

MINI Cooper S R56 Timing Chain Rattle Noise from Engine

Early symptoms of chain tensioner failure on the R55, R56, R57 models consists a slight rattling sound from the passenger side of the engine valve cover, even with engine running but not driven. The rattle sound will increase with speed, but go away when the engine reaches approximately 1800 R.P.M. The sound will return when the engine returns to lower R.P.M.s during deceleration or idle. In early stages this sound may be more pronounced at colder temperatures, but in more severe cases the sound and vibration will be heard at all temperatures.

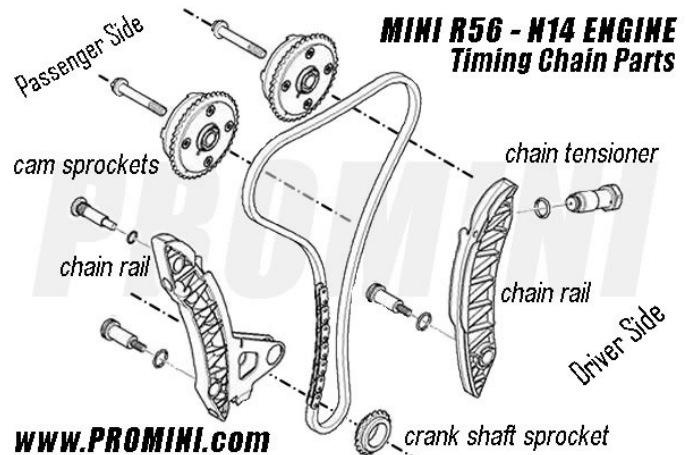


Vehicles Affected:

- Mini Cooper S R56 (-2012) N14 Engine
- Mini Cooper S Clubman R55 (2008-2012) N14 Engine
- Mini Cooper S Convertible R57 (2009-2012) N14 Engine



Diagram is provided to the left for quick reference of the timing chain components and their orientation or location on the engine.



Common MINI Cooper S R56 Engine Failure:

This failure is the result of a weak or collapsed timing chain tensioner. If driven for an extended period of time the results will be a broken plastic tensioner rail or upper guide rail.

The noise you are hearing is the loose timing chain resulting from a collapsed timing chain tensioner. The slapping action of the timing chain will eventually break the tension rails. This condition will also effect cam timing and risk an eventual chain failure.

The chain will also need to be replaced at the time of repair in case of stretching or elongation. We do not recommend driving a vehicle in this condition other than at low R.P.M. to a nearby repair shop.



How to determine if the engine noise is a bad timing chain?

DIAGNOSIS PROCEDURE

Work through the following to eliminate other causes.

1. If a Fault is stored in the DME memory (e.g., misfiring, VANOS, etc.), then work through all the relevant test plans first.
2. A one-time short shrill will be heard within the first two seconds of engine operation. This is an inherent noise caused by the first regulation cycle of the engine oil pump. This is normal operation and no parts should be replaced.
3. If the noise appears to be coming from the valve cover or the vacuum pump area, refer to SIM11 02 08. To verify the source of the noise, disconnect the vacuum hose from the mechanical vacuum pump to eliminate the knocking noise. This is not a failure of the mechanical vacuum pump; do not replace any parts.
4. Ensure the noise is not created or eliminated by depressing the clutch pedal, if equipped.
5. Disconnect the electrical connector from the tank ventilation valve. If the noise disappears when the connector is removed, reconnect to verify whether the noise returns. If the noise returns, replace the tank ventilation valve.



If ALL of the steps above are unsuccessful in eliminating the noise, start the Timing Chain Removal and Inspection process: To remove the timing chain you will need the [MINI Cooper S R56 Cam Timing Tool Kit for N12/N14 engines](#) Promini Part# 138007. (products shown fit model, please select your year for availability).

This tool is used to avoid improper cam timing on MINI Cooper engines, the factory has devised a cam timing system that locks the crankshaft and cams into a specific position prior to cylinder head removal.

This method was devised to avoid any misalignment, resulting in piston to valve damage. Unfortunately without these tools re-timing the camshafts after a valve job is almost impossible. The factory specification manual does not supply installation specifications. (includes all the necessary components to lock the crankshaft and flywheel position as well as the cams).



To replace the timing chain you will need the following necessary parts to complete the job: [Complete MINI Cooper S R56 Timing Chain Replacement Kit](#) Promini Part# 180846.

(note: we recommend replacing all of the timing chain parts while you have the engine apart to save time and money, and avoiding mixing new and old parts to ensure that you won't have to do it over in the future, and to keep your car in optimal running condition.)

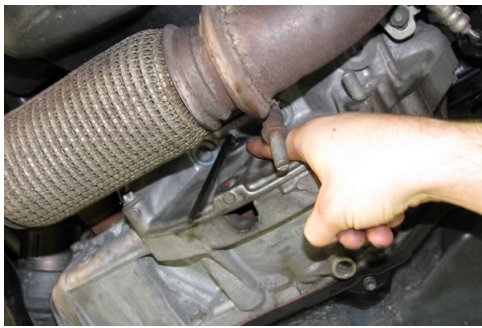
Compatible with models from 01/ to 04/2010.

[Click here to view a complete list of parts in this kit.](#)

To replace the timing chain tensioner only you will need the following part: [Complete MINI Cooper S R56 Timing Chain Replacement Kit](#) Promini Part# 180841.

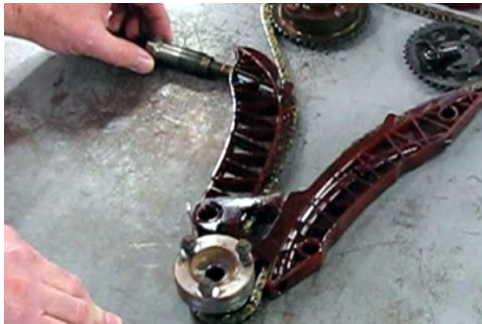
(note: only removal the complete timing chain rail cassette is the only way to determine if there are broken pieces that will damage the chain operation.)





Step 1: Remove the right-hand wheel arch trim to access the crankshaft central bolt.

Turn the engine by hand to move the flywheel to approximately 90 degrees before TDC. (Top Dead Center) Install the locating pin (see photo) ([MINI Cooper S R56 Special Tool 11 9 590](#)) to lock the position of the engine.



Step 2: Remove the chain tensioner and collect the residual oil with a shop towel.

(The tensioner is located on the side of the engine block timing cover facing the firewall.)

Fit the timing chain tensioner tool ([MINI Cooper S R56 Special Tool 11 9 340](#)) without the seal ring and with the lock nut loose. Pretension the chain tensioner tool to 0.6 Nm, and finger-tighten the lock nut.

Remove the chain tensioner tool ([MINI Cooper S R56 Special Tool 11 9 340](#)) from the engine, with the lock nut still tight. Measure the distance (A) as shown. If the distance (A) is less than 68mm, then only replace the chain tensioner piston with BMW P/N [11 31 7 598 956](#).

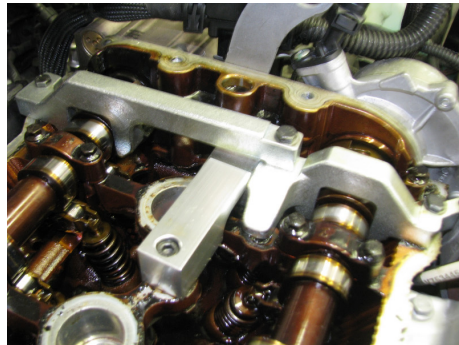


If the distance (A) is 68mm or greater, then replace the following timing chain components:
! Important: Do not replace the intake camshaft VANOS adjustment unit or the exhaust camshaft sprocket.

Step 3: Remove serpentine belt.

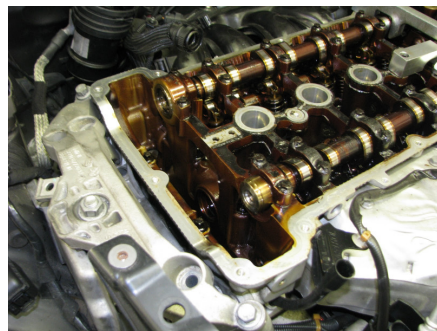
Step 4: Remove the valve cover.

Step 5: Assemble and install the cam locking tool brackets.



Step 6: Remove crankshaft bolt inside the crankshaft pulley which allows for timing chain cassette removal.

Step 7: Remove the old timing chain rail cassette by sliding the whole assembly up and out.



Step 8: Assemble the new timing chain rail cassette with the new crank sprocket held in place with the specially designed tabs.



Step 9: Install the crankshaft pulley and bolt.

Step 10: Install the new timing tensioner.

Step 11: Remove the Cam locking tool. Remove the Crankshaft locking tool.

Step 12: Install the new valve cover gasket, and replace the valve cover to factory torque specifications.

Step 13: Install the new serpentine belt.



**MINI Cooper S Engine Parts available at:
www.Promini.com**



[2007 MINI Cooper S Timing Chain Kit](#)
Part Number: 180846

Fix the famous R56 "death rattle" with this timing chain kit. Compatible with models from 01/2007 to 04/2010

NEW PARTS INFORMATION:
Save \$25 when you purchase parts as a kit!
Click here to order this [2007 MINI Cooper S R56 Timing Chain Kit](#) online.

1	Chain Tensioner R55, R56, R57, R58, R59, R60	11 31 4 609 483
1	Timing Chain only	11 31 7 516 088
1	Timing Guide Rail (side)	11 31 7 568 241
1	Timing Chain Tensioning Rail	11 31 7 534 833
1	Timing Guide Rail (top)	11 31 7 546 697
1	Bearing Bolt with Seal Ring	11 31 7 534 771
2	Bearing Bolt with O-Ring	11 31 7 534 768
1	Bearing Bolt Gasket Ring	11 31 7 550 461
1	Crankshaft Sprocket	11 21 7 588 996
1	Crankshaft Pulley Bolt (14X70mm)	11 21 7 616 164
1	Valve Cover Gasket	11 12 7 572 851
1	Permatex Hylomar Gasket Sealant	074 105 001
1	Serpentine Belt	11 28 7 566 789



[2007 MINI Cooper S Rear Crankshaft Seal](#)
Part Number: 191229

Crankshaft Seal (105 X 85 X 8 mm)



[2007 MINI Cooper S Serpentine Belt](#)
Part Number: 180847

Replacement Serpentine Belt Compatible with models from 01/2007 to 04/2010



[2007 MINI Cooper S NGK Spark Plug](#)
Part Number: 180848

NGK Spark Plug



[2007 MINI Cooper S Ignition Coil](#)
Part Number: 301227

Ignition Coil. Replace your bad, or failing coils with these OEM quality coils.



[2007 MINI Cooper S Valve Cover Gasket](#)
Part Number: 180845

Valve Cover Gasket



[2007 MINI Cooper S Valve Cover](#)
Part Number: 180839

Replacement Valve Cover

[2007 MINI Cooper S Oil Pan Gasket](#)
Part Number: 52273

[2007 MINI Cooper S Oil Pan Gasket](#)
Part Number: 52273



Engine Oil Pan Gasket

[2007 MINI Cooper S Hylomar Gasket Sealant \(Blue Formula\)](#)
Part Number: 63405



This no-run formula seals surface imperfections on machined flanges and is vibration resistant and resists engine fluids.

[2007 MINI Cooper S Timing Chain Tensioner](#)
Part Number: 180841



Timing Chain Tensioner

[2007 MINI Cooper S Oil Drain Plug Seal](#)
Part Number: 35032



Oil Drain Plug Seal

[2007 MINI Cooper S Timing Chain Guide Rail](#)
Part Number: 180843



Timing Chain Guide Rail.

[2007 MINI Cooper S Oil Drain Plug 16x1.5mm](#)
Part Number: 35031



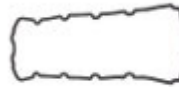
Oil Drain Plug 16x1.5mm

[2007 MINI Cooper S Timing Chain](#)
Part Number: 180842



Timing Chain

[2007 MINI Cooper S Valve Cover Gasket](#)
Part Number: 300537



Mini Cooper Valve Cover Gasket

[2007 MINI Cooper S Timing Chain Tensioning Rail](#)
Part Number: 180844



Timing Chain Tensioning Rail

For technical advice concerning this
Product or its' installation call our
Tech Support
PHONE: 800-648-7278

Or visit our tech tip section at:
www.Promini.com