The Missing Link

Do you remember the Toyota Carina of the early Seventies? How about the Toyota Starlet of the early Eighties? Each of these models was introduced with the usual new car fanfare, then manufactured for only a few short years before vanishing into automotive extinction.

By contrast, the Toyota Celica has played a more important role in Toyota's evolutionary development. The Carina and Celica both trace their beginnings to 1971. But unlike the Carina, the Celica's production run remains unbroken more than twenty years later. Hardly an evolutionary dead end, the Celica represents an important link between the simpler Toyotas of the past and the more complicated Toyotas of the present.

Introduced as a rear wheel drive model, the Celica went through several body styles and sizes before switching to front wheel drive in 1986. Because the Celica has changed several times, it was necessary to limit the focus of this article. We decided to concentrate on 1982-85 Celicas. This four year run takes us to the end of rear wheel drive Celica models.

An informal survey on the roadways of our area found a surprising number of survivors in this Celica age group. The tin worm has taken its toll on some of these cars, but we found several Celicas that were well into their second 100,000 miles and still looking good and going strong. Your prospects for maintenance and repair work from this group also look very good.

Technician Feedback

We talked with several Toyota specialists to gather information for this article, and we got very similar responses from each. It was hard for them to find serious fault with any of the Celica model years we had chosen. All agreed that these were better than average cars, but they do have some quirks and personality traits that are worth mentioning.

You'll find the majority of our Celica tips accompanied by photos on the following pages. We had some additional information that didn't fit this format, so we have included it here.

• Timing Chain

Everyone we talked with mentioned the Celica timing chain. Early Celicas equipped with the 22R engine have a double row timing chain, a chain worthy of a much larger engine. Then Toyota swapped the double row chain for a single row on 1983 and later 22R and 22R-E engines. When you make something half as wide as it was before, you have to wonder about the effect on durability.

Installing the early 22R's timing chain, gears, tensioner, and dampers was a popular late 22R and 22R-E retrofit during a chain replacement. Toyota put an end to that practice when they took two links out of the timing chain and made the front cover shallower on 1985 and later 22R and 22R-E engines, making it impossible to install the earlier 22R parts.

Proper attention to the timing chain is especially important. If it breaks, the pistons will bend the valves and possibly damage other parts too. Long before it breaks, a loose chain can do other damage as well.

The single row 22R-E chains don't seem as noisy as the older double row chains when they are loose. You'll be lucky to hear a light tinkling noise. Make it a habit to inspect the chain each time the valve cover is removed for a valve adjustment or gasket replacement.

If the timing chain or water pump require replacement, carefully inspect the timing cover for damage. A loose timing chain can cut through the aluminum cover, causing a coolant leak between the water pump cavity and the crankcase. Damaged covers can be repaired by a skillful welder, saving the cost of a replacement.

• Cylinder Head Repairs

When removing the cylinder head for a head gasket replacement, some techs leave everything attached to the head. They don't remove the manifolds or fuel injection wiring because they may be difficult to reach.

After removing the head bolts, place some stiff cardboard on top of the right fender. Now flip the whole head and manifold assembly upside down and rest it on top of the cardboard. Have an assistant help you with this step, the whole assembly is pretty heavy.

Remove the head gasket and clean up its mating surface on the block. Measure the head surface for warpage. If the head isn't warped enough to require resurfacing, you can flip it back into position, saving the trouble of reassembling everything.

• Crankshaft Thrust Washers

Worn crankshaft thrust washers may fall out of their locating slots in the block. When they do, you will probably hear the noise as the crankshaft walks back and forth in the block. If you still aren't sure, use a pry bar or have an assistant operate the clutch with the engine off while you watch for excessive crankshaft movement. If the thrust bearings have fallen out, the block will usually be damaged beyond repair.

Starting the engine with your foot on the clutch (as many people do), or waiting at traffic lights with the clutch disengaged puts a lot of strain on the thrust washers. The thrust washers don't get much lubrication when the engine is first started. This may be the cause of the thrust washer failure, since this problem never seems to occur on automatic transmission models.

• Cylinder Wall Refinishing

Oil consumption can be a problem if the cylinder walls are not properly honed during engine overhaul. 1985 and later Celica engines are designed for low internal friction. They use low tension oil control rings which require a very smooth cylinder wall finish for proper oil economy.

A rough cylinder wall finish will cause oil consumption problems with low tension rings. Unless your machinist can carry out the proper cylinder honing procedures, specify regular tension rings to assure proper oil control ring sealing. The difference in engine fuel economy with regular tension rings will be slight.

• Carbon Deposits

Fuel injected Celicas aren't immune from intake valve deposits. These deposits can cause a variety of performance and driveability problems that can be misdiagnosed, leading to unnecessary replacement of expensive EFI components. Properly maintained EFI systems cause very few performance problems.

— By Karl Seyfert

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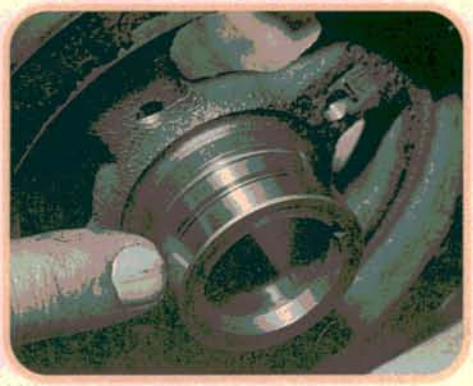
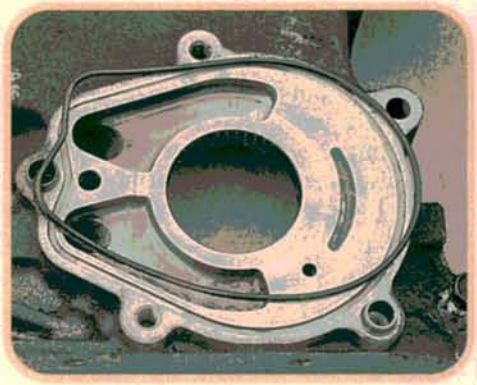


1

Front crankshaft seals usually last 85 to 90 thousand miles. When they leak, the fan blows the oil all over the front cover. Check the crank pulley for groove damage. If the pulley groove is mild, a light polishing will usually do the trick. A new seal will leak if the pulley is badly grooved.

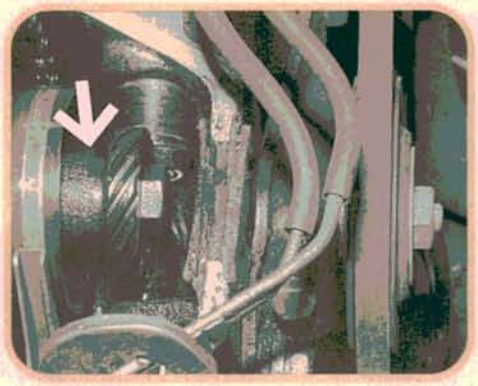


2

While the crank pulley is off, don't forget to replace the oil pump o-ring. The o-ring seals the oil pump to the front cover. Pump o-ring leaks are easily mistaken for front seal leaks. Dirty oil may have worn the oil pump. Check the pump clearances while it's off the engine.

3

The 22R and 22R-E engines use a hydraulic timing chain tensioner. A chain that's stretched and loose can cut through the inside of the timing cover. The water pump bolts to the front cover, so a damaged cover will leak coolant into the oil. A front cover leak can be mistaken for a blown head gasket.

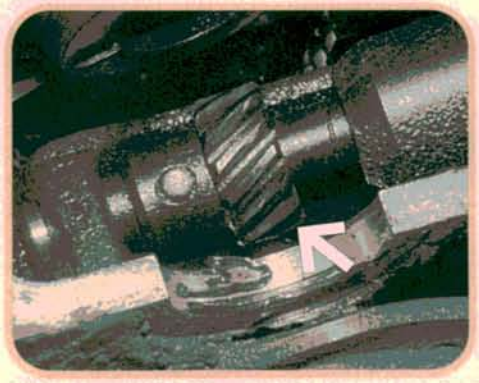


4

If you suspect a front cover coolant leak, remove the valve cover. The chain dampers may be broken, and pieces may have fallen into the pan in extreme cases. Fill and pressurize the cooling system. If the cover is damaged, you should hear coolant squirting out of the cover and running into the pan.

5

Timing chain and cover repairs can be made without removing the cylinder head. Remove the oil pan first. You may find pieces of the chain dampers trying to block off the oil pump pickup screen. Check the rod and main bearings for metal contamination. Metal particles may also obstruct the oil galleries.



6

There's one bolt directly below the distributor gear that's easy to overlook when pulling the head or removing the front cover. If you miss the bolt, you'll crack the cover trying to remove it. Remove the distributor to get a clear shot at the cover bolt. The bolt is usually submerged in oil.

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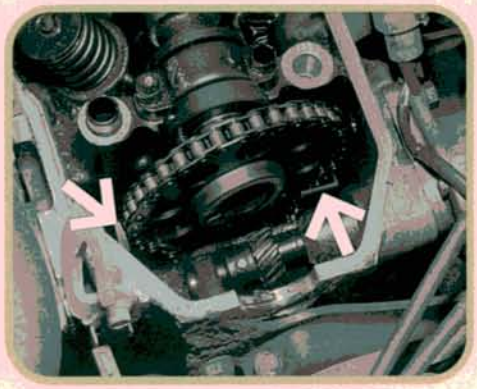
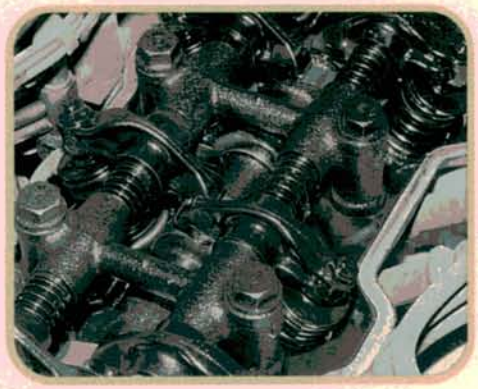


7

Two plastic dampers directly below the camshaft timing gear on later engines prevent the chain and gear from dropping into the front cover when the gear is removed from the cam. These dampers are easily broken. Have an assistant guide the head past the dampers as the head is removed or installed.

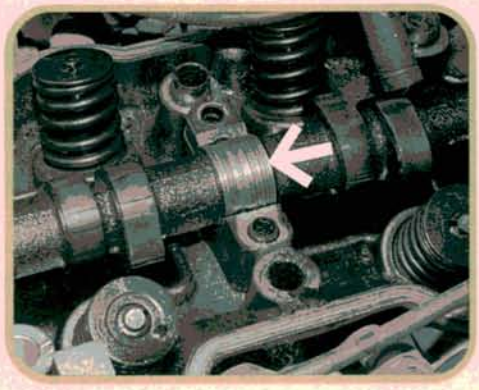
8

Using a remote starter switch might be a bad idea when adjusting the valves on high mileage engines. If the timing chain is loose, bumping the starter can jam the chain tensioner in its housing. Engine oil pressure may not be strong enough to push the tensioner out again when the engine is restarted.



9

The head bolts pass through the rocker shaft assembly. If it's necessary to remove the rocker assembly or camshaft, the factory recommends replacing the head gasket at the same time. Some techs have successfully removed and reinstalled the head bolts, without head gasket leaks.

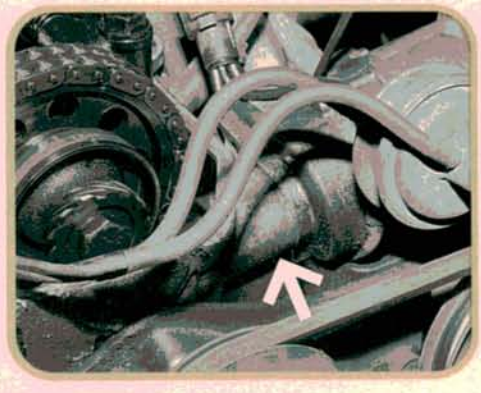


10

The head doesn't have replaceable cam bearings. The cam rides on machined bearing surfaces in the head and is located by machined aluminum bearing caps. Dirty or low oil can cause cam and bearing failure. Extreme galling will crack the bearing caps. The caps are matched to the head and aren't available separately.

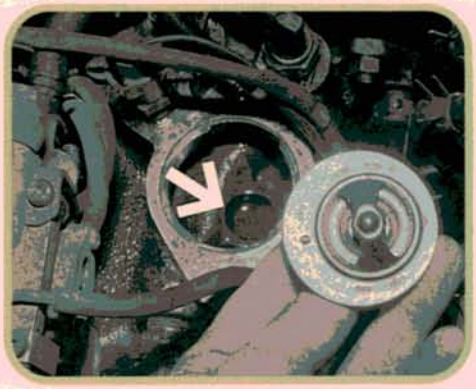
11

Start thinking head gasket replacement if you find a coolant leak on the left side of the engine, under the exhaust manifold. There's not much else on that side of the engine that can leak coolant. Cracked or leaking exhaust manifolds can also cause exhaust leaks.



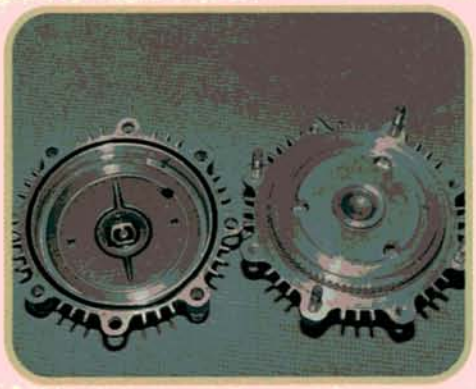
12

The distributor o-ring seal may also leak oil with age. A leaking o-ring can make a real mess at the front of the engine. The fan helps to spread the oil around and may mislead you by disguising the source of the leak. Remove the distributor adjusting bolt, then remove the distributor to replace the o-ring.



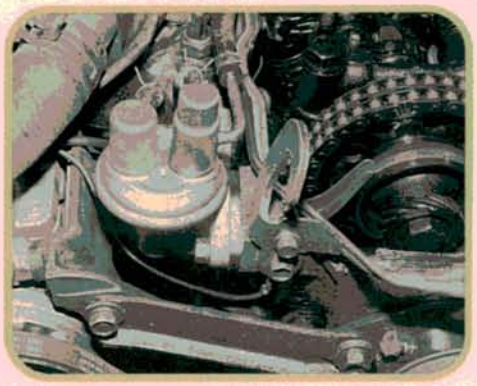
13

Improper thermostat installation can cause overheating problems on Celica engines. The thermostat and housing have an offset design. The thermostat air bleed must be installed toward the rear of the engine, the offset should face forward to match the housing. If not, the thermostat can't open completely.



14

A lazy cooling fan clutch may cause the engine to run hot at idle. To repair the clutch, remove it from the water pump. Remove the clutch housing screws with an impact driver, then split the clutch in half. New silicone fluid is available from Toyota parts departments.



15

A loud clicking noise after a run on the freeway may be caused by the fuel pump on 1983 carbureted models. The float needle closes because no more fuel is needed in the carburetor. The pump arm hits the nylon pump diaphragm bushing, causing the clicking noise. A revised pump cures the problem.

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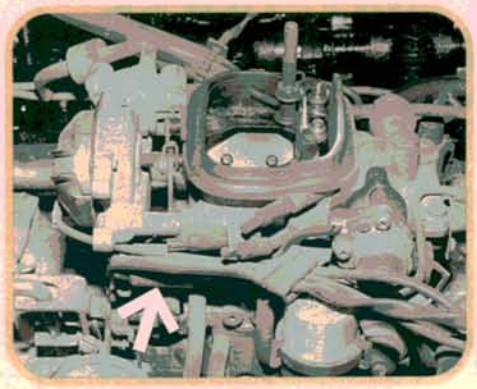
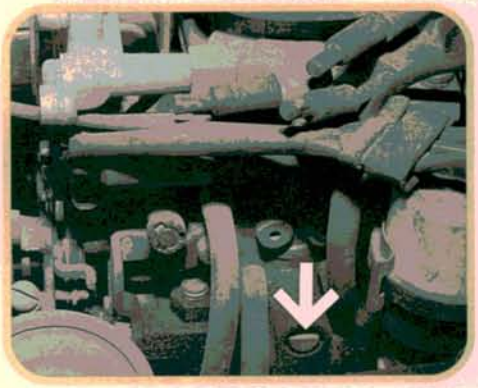


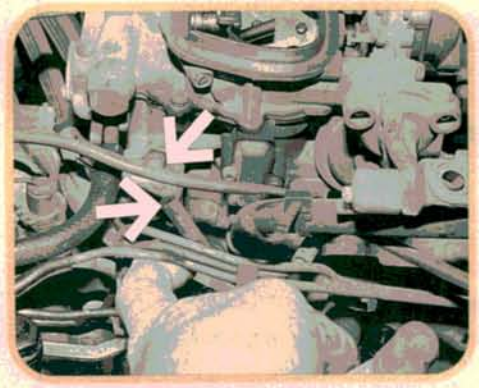
16

A sticking or inoperative fuel cut solenoid can cause a rough or no idle on carbureted models. Make sure the solenoid is getting power from the ignition circuit and ground from the fuel system ECU before condemning the solenoid. The ECU also shuts off the solenoid during closed throttle deceleration.



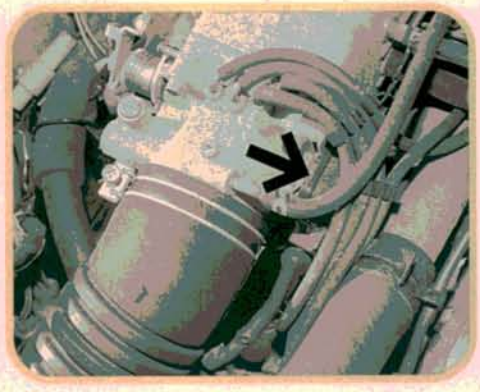
17

If the fuel cut solenoid is operating properly and the idle can't be enriched enough by adjusting the idle mixture screw (arrow), the problem may be a clogged slow fuel metering jet. It's a long slender jet, and can be cleaned out using compressed air after removing the jet.



18

Auxiliary accelerator pump (AAP) leaks are common on carbureted Toyota models. Celicas are no exception. The AAP diaphragm ruptures, allowing raw fuel to be sucked through the pump's vacuum control line during cold operation. Gas-fouled plugs can cause poor engine operation, even after the AAP is shut off.

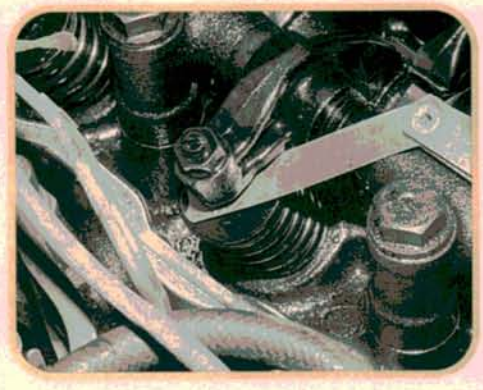


19

Misadjusted throttle switches can cause problems on EFI models. If the timing won't return to the base setting when the diagnostic connector terminals are jumpered, make sure the throttle switch idle contacts are closed at idle. Someone may have moved the throttle stop screw to set the idle speed.

20

Igniter failures can throw you a curve on injected Celicas. Besides controlling the secondary ignition, the igniter also provides an input spark signal to the fuel system ECU. The ECU cuts ground to the injectors if it doesn't see the spark signal. Check for spark before digging into the fuel system.



21

Tight valve clearances can cause a rough idle on "low maintenance" Celicas. Adjust them every 15,000 miles. Proper idle speed is important on injected models. Idle quality will fluctuate as the mixture changes in closed loop. Resist the temptation to raise the idle speed above 950 RPM.

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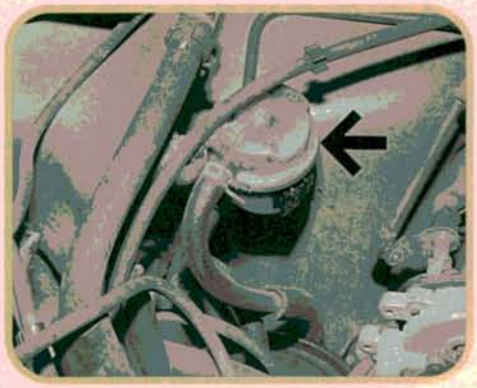
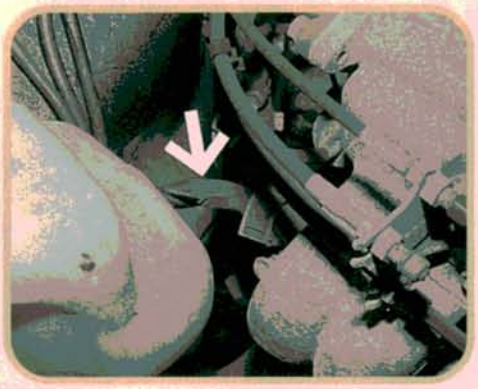


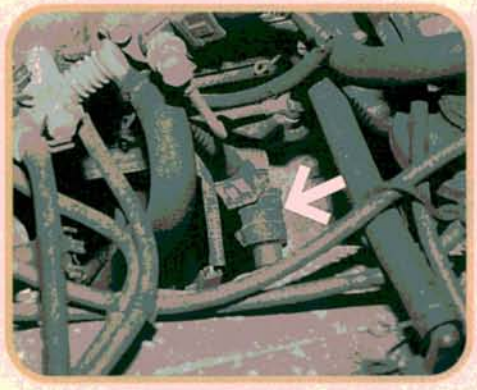
22

The fuel filter is mounted above the starter on fuel injected models. It's on the firewall on carbureted models (arrow). Always relieve the fuel pressure before removing the filter on injected models. Disconnect the battery for extra safety. Make sure the starter is dry before starting the engine.



23

The fuel injection wiring harness may be stretched too tight where it passes from the body to the intake manifold. Wires inside the harness are pulled apart by engine movement. The splice connection that joins the power supply leads for the injectors may break, causing one or more injector to open circuit.

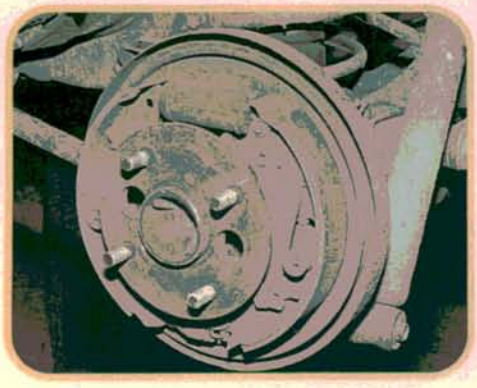


24

The injectors are hidden under the intake plenum. To replace them, unbolt the upper section of the intake manifold and swing it out of the way. This will expose the fuel rail and injectors. You can replace the injectors in less time than it takes to decide if they are the cause of your problem.

25

Noisy rear axle bearings may be misdiagnosed as differential problems. When you identify the source of the noise, be sure to inform your customer that you are replacing only the noisy wheel bearing. Then give him the option to replace both. This avoids misunderstandings if the other bearing fails later.



26

Rear drum brake linings can last 60,000 miles or more. By the time the car has that many miles on it, the wheel cylinder bores may be corroded. Pull back the boots and check for brake fluid leakage. For safety sake, recommend wheel cylinder replacement of both cylinders if you find any brake fluid.