

E-type engine removal

PART ONE: In the first of a two-part series, we follow the preparation work required prior to removing the engine and gearbox from an E-type

WORDS & PHOTOGRAPHY **ROB HAWKINS**

“**T**here’s a massive hole in the side of the sump,” remarks Annie Jenkins at independent classic Jaguar specialist Ken Jenkins, concerning the E-type Series I 4.2 that’s recently been delivered to the workshop. The owner had switched off the engine when it made a worrying noise, and he promptly spotted a large pool of oil underneath it.

When whatever oil left inside the sump is drained, it’s full of engine coolant, which suggests there’s more internal

damage. The first solution is to remove the engine and gearbox to further assess the damage, which is when we arrive on the scene and photograph the story as it unfolds. We’ll conclude the mystery in the next issue of *JW*.

DOING IT YOURSELF

Difficulty 

Time required: 5-6 hours

On your own? No

THANKS TO

Ken Jenkins Classic Jaguar Specialist

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Holme House Farm Bungalows

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When we arrive at Ken Jenkins' workshop, the E-type is on the four-post lift and its sump has already been removed. It's hard to miss the hole in the side of it and the fragments of a piston



Looking up into the engine, we can see that piston number four is missing. All that's left is its gudgeon pin and a bent conrod. At this stage, we can't see all the remains of the piston



Mechanic Shaun makes a start on removing the engine and gearbox. First, he detaches the exhaust system from the downpipes. After loosening the clamps, he taps the joints with a hammer to release them



With the exhaust system supported by a transmission jack, he hits the front edge of the silencers with a mallet to detach the entire system and be able to carry it away



There's a metal plate attached to the underside of the vehicle, below the gearbox. Shaun removes all of its fastenings and lifts it off. This needs to be removed to lower the engine and gearbox



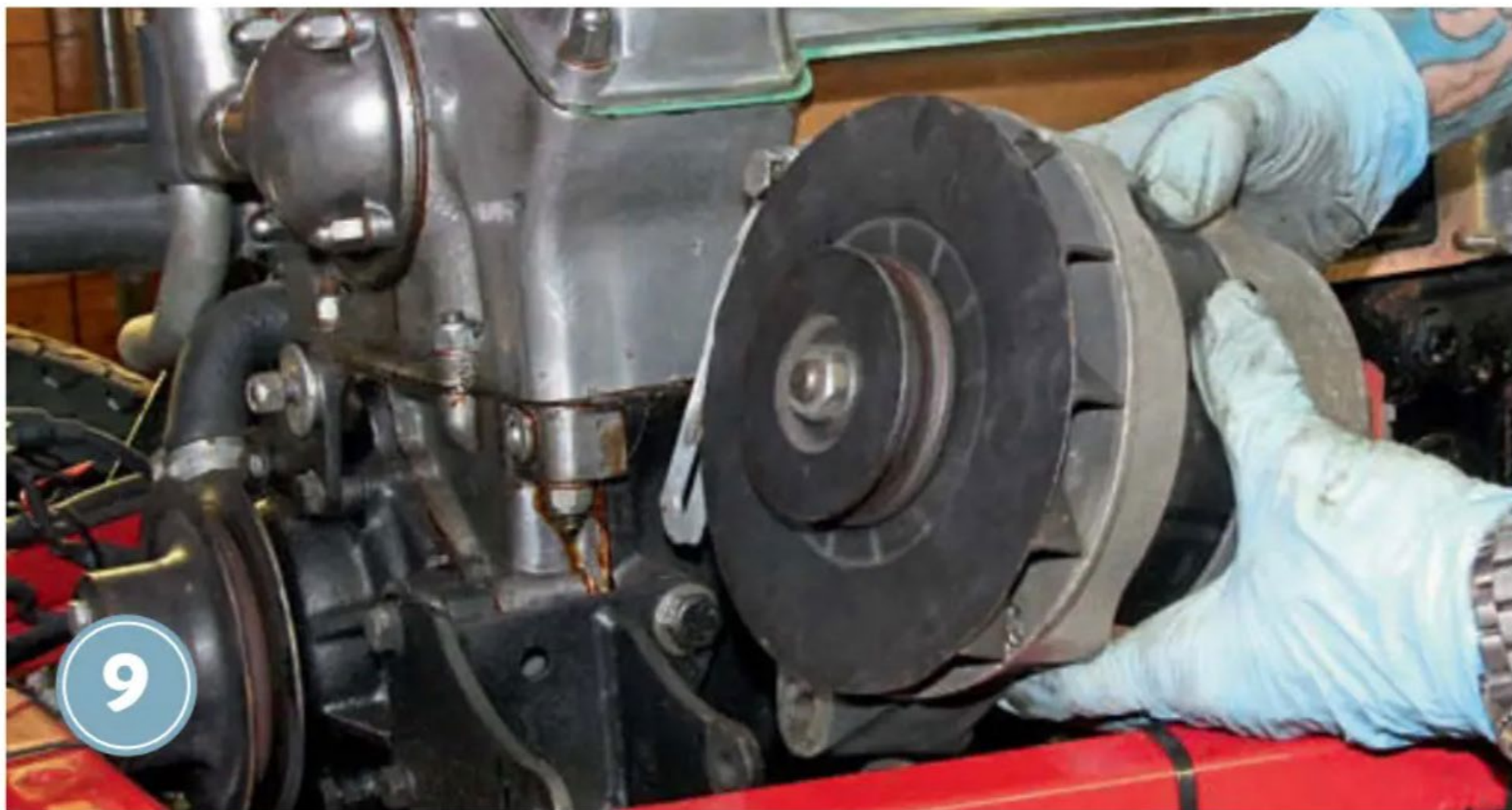
Moving to the top of the engine bay, the pair of tubular exhaust manifolds are removed. He starts with the rearmost, undoing eight 1/2in brass nuts. Brass is less prone to corrosion than steel



The rearmost exhaust manifold is straightforward to remove, whereas the frontmost is obstructed by a cover around the alternator, which needs removing first. Then the manifold can be removed



The alternator needs to be removed to create more space when lowering the engine and gearbox. Shaun wisely takes a photograph of the wiring attached to the back of it to ensure it's correctly refitted



After undoing a 1/2in fastening for the alternator's adjuster (for the drive belt) and 9/16in nut and bolt for its mounting, it's removed. Its mounting bracket is then removed, secured with 9/16in and 5/8in fastenings



Moving to the offside, Shaun removes the air cleaner (air filter) housing. He starts with the large metal feed between the air filter and the three carburetors, usually secured with wing nuts



The air filter housing is secured with a couple of 1/2in nuts to a mounting bracket on the outside. The air filter is removed to reveal a single screw on the inside that needs to be undone



After carefully lifting the bucket-sized air filter housing out of the engine bay, Shaun spots a large lump of shiny metal sitting underneath it. At first, it's difficult to identify and looks like a rock, but...



...upon closer inspection, it's the remains of the piston from cylinder number four, including a melted piston ring. We now realise that this is what created the hole in the side of the alloy sump



We continue to remove more components to help with lowering the engine and gearbox, including a breather hose between the carbs and the front of the engine and the top radiator hose



The inlet manifold, complete with carbs, needs to be removed, so a breather and a coolant hose are detached from this assembly. All of the engine coolant has already been drained



Shaun finds a couple of Whitworth spanners (3/8 and 5/16) to undo the fuel feed fastenings attached to the underside of the carburettor assembly. There are a few Whitworth fastenings on this E-type



A 1/4 Whitworth spanner is used to undo the banjo bolt on the top of each carburettor for its breather pipe. Shaun says the pipes are originally made of steel, but these have been replaced with copper



The throttle linkage needs to be detached. Shaun decides to disconnect it at the pivot arm on the bulkhead, extracting a small securing clip before releasing a metal rod



The choke cable also needs to be detached. Underneath the carbs, Shaun undoes a nut for a mount, then uses a small screwdriver to undo a screw that secures the end of the choke cable

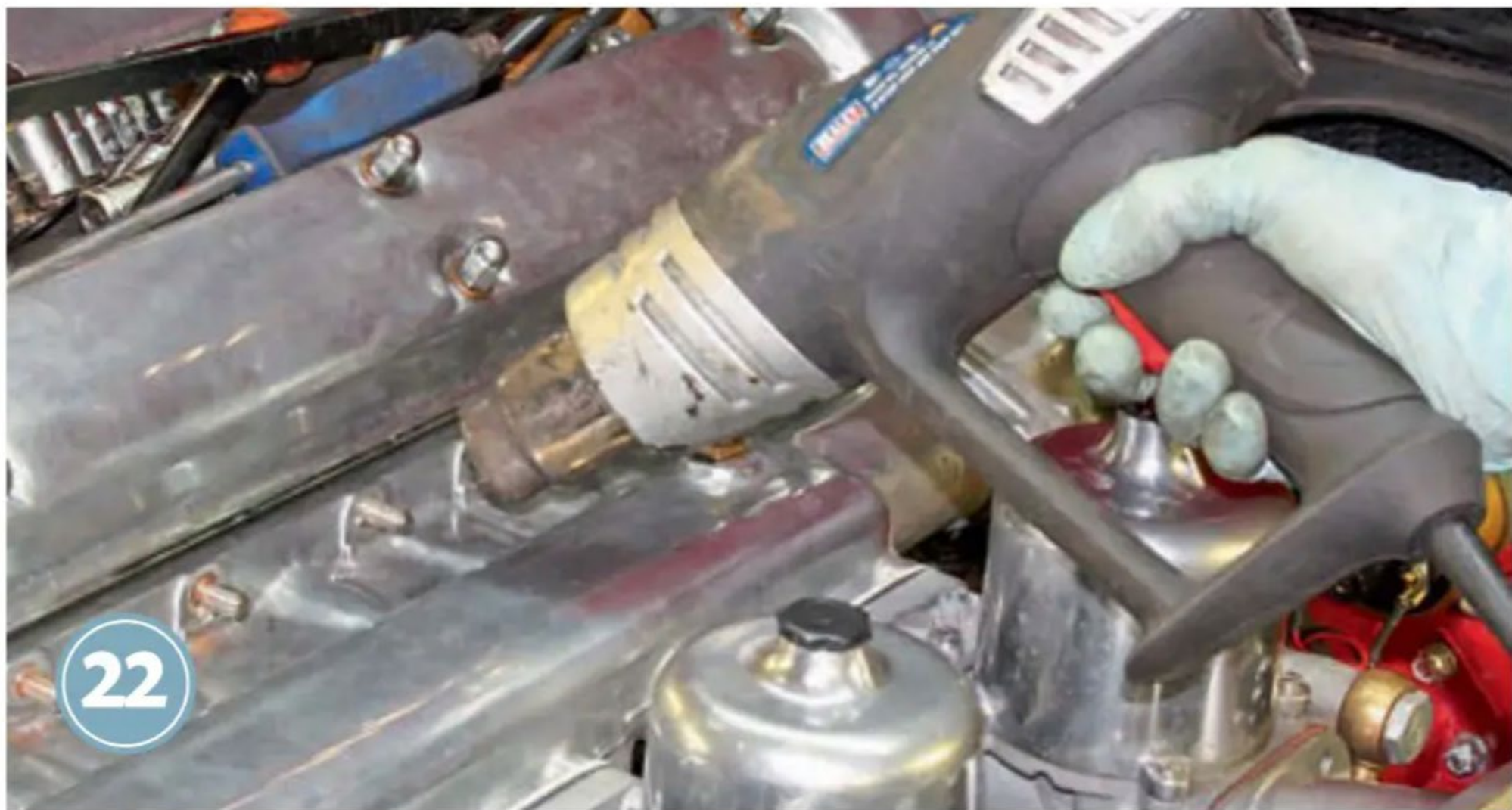


Shaun's almost ready to undo all of the inlet manifold nuts and remove the complete assembly. He removes the distributor cap to improve access to one of those manifold nuts



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There is a total of 18 ½in nuts to undo for the inlet manifold. Shaun can clearly do this blindfolded and uses various spanners and sockets to reach around the manifold and undo them



Typically, the inlet manifold initially refuses to budge once all of its nuts have been undone. Shaun carefully levers against it with a pry bar, but it's still stuck. Then he applies heat with a heat gun



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Eventually, there's the reassuring sound of the inlet manifold releasing itself from the cylinder head and we all breathe a sigh of relief – we didn't want to risk fracturing it



Looking inside the inlet port for cylinder number four, there's no valve. There's more piston debris inside inlet port number three. Has it been forced out of cylinder four and sucked into here?

PART TWO: In the final instalment, we follow the 4.2-litre XK engine and manual gearbox being removed from a Series I E-type

WORDS & PHOTOGRAPHY **ROB HAWKINS**

IN THE November issue of JW, we outlined the initial shock of seeing an E-type Series I's 4.2 litre XK engine with a hole in the side of the sump and the remains of a piston scattered around the engine bay and inside one of the inlet ports. We're concluding with the removal of the engine, followed by the cylinder head and an assessment of the damage.

There are a number of approaches to removing the engine from an E-type, which boil down to either winching it out from above or lowering it to the ground and raising the vehicle. In all cases, it's easier to remove the engine

and gearbox together because there's little space to separate the two in situ.

We're following an engine and gearbox being removed at independent classic Jaguar specialist Ken Jenkins. Whilst many people will detach the front upper suspension balljoints to take the load off the torsion bars, Ken's mechanic Shaun doesn't do this and successfully manages to remove the large reaction plate that's secured to the rearmost ends of those torsion bars.

As you'll see over the following 24 steps, the reason why this engine has failed unfolds before our very eyes.

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Time required: 5-6 hours

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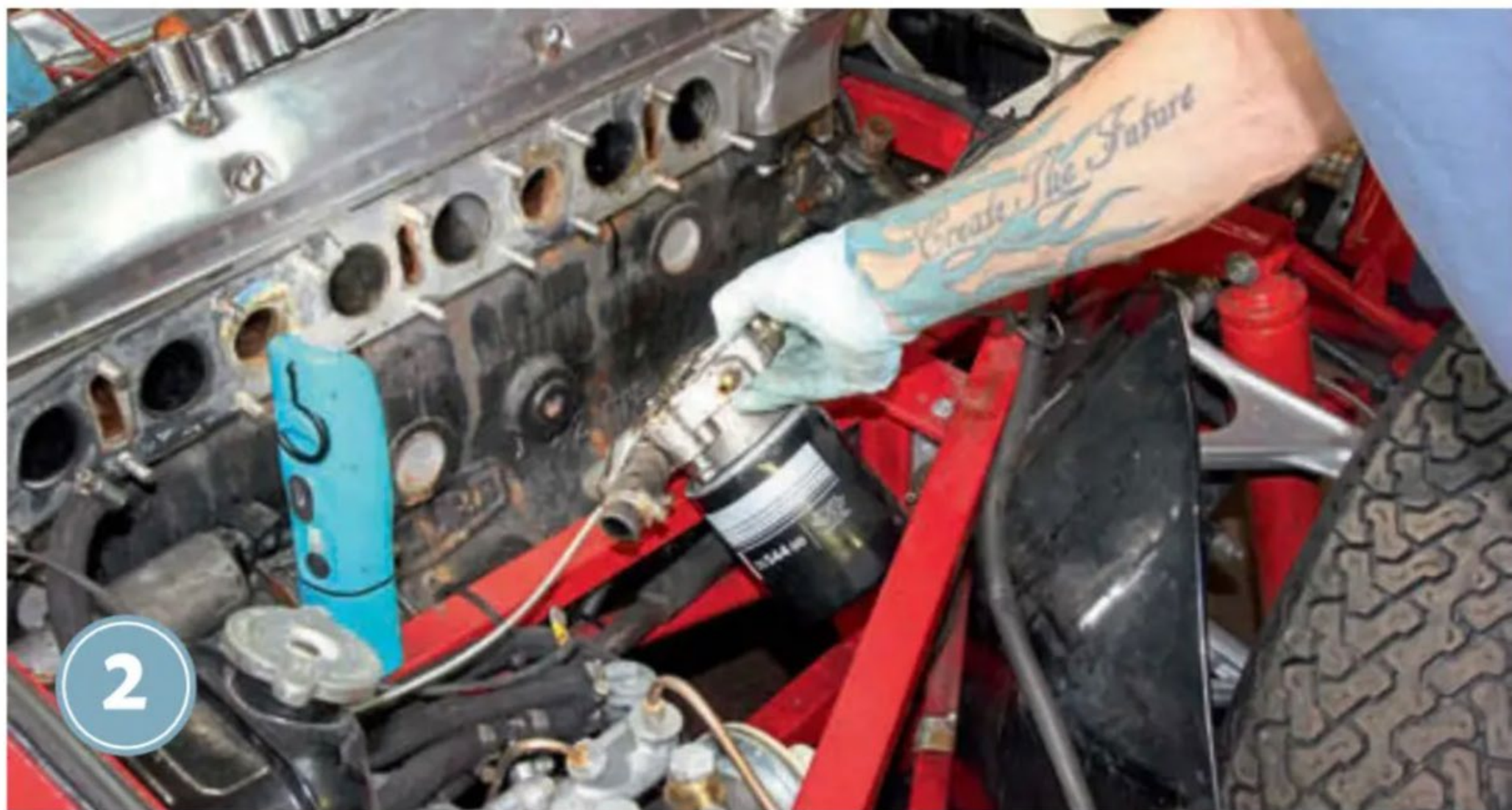
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Having removed the inlet manifold and carbs, Shaun extracts the distributor, which in this case is a 123 Ignition unit. The engine cannot be reused, so there's no point in timing it up with the distributor



There's also a spin-on oil filter instead of the original canister. The oil has already been drained, so the entire oil filter housing is removed, along with a feed for the oil pressure gauge



The water pump can foul the framework when lowering the engine and gearbox, so it's removed. The pulley is detached (four 7/16in bolts) to access one of the pump's mounting bolts



With insufficient room to fully remove the water pump pulley, it has to be removed with the pump after undoing nine 1/2in mounting bolts. The coolant has already been drained



The tachometer drive attached to the back of the cylinder head (inlet side) is removed to avoid damaging it. Three 3/16in hex mounting screws are undone before it can be removed



Shaun had already slackened the engine stabiliser, which is attached to the bulkhead, when he removed the sump. He now removes the 9/16in nut and uses a special tool to fully unwind it



The propshaft needs to be detached from the gearbox, which can be accessed via the gearbox tunnel. Sitting in the passenger seat, Shaun removes a storage compartment and the centre console

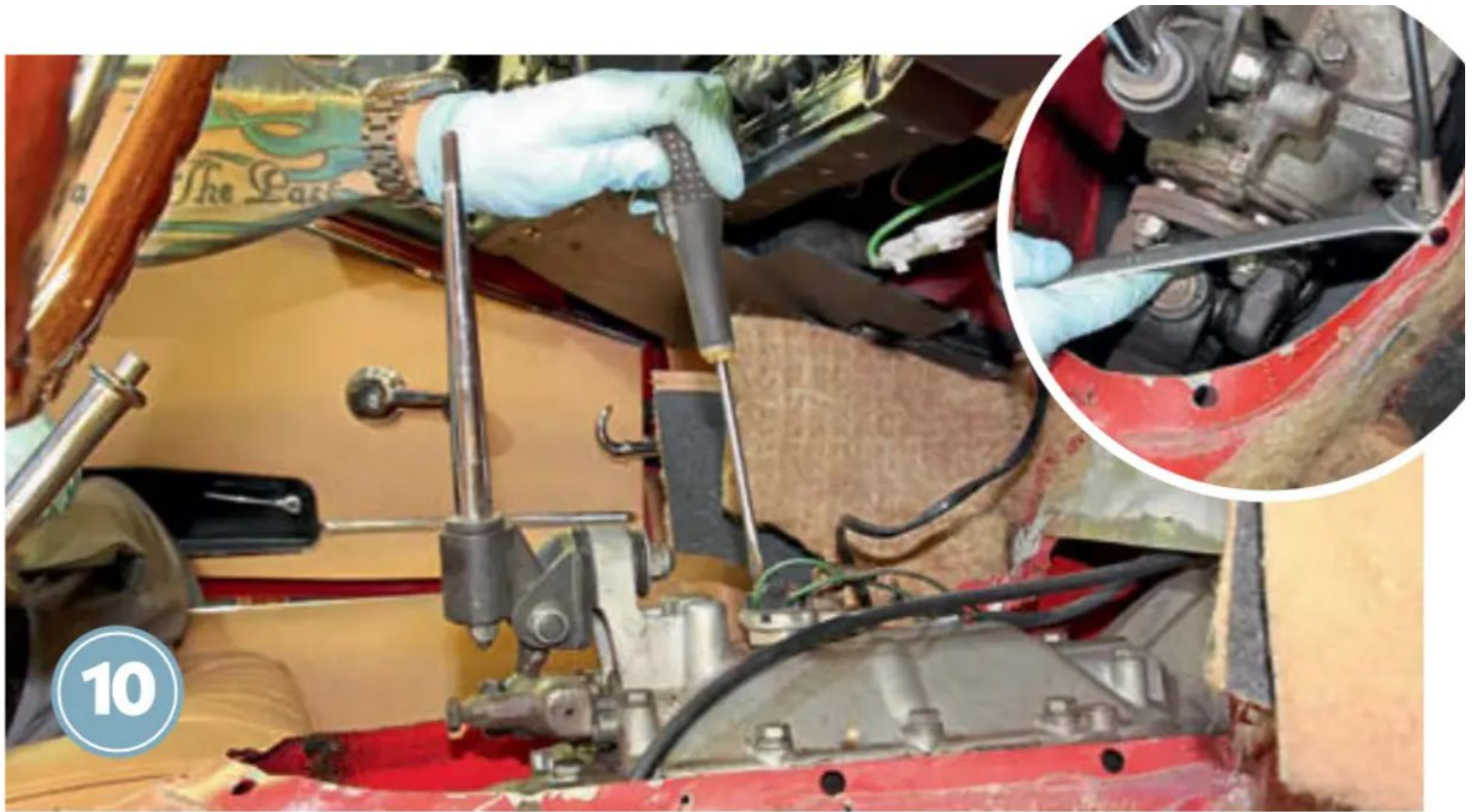


The trim that sits over the propshaft tunnel is removed by undoing any fastenings, along with the 5/8in bolts for the seatbelt socket mounts. This helps to access the propshaft and release the gear stick



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Shaun notices that the gearbox tunnel cover isn't standard, but an aftermarket GRP item. It's only secured with a couple of screws, so it's more straightforward than expected to remove



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The wiring for the reverse light switch is disconnected from the top of the gearbox by undoing a couple of screws. The speed drive cable is also released from the gearbox using a 5/8in spanner



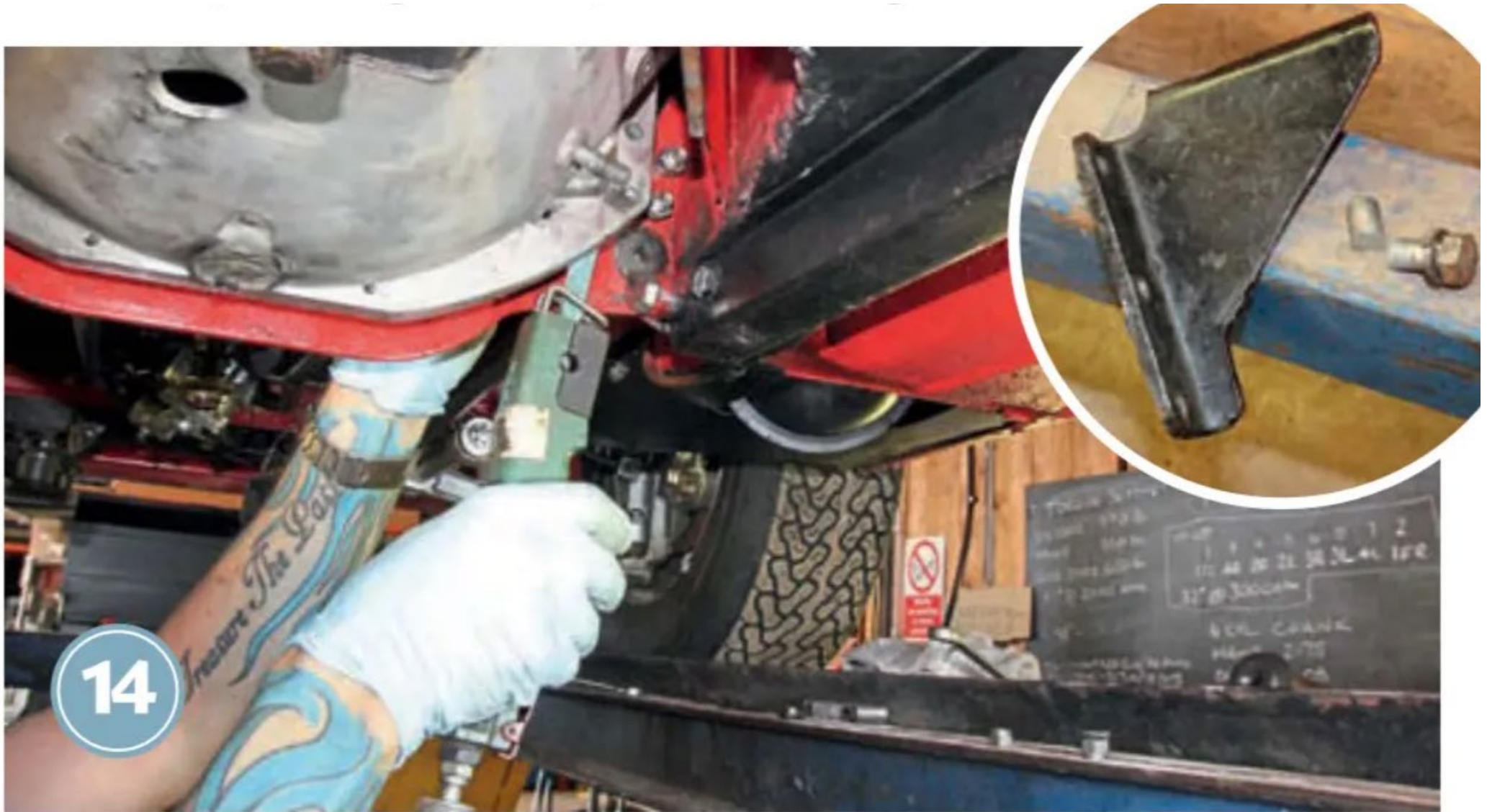
Finally, the propshaft can be detached from the gearbox by undoing four 9/16in nuts and bolts. The E-type is rolled forwards a little to rotate the propshaft and access some of these fastenings



Moving to the underside of the E-type, the feed pipe to the clutch slave cylinder is detached and the fluid drained, then the slave cylinder is removed by undoing its two 9/16in mounting nuts



With the clutch slave cylinder removed, there's more space to remove the large reaction plate. First, a small black triangular mounting bracket at each side of it needs to be removed



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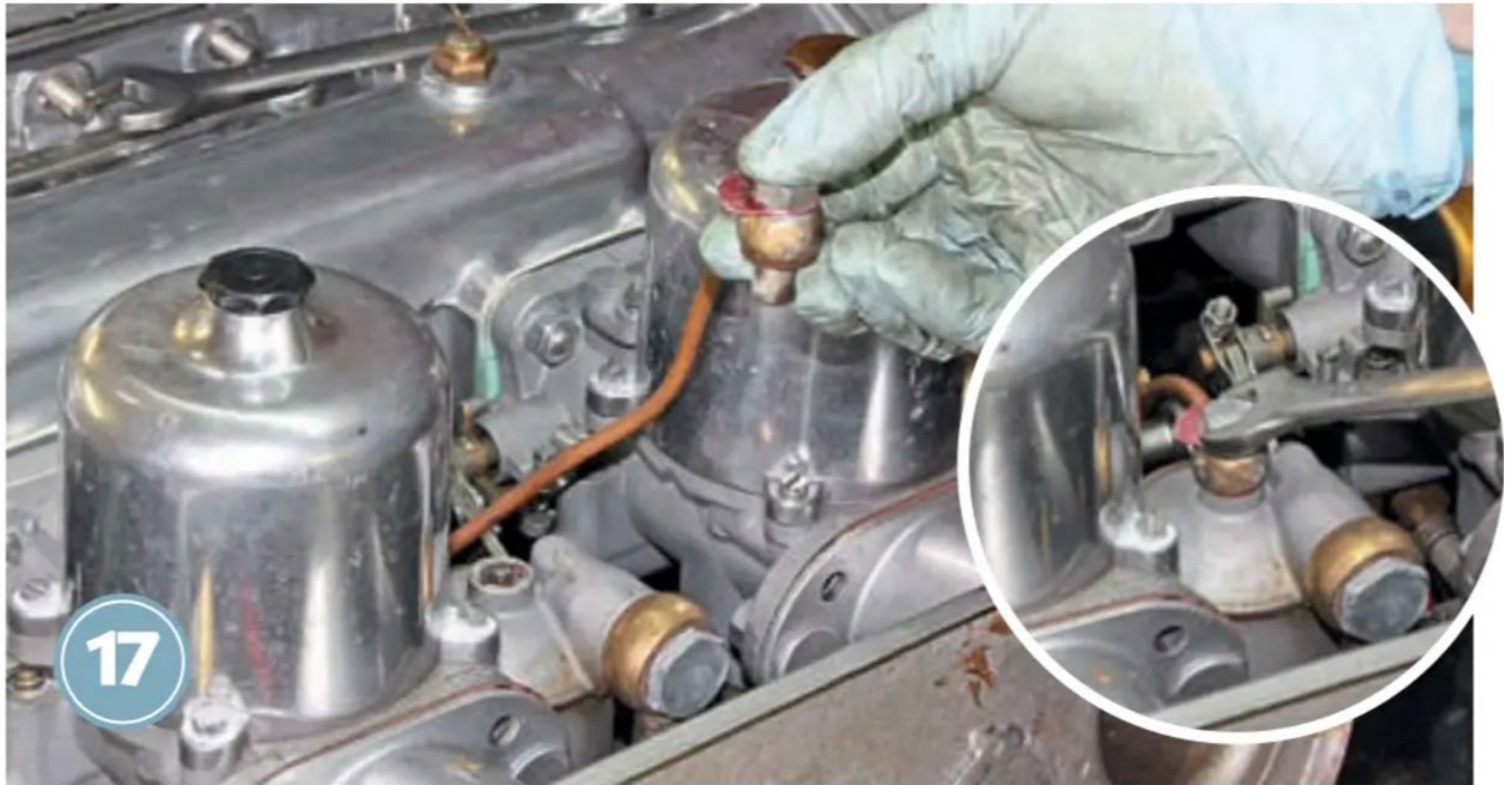
On the offside, one of the bolts for the mounting bracket cannot be extracted (it has been incorrectly fitted), so Shaun resorts to cutting through it to be able to remove the bracket



The large reaction plate is secured with 9/16in and 3/4in nuts and bolts at each side. Using a hammer, Shaun detaches it from the ends of the torsion bars, then levers it off and removes it



The sump needs to be refitted to be able to sit the engine on a wooden pallet, so it's secured with four of its mounting bolts. It's manoeuvred into position using a transmission jack



A 1/4 Whitworth spanner is used to undo the banjo bolt on the top of each carburettor for its breather pipe. Shaun says the pipes are originally made of steel, but these have been replaced with copper



Using a gantry-mounted hoist, the back of the engine is supported. We can now remove the engine mounts at the sides of the block by undoing three 9/16in bolts for each one



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The engine and gearbox are now separated from the E-type and need to be lowered on to a wooden pallet below. Shaun slowly lowers the assembly, checking it doesn't foul anything



It takes a few attempts to successfully lower the engine and gearbox all the way through the tight space in the E-type's engine bay. Several people help to manoeuvre it through



Once the engine and gearbox are sat on the pallet, the hoist is removed and the four-post lift with the E-type sat on it is raised. Six hours has passed as we have slowed down a little with taking photos



The next day, the cylinder head is removed to discover yet more damage. There's still a piston in cylinder number four, although it has a huge hole in the top of it and not much remaining



After removing the piston from cylinder number four, we can see why the coolant had escaped – there's a large hole in the wall of the cylinder, which goes through to the coolant chamber



And as for the missing valve in cylinder number four, we discover the remains of it are lodged into the combustion chamber. The impact of the piston has done this, resulting in the damage to it