**CDX Distance Learning**

**Exercise #45**

**Clutch Operation**

**Student Name:** Click or tap here to enter text.

To complete this assignment, use this [**clutch operation animation**](http://144.137.28.1/Animations/MTanim/MT_ClutchTypesOp_C1/MT_ClutchTypesOp_C1.html). The animation allows you to choose the type of clutch operation to display: push, pull, or lever clutch type. This assignment also taps into the general automotive clutch operational knowledge you have gained from the manual transmission book. Using the animation and your knowledge, follow the directions in the questions and select the correct answer. Click or tap the check box next to the answer choice that best completes the statement or answers the question.

1. Switch the clutch operation to the lever type of clutch operation. Which of the following issues can happen if the slave cylinder starts to fail and allows clutch fluid to leak?
   1. Nothing happens; the clutch fluid will fall out of the transmission bell housing onto the ground, thereby not affecting the clutch.
   2. The clutch fluid can contaminate the clutch plate, which then can cause clutch slippage under heavy acceleration.
   3. The slave cylinder does not have any fluid in it so there will not be any leaks on the clutch plate.
   4. The clutch master cylinder will adapt to the slave cylinder leak and disable the clutch operational action.
2. Using the animation in the lever clutch type mode, what is the thrust race bearing doing when the clutch fork is moving it towards the diaphragm spring on the pressure plate?
   1. It is pushing the release lever on the clutch pressure plate to release the pressure plate against the clutch plate.
   2. The thrust race pushes the pressure plate against the clutch plate to engage the transmission to the engine.
   3. The thrust race presses against the clutch plate to engage the transmission.
   4. The release lever allows the clutch to speed up while the engine is operating at a set rpm.
3. Switch the animation to the pull clutch type. Which of the following components allow for the clutch pedal to return to the home position?
   1. The thrust race bearing
   2. The pilot bearing
   3. The clutch plate
   4. The diaphragm spring
4. Switch the animation to the push clutch type. What actuates the clutch fork on this application?
   1. Slave cylinder
   2. Clutch cable
   3. Master cylinder
   4. Pressure plate
5. Which of the following types of clutch applications has the ability for manual adjustment as the clutch wears?
   1. Clutch diaphragm spring push type
   2. Clutch lever type
   3. Clutch diaphragm spring pull type
   4. None of the above
6. Using the push type of clutch operation, what can happen if the diaphragm wears out or breaks?
   1. The pressure plate will adjust to a failed diaphragm spring to maintain clutch operation.
   2. The clutch plate can slip and cause the vehicle to decelerate.
   3. The pressure plate will disintegrate and cause the vehicle to stop moving.
   4. The pressure plate will lock up the transmission to the engine and cause it to stop the engine.
7. Switch the animation to the pull clutch type. What can happen if the master cylinder becomes worn and will not make enough output pressure?
   1. The slave cylinder will not operate correctly, and the clutch plate will not disconnect from the flywheel.
   2. The slave cylinder will be unaffected no matter what happens with the master cylinder.
   3. The clutch fork will fail and not actuate the diaphragm spring within the clutch assembly.
   4. The transmission input shaft will stop turning, which will cause the vehicle to stop moving.
8. On the lever clutch type, what does the pilot bearing do for clutch operation?
   1. It supports the clutch disc so that it will sit right on the pressure plate.
   2. It supports the input shaft so it will maintain alignment with the clutch disc.
   3. It supports the last crankshaft bearing so it does not prematurely wear out.
   4. It supports the pressure plate so that it properly aligns with the clutch disc.
9. When replacing the clutch disc and the pressure plate, what must be done to the flywheel to ensure the proper clutch to flywheel coefficient of friction?
   1. Properly torqueing the flywheel and clutch pressure plate down will maintain the proper coefficient of friction between the two components.
   2. Nothing; the flywheel is made of steel and it will never wear or lose its ability to maintain the proper coefficient of friction between it and the clutch disc.
   3. Resurface the flywheel to get a perfectly flat surface to maintain the proper coefficient of friction between both surfaces.
   4. Lubricating the pressure plate to clutch disc contact area will increase the coefficient of friction between the two components.
10. Switch to the pull clutch type on the animation. What will most likely happen if the clutch fork mounting shaft becomes worn and creates a misalignment between it and the thrust race?
    1. The clutch fork will slip and fall off the slave cylinder and the driver will not be able to actuate the clutch.
    2. The input shaft will stop the clutch fork from falling too far and will help to maintain clutch fork operation.
    3. The clutch fork will get stuck between the input shaft and the thrust race causing permanent clutch engagement.
    4. Proper clutch actuation will not happen, which can increase the heat generated when the driver wants to change gears.