	1st <b>29</b> , 2nd <b>58</b>	37	
1588cc DOHC (4XE1W) 16 Valve	1992-89	●	1st <b>29</b> , 2nd <b>58</b>	100	
1588cc DOHC Turbo (4XE1W-T) 16 Valve	1992-90	●	1st <b>29</b> , 2nd <b>58</b>	100	
1808cc DOHC (4XF1) 16 Valve	1993-92	●	1st <b>29</b> , 2nd <b>58</b>	100	
1817cc SOHC (G180Z) 8 Valve	1985-81	●	<b>72</b>	37	
1817cc SOHC Diesel (4FB1) 8 Valve	1985-81	●	New bolts <b>98</b> ; Used bolts <b>105</b>	75	
1949cc SOHC (G200Z) 8 Valve	1987-83	●	1st <b>61</b> , 2nd <b>72</b>	37	
1994cc SOHC Turbo (4ZC1-T) 8 Valve	1989-85	●	1st <b>62</b> , 2nd <b>72</b>	12	
2156cc SOHC (F22B6) 16 Valve Honda	1997-96	●	1st <b>29</b> , 2nd <b>51</b> , 3rd <b>72.3</b>	108	
2189cc OHV (LN2) 8 Valve Chevrolet Truck	2001-98	●○	1st Long bolts <b>46</b> ; Short bolts <b>43</b> , 2nd all bolts turn 90 degrees	149	ES 72170
2189cc OHV (LN2) 8 Valve Chevrolet Truck	1997-96	●○	1st Long bolts <b>46</b> ; Short bolts <b>43</b> , 2nd all bolts turn 90 degrees	149	ES 72172
2198cc DOHC (X22SE) 16 Valve Opel	2003-98		1st <b>18</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees	109	
2238cc OHV Diesel (C223) 8 Valve	1987-81	●	1st <b>40-47</b> , 2nd <b>54-61</b>	76	
2238cc OHV Turbo Diesel (C223-T) 8 Valve	1987-86	●	1st <b>30-40</b> , 2nd turn 120-150 degrees	76	
2254cc SOHC (F23A7) 16 Valve Honda	1999-98	●	1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	108	
2254cc SOHC (4ZD1) 8 Valve	1995-86	●	1st <b>58</b> , 2nd <b>72</b>	79	
2559cc SOHC (4ZE1) 8 Valve	1997-88	●	1st <b>58</b> , 2nd <b>72</b>	79	
2770cc DOHC (VIN 8) 16 Valve Chevrolet Truck	2006	●○	Bolts 1-10 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 11 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 12-13 6th <b>5.1</b> , 7th turn 60 degrees	253	ES 72195
2921cc DOHC (VIN 9) 16 Valve Chevrolet Truck	2008-07		Bolts 1-10 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 11 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 12-13 6th <b>5.1</b> , 7th turn 60 degrees	253	
3856cc OHV Diesel (4BD1-N) 8 Valve	1988-85	●	1st <b>50</b> , 2nd <b>65</b> , 3rd turn 60-90 degrees	180	
3856cc OHV Turbo Diesel (4BD1-T, 4BD2-TC) 8 Valve	1998-85	●	1st <b>50</b> , 2nd <b>65</b> , 3rd turn 60-90 degrees	180	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
ISUZU 5					
3460cc DOHC (VIN 6) 20 Valve Chevrolet Truck	2006	●○	Bolts 1-12 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 13 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 14-15 6th <b>5.1</b> , 7th turn 60 degrees	254	ES 72195
3654cc DOHC (VIN E) 20 Valve Chevrolet Truck	2008-07		Bolts 1-12 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 13 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 14-15 6th <b>5.1</b> , 7th turn 60 degrees	254	
ISUZU 6 & V6					
2835cc OHV (LL2) 12 Valve Chevrolet Truck	1991-89	●○	1st <b>40</b> , 2nd turn 90 degrees	49	ES 72857
3136cc OHV (LG6) 12 Valve Chevrolet Truck	1994-91	●○	1st <b>40</b> , 2nd turn 90 degrees	49	ES 72901
3165cc SOHC (6VD1) 24 Valve	1997-96	●	M11 Bolts 1-8 <b>47</b> ; M8 Bolts 9-11 <b>15</b>	132	
3165cc SOHC (6VD1) 24 Valve	1995-92	●	M11 Bolts 1-8 <b>47</b> ; M8 Bolts 9-10 <b>15</b>	160	
3165cc DOHC (6VD2) 24 Valve	2004-98	●	1st <b>21</b> , 2nd <b>47</b>	134	
3165cc DOHC (6VD2) 24 Valve	1995-92	●	M11 Bolts 1-8 <b>47</b> ; M8 Bolts 9-10 <b>15</b>	160	
3494cc DOHC (6VE1) 24 Valve	2004-98	●	1st M11 Bolts 1-8 <b>21</b> , 2nd M11 Bolts 1-8 <b>47</b> , 3rd M8 Bolt 9 <b>15</b>	257	
4160cc DOHC (VIN S) 24 Valve Chevrolet Truck	2008-03	●○	Bolts 1-14 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 15 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 16-17 6th <b>5.1</b> , 7th turn 60 degrees	211	ES 72195
4293cc OHV (LB4, LF6) 12 Valve Chevrolet Truck	2001-97	●○	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	64	ES 74034
5785cc OHV Turbo Diesel (6BD1-T) 12 Valve	1995-87	●	1st <b>50</b> , 2nd <b>65</b> , 3rd turn 60-90 degrees	181	
ISUZU V8					
5328cc OHV (VIN M, P) Chevrolet Truck	2007-04 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
5328cc OHV (VIN P) Chevrolet Truck	2004-03 1st Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-8 turn 90 degrees, 4th M11 Bolts 9-10 turn 50 degrees, 5th M8 Bolts 11-15 <b>22</b>	159	ES 72173
5736cc OHV (CPC) Chevrolet Truck	2000-97	●○	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	7	ES 72856
5736cc OHV (CPC) Chevrolet Truck	1996	●○	1st <b>24</b> , 2nd <b>45</b> , 3rd <b>65</b>	7	ES 72856
5736cc OHV (CPC) Chevrolet Truck	1995-93	●○	<b>65</b> in three steps	7	ES 72856
JAGUAR V6					
2495cc DOHC (VIN D) 24 Valve Ford	2005-02 Duratec	●○	1st <b>22</b> , 2nd turn 90 degrees, 3rd loosen one turn, 4th <b>22</b> again, 5th turn 90 degrees, 6th turn 90 degrees	233	ES 72208
2967cc DOHC (VIN F) 24 Valve Ford	2008-00 Duratec	●○	1st <b>22</b> , 2nd turn 90 degrees, 3rd loosen one turn, 4th <b>22</b> again, 5th turn 90 degrees, 6th turn 90 degrees	233	ES 72208
JEEP 4					
122 DOHC (2.0L) 16 Valve Chrysler	2008 VIN 0 2nd Design Bolts		1st <b>25</b> , 2nd <b>54</b> , 3rd <b>54</b> again, 4th turn 90 degrees	71	
122 DOHC (2.0L) 16 Valve Chrysler	2008-07 VIN 0 1st Design Bolts		1st <b>25</b> , 2nd <b>45</b> , 3rd <b>45</b> again, 4th turn 90 degrees	71	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
JEEP 4 (CONT.)				
126 SOHC Turbo Diesel (2.1L) 8 Valve Renault	1990-85	1st 22, 2nd 37, 3rd 73.5	93	
134F F-Head	1973-50 Hurricane	65-70	30	
134L L-Head	1968-38 Lightning	65-70	30	
144 DOHC (2.4L) 16 Valve Chrysler	2008 VIN W 2nd Design Bolts	1st 25, 2nd 54, 3rd 54 again, 4th turn 90 degrees	71	
144 DOHC (2.4L) 16 Valve Chrysler	2008-07 VIN W 1st Design Bolts	1st 25, 2nd 45, 3rd 45 again, 4th turn 90 degrees	71	ES 71028
148 DOHC (2.4L) 16 Valve Dodge Truck	2006-05 VIN 1	1st 25, 2nd 60, 3rd 60 again, 4th turn 90 degrees	37	ES 71028
148 DOHC (2.4L) 16 Valve Dodge Truck	2004-02 VIN 1	1st 25, 2nd 50, 3rd 50 again, 4th turn 90 degrees	37	ES 71028
150 OHV (2.5L) AMC	2002-98	1st 22, 2nd 45, 3rd 45 again, 4th Bolts 1-6, 8-10 110; Bolt 7 100	151	ES 72896
150 OHV (2.5L) AMC	1997	1st 22, 2nd 45, 3rd Bolts 1-6, 8-10 110; Bolt 7 100	151	ES 72896
150 OHV (2.5L) AMC	1996-91	1st 22, 2nd 45, 3rd Bolts 1-6, 8-10 110; Bolt 7 100	151	
150 OHV (2.5L) AMC	1990-89	1st 22, 2nd 45, 3rd Bolts 1-7, 9-10 110; Bolt 8 100	72	
150 OHV (2.5L) AMC	1988-83	Bolts 1-7, 9-10 85; Bolt 8 75	72	
151 OHV (2.5L) Pontiac	1983-80	92 in three steps	37	
169 DOHC Turbo Diesel (2.8L) 16 Valve VM Motori	2006-05 VIN 5	1st Bolts 1-18 22, 2nd Bolts 1-10 turn 75 degrees, 3rd Bolts 11-18 turn 50 degrees, 4th Bolts 1-18 turn 75 degrees	258	
JEEP 6 & V6				
148L L-Head Willys	1951-47	60-65	185	
161F F-Head Willys	1955-52	60-65	186	
161L L-Head Willys	1955-50	60-65	185	
173 OHV (2.8L) 12 Valve Chevrolet Truck	1986-84 VIN W	70 in three steps	49	ES 72857
182 DOHC Turbo Diesel (3.0L) 24 Valve Mercedes-Benz	2008-07 VIN M	1st Bolts 1-8 44, 2nd Bolts 9-10 15, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 15 again, 5th Bolts 1-8 turn 90 degrees	242	
225 OHV Buick	1971-66	65-70	19	
226 SOHC (3.7L) 12 Valve Dodge Truck	2008-02	1st M11 Bolts 1-8 20, 2nd M11 Bolts 1-8 20 again, 3rd M8 Bolts 9-12 10, 4th M11 Bolts 1-8 turn 90 degrees, 5th M11 Bolts 1-8 turn 90 degrees, 6th M8 Bolts 9-12 19	204	ES 71129-1
226L L-Head Continental	1966-47	30-35	18	
230 SOHC Continental	1965-62 Tornado	80-95	47	
231 OHV (3.8L) 12 Valve Dodge Truck	2008-07	M11 Bolts 1-8 1st 45, 2nd 65, 3rd 65 again, 4th turn 90 degrees; M8 Bolt 9 5th 25 in three steps	215	ES 72163
232 OHV	1979-73	105 in three steps	9	
232 OHV	1972-65	80-85	2	
242 OHV (4.0L)	2006-96	1st 22, 2nd 45, 3rd 45 again, 4th Bolts 1-10, 12-14 110; Bolt 11 100	2	ES 71102
242 OHV (4.0L)	1995-91	1st 22, 2nd 45, 3rd 45 again, 4th Bolts 1-10, 12-14 110; Bolt 11 100	2	
242 OHV (4.0L)	1990-87	1st 22, 2nd 45, 3rd Bolts 1-13 110; Bolt 14 100	9	
258 OHV (4.2L)	1990-81	85 in three steps	9	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
JEEP 6 & V6 (CONT.)				
258 OHV (4.2L)	1980-73	105 in three steps	9	
258 OHV (4.2L)	1972-71	80-85	2	
JEEP V8				
287 SOHC (4.7L) 16 Valve Dodge Truck	2008	1st M11 Bolts 1-10 20, 2nd M11 Bolts 1-10 20 again, 3rd M8 Bolts 11-14 10, 4th M11 Bolts 1-10 turn 90 degrees, 5th M11 Bolts 1-10 turn 90 degrees, 6th M8 Bolts 11-14 19	163	ES 71129
287 SOHC (4.7L) 16 Valve Dodge Truck	2007-99	1st M11 Bolts 1-10 15, 2nd M11 Bolts 1-10 35, 3rd M8 Bolts 11-14 18, 4th M11 Bolts 1-10 turn 90 degrees, 5th M8 Bolts 11-14 22	163	ES 71129
304 (5.0L)	1981-71	1st 80, 2nd 110	1	
318 OHV (5.2L) Dodge Truck	1998-94	1st 50, 2nd 105, 3rd 105 again	12	ES 71038-1
318 OHV (5.2L) Dodge Truck	1993	1st 50, 2nd 105, 3rd 105 again	12	
327	1970-65 Vigilante	58-62	22	
345 Hemi (5.7L) 16 Valve Dodge Truck	2008-05	1st M12 Bolts 1-10 25, 2nd M8 Bolts 11-15 15, 3rd M12 Bolts 1-10 40, 4th M8 Bolts 11-15 15 again, 5th M12 Bolts 1-10 turn 90 degrees, 6th M8 Bolts 11-15 25	216	ES 72200
350 Buick	1971-68	65-75	4	
360 OHV (5.9L) Dodge Truck	1998	1st 50, 2nd 105, 3rd 105 again	12	ES 71038-1
360 (5.9L) AMC	1993-70	1st 80, 2nd 110	1	
370 Hemi (6.1L) 16 Valve Chrysler	2008-06	1st M12 Bolts 1-10 25, 2nd M8 Bolts 11-15 15, 3rd M12 Bolts 1-10 40, 4th M8 Bolts 11-15 15 again, 5th M12 Bolts 1-10 turn 90 degrees, 6th M8 Bolts 11-15 25	216	
401	1978-74	1st 80, 2nd 110	1	
JENSEN V8				
383 Chrysler	1972-68	70	11	
440 Chrysler	1976-72	70	11	
KAISER 4				
134L L-Head Jeep	1954-51	65-70	30	
KAISER 6				
161F F-Head Willys	1954	60-65	186	
161L L-Head Willys	1954-51	60-65	185	
226L L-Head Continental	1955-46	30-35	18	
KIA 4				
1493cc DOHC (B5) 16 Valve	2002-01	1st 36.1, 2nd loosen all bolts, 3rd 18, 4th turn 90 degrees, 5th turn 90 degrees	150	ES 72227
1594cc DOHC (B6) 16 Valve	2005-03	1st 36.1, 2nd loosen all bolts, 3rd 18, 4th turn 90 degrees, 5th turn 90 degrees	150	ES 72227
1597cc SOHC (B6) 8 Valve Mazda	1995-93	56-60 in three steps	150	
1597cc SOHC (B6) 16 Valve Mazda	1995	56-60 in three steps	150	
1597cc DOHC (B6-ZE) 16 Valve Mazda	1997-95	56-60 in three steps	150	
1599cc DOHC (G4ED) 16 Valve	2008-06	1st 22, 2nd turn 90 degrees, 3rd loosen all bolts, 4th 22 again, 5th turn 90 degrees	71	ES 71203



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>KIA 4 (CONT.)</b>					
1793cc DOHC (T8) 16 Valve	2004-98	●○	1st <b>36.1</b> , 2nd loosen all bolts, 3rd <b>28.9</b> , 4th turn 90 degrees, 5th turn 90 degrees	37	ES 72909
1839cc DOHC (BP-ZE) 16 Valve Mazda	1997-95	●○	<b>56-60</b> in three steps	150	ES 72909
1975cc DOHC (G4GF) 16 Valve	2008-04	●	M10 bolts 1st <b>18</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees; M12 bolts 1st <b>22</b> , 2nd turn 60-65 degrees, 3rd turn 60-65 degrees	147	
1998cc SOHC (FE) 8 Valve Mazda	1995	●	<b>59-64</b>	37	
1998cc DOHC (FED) 16 Valve Mazda	2002-95	●	<b>59-64</b>	37	
2351cc DOHC (G4JS) 16 Valve	2006-01	●○	1st <b>46</b> , 2nd loosen all bolts, 3rd <b>14</b> , 4th turn 90 degrees, 5th turn 90 degrees	147	ES 72211
2359cc DOHC (G4KC) 16 Valve	2008-06	●	1st <b>25</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	147	

<b>KIA V6</b>					
2493cc DOHC (G6BV) 24 Valve	2001		1st <b>18</b> , 2nd turn 60-64 degrees, 3rd turn 45-49 degrees	154	
2656cc DOHC (G6BA) 24 Valve	2008-02	●○	1st <b>18</b> , 2nd turn 60 degrees, 3rd turn 45 degrees	154	ES 72205
3342cc DOHC (G6DB) 24 Valve	2008		1st <b>29</b> , 2nd turn 120 degrees, 3rd turn 90 degrees, 4th single bolt <b>15</b>	154	
3497cc DOHC (G6CU) 24 Valve	2006-04	●○	<b>76-83</b> in three steps	154	ES 72859
3497cc DOHC (G6CU) 24 Valve	2003-02	●○	Cold 1st <b>75-82</b> in three steps, 2nd warm engine & allow to cool, 3rd loosen all bolts, 4th <b>75-82</b> in three steps again	154	ES 72859
3778cc DOHC (G6DA) 24 Valve	2008-06		1st <b>29</b> , 2nd turn 120 degrees, 3rd turn 90 degrees, 4th single bolt <b>15</b>	154	

<b>LaFORZA V8</b>					
302 (5.0L) Ford	2001-92	●○	Flanged Hex Head bolts: 1st <b>25-35</b> , 2nd <b>45-55</b> , 3rd turn 85-95 degrees	70	ES 72155
302 (5.0L) Ford	1992-89	●	Standard Hex Head bolts: Intake Side <b>80</b> , Exhaust Side <b>68</b>	70	
302 Supercharged (5.0L) Ford	2001-98	●○	Flanged Hex Head bolts: 1st <b>25-35</b> , 2nd <b>45-55</b> , 3rd turn 85-95 degrees	70	ES 72155

**LANCIA.....SEE FIAT**

<b>LAND ROVER 6 &amp; V6</b>					
3192cc DOHC (B6324S) 24 Valve Volvo	2008		1st <b>33</b> , 2nd <b>33</b> again, 3rd turn 90 degrees, 4th turn 180 degrees	252	
4015cc SOHC (F40) 12 Valve Ford Truck	2008-05	●○	1st M12 Bolts 1-8 <b>9</b> , 2nd M12 Bolts 1-8 <b>18</b> , 3rd M8 Bolts 9-10 <b>24</b> , 4th M12 Bolts 1-8 turn 90 degrees, 5th M12 Bolts 1-8 turn 90 degrees	218	ES 72171

<b>LAND ROVER V8</b>					
4398cc DOHC (M62B44) 32 Valve BMW	2005-03		1st <b>22.1</b> , 2nd turn 80 degrees, 3rd turn 80 degrees	137	

<b>LEXUS 6 &amp; V6</b>					
2499cc DOHC (4GRFSE) 24 Valve	2008-06		1st Bolts 1-8 <b>27</b> , 2nd Bolts 1-8 turn 90 degrees, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 <b>22</b>	262	
2507cc DOHC (2VZFE) 24 Valve	1991-90	●	1st 12 point bolts <b>25</b> , 2nd 12 point bolts turn 90 degrees, 3rd 12 point bolts turn 90 degrees, 4th recessed bolts <b>13</b>	112	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>LEXUS 6 &amp; V6 (CONT.)</b>					
2958cc DOHC (3VZFE) 24 Valve	1993-92	●	1st 12 point bolts <b>25</b> , 2nd 12 point bolts turn 90 degrees, 3rd 12 point bolts turn 90 degrees, 4th recessed bolts <b>13</b>	112	
2995cc DOHC (3GRFSE) 24 Valve	2006		1st Bolts 1-8 <b>27</b> , 2nd Bolts 1-8 turn 90 degrees, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 <b>22</b>	262	
2995cc DOHC (1MZFE) 24 Valve	2003-94		1st 12 point bolts <b>40</b> , 2nd 12 point bolts turn 90 degrees, 3rd recessed bolts <b>13</b>	120	ES 71036
2997cc DOHC (2JZGE) 24 Valve	2005-92	●○	1st <b>26</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	92	ES 72213
3311cc DOHC (3MZFE) 24 Valve	2006-04	●	1st 12 point bolts <b>40</b> , 2nd 12 point bolts turn 90 degrees, 3rd recessed bolts <b>13</b>	120	
3311cc DOHC (3MZFXE) 24 Valve Hybrid	2008-06	●	1st 12 point bolts <b>40</b> , 2nd 12 point bolts turn 90 degrees, 3rd recessed bolts <b>13</b>	120	
3456cc DOHC (2GRFE) 24 Valve	2008-07	●○	1st Bolts 1-8 <b>27</b> , 2nd Bolts 1-8 turn 90 degrees, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 <b>22</b>	262	ES 72249
3456cc DOHC (2GRFSE) 24 Valve	2008-06	●○	1st Bolts 1-8 <b>27</b> , 2nd Bolts 1-8 turn 90 degrees, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 <b>22</b>	262	ES 72249
3456cc DOHC (2GRFSE) 24 Valve Hybrid	2008-07	●○	1st Bolts 1-8 <b>27</b> , 2nd Bolts 1-8 turn 90 degrees, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 <b>22</b>	262	ES 72249
4476cc DOHC (1FZFE) 24 Valve	1997-96		1st <b>29</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	92	

<b>LEXUS V8</b>					
3968cc DOHC (1UZFE) 32 Valve	2000-98	●○	1st <b>29</b> , 2nd turn 90 degrees	164	ES 72202
3968cc DOHC (1UZFE) 32 Valve	1997-90	●	1st <b>29</b> , 2nd turn 90 degrees	164	
4293cc DOHC (3UZFE) 32 Valve	2008-01	●○	1st <b>44</b> , 2nd turn 90 degrees	205	ES 72202
4608cc DOHC (1URSFE) 32 Valve	2008-07		1st <b>27</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	236	
4663cc DOHC (2UZFE) 32 Valve	2008-05	●○	1st <b>30</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	164	ES 74035
4663cc DOHC (2UZFE) 32 Valve	2004-98	●○	1st <b>24</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	164	ES 74035
4968cc DOHC (2URSFE) 32 Valve Hybrid	2008-07		1st Bolts 1-10 <b>27</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees; 4th Bolts 11-12 <b>15</b>	263	
5663cc DOHC (3URFE) 32 Valve	2008		1st Bolts 1-10 <b>27</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees; 4th Bolts 11-12 <b>15</b>	264	

**LINCOLN .....SEE FORD PRODUCTS**

<b>LOTUS 4</b>					
948cc OHV Austin	1961-58		<b>40</b>	54	
1588cc DOHC Turbo (4XE1W-T) 16 Valve Isuzu	1993-90	●	1st <b>29</b> , 2nd <b>58</b>	100	
1796cc DOHC (2ZZGE) 16 Valve Toyota	2007-04	●○	1st <b>26</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	99	ES 71066



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>MARCOS 6</b>				
2980cc OHV (B30A) Volvo	1972-70	61-69	2	
<b>MAZDA 4</b>				
1272cc SOHC (TC) 8 Valve	1978-76	Cold 47-51, Warm 51-54	37	
1415cc SOHC (UC) 8 Valve	1980-79	Cold 47-51, Warm 51-54	149	
1489cc DOHC (Z5-DE) 16 Valve	1998-95	● 1st 13-16, 2nd turn 90 degrees, 3rd turn 90 degrees	150	
1490cc SOHC (D5) 8 Valve	1986-81	56-59	150	
1490cc SOHC (E5) 8 Valve	1986-81	● 56-59	150	
1586cc SOHC (NA) 8 Valve	1977-70	● 1st 20, 2nd 40, 3rd 56-60, 4th warm engine, 5th 69-72	37	
1597cc SOHC (B6) 8 Valve	1995-86	● 56-60 in three steps	150	
1597cc SOHC (B6) 16 Valve	1993-92	● 56-60 in three steps	150	
1597cc DOHC (ZM-DE) 16 Valve	2003-99	1st 13-16, 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	150	
1597cc DOHC (B6-ZE) 16 Valve	1996-90	● 56-60 in three steps	150	
1597cc DOHC Turbo (B6-T) 16 Valve	1989-88	● 56-60 in three steps	150	
1796cc SOHC (VB) 8 Valve	1978-77	● 1st 20, 2nd 40, 3rd 56-60, 4th warm engine, 5th 69-72	150	
1796cc SOHC (VB) 8 Valve	1973-72	● 1st 20, 2nd 40, 3rd 56-60, 4th warm engine, 5th 69-72	37	
1839cc SOHC (BP-ZD) 16 Valve	1996-90	● 56-60 in three steps	150	
1839cc DOHC (BP-Z3, BP-4W) 16 Valve	2005-99	● 56-60 in three steps	150	
1839cc DOHC (FP-ZE) 16 Valve	2001-99	● 1st 13-16, 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	150	
1839cc DOHC (BP-ZE) 16 Valve	1998-90	● 56-60 in three steps	150	
1839cc DOHC Turbo (BP-Z3T) 16 Valve	2005-04	● 56-60 in three steps	150	
1970cc SOHC (MA) 8 Valve	1984-82	● Cold 65-69, Warm 69-72	150	
1970cc SOHC (MA) 8 Valve	1981-79	● Cold 59-64, Warm 69-72	150	
1988cc DOHC (YF) 16 Valve Ford	2004-01 Zetec	●○ 1st 15, 2nd 30, 3rd turn 90 degrees	148	ES 72175
1991cc DOHC (FS-DE) 16 Valve	2003-98	● 1st 13-16, 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	150	
1991cc DOHC (FS-DE) 16 Valve	1997-93	●○ 1st 13-16, 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	150	ES 74020
1991cc DOHC Turbo (FS-DET) 16 Valve	2003	● 1st 13-16, 2nd turn 85-95 degrees, 3rd turn 85-95 degrees	150	
1998cc SOHC (FE, FEH1) 8 Valve	1987-83	● 59-64	37	
1998cc SOHC Turbo (FE-T, FEH5) 8 Valve	1987-86	● 59-64	37	
1998cc SOHC Diesel (RF) 8 Valve	1985-84	1st 21, 2nd turn 90 degrees, 3rd turn 90 degrees	150	
1999cc DOHC (LFD) 16 Valve Ford	2008-04 Duratec	●○ 1st 4, 2nd 11, 3rd 33, 4th turn 90 degrees, 5th turn 90 degrees	150	ES 72207
2184cc SOHC (F2G, F2L) 8 Valve	1993-87 Truck	● 59-64 in three steps	37	
2184cc SOHC (F2) 12 Valve	1992-88 Car	● 59-64 in three steps	37	
2184cc SOHC Turbo (F2-T) 12 Valve	1992-88 Car	● 59-64 in three steps	37	
2209cc OHV Diesel (S2) 8 Valve	1984-82	● 1st 25, 2nd 45, 3rd 80-85, 4th warm engine, 5th 80-85 again	91	
2261cc DOHC (MZR) 16 Valve Ford	2008-01 Duratec	●○ 1st 4, 2nd 11, 3rd 33, 4th turn 90 degrees, 5th turn 90 degrees	150	ES 72207
2261cc DOHC (MZR) 16 Valve Hybrid Ford	2008 Duratec	●○ 1st 4, 2nd 11, 3rd 33, 4th turn 90 degrees, 5th turn 90 degrees	150	ES 72207
2261cc DOHC Turbo (MZR-T) 16 Valve Ford	2008-06 Duratec	●○ 1st 4, 2nd 11, 3rd 33, 4th turn 90 degrees, 5th turn 90 degrees	150	ES 72207



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>MAZDA 4 (CONT.)</b>				
2302cc SOHC (8A) 8 Valve Ford	1997-94	●○ 1st 51, 2nd 51 again, 3rd turn 90-100 degrees	17	ES 72137
2503cc SOHC (VIN C) 8 Valve Ford	2001-98	●○ 1st 51, 2nd 51 again, 3rd turn 90-100 degrees	17	ES 72137
2555cc SOHC (AM1, G54B) 8 Valve Mitsubishi	1988-87	●○ Bolts 1-10 Cold 65-72, Warm 73-79; Bolts 11-12 11-15	105	ES 72860
2606cc SOHC (G6) 12 Valve	1994-89	● Bolts 1-10 59-64; Bolts 11-12 12-17	104	
<b>MAZDA V6</b>				
1844cc DOHC (K8-ZE) 24 Valve	1996-92	1st 17-19, 2nd turn 90 degrees, 3rd turn 90 degrees	123	
2254cc DOHC Supercharged (EJ) 24 Valve	2002-95	1st 17-19, 2nd turn 90 degrees, 3rd turn 90 degrees	154	
2495cc DOHC (GY) 24 Valve Ford	2001-00 Duratec	●○ 1st 28-31, 2nd turn 90 degrees, 3rd loosen one turn, 4th 28-31 again, 5th turn 90 degrees, 6th turn 90 degrees	140	ES 72159
2497cc DOHC (KL-ZE) 24 Valve	2002-93	● 1st 17-19, 2nd turn 90 degrees, 3rd turn 90 degrees	123	
2954cc SOHC (JE, JE-E) 18 Valve	1999-92	● 1st 13-16, 2nd turn 90 degrees, 3rd turn 90 degrees	123	
2954cc SOHC (JE, JE-06, JE-07, JE-39) 18 Valve	1991-88	● 1st 14, 2nd turn 90 degrees, 3rd turn 90 degrees	123	
2954cc DOHC (JE-ZE, JE-48) 24 Valve	1995-92	● 1st 13-16, 2nd turn 90 degrees, 3rd turn 90 degrees	123	
2954cc DOHC (JE-ZE, JE-27) 24 Valve	1991-90	● 1st 14, 2nd turn 90 degrees, 3rd turn 90 degrees	123	
2967cc DOHC (ADJ, AJ, MZI) 24 Valve Ford	2008-01 Duratec	●○ 1st 30, 2nd turn 90 degrees, 3rd loosen one turn, 4th 30 again, 5th turn 90 degrees, 6th turn 90 degrees	140	ES 72159
2982cc OHV (8U) 12 Valve Ford	2008-99	●○ 1st 36-39, 2nd loosen one turn, 3rd 20-24, 4th turn 85-95 degrees, 5th turn 85-95 degrees	141	ES 72136 ES 72174
2982cc OHV (8U) 12 Valve Ford	1998-94	●○ 1st 59, 2nd loosen one turn, 3rd 37, 4th 68	141	ES 72136 ES 72174
3496cc DOHC 24 Valve Ford	2007 Duratec	1st Bolts 1-8 15, 2nd Bolts 1-8 26, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees, 5th Bolts 1-8 turn 90 degrees, 6th Bolt 9 7.5	234	
3721cc DOHC 24 Valve Ford	2008 Duratec	1st Bolts 1-8 15, 2nd Bolts 1-8 26, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees, 5th Bolts 1-8 turn 90 degrees, 6th Bolt 9 7.5	234	
4015cc OHV (8X) 12 Valve Ford	2000-95	●○ 1st 23, 2nd 53, 3rd turn 90 degrees	217	ES 72794
4015cc OHV (ZZL, 8X) 12 Valve Ford	1994-91	●○ INSTALL HEAD BOLTS AND LOWER INTAKE BOLTS TOGETHER (TORQUE ALTERNATELY): Head bolts 1st 44, 2nd 59, 3rd turn 80-85 degrees; Lower intake bolts 1st 3-6, 2nd 6-11, 3rd 11-15, 4th 15-18	102	ES 72794
4015cc SOHC (VIN E) 12 Valve Ford	2008-05	●○ 1st M12 Bolts 1-8 9, 2nd M12 Bolts 1-8 18, 3rd M8 Bolts 9-10 24, 4th M12 Bolts 1-8 turn 90 degrees, 5th M12 Bolts 1-8 turn 90 degrees	218	ES 72171
4015cc SOHC (VIN E) 12 Valve Ford	2004-02	●○ 1st M12 Bolts 1-8 24, 2nd M8 Bolts 9-10 24, 3rd M12 Bolts 1-8 turn 80 degrees, 4th M12 Bolts 1-8 turn 80 degrees	218	ES 72171
4015cc SOHC (VIN E) 12 Valve Ford	2001	●○ 1st M12 Bolts 1-8 28, 2nd M8 Bolts 9-10 28, 3rd M12 Bolts 1-8 turn 90 degrees, 4th M12 Bolts 1-8 turn 90 degrees	218	ES 72171



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>MERCEDES-BENZ 4</b>				
<b>1796cc DOHC Supercharged (111.983) 16 Valve</b>	<b>2005-03</b>	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-14 <b>13</b> , 5th Bolts 11-14 turn 90 degrees	237	
<b>2199cc DOHC (111.961) 16 Valve</b>	<b>1996-94</b>	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-14 <b>13</b> , 5th Bolts 11-14 turn 90 degrees	237	
<b>2295cc DOHC (111.974) 16 Valve</b>	<b>1998-97</b> ●	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-14 <b>13</b> , 5th Bolts 11-14 turn 90 degrees	237	
<b>2295cc DOHC Supercharged (111.973, 111.975, 111.983) 16 Valve</b>	<b>2005-98</b>	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-14 <b>13</b> , 5th Bolts 11-14 turn 90 degrees	237	
<b>2298cc SOHC (102.985) 8 Valve</b>	<b>1993-91</b>	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-14 <b>21</b>	238	
<b>2298cc SOHC (102.961, 102.985) 8 Valve</b>	<b>1988-84</b> ●	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-14 <b>21</b>	238	

<b>MERCEDES-BENZ 5</b>				
<b>2686cc DOHC Turbo Diesel (602.984) 20 Valve</b>	<b>2007-02</b> ●○	1st Bolts 1-12 <b>12</b> , 2nd Bolts 13-14 <b>15</b> , 3rd Bolts 1-12 <b>45</b> , 4th Bolts 13-14 <b>15</b> again, 5th Bolts 1-12 turn 90 degrees, 6th Bolts 1-12 turn 90 degrees	255	<b>ES 71233</b>

<b>MERCEDES-BENZ 6 &amp; V6</b>				
<b>2496cc DOHC (272.920) 24 Valve</b>	<b>2007-06</b>	1st Bolts 1-8 <b>15</b> , 2nd Bolts 1-8 <b>30</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>12</b> , 6th Bolts 9-12 turn 90 degrees	239	
<b>2597cc SOHC (112.912, 112.916) 18 Valve</b>	<b>2005-01</b>	1st Bolts 1-8 <b>7.5</b> , 2nd Bolts 1-8 <b>22</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>15</b>	240	
<b>2599cc SOHC (103.940, 103.942) 12 Valve</b>	<b>1993-87</b> ●	1st <b>40</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	39	
<b>2799cc SOHC (112.920) 18 Valve</b>	<b>2000-98</b>	1st Bolts 1-8 <b>7.5</b> , 2nd Bolts 1-8 <b>22</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>15</b>	240	
<b>2799cc DOHC (104.941, 104.942, 104.961) 24 Valve</b>	<b>1997-93</b> ●	1st <b>40</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	39	
<b>2962cc SOHC (103.981, 103.983, 103.985) 12 Valve</b>	<b>1993-86</b> ●	1st <b>40</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	39	
<b>2962cc DOHC (104.980, 104.981) 24 Valve</b>	<b>1993-90</b>	1st <b>40</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	39	
<b>2987cc DOHC Turbo Diesel (642.920, 642.940) 24 Valve</b>	<b>2008-07 Bluetec</b>	1st Bolts 1-8 <b>44</b> , 2nd Bolts 9-10 <b>15</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 <b>15</b> again, 5th Bolts 1-8 turn 90 degrees	242	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>MERCEDES-BENZ 6 &amp; V6 (CONT.)</b>				
<b>2996cc DOHC (272.940, 272.941, 272.942) 24 Valve</b>	<b>2008-06</b>	1st Bolts 1-8 <b>15</b> , 2nd Bolts 1-8 <b>30</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>12</b> , 6th Bolts 9-12 turn 90 degrees	239	
<b>2996cc DOHC Diesel (606.912) 24 Valve</b>	<b>1997-94</b>	1st Bolts 1-26 <b>12</b> , 2nd Bolts 1-26 <b>26</b> , 3rd Bolts 1-26 turn 90 degrees, 4th wait 10 minutes, 5th Bolts 1-26 turn 90 degrees; 6th Bolts 27-30 <b>18</b>	243	
<b>2996cc DOHC Turbo Diesel (606.962) 24 Valve</b>	<b>1999-98</b>	1st Bolts 1-26 <b>12</b> , 2nd Bolts 1-26 <b>26</b> , 3rd Bolts 1-26 turn 90 degrees, 4th wait 10 minutes, 5th Bolts 1-26 turn 90 degrees; 6th Bolts 27-30 <b>18</b>	243	
<b>3199cc SOHC (112.946, 112.947, 112.953, 112.955) 18 Valve</b>	<b>2005-01</b>	1st Bolts 1-8 <b>7.5</b> , 2nd Bolts 1-8 <b>22</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>15</b>	240	
<b>3199cc SOHC (112.940, 112.941, 112.942) 18 Valve</b>	<b>2005-98</b>	1st Bolts 1-8 <b>7.5</b> , 2nd Bolts 1-8 <b>22</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>15</b>	240	
<b>3199cc DOHC (104.991, 104.994, 104.995) 24 Valve</b>	<b>1999-94</b> ●	1st <b>40</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	39	
<b>3199cc DOHC (104.990, 104.992) 24 Valve</b>	<b>1995-92</b> ●	1st <b>40</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	39	
<b>3199cc SOHC Supercharged (112.960) 18 Valve</b>	<b>2004-02</b>	1st Bolts 1-8 <b>7.5</b> , 2nd Bolts 1-8 <b>22</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>15</b>	240	
<b>3222cc DOHC Turbo Diesel (648.961) 24 Valve</b>	<b>2006-05</b>	1st Bolts 1-14 <b>12</b> , 2nd Bolts 15-16 <b>15</b> , 3rd Bolts 1-14 <b>45</b> , 4th Bolts 15-16 <b>15</b> again, 5th Bolts 1-14 turn 90 degrees, 6th Bolts 1-14 turn 90 degrees	244	
<b>3498cc DOHC (272.056, 272.087) 24 Valve</b>	<b>2008-06</b>	1st Bolts 1-8 <b>15</b> , 2nd Bolts 1-8 <b>30</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>12</b> , 6th Bolts 9-12 turn 90 degrees	239	
<b>3498cc DOHC (272.960) 24 Valve</b>	<b>2008-06</b>	1st Bolts 1-8 <b>15</b> , 2nd Bolts 1-8 <b>30</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>12</b> , 6th Bolts 9-12 turn 90 degrees	239	
<b>3498cc DOHC (272.963, 272.964, 272.967, 272.972) 24 Valve</b>	<b>2008-05</b>	1st Bolts 1-8 <b>15</b> , 2nd Bolts 1-8 <b>30</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>12</b> , 6th Bolts 9-12 turn 90 degrees	239	
<b>3606cc DOHC (104.941) 24 Valve</b>	<b>1997-95</b> ●	1st <b>40</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	39	
<b>3724cc SOHC (112.M37, 112.972) 18 Valve</b>	<b>2006-03</b>	1st Bolts 1-8 <b>7.5</b> , 2nd Bolts 1-8 <b>22</b> , 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees; 5th Bolts 9-12 <b>15</b>	240	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>MERCEDES-BENZ V8</b>				
4196cc SOHC (116.965) 16 Valve	1991-86	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-13 <b>18.5</b>	245	
4196cc DOHC (119.971, 119.975, 119.981) 32 Valve	1999-92 ●	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-13 <b>18.5</b>	245	
4266cc SOHC (113.941, 113.948) 24 Valve	2006-00	1st Bolts 1-10 <b>7.5</b> , 2nd Bolts 1-10 <b>22</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>15</b>	241	
4266cc SOHC (113.940, 113.942, 113.943, 113.944) 24 Valve	2003-98	1st Bolts 1-10 <b>7.5</b> , 2nd Bolts 1-10 <b>22</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>15</b>	241	
4663cc DOHC (273.923) 32 Valve	2008-07	1st Bolts 1-10 <b>15</b> , 2nd Bolts 1-10 <b>30</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>12</b> , 6th Bolts 11-14 turn 90 degrees	246	
4966cc SOHC (113.960, 113.961) 24 Valve	2008-99	1st Bolts 1-10 <b>7.5</b> , 2nd Bolts 1-10 <b>22</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>15</b>	241	
4966cc SOHC (113.965, 113.966, 113.969) 24 Valve	2006-02	1st Bolts 1-10 <b>7.5</b> , 2nd Bolts 1-10 <b>22</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>15</b>	241	
4973cc DOHC (119.970, 119.980, 119.982) 32 Valve	1999-92 ●	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-13 <b>18.5</b>	245	
4973cc DOHC (119.960, 119.972, 119.974) 32 Valve	1995-90 ●	1st Bolts 1-10 <b>40</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 11-13 <b>18.5</b>	245	
5439cc SOHC (113.982, 113.984, 113.988, 113.989) 24 Valve	2008-01	1st Bolts 1-10 <b>7.5</b> , 2nd Bolts 1-10 <b>22</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>15</b>	241	
5439cc SOHC (113.980, 113.981) 24 Valve	2003-99	1st Bolts 1-10 <b>7.5</b> , 2nd Bolts 1-10 <b>22</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>15</b>	241	
5439cc SOHC Supercharged (113.980, 113.982, 113.987, 113.992) 24 Valve	2008-03	1st Bolts 1-10 <b>7.5</b> , 2nd Bolts 1-10 <b>22</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>15</b>	241	
5439cc SOHC Supercharged (155.980) 24 Valve	2008-03	1st Bolts 1-10 <b>7.5</b> , 2nd Bolts 1-10 <b>22</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>15</b>	241	
5461cc DOHC (273.960, 273.961, 273.962) 32 Valve	2008-07	1st Bolts 1-10 <b>15</b> , 2nd Bolts 1-10 <b>30</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>12</b> , 6th Bolts 11-14 turn 90 degrees	246	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>MERCEDES-BENZ V8 (CONT.)</b>				
5461cc DOHC (273.965, 273.967) 32 Valve	2008-07	1st Bolts 1-10 <b>15</b> , 2nd Bolts 1-10 <b>30</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 11-14 <b>12</b> , 6th Bolts 11-14 turn 90 degrees	246	
6208cc DOHC (156.980, 156.982, 156.983, 156.984) 32 Valve	2008-07	1st Bolts 1-10 <b>7.5</b> , 2nd Bolts 1-10 <b>37</b> , 3rd Bolts 1-10 turn 90 degrees, 4th Bolts 1-10 turn 90 degrees; 5th Bolts 1-10 turn 90 degrees, 6th Bolts 11-14 <b>15</b>	241	
<b>MERCEDES-BENZ V12</b>				
5987cc DOHC (120.980, 120.981, 120.982, 120.983) 48 Valve	2002-92	1st <b>40</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	247	
<b>MERCURY .....SEE FORD PRODUCTS</b>				
<b>MERKUR .....SEE FORD PRODUCTS</b>				
<b>METROPOLITAN 4</b>				
1198cc OHV	1957-54	<b>45</b>	182	
1489cc OHV	1962-56	<b>45</b>	182	
<b>MG 4</b>				
948cc OHV	1962-61	<b>40</b>	54	
1098cc OHV	1968-62	<b>46</b>	54	
1275cc OHV	1974-67	<b>46</b> in three steps	54	
1489cc OHV	1961-54	<b>45</b>	182	
1493cc OHV	1979-75	<b>46</b> in three steps	42	
1588cc OHV	1961-59	<b>45</b>	182	
1622cc OHV	1968-61	<b>45</b>	182	
1798cc OHV	1981-61	<b>45-50</b> in three steps	55	
<b>MG V8</b>				
3528cc OHV	1977-75 ●	Bolts 1-10 <b>65-70</b> ; Bolts 11-14 <b>40-45</b>	24	
<b>MINI 4</b>				
1598cc SOHC (W10B16) 16 Valve BMW Tritec	2008-02	1st Bolts 1-10 <b>30</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 11-12 <b>21</b>	248	
1598cc SOHC Supercharged (W11B16) 16 Valve BMW Tritec	2008-02	1st Bolts 1-10 <b>30</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 11-12 <b>21</b>	248	
<b>MITSUBISHI 4</b>				
1468cc SOHC (G4DJ, 4G15) 8 Valve	1994-89 ●	<b>51-54</b> in three steps	81	
1468cc SOHC (G4AJ, G15B) 8 Valve	1989-85 ●	<b>51-54</b> in three steps	81	
1468cc SOHC (4G15) 12 Valve	2002-97 ●○	1st <b>36</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	<b>ES 71206</b>
1468cc SOHC (4G15) 12 Valve	1996-91 ●○	<b>53</b> in three steps	71	<b>ES 71206</b>
1595cc DOHC (4G61) 16 Valve	1992-90 ●	Cold <b>65-72</b> in three steps	81	
1595cc DOHC Turbo (4G61-T) 16 Valve	1989 ●	Cold <b>65-72</b> in three steps	81	
1597cc SOHC Turbo (G32B-T) 8 Valve	1988-85 ●	<b>51-54</b> in three steps	81	
1755cc SOHC (4G37) 8 Valve	1994-89 ●○	<b>53</b> in three steps	81	<b>ES 71174</b> <b>ES 71175</b>



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
MITSUBISHI 4 (CONT.)					
1795cc SOHC (G62B) 8 Valve	1983	●	Cold <b>65-72</b> , Warm <b>73-79</b>	71	
1795cc SOHC Turbo (G62B-T) 8 Valve	1988-84	●	Cold <b>65-72</b> , Warm <b>73-79</b>	71	
1834cc SOHC (4G93) 16 Valve	2002-97	●○	1st <b>54</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71209
1834cc SOHC (4G93) 16 Valve	1996-93	●○	1st <b>14.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	71	ES 71209
1834cc SOHC (4G93) 16 Valve	1992	●○	1st <b>54</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71209
1996cc DOHC (A588, 420A) 16 Valve Chrysler	1999-95	●○	1st Long bolts <b>25</b> ; Short bolts <b>20</b> , 2nd Long bolts <b>50</b> ; Short bolts <b>20</b> , 3rd Long bolts <b>50</b> ; Short bolts <b>20</b> , 4th all bolts turn 90 degrees	37	ES 72166
1997cc SOHC (4G63) 16 Valve	1993	●	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	
1997cc SOHC (G63B, 4G63) 8 Valve	1992-83	●	Cold <b>65-72</b> , Warm <b>73-79</b>	71	
1997cc DOHC (4G63) 16 Valve	1994-93	●○	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71175
1997cc DOHC (4G63) 16 Valve	1992-89	●○	Cold <b>65-72</b> , Warm <b>73-79</b>	81	ES 71175
1997cc DOHC Turbo (4G63-T) 16 Valve	1999-95	●○	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71177
1997cc DOHC Turbo (4G63-T) 16 Valve	1994-93	●○	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71175
1997cc DOHC Turbo (4G63-T) 16 Valve	1992-89	●○	Cold <b>65-72</b> , Warm <b>73-79</b>	81	ES 71175
1999cc SOHC (4G94) 16 Valve	2007-02	●	1st <b>54</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	
1999cc DOHC Turbo (4G94-T) 16 Valve	2007-03		1st <b>54</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	
2346cc SOHC Turbo Diesel (4D55-T) 8 Valve	1985-83	●	Cold <b>76-83</b> , Warm <b>84-90</b>	43	
2351cc SOHC (4G64) 8 Valve	1996-93	●	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	
2351cc SOHC (G64B, 4G64) 8 Valve	1992-85	●	Cold <b>65-72</b> , Warm <b>73-79</b>	71	
2351cc SOHC (4G64) 16 Valve	2005-00	●○	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	ES 71177
2351cc SOHC (4G64) 16 Valve	1999-93	●	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	
2351cc DOHC (4G64) 16 Valve	1997-94		1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	
2378cc SOHC (4G69) 16 Valve	2008-04	●	1st <b>58</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 90 degrees, 5th turn 90 degrees	71	
2555cc SOHC (G54B) 8 Valve	1989-83	●○	Bolts 1-10 Cold <b>65-72</b> , Warm <b>73-79</b> ; Bolts 11 <b>11-15</b>	38	ES 72860
2555cc SOHC Turbo (G54B-T) 8 Valve	1989-83	●○	Bolts 1-10 Cold <b>65-72</b> , Warm <b>73-79</b> ; Bolts 11 <b>11-15</b>	38	ES 72860
3907cc OHV Turbo Diesel (4D34-T, 4D34-T3) 8 Valve	1999-92	●	<b>145</b>	187	
MITSUBISHI V6					
2497cc SOHC (6G73) 24 Valve	1998	●○	Cold <b>80</b> in three steps	154	ES 72859
2497cc SOHC (6G73) 24 Valve	1997-95	●	Cold <b>80</b> in three steps	154	
2972cc SOHC (6G72) 12 Valve	1999-93	●○	1st <b>76-83</b> in three steps, 2nd loosen all bolts, 3rd <b>76-83</b> in three steps again	154	ES 72859
2972cc SOHC (6G72) 12 Valve	1992-88	●○	<b>65-72</b> in three steps	154	ES 72859



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
MITSUBISHI V6 (CONT.)					
2972cc SOHC (6G72) 24 Valve	2005-95	●○	1st <b>76-83</b> in three steps, 2nd loosen all bolts, 3rd <b>76-83</b> in three steps again	154	ES 72859
2972cc DOHC (6G72) 24 Valve	1999-93	●○	1st <b>76-83</b> in three steps, 2nd loosen all bolts, 3rd <b>76-83</b> in three steps again	154	ES 72859
2972cc DOHC (6G72) 24 Valve	1992-91	●○	<b>76-83</b> in three steps	154	ES 72859
2972cc DOHC Turbo (6G72-T) 24 Valve	1999-93	●○	1st <b>87-94</b> in three steps, 2nd loosen all bolts, 3rd <b>87-94</b> in three steps again	154	ES 72859
2972cc DOHC Turbo (6G72-T) 24 Valve	1992-91	●○	<b>87-94</b> in three steps	154	ES 72859
2998cc SOHC (6B31) 24 Valve	2008-07		1st <b>33</b> , 2nd turn 75 degrees, 3rd turn 75 degrees	154	
3497cc SOHC (6G74) 24 Valve	2005-97	●○	<b>76-83</b> in three steps	154	ES 72859
3497cc DOHC (6G74) 24 Valve	1996-94		<b>76-83</b> in three steps	154	
3704cc SOHC (VIN K) 12 Valve Dodge Truck	2008-06	●○	1st M11 Bolts 1-8 <b>20</b> , 2nd M11 Bolts 1-8 <b>20</b> again, 3rd M8 Bolts 9-12 <b>10</b> , 4th M11 Bolts 1-8 turn 90 degrees, 5th M11 Bolts 1-8 turn 90 degrees, 6th M8 Bolts 9-12 <b>19</b>	204	ES 71129-1
3828cc SOHC (6G75) 24 Valve	2008-03	●	<b>76-83</b> in three steps	154	
MITSUBISHI V8					
4703cc SOHC (VIN N) 16 Valve Dodge Truck	2008	●○	1st M11 Bolts 1-10 <b>20</b> , 2nd M11 Bolts 1-10 <b>20</b> again, 3rd M8 Bolts 11-14 <b>10</b> , 4th M11 Bolts 1-10 turn 90 degrees, 5th M11 Bolts 1-10 turn 90 degrees, 6th M8 Bolts 11-14 <b>19</b>	163	ES 71129
4703cc SOHC (VIN N) 16 Valve Dodge Truck	2007-06	●○	1st M11 Bolts 1-10 <b>15</b> , 2nd M11 Bolts 1-10 <b>35</b> , 3rd M8 Bolts 11-14 <b>18</b> , 4th M11 Bolts 1-10 turn 90 degrees, 5th M8 Bolts 11-14 <b>22</b>	163	ES 71129
MORGAN 4					
1597cc SOHC (8 Valve) Ford	1994-82	●○	1st <b>44</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	36	ES 72672
MORGAN V8					
3528cc OHV Rover	1971-68	●	Bolts 1-10 <b>65-70</b> ; Bolts 11-14 <b>40-45</b>	24	
MORRIS 4					
803cc OHV	1956-52		<b>40</b>	54	
948cc OHV	1962-56		<b>40</b>	54	
1098cc OHV	1971-62		<b>46</b>	54	
1489cc OHV	1961-54		<b>45</b>	182	
1622cc OHV	1971-61		<b>45</b>	182	
NASH .....SEE AMERICAN MOTORS					
NAVISTAR .....SEE INTERNATIONAL					
NISSAN 4					
988cc OHV (A10) 8 Valve	1971-65	●	<b>35</b>	40	
1171cc OHV (A12) 8 Valve	1973	●	<b>42</b>	40	
1171cc OHV (A12) 8 Valve	1972-71	●	<b>35</b>	40	
1237cc OHV (A12A) 8 Valve	1982-79	●	<b>53</b>	40	





# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
NISSAN 4 (CONT.)					
1288cc OHV (A13) 8 Valve	1974-72	●	53	40	
1397cc OHV (A14) 8 Valve	1982-75	●	53	40	
1487cc OHV (A15) 8 Valve	1982-79	●	53	40	
1487cc SOHC (E15) 8 Valve	1983-82	●	1st 29-33, 2nd 51-54	42	
1487cc SOHC Turbo (E15ET, E15T) 8 Valve	1984-83	●	1st 29-33, 2nd 51-54	42	
1595cc SOHC (L16) 8 Valve	1973-68	●	43	40	
1597cc SOHC (E16I, E16S) 8 Valve	1988-86	●○	1st 22, 2nd 51, 3rd loosen all bolts, 4th 22 again, 5th 51-54	42	ES 74024
1597cc SOHC (E16) 8 Valve	1987-83	●	1st 22, 2nd 51, 3rd loosen all bolts, 4th 22 again, 5th 51-54	42	
1597cc SOHC (GA16I) 12 Valve	1990-89	●○	1st Bolts 1-10 22, 2nd Bolts 1-10 47, 3rd loosen all bolts, 4th Bolts 1-10 22 again, 5th Bolt 1 turn 80-85 degrees; Bolts 2-10 turn 60-65 degrees, 6th Bolts 11-15 4.6-6.1	113	ES 74025
1597cc DOHC (GA16DE) 16 Valve	1999-91	●	1st Bolts 1-10 22, 2nd Bolts 1-10 43, 3rd loosen all bolts, 4th Bolts 1-10 22 again, 5th Bolts 1-10 turn 50-55 degrees, 6th Bolts 11-15 4.6-6.1	113	
1598cc DOHC (CA16DE) 16 Valve	1987	●	1st 22, 2nd 76, 3rd loosen all bolts, 4th 22 again, 5th 76	36	
1680cc SOHC Diesel (CD17) 8 Valve	1987-83		1st 43-51, 2nd 72-80	36	
1769cc DOHC (QG18DE) 16 Valve	2006-00	●○	1st Bolts 1-10 22, 2nd Bolts 1-10 43, 3rd loosen all bolts, 4th Bolts 1-10 22 again, 5th Bolts 1-10 turn 50-55 degrees, 6th Bolts 11-14 4.6-6.1	206	ES 72203
1770cc SOHC (L18) 8 Valve	1974-73	●	54	40	
1797cc DOHC (MR18DE) 16 Valve	2008-07		1st 30, 2nd turn 100 degrees, 3rd loosen all bolts, 4th 30 again, 5th turn 100 degrees, 6th turn 100 degrees	80	
1809cc DOHC (CA18DE) 16 Valve	1990-88	●	1st 22, 2nd 76, 3rd loosen all bolts, 4th 22 again, 5th 76	36	
1809cc SOHC Turbo (CA18ET) 8 Valve	1987-84	●○	1st 22, 2nd 58, 3rd loosen all bolts, 4th 22 again, 5th 54-61	79	ES 74023
1952cc SOHC (Z20) 8 Valve	1987-83	●	1st 22, 2nd 58, 3rd loosen all bolts, 4th 22 again, 5th 54-61	79	
1952cc SOHC (Z20E, Z20S) 8 Valve	1981-80	●	58	79	
1952cc SOHC (L20B) 8 Valve	1980-74	●	54	40	
1974cc SOHC (CA20E) 8 Valve	1989-84	●	1st 22, 2nd 58, 3rd loosen all bolts, 4th 22 again, 5th 54-61	79	
1974cc SOHC (CA20S) 8 Valve	1986-82	●	1st 22, 2nd 58, 3rd loosen all bolts, 4th 22 again, 5th 54-61	79	
1998cc DOHC (MR20DE) 16 Valve	2008-07		1st 30, 2nd turn 100 degrees, 3rd loosen all bolts, 4th 30 again, 5th turn 100 degrees, 6th turn 100 degrees	80	
1998cc DOHC (SR20DE) 16 Valve	2001-91	●○	1st 29, 2nd 58, 3rd loosen all bolts, 4th 25-33, 5th turn 90-95 degrees, 6th turn 90-95 degrees	109	ES 72192
2164cc OHV Diesel (SD22) 8 Valve	1983-81		Main bolts 87-108; Sub bolts 36-47	50	
2187cc SOHC (Z22E, Z22S) 8 Valve	1983-81	●	58	79	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
NISSAN 4 (CONT.)					
2389cc SOHC (Z24, Z24I, Z24S) 8 Valve	1990-83	●○	1st 22, 2nd 58, 3rd loosen all bolts, 4th 22 again, 5th 54-61	79	ES 74026
2389cc SOHC (KA24E) 12 Valve	1997-89	●○	1st 22, 2nd 58, 3rd loosen all bolts, 4th 22 again, 5th 54-61; OR turn 80-85 degrees	80	ES 74026
2389cc DOHC (KA24DE) 16 Valve	2004-98 Truck	●○	1st 22, 2nd 59, 3rd loosen all bolts, 4th 18-25, 5th turn 55-62; OR turn 86-91 degrees	80	ES 72231
2389cc DOHC (KA24DE) 16 Valve	2001-91 Car	●	1st 22, 2nd 59, 3rd loosen all bolts, 4th 18-25, 5th turn 55-62; OR turn 86-91 degrees	80	
2488cc DOHC (QR25DE) 16 Valve	2008-07 Car		1st 72, 2nd loosen all bolts, 3rd 29, 4th turn 75 degrees, 5th turn 75 degrees	80	
2488cc DOHC (QR25DE) 16 Valve	2006-04 Car	●○	1st 37, 2nd turn 60 degrees, 3rd loosen all bolts, 4th 32, 5th turn 75-80 degrees, 6th turn 75-80 degrees	80	ES 72198
2488cc DOHC (QR25DE) 16 Valve	2003-02 Car	●○	1st 72, 2nd loosen all bolts, 3rd 25-33, 4th turn 75-80 degrees, 5th turn 75-80 degrees	80	ES 72198
2488cc DOHC (QR25DE) 16 Valve	2008-05 Truck	●○	1st 37, 2nd turn 60 degrees, 3rd loosen all bolts, 4th 29, 5th turn 75 degrees, 6th turn 75 degrees	80	ES 72198
2488cc DOHC (QR25DE) 16 Valve Hybrid	2008-07 Car		1st 72, 2nd loosen all bolts, 3rd 29, 4th turn 75 degrees, 5th turn 75 degrees	80	
2488cc OHV Diesel (SD25) 8 Valve	1986-83	●	Main bolts 87-94; Sub bolts 33-40	50	
NISSAN 6 & V6					
2393cc SOHC (L24E) 12 Valve	1984-83	●	62	39	
2393cc SOHC (L24E) 12 Valve	1982-77	●	56	39	
2393cc SOHC (L24) 12 Valve	1973-70	●	54	39	
2565cc SOHC (L26) 12 Valve	1974	●	57	39	
2753cc SOHC (L28E) 12 Valve	1983	●	62	39	
2753cc SOHC (L28E) 12 Valve	1982-75	●	56	39	
2753cc SOHC Turbo (L28ET) 12 Valve	1983	●	62	39	
2753cc SOHC Turbo (L28ET) 12 Valve	1982-81	●	56	39	
2793cc SOHC Diesel (LD28) 12 Valve	1983-81		1st 29, 2nd 43, 3rd 87-94, 4th warm engine, 5th 87-94 again	9	
2960cc SOHC (V30E, VG30, VG30E, VG30I) 12 Valve	1998-84	●	1st 22, 2nd 43, 3rd loosen all bolts, 4th 22 again, 5th 40-47; OR turn 60-65 degrees	85	
2960cc DOHC (VG30D, VG30DE) 24 Valve	1996-92	●	1st 29, 2nd 90, 3rd loosen all bolts, 4th 25-33, 5th 90; OR turn 60-70 degrees	161	
2960cc DOHC (VG30D, VG30DE) 24 Valve	1991-90	●	1st 29, 2nd 90, 3rd loosen all bolts, 4th 25-33, 5th 90; OR turn 60-70 degrees	114	
2960cc DOHC (VE30DE) 24 Valve	1994-92		1st 29, 2nd 90, 3rd loosen all bolts, 4th 25-33, 5th 87-94	161	
2960cc SOHC Turbo (V30ET, VG30T) 12 Valve	1989-84	●	1st 22, 2nd 43, 3rd loosen all bolts, 4th 22 again, 5th 40-47; OR turn 60-65 degrees	85	
2960cc DOHC Turbo (VG30DETT, VG30DTT) 24 Valve	1996-92	●	1st 29, 2nd 90, 3rd loosen all bolts, 4th 25-33, 5th 90; OR turn 60-70 degrees	161	
2960cc DOHC Turbo (VG30DETT, VG30DTT) 24 Valve	1991-90	●	1st 29, 2nd 90, 3rd loosen all bolts, 4th 25-33, 5th 90; OR turn 60-70 degrees	114	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>NISSAN 6 &amp; V6 (CONT.)</b>					
2988cc DOHC (VQ30DE) 24 Valve	2001-95	●○	1st <b>72</b> , 2nd loosen all bolts, 3rd <b>25-33</b> , 4th turn 90-95 degrees, 5th turn 90-95 degrees	161	ES 72900
3274cc SOHC (VG33E) 12 Valve	2004-96	●○	1st <b>22</b> , 2nd <b>43</b> , 3rd loosen all bolts, 4th 7, 5th <b>22</b> , 6th <b>40-47</b> ; <b>OR</b> turn 60-65 degrees	162	ES 72194
3274cc SOHC Supercharged (VG33ER) 12 Valve	2004-01	●○	1st <b>22</b> , 2nd <b>43</b> , 3rd loosen all bolts, 4th 7, 5th <b>22</b> , 6th <b>40-47</b> ; <b>OR</b> turn 60-65 degrees	162	ES 72194
3498cc DOHC (VQ35HR) 24 Valve	2008-07		1st <b>77</b> , 2nd loosen all bolts, 3rd <b>29</b> , 4th turn 95 degrees, 5th turn 95 degrees	161	
3498cc DOHC (VQ35DE) 24 Valve	2008-01	●○	1st <b>72</b> , 2nd loosen all bolts, 3rd <b>25-33</b> , 4th turn 90-95 degrees, 5th turn 90-95 degrees	161	ES 72900
3954cc DOHC (VQ40DE) 24 Valve	2008-05	●	1st <b>72</b> , 2nd loosen all bolts, 3rd <b>25-33</b> , 4th turn 90-95 degrees, 5th turn 90-95 degrees	161	

<b>NISSAN V8</b>					
5552cc DOHC (VK56DE) 32 Valve	2008-04	●	1st <b>72</b> , 2nd loosen all bolts, 3rd <b>33</b> , 4th turn 60 degrees, 5th turn 60 degrees	203	

<b>OLDSMOBILE ..... SEE GM PRODUCTS</b>					

<b>OPEL 4</b>					
1817cc SOHC (G180Z) 8 Valve Isuzu	1979-76	●	1st <b>61</b> , 2nd <b>72</b>	37	
1897cc SOHC (1.9S) 8 Valve	1975-67	●	<b>72</b>	56	

<b>PACKARD L8 &amp; V8</b>					
288 L-Head	1954-48		<b>63</b>	191	
289 OHV	1958-57		<b>55-65</b>	170	
289 OHV Supercharged	1958-57		<b>55-65</b>	170	
320 OHV	1955		<b>60-65</b>	22	
327 L-Head	1954-48		<b>63</b>	191	
352 OHV	1956-55		<b>60-65</b>	22	
356 L-Head	1950-48		<b>63</b>	191	
359 L-Head	1954-53		<b>63</b>	191	
374 OHV	1956		<b>60-65</b>	22	

<b>PANOFZ V8</b>					
281 DOHC (4.6L) 32 Valve Ford	2007-99	●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd loosen one turn, 4th <b>27-32</b> again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	124	ES 72798
281 DOHC Supercharged (4.6L) 32 Valve Ford	2007-04	●○	1st <b>27-32</b> , 2nd turn 85-95 degrees, 3rd loosen one turn, 4th <b>27-32</b> again, 5th turn 85-95 degrees, 6th turn 85-95 degrees	124	ES 71173

<b>PEUGEOT 4</b>					
1905cc SOHC (XU-9J2) 8 Valve	1992-89		1st <b>44</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 300 degrees	149	
1905cc DOHC (XU-9J4) 16 Valve	1992-89		1st <b>44</b> , 2nd loosen all bolts, 3rd <b>15</b> , 4th turn 300 degrees	149	
1971cc OHV (XN-2, XN-6) 8 Valve	1987-80		1st <b>36</b> , PERFORM THE NEXT THREE STEPS ON EACH BOLT BEFORE MOVING TO NEXT BOLT IN SEQUENCE: 1) loosen completely, 2) <b>14</b> , 3) turn 90 degrees	37	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>PEUGEOT 4 (CONT.)</b>					
1971cc OHV (XN-1, XN-6) 8 Valve	1979-71		1st <b>43</b> , 2nd <b>60</b>	37	
2155cc SOHC Turbo (N9-T, N9-TE) 8 Valve Renault	1992-85		1st <b>36</b> , 2nd <b>62</b>	149	
2165cc SOHC (ZD-JL) 8 Valve Renault	1992-87		1st <b>37</b> , 2nd <b>59</b> , 3rd loosen all bolts, 4th <b>64-72</b>	149	
2304cc OHV Diesel (XD-2) 8 Valve	1983-77		1st <b>22</b> , 2nd <b>47</b> , 3rd loosen all bolts 90 degrees, 4th <b>22</b> again, 5th <b>47</b>	165	
2304cc OHV Turbo Diesel (XD-2S) 8 Valve	1986-81		1st <b>22</b> , 2nd <b>51</b> , 3rd loosen all bolts 90 degrees, 4th <b>22</b> again, 5th <b>51</b>	165	
2498cc OHV Turbo Diesel (XD-3T) 8 Valve	1988-85		1st <b>22</b> , 2nd <b>51</b> , 3rd loosen all bolts 90 degrees, 4th <b>22</b> again, 5th <b>51</b>	165	

<b>PEUGEOT V6</b>					
2664cc SOHC (ZM) 12 Valve	1978-77		1st 7, 2nd <b>22</b> , 3rd <b>44</b> , 4th loosen all bolts, 5th <b>11-14</b> , 6th turn 116-120 degrees, 7th warm engine & allow to cool, 8th loosen all bolts, 9th <b>11-14</b> again, 10th turn 113-117 degrees	52	
2849cc SOHC (ZN, ZN-3J) 12 Valve	1990-79		1st 7, 2nd <b>22</b> , 3rd <b>44</b> , 4th loosen all bolts, 5th <b>15</b> , 6th turn 106 degrees, 7th warm engine & allow to cool, 8th turn 45 degrees	52	

<b>PINNINFARINA ..... SEE FIAT</b>					

<b>PLYMOUTH ..... SEE CHRYSLER PRODUCTS</b>					

<b>PONTIAC ..... SEE GM PRODUCTS</b>					

<b>PORSCHE 4 &amp; H04</b>					
1679cc OHV Volkswagen	1973-70		<b>23</b> in three steps	166	
1795cc OHV Volkswagen	1975-74		<b>23</b> in three steps	166	
1970cc OHV Volkswagen	1976-73		<b>23</b> in three steps	166	
1984cc SOHC (8 Valve)	1982-77	●	1st <b>47</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	
1984cc SOHC Turbo (8 Valve)	1982-80		1st <b>47</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	
2479cc SOHC (8 Valve)	1988-83		1st <b>14</b> , 2nd <b>36</b> , 3rd <b>65</b>	17	
2479cc SOHC Turbo (8 Valve)	1988-86		1st <b>14</b> , 2nd <b>36</b> , 3rd <b>65</b>	17	

<b>PORSCHE H06 &amp; V6</b>					
3164cc OHV	1989-84		1st <b>11</b> , 2nd turn 90 degrees	167	
3189cc DOHC (24 Valve) Volkswagen	2007-04		1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	
3597cc DOHC (24 Valve) Volkswagen	2008-07		1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	

<b>PUMA H04</b>					
1584cc OHV Volkswagen	1982-81		1st <b>11</b> , 2nd <b>23</b>	166	

<b>RAMBLER.....SEE AMERICAN MOTORS</b>					

<b>RENAULT 4</b>					
1289cc OHV (810) 8 Valve	1979-68		1st <b>40</b> , 2nd warm engine & allow to cool, 3rd <b>45</b>	71	
1397cc OHV (C3J, 847) 8 Valve	1987-80	●	1st <b>41-44</b> , 2nd warm engine & allow to cool, 3rd loosen 180 degrees, 4th <b>41-44</b> again	149	
1565cc OHV Turbo (A7L) 8 Valve	1985-82		1st <b>30</b> , 2nd <b>57-61</b> , 3rd warm engine & allow to cool, 4th <b>57-61</b> again	149	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
RENAULT 4 (CONT.)					
1647cc OHV (841, 843) 8 Valve	1983-72		1st <b>30</b> , 2nd <b>57-61</b> , 3rd warm engine & allow to cool, 4th <b>57-61</b> again	149	
1721cc SOHC (F3N) 8 Valve	1987-85	●	1st <b>22</b> , 2nd <b>52</b> , 3rd loosen all bolts, 4th <b>15</b> , 5th turn 123 degrees	149	
1965cc SOHC (F3R) 8 Valve	1987	●	1st <b>22</b> , 2nd <b>52</b> , 3rd loosen all bolts, 4th <b>15</b> , 5th turn 123 degrees	149	
2165cc SOHC (J7T) 8 Valve	1989-84		1st <b>37</b> , 2nd <b>59</b> , 3rd loosen all bolts, 4th <b>64-72</b>	149	
RILEY 4					
1489cc OHV	1960-58		<b>45</b>	182	
ROVER V8					
3528cc OHV	1982-68	●	Bolts 1-10 <b>65-70</b> ; Bolts 11-14 <b>40-45</b>	24	
SAAB 4 & H04					
1985cc SOHC (B201, B201I) 8 Valve	1988-85	●	1st <b>44</b> , 2nd <b>66</b> , 3rd warm engine & allow to cool, 4th loosen all bolts, 5th <b>44</b> again, 6th <b>66</b> , 7th turn 90 degrees	151	
1985cc SOHC (B201, B201I) 8 Valve	1984-81	●	1st <b>45</b> , 2nd <b>65</b> , 3rd warm engine & allow to cool, 4th loosen all bolts, 5th <b>45</b> again, 6th <b>65</b> , 7th turn 90 degrees	151	
1985cc SOHC (B20, B201I) 8 Valve	1980-79		1st <b>44</b> , 2nd <b>70</b>	151	
1985cc SOHC (B20) 8 Valve	1978-72		1st <b>44</b> , 2nd 17mm bolts <b>70</b> ; 12mm & 15mm bolts <b>59</b> , 3rd warm engine & allow to cool, 4th loosen all bolts, 5th 17mm bolts <b>70</b> again; 12mm & 15mm bolts <b>59</b> again, 6th 12mm & 15mm bolts turn 90 degrees	151	
1985cc DOHC (B202I) 16 Valve	1990-86 900 Series	●	1st <b>45</b> , 2nd <b>63</b> , 3rd warm engine & allow to cool, 4th loosen all bolts, 5th <b>45</b> again, 6th <b>63</b> , 7th turn 90 degrees	151	
1985cc DOHC (B202I) 16 Valve	1990-87 9000 Series	●	1st <b>44</b> , 2nd <b>66</b> , 3rd warm engine & allow to cool, 4th loosen all bolts, 5th <b>44</b> again, 6th <b>66</b> , 7th turn 90 degrees	151	
1985cc SOHC Turbo (B201L) 8 Valve	1984-81	●	1st <b>45</b> , 2nd <b>65</b> , 3rd warm engine & allow to cool, 4th loosen all bolts, 5th <b>45</b> again, 6th <b>65</b> , 7th turn 90 degrees	151	
1985cc SOHC Turbo (B201L) 8 Valve	1980-78		1st <b>44</b> , 2nd <b>70</b>	151	
1985cc DOHC Turbo (B205L, B205R) 16 Valve	2003-99		1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees	151	
1985cc DOHC Turbo (B204L) 16 Valve	1998-94		1st <b>44</b> , 2nd <b>59</b> , 3rd turn 90 degrees	151	
1985cc DOHC Turbo (B202L) 16 Valve	1994-91 900 Series	●	1st <b>44</b> , 2nd <b>59</b> , 3rd turn 90 degrees	151	
1985cc DOHC Turbo (B202L) 16 Valve	1990-85 900 Series	●	1st <b>44</b> , 2nd <b>66</b> , 3rd warm engine & allow to cool, 4th loosen all bolts, 5th <b>44</b> again, 6th <b>66</b> , 7th turn 90 degrees	151	
1985cc DOHC Turbo (B202L) 16 Valve	1990-86 9000 Series	●	1st <b>44</b> , 2nd <b>66</b> , 3rd warm engine & allow to cool, 4th loosen all bolts, 5th <b>44</b> again, 6th <b>66</b> , 7th turn 90 degrees	151	
1994cc DOHC Turbo (EJ20T, EJ205) 16 Valve Subaru	2005		1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>29</b> , 6th turn 80-90 degrees, 7th turn 40-45 degrees, 8th Bolts 1-2 turn 40-45 degrees	125	
1998cc DOHC Turbo (B207L, B207R) 16 Valve Opel	2008-03		Bolts 1-10 1st <b>22</b> , 2nd turn 155 degrees; Bolts 11-14 3rd <b>26</b>	231	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
SAAB 4 & H04 (CONT.)					
2119cc DOHC (B212I) 16 Valve	1994-91		1st <b>44</b> , 2nd <b>59</b> , 3rd turn 90 degrees	151	
2290cc DOHC (B234I) 16 Valve	1998-90		1st <b>44</b> , 2nd <b>59</b> , 3rd turn 90 degrees	151	
2290cc DOHC Turbo (B235E, B235L, B235R) 16 Valve	2008-99		1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees	151	
2290cc DOHC Turbo (B234E, B234L, B234R) 16 Valve	1998-91		1st <b>44</b> , 2nd <b>59</b> , 3rd turn 90 degrees	151	
2457cc SOHC (EJ251, EJ253) 16 Valve Subaru	2006-05	●○	1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>31</b> , 6th turn 80-90 degrees, 7th turn 40-45 degrees, 8th Bolts 1-2 turn 40-45 degrees	125	ES 72212
2457cc DOHC Turbo (EJ25T, EJ255) 16 Valve Subaru	2006	●○	1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>36</b> , 6th turn 80-90 degrees, 7th turn 40-45 degrees, 8th Bolts 1-2 turn 40-45 degrees	125	ES 72212
SAAB 6 & V6					
2498cc DOHC (B258I) 24 Valve Opel	1997-94		1st <b>18.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees	49	
2792cc DOHC Turbo (B284L) 24 Valve Opel	2008-06		Right Head 1st <b>33</b> , 2nd turn 120 degrees; Left Head 1st Bolts 1-8 <b>33</b> , 2nd Bolts 1-8 turn 120 degrees, 3rd Bolts 9-10 <b>11</b> , 4th Bolts 9-10 turn 60 degrees	230	
2962cc DOHC (B308I) 24 Valve Opel	2000-95	●○	1st <b>18.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees	49	ES 72906
2962cc DOHC Turbo (B308E) 24 Valve Opel	2004-99	●○	1st <b>18.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees	49	ES 72906
4160cc DOHC (VIN S) 24 Valve Chevrolet Truck	2008-05	●○	Bolts 1-14 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 65 degrees; Bolt 15 4th <b>5.1</b> , 5th turn 120 degrees; Bolts 16-17 6th <b>5.1</b> , 7th turn 60 degrees	211	ES 72195
SAAB V8					
5328cc OHV (VIN M) 16 Valve Chevrolet Truck	2008-05 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
5967cc OHV (VIN H) 16 Valve Chevrolet Truck	2008 2nd Design Bolts	●○	1st M11 Bolts 1-10 <b>22</b> , 2nd M11 Bolts 1-10 turn 90 degrees, 3rd M11 Bolts 1-10 turn 70 degrees, 4th M8 Bolts 11-15 <b>22</b>	159	ES 72220
SATURN 4					
1796cc DOHC (1.8L) 16 Valve Opel	2008 Ecotec VIN 1		1st <b>18</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees, 5th turn 45 degrees	100	
1901cc SOHC (1.9L) 8 Valve	2002-91 VIN 8, 9	●○	1st <b>22</b> , 2nd <b>33</b> , 3rd turn 90 degrees	151	ES 72902
1901cc DOHC (1.9L) 16 Valve	2002-91 VIN 7	●○	1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees	151	ES 72903
1998cc DOHC Supercharged (2.0L) 16 Valve Opel	2007-04 Ecotec VIN P		Bolts 1-10 1st <b>22</b> , 2nd turn 155 degrees; Bolts 11-14 3rd <b>26</b>	231	
1998cc DOHC Turbo (2.0L) 16 Valve Opel	2008-07 Ecotec VIN X		Bolts 1-10 1st <b>22</b> , 2nd turn 155 degrees; Bolts 11-14 3rd <b>26</b>	231	
2198cc DOHC (2.2L) 16 Valve Opel	2007-00 Ecotec VIN D, F, 2	●○	Bolts 1-10 1st <b>22</b> , 2nd turn 155 degrees; Bolts 11-14 3rd <b>26</b>	199	ES 72196
2384cc DOHC (2.4L) 16 Valve Opel	2008-05 Ecotec VIN B, P		Bolts 1-10 1st <b>22</b> , 2nd turn 155 degrees; Bolts 11-14 3rd <b>26</b>	231	
2384cc DOHC (2.4L) 16 Valve Hybrid Opel	2008-07 Ecotec VIN Z, 5		Bolts 1-10 1st <b>22</b> , 2nd turn 155 degrees; Bolts 11-14 3rd <b>26</b>	231	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
SATURN V6				
2962cc DOHC (3.0L) 24 Valve Opel	2005-00 VIN B, R	●○	1st <b>18.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees, 5th turn 15 degrees	49 ES 72906
3471cc SOHC (3.5L) 24 Valve Honda	2007-06 VIN 4	●○	12 point bolts 1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees NOTE: New bolts turn additional 90 degrees	131 ES 72221
3471cc SOHC (3.5L) 24 Valve Honda	2005-04 VIN 4	●○	6 point bolts 1st <b>29</b> , 2nd <b>29</b> again, 3rd <b>51</b> , 4th <b>51</b> again, 5th <b>72.3</b> , 6th <b>72.3</b> again	131 ES 72221
3491cc OHV (3.5L) 12 Valve Chevrolet	2006-05 VIN L	●	1st <b>44</b> , 2nd turn 95 degrees	196
3510cc OHV (3.5L) 12 Valve Chevrolet	2008 VIN N	●○	1st <b>44</b> , 2nd turn 140 degrees	196 ES 72230
3510cc OHV (3.5L) 12 Valve Chevrolet	2007 VIN N	●○	1st <b>44</b> , 2nd turn 95 degrees	196 ES 72230
3564cc DOHC (3.6L) 24 Valve Opel	2008-07 VIN 7		Right Head 1st Bolts 1-8 <b>22</b> , 2nd Bolts 1-8 turn 150 degrees, 3rd Bolt 9 <b>11</b> , 4th Bolt 9 turn 75 degrees; Left Head 1st Bolts 1-8 <b>22</b> , 2nd Bolts 1-8 turn 150 degrees, 3rd Bolts 9-10 <b>11</b> , 4th Bolts 9-10 turn 75 degrees	260
3880cc OHV (3.9L) 12 Valve Chevrolet	2007-06 VIN W, 1	●○	1st <b>44</b> , 2nd turn 95 degrees	196 ES 72230
SCION 4				
1497cc DOHC (1NZFE) 16 Valve	2007-03	●○	1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	99 ES 72197 ES 72184
1798cc DOHC (2ZRFE) 16 Valve	2008		1st <b>36</b> , 2nd turn 90 degrees, 3rd turn 45 degrees	99
2362cc DOHC (2AZFE) 16 Valve	2008-05	●○	1st <b>58</b> , 2nd turn 90 degrees	71 ES 71183 ES 72899
SHELBY V8				
244 DOHC (4.0L) 32 Valve Oldsmobile	2000	●○	1st <b>30</b> , 2nd turn 70 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th M6 bolts <b>8.8</b>	198 ES 72187
244 DOHC (4.0L) 32 Valve Oldsmobile	1999	●○	1st <b>30</b> , 2nd turn 70 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th M6 bolts <b>8.8</b>	198 ES 72186
244 DOHC Supercharged (4.0L) 32 Valve Oldsmobile	2002-01	●○	1st <b>30</b> , 2nd turn 70 degrees, 3rd turn 60 degrees, 4th turn 60 degrees, 5th M6 bolts <b>8.8</b>	198 ES 72187
STERLING V6				
2494cc SOHC (C25A1) 24 Valve Honda	1988-87	●	1st <b>29</b> , 2nd <b>56</b>	89
2675cc SOHC (C27A1) 24 Valve Honda	1991-89	●	1st <b>29</b> , 2nd <b>56</b>	107
STUDEBAKER 6				
164.3 L-Head	1940-39		<b>52</b>	188
169.6 L-Head	1960-51		<b>46-50</b>	188
169.6 L-Head	1950-39		<b>52</b>	188
169.6 OHV	1964-61		<b>46-50</b>	189
185.6 L-Head	1960-55		<b>46-50</b>	188
194 OHV Chevrolet	1966-65	●	<b>95</b>	2
217.8 L-Head	1937-36		<b>80-85</b>	190
226.2 L-Head	1948-36		<b>80-85</b>	190
230 OHV Chevrolet	1966	●	<b>95</b>	2



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
STUDEBAKER 6 (CONT.)				
245.6 L-Head	1960-55		<b>55-65</b>	190
245.6 L-Head	1954-36		<b>80-85</b>	190
STUDEBAKER V8				
224 OHV	1955 Car		<b>46-50</b>	170
224 OHV	1956-55 Truck		<b>55-65</b>	170
232 OHV	1954-51		<b>46-50</b>	170
259 OHV	1964-56 Car		<b>55-65</b>	170
259 OHV	1955 Car		<b>46-50</b>	170
259 OHV	1964-55 Truck		<b>55-65</b>	170
283 OHV Chevrolet	1966-65	●○	<b>65</b>	7 ES 72856
289 OHV	1964-56		<b>55-65</b>	170
289 OHV Supercharged	1964-57		<b>55-65</b>	170
304 OHV	1964-63		<b>55-65</b>	170
304 OHV Supercharged	1964-63		<b>55-65</b>	170
352 OHV Packard	1956		<b>60-65</b>	22
SUBARU 3				
1189cc SOHC (EF12) 9 Valve	1994-89	●	1st <b>29</b> , 2nd <b>54</b> , 3rd loosen 90 degrees, 4th <b>54</b> again	116
1189cc SOHC (EF12) 9 Valve	1988-87	●	1st <b>29</b> , 2nd <b>43</b> , 3rd <b>51</b>	116
SUBARU H04				
1361cc OHV (EA63) 8 Valve	1976-73		Bolts 1-9 1st <b>14</b> , 2nd <b>25-29</b> , 3rd <b>37-43</b> ; Bolts 10-11 4th <b>6.5-8</b>	122
1595cc OHV (EA71) 8 Valve	1988-82	●	1st <b>22</b> , 2nd <b>43</b> , 3rd <b>47</b>	58
1595cc OHV (EA71) 8 Valve	1981-79	●	Bolts 1-9 1st <b>22</b> , 2nd <b>43</b> , 3rd <b>47</b> ; Bolts 10-11 4th <b>6.5-8</b>	122
1595cc OHV (EA71) 8 Valve	1978-76	●	Bolts 1-9 1st <b>14</b> , 2nd <b>25-29</b> , 3rd <b>37-43</b> ; Bolts 10-11 4th <b>6.5-8</b>	122
1781cc OHV (EA81) 8 Valve	1989-82	●	1st <b>22</b> , 2nd <b>43</b> , 3rd <b>47</b>	58
1781cc OHV (EA81) 8 Valve	1981-80	●	Bolts 1-9 1st <b>22</b> , 2nd <b>43</b> , 3rd <b>47</b> ; Bolts 10-11 4th <b>6.5-8</b>	122
1781cc SOHC (EA82) 8 Valve	1994-85	●	1st <b>22</b> , 2nd <b>43</b> , 3rd <b>47</b>	58
1781cc OHV Turbo (EA81T) 8 Valve	1984-83	●	1st <b>22</b> , 2nd <b>43</b> , 3rd <b>47</b>	58
1781cc SOHC Turbo (EA82T) 8 Valve	1990-85	●	1st <b>22</b> , 2nd <b>43</b> , 3rd <b>47</b>	58
1820cc SOHC (EJ18E) 16 Valve	1997-93	●	1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th Bolts 1-2 <b>25</b> , 6th Bolts 3-6 <b>11</b> , 7th all bolts turn 80-90 degrees, 8th all bolts turn 80-90 degrees	117
1994cc DOHC Turbo (EJ20T, EJ205) 16 Valve	2005-02		1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>29</b> , 6th turn 80-90 degrees, 7th turn 40-45 degrees, 8th Bolts 1-2 turn 40-45 degrees	125
2212cc SOHC (EJ22E, EJ22EZ, EJ222) 16 Valve	2001-90	●	1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th Bolts 1-2 <b>25</b> , 6th Bolts 3-6 <b>11</b> , 7th all bolts turn 80-90 degrees, 8th all bolts turn 80-90 degrees	125
2212cc SOHC Turbo (EJ22T) 16 Valve	1995-90	●	1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th Bolts 1-2 <b>27</b> , 6th Bolts 3-6 <b>14</b> , 7th all bolts turn 80-90 degrees, 8th all bolts turn 80-90 degrees	125



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>SUBARU H04 (CONT.)</b>					
2457cc SOHC (EJ251, EJ253) 16 Valve	2008-04	●○	1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>31</b> , 6th turn 80-90 degrees, 7th turn 40-45 degrees, 8th Bolts 1-2 turn 40-45 degrees	125	<b>ES 72212</b>
2457cc SOHC (EJ251, EJ252, EJ253) 16 Valve	2003-99	●○	1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th Bolts 1-2 <b>25</b> , 6th Bolts 3-6 <b>11</b> , 7th all bolts turn 80-90 degrees, 8th all bolts turn 80-90 degrees	125	<b>ES 72212</b>
2457cc DOHC (EJ25D) 16 Valve	1999-96	●○	1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th Bolts 1-2 <b>25</b> , 6th Bolts 3-6 <b>11</b> , 7th all bolts turn 80-90 degrees, 8th all bolts turn 80-90 degrees	125	<b>ES 72905</b>
2457cc DOHC Turbo (EJ25T, EJ255, EJ257) 16 Valve	2008-04	●○	1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>36</b> , 6th turn 80-90 degrees, 7th turn 40-45 degrees, 8th Bolts 1-2 turn 40-45 degrees	125	<b>ES 72212</b>

<b>SUBARU H06</b>					
2672cc SOHC (ER27) 12 Valve	1991-88	●	1st <b>29</b> , 2nd <b>47</b> , 3rd loosen 90 degrees, 4th <b>47</b> again	118	
2999cc DOHC (EZ30D) 24 Valve	2008-04		1st <b>14</b> , 2nd <b>37</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>14</b> , 6th Bolts 1-4 <b>35</b> , 7th Bolts 5-8 <b>33</b> , 8th Bolts 1-8 turn 90 degrees, 9th Bolts 1-4 turn 45 degrees	131	
2999cc DOHC (EZ30D) 24 Valve	2003-01		1st <b>15</b> , 2nd <b>37</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>18.5</b> , 6th <b>18.5</b> again, 7th turn 90 degrees, 8th Bolts 1-4 turn 90 degrees, 9th Bolts 5-8 turn 45 degrees	116	
3318cc DOHC (EG33D) 24 Valve	1997-92		1st <b>22</b> , 2nd <b>51</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>20</b> , 6th Bolts 1-4 <b>33</b> , 7th Bolts 1-4 turn 80-90 degrees, 8th Bolts 5-8 <b>33</b> , 9th Bolts 5-8 turn 80-90 degrees	219	
3630cc DOHC (EZ36D) 24 Valve	2008		1st <b>14</b> , 2nd <b>37</b> , 3rd loosen 180 degrees, 4th loosen 180 degrees, 5th <b>14</b> , 6th Bolts 1-4 <b>35</b> , 7th Bolts 5-8 <b>33</b> , 8th Bolts 1-8 turn 90 degrees, 9th Bolts 1-4 turn 45 degrees	131	

<b>SUNBEAM V8</b>					
260 Ford	1967-64	●	<b>65-70</b>	70	
289 Ford	1968-64	●	<b>65-70</b>	70	

<b>SUZUKI 3</b>					
993cc SOHC (G10) 6 Valve	1994-92	●○	<b>54</b> in three steps	142	<b>ES 74021</b>
993cc SOHC (G10) 6 Valve	1988-85	●○	<b>46-50</b> in three steps	142	<b>ES 74015</b>
993cc SOHC Turbo (G10-T) 6 Valve	1988-85	●○	<b>46-50</b> in three steps	142	<b>ES 74015</b>

<b>SUZUKI 4</b>					
1298cc DOHC (G13B) 16 Valve	1994-89	●	<b>47-50</b> in three steps	119	
1324cc SOHC (SW413) 16 Valve	2001-98 Car	●	<b>49</b> in three steps	110	
1324cc SOHC (G13A) 8 Valve	1997-89 Car	●	<b>51-54</b> in three steps	59	
1324cc SOHC (G13A) 8 Valve	1995-89 Truck	●	<b>51-54</b> in three steps	59	
1324cc SOHC (G13A) 8 Valve	1988-85 Truck	●	<b>46-50</b> in three steps	59	
1590cc SOHC (G16KC) 8 Valve	1995-89	●	<b>51-54</b> in three steps	59	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
<b>SUZUKI 4 (CONT.)</b>					
1590cc SOHC (G16KV) 16 Valve	2002-00 Car	●	1st <b>26</b> , 2nd <b>41</b> , 3rd loosen all bolts, 4th <b>26</b> again, 5th <b>52</b>	110	
1590cc SOHC (G16KV) 16 Valve	1999-92 Car	●	<b>49</b> in three steps	110	
1590cc SOHC (G16KV) 16 Valve	2001-99 Truck	●	1st <b>26</b> , 2nd <b>41</b> , 3rd loosen all bolts, 4th <b>26</b> again, 5th <b>52</b>	110	
1590cc SOHC (G16KV) 16 Valve	1998-92 Truck	●	1st <b>26</b> , 2nd <b>41</b> , 3rd <b>52</b>	110	
1788cc DOHC (SY418) 16 Valve	2002-99 Car		Bolts 1-10 1st <b>38.5</b> , 2nd <b>61</b> , 3rd loosen all bolts, 4th <b>27</b> , 5th <b>76</b> ; Bolt 11 6th <b>8</b>	207	
1788cc DOHC (G18KV) 16 Valve	1998-96 Truck		Bolts 1-10 1st <b>38.5</b> , 2nd <b>61</b> , 3rd loosen all bolts, 4th <b>27</b> , 5th <b>76</b> ; Bolt 11 6th <b>8</b>	207	
1995cc DOHC (J20A) 16 Valve	2008-07		Bolts 1-10 1st <b>38.5</b> , 2nd <b>61</b> , 3rd loosen all bolts, 4th <b>38.5</b> again, 5th <b>76</b> ; Bolt 11 6th <b>8</b>	207	
1995cc DOHC (J20A) 16 Valve	2004-99	●○	Bolts 1-10 1st <b>38.5</b> , 2nd <b>61</b> , 3rd loosen all bolts, 4th <b>38.5</b> again, 5th <b>76</b> ; Bolt 11 6th <b>8</b>	207	<b>ES 72206</b>
1998cc DOHC (A20DMS) 16 Valve Opel	2008-04	●	1st <b>18</b> , 2nd turn 90 degrees, 3rd turn 90 degrees, 4th turn 90 degrees	100	
2290cc DOHC (J23A) 16 Valve	2007-04	●○	Bolts 1-10 1st <b>38.5</b> , 2nd <b>61</b> , 3rd loosen all bolts, 4th <b>38.5</b> again, 5th <b>76</b> ; Bolt 11 6th <b>8</b>	207	<b>ES 72206</b>

<b>SUZUKI 6 &amp; V6</b>					
2492cc DOHC (RP625) 24 Valve Daewoo	2006-04		1st <b>15</b> , 2nd <b>18</b> , 3rd turn 70 degrees, 4th turn 70 degrees	39	
2492cc DOHC (H25A) 24 Valve	2005-99		Bolts 1-8 1st <b>38.5</b> , 2nd <b>61</b> , 3rd loosen all bolts, 4th <b>38.5</b> again, 5th <b>76</b> ; Bolt 9 6th <b>8</b>	212	
2736cc DOHC (H27A) 24 Valve	2008-01		Bolts 1-8 1st <b>38.5</b> , 2nd <b>61</b> , 3rd loosen all bolts, 4th <b>38.5</b> again, 5th <b>76</b> ; Bolt 9 6th <b>8</b>	212	
3564cc DOHC (N36A) 24 Valve Opel	2008-07		Right Head 1st Bolts 1-8 <b>22</b> , 2nd Bolts 1-8 turn 150 degrees, 3rd Bolt 9 <b>11</b> , 4th Bolt 9 turn 75 degrees; Left Head 1st Bolts 1-8 <b>22</b> , 2nd Bolts 1-8 turn 150 degrees, 3rd Bolts 9-10 <b>11</b> , 4th Bolts 9-10 turn 75 degrees	260	

<b>TOYOTA 4</b>					
1077cc OHV (KC) 8 Valve	1969-68		<b>39-48</b>	71	
1166cc OHV (3KC) 8 Valve	1979-69		<b>39-48</b>	71	
1290cc OHV (4KC, 4KE) 8 Valve	1984-81	●	<b>40-47</b>	71	
1452cc SOHC (1AC, 3AC) 8 Valve	1988-80	●	<b>40-47</b>	71	
1456cc SOHC (3EE) 12 Valve	1994-90	●○	1st <b>22</b> , 2nd <b>36</b> , 3rd turn 90 degrees	80	<b>ES 74027</b>
1456cc SOHC (3E) 12 Valve	1990-87	●	1st <b>22</b> , 2nd <b>36</b> , 3rd turn 90 degrees	80	
1497cc DOHC (1NZFE) 16 Valve	2008-00	●○	1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	99	<b>ES 72197</b> <b>ES 72184</b>
1497cc DOHC (1NZFXE) 16 Valve Hybrid	2008-01	●○	1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	99	<b>ES 72197</b> <b>ES 72184</b>
1497cc DOHC (5EFE) 16 Valve	1999-92	●○	1st <b>33</b> , 2nd turn 90 degrees	71	<b>ES 72181</b> <b>ES 72184</b>
1587cc SOHC (4AC, 4ALC) 8 Valve	1988-83	●	<b>40-47</b>	71	
1587cc DOHC (4AF) 16 Valve	1989-88	●	<b>40-47</b>	99	
1587cc DOHC (4AFE) 16 Valve	1997-93	●	1st <b>22</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	71	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
TOYOTA 4 (CONT.)					
1587cc DOHC (4AFE) 16 Valve	1992-90	●	44 in three steps	99	
1587cc DOHC (4AFE) 16 Valve	1989-88	●	40-47	99	
1587cc DOHC (4AGE) 16 Valve	1991-88	●	1st 22, 2nd turn 90 degrees, 3rd turn 90 degrees	121	
1587cc DOHC (4AGEC) 16 Valve	1987-85	●	40-47	121	
1587cc DOHC (4AGELC) 16 Valve	1989-85	●	44 in three steps	121	
1587cc DOHC Supercharged (4AGZE) 16 Valve	1989-88	●	1st 22, 2nd turn 90 degrees, 3rd turn 90 degrees	121	
1588cc OHV (2T, 2TC) 8 Valve	1979-71	●	62-68	80	
1762cc DOHC (7AFE) 16 Valve	1997-93	●	1st 22, 2nd turn 90 degrees, 3rd turn 90 degrees	71	
1770cc OHV (3TC) 8 Valve	1982-80	●	62-68	80	
1794cc DOHC (1ZZFE) 16 Valve	2008-98	●○	1st 36, 2nd turn 90 degrees	99	ES 71066
1796cc DOHC (2ZZGE) 16 Valve	2006-00	●○	1st 26, 2nd turn 90 degrees, 3rd turn 90 degrees	99	ES 71066
1839cc SOHC Diesel (1CLC) 8 Valve	1985-84		62 in three steps	46	
1839cc SOHC Turbo Diesel (1CTL) 8 Valve	1986-84		62 in three steps	46	
1858cc SOHC (8R, 8RC) 8 Valve	1971-69	●	75-85	59	
1968cc SOHC (18RC) 8 Valve	1974-72	●	75-85	59	
1974cc SOHC Turbo Diesel (2CTL) 8 Valve	1986		1st 33, 2nd turn 90 degrees, 3rd turn 90 degrees	46	
1995cc SOHC (2SEL) 8 Valve	1986-83	●	47 in three steps	71	
1998cc OHV (3YEC) 8 Valve	1985-84	●	14mm bolts 65; 12mm bolts 14	86	
1998cc DOHC (1AZFE) 16 Valve	2003-01	●○	1st 36, 2nd turn 90 degrees, 3rd turn 90 degrees	71	ES 71183 ES 72899
1998cc DOHC (3SFE) 16 Valve	2000-96	●○	1st 36, 2nd turn 90 degrees, 3rd turn 90 degrees	71	ES 72154 ES 72183
1998cc DOHC (3SFE) 16 Valve	1992-90	●○	1st 36, 2nd turn 90 degrees	71	ES 72154 ES 72183
1998cc DOHC (3SFE) 16 Valve	1989-87	●○	47 in three steps	71	ES 74032
1998cc DOHC (3SGEL) 16 Valve	1989-86	●	40 in three steps	71	
1998cc DOHC Turbo (3SGTE) 16 Valve	1995-90	●	1st 36, 2nd turn 90 degrees	71	
1998cc DOHC Turbo (3SGTE) 16 Valve	1989-88	●	40 in three steps	71	
2164cc DOHC (5SFE, 5SNFE) 16 Valve	2001-90	●○	1st 36, 2nd turn 90 degrees	71	ES 72154 ES 72183
2188cc SOHC Diesel (L) 8 Valve	1983-81	●	84-90 in three steps	46	
2189cc SOHC (20R) 8 Valve	1980-75	●	53-63 in three steps	53	
2237cc OHV (4YEC) 8 Valve	1990-86	●	14mm bolts 65; 12mm bolts 14	86	
2362cc DOHC (2AZFE) 16 Valve	2008-07 Camry, Solara	●○	1st 52, 2nd turn 90 degrees	71	ES 71183 ES 72899
2362cc DOHC (2AZFE) 16 Valve	2006-02 Camry, Solara	●○	1st 58, 2nd turn 90 degrees	99	ES 71183 ES 72899
2362cc DOHC (2AZFE) 16 Valve	2008-06 RAV4	●○	1st 52, 2nd turn 90 degrees	71	ES 71183 ES 72899
2362cc DOHC (2AZFE) 16 Valve	2005-04 RAV4	●○	1st 58, 2nd turn 90 degrees	99	ES 71183 ES 72899
2362cc DOHC (2AZFE) 16 Valve	2007-01 Highlander	●○	1st 58, 2nd turn 90 degrees	99	ES 71183 ES 72899
2362cc DOHC (2AZFXE) 16 Valve Hybrid	2008-07	●○	1st 52, 2nd turn 90 degrees	71	ES 71183 ES 72899
2366cc SOHC (22R, 22RE, 22REC) 8 Valve	1995-87	●○	58 in three steps	81	ES 71178
2366cc SOHC (22R, 22REC) 8 Valve	1986-81	●	58 in three steps	81	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
TOYOTA 4 (CONT.)					
2366cc SOHC Turbo (22RTEC) 8 Valve	1989-87	●○	58 in three steps	81	ES 71178
2366cc SOHC Turbo (22RTEC) 8 Valve	1986-85	●	58 in three steps	81	
2438cc DOHC (2RZFE) 16 Valve	2004-95	●○	1st 29, 2nd turn 90 degrees, 3rd turn 90 degrees	71	ES 72182
2438cc DOHC (2TZFE) 16 Valve	1996-91	●	1st 29, 2nd turn 90 degrees, 3rd turn 90 degrees	71	
2438cc DOHC Supercharged (2TZFE) 16 Valve	1997-94	●	1st 29, 2nd turn 90 degrees, 3rd turn 90 degrees	71	
2446cc SOHC Diesel (2L) 8 Valve	1987-84	●	84-90 in three steps	46	
2446cc SOHC Turbo Diesel (2LT) 8 Valve	1987-84	●	84-90 in three steps	46	
2693cc DOHC (2TRFE) 16 Valve	2008-05		1st 29, 2nd turn 90 degrees, 3rd turn 90 degrees	71	
2693cc DOHC (3RZFE) 16 Valve	2004-94	●○	1st 29, 2nd turn 90 degrees, 3rd turn 90 degrees	71	ES 72182
TOYOTA 6 & V6					
2253cc SOHC (2M) 12 Valve	1972-67		12mm bolts 54-61; 8mm bolts 11-16	83	
2507cc DOHC (2VZFE) 24 Valve	1992-88	●	1st 12 point bolts 25, 2nd 12 point bolts turn 90 degrees, 3rd 12 point bolts turn 90 degrees, 4th recessed bolts 13	112	
2563cc SOHC (4M) 12 Valve	1979-79	●	12mm bolts 54-61; 8mm bolts 11-16	83	
2563cc SOHC (4ME) 12 Valve	1980-79	●	12mm bolts 55-61; 8mm bolts 11-15	66	
2759cc SOHC (5ME) 12 Valve	1982-81	●	12mm bolts 55-61; 8mm bolts 11-15	66	
2759cc DOHC (5MGE) 12 Valve	1988-82	●	58 in three steps	48	
2954cc DOHC (7MGE) 24 Valve	1992-86	●	58 in three steps	92	
2954cc DOHC Turbo (7MGTE) 24 Valve	1992-87	●	58 in three steps	92	
2958cc SOHC (3VZE) 12 Valve	1995-88	●○	1st Bolts 1-8 27, 2nd Bolts 1-8 33, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 1-8 turn 90 degrees, 5th Bolt 9 27	220	ES 72185
2958cc DOHC (3VZFE) 24 Valve	1993-92	●	1st 12 point bolts 25, 2nd 12 point bolts turn 90 degrees, 3rd 12 point bolts turn 90 degrees, 4th recessed bolts 13	112	
2995cc DOHC (1MZFE) 24 Valve	2006-94	●○	1st 12 point bolts 40, 2nd 12 point bolts turn 90 degrees, 3rd recessed bolts 13	120	ES 71036
2997cc DOHC (2JZGE) 24 Valve	1998-93	●○	1st 25, 2nd turn 90 degrees, 3rd turn 90 degrees	92	ES 72213
2997cc DOHC Turbo (2JZGTE) 24 Valve	1998-93	●○	1st 25, 2nd turn 90 degrees, 3rd turn 90 degrees	92	ES 72213
3311cc DOHC (3MZFE) 24 Valve	2008-04	●	1st 12 point bolts 40, 2nd 12 point bolts turn 90 degrees, 3rd recessed bolts 13	120	
3311cc DOHC (3MZFXE) 24 Valve Hybrid	2008-06	●	1st 12 point bolts 40, 2nd 12 point bolts turn 90 degrees, 3rd recessed bolts 13	120	
3378cc DOHC (5VZFE) 24 Valve	2004-95	●○	1st 12 point bolts 25, 2nd 12 point bolts turn 90 degrees, 3rd 12 point bolts turn 90 degrees, 4th recessed bolts 13	112	ES 72168 ES 72899
3456cc DOHC (2GRFE) 24 Valve	2008-05	●○	1st Bolts 1-8 27, 2nd Bolts 1-8 turn 90 degrees, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 22	262	ES 72249



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
TOYOTA 6 & V6 (CONT.)				
3878cc OHV (F) 12 Valve	1974-67	83-98 in three steps	61	
3955cc DOHC (1GRFE) 24 Valve	2008-03	1st Bolts 1-8 <b>27</b> , 2nd Bolts 1-8 turn 90 degrees, 3rd Bolts 1-8 turn 90 degrees, 4th Bolts 9-10 <b>22</b>	262	ES 72249
3956cc OHV (3FE) 12 Valve	1992-88	90 in three steps	61	
4230cc OHV (2F) 12 Valve	1987-75	83-98 in three steps	61	
4476cc DOHC (1FZFE) 24 Valve	1997-93	1st <b>29</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	92	

TOYOTA V8				
4663cc DOHC (2UZFE) 32 Valve	2008-05	1st <b>30</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	164	ES 74035
4663cc DOHC (2UZFE) 32 Valve	2004-98	1st <b>24</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	164	ES 74035
5663cc DOHC (3URFE) 32 Valve	2008-07	1st Bolts 1-10 <b>27</b> , 2nd Bolts 1-10 turn 90 degrees, 3rd Bolts 1-10 turn 90 degrees; 4th Bolts 11-12 <b>15</b>	264	

TRIUMPH 4				
1147cc OHV	1970-61	42-46	42	
1296cc OHV	1972-67	42-46	42	
1493cc OHV	1980-73	46 in three steps	42	
1998cc SOHC	1982-75	55 in three steps	62	

TRIUMPH 6				
1998cc OHV	1973-67	42-46	63	
2498cc OHV	1976-67	80 in three steps	63	

TRIUMPH V8				
3528cc OHV	1982-77	Bolts 1-10 <b>65-70</b> ; Bolts 11-14 <b>40-45</b>	24	

TURNER 4				
948cc OHV Austin	1963-59	40	54	

TVR 6 & V6				
2498cc OHV Triumph	1977-76	80 in three steps	63	
2792cc OHV Ford	1986-82	1st <b>29-40</b> , 2nd <b>40-51</b> , 3rd <b>70-85</b>	57	
2935cc OHV Ford	1988-87	1st <b>22</b> , 2nd <b>51-55</b> , 3rd turn 90 degrees	97	ES 72794

VOLKSWAGEN 4 & H04				
1192cc OHV	1966-54	1st <b>7</b> , 2nd <b>23</b>	166	
1285cc OHV	1966	1st <b>7</b> , 2nd <b>23</b>	166	
1457cc SOHC (8 Valve)	1980-78	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1471cc SOHC (8 Valve)	1975-74	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1471cc SOHC Diesel (8 Valve)	1980-77	12 point M12 bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees, 5th warm engine, 6th turn 90 degrees, 7th after 1000 miles turn 90 degrees	60	
1471cc SOHC Diesel (8 Valve)	1980-77	6 point M11 bolts 1st <b>35</b> , 2nd <b>50</b> , 3rd <b>65</b> , 4th warm engine, 5th <b>65</b> again, 6th after 1000 miles turn 90 degrees	60	
1493cc OHV	1969-63	1st <b>7</b> , 2nd <b>23</b>	166	
1584cc OHV	1980-66	1st <b>11</b> , 2nd <b>23</b>	166	
1588cc SOHC (8 Valve)	1980-75	12 point bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1588cc SOHC (8 Valve)	1980-75	6 point bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd <b>54</b> , 4th warm engine, 5th <b>61</b> , 6th retorquer after 1000 miles	60	



# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
VOLKSWAGEN 4 & H04 (CONT.)				
1588cc SOHC Diesel (8 Valve)	1992-82	12 point M12 bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees, 5th warm engine, 6th turn 90 degrees, 7th after 1000 miles turn 90 degrees	60	ES 74028
1588cc SOHC Diesel (8 Valve)	1984-81	6 point M11 bolts 1st <b>35</b> , 2nd <b>50</b> , 3rd <b>65</b> , 4th warm engine, 5th <b>65</b> again, 6th after 1000 miles turn 90 degrees	60	
1588cc SOHC Turbo Diesel (8 Valve)	1992-82	12 point M12 bolts 1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees, 5th warm engine, 6th turn 90 degrees, 7th after 1000 miles turn 90 degrees	60	ES 74028
1679cc OHV	1974-71	1st <b>11</b> , 2nd <b>23</b>	166	
1715cc SOHC (8 Valve)	1984-81	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1780cc SOHC (8 Valve)	1993-83	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	ES 74029
1780cc DOHC (16 Valve)	1989-86	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1780cc SOHC Supercharged (8 Valve)	1994-90	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1780cc DOHC Turbo (20 Valve)	2006-04 exc. Passat	1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	ES 71172 ES 71193
1780cc DOHC Turbo (20 Valve)	2005-04 Passat	1st <b>29.5</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	ES 71172 ES 71193
1780cc DOHC Turbo (20 Valve)	2003-98	1st <b>44</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	ES 71172 ES 71193
1795cc OHV	1975-74	1st <b>11</b> , 2nd <b>23</b>	166	
1896cc SOHC Diesel (8 Valve)	1995-92	1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1896cc SOHC Turbo Diesel (BRM) (8 Valve)	2007-05	1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	
1896cc SOHC Turbo Diesel (AAZ, AHU, ALH, BEW) (8 Valve)	2007-96	1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1915cc OHV	1985-83	26	166	
1969cc SOHC Turbo Diesel (BHW) (8 Valve)	2007-04	1st <b>29.5</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1970cc OHV	1983-80	22	166	
1970cc OHV	1979-76	1st <b>11</b> , 2nd <b>23</b>	166	
1984cc SOHC (AEG, AVH, AZG, BBW, BDC, BEV, BGD) (8 Valve)	2006-04	1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	ES 72189
1984cc SOHC (AEG, AVH, AZG, BDC) (8 Valve)	2003-98	1st <b>30</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	ES 72189
1984cc SOHC (ABA) (8 Valve)	2002-93	1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	ES 74029
1984cc DOHC (16 Valve)	1994-90	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	60	
1984cc DOHC Turbo (20 Valve)	2008-06	1st <b>29.5</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	60	
2109cc OHV	1991-86	1st <b>7</b> , 2nd <b>30</b> , 3rd <b>37</b>	166	

VOLKSWAGEN 5				
2144cc SOHC (10 Valve)	1985-83	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
2226cc SOHC (10 Valve)	1988-85	1st <b>29</b> , 2nd <b>43</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
2461cc SOHC (10 Valve)	1996-92	1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	78	
2480cc DOHC (20 Valve)	2008-05	1st Bolts 1-12 <b>30</b> , 2nd Bolts 1-12 turn 90 degrees, 3rd Bolts 1-12 turn 90 degrees; 4th Bolts 13-18 <b>7.5</b>	249	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
VOLKSWAGEN V6					
2771cc DOHC (30 Valve)	2005-98	●	1st <b>44</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	135	
2792cc SOHC (12 Valve)	2002-92 Car	●	1st <b>30</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	
2792cc SOHC (12 Valve)	2000-97 Truck	●	1st <b>30</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	
2792cc DOHC (24 Valve)	2005-04 Car	●	1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	
2792cc DOHC (24 Valve)	2003-01 Car	●	1st <b>37</b> , 2nd turn 90 degrees, 3rd turn 90 degrees	168	
2792cc DOHC (24 Valve)	2004-01 Truck	●	1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	
3189cc DOHC (24 Valve)	2008-03		1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	
3597cc DOHC (24 Valve)	2008-06		1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	168	

VOLKSWAGEN V8					
3998cc DOHC (32 Valve)	2005-02		1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	250	
4163cc DOHC (40 Valve)	2008-07		1st <b>22</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	136	
4172cc DOHC (40 Valve)	2007-03		1st <b>22</b> , 2nd <b>44</b> , 3rd turn 90 degrees, 4th turn 90 degrees	136	

VOLKSWAGEN V10					
4921cc SOHC Turbo Diesel (20 Valve)	2008-04		1st <b>22</b> , 2nd <b>44</b> , 3rd turn 180 degrees, 4th turn 180 degrees	259	

VOLKSWAGEN V12					
5998cc DOHC (48 Valve)	2006-04		1st <b>22</b> , 2nd <b>37</b> , 3rd turn 90 degrees, 4th turn 90 degrees	227	

VOLVO 4					
1580cc OHV (B16A, B16B, B16D) 8 Valve	1961-57		<b>61-69</b>	110	
1780cc OHV (B18A, B18B, B18D) 8 Valve	1968-61		<b>61-69</b>	110	
1948cc DOHC Turbo (B4194T, B4204T2, B4204T3) 16 Valve	2004-00		1st Bolts 1-2 <b>15</b> , 2nd Bolts 3-10 <b>44</b> , 3rd turn all bolts 130 degrees	40	
1986cc OHV (B20E, B20F) 8 Valve	1975-70		1st <b>29</b> , 2nd <b>58</b> , 3rd <b>65</b> , 4th warm engine, 5th <b>65</b> again	110	
1986cc OHV (B20A, B20B) 8 Valve	1974-69		<b>61-69</b>	110	
2127cc SOHC (B21E, B21F) 8 Valve	1984-76	●	1st <b>43</b> , 2nd <b>76-83</b> , 3rd warm engine, 4th <b>76-83</b> again	110	
2127cc SOHC Turbo (B21FT) 8 Valve	1985-81	●	1st <b>15</b> , 2nd <b>44</b> , 3rd turn 90 degrees	110	
2316cc SOHC (B230F, B230FD, B230FS) 8 Valve	1995-85	●	1st <b>14</b> , 2nd <b>43</b> , 3rd turn 90 degrees	110	
2316cc SOHC (B23E, B23F) 8 Valve	1984-81	●	1st <b>15</b> , 2nd <b>44</b> , 3rd turn 90 degrees	110	
2316cc DOHC (B234F) 16 Valve	1991-89	●	1st <b>15</b> , 2nd <b>30</b> , 3rd turn 115 degrees	110	
2316cc SOHC Turbo (B234FT, B234T) 8 Valve	1995-89	●	1st <b>14</b> , 2nd <b>43</b> , 3rd turn 90 degrees	110	
2316cc SOHC Turbo (B230FT) 8 Valve	1995-85	●	1st <b>14</b> , 2nd <b>43</b> , 3rd turn 90 degrees	110	
2316cc SOHC Turbo (B23FT) 8 Valve	1984	●	1st <b>15</b> , 2nd <b>44</b> , 3rd turn 90 degrees	110	



# TORQUE TABLES™

ENGINE	YEARS		FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
VOLVO 5					
2319cc DOHC Turbo (B5234FT, B5234T3) 20 Valve	2008-04		1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	251	
2319cc DOHC Turbo (B5234FT, B5234T, B5234T3) 20 Valve	2003-94		1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	208	
2435cc DOHC (B5244FS, B5244S, B5244S4, B5244S5, B5244S6, B5244S7, B5254FS, B5254S) 20 Valve	2008-04	●○	1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	251	ES 72908
2435cc DOHC (B5244FS, B5244S, B5254FS, B5254S) 20 Valve	2003-93	●○	1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	208	ES 72908
2435cc DOHC Turbo (B5244T3, B5254FT, B5254T) 20 Valve	2008-04	●○	1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	251	ES 72908
2435cc DOHC Turbo (B5244T, B5244T2, B5244T3, B5254FT, B5254T) 20 Valve	2003-97	●○	1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	208	ES 72908
2521cc DOHC Turbo (B5254T2, B5254T3, B5254T4) 20 Valve	2008-04		1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	251	
2521cc DOHC Turbo (B5254T2) 20 Valve	2003		1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	208	

VOLVO 6 & V6					
2383cc SOHC Diesel (D24) 12 Valve	1985-81		12 point M12 bolts 1st <b>30</b> , 2nd <b>44</b> , 3rd <b>55</b> , 4th turn 180 degrees, 5th warm engine, 6th turn 90 degrees, 7th after 1000 miles turn 90 degrees	84	
2383cc SOHC Diesel (D24) 12 Valve	1981-80		6 point M11 bolts 1st <b>35</b> , 2nd <b>50</b> , 3rd <b>65</b> , 4th warm engine, 5th <b>65</b> again, 6th after 1000 miles turn 90 degrees	84	
2383cc SOHC Turbo Diesel (D24T) 12 Valve	1986-83		12 point M12 bolts 1st <b>30</b> , 2nd <b>44</b> , 3rd <b>55</b> , 4th turn 180 degrees, 5th warm engine, 6th turn 90 degrees, 7th after 1000 miles turn 90 degrees	84	
2664cc SOHC (B27E, B27F) 12 Valve	1979-75		1st <b>7</b> , 2nd <b>22</b> , 3rd <b>44</b> , 4th loosen all bolts, 5th <b>11-14</b> , 6th turn 116-120 degrees, 7th warm engine & allow to cool, 8th loosen all bolts, 9th <b>11-14</b> again, 10th turn 113-117 degrees	52	
2783cc DOHC Turbo (B6284T) 24 Valve	2004-99		1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	209	
2849cc SOHC (B280F) 12 Valve	1991-90		1st <b>7</b> , 2nd <b>22</b> , 3rd <b>44</b> , 4th loosen all bolts, 5th <b>30</b> , 6th turn 160-180 degrees	52	
2849cc SOHC (B280F) 12 Valve	1989-86		1st <b>7</b> , 2nd <b>22</b> , 3rd <b>44</b> , 4th loosen all bolts, 5th <b>15</b> , 6th turn 106 degrees, 7th warm engine & allow to cool, 8th turn 45 degrees	52	
2849cc SOHC (B28F) 12 Valve	1986		1st <b>7</b> , 2nd <b>22</b> , 3rd <b>44</b> , 4th loosen all bolts, 5th <b>15</b> , 6th turn 106 degrees, 7th warm engine & allow to cool, 8th turn 45 degrees	52	
2849cc SOHC (B28F) 12 Valve	1985-80		1st <b>7</b> , 2nd <b>22</b> , 3rd <b>44</b> , 4th loosen all bolts, 5th <b>11-14</b> , 6th turn 116-120 degrees, 7th warm engine & allow to cool, 8th loosen all bolts, 9th <b>11-14</b> again, 10th turn 113-117 degrees	52	
2922cc DOHC (B6294S, B6304F, B6304S, B6304S3) 24 Valve	2006-92		1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	209	
2922cc DOHC Turbo (B6294T) 24 Valve	2006-03		1st <b>15</b> , 2nd <b>44</b> , 3rd turn 130 degrees	209	



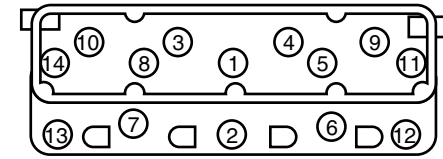


# TORQUE TABLES™

ENGINE	YEARS	FT.-LBS.	TORQ. SEQ.	HEAD BOLT SET PART NUMBER
VOLVO 6 & V6 (CONT.)				
2980cc OHV (B30E, B30F) 12 Valve	1975-71	1st <b>29</b> , 2nd <b>58</b> , 3rd <b>65</b> , 4th warm engine, 5th <b>65</b> again	2	
2980cc OHV (B30A) 12 Valve	1972-69	<b>61-69</b>	2	
3192cc DOHC (B6324S) 24 Valve	2008-07	1st <b>33</b> , 2nd <b>33</b> again, 3rd turn 90 degrees, 4th turn 180 degrees	252	
VOLVO V8				
4414cc DOHC (B8444S) 32 Valve Yamaha	2008-05	1st <b>29.5</b> , 2nd turn 90 degrees	68	
WILLYS..... SEE JEEP				
WORKHORSE V8				
350 OHV (5.7L) Chevrolet Truck	2002-01 VIN R ●○	1st all bolts <b>22</b> , 2nd Long bolts turn 75 degrees, 3rd Medium bolts turn 65 degrees, 4th Short bolts turn 55 degrees	7	ES 72856
395 OHV Turbo Diesel (6.5L) Chevrolet Truck	2003-99 VIN F ●○	1st <b>20</b> , 2nd <b>55</b> , 3rd <b>55</b> again, 4th turn 90 degrees	77	ES 72724
454 OHV (7.4L) Chevrolet Truck	2000-99 VIN J ●	1st <b>37</b> , 2nd Bolts 1, 2, 3, 6, 7, 8, 9, 12, 13, 14, 15, 16 turn 150 degrees, 3rd Bolts 4, 5, 10, 11 turn 90 degrees	8	
496 OHV (8.1L) Chevrolet Truck	2006-01 VIN G ●○	1st <b>22</b> , 2nd <b>22</b> again, 3rd turn 120 degrees, 4th Bolts 1, 2, 3, 6, 7, 8, 9, 10, 11, 14, 16, 17 turn 60 degrees, 5th Bolts 15, 18 turn 45 degrees, 6th Bolts 4, 5, 12, 13 turn 30 degrees	210	ES 72188
YUGO 4				
1116cc SOHC (128A) 8 Valve	1989-86	1st <b>15</b> , 2nd <b>30</b> , 3rd <b>69</b>	41	
1290cc SOHC (128A.064) 8 Valve	1992-87	1st <b>15</b> , 2nd <b>30</b> , 3rd <b>69</b>	41	

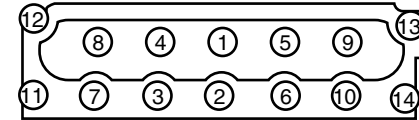


# TORQUE TABLES™

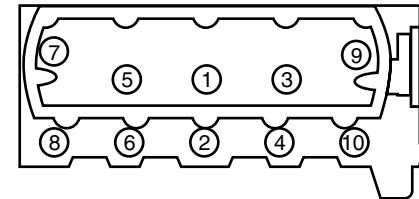


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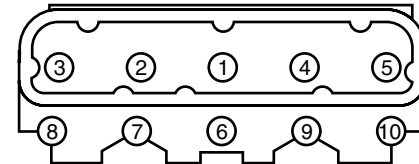
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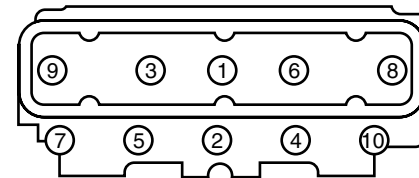
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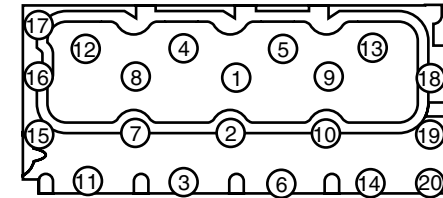


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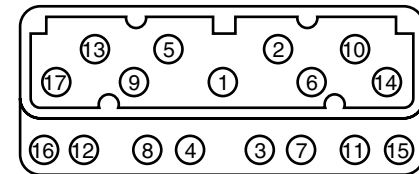


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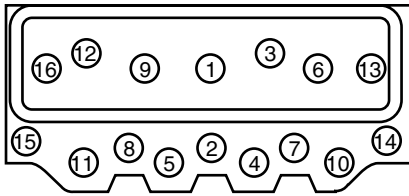


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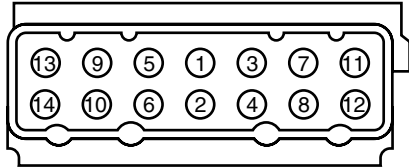


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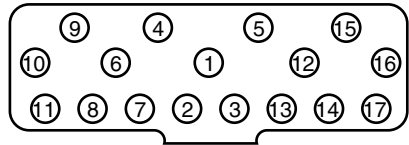
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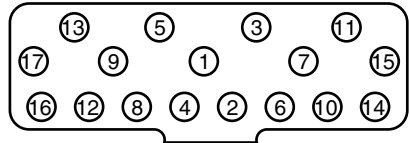
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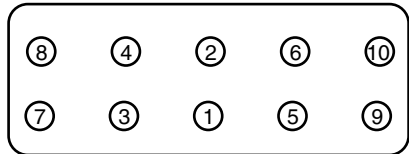
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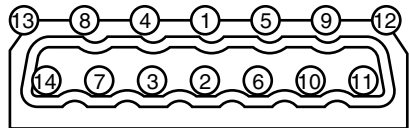
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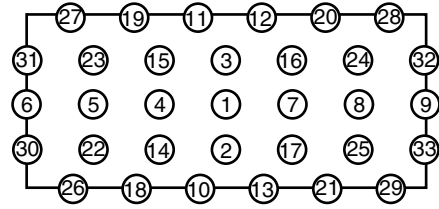
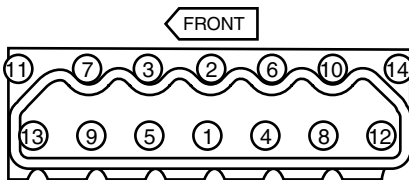
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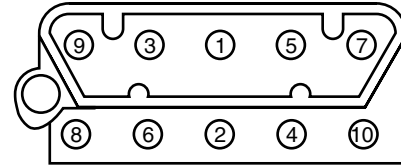
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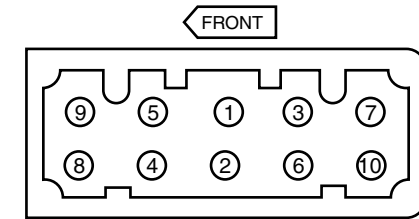
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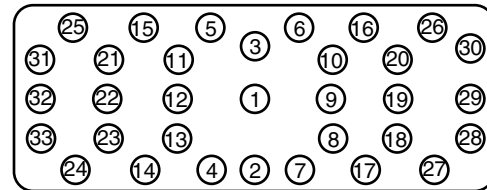
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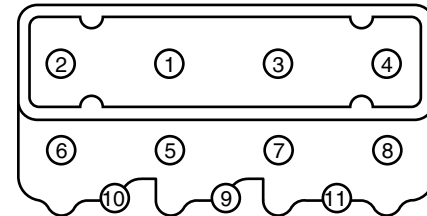
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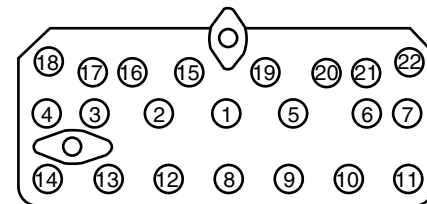
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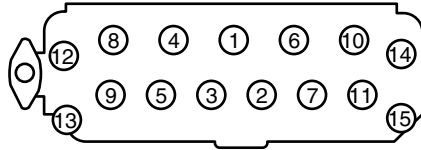


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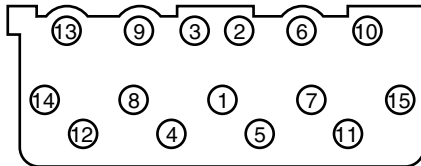


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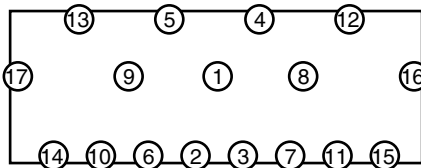
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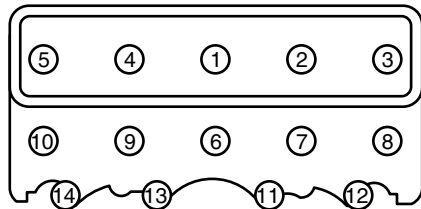
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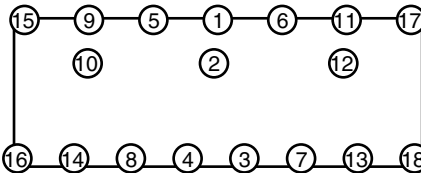
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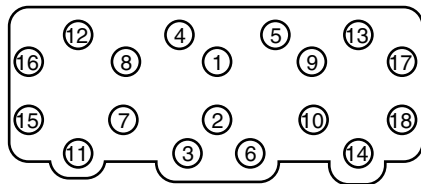
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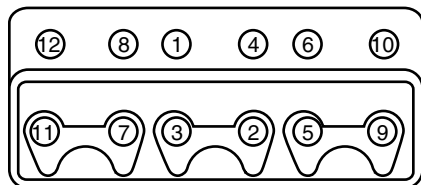
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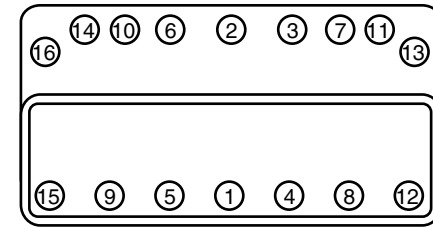
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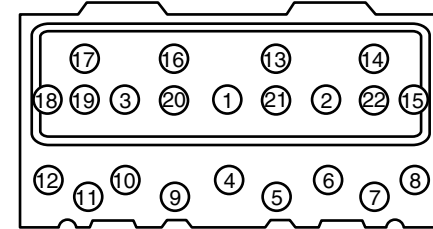
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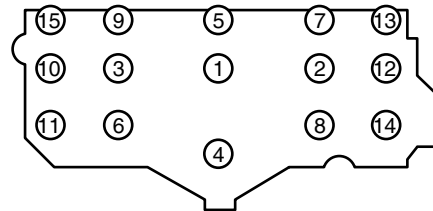
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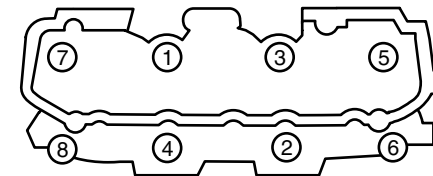
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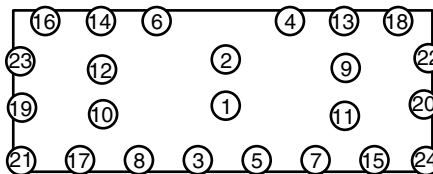
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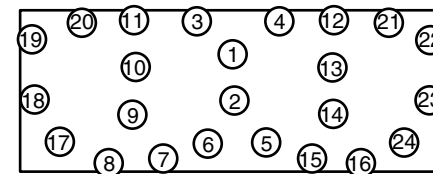
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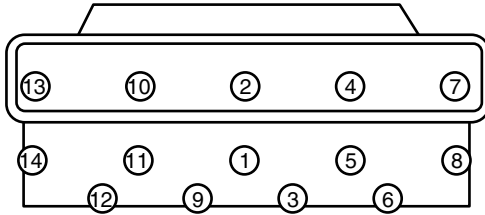
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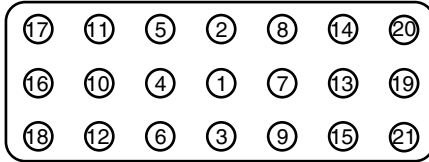
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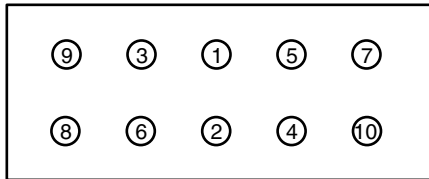
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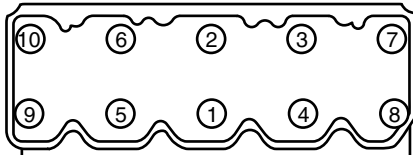
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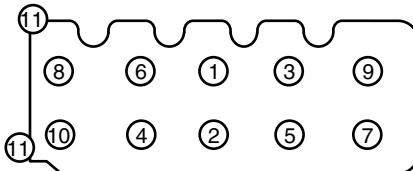
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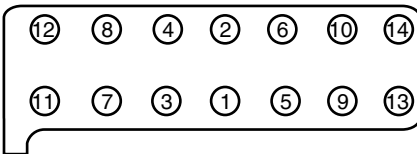
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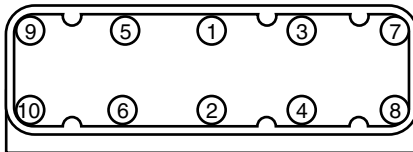
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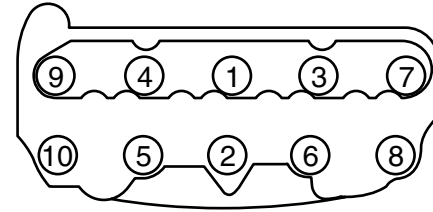
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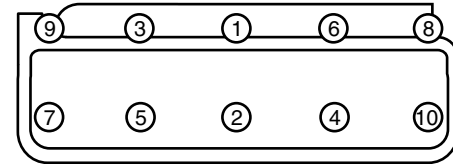
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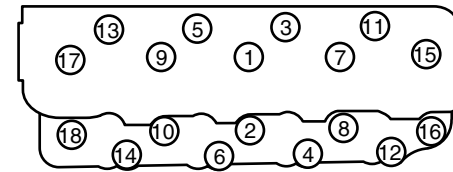
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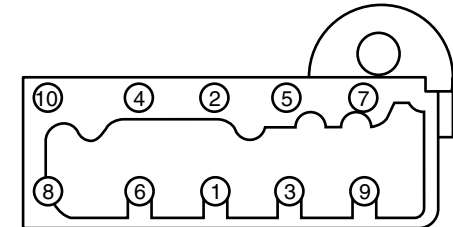
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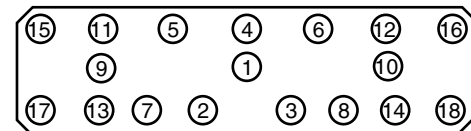
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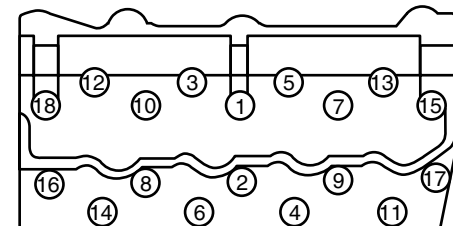
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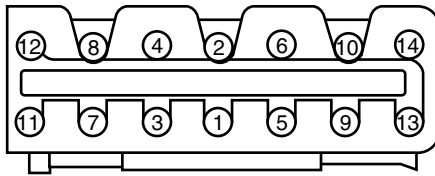
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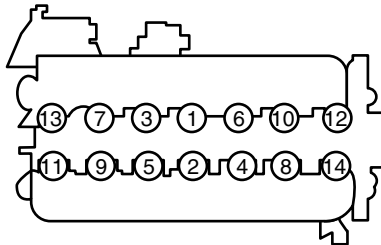
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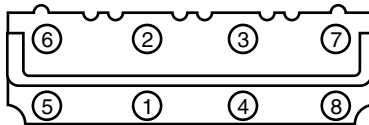
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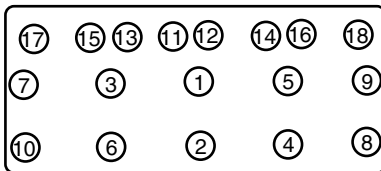
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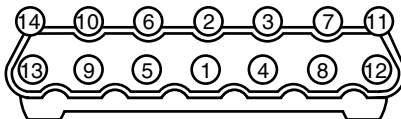
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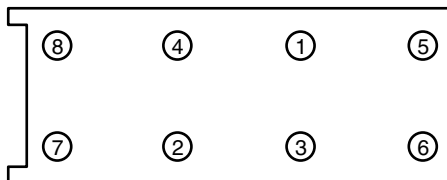
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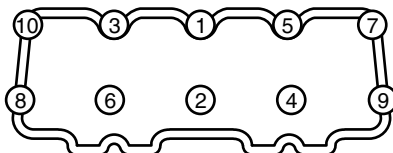
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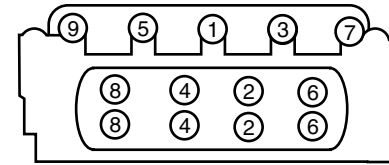
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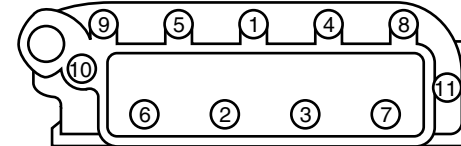
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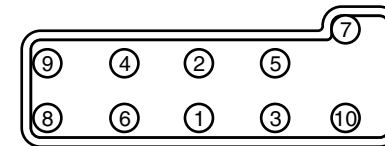
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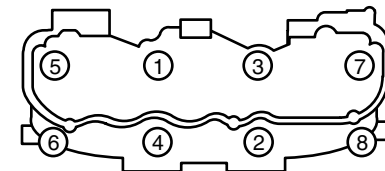
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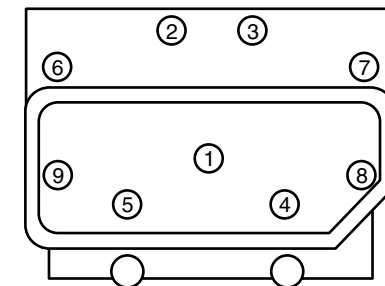
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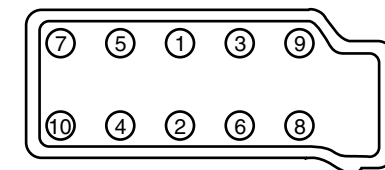
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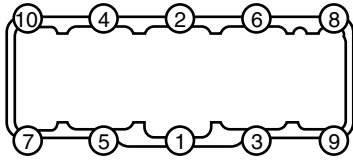
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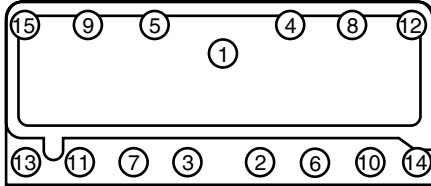
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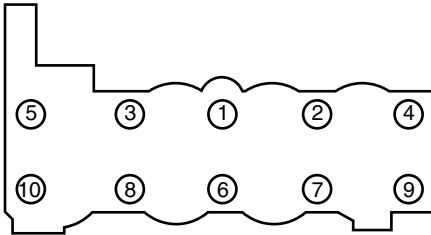
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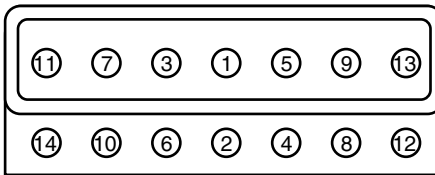
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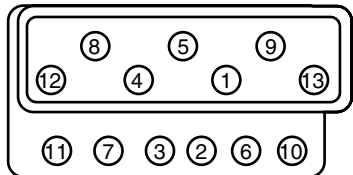
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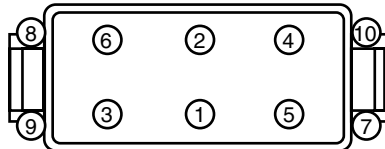
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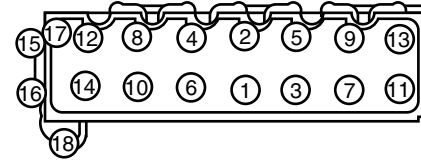
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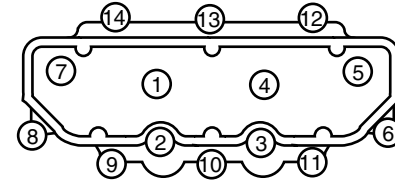
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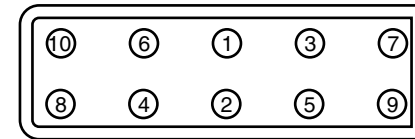
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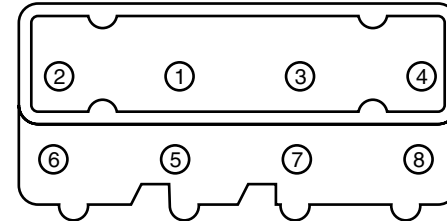
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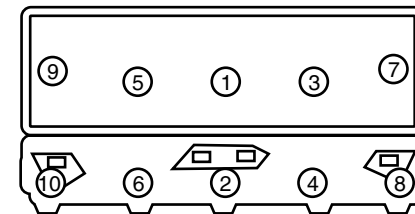
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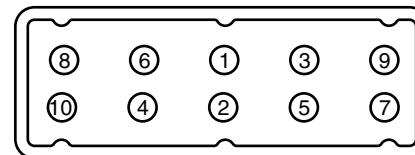
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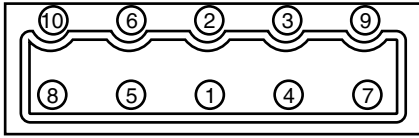
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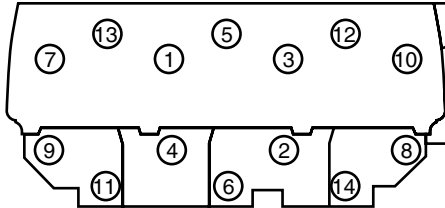
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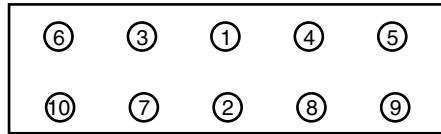
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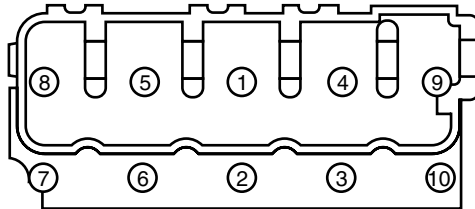
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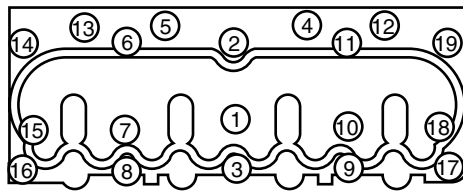
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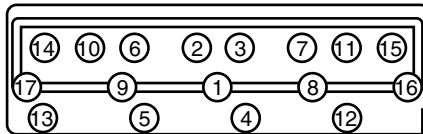
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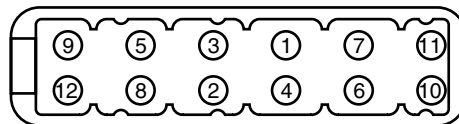
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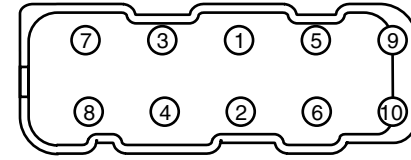
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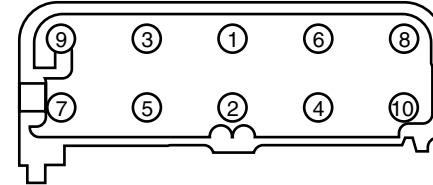
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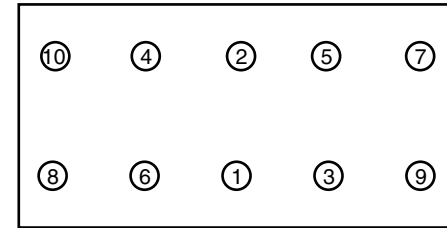
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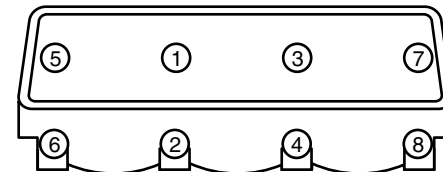
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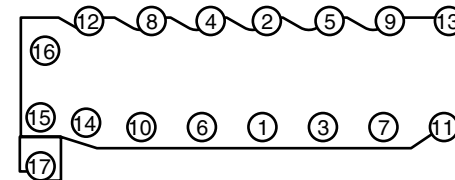
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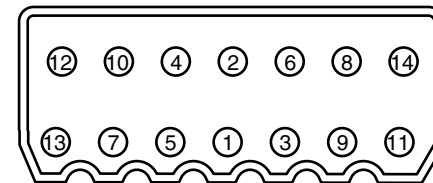
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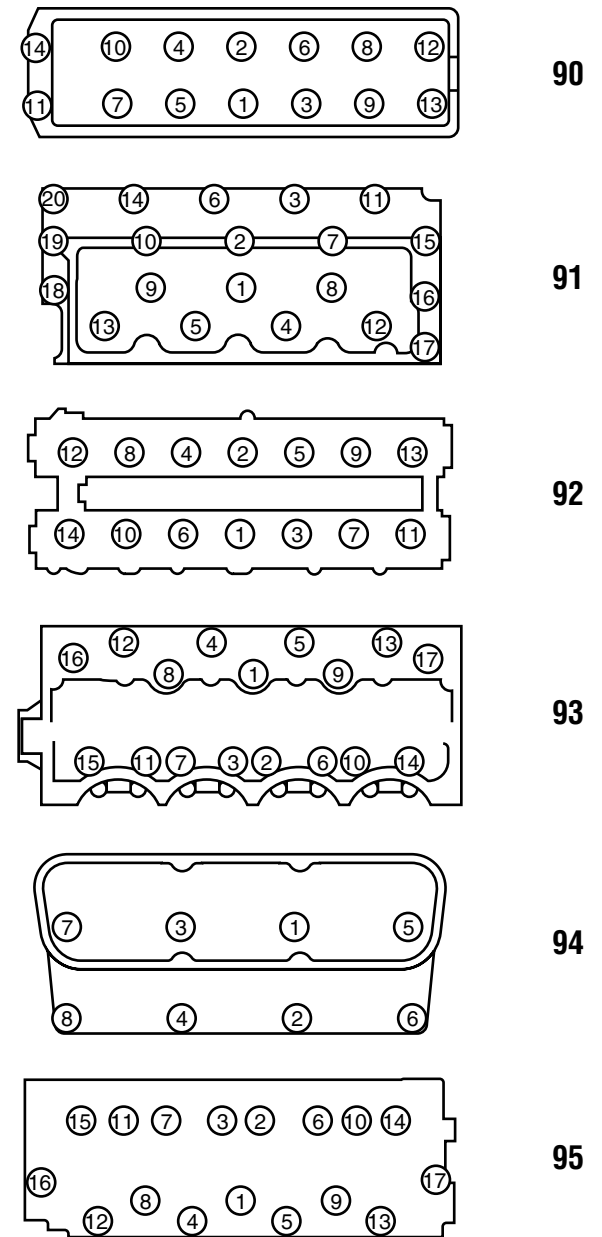
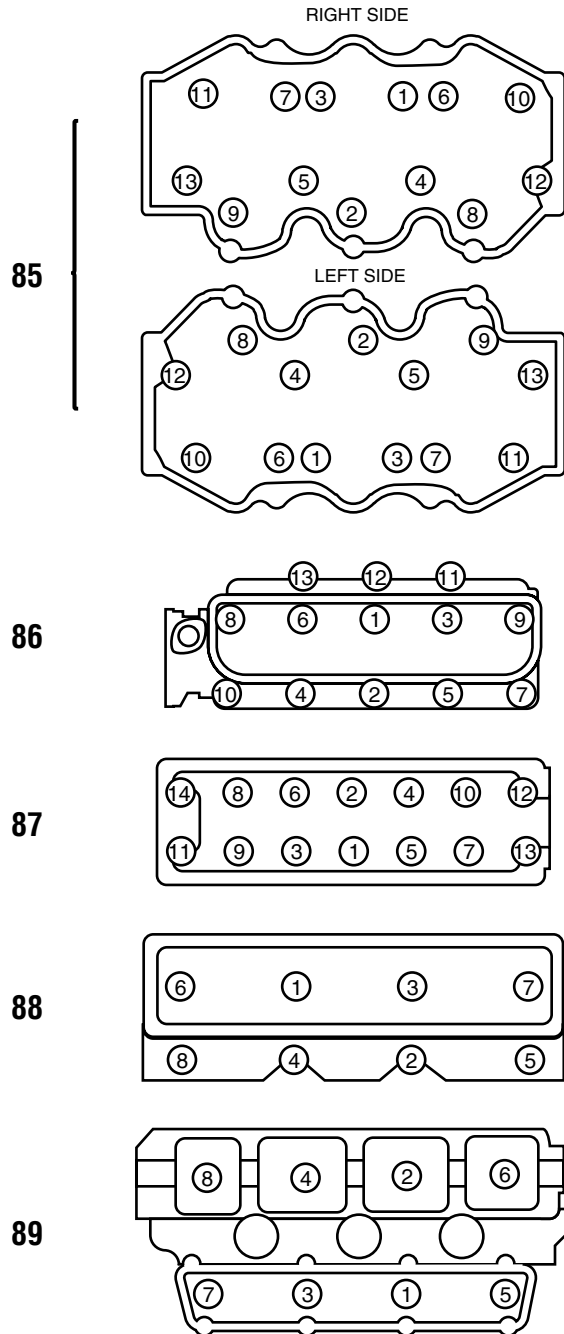


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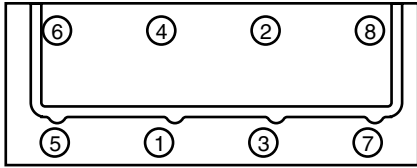
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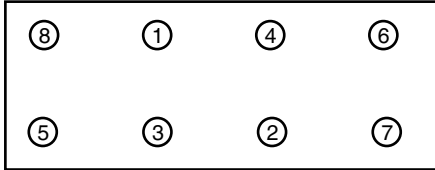




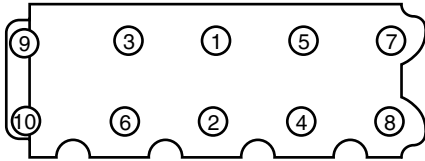
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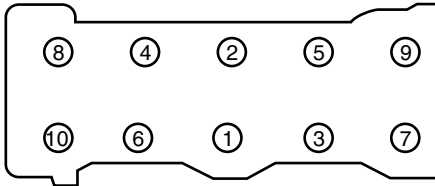
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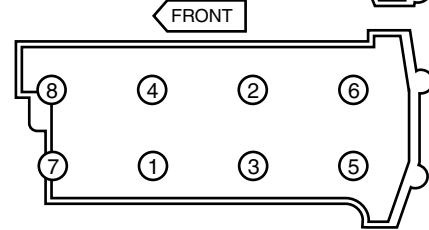
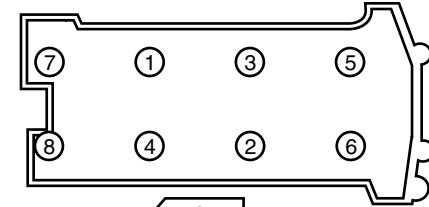
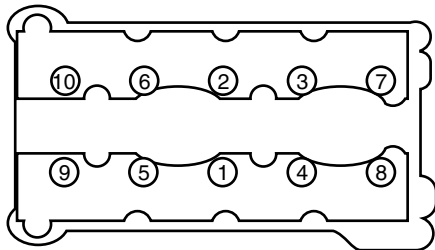
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99

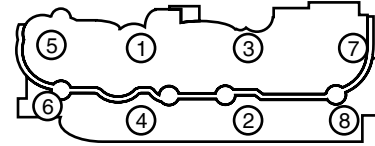


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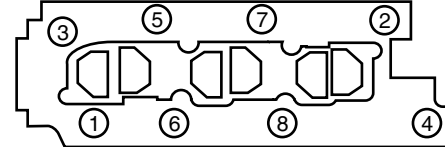


101

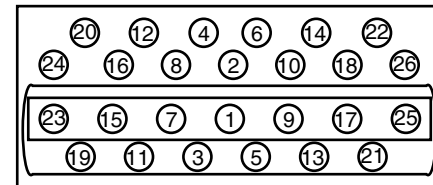
Cylinder Head Bolt Tightening Sequence



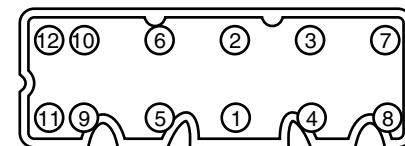
Lower Intake Manifold Bolt Tightening Sequence



102

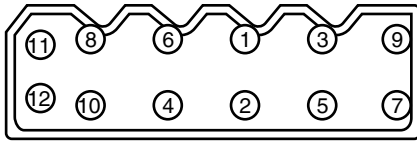


103

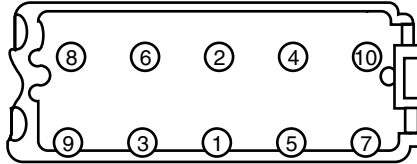


104

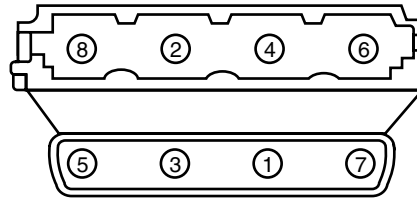
105



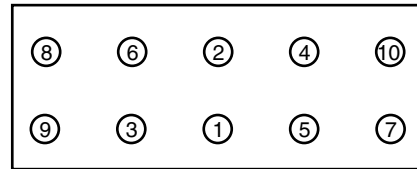
106



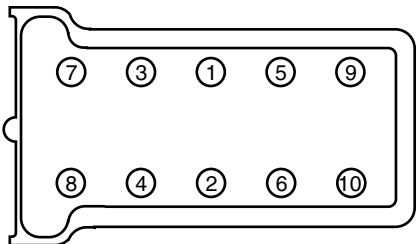
107



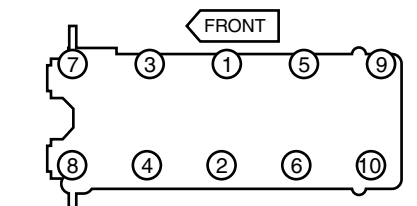
108



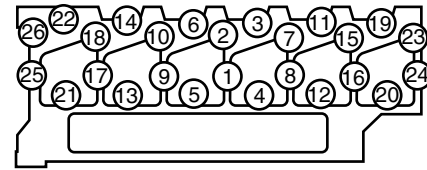
109



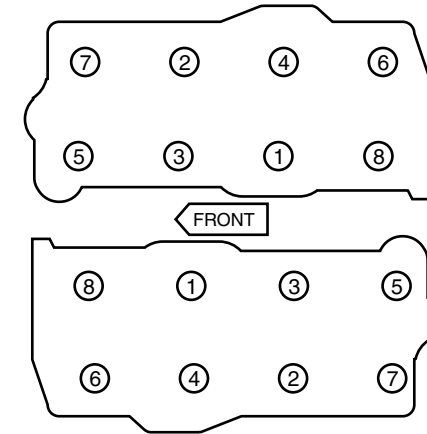
110



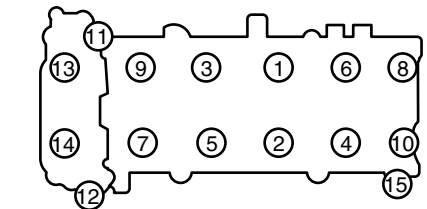
111



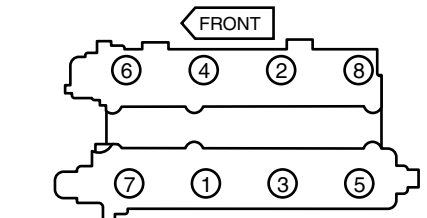
112



113

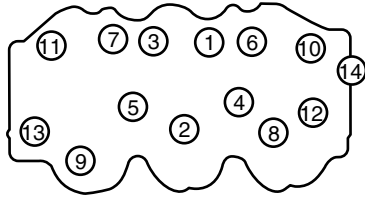


114

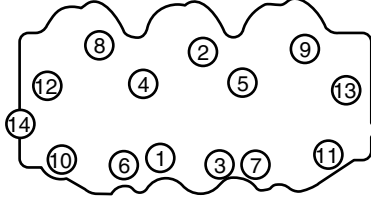


115

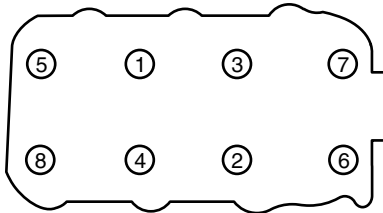
RIGHT SIDE



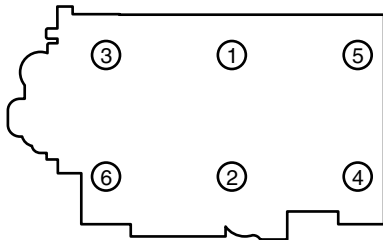
LEFT SIDE



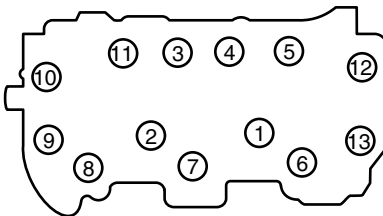
116



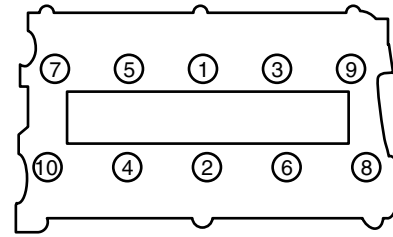
117



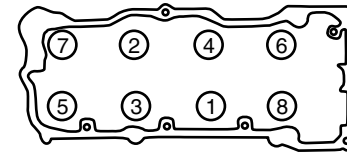
118



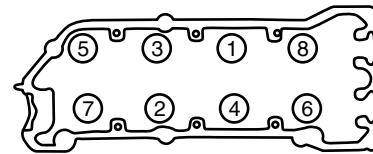
119



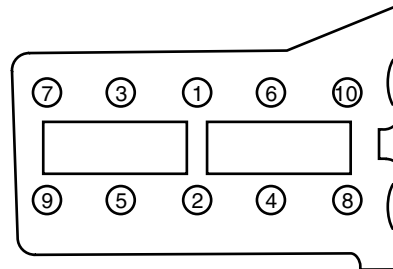
120



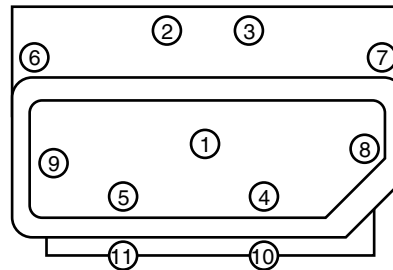
FRONT



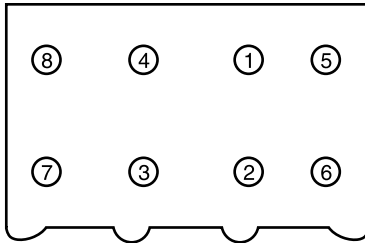
121



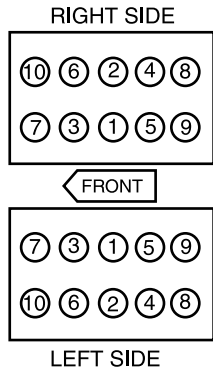
122



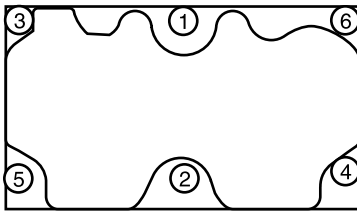
123



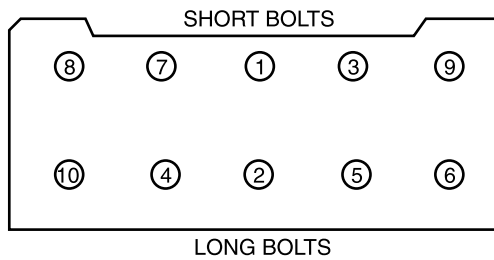
124



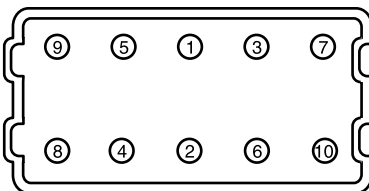
125



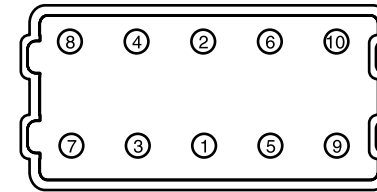
126



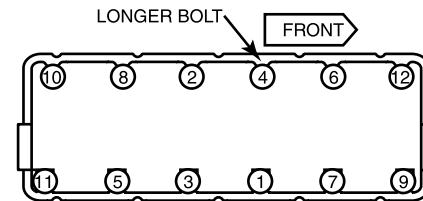
127



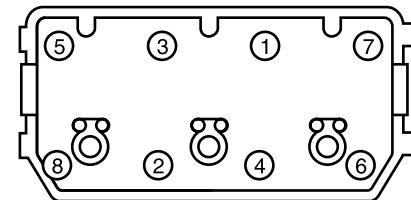
128



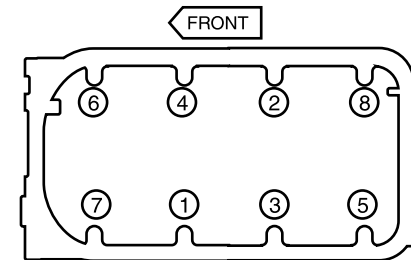
129



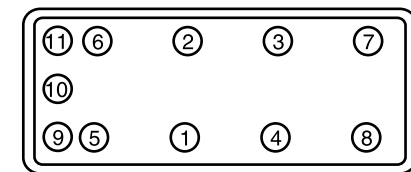
130



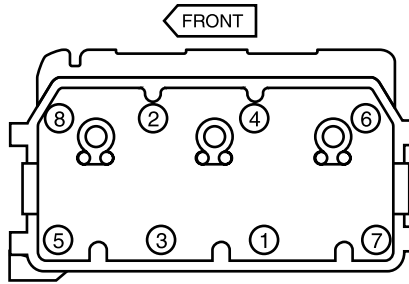
131



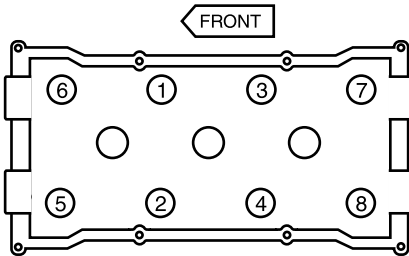
132



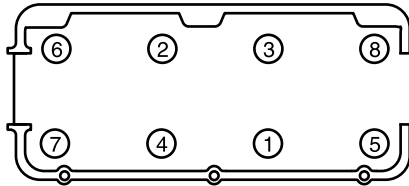
133



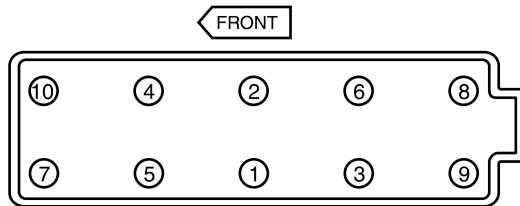
134



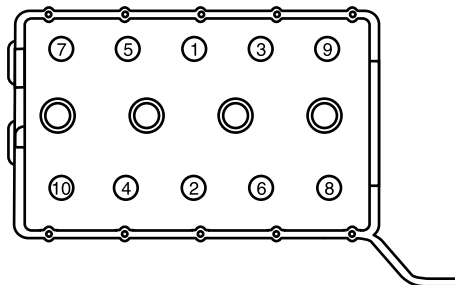
135



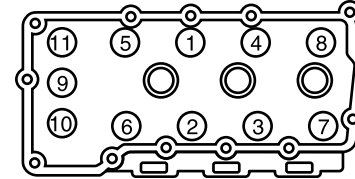
136



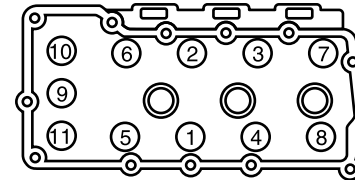
137



RIGHT SIDE



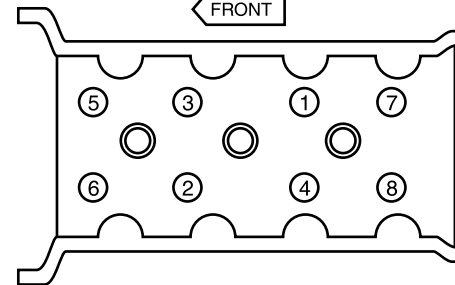
FRONT



LEFT SIDE

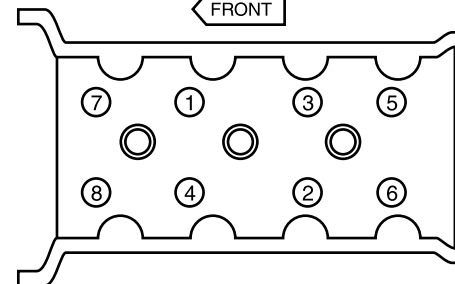
138

FRONT



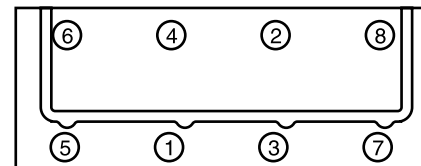
139

FRONT

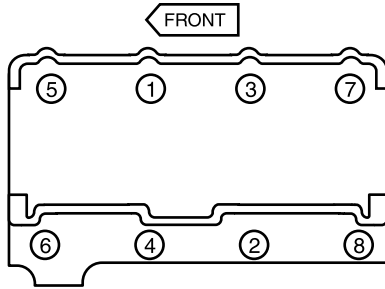


140

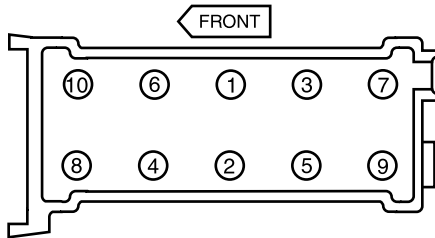
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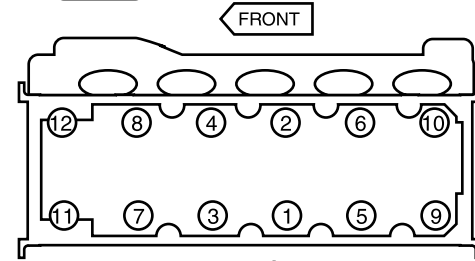
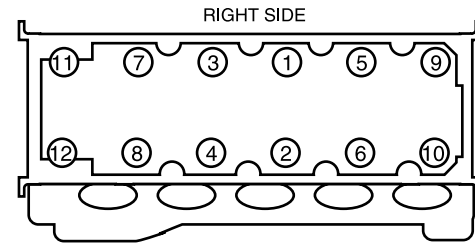
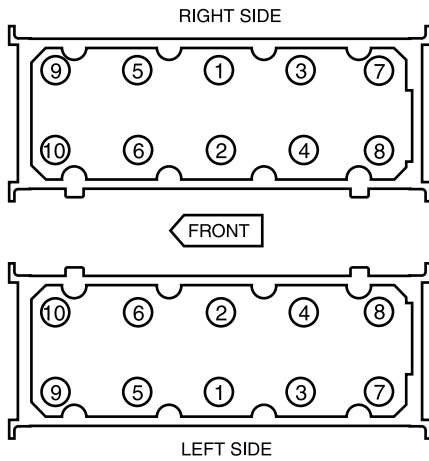
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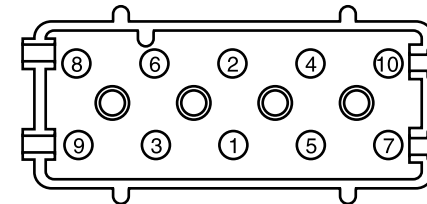
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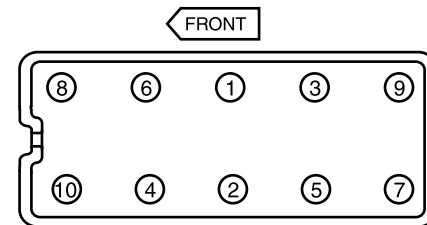
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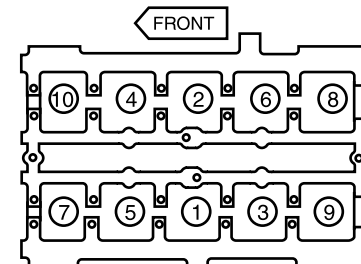
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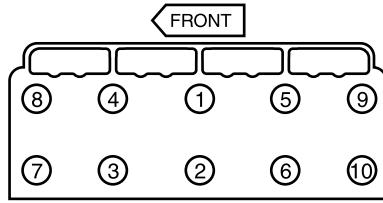


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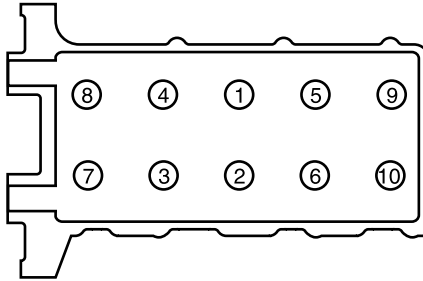


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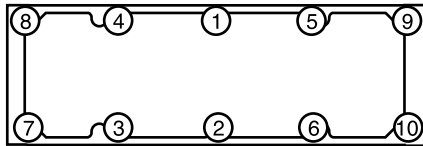
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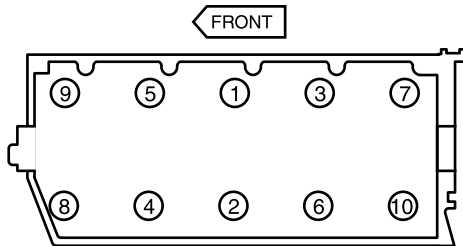
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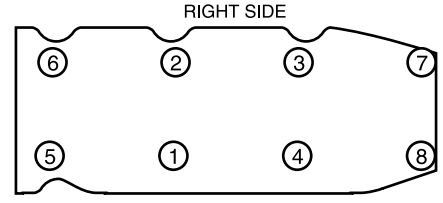
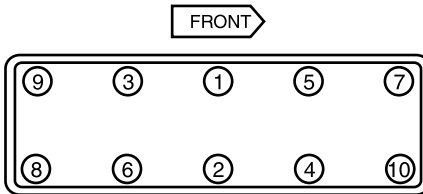
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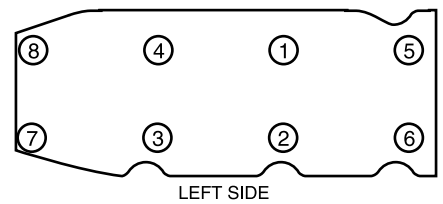
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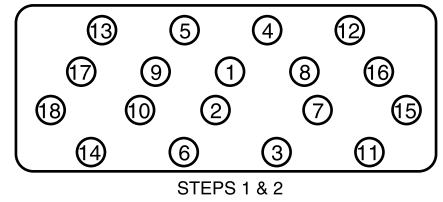
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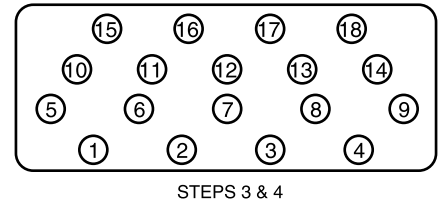
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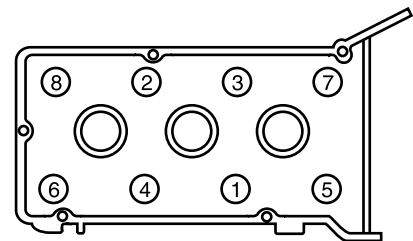
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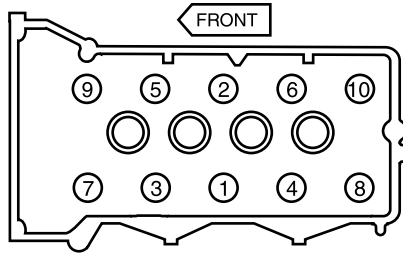
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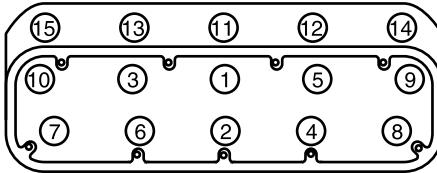
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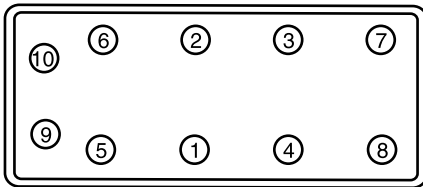
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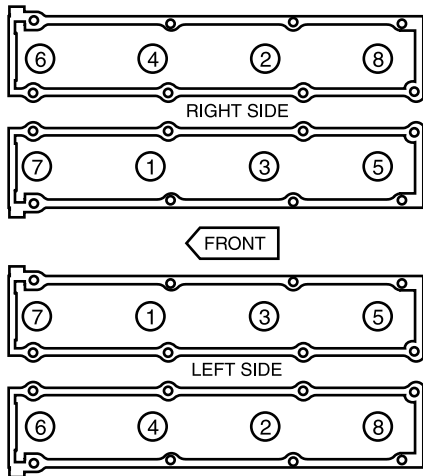
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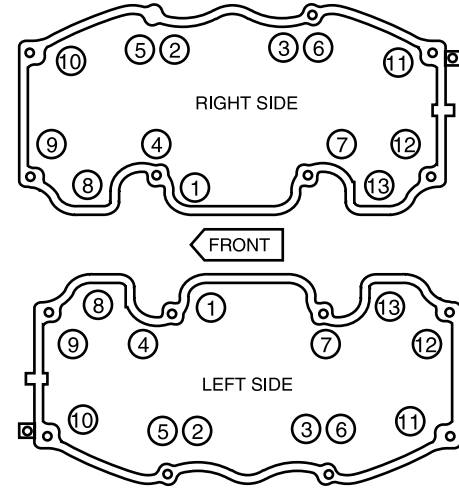
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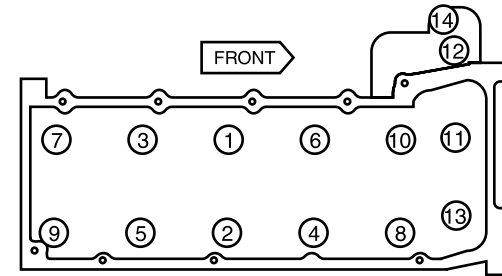
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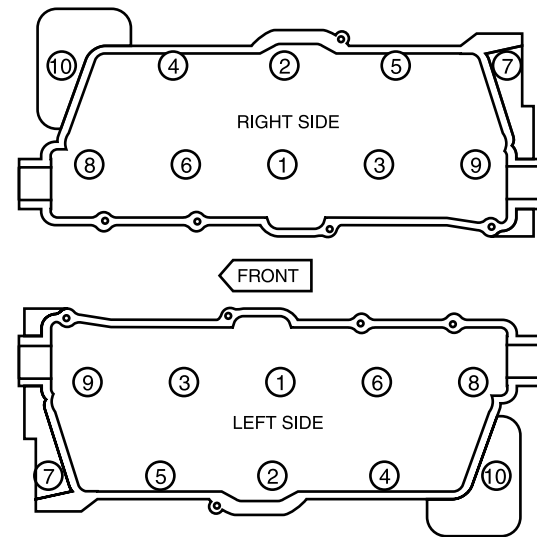
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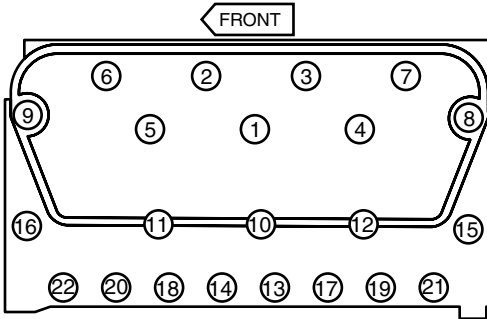


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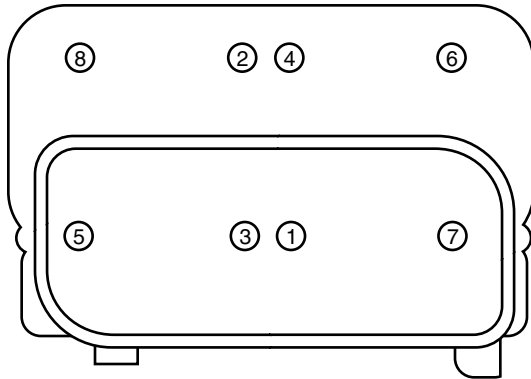




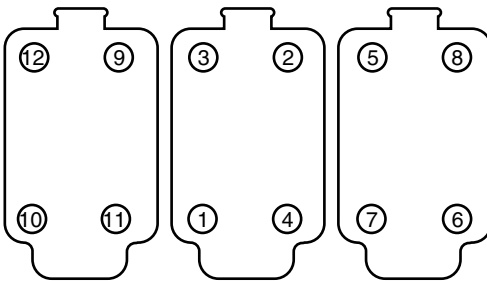
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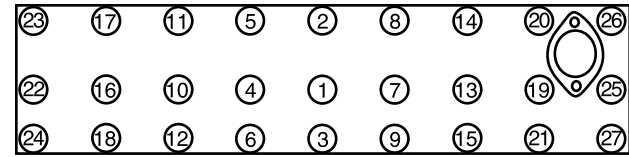
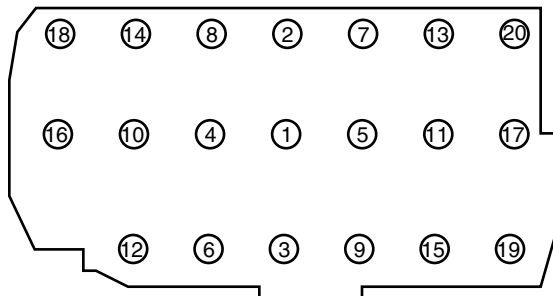
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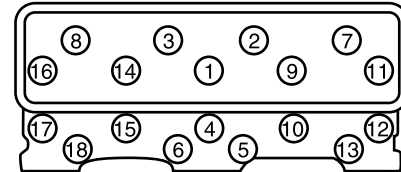
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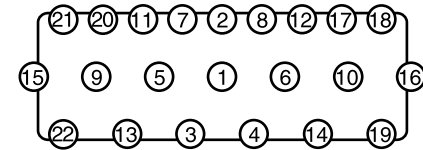
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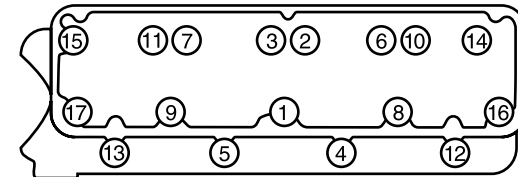
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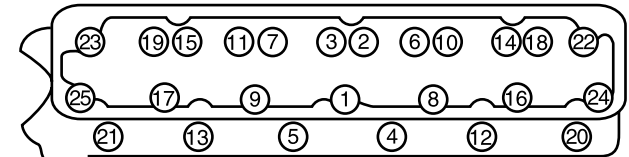
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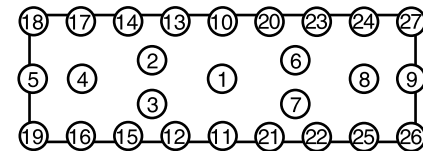
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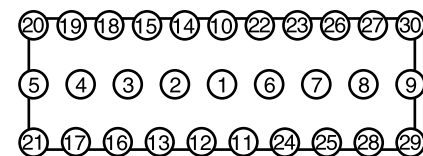
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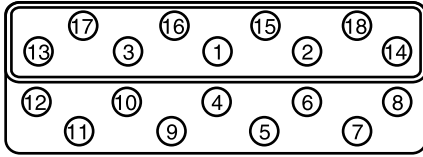


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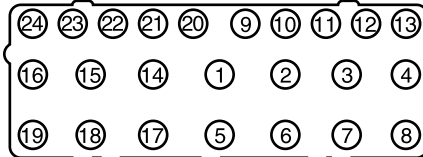


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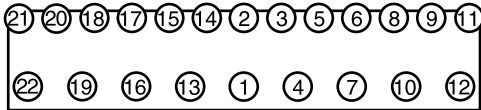
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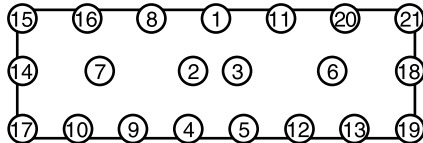
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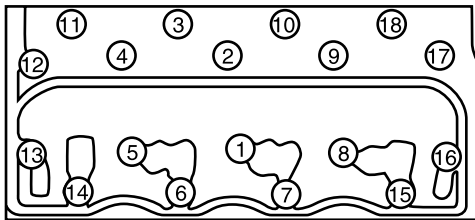
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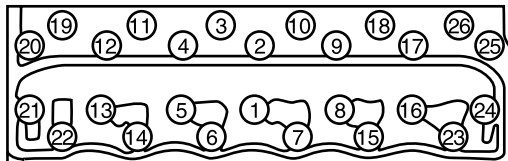
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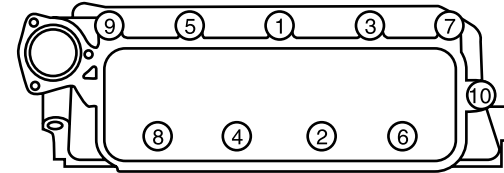
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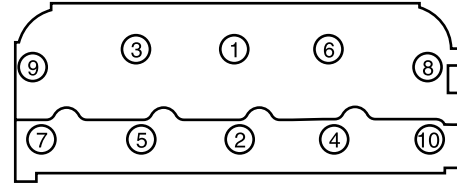
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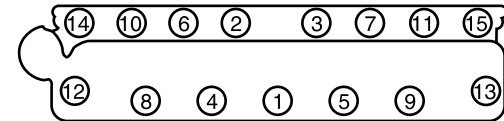
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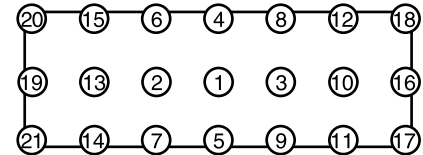
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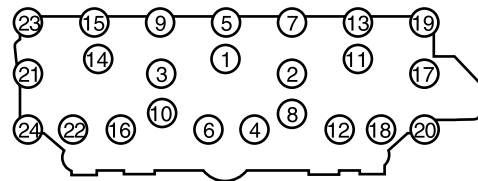
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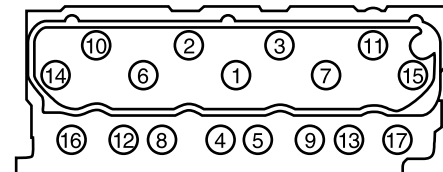
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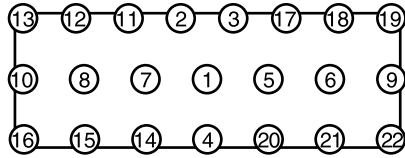
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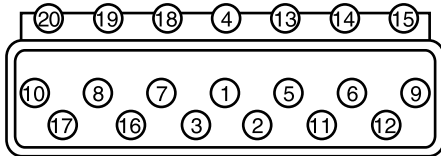


# TORQUE TABLES™

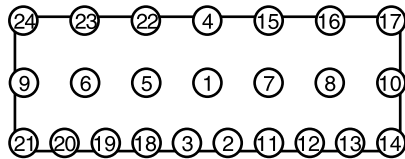
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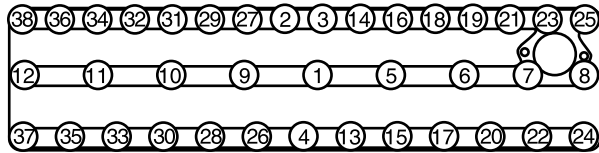
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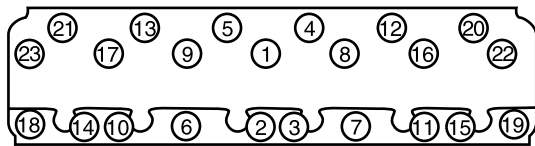
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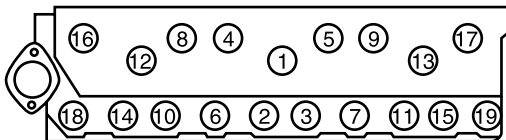
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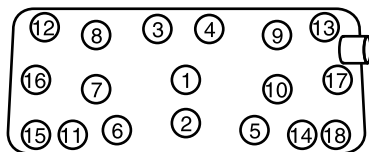
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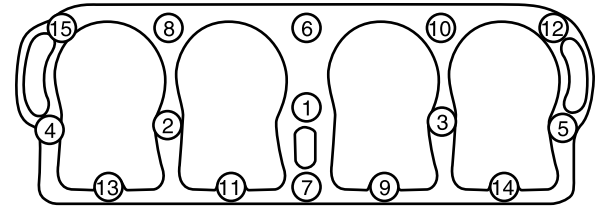


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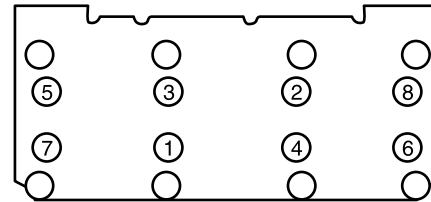


# TORQUE TABLES™

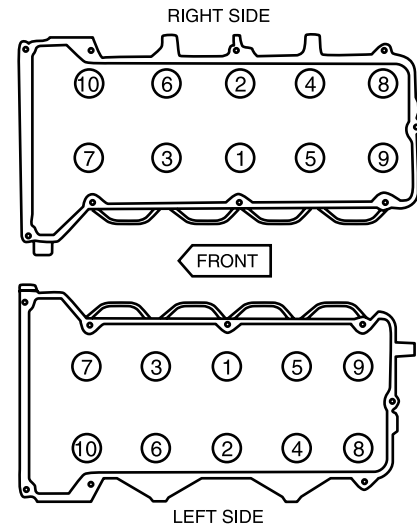
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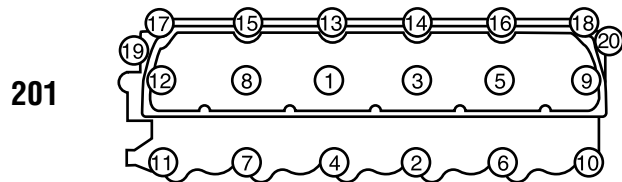
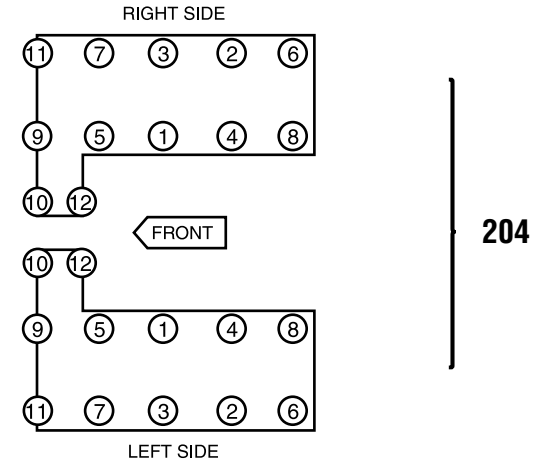
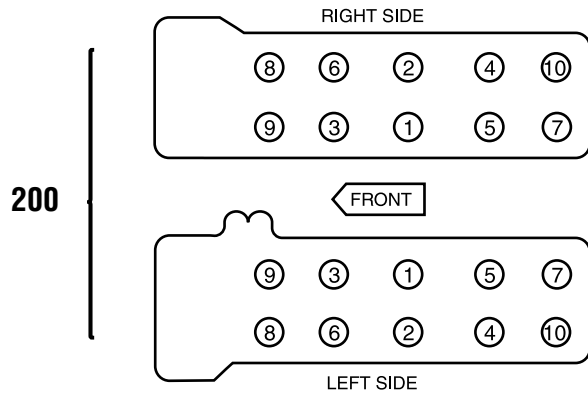
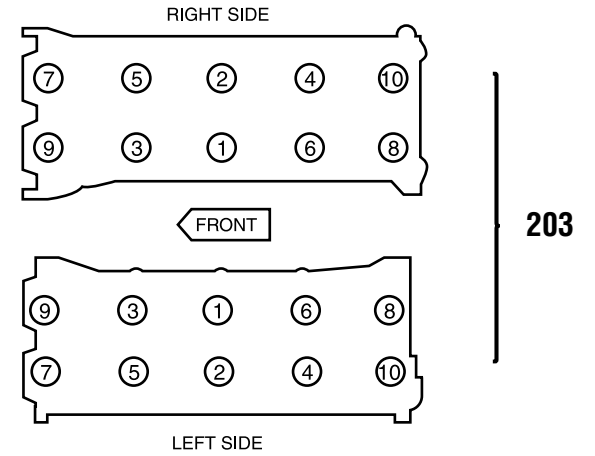
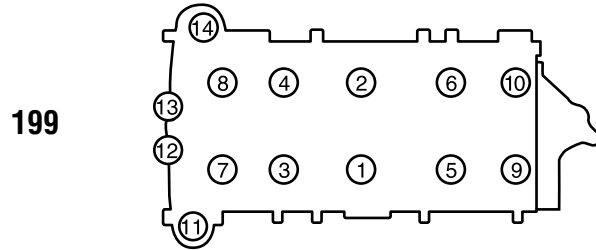
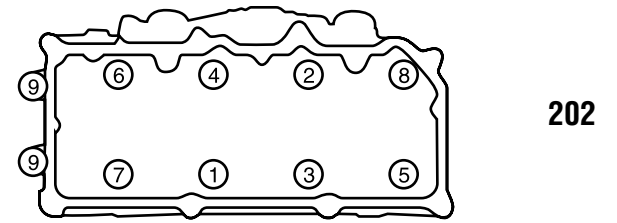
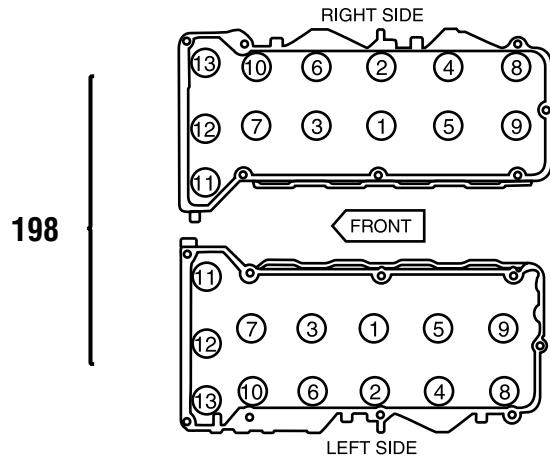


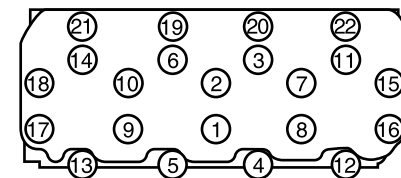
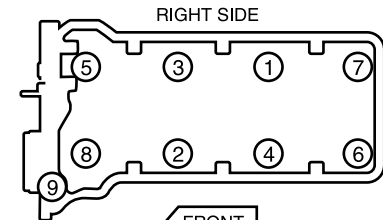
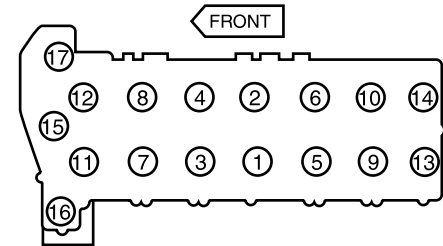
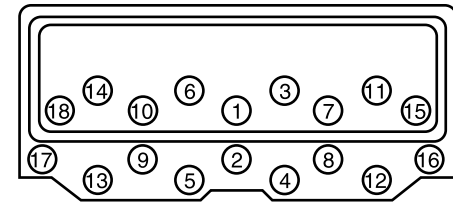
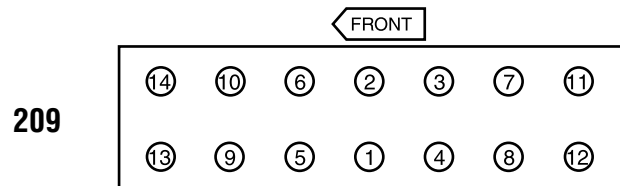
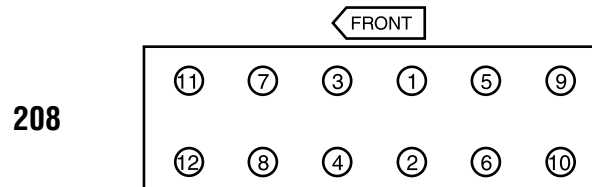
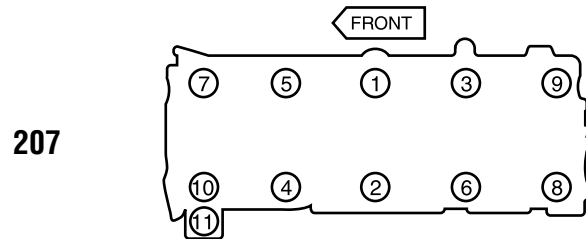
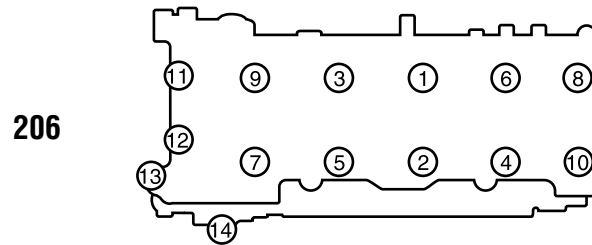
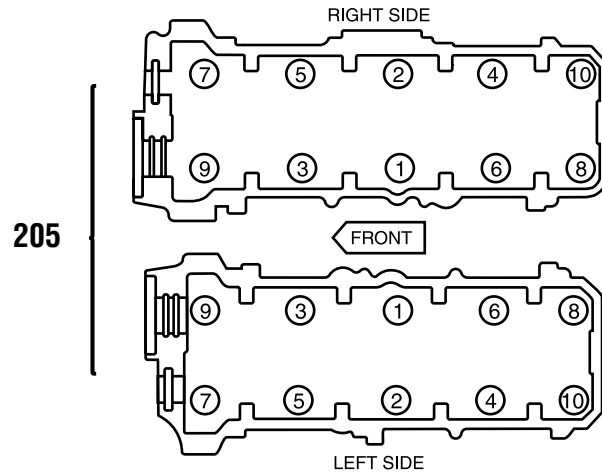
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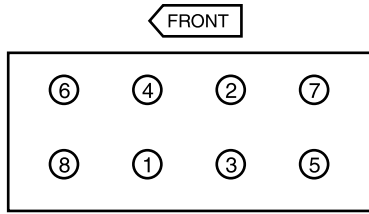
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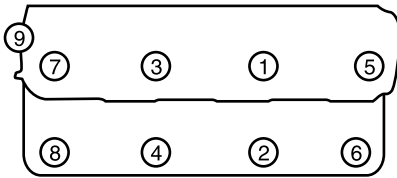
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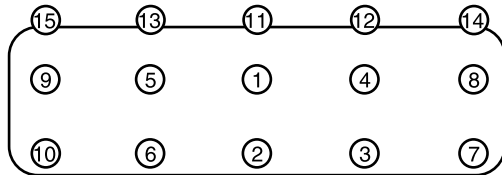
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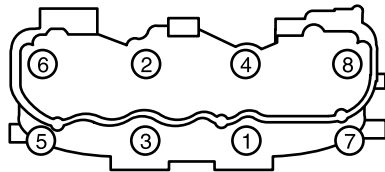
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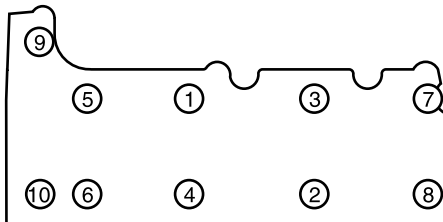
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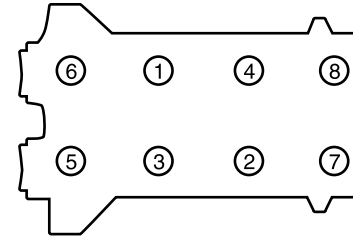
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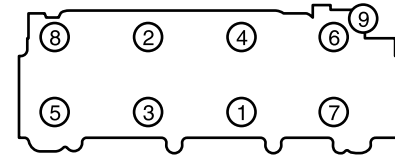
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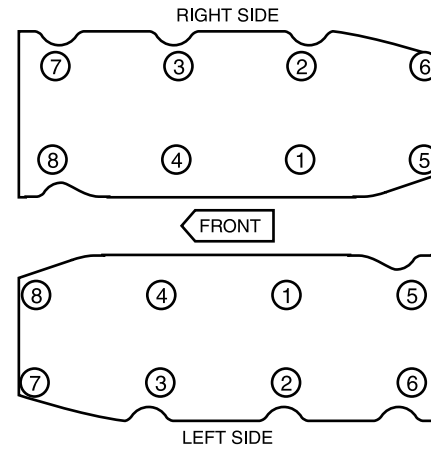
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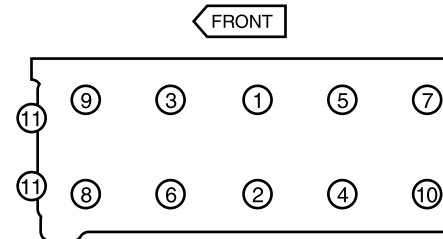
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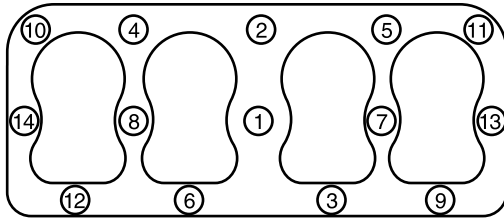
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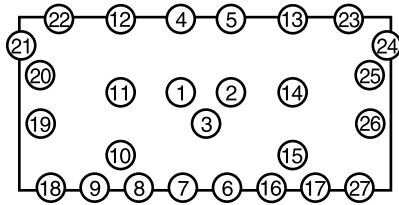
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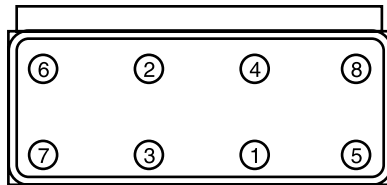
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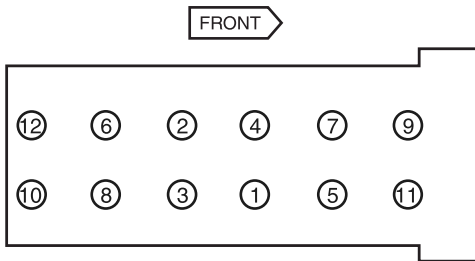
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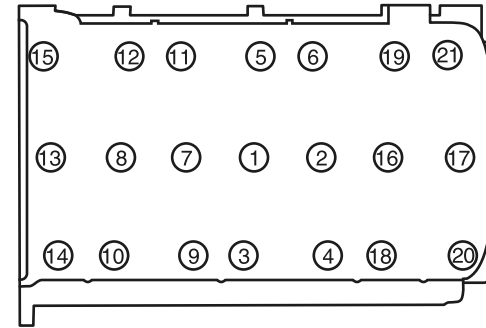
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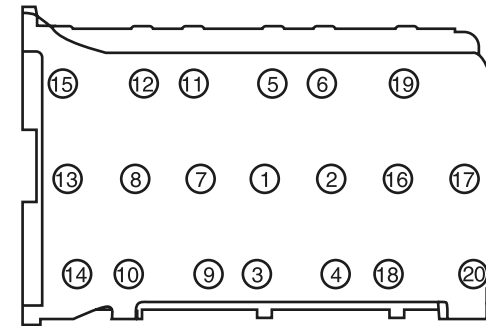


RIGHT SIDE



FRONT

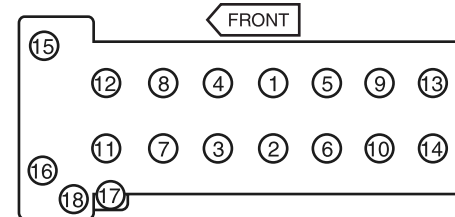
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LEFT SIDE

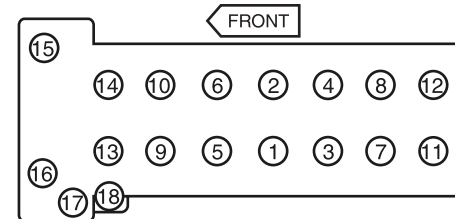
FRONT

228

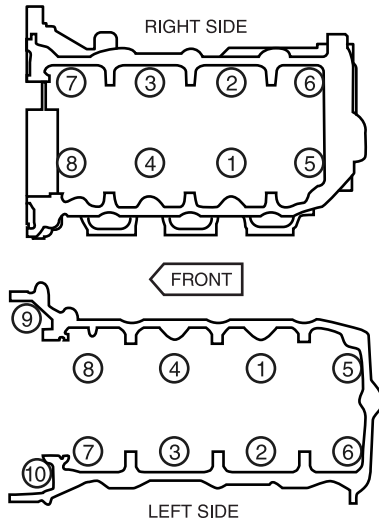


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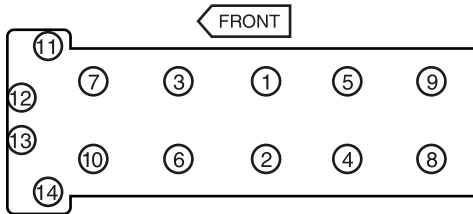
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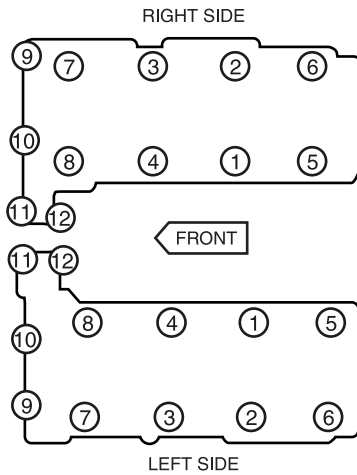
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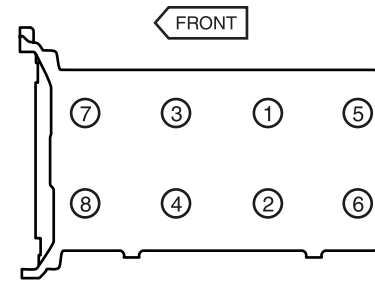
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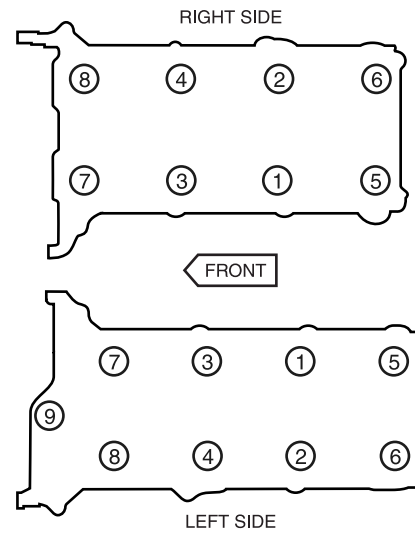
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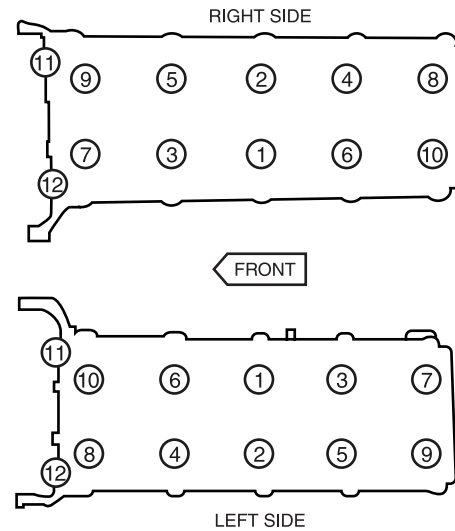
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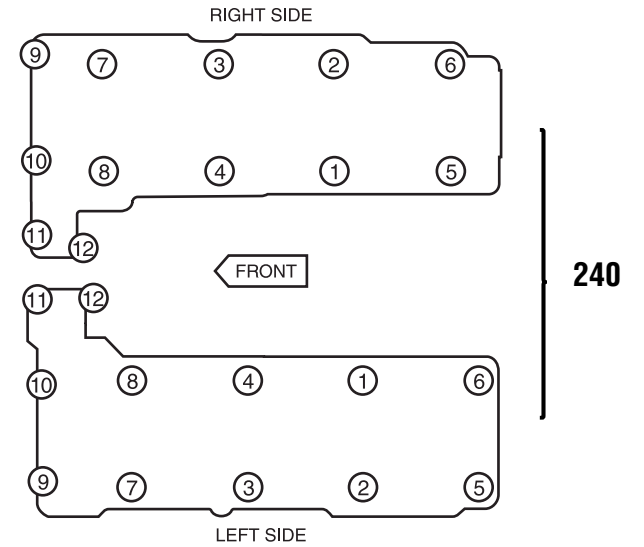
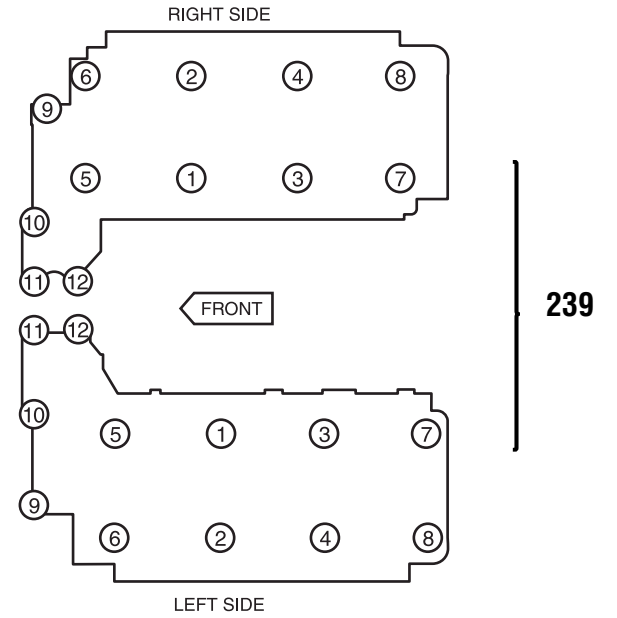
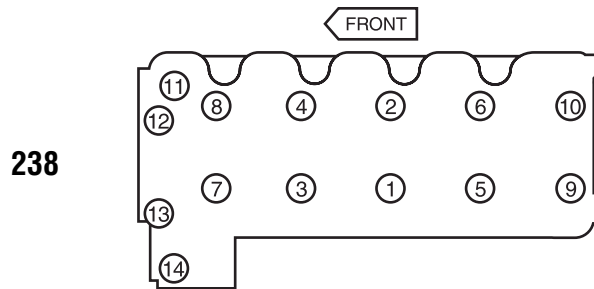
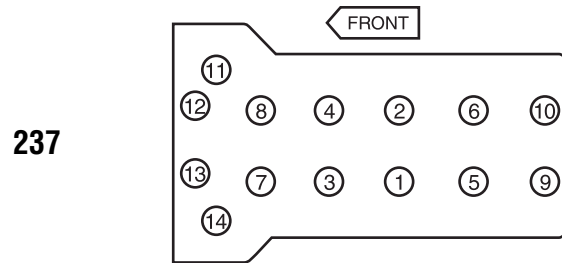
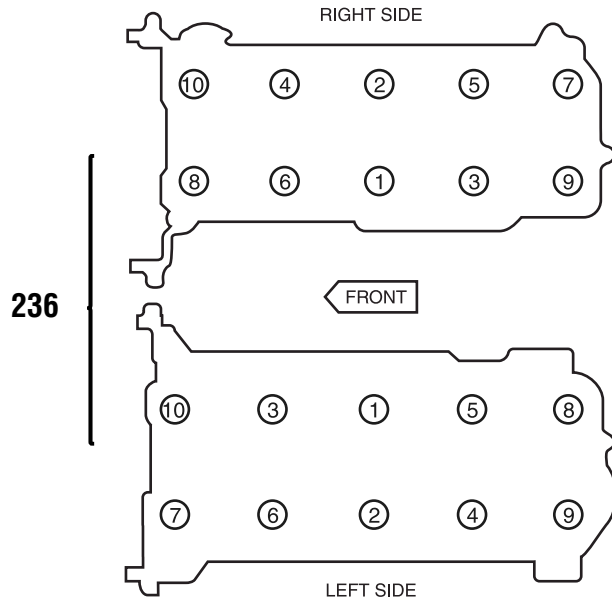
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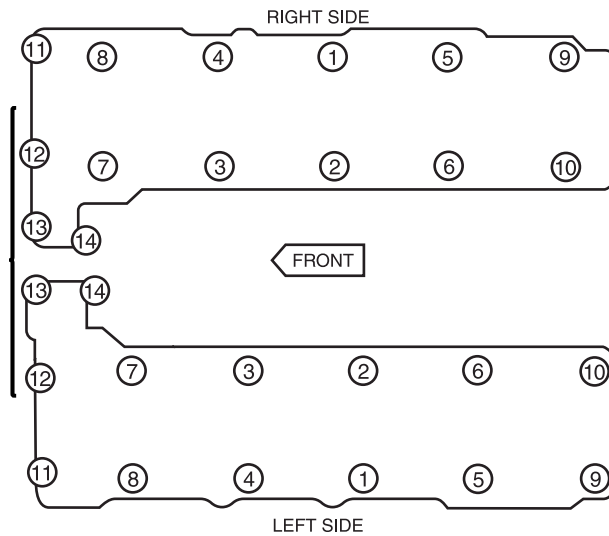


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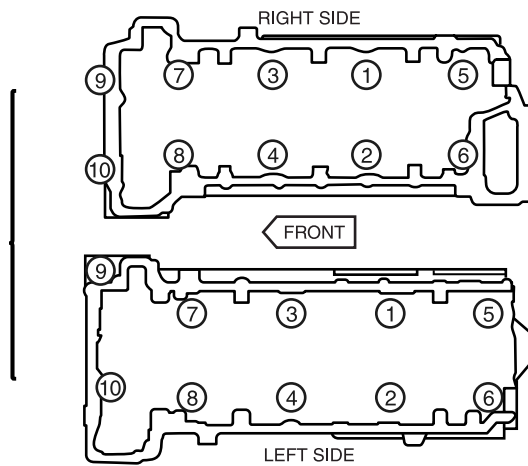


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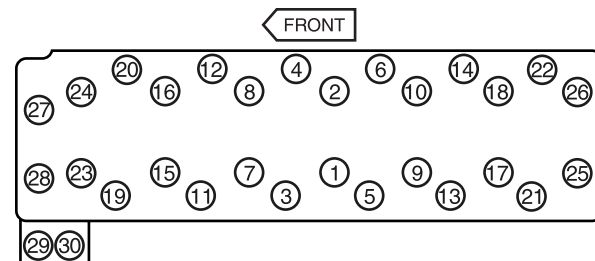
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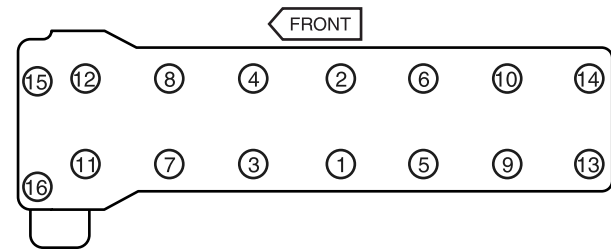
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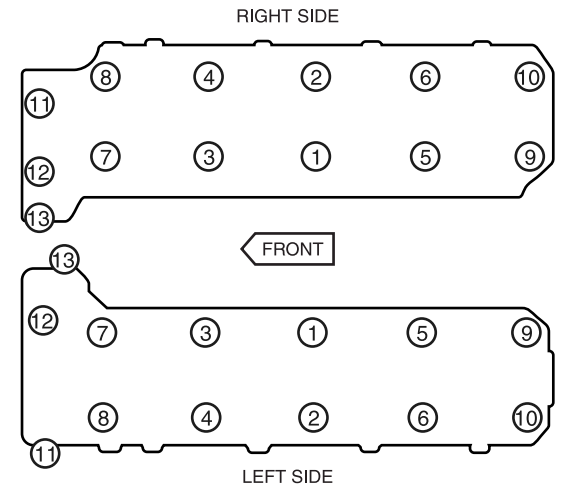
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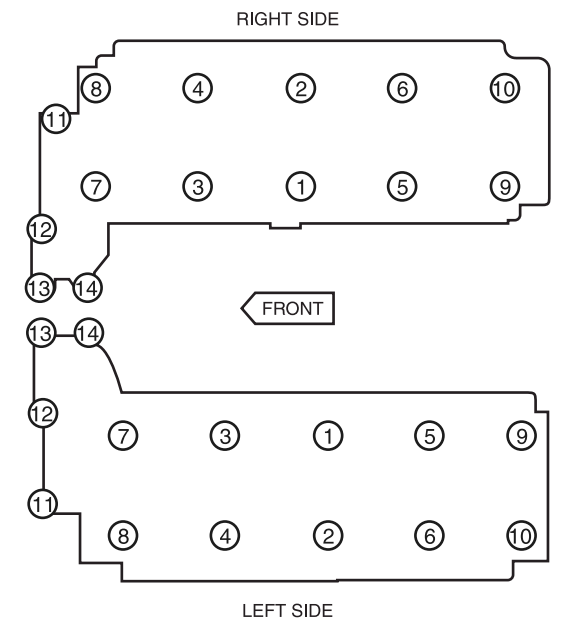
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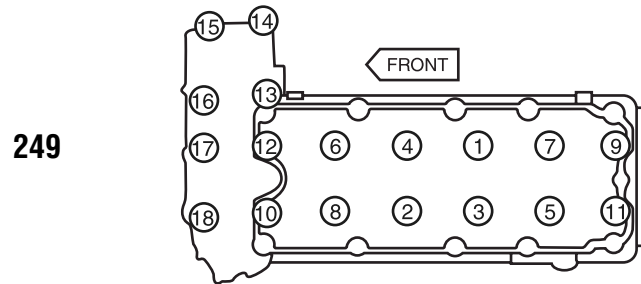
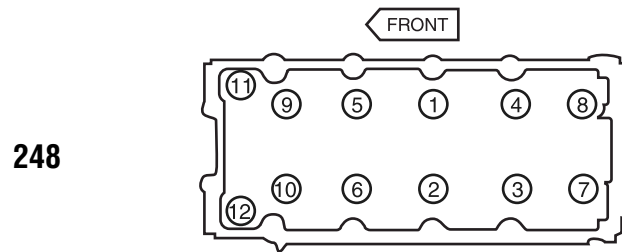
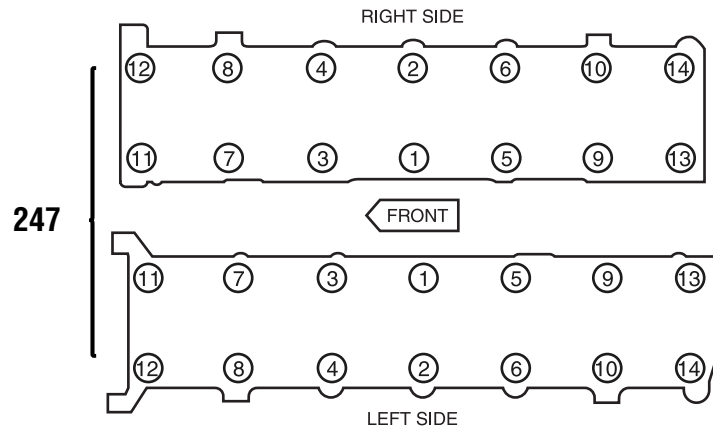


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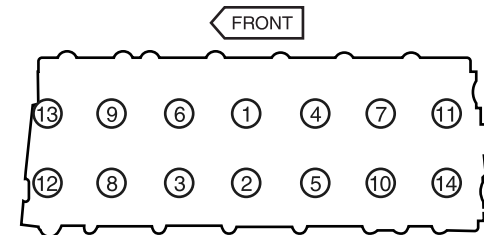
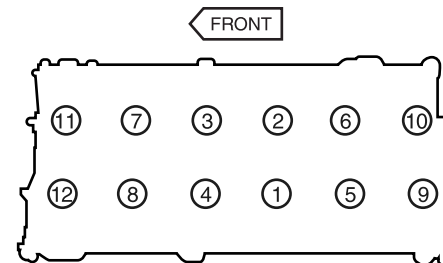
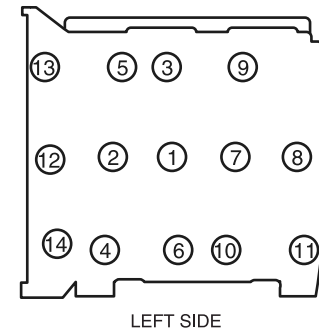
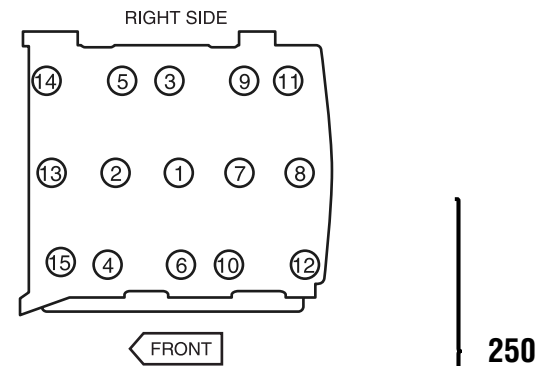




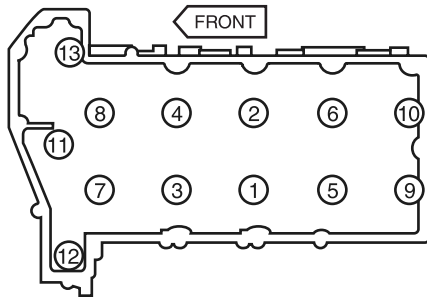
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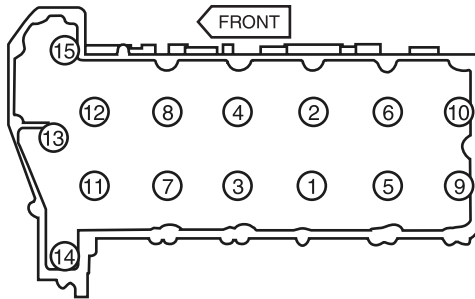
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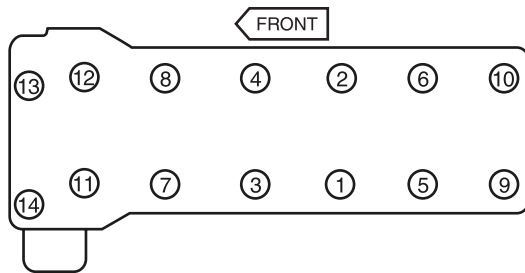
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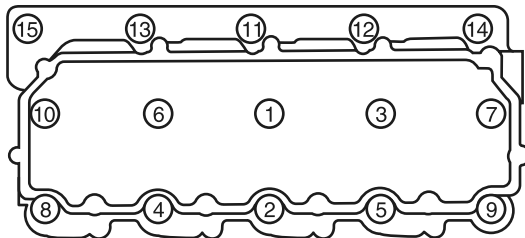
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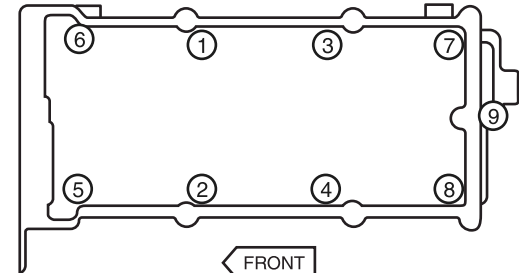
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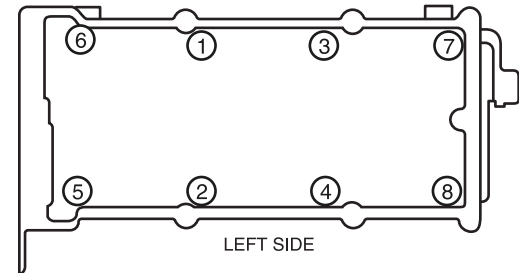
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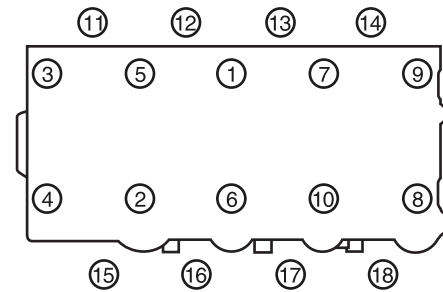


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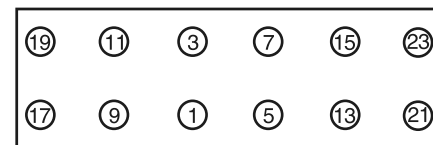


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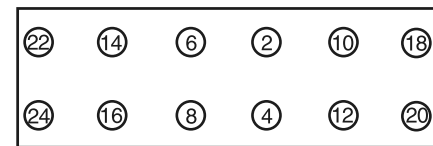
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RIGHT SIDE



FRONT



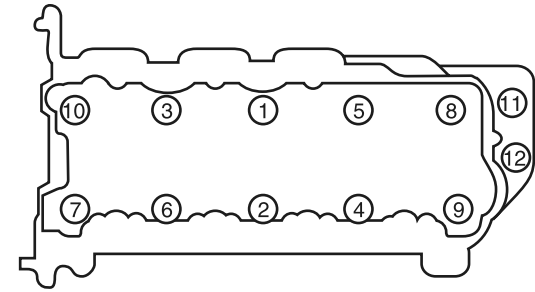
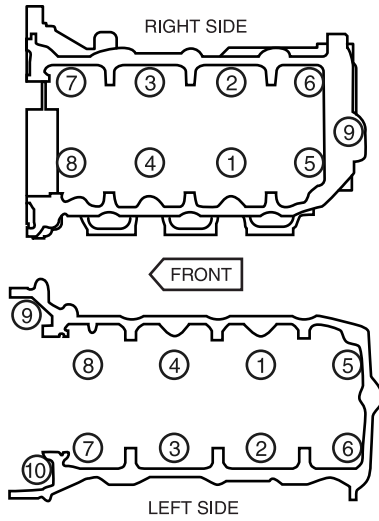
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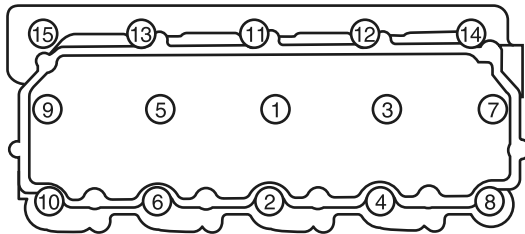
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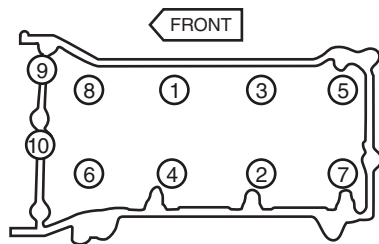


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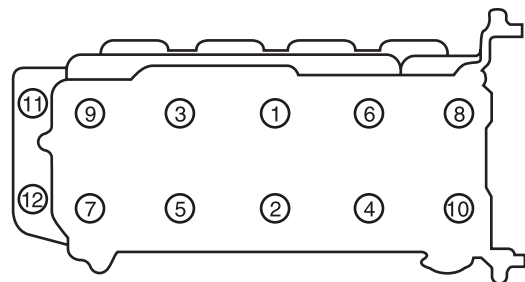
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