Service Alert

Mazda North American Operations
Irvine, CA 92618-2922

Subject:	**Service Alert No.:** SA-026/19
2018-2019 CX-5 SKYACTIV-D 2.2L - NEW DIESEL ENGINE FEATURES AND SERVICE CAUTIONS	**Last Issued:** 06/13/2019

APPLICABLE MODEL(S)/VINS
2018-2019 CX-5 SKYACTIV-D 2.2L

DESCRIPTION

Not only does the diesel engine have unique features compared with a traditional gasoline engine, but the Mazda SKYACTIV-D 2.2L has many unique features even when compared with a conventional diesel engine. For this reason, we are providing the following necessary basic information for service. Please familiarize yourself with the material so that you understand and can explain the unique features and operation of this engine.

I. TECHNICAL FEATURES

Common Rail Injection System

Diesel Particulate Filter (DPF)

Selective Catalytic Reduction (SCR) System

NSC (NOx Storage Catalyst) Control

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IV. PRE-DELIVERY INSPECTION (PDI)

Diesel Particulate Filter (DPF) Regeneration

I. TECHNICAL FEATURES	
Common Rail Injection System 1. The common rail fuel injection system stores fuel pressurized by the supply pump in the common rail and injects fuel into each cylinder using fuel injectors based on control from the PCM. 2. Fuel is atomized by extremely high fuel injection pressure and the generation of particulate matter (PM) is reduced by the dissipation of unburnt fuel. 3. There is a high degree of flexibility in the fuel injection amount, fuel injection timing and fuel injection pattern. NOx/PM is reduced by controlling the fuel conditions based on vehicle conditions.	MGSS: COMMON RAIL INJECTION SYSTEM [SKYACTIV-D 2.2]
Diesel Particulate Filter (DPF) 1. Diesel particulate elimination equipment (DPF) has been adopted to eliminate PM from the exhaust gas. 2. When the amount of accumulated particulate matter (PM) in the diesel particulate filter exceeds a certain value, the PCM acts to combust and eliminate the PM.	See Owner's Manual -> Maintenance and Care -> Diesel Particulate Filter (DPF) MGSS: DIESEL PARTICULATE FILTER REGENERATION CONTROL [SKYACTIV-D 2.2]
Selective Catalytic Reduction (SCR) System 1. Reduction of NOx in the exhaust gas has been achieved by optimally controlling the SCR system (such as Diesel Exhaust Fluid (DEF) injection amount) according to the vehicle conditions.	See Owner's Manual -> Maintenance and Care -> Selective Catalytic Reduction (SCR) System MGSS: SCR CONTROL [SKYACTIV-D 2.2]

NSC (NOx Storage Catalyst) Control 1. The NSC absorbs the NOx from the engine exhaust. 2. The PCM performs NOx reduction control periodically to break down NOx stored in the NSC (DENOx control). 3. The PCM performs NOx reduction control periodically to break down NOx accumulated in the NSC (DENOxcontrol). NOx reduction control is performed at the same time as diesel particulate filter regeneration control.	See Owner's Manual -> Maintenance and Care -> NSC (NOx Storage Catalyst) Control MGSS: NSC CONTROL [SKYACTIV-D 2.2]

II. CUSTOMER ADVICE

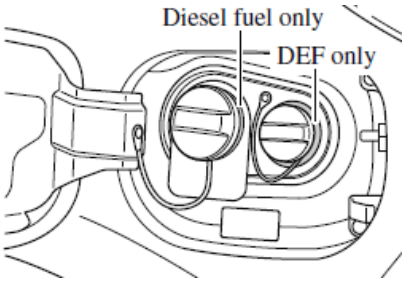
Before Driving

▼Fuel Requirements

The vehicle will operate efficiently on diesel fuel with specification Ultra-Low Sulfur Diesel (ULSD, 15 ppm sulfur or less) fuel that meets the ASTM D975 standard or the equivalent. Fuel grade labels are visible on the fuel-filler lid, therefore, always verify the fuel grade before refueling. If the fuel grade cannot be verified, ask the gas station attendant.

CAUTION:

1. Never use fuel other than specification Ultra-Low Sulfur Diesel (ULSD, 15 ppm sulfur or less) fuel that meets the ASTM D975 standard or the equivalent for your vehicle. Use of gasoline or kerosene in diesel engines will result in fuel system and engine damage.
2. Never use diesel fuel with concentrations of methyl ester bio-diesel higher than 5% (B5), such as B20 or B100.
3. Never add fuel system additives, otherwise, the emission control system could be damaged.
4. If any type of incorrect fuel is accidentally pumped into the fuel tank, do not turn on the engine or drive the vehicle, instead, consult an Authorized Mazda Dealer.
5. Turning on the engine or driving the vehicle with the incorrect fuel could cause damage to the fuel pump and fuel injectors.
6. Do not mistake the refueling port for the DEF filler port. If fuel is added to the DEF filler port by mistake, do not turn on the engine or drive the vehicle, instead, consult an Authorized Mazda Dealer.
7. Turning on the engine or driving the vehicle with fuel in the DEF filler port could cause damage to the emission control system.



NOTE:

1. Fuel for winter driving is available. Ask the gas station attendant for details.
2. When refueling, always add at least 2.6 US gal (10 L, 2.2 Imp gal) of fuel.

Low outside temperatures

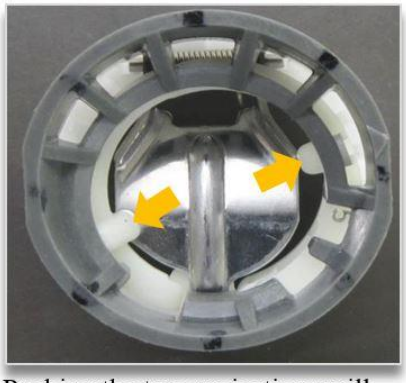
When the outside temperature is low, diesel fuel (which is a light oil) may freeze and clog the fuel pipe, leading to problems such as the engine not starting. When driving to a cold region, add winter grade diesel fuel as soon as possible.

See Owner's Manual -> Before Driving -> Fuel Requirements

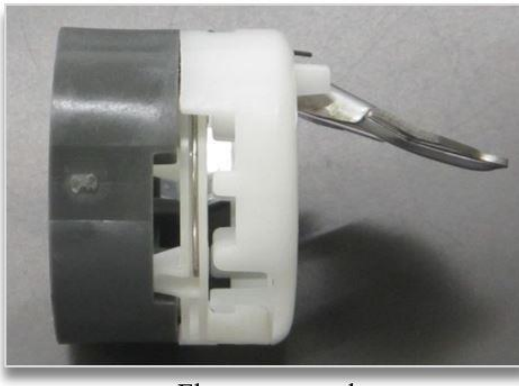
Never use engine starting assist additives
Using engine starting assist additives is dangerous because they may cause a vehicle explosion or a vehicle runaway condition, leading to serious injury or death.

(Technical Background)

1. *The flapper is equipped on the fuel filler neck to prevent non-diesel fuel filling. Diesel's wider diameter nozzle can release the lock and open the flapper.*



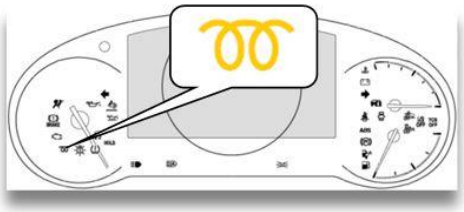
Pushing the two projections will release the lock for the flapper.



Flapper opened

RUN DRY PREVENTION (RDP) CONTROL

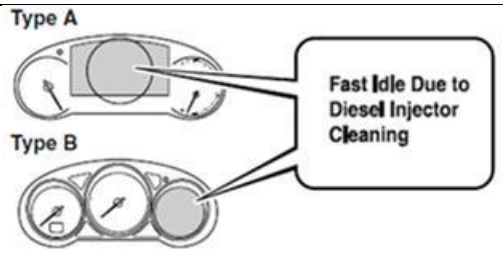
To prevent air from flowing into the fuel line when fuel decreases in the fuel tank, the output is intentionally controlled to warn the driver to supply fuel. The PCM stores the output limit or DTC according to the remaining fuel level.

Starting the Engine 1. The starter motor will not engage until the glow indicator light turns off. 2. If the ignition switch is left ON for a long period of time without the engine running, the glow plugs could have cooled down. The glow plugs may require warming up again, which will illuminate the glow indicator light. 3. When starting the engine, do not release the brake pedal until the glow indicator light in the instrument cluster turns off and the engine starts.  *(Technical Background)* 1. *Heating the glow plugs is controlled by the PCM through the glow control module to improve engine start ability.* 2. *Energization time to the glow plugs is determined according to the engine coolant temperature and engine starting conditions.*	See Owner's Manual -> When Driving -> Starting the Engine

Turning the Engine Off

1. If the engine is started and stopped repeatedly before it warms up, the engine may speed up to 1,500 rpm while the vehicle is stopped and in Park or Neutral in order to clean the engine internally.
2. Do not shut off the engine until the engine returns to normal idle speed.

Display	Content	Action to be taken
Fast Idle Due to Diesel Injector Cleaning	Indicated when the engine speed increases because the engine is being cleaned internally	The engine speed will increase while the engine is running an internal cleaning cycle with the selector lever in the P or N position. Do not stop the engine while the engine speed is high. When the cleaning cycle is completed, the engine speed will return to normal.



See Owner's Manual -> When Driving -> Turning the Engine Off

(Technical Background)

1. *The PCM implements fuel injection control when it determines that the ignition switch is being switched OFF repeatedly while the engine has not been warmed up sufficiently.*
2. *To prevent condensation accumulation in the fuel injection system, the combustion chamber temperature is increased by increasing idle speed to approximately 1,500 rpm under no-load. When the temperature in the combustion chamber increases to the specified temperature, the idle speed increase is automatically canceled.*

When Driving **▼Diesel Particulate Filter** The diesel particulate filter collects and removes most of the particulate matter (PM) in the exhaust gas of a diesel engine. PM collected by the diesel particulate filter is cleared during normal driving, however, PM may not be removed and the diesel particulate filter indicator light may illuminate under the following conditions: 1. If the vehicle is driven at 9 mph (15 km/h) or less continuously. 2. If the vehicle is repeatedly driven for a short period of time (10 minute or less) or driven while the engine is cold. 3. If the vehicle is idled for a long time. ***When "DPF Clogged" is indicated*** When the particulate matter (PM) cannot be removed automatically and the amount of collected PM has reached a specified amount, perform the following to clear the PM from the DPF. 1. After the engine has sufficiently warmed up (engine coolant temperature of 176 °F (80 °C) or more), drive the vehicle at a speed of 12 mph (20 km/h) or more for about 15 to 20 minutes. **CAUTION:** 1. If the vehicle continues to be driven with "*DPF Clogged"* indicated in the display, the particulate matter (PM) increases and the indication may change to *"DPF malfunction".* If the indication changes to "DPF malfunction", have the vehicle inspected immediately at an Authorized Mazda Dealer. 2. If the vehicle is not inspected and continues to be driven, the engine may malfunction. **NOTE:** 1. When *"DPF malfunction"* is indicated in the display, the engine output is restricted to protect the diesel particulate filter. 2. The engine sound and exhaust gas smell may change when PM is being removed while driving. *(Technical Background)* 1. *When the amount of accumulated particulate matter (PM) in the diesel particulate filter exceeds a certain value, the PCM controls post fuel injection to combust and eliminate PM.* 2. *Two methods are available to combust and eliminate PM, one is automatic DPF regeneration control which is performed by the PCM automatically. The other method is compulsory DPF regeneration control which can be forcibly performed externally (using the Mazda Modular Diagnostic System (M-MDS)).* 3. *During DPF regeneration control, fuel is injected after the main injection to increase the temperature (follow-up injection, post injection).*	See Owner's Manual -> When Driving -> Diesel Particulate Filter (DPF)

4. *The value displayed, as the current fuel economy increases, shows a lower MPG value during DPF regeneration.*

▼Selective Catalytic Reduction (SCR) System

The SCR system is designed to reduce nitrogen oxide (NOx) in the exhaust gas and purify the exhaust gas by injecting it with Diesel Exhaust Fluid (DEF).

WARNING:

Be careful not to allow the DEF to run out. If the DEF completely runs out, the SCR system will not operate normally. When the remaining DEF is low, a message is displayed on the multi-information display, and the SCR warning light turns on/flashes. If DEF needs to be replenished, add DEF following the specified procedure.

NOTE:

1. DEF needs to be replenished periodically according to the scheduled maintenance information.
2. Normally, the vehicle can be driven about 7,500 miles (12,000 km) before the DEF needs to be replenished. However, it may need to be replenished earlier depending on the driving and environmental conditions (i.e. high load on the engine while driving or driving the vehicle at high altitude).
3. The sound of the SCR system operating may be heard from under the vehicle, however, this does not indicate a problem.

▼Selective Catalytic Reduction (SCR) System Indications

As the remaining amount of Diesel Exhaust Fluid (DEF) lowers, the SCR system notifies the driver using the following indications. The vehicle speed may be restricted for a while, even if the warning light turns off after replenishing the DEF. To cancel the vehicle speed restriction immediately, switch the ignition OFF after the warning light turns off, then switch the ignition ON again.

Status	Warning sound	SCR warning light	Multi-information display indication	Driving restriction
Remaining DEF has decreased (Max. driving distance: 600 miles (966 km) or less).	Sound is activated when the ignition is switched ON.	Turns off	 **Refill DEF Speed Will Be Limited to 50 MPH in 200 Miles**	None

See Owner's Manual -> When Driving -> Selective Catalytic Reduction (SCR) System

Remaining DEF is low (Max. driving distance: 400 miles (644 km) or less).	Sound is activated when the ignition is switched ON.	Turns on	 Refil DEF Speed Wil Be Limited to 30 MPH in 200 Miles	Vehicle speed of 50 mph (80 km/h) or slower.
Remaining DEF is extremely low (Max. driving distance: 200 miles (322 km) or less).	Sound is activated when the ignition is switched ON.	Flashes	 Refill DEF Now Engine Will Go into Forced Idle Mode in 200 Miles	Vehicle speed of 30 mph (48 km/h) or slower.
No remaining DEF (Max. driving distance: 0 miles (0 km)).	Sound is activated when the remaining distance to empty indication is miles (0 km).	Flashes	 Forced Idle Mode On: DEF Empty Refil Now	Creep travel *1

The following indications are displayed when there is a problem with the SCR system/DEF. The vehicle speed may be restricted for a while, even if the warning light turned off after having the vehicle repaired. To cancel the vehicle speed restriction immediately, switch the ignition OFF after the warning light turns off, then switch the ignition ON again.

Status	Warning sound	SCR warning light	Multi-information display indication	Driving restriction
There is a problem with the SCR system/DEF (Max. driving distance: 250 miles (402 km) or less).	Sound is activated when there is a problem. Sound is activated when the ignition is switched ON.	Flashes	 SCR Malfunction Speed Will Be Limited to 30 MPH in 125 Miles	None
Condition in which a problem with SCR system/DEF continues (Max. driving distance: 125 miles (201 km) or less).	Sound is activated when the ignition is switched ON.	Flashes	 SCR Malfunction Engine Will Go into Forced Idle Mode in 125 Miles	Vehicle speed of 30 mph (48 km/h) or slower.

Condition in which a problem with SCR system/DEF continues (Max. driving distance: 0 miles (0 km)).	Sound is activated when the remaining distance to empty indication is 0 miles (0 km).	Flashes	 **Forced Idle Mode On: SCR Malfunction**	Creep travel *1	
DEF has been replenished over the specified amount.	---	Turns on	 **Overfilled DEF Drain Excess DEF as Soon as Possible**	None	

1. *If the SCR catalyst temperature exceeds 356 °F, {180 °C}, the NOx sensor is activated, and NOx is detected. The Diesel Exhaust Fluid (DEF) injection function operates according to the purification rate of the catalyst.*
2. *The dosing control unit controls the heater (urea tank, urea hose) to keep warm or defrost the Diesel Exhaust Fluid (DEF) according to the surrounding environment and Diesel Exhaust Fluid (DEF) conditions.*
3. *The warning function operates if there is low or excess Diesel Exhaust Fluid (DEF) or fluid other than normal Diesel Exhaust Fluid (DEF) is in the tank, or there is a malfunction in the SCR system.*

Maintenance **▼Diesel Exhaust Fluid (DEF) Handling** **CAUTION:** 1. Store DEF in a place out of the reach of children. If DEF gets in your mouth, wash your mouth with a large amount of water immediately and seek medical attention. If DEF is mistakenly swallowed, drink 1 to 2 cups of water immediately and seek medical attention. If DEF gets in your eyes, rinse them with running water immediately and seek medical attention. 2. Do not use DEF when 2 years have elapsed from the production date indicated on the container or the use period has expired. If DEF with an expired use period is used, the Selective Catalytic Reduction (SCR) System may not operate normally. 3. Do not store DEF in the vehicle. DEF may deteriorate or the interior may be damaged due to fluid leakage from the container. 4. If DEF gets on the painted surface or the interior, wash it off with water or wipe it off with a wet cloth immediately, otherwise, it may damage the painted surface or the interior. 5. Do not put DEF into a different container. There may be foreign matter in the container. If DEF containing foreign matter is used, it could cause a problem with the SCR system. In addition, changing containers is dangerous because it increases the risk of accidental ingestion. **NOTE:** 1. Store DEF in a cool, dark place. DEF freezes at 12 °F (–11 °C), however, when the temperature increases, the DEF returns to its original condition. 2. DEF is a colorless, transparent, odorless, and nonpoisonous solution (urea: 32.5 %, aqueous solution (AUS32)). When opening the container, there may be a smell of ammonia. Open the container in a well-ventilated area. 3. If DEF gets on your hands, wash them with running water immediately. **▼Diesel Exhaust Fluid (DEF) Replenishment** **CAUTION:** 1. Use a Mazda genuine product or a product conforming to ISO22241-1 for DEF. If incompatible DEF is used, the Selective Catalytic Reduction (SCR) system may not operate normally. 2. Do not dilute DEF with water. If diluted DEF is used, it could cause a problem with the SCR system or damage it. Do not add any fluid other than DEF to the urea tank. If any fluid other than DEF is added, it could cause a problem with the SCR system or damage it. Do not switch the ignition ON, and contact an Authorized Mazda Dealer.	See Owner's Manual -> Maintenance and Care -> Diesel Exhaust Fluid (DEF) Handling

3. When adding DEF, use a bottle with an anti-spill nozzle. If a bottle without an anti-spill nozzle or a commercial dispenser at a gasoline station is used, it could cause leakage or the DEF could spray out.
4. Do not overfill the DEF. If the DEF is overfilled, it may freeze during cold temperatures of 12 °F (–11°C) or less. When urea freezes, it expands and could cause tank breakage. Always use a bottle with an auto-stop function and stop adding fluid when the auto-stop function operates.

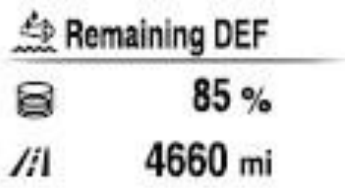
NOTE:

1. When adding DEF during low temperatures of 12 °F (–11°C) or less, move the vehicle to a warm location. If the DEF starts to freeze, it may not flow correctly, and the correct amount may not have been added. In addition, if the fluid freezes in the urea tank, you may not be able to tell if the correct amount of fluid was added.
2. Replenishment of DEF by an Authorized Mazda Dealer is recommended. If you want to replenish the DEF yourself, follow the replenishment procedure below.

DEF Replenishment Procedure

1. Check the remaining amount of Diesel Exhaust Fluid (DEF) on the multi-information display. The remaining amount of DEF and the remaining-distance-to-empty indications are displayed when the ignition is switched ON (the screen content changes each time the INFO switch is pressed).

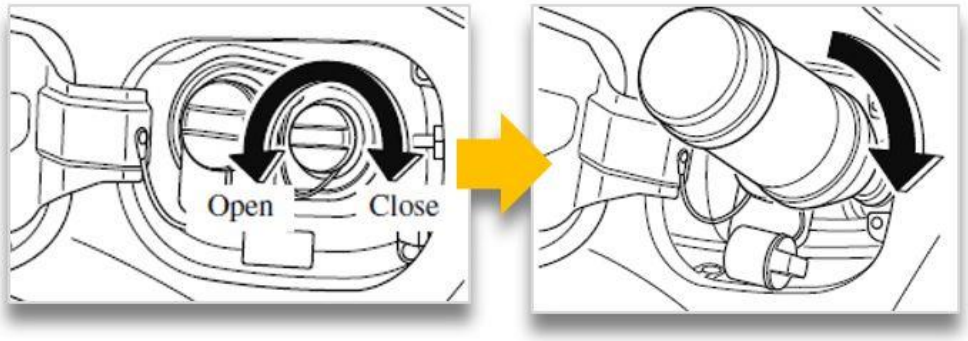
See Owner's Manual -> Maintenance and Care -> Diesel Exhaust Fluid (DEF) Replenishment



NOTE:

The replenishment amount (reference) according to the DEF level (%) indication is mentioned in the Owner's Manual or Workshop Manual. Even if DEF is added at the indicated replenishment amount, 100% may not be indicated on the display.

2. Stop the vehicle on level ground.
3. Switch the ignition OFF.
4. Open the fuel-filler lid.



See Owner's Manual -> Maintenance and Care -> DEF Replenishment Procedure

5. Open the cap for the DEF filler port.
6. Remove the cap from the DEF bottle. Insert the bottle into the DEF filler port and screw it in lightly until it stops.

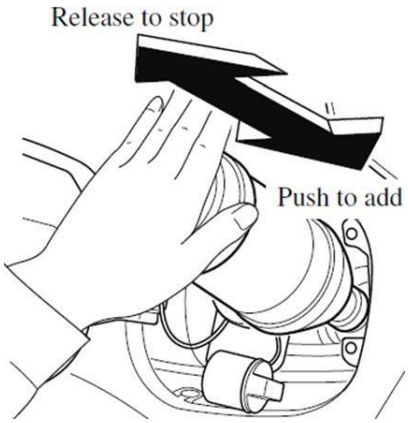
CAUTION:

If too much DEF is added, the SCR system might display a warning. If the warning remains displayed, the urea tank may have a problem, or it may be damaged.

NOTE:

1. If excessive force is applied when pressing in the bottom of the bottle, the bottle or the DEF filler port may be damaged.
2. When the urea tank is full, stop adding DEF. The flow from the bottle slows down due to the bottle's auto-stop function. If you continue adding DEF, the urea tank will overfill.

7. Press in the bottom of the bottle straight and add DEF.



See Owner's Manual -> Maintenance and Care -> Recommended Oil

NOTE:Always use a bottle with an auto-stop function and stop adding fluid when the auto-stop function operates.

8. Remove the bottle in the reverse order of insertion. At this time, be careful of DEF

dripping from the bottle. 9. Tighten the cap of the DEF filler port until you hear two or more click sounds. 10. Switch the ignition ON once. 11. Check the following while the vehicle is stopped. 1. No DEF level warning indication is displayed on the multi-information display. 2. The DEF level (%) indication on the multi-information display shows an increase. 12. Switch the ignition OFF. **If the above indications remain unchanged even after one minute has passed with the vehicle stopped:** 1. If you have already added 1.0 US gal (3.8 L, 0.84 Imp gal) of DEF according to the DEF level (%) indication on the multi-information display, prepare an additional 1.0 US gal (3.8 L, 0.84 Imp gal) of DEF or more and add it following the replenishment procedure. 2. If you added the correct amount of DEF, the DEF level (%) indication on the multi-information display will show an increase while the vehicle is being driven. If the DEF level (%) shows no increase or the speed restriction does not cancel even while driving the vehicle, consult an Authorized Mazda Dealer. *(Technical Background)* 1. *Top up with new diesel exhaust fluid in the urea tank once a year.* 2. *Check the total driving mileage for the last three years. If 12,000 miles (19,200 km) or more, top up with new diesel exhaust fluid in the urea tank. If less than 12,000 miles (19,200 km), replace the diesel exhaust fluid in the urea tank.* **▼Recommended Oil** **SKYACTIV-D SAE 0W-30 engine oil** Mazda Genuine Oil is used in your Mazda vehicle and is the recommended SKYACTIV-D SAE 0W-30 lubricant. Mazda Genuine SKYACTIV-D SAE 0W-30 Oil is exclusively for SKYACTIV-D and required to achieve optimum fuel economy and durability for the Diesel Particulate Filter. If Mazda Genuine SKYACTIV-D SAE 0W-30 Oil is not available, ACEA C3 0W-30 may be used for oil level maintenance and oil changes however, it is strongly recommended to replace with Mazda Genuine SKYACTIV-D SAE 0W-30 at the next oil change to maintain optimum performance.	See Owner's Manual -> Maintenance and Care -> Inspecting Engine Oil Level

CAUTION:

SKYACTIV-D 2.2L uses specified oil. Please confirm the specification in owner's manual. If engine oil other than the specified oil is used, the Diesel Particulate Filter effective period of use will be shortened or the Diesel Particulate Filter may be damaged.

NOTE:

Whenever the engine oil is replaced, the vehicles engine control unit needs to be reset as soon as possible. Otherwise, the engine oil warning light or the wrench indicator light may display at the wrong time.

(Technical Background)

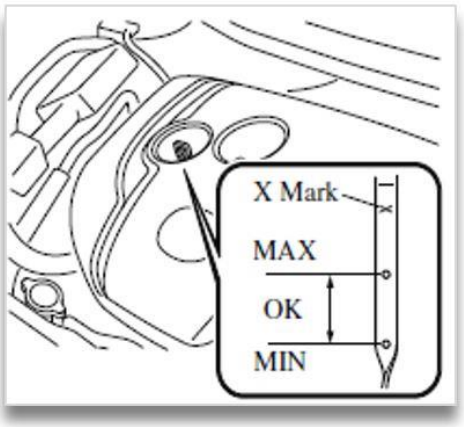
1. *During DPF regeneration, soot or particulate matter (PM) inside the DPF is burnt off and as a result, ash accumulates inside the DPF. The main sources of soot comes from engine oil additives. The accumulation of ash in the DPF is an important factor limiting the service life of the DPF. Since the DPF used in the SKYACTIV-D is light and compact, its capacity is relatively small. Therefore, in order to retain DPF longevity, the use of low ash oil is very important.*
2. *The DPF capacity is diminished when using oils other than Mazda Genuine SKYACTIV-D SAE as they contain too much ash.*
3. *Use of non-specified oils also results in premature oil dilution due to the frequent DPF regeneration attempts to remove the ash.*

▼Inspecting Engine Oil Level

When inspecting the engine oil level, pull out the dipstick straight without twisting. In addition, when inserting the dipstick, always insert it without twisting so that the “X” mark faces the front of the vehicle.

See Owner's Manual -> Maintenance and Care -> Maintenance Monitor (Engine Oil)

See Owner's Manual -> Maintenance and Care -> Fuel Filter



1. Be sure the vehicle is on a level surface.
2. Warm up the engine to normal operating temperature.
3. Turn it off and wait at least 5 minutes for the oil to return to the oil pan.
4. Pull out the dipstick, wipe it clean, and reinsert it fully.
5. Pull it out again and examine the level. The level is normal if it is between the MIN and MAX marks. If it is near or below MIN, add enough oil to bring the level to MAX.

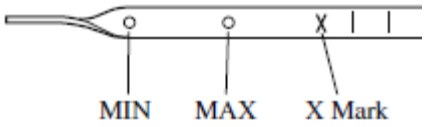
CAUTION:

Do not overfill the engine oil. This may cause engine damage.

6. Make sure the O-ring on the dipstick is positioned properly before reinserting the dipstick.
7. Reinsert the dipstick fully.

NOTE:

1. Inspect the engine oil level periodically. When inspecting the engine oil, if the engine oil level exceeds the “X” mark on the dipstick, replace the engine oil. This should be done by an Authorized Mazda Dealer.
2. When replacing the engine oil, inspect the oil level using the dipstick and refill so that the engine oil level is within the MIN and MAX range, as shown below.



(Technical Background)

1. *The PCM calculates the engine oil level based on the engine oil level sensor signal and the vehicle driving information. When engine oil level high is determined, the instrument cluster displays a message "Engine Oil Level High" and DTC P252F:00 is*

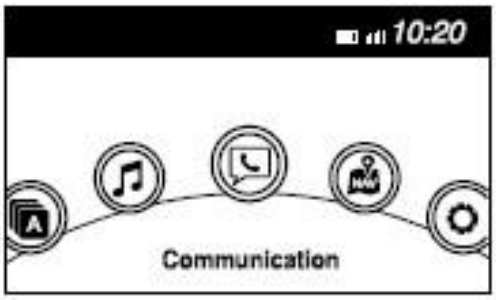
stored. Overfilling the engine oil leads to an early determination of "Engine Oil Level High".

2. *During DPF generation control, extra fuel is injected after the main injection to increase the temperature and burn off excess PM. This can cause engine oil dilution and gradually raise the oil level.*

▼Maintenance Monitor (Engine Oil)

The vehicle calculates the remaining oil life based on engine operating conditions. The vehicle lets you know when an oil change is due by illuminating the wrench indicator light in the instrument cluster.

1. Select the  icon on the home screen to display the Applications screen.



2. Select *"Vehicle Status Monitor"*.
3. Select *"Maintenance"* to display the maintenance list screen.
4. Switch the tab and select the *"Oil Change"*. You can customize settings in the setup display as follows:

Item	Explanation
Setting Interval	Oil replacement period can be selected from the flexible setting or fixed setting. Once engine oil flexible maintenance is selected, the vehicle calculates the remaining oil life based on the engine operating conditions. The vehicle lets you know when an oil change is due by illuminating the wrench indication/indicator light in the instrument cluster.
Distance (mile or km) (Displays only in fixed setting)	Displays the distance until the oil replacement is due. Select this item to set the oil replacement distance. The wrench indication/indicator light in the instrument cluster will be illuminated when the remaining distance is less than 600 miles (1,000 km) (*1).
Distance (mile or km) (Displays only in flexible setting)	Displays the distance until the oil replacement is due. The wrench indication/indicator light in the instrument cluster will

	be illuminated when the remaining distance is less than 600 miles (1,000 km).
Reset	Resets the remaining distance to the initial value. Once the system turns on, it needs to be reset whenever replacing the engine oil.

Item	**Explanation**
Setting Interval	Oil replacement period can be selected from the fixed setting. The vehicle lets you know when an oil change is due by illuminating the wrench indicator light in the instrument cluster.
Distance (mile or km)	Displays the distance until the oil replacement is due. Select this item to set the oil replacement distance. The wrench indication/indicator light in the instrument cluster will be illuminated when the remaining distance is less than 1,000 km or 600 mile (*1).
Reset	Resets the remaining distance to the initial value. Once the system turns on, it needs to be reset whenever replacing the engine oil.

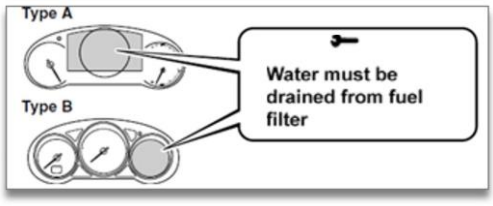
1. *The PCM performs the following calculations, and when any of the following exceed their specifications, it determines that the engine oil replacement period has been reached.*

- Traveled distance
*- Elapsed days **(* counts only when room fuse is installed)***
- Engine oil deterioration condition

1. *Engine oil data reset can be performed not only on the Reset menu of the Maintenance Monitor, but also by M-MDS, the TEST TERMINAL and the TRIP METER Switch. Refer to Workshop Manual for details.*

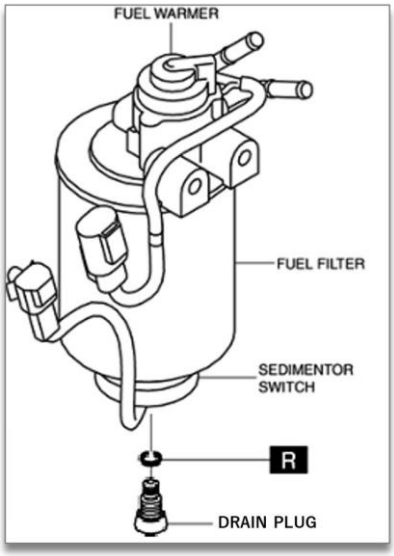
▼Fuel Filter

1. Fuel Filter needs to be replaced according to the Scheduled maintenance table.
2. When fuel filter (sedimentor) draining is required, the wrench indication is displayed with the message *"Water must be drained from fuel filter"*



(Technical Background)

1. *The fuel filter is installed in the engine compartment.*
2. *Fuel filter consists of a fuel warmer (with fuel warmer) and sedimentor switch. If the water level in the sedimentor exceeds a certain level, the sedimentor switch turns on, which is input to the PCM.*
3. *When the outside temperature is low, diesel fuel (light oil) may freeze and clog the fuel filter, leading to problems such as the engine not starting. When driving to a cold region, advise the customer to add winter grade diesel fuel as soon as possible.*



III. REPAIR

Fuel Injector Installation

▼Fuel Injector bracket installation nut tightening procedure

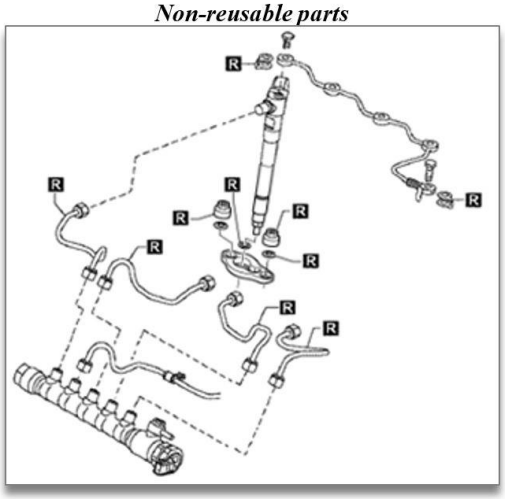
NOTE:

1. If the fuel injector bracket installation nuts are tightened incorrectly, it could cause gas leakage or influence the correct injector operation. Also, re-using non-reusable parts or insufficient cleaning on the sealing surface could cause gas leakage (injector bore cleaning kit is available).
2. The following procedure is for reference only. Always refer to the workshop manual for the latest information.

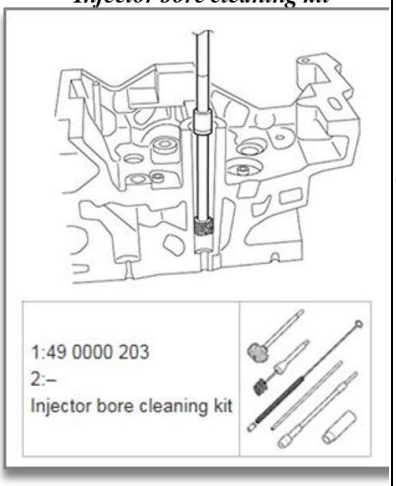
CAUTION:

1. If hands or tools touch the fuel injector terminal, the fuel injector might be damaged. To prevent this, do not touch the fuel injector terminal.
2. To prevent clogging, do not let foreign matter get into the injection pipe.

Non-reusable parts



Injector bore cleaning kit



1. Set the fulcrum

a) Temporarily tighten the nut on the engine front side until nut is seated.

b) Tighten the nut on the engine front side to snug torque (2.0 N·m {20 kgf·cm, 18 in·lbf}).

c) Loosen the nut on the engine front side 90 degrees.

2. Apply clamping force

a) Temporarily tighten the nut on the engine rear side until nut is seated.

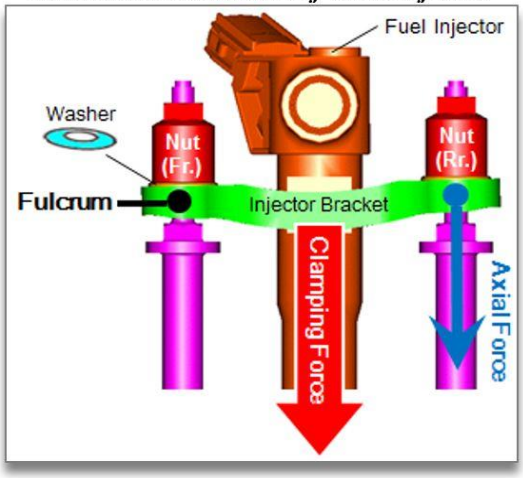
b) Tighten the nut on the engine rear side to snug torque (2.0 N·m {20 kgf·cm, 18 in·lbf}).

c) Tighten the nut on the engine rear side to the specified angle (PAINT MARKS and SCRIBED LINES

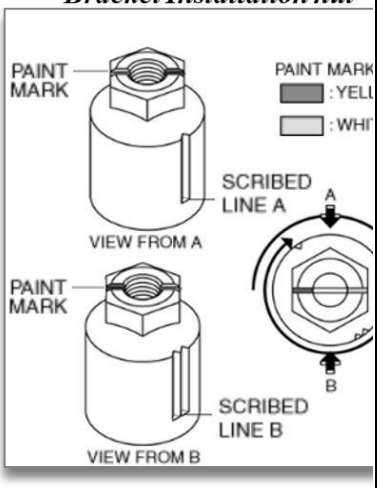
MGSS: FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2]

are on the nut to guide angle tightening).

Installation Structure of Fuel Injector



Bracket Installation nut



IV. PRE-DELIVERY INSPECTION (PDI)

Diesel Particulate Filter (DPF) Regeneration

In order to prevent generating white smoke from the exhaust system after delivery, burn off protective coating by
performing a DPF Regeneration as instructed in the PDI CX-5 VEHICLE RECEIVING PROCESS form.

Pressing and holding the "*TCS OFF*" switch starts a compulsory DPF Regeneration only when no DPF
Regeneration history has been logged into the PCM.

MGSS: DIESEL PARTICULATE FILTER REGENERATION CONTROL [SKYACTIV-D 2.2]

ROAD TEST - ENGINE RUNNING AT OPERATING TEMPERATURE

INSPECT the following items:

- ____ Verify that warning lights stay on for a few seconds after engine start and then turn off
- ____ Check that engine starts with all keys
- ____ Steering wheel alignment (centered)
- ____ Brake operation
- ____ Steering control
- ____ Engine general performance
- ____ Heater, defroster, and air conditioner at various mode selections
- ____ Operation of Cruise control system/MRCC*
- ____ Operation of (BSM) Blind Spot Monitoring System
- ____ Operation of meters, gauges and Active Driving Display*
- ____ Operation of speed response auto door lock function
- ____ Operation of AFS* (Adaptive Front-Lighting System)
- ____ Operation of (EPB) Electronic Parking Brake
- ____ Operation of AUTOHOLD feature
- ____ Squeaks, rattles, & abnormal noises
- ____ Verify Navigation System receives GPS signal (vehicle follows map)*
- ____ All warning lights are off
- ____ (Diesel Only): When idling, press and hold TCS OFF button until "Forced Idle-Up Procedure" begins (engine idle will raise and hold at 1750 rpm for 15-25 min) to burn off protective coating from exhaust system

MGSS: CX-5 STEP 1 VEHICLE RECEIVING PROCESS

WARNING:

1. High temperature exhaust gas is emitted during DPF regeneration. People near the vehicle could be seriously burned, or flammable objects could catch fire. Always perform compulsory DPF regeneration away from people and flammable objects.
2. If large amounts of exhaust gas are inhaled, it may cause carbon monoxide poisoning. Always perform compulsory DPF regeneration in a well-ventilated place (avoid using an exhaust air duct indoors and perform compulsory DPF regeneration in the open air).

CAUTION:

1. Perform compulsory DPF regeneration with the hood opened to prevent engine compartment overheating.

2. If an electrical load is applied, the post injection amount of the fuel injection control changes and compulsory DPF regeneration cannot be performed normally. Do not apply an electrical load such as turning on the headlights or the rear window defroster during compulsory DPF regeneration (A/C cut control is performed during compulsory DPF regeneration, and A/C is stopped). 3. If there are obstructions such as a wall around the tailpipe, it will obstruct the exhaust gas passage (airflow), and compulsory DPF regeneration may not be performed correctly due to the increase in exhaust gas temperature. Always perform compulsory DPF regeneration with no obstructions around the tailpipe. 4. The temperature in the rear cargo area increases because high temperature exhaust gas is emitted during DPF regeneration. If an object which can be easily damaged by heat is in the rear cargo area, such as an electronic device, it could be damaged by the temperature increase. If compulsory DPF regeneration is performed, do not place objects such as electronic devices which can be easily damaged by heat in the rear cargo area. 5. If any DTC other than P2458:00, P2463:00, and P242F:00 is stored, the PCM may inhibit compulsory DPF regeneration. Before performing compulsory DPF regeneration, resolve the malfunction and clear the DTC.	