

Manual Transmission Exam 2 Practice (Sample)

Study Guide



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SAMPLE

Questions

SAMPLE

- 1. What is the role of a shift fork in a manual transmission?**
 - A. To control engine temperature**
 - B. To engage the gears by sliding them into position**
 - C. To provide support for the transmission casing**
 - D. To relieve pressure in the system**

- 2. The splines of the drive shaft yoke should be lubricated to prevent _____.**
 - A. Excess wear**
 - B. Spline bind**
 - C. Vibration**
 - D. Noise**

- 3. How can cold temperatures affect the operation of a manual transmission?**
 - A. They make shifting easier**
 - B. They cause oil leaks**
 - C. They thicken the transmission fluid**
 - D. They improve acceleration**

- 4. Which noise during operation typically suggests a problem with a throw-out bearing?**
 - A. High-pitched whine**
 - B. Grinding sound**
 - C. Rattling noise**
 - D. Constant humming**

- 5. What is the primary function of CV joints in a vehicle?**
 - A. To support the vehicle weight**
 - B. To transmit engine power to the wheels**
 - C. To control steering response**
 - D. To absorb bumps in the road**

- 6. What is the most likely cause of a rear-wheel drive vehicle shuddering or vibrating when starting from a stop?**
- A. Excessive U-joint working angles**
 - B. Worn tires**
 - C. Loose suspension components**
 - D. Imbalanced wheels**
- 7. Drive axle shafts are also called _____.**
- A. Drive shafts**
 - B. Half shafts**
 - C. Axle tubes**
 - D. Rear shafts**
- 8. During a typical upshift, the synchronizer must perform which action?**
- A. Slow down the clutch disc, main drive gear, cluster gear, and speed gears**
 - B. Speed up the engine RPM**
 - C. Engage the clutch instantly**
 - D. Disengage the transmission smoothly**
- 9. What is essential for proper operation of tapered roller bearings in a transaxle?**
- A. Loose fitting**
 - B. Even heat distribution**
 - C. Correct preloading**
 - D. Frequent inspection**
- 10. What is the consequence of over-revving an engine in a manual transmission vehicle?**
- A. Improved fuel efficiency**
 - B. Increased speed**
 - C. Engine and transmission damage**
 - D. Enhanced shifting performance**

Answers

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- 1. B**
- 2. B**
- 3. C**
- 4. A**
- 5. B**
- 6. A**
- 7. B**
- 8. A**
- 9. C**
- 10. C**

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Explanations

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1. What is the role of a shift fork in a manual transmission?

- A. To control engine temperature
- B. To engage the gears by sliding them into position**
- C. To provide support for the transmission casing
- D. To relieve pressure in the system

The role of a shift fork in a manual transmission is to engage the gears by sliding them into position. When the driver selects a gear by moving the gear lever, the shift fork is actuated, either by a cable or linkage, which then moves the corresponding gear selector sleeve. This action allows the gear to mesh with the selected gear pair, facilitating the transmission of power from the engine to the wheels. In this process, the shift fork enables precise gear engagement, ensuring that the transmission operates smoothly without grinding or damaging the gears. This is crucial for maintaining performance and ensuring the durability of the transmission system over time.

2. The splines of the drive shaft yoke should be lubricated to prevent _____.

- A. Excess wear
- B. Spline bind**
- C. Vibration
- D. Noise

Lubricating the splines of the drive shaft yoke is essential for preventing spline bind. Spline bind occurs when the splines, which are designed to allow for some degree of movement and flexibility during operation, become stiff or stuck due to inadequate lubrication. When this happens, the drive shaft may not slide freely when needed, particularly during suspension movement or when the vehicle accelerates and decelerates. This can lead to a reduction in performance and may cause excessive stress on the components, ultimately leading to failure. Proper lubrication ensures that the splines can function as intended, allowing for smooth engagement and disengagement, thus maintaining the efficiency and longevity of the drive system.

3. How can cold temperatures affect the operation of a manual transmission?

- A. They make shifting easier**
- B. They cause oil leaks**
- C. They thicken the transmission fluid**
- D. They improve acceleration**

Cold temperatures significantly affect the viscosity of transmission fluid, which is essential for proper operation in a manual transmission. When temperatures drop, the transmission fluid becomes thicker and more viscous. This increased viscosity can impede the smooth flow of fluid within the transmission, making it more difficult for the gears to engage and shift properly. As the fluid thickens, it doesn't lubricate and cool the components effectively, potentially leading to increased wear and strain on the system. This is why it's crucial to ensure that the transmission fluid is suitable for the prevailing temperatures, as fluid that maintains its viscosity and lubrication properties will lead to better performance and longevity of the transmission. In contrast, other options do not accurately represent the impact of cold temperatures on manual transmission operation. For instance, cold weather does not make shifting easier, and it typically does not cause oil leaks as a primary issue; rather, it affects the fluid's ability to flow. Cold temperatures do not improve acceleration either, as the lack of proper lubrication can actually hinder performance.

4. Which noise during operation typically suggests a problem with a throw-out bearing?

- A. High-pitched whine**
- B. Grinding sound**
- C. Rattling noise**
- D. Constant humming**

A high-pitched whine during operation can indicate an issue with the throw-out bearing, which is a critical component in a manual transmission system that engages and disengages the clutch. When the throw-out bearing begins to wear out or fails, it may produce a high-frequency noise as it struggles to perform its function of allowing smooth engagement and disengagement of the clutch. The noise can become more pronounced as pressure is applied to the clutch pedal, resulting from the bearing's inability to rotate freely or its improper alignment. In comparison, other noises associated with transmission problems usually point to different issues. For instance, grinding sounds typically indicate a problem with gear engagement, suggesting that the gears are not aligning properly due to a worn synchronizer or improper shifting technique. Rattling noises may suggest loose components or other mechanical failures unrelated to the throw-out bearing, while constant humming could imply issues with differential or gear wear, which is also separate from clutch operation. Understanding these distinctions helps in diagnosing clutch-related noise effectively.

5. What is the primary function of CV joints in a vehicle?

- A. To support the vehicle weight**
- B. To transmit engine power to the wheels**
- C. To control steering response**
- D. To absorb bumps in the road**

The primary function of CV joints, or Constant Velocity joints, in a vehicle is to transmit engine power to the wheels. These joints are crucial components of the drivetrain, allowing the drive shafts to transfer torque from the engine through the transmission to the wheels while accommodating the movements of the suspension and steering. The design of CV joints enables them to maintain a constant velocity during operation, regardless of the angle of the shafts or the suspension travel, which is essential for smooth vehicle operation. While the other choices describe important vehicle functions, they do not pertain to the specific role of CV joints. Supporting the vehicle weight relates more to suspension components, controlling steering response pertains to the steering system, and absorbing bumps in the road is a function of the suspension design rather than the CV joints themselves. Thus, understanding the primary role of CV joints helps clarify their function within the overall mechanics of a vehicle's drivetrain.

6. What is the most likely cause of a rear-wheel drive vehicle shuddering or vibrating when starting from a stop?

- A. Excessive U-joint working angles**
- B. Worn tires**
- C. Loose suspension components**
- D. Imbalanced wheels**

In a rear-wheel drive vehicle, the drive shaft transmits power from the transmission to the rear axle via universal joints (U-joints). If the U-joints are positioned at excessive working angles, this can lead to vibrations and shuddering when starting from a stop. The U-joints must operate within a specified angle to function smoothly; excessive angles can result in increased vibrations that are felt throughout the vehicle. This is often perceived most acutely during low-speed maneuvers such as starting from a stop, where the torque demands are highest and the angles are changing rapidly. Therefore, the presence of excessive U-joint working angles is a plausible explanation for the shuddering or vibrating symptoms. Other factors such as worn tires, loose suspension components, or imbalanced wheels can certainly cause vibrations, but they might not be as specifically linked to the behavior seen when starting from a stop in the context of a rear-wheel drive vehicle. For instance, while worn tires can lead to uneven traction and vibrations, they typically manifest differently than the specific symptom of shuddering linked to U-joint angles. Similarly, loose suspension components could cause a range of handling issues but would not directly account for that specific shuddering at startup, and imbalanced wheels

7. Drive axle shafts are also called _____.

- A. Drive shafts
- B. Half shafts**
- C. Axle tubes
- D. Rear shafts

Drive axle shafts are commonly referred to as half shafts because they connect the differential of the vehicle to the drive wheels. In a typical front-wheel-drive vehicle, for example, the power from the engine is transferred through the transmission to the differential, which then splits the power between the two half shafts leading to the front wheels. This design allows the vehicle to turn while still providing power to the wheels. The term "half" refers to the fact that each half shaft is only a part of the complete axle assembly, which consists of not just the shafts themselves but also includes the differential and other components that help rotate the wheels. This makes the terminology particularly relevant for understanding how power is distributed within the drivetrain. In contrast, the other terms do not accurately describe drive axle shafts in the same context. Drive shafts typically refer to the long shafts that transmit power from the transmission to the differential in rear-wheel-drive and four-wheel-drive vehicles, while axle tubes are the housings that contain the axle shafts and other components of the axle assembly. Rear shafts could imply shafts used in only rear-wheel-drive configurations and don't encompass the full definition applicable to front-wheel-drive systems, making "half shafts" the most precise term in this context.

8. During a typical upshift, the synchronizer must perform which action?

- A. Slow down the clutch disc, main drive gear, cluster gear, and speed gears**
- B. Speed up the engine RPM
- C. Engage the clutch instantly
- D. Disengage the transmission smoothly

During a typical upshift, the synchronizer's primary role is to match the rotating speeds of the gears involved in the shift. This means that the synchronizer needs to facilitate the slowing down of the clutch disc, main drive gear, cluster gear, and the speed gears to a point where they can engage smoothly without clashing. When a driver initiates an upshift, they are generally moving from a lower gear to a higher gear. The engine speed (RPM) should be reduced relative to the input speed of the transmitting components. The series of actions taken by the synchronizer ensures that the new gear can mesh with the ongoing rotation of the driveshaft at a compatible speed, allowing for seamless engagement and preventing gear damage or wear from clash or grinding. The other options focus incorrectly on the direct behaviors of the clutch or engine RPMs, which do not capture the critical function of the synchronizer during the shifting process. It is the synchronizer's task specifically to manage and synchronize speed to allow for a proper gear change.

9. What is essential for proper operation of tapered roller bearings in a transaxle?

- A. Loose fitting**
- B. Even heat distribution**
- C. Correct preloading**
- D. Frequent inspection**

For tapered roller bearings to function properly in a transaxle, correct preloading is essential. Preloading involves applying a specific amount of pressure to the bearings to ensure that they are properly seated within their housings. This process helps maintain an optimal clearance between the roller elements and the races, allowing for smooth operation and minimizing excess play or movement. When tapered roller bearings are preloaded correctly, it enhances their load-carrying capacity and stability, particularly under varying loads often encountered in a transaxle during operation. It also helps reduce the risk of bearing failure due to excessive clearance, which can lead to misalignment and uneven wear. In contrast, loose fitting would lead to insufficient contact between the bearing surfaces, ultimately resulting in premature wear or failure. Even heat distribution is important for various components in the transaxle but does not directly address the fitting and operational efficiency of the bearings themselves. Frequent inspection, while valuable for maintenance, cannot substitute for the necessity of initial correct preloading to ensure the longevity and functionality of the bearings during normal operation.

10. What is the consequence of over-revving an engine in a manual transmission vehicle?

- A. Improved fuel efficiency**
- B. Increased speed**
- C. Engine and transmission damage**
- D. Enhanced shifting performance**

Over-revving an engine occurs when the engine operates at speeds exceeding its designed limit, which can lead to severe consequences. This excessive speed can cause components within the engine, such as pistons and connecting rods, to experience undue stress. The engine's internal parts are engineered to function within specific RPM ranges; surpassing these limits increases the likelihood of mechanical failure. Specifically, over-revving can lead to catastrophic failure, such as bending or breaking components, which may render the engine inoperable. Additionally, excessive RPMs can cause the timing chain or belt to fail, lead to harmful vibrations, or result in the engine overheating due to insufficient lubrication. The transmission can also suffer damage due to the mismatch of speeds and strains placed on its components. In contrast, other potential outcomes like improved fuel efficiency, increased speed, or enhanced shifting performance are not associated with over-revving. Instead, these factors tend to show decreases in performance or efficiency as a result of the stress and potential damage inflicted on the engine and transmission by operating outside their intended RPM range.