

2013 E70 X5M SPARK PLUG and IGNITION COIL REPLACEMENT

1. OVERVIEW

BMW maintenance identifies spark plug replacement at every second oil change. However, that varies with BMW's conditioned base service (CBS) of each vehicle. ISTA 00 06 09 (609) 'New Service Contents E70M, E71M' notification identifies a standard oil change interval of 15,000 miles and thus every second oil change results in spark plug replacement at 30,000 miles. Prior to this ISTA notification, BMW's Quality Certification I, found in the owner's manual, identified spark replacement at 45,000 miles (superseded).

Ignition coils, per BMW, last significantly longer and are not usually replaced as preventive maintenance unless signs of failure exist. Sometimes these signs can be subtle, and testing may be needed to identify a failed coil if it exists. However, in this DIY, ignition coils are being replaced at 44,000 miles because of a poor fuel economy symptom.

If the vehicle is pushed to its limits frequently, then you likely already know to consider reducing the interval between replacements. Various sources claim that OEM ignition coils can last beyond 100,000 miles. However, in a previous BMW model I had an ignition coil fail at 29,000 miles. In the end, no one knows the engine better than the driver and maintainer of the vehicle.

2. DISCLAIMER!

This DIY document is for **REFERENCE ONLY and directs readers to use this document only as a guide secondary to your technical experience and abilities. This guide is not a substitute for technical experience and understanding all the potential risks involved when working on your own unique vehicle. This guide does not supersede manufacturers' installation instructions. The DIY instructions below are derived from ISTA as pulled for this specific vehicle: 2013 E70 X5M. Use extreme caution and all applicable safety processes when working on your vehicle.**

3. REPLACEMENT PARTS (2013 E70 X5M)

ITEM	DESCRIPTION	PART NO.	MFG.	MIN QTY.	APPLICATION
A	Spark Plugs, 14mm Bi-Hex, M14x1.25	12-12-0-037-581	BMW	8	Engine
B	Ignition Coils, with Silicone Boot	12-52-7-519-996	BMW	8	Engine
B1	Ignition Coils, with Silicone Boot	12138616153T	TMS	8	Alternate Spec
C	Connector, Ignition Coil	12-52-7-519-996	BMW	AR	Spare

Item B1 is a less expensive alternative, but equivalent. This DIY installed alternative ignition coils.
Item C is a recommended spare in case the connector is broken during installation. Requires depinning tool CTA-9812E or equivalent.

4. TOOLS

ITEM	DESCRIPTION	PART NO.	MFG.	APPLICATION
1	3/8-Drive Ratchet	N/A	Wera	Various Removal/Install
2	Sockets (mm): 6 Deep, 10, 10 Deep	N/A	Wera	Engine Equipment Removal/Install
3	Torx: T20, T25 Long	N/A	Wera	Engine Equipment Removal/Install
4	Socket, Spark Plug, 14mm Bi-Hex, w/Magnetic Retainer	001247SCH01A	Schwaben	Spark Plug Removal/Install
5	3/8-Zyklop Universal Joint	8795 B	Wera	Spark Plug Removal/Install

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6	3/8-Drive Extension, locking, 125 and 200mm	8796 SC 8796 LB	Wera	Spark Plug Removal/Install
7	BMW Special Tool	12 1 230	BMW	Spark Plug Installation
8	3/8-Drive CDI Torque Wrench (10Nm – 100Nm)	1002NMRMHSS	CDI	Spark Plug Installation
9	1/4-Drive CDI Torque Wrench (2.8Nm-15.3Nm)	1501MRMH	CDI	Engine Equipment Installation
10	Magnet	Any	Any	Spark Plug Removal/Install
11	1/2-Drive Ratchet Koloses w/Handle Extension & reducer to 3/8" drive	8002C, 8780C	Wera	Spark Plug Removal
12	Channel Locks/Pliers	Any	Any	Ignition Coil Removal
13	Ignition Coil Connector Extraction Tool (Depinning)	CTA-9812E	CTA	Optional only for broken connector

5. INSTRUCTIONS

a. NOTES:

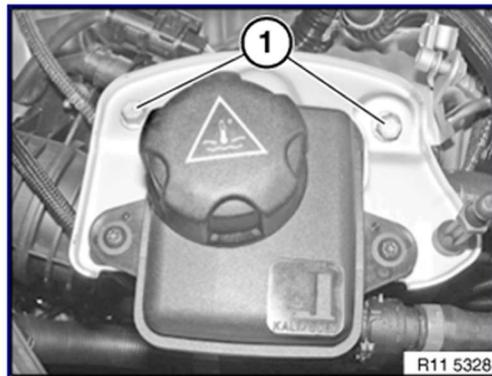
- i. *Keep ignition coils clean and avoid all contact with fuel.*
- ii. *Do not grease the ignition coil silicone tube. It is internally coated with talc to reduce friction upon removal and/or installation from spark plug.*
- iii. *Do not grease or apply oil to new spark plug threads in any way.*

b. Remove Intake Filter Housing:

- i. Lift off engine cover and slide back intake filter housing trim piece to remove.
- ii. Loosen both (2) intake housing clamps.
- iii. Remove intake filter housing by releasing four (4) T25 bolts.
- iv. **Hose Clamp Tightening Torque = 3Nm, 6mm Socket**
- v. **Housing Tightening Torque = 3.5Nm, T25 Long**

c. Loosen Expansion Tank Reservoir with Retaining Plate:

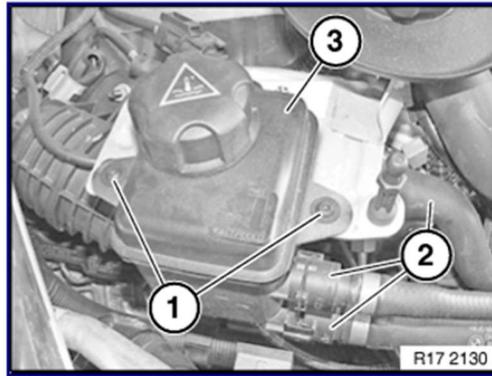
- i. Remove two (2) M6 screws [1].
- ii. **Tightening Torque = 8Nm, 10mm Socket**



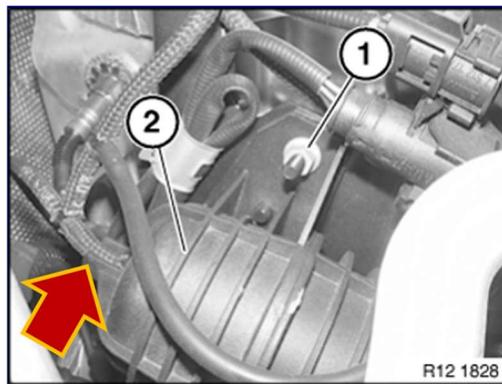
d. Separate Retaining Plate from Expansion Tank:

- i. Remove two (2) T20 Torx K50x18 screws [1].
- ii. Do not remove coolant hoses [2].
- iii. Set expansion tank [3] aside.
- iv. **Tightening Torque = 4Nm, T20 Torx Socket**

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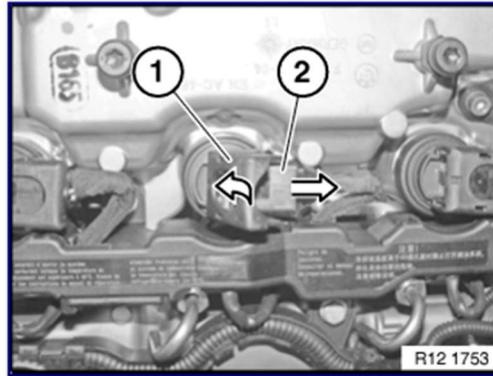


- e. Remove Left and Right Vacuum Reservoirs:
 - i. For left and right reservoirs, remove single M6 nut [1] using deep 10mm socket.
 - ii. Remove vacuum reservoir [2] from holder.
 - iii. On the right side (see arrow below), disconnect aft-most tube from vacuum reservoir.
 - iv. Set vacuum reservoirs aside.
 - v. **Tightening Torque = 10Nm, 10mm Deep Socket**



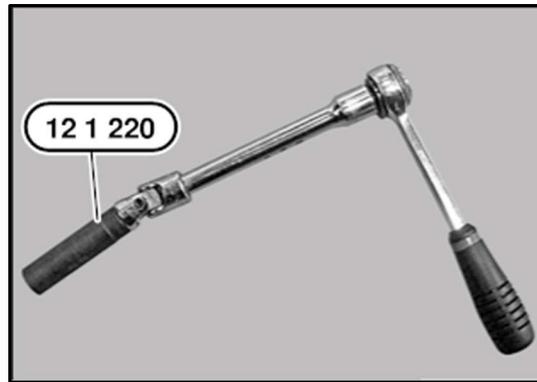
- f. Disconnect Eight (8) Ignition Coil Connectors:
 - i. **NOTE: There is a possibility that the ignition coil [2] boot may tear and be destroyed.**
 - ii. Observe orientation of ignition coils, dictated by connector at each location. **Note: the fore-most ignition coils on each side are oriented contra to the others.**
 - iii. Unlock ignition coil connector catch [1] by lifting upward. The hinge is at the centerline of the ignition coil. Once coil connector catch is unlocked, lift fully vertical to release connector.
 - iv. Unplug connector from ignition coil [2]. This should require very little effort.
 - v. Slowly pull-out ignition coil [2] in a smooth upwards movement.
 - 1. First close coil connector catch.
 - 2. Next ensure the ignition coil connector is safely out of the way.
 - 3. Rotate the ignition coil to break the friction seal for easier removal. If the ignition coil is sufficiently stuck such that you're unable to remove it by hand, then consider carefully using pliers or channel locks to rotate coil in the available direction to break seal. Forceful clamping force is not required. Next pull the ignition coil slowly upwards. Pliers seemed to be best where you have the most room, whereas channel locks are definitely recommended at the aft most ignition coil locations.

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- g. [REF ONLY] Spark Plug Removal/Installation Summary:
- i. Using rubber gloves, prepare new spark plug on bench and insert into special tool 12 1 230.
 - ii. Use breaker bar or equivalent to loosen old spark plug.
 - iii. Next use normal drive ratchet assembly to unthread old spark plug further.
 - iv. Once very loose, use a finger ratchet for the final unthreading and careful removal.
 - v. Carefully insert the new spark plug with the special tool, thread to limit, and then remove special tool.
 - vi. Use combination finger ratchet and/or standard ratchet assembly to install new spark plug hand tight.
 - vii. Use torque wrench to tighten new spark plug, 30Nm.
 - viii. Repeat.
- h. Remove Eight (8) Spark Plugs:
- i. **NOTES:**
 1. *This procedure requires a light hand and patience to ensure a damage-free experience.*
 2. *If possible, use ratchet/extension/socket combinations that have ball plunger locking features. This can help prevent tools separating and remaining in the spark plug well. It also prevents components from free falling down the well and damaging or breaking the spark plug ceramic stem. This is especially needed if using a magnetic bi-hex socket to remove spark plugs.*
 3. *Otherwise, to reduce the chances of tools separating, remove ratchet and then lightly rotate extension back and forth to free socket from spark plug.*
 4. *Have a strong magnet on hand when tools separate and are left in the spark plug well.*
 5. *Consider using a breaker bar to first loosen each spark plug.*
 - ii. With ignition coils removed, and prior to removing spark plugs, clean spark plug well with compressed air to displace any debris.
 - iii. Using a breaker bar ratchet or equivalent, loosen the spark plug.
 - iv. Carefully unthread and remove spark plug with 14mm bi-hex socket with magnetic retainer, universal joint, extension, and drive ratchet. **NOTES:** *Once the spark plug is broken free, it should be easily unthreaded. Hold the ratchet assembly, used for removal, in a neutral position while unthreading. Pulling up or pressing down will add significant friction to the unthreading process.*

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- v. With spark plugs removed, use magnet (or vacuum) down spark plug well to remove any loose debris. *NOTE: Caution do not use compressed air with spark plugs removed.*

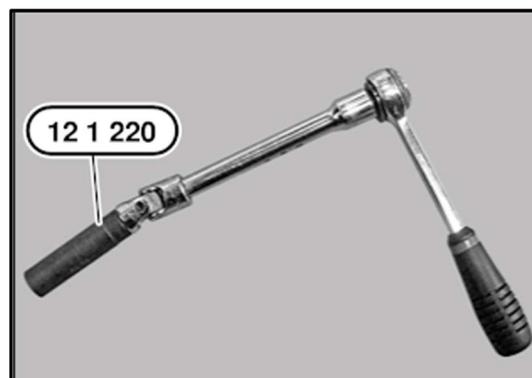
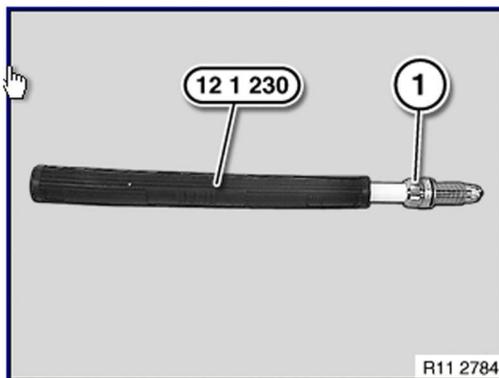
- i. Install Eight (8) New Spark Plugs

- i. *NOTES:*

- 1. *Do not grease or oil new spark plug threads in any way.*
 - 2. *Do not let spark plug fall into spark plug shaft, as this can change the electrode gap and impair smoothness of engine operation.*

- ii. Attach new spark plug to BMW special tool 12 1 230 and thread into position furthest possible.

NOTE: Using this tool may seem unnecessary, especially if you have a magnetic bi-hex socket. However, using this tool provides feedback so you may thread in the spark plug easily without any possibility of cross threading. For best results, hold tool with spark plug inserted in neutral position and rotate to thread in spark plug. Neutral position means to hold tool such that the thread pulls the tool inward without any additional user force besides rotation.



- iii. Carefully thread new spark plug to limit with 14mm bi-hex socket with magnetic retainer, universal joint, extension, and 3/8-drive ratchet into engine cylinder head thread.
 - iv. **Tightening Torque = 30Nm±3Nm, 14mm Bi-Hex Socket**

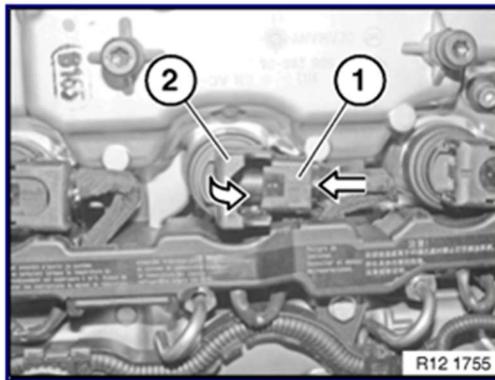
- j. Install Eight Ignition Coils:

- i. Position the ignition coil [1] and gently push it to the limit position. If necessary, by twisting back and forth slightly.
 - ii. The rubber cap must completely surround the sealing collar of the cylinder head cover.
 - iii. Ensure the ignition coil connector catch [2] is fully open/vertical.
 - iv. Push OEM plug connector [1] into ignition coil socket. The objective is to press the plug in sufficiently so that the plug tabs engage the ignition coil catch such that upon closure of the

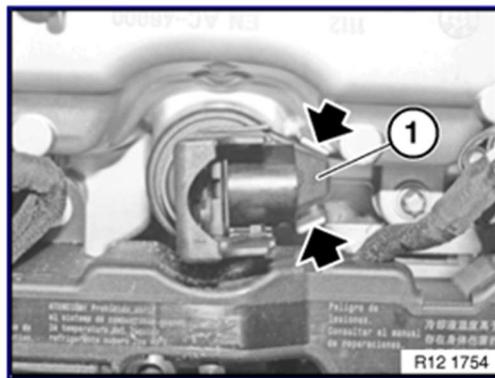
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catch lever the OEM plug is pulled inward for final mating. If this is not done, then the OEM plug will be pushed away from the ignition coil socket when trying to fold the catch lever downward.

1. Position the OEM plug in the ignition coil socket. With thumb opposite connector socket, firmly squeeze the OEM plug into the socket while simultaneously closing the catch lever with the other hand. There should be an audible click once the catch grabs the plug tabs and the connector will be pulled tighter into the ignition coil socket. The connector catch must snap into place without great effort. Otherwise, the connector is not properly installed. *NOTE per ISTA: The connector must be positioned on the counter piece with hardly any gaps when the locking lever is being closed. In the process, the cheeks of the lever are positioned inside the counter piece. The locking lever can be deformed if it is not installed correctly. This means there is no longer a safety lock on the plug connection. As a result, the connection can slip out during engine operation resulting in loose contact and misfire.*



- v. Check that the ignition coil is coupled/touching the anti-twist lock feature [1], see arrows below.



- k. Reinstall engine hardware in reverse of removal.

6. END/RESERVED.