

Volkswagen 1.4L TSI EA211: Coolant Pump Replacement

Used in many Volkswagen, Audi, SEAT and Skoda vehicle models from 2013 onwards.



The coolant pump is fitted to the back of the head and is driven by a toothed belt. Applying the correct tension to the belt is the tricky part.

Diagram # 1



Rear view showing the belt and sprocket. NOTE: No tensioner.

In the March 2017 issue of Tech Talk, we covered the coolant pump replacement of on the 1.4L TSI EA111 series of engine. These engine's coolant pump is mounted on the front of the engine. As of 2013, the Volkswagen group has released the EA211 family of engines with the coolant pump at the rear of the head. This article will give you an overview of the system and the procedure to replace the pump for 1.4L TSI engines with I.D. codes of CPTA, CHPA, CMBA and CPVA.

The ongoing push to reduce emissions and increase efficiency has led to the trend in engine downsizing. Downsizing means that a smaller more efficient engine is now doing the job which a larger engine once did. This has led the Volkswagen group to develop the EA211 family of engines which is used in a wide range of VAG makes and models since 2013. One of the more common engines in

this family is the 1.4L TSI. TSI stands for "Turbo Stratified Injection" which indicates that this is a turbocharged direct petrol injected engine. There are many innovations applied to this engine to reduce emissions, and the engine cooling system is one of them, which has made replacing the coolant pump tricky.

Cooling System Operation

The EA211 engines have a dual-circuit cooling system, which means that coolant directed through the cylinder head is controlled differently from the coolant in the cylinder block. This is because the exhaust manifold is now integrated into the cylinder head which allows the head to warm up faster. This, in turn, allows the engine to reach operating temperature sooner, which reduces emissions (and allows the heater in the car to work faster on a cold morning).

The cylinder head cooling circuit has its own thermostat which opens

at 87°C and allows coolant to flow through the radiator. The cylinder block cooling circuit has a thermostat that opens at 105°C which assists the block to warm up faster, and the higher temperature reduces operating friction.

Both of these thermostats are now fitted into the coolant pump assembly at the rear of the cylinder head. The coolant pump is driven via a toothed belt from the rear of the intake camshaft. This belt is maintenance free and does not require regular replacement.

It is reasonably common for the seals in these pumps to fail and start leaking. It is possible to dismantle this assembly and fit a new pump, however, feedback we have received recommends that you replace the whole assembly (pump, thermostats and housings as a unit) due to difficulties with warpage of the housings. Fit a new drive belt as well to avoid any future problems. ▶

Diagram # 2

View of Golf 7 Engine Bay with 1.4L TSI EA211 Engine

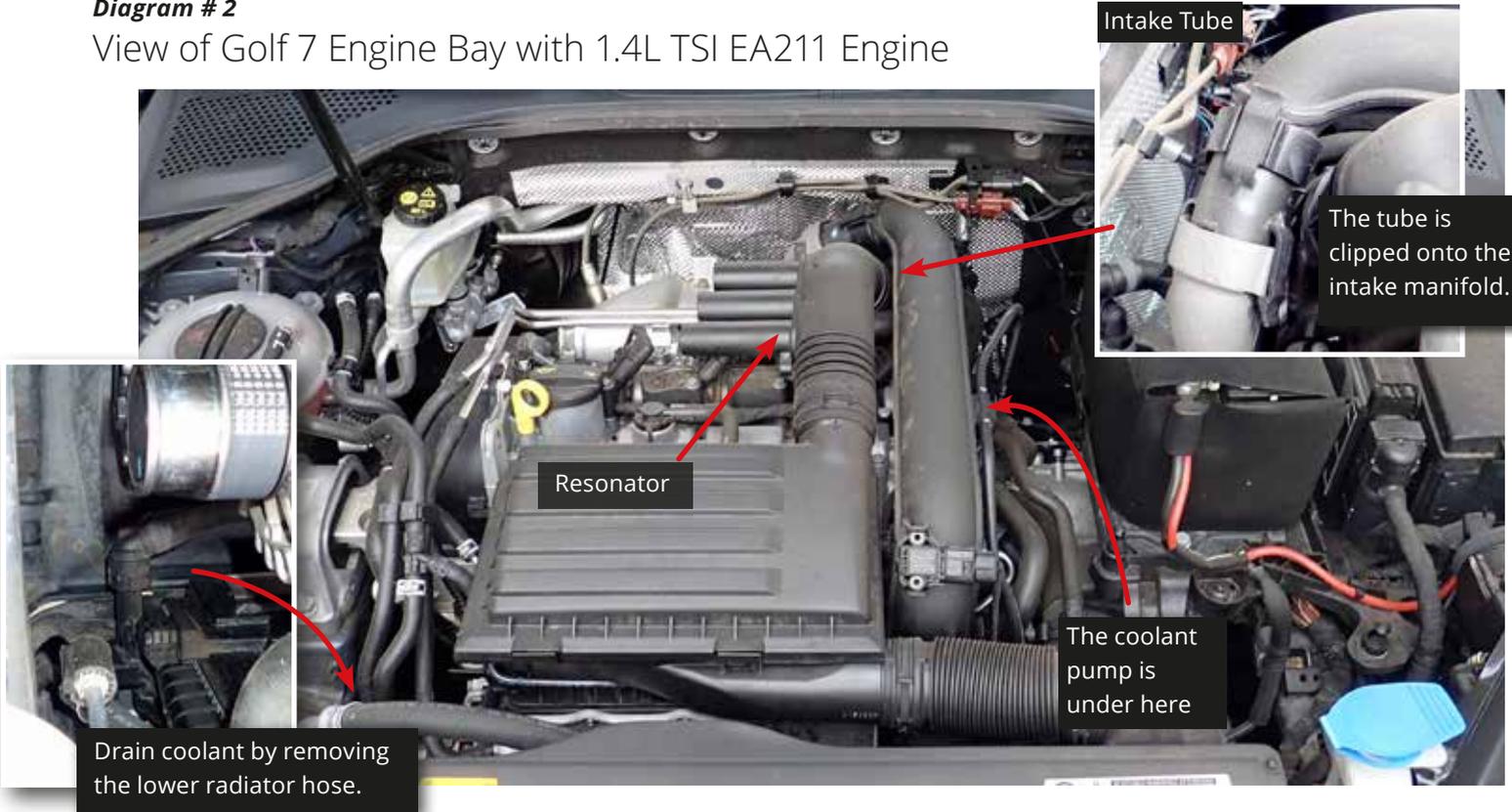
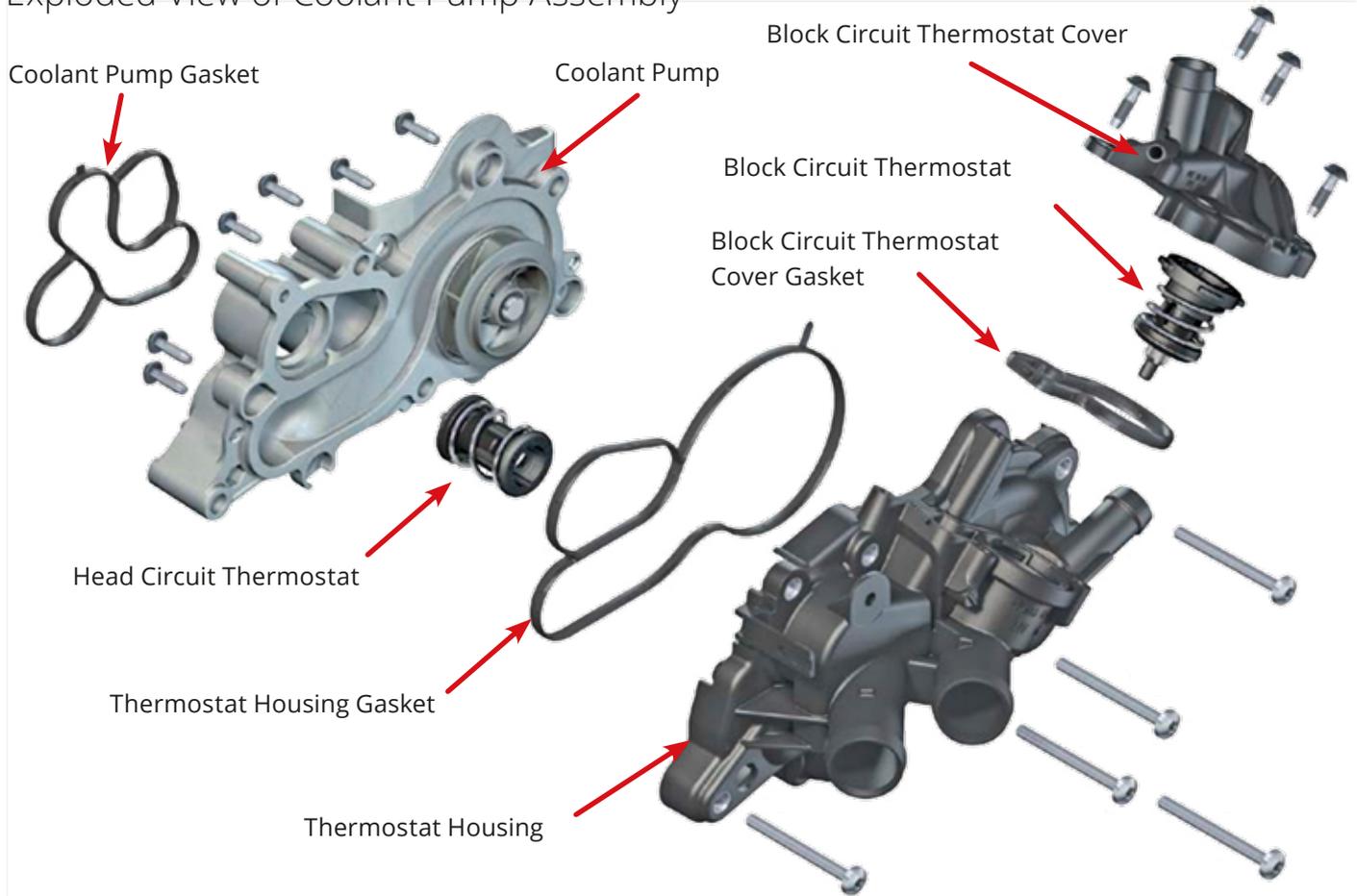


Diagram # 3

Exploded View of Coolant Pump Assembly



Pump Removal

1. Drain the coolant.
2. Remove the battery and battery tray.
3. Remove the air intake pipe (the one with the 3 resonators on it).
See Diagram #2
4. Disconnect the wiring harness from the intake air pipe, then remove the pipe by releasing the clips at each end.
5. Disconnect the hose to the charcoal canister.
6. Remove the bolts at each end of the crankcase breather hose and remove the hose.
7. Unclip the wiring harness from the coolant pump belt cover and move the harness out of the way.
8. Remove the coolant pump belt cover (3 bolts).
9. Remove the coolant hoses from the pump assembly.
10. Loosen the pump assembly bolts in the opposite sequence shown, then remove the bolts.

See Diagram #5

11. Remove the pump and toothed belt.

See Diagram #1

Block Cooling Circuit Thermostat Replacement

To remove the block cooling circuit thermostat, complete the disassembly above to step 4 leaving the coolant pump attached to the engine.

1. Then remove the coolant hose that attaches to the thermostat housing.
2. Remove the four bolts to remove the thermostat housing.
See Diagram #2
3. Use special tool T10508 on a ratchet, press down on the thermostat while turning anti-clockwise and the thermostat should come out of the pump assembly.

Installation

1. Fit the thermostat to the pump assembly making sure that the pin in the end of the thermostat fits into the hole at the base of the housing.
2. Use special tool T10508 on a ratchet, press down on the thermostat while turning clockwise.
3. Fit a new rubber gasket to the thermostat housing, making sure that you lubricate it with coolant.
4. Tighten bolts to **8 Nm**.

Head Cooling Circuit Thermostat Replacement

NOTE: You can buy the pump separately from the thermostat housing. Use this procedure to fit the new pump. However, it is recommended that if the pump has failed you should replace the entire assembly with a new drive belt.

1. Remove the coolant pump assembly from the engine.
2. Remove the bolts at the rear of the pump in the opposite sequence.
See Diagram #4
3. Remove the rear cover from the pump to expose the head thermostat which can now be removed from the housing.

See Diagram #2

Installation

1. Fit the thermostat in the correct orientation into the housing.
2. Fit a new rubber gasket to the housing, making sure that you lubricate it with coolant.
3. Fit the rear cover to the pump assembly. Ensure that the guide pins / dowel pins align.
4. Tighten bolts in sequence to **8 Nm**. **See Diagram #4**

Pump Installation.

1. Fit a new gasket lubricated with coolant. **See Diagram #3**
2. Turn the engine so that No. 1 cylinder is a TDC.
3. Fit the new drive belt to the sprocket at the rear of the head.
4. Fit the coolant pump to the head, screw in the bolts in sequence, **hand tight**. **See Diagram #5**
5. Tighten the bolts in sequence to **10 Nm**. **See Diagram #5**
6. **LOOSEN** all bolts **ONE** turn.
7. Fit a 10 mm Allen key socket attached to a tension wrench into the coolant pump.
See Diagram #5 ▶

Diagram # 4

Rear View of Coolant Pump Assembly

NOTE: It is recommended to replace the whole assembly to avoid future issues

If you have removed the thermostat housing from the pump use this sequence and tighten the bolts to **8 Nm**.

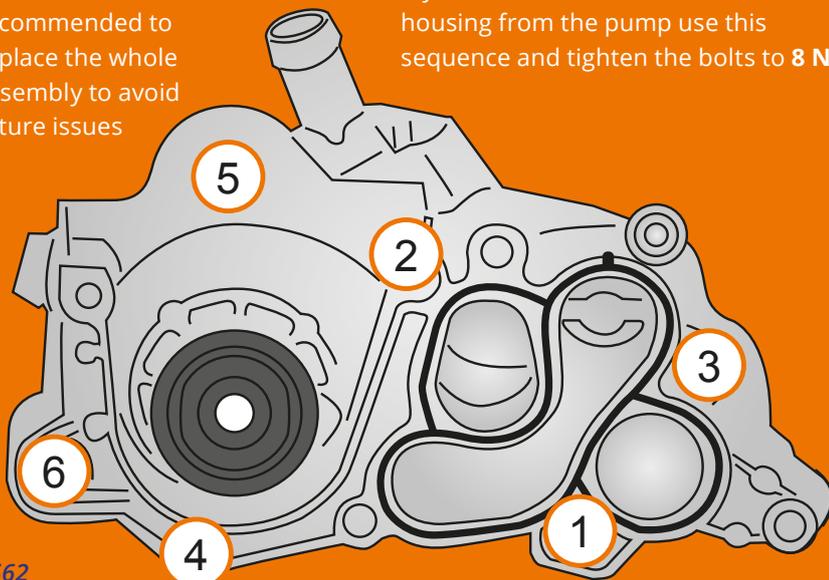
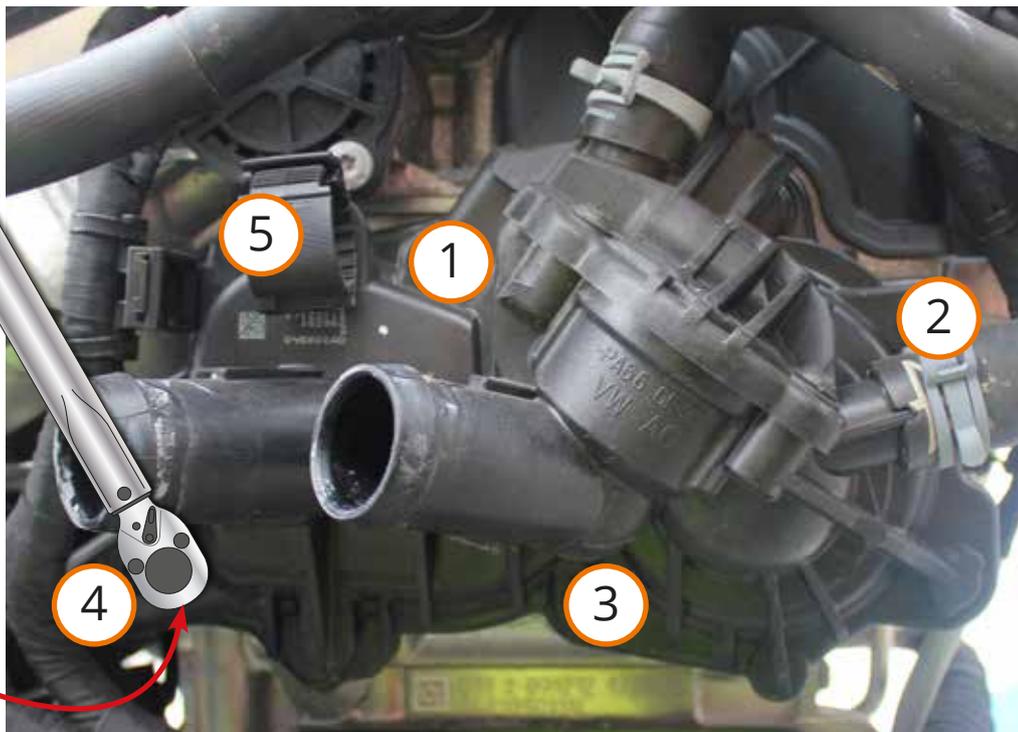


Diagram # 5

Coolant Pump Tensioning and Tightening Sequence

To apply the correct tension to the drive belt, fit a 10 mm Allen key socket on a tension wrench into the hexagon hole in the pump. Then apply **30 Nm** of force in an anti-clockwise direction.



8. With the assistance of a second technician, apply **30 Nm** of torque to the coolant pump, which will apply the correct tension to the drive belt. **See Diagram #5**
9. With the torque applied to the coolant pump, tighten the coolant pump bolts in the following sequence, and two stages.
1st: Bolts 2, 1 and 5 to **10 Nm**
2nd: Bolts 3,4,5,1 and 2 to **12 Nm**
10. Refit belt cover and tighten bolts to **8 Nm**.
11. Reassemble all other components in reverse order.
12. The workshop manual recommends refilling the coolant with a vacuum coolant filler to avoid airlocks.
13. Pressure test for leaks.
14. Test drive and recheck for leaks and coolant levels.
15. Check for DTC and clear or repair as required.

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Thanks to the team at Grant Walker Parks for their assistance with the photos in this article.

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To mark the occasion, the **VACC Centennial Cavalcade** – featuring **'100 vehicles from 100 years'** – will travel from Melbourne to Bendigo, VACC's birthplace on Saturday, 22 September. The same evening, VACC will host a Centennial Gala Dinner in the magnificent Bendigo Town Hall to celebrate its 100th anniversary.

VACC is seeking significant vehicles dating from 1918 to 2018 to participate in the Cavalcade and/or Show 'n Shine in Bendigo. For more info visit vacc.com.au/News/Events

