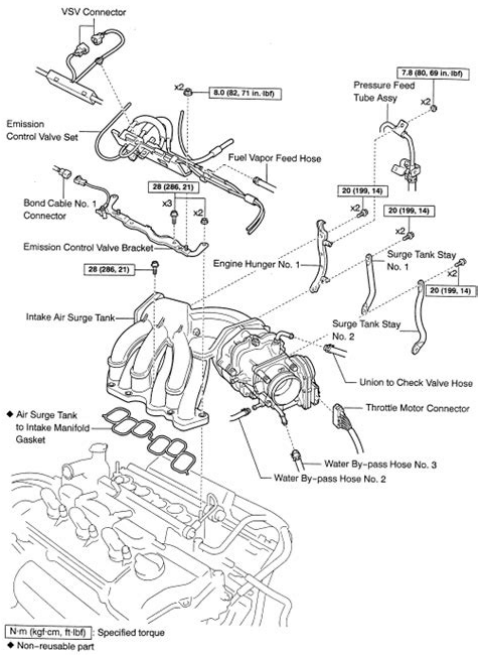
3mz-fe engine manual



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To avoid this, the followingRemove the 5Remove the 5Other tools will deformVVTi and the screw threads. Other tools will deformTo avoid this, the followingTo avoid this, the followingExtended length of SST 0924963010. To avoid this, the followingRemove the 5Remove the 5Other tools will deformOther tools will deformTo avoid this, the followingTo avoid this, the following. Belt tension gauge DENSO BTG20 9550600020 Borroughs No. BT3373F Drive belt tension Item Specified Condition A87786 Cooler compressor to crankshaft pulley New belt Cooler compressor to crankshaft pulley Used belt 143 to 165 lbf 80 to 132 lbf Vane pump New belt 132 to 154 lbf Vane pump Used belt 55 to 88 lbf CORRECT INCORRECT A87787 HINT After installing the drive belt, check that it fits properly in the ribbed grooves. Check that the belt has not slipped out of the groove on the bottom of the crank pulley with your hand. ”New belt” is a belt which has been used for less than 5 minutes on a running engine. ”Used belt” is a belt which has been used on a running engine for 5 minutes or more. After installing a new belt, run the engine for approximately 5 minutes and then recheck the tension. 7. INSPECT IGNITION TIMING a Warm up the engine. Handheld Tester b When using the handheld tester Check the ignition timing. 1 Connect the handheld tester to the DLC3. 2 Enter DATA LIST MODE on the handheld tester. A80020 2005 HIGHLANDER REPAIR MANUAL RM1144U Author Date 2614 Page 2 and 3 14122 ENGINE MECHANICAL ENGINE Page 4 14124 ENGINE MECHANICAL ENGINE Thank you, for helping us keep this platform clean. The editors will have a look at it as soon as possible. The Toyota 3MZFE engine is equipped with SFI Sequential Multiport Fuel Injection system, ETCSi Electronic Throttle Control Systemintelligent, DIS Direct Ignition System with individual coils on each spark plug and VVTi Variable Valve Timing system for the intake camshafts. A 92.0 mm 3.62 in cylinder bore and 83.0 mm 3.http://energyprobg.com/userfiles/comcast-universal-remote-manual.xml

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27 in piston stroke give the motor a total of 3,310 cc of displacement. From 210 PS 155 kW; 208 HP at 5,600 rpm to 234 PS 172 kW; 231 HP at 5,600 rpm Torque output. The crankshaft is supported by 4 bearings and integrated with 9 semi counterweights for balance. Oil holes are placed in the center of the crankshaft for supply oil to the connecting rods, bearings, pistons and other components. Pistons are made of high temperatureresistant aluminum alloy. Piston pins are the fullfloating type. The Toyota 3MZFE motor has two compression and one oil control rings. The spark plugs are located in the center of the combustion chambers. The exhaust camshafts are driven by a single timing belt, and a gear on the exhaust camshaft engages with a gear on the intake camshaft to drive it. The camshaft journal is supported at 5 places between the valve lifters of each cylinder and on the front end of the cylinder head. Exhaust and intake valves are equipped with irregular pitch springs made of special valve spring carbon steel which are capable of following the cam profile at all engine speeds. The intake valve diameter is 34.0 mm 1.33 in and the exhaust valve diameter is 27.3 mm 1.07 in. Adjustment of the valve clearance is done by means of an outer shim type system, in which valve adjusting shims are located above the valve lifters. This permits replacement of the shims without removal of the camshafts.With filter change 4.7 liters 5.0 US qts, 4.1 Imp, qts Without filter change 4.5 liters 4.8 US qts, 4.0 Imp. qts Oil change interval, km miles 8,000 5,000 Oil Pressure. Idle speed More than 29 kPa 3,000 rpm More than 294539 kPa Ignition system Spark plug Denso SK20R11, NGK IFR6A11 Spark plug gap 1.01.1 mm 0.0390.043 in Spark plug tightening torque 25 Nm 2.5 kgm, 18 ftlb Valve clearance adjustment data Calculate the thickness of new adjusting valve

shim so valve clearance comes within specified values.http://turbobg.com/fckeditorfiles/comcast-user-manual-remote-control.xml

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Learn more opens in a new window or tab Learn more opens in a new window or tab Learn more opens in a new window or tab Learn more opens in a new window or tab Learn more opens in a new window or tab See the sellers listing for full details. If you dont follow our item condition policy for returns, you may not receive a full refund. Refunds by law In Australia, consumers have a legal right to obtain a refund from a business if the goods purchased are faulty, not fit for purpose or dont match the sellers description. More information at returns. Contact the seller opens in a new window or tab and request a postage method to your location. Please enter a valid postcode. Please enter a number less than or equal to 4. All Rights Reserved. User Agreement, Privacy, Cookies and AdChoice Norton Secured powered by Verisign. Contact Author It is used in many Toyota and Lexus cars from 1994 to 2003, including the Lexus ES300 and RX300, and the Toyota Camry, Avalon, and Solara. It comes in a 3.0 liter version, the 1MZFE, and a 3.3 liter version, the 3MZFE. Most engine components in the 1MZFE are interchangeable with the 3MZFE, including the timing belt, tensioner pulley, and guide pulley, although the 3MZFE has a different tensioner configuration. Therefore, you can use the instructions below to replace a broken timing belt on a nonVVTI engine. Positioning the camshaft sprockets and the crankshaft pulley alignment marks to Top Dead Center TDC is all you need to do before installing the new belt. After installing the belt, you can do a compression leakage test to make sure the valves are still okay. Some shops always replace the water pump with the belt, but in my experience the Aisin water pumps that come with the MZFE Camry are good for at least 200,000 miles. At 150,000 miles, some guide pulleys idler pulleys and tensioner pulleys look worn and need replacement. The tensioner actuator doesnt generally need replacing.

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After 200,000 miles, I would definitely replace the seals camshaft, crankshaft, and oil pump and the water pump as well, along with the timing belt. Whether or not you need to replace the seals depends on their mileage, age, and their observed condition after you remove the timing belt cover. On the fourcylinder 5SFE Camry these seals do start to leak at about 150K, but on the V6 MZFE they last longer.This is a tool of many uses. You can get a manual impact driver, but an electric impact driver is even better, if you can afford it. The one below is the best I have used. If you want to

use Japanese OEM Original Equipment Manufacturer partsthe parts that Toyota puts its own label onyou will want a Mitsuboshi timing belt, Koyo pulleys, and an Aisin water pump. Other Japanese OEM brands include Denso, NGK, KYB, Akebono, GMB, and Sumoto. Shop and compare prices, including shipping costs, for the best deals. As Japanese cars shift their manufacturing to the US, OEM manufactureres have come to include American companies like Gates and Dayco. The water pump is from Aisin, the timing belt from Mitsuboshi or Gates, and the rest from reputable OEM vendors. In my experience, Aisin makes the best and longestlasting water pumps for this engine.The steps in this video will work on other cars with the V6 1MZFE engine, such as the Camry V6, Solara V6, Highlander V6, Sienna, Avalon, and Lexus RX300. The video gives more detail than is in the text about replacing the water pump, crankshaft seal, and cam seals. Click on a photo to enlarge it. The torque from the starter motor should relieve the tension on the bolt. If that desnt work, its possible your cars battery is too weak to provide enough amps to loosen the bolt; you can try jumping the battery with another car's battery. If that doesnt work, applying heat to the bolt from a propane torch can help.As a last resort, find a friendly garage owner wholl torque the bolt off for you with their 180lb airpowered impact driver.

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Use an impact driver, or do a quick twist of the socket wrench counterclockwise, to spin off the crankshaft pulley without upsetting the alignment. Remove the hose clamp and hose from the metal tube located below the crankshaft pulley G. When completely drained, reconnect the hose and clamp H. Alternatively, a few light taps with a hammer on the power steering pump bracket will move the pump forward of the bolt and relieve tension on the belt. Click on a photo to enlarge it. Keep the one long bolt in place while removing the bracket W. X Remove the belt guide. Y. Lower timing belt cover removed Z. Upper timing belt cover removed AA. Side engine mount bracket removed BB. Timing belt, exposed by removing timing belt covers and side engine mount bracket Click on a photo to enlarge it. If not aligned, screw the crankshaft bolt back in and rotate the engine with a wrench until alignment is made CC. These marks will help with realignment if the crankshaft or camshafts happen to move during belt installation DD . To remove the 3MZFE belt tensioner, the right lower engine mount must first be removed followed by the engine mount bracket. To do this 1. Remove the front motor mount bolt. 2. Remove the lower right motor mount upper and lower nuts. 3. Place a hydraulic jack with wood block under the engine oil pan and slowly tilt the engine up until there is enough clearance to removed the right motor mount. 4. After the mount has been removed, unbolt the mount bracket which will allow access to the belt tensioner bolts for removal. This will slightly move both camshafts clockwise, which makes it easier to remove the old belt, as well as easier to install the new belt. A small amount of slack will now exist between both camshafts and between the right camshaft and the crankshaft. If out of alignment, rotate engine using crankshaft pulley bolt. Apply paint marks to camshaft pulley, timing belt, and backing plate. DD.

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At TDC, apply paint marks to the old timing belt, crankshaft pulley, and engine. EE. Remove the bolts to remove the timing belt tensioner. FF. To make the belt easier to remove, and the new belt easier to install, advance the camshafts slightly by twisting the belt 45 degrees at a and b. Removing the stud is easier than removing the camshaft sprockets and belt cover before removing the pump. Use a wire brush see video at 1350 to remove any residual corrosion before installing the new gasket I use a round brush mounted on a angled drill. Denso water pumps come with a metal gasket with a rubber coated inside lip which does not require any RTV. The guide pulley can be easily replaced by unbolting the old and bolting on the new. The tensioner pulley is slightly more difficult. This pulley is part of an assembly that allows the pulley to dynamically apply continuous pressure on the timing belt via the tensioner to take up the slack if the belt stretches. The tensioner mounting bolt runs through a sleeve that allows the pulley to move approximately 30 degrees to take up belt

slack. Click on a photo to enlarge it. See also the video at 2400 and following. Prevent the belt from slipping off by using a spring loaded plastic alligator clip HH. Again, use the paint line on the new belt for alignment and use a plastic alligator clip to prevent the belt from slipping off. There should be little to no slack when this is done. Slack may be a sign that the belt is loose by one cog. Applying alternating equal turns on each bolt will gradually compress the tensioner pin against the tensioner pulley assembly. As this occurs, the timing belt will tighten up. Being off by one cog will cause an engine misfire. If this happens, the problem is usually between the right camshaft and the crankshaft.

The crankshaft pulley bolt can be shocked torqued on with a mechanical impact driver, if either an air or electrically powered impact driver is not available you may be able to rent them at an auto retailer. Alternatively, you can always bring your car to a private garage and ask them to torque the bolt on for you. Usually theyll do it for free out of professional courtesy. The fluid level should drop. Add more fluid and repeat the procedure until the fluid level has stabilized. Put the new belt onto the right camshaft sprocket, using the paint mark on the belt for alignment. HH. Stretch the belt onto the left camshaft sproket. Secure the belt onto the sprockets with plastic alligator clips. II. Stretch the right side of the new belt onto the crankshaft pulley, leaving no slack between the crankshaft and right camshaft. Hold it there with one hand, and with the other hand slip the left side of the belt over the belt tensioner pulley. JJ. After installing the new belt, put parts back in this order. Content is for informational or entertainment purposes only and does not substitute for personal counsel or professional advice in business, financial, legal, or technical matters.Answer Tough question. What I would do is replace the time belt, start the car up and see how it runs. Otherwise, youll have to do a compression check on each cylinder which in itself is time consuming. After putting on the new belt, you can start the car without having to put everything back on i.e. crankshaft pulley, covers, motor mounts, belts, etc. Helpful 12 Question Do the arrows on timing belt point toward the engine or the mechanic. Answer The engine. Helpful 10 Question I have a 2006 sienna 3.3 l, and it just didn’t start one morning. I replaced the whole timing kit, but before I put the belt on, I safely lined up the camshaft marks and the crankshaft mark without causing damage. Any advice Answer You can try, but the 3.3 3MZFE is an interference engine.

While getting the crankshaft to TDC, you have to gradually move the camshafts aligned with the pistons. Helpful 7 Question My dad has a 2002 Toyota Avalon XL with the 1MZFE engine. I have already replaced the rear valve cover gasket as I notice oil leaking. However, after changing the rear valve cover, I still see some oil sipping down from the corner of the valve cover right below the timing cover on the rear passenger side. Could it be coming from the rear cam seal. Answer Yes, more than likely its the rear cam seal. The lower cover mounts over the top cover so you have to remove the lower before taking off the top. Its a timing belt job. Helpful 5 Question Do you have similar detailed instructions to remove an axle from a Toyota Camry with a 3.0L 1MZFE Engine Answer If youre dealing with the drivers side, you can use the Toyota Camry 2.2L 5SFE instructions, but I dont have one yet for the passenger side.What should I do now. Answer Youll have to double check all your work. Helpful 1 Question I have a 93 Lexus es300 and would like to know which slot on the camshaft sprockets pulleys is used. Does the camshaft use the 3V or 4V slot. It appears that each sprocket can be installed in two different ways. Answer You are correct. The same sprocket is used for both the left and right banks. Theyre mounted in opposition sides to prevent the belt from slipping off. Helpful Question I changed the timing belt on a 2002 es300 and the harmonic balancer is up against the lower timing cover. I also cut grooves in the cover. Ive checked all the work and put a new balancer, but still, Im having the same problem. Answer I see this occasionally with some cars. Believe the plastic cover bellows out over time from heat. I wouldnt worry too much about it.

Its just a dust cover. Helpful Question When removing the side engine mount, do you need to support the engine with a jack from underneath. Answer No, it is not necessary to support the engine.

Helpful Comments are not for promoting your articles or other sites.You should be able to find them online. To prevent the cam from jumping again, go the cam bolt with a box wrench with one hand and install the belt with the other hand. When the belt is on and aligned, turn to cam back to TDC. I just moved it clockwise back to the DTC mark with wrench. Is there any problem with that Thank you. Mine had compression washers, great for the factory, but they only work once. I replaced them with enough flat washers so I could compress the gasket again.You can subscribe and make comments on my youtube channel if youd like. You can still mount the belt without the marks. What can I do. The only thing that might be different is the timing belt tensioner. I explain the difference in my article. The 4 is no problem. Youll just have to realign the timing marks on the crankshaft and camshaft when installing a new belt. Same thing with a 6 if it is NOT a VVTi engine. VVTi is an interference engine and the piston could touch and bend the valves. If it is VVTi, and if the belt broke at idle, you might have a chance that the pistons did not bend the valves. Only way to tell is to do a compression test or simply installing a new belt and see how the engine runs. So much had to be removed before I was able to get off the pump. But they caved and I got pump off. New pump is on and Im slowly putting the pieces back together. Im forgetting where things went like brackets to ac conditioning and alt brackets. Hoping to have car back and ready for the big test in a day. If I am successful, Ill be amazed. If something goes wrong, well, dont know. Thanks for the help. Wishful praying. I cant lift the pump up so the bolts clear. I looked at a Autozone site with instructions, once again and it looks like I still have more things to take off. I took lots of screenshots and notes. Im going to give it another try. If I still cant remove this pump, Ill be having a Lexus BBQ. Ha ha. Wish me luck.

Fingers crossed. Toyota sealant is very tough. Mechanic said it was going out and later that day, it did. I have it almost off but cant figure out why its not coming completely off. Im stuck. Im getting a bit frustrated The compression occurs when the cam lob high point applies pressure to the valve. So after the jump and when you turn the camshaft back to the TDC position, you are reapply valve spring pressure and compression to some of the valves. Because at any moment or position, one of the six cylinders will be in “compression status”, aligns crankshaft pulley marks to Top Dead Center TDC will still have this tension problem. To solve this problem, a person can aligns crankshaft pulley marks to Top Dead Center TDC and let the car “sleep in the garage for a night”. I guess next morning the “compressed cylinders” will have no more pressure tension due to air leaking. Will this “sleeping” method remove the potential “jumping” problem for sure. Thank you for answering my “using parking gear and driver side front wheel on the ground” question to remove crankshaft bolt. It will be nice to find some good and true videos there. Cant wait to see the other stuff you do. Thanks I do try to put out quality work that a layman can understand. This article is what I needed to guide me through this horrible repair. But, its my girlfriends only ride. She does so much volunteer work handing out food at the Clear Lake Gleaner, driving their truck and trailer to other Gleaners around Lake County Ca, getting up at 4am. On top of that she does inhome health care, enrolled in 2 colleges to finish getting her Master, doing side jobs to help with rent and other bills, and still cooks a great dinner at night. She is the hardest worker Ive ever known. Keeps going and going to help others. She cant be without a vehicle much longer. Anyway, thats why I decided to get greasy and at least get the majority of the work done.

I know my way around a few nuts and bolts, Ive done this sort of thing in my younger days, but Im more of a non greasy, put in nice stereo, tint the windows and make it shine in and out. Thanks again for easy to understand guide. Great job. No, should harm the transmission. This way I will have plenty of room to use a cheat bar sixfoot long to unscrew the crankshaft bolt. Will this method

damage my transmission. What I did before was to remove the side motor mount but found that to be too much of a pain as well. If the cam sprocket jumps, I just reposition the sprocket. Just adds to the confusion of a simple job. I just tighten the bolt with a long breaker bar. I will be working on my wifes 2005 Lexus ES330 180k miles all TB components including cam seals and crank seals. After lining up Crank and cams at TDC, Toyota Service manual states to turn crankshaft approx 60deg CCW prior releasing belt tensioner. Doesnt turning 60 deg CCW throws off the initial TDC alignment. Do you simply turn it CCW and align it again.I have done 1MZFE timing belt before on 1999 Solara but this interference 3MZFE chickens me out lol. No big deal. I just repositioned the sprocket back to the alignment mark. Thanks for putting this thread together.I just ordered my Aisin Kit from Rockauto. 2003 Avilon 3.0. My question is, for the back Cam Pully there is the normal 95 Ft. Lbs. and an asterisk for the Specific Torque.65 Ft.Lbs rather than 95 for the front one, do you know what the asterick is for Here is the link down below is the engine model.How about the models after 2003. I have a 2005 Camry V6 that does has VVTI Variable Valve Timing technology.That is not necessary and only works on single camshaft gear set ups. Just get the engine to TDC and align the belt with the camshaft alignment marks. Pull out the tension pin from the tensioner after alignment and your done installing the belt. Can you explain a little more on that Thanks again and appreciate you help.

Then remove the pulley and cover. There should be a both a V and dot metal marking on the engine a timing gear that should now be in alignment at 0 degrees. Back row 1 3 5 Front row 2 4 6 After putting in the new belt and aligned the 3 timing marks left and right camshaft and crankshaft pulleys. I turned crankshaft 2 full rotations but without pulling the tensioner pin. Recheck the 3 timing marks, unfortunately they are not aligned. I remove the belt but messed up the timing marks. Now I’m able to set TDC for crankshaft. by making sure piston 3 is at the top, since piston 3 is sync with piston 1 which is at the back. My question is after made sure crankshaft is at TDC, can I simply align the left and right camshafts timing marks and reinstall the timing belt Throw on a new belt, start the car and see how it runs. The VVTI lettering is noted on the silver plastic engine cover when you open the engine hood. If you can bring your car to Memphis, TN, yes, I can fix it. The starter runs way to free but I havent looked under the hood. How can I tell if my 2003 has VVTI or not. My 2nd question is can I bring my car to you to fix! I figured out the problem. After I would let go of the belt where it was wrapped around the crankshaft sprocket, the firewall side of the belt would constrict by a tooth causing me to not have enough slack to install the tensioner. Once I realized this was happening, I put a a large socket between the No. 1 idler pulley and its bracket which would keep enough pressure on the belt to keep it from jumping a tooth on the crankshaft sprocket. After I put the tensioner against the belt, Id pull the socket out. I had enough slack in the belt to install the tensioner. My tensioner had 12mm bolts. You can do that by either turning the crankshaft either clockwise or the firewall side camshaft pulley counter clockwise. You can use any type of clip to prevent the timing belt from jumping a clog from the camshaft pulley.

You should then have enough space to insert the tensioner bolt through the tensioners top bolt hole. Youll have to push the tensioner against the tensioner pulley bracket to get the hole lined up. Once the top one is in, the bottom bolt is relatively easy to install. If youre doing this with the motor mount in place, youll have the move the power steering pump bracket either up or down to get a path to either hole. I use a long pry bar or rod to tap down or up on the steering pump bracket. The tensioner bolts are 90 degrees to the direction of the pin. If I try to install the belt with the tensioner removed, I cant force the belt over far enough to align the tensioner with its bolt holes. Should I just force the belt on the idler or is there something else going on Around a 5 minute job. Soooo, I may need to do it again. But, the good news was, after replacing everything, belts, tensioner, pulleys, waterpump, cam and crank seals, etcs.wouldnt you know, it started back up again. Woo hoo. Hadnt been that far into a car repair before, so I feel pretty good. I may allow it to leak for a bit, before getting at it again. Thanks for all the advice. No big deal. I just repositioned the sprocket back to the

alignment mark. I was able to find the manufacturers manual on this. Seems with the 2005 Sienna, they do recommend turning the crankshaft counterclockwise by 60 degrees prior to removing the belt to release the spring tension. Yet for my model 1998the guide mentions none of that, and like you said, just remove it. Thanks again. Afterwards, you can advance the camshafts to the right by one cog to mount the belt and then position it back. I have a 98 Sienna. Looking to DIY this. Have watched a number of YouTube videos. I need to change the CAM oil seals too. Any guidance or tips on how best to do that. Can I remove the timing belt and then carefully release the tenions on just that one CAM.

or should I keep belt on, turn CRANK which turns everything, and then remove the old belt. I do not see any major leaks from the wp or cams. Would you recommend replacing all bearings, seals, tensioner, water pump in addition to the tbelt. On the V6, there are two heads and you cant do one without doing the other. You can reference my repair article on a Honda Accord head gasket replacement. Id do a compression check before doing a head gasket replacement. Also, check if there is white smoke coming out of your exhaust pipe an indicator that coolant is leaking into your combustion chamber. Head gaskets usually get blown from overheating the engine due to lack of coolant. I have a 2002 ES300 that is due for a timing belt and just happened to blow a head gasket. You wouldnt happen to have a writeup on replacing he head gasket on this engine would you. Also, in my case, just the front is blown I think since all codes reference bank 2. I would like to shortcut this and not do bank 1. Bad idea. Im guessing that Toyota removed the valve depressions WITH VVTi engines to increase the compression ratio and to control engine knock via VVTi. Therefore, if the timing belt brakes, there is a chance of valve damage.From my experience, I can have the belt on in around 1.5 hours. Thats how long it takes me. Then start the engine and youll know if the valves are bent. Otherwise, the work involved to determine if the valves are bent, in my opinion, isnt worth it when I could be taking the time replacing the belt. If the valves are bent, then you talking a big job taking off the cylinder heads to replace the damaged valves.It turns out the timing belt broke. I read online to see if the engine is ruined by this, but there are many contradicting informations. Some say the timing belt interfere the engine and some say it doesnt. I dont want to tow the van to the garage just to here that the engine is dead. Any advice would be appreciated!