

CDL Study Guide

185+ High-Yield Terms & Concepts

for the Commercial Driver's License (FMCSA / State DMV)

Covers the three core knowledge tests - General Knowledge, Air Brakes, and Combination Vehicles - plus the HazMat, Tanker, Passenger, School Bus, and Doubles/Triples endorsement tests. Includes Class A/B/C breakdown, ELDT requirements, the FMCSA medical card and self-certification, and the 3-part skills test. Each concept pairs key facts with a driver tip and a practical example.

How to Use This Guide

STEP ONE - write down your target class (A, B, or C) and every endorsement you need (H, N, P, S, T). That defines the exact tests you will sit. STEP TWO - master General Knowledge first, then Air Brakes, then Combination Vehicles, then the endorsement sections you need. STEP THREE - verify your state's question counts and 80% passing standard, and use the format reference appendices + final review to lock in the numbers. This is an independent study aid - not affiliated with the FMCSA, USDOT, any state DMV/DPS, or any training provider. The official FMCSA Commercial Driver's License Manual and your state CDL handbook are the authoritative sources for current requirements.

Your Test Map

General Knowledge (all classes, ~50q) -> Air Brakes (Class A/B or air-braked, ~25q) -> Combination Vehicles (Class A, ~20q) -> Endorsements: HazMat (30q), Tanker (20q), Passenger (20q), School Bus (20q), Doubles/Triples (20q). Passing: 80% per test. ELDT (since Feb 7 2022) before the skills test; CLP held 14+ days; 3-part skills test: pre-trip, basic control, road.

How to Use This Guide

Your CDL, your tests, your 80%

The CDL written test is a series of knowledge tests, each passed independently at 80% (typical). Every state builds its questions from the FMCSA Commercial Driver's License Manual, so the content is standardized even though the administration (DMV/DPS) is state-run. Work through the sections in this guide in order, finish with the final review and test-day strategy, and verify your state's exact counts, passing scores, fees, and ELDT rules before test day.

Part 1: Exam Overview

2026-current format - 3 core tests, endorsements, ELDT, medical card, CLP & skills test

1. Three Written Knowledge Tests

The CDL written test is a series of knowledge tests administered by each state (DMV/DPS): General Knowledge (required for ALL CDL classes), Air Brakes (required for Class A, Class B, or any air-braked vehicle), and Combination Vehicles (required for Class A). Endorsement tests (HazMat, Tanker, Passenger, School Bus, Doubles/Triples) are added only if you want that endorsement.

Driver Tip: Before studying, write down your target class and every endorsement you need - that defines which tests you actually sit.

e.g. A Class B applicant usually takes just General Knowledge + Air Brakes; only add Passenger or School Bus if you want those endorsements.

2. State-Administered, FMCSA-Based

There is no single national written test - each state runs its own at the DMV/DPS, but every state builds its questions from the FMCSA Commercial Driver's License Manual, so the content is standardized across the country.

Driver Tip: Study from the FMCSA manual + your state's CDL handbook side by side; state rules (like air brake restrictions or endorsement rules) vary slightly.

e.g. Two applicants in different states see the same core topics but slightly different question counts and state-specific rules.

3. Format & Passing Score

The tests are computer-based in most states and multiple-choice. Typical counts: General Knowledge 50 questions / 50-60 min (40 correct = 80%), Air Brakes 25 (20 correct), Combination Vehicles 20 (16 correct), HazMat 30 (24 correct), Tanker / Doubles-Triples / Passenger / School Bus 20 each (16 correct). Passing is 80% PER TEST - a high score on one test does not offset a low score on another.

Driver Tip: Confirm your state's exact counts and passing standard before test day; most states require 80% on each test you take.

e.g. If you pass General Knowledge but fail Air Brakes, you retake only Air Brakes - passed sections stay valid per state policy.

4. Class A / B / C Breakdown

Class A: any combination of vehicles with a GCWR of 26,001+ lb where the towed unit is over 10,000 lb (tractor-trailers) - requires General Knowledge + Combination Vehicles + Air Brakes (for air-braked rigs). Class B: single vehicle over 26,000 lb, or such a vehicle towing a trailer under 10,000 lb (straight trucks, buses) - General Knowledge + Air Brakes if applicable. Class C: single vehicle under 26,000 lb designed to carry 16+ passengers or hazardous materials - General Knowledge + the relevant endorsement tests.

Driver Tip: Pick your class by the vehicle you will drive, not the biggest possible license - each class requires its own set of tests.

e.g. A dump-truck driver goes Class B; a tractor-trailer driver goes Class A; a small hazmat van driver goes Class C with an H endorsement.

5. Endorsement Tests

HazMat (H): 30 questions - placarding, segregation, HM safety. Tanker (N): 20 - liquid surge, loading, baffles. Passenger (P): 20 - loading, passenger safety, backing a bus. School Bus (S): 20 - student loading/unloading, crossing arms, railroad crossings. Doubles/Triples (T): 20 - coupling, converter dollies, handling. Each is a separate 80% test.

Driver Tip: Take endorsement tests in the same visit as your core tests if your state allows it - one trip, one fee in many states.

e.g. A tanker driver who also hauls fuel may need both N (tanker) and H (hazmat) endorsements - two separate tests.

6. ELDT Requirement (Since Feb 2022)

Entry-Level Driver Training (49 CFR 380 Subpart F) is federally required since February 7, 2022 for first-time Class A/B applicants, Class B-to-A upgrades, and anyone adding HazMat, Passenger, or School Bus endorsements. You must complete theory + behind-the-wheel training with an FMCSA-registered provider (on the Training Provider Registry) BEFORE taking the skills test - not the knowledge tests.

Driver Tip: ELDT is verified electronically through the TPR when you schedule the skills test; your certificate stays in the registry indefinitely.

e.g. You can take the knowledge tests and get your CLP before finishing ELDT - but you cannot sit the skills test without it.

7. FMCSA Medical Card + Self-Certification

You must hold a valid DOT medical certificate (medical card) and self-certify your driving type (non-excepted interstate, excepted interstate, non-excepted intrastate, or excepted intrastate) with your state. The state puts your self-certification on your CDLIS record; hazmat additionally requires a TSA background check and fingerprinting.

Driver Tip: Complete your DOT physical BEFORE applying - many DMVs will not issue a CLP without a valid medical card on file.

e.g. A driver who self-certifies as non-excepted interstate must always carry a current medical card while driving.

8. The CLP (Commercial Learner's Permit)

After passing the knowledge tests you get a CLP, which lets you practice a commercial vehicle on public roads WITH a CDL holder of the same class sitting beside you. Federal rules: hold the CLP at least 14 days before the skills test (49 CFR 383.25), and it is valid 180 days (extendable once in most states).

Driver Tip: Use the 14-day minimum as your practice runway - schedule road practice every day before the skills test.

e.g. A CLP holder can never drive solo; the accompanying CDL holder must have the same class and endorsements.

9. The 3-Part Skills Test

The CDL skills test has three parts: (1) pre-trip inspection - walk around and demonstrate the vehicle and parts are safe, (2) basic control skills - off-road maneuvering (straight-line backing, offset backing, parallel parking, alley docking), and (3) the road test - on-street driving. You must pass all three; a failure on one means you retake only that part.

Driver Tip: Memorize a systematic pre-trip order (engine area, cab, lights, tires, brakes, coupling, air brakes) so you never forget a category.

e.g. Most applicants who fail the skills test fail the pre-trip because they rushed the inspection - slow down and use a checklist.

10. Pre-Trip Inspection Is Scored

The pre-trip is a scored part of the skills test, not a formality. You must point to and name components, check fluid levels, verify lights, tires, brakes, and for combination vehicles the coupling (fifth wheel, kingpin, air lines) - all while speaking aloud.

Driver Tip: Practice the inspection OUT LOUD with the same scripted order you will use on test day; examiners score what you say and point to.

e.g. Pointing at a tire and saying 'tread depth, inflation, no cuts' scores - standing silently at the front bumper scores nothing.

11. Cost & Registration

Total cost typically runs \$200-\$500 (knowledge tests, CLP, skills test, license fee) plus entry-level training if you need it (\$3,000-\$8,000 for a full commercial driving school). Paid by state; register at your DMV/DPS.

Driver Tip: Ask your state DMV for the exact fee schedule and whether the knowledge test fee covers retakes of individual sections.

e.g. A \$40-per-test fee means a Class A applicant with two endorsements pays for several separate tests.

12. Study Priority

General Knowledge is the foundation - master it first. Air Brakes matters for most commercial vehicles (and a failed air brakes test blocks the license in many states). Combination Vehicles is the top Class A differentiator. Then add endorsement sections only for the endorsements you need.

Driver Tip: Score 85%+ on practice tests before booking the real exam - the real test draws from the same universe of questions.

e.g. A Class A tanker driver's priority order: General Knowledge, Air Brakes, Combination Vehicles, Tanker, HazMat.

13. Non-Affiliation Note

CDL, Commercial Driver's License, and related marks are regulated by the FMCSA and each state's DMV/DPS. This guide is an independent study aid written by an unaffiliated author - it is NOT affiliated with, endorsed by, or sponsored by the FMCSA, USDOT, any state DMV/DPS, or any training provider.

Driver Tip: Always verify current format, question counts, passing scores, fees, and eligibility with your state DMV and the official FMCSA Commercial Driver's License Manual.

e.g. The official FMCSA CDL Manual and your state handbook remain the authoritative sources for your testing year.

14. Passing Score Is Per Test

Every CDL knowledge test is scored separately and passed at ~80%. A strong score on General Knowledge does NOT reduce the passing bar on Air Brakes or an endorsement test - each section must clear its own threshold.

Driver Tip: Before booking, write down your exact passing number per test: 40/50 GK, 20/25 Air, 16/20 Combo, 24/30 HazMat, 16/20 others.

e.g. An applicant who scores 48/50 on GK but 18/25 on Air Brakes passes GK and retakes Air Brakes only.

14 Topics in this section.

Part 2: General Knowledge

Required for ALL classes - inspection, control, shifting, braking, speed & space, conditions, cargo, safety

1. Vehicle Inspection Basics

Before operating a CMV you must inspect it - the pre-trip is both a habit and a scored skills-test item. The classic order: engine compartment (fluids, belts, leaks), cab (mirrors, gauges, steering), lights and reflectors, tires and wheels, brakes, and coupling for combinations.

Driver Tip: Build one fixed order and rehearse it so thoroughly that you never skip a category under pressure.

e.g. Start at the engine area, walk to the cab, circle the vehicle checking lights and tires, then check brakes and coupling.

2. Fluid Levels & Leaks

Check engine oil, coolant, power steering, brake fluid, windshield washer fluid, and (in the cab) DEF if applicable. Any significant leak (oil, coolant, air) medians into the pre-trip inspection wording: 'no leaks' means no dripping fluids under the vehicle.

Driver Tip: Look UNDER the vehicle for puddles, not just at the caps - a drip line tells you what is leaking.

e.g. A fresh oil puddle under the engine area is a defect - identify the fluid and whether it is safe to drive.

3. Tires & Wheels

Inspect tires for tread depth (at least 4/32 inch on steering axle, 2/32 elsewhere), cuts, bulges, and proper inflation. Check wheel lug nuts for looseness and missing studs; look for cracked rims.

Driver Tip: Steering-axle tires are held to a HIGHER tread minimum (4/32) than other positions (2/32) - memorize which is which.

e.g. A tire with a bulge or a visible cord must be replaced before you drive; a lug nut missing on a dual wheel is a violation.

4. Brake Checks

Test brakes before moving: brake feel, brake response, and (for air brakes) the full air brake check sequence. Verify the parking brake holds and the service brake responds smoothly without pulling.

Driver Tip: Always do a controlled brake test at 5 mph before entering traffic - 'brakes feel firm and hold' is the phrase examiners accept.

e.g. If the brake pedal sinks to the floor, do not drive - identify the cause (hydraulic leak / air loss) first.

5. Basic Vehicle Control

Control fundamentals: smooth steering, steady acceleration, even braking, and looking far ahead (12-15 seconds) to avoid abrupt moves. The 'one-second per gear' rule and clutch/shift timing make starts and stops smooth.

Driver Tip: Look where you want the vehicle to go - your hands follow your eyes; target the exit of your lane, not the vehicle ahead.

e.g. A smooth driver brakes early and gently instead of stomping at the last second - cargo and passengers both benefit.

6. Shifting Gears

Shift smoothly through the pattern; know your vehicle's gear positions. In heavy traffic, downshift before the engine lugs; avoid riding the clutch. Double-clutching keeps revs matched for a smooth, grind-free shift.

Driver Tip: When in doubt, drop a gear early on an upgrade so you do not get stuck lugging - momentum is hard to rebuild in a truck.

e.g. Approaching a hill: downshift BEFORE the grade, not after the engine starts straining.

7. Backing Safety

Back only when necessary; get out and look before backing if you cannot see the path. Use mirrors and a spotter; back slowly (walking pace); steer from the driver's side when possible. Never back without knowing what is behind you.

Driver Tip: The phrase 'I got out and looked' is exactly what the skills-test examiner wants to hear - do it before every backing maneuver.

e.g. At a dock with a spotter, agree on hand signals; stop immediately if you lose sight of the spotter.

8. Speed Management

Speed limits are a ceiling, not a target - the safe speed depends on traffic, weather, road, curves, and your load. In curves, brake BEFORE the curve and accelerate gently through it; on downgrades, use a lower gear to control speed.

Driver Tip: Ask 'what is the safest speed for THIS situation' - not the posted limit - especially with a heavy or tall load.

e.g. A truck that enters a curve 10 mph over the safe speed can roll or slide off - slow before, not during.

9. Space Management (Following)

Keep a following gap of at least ONE SECOND per 10 feet of vehicle length at speeds under 40 mph, and add seconds at higher speeds (many states test the 4-second rule above 40 mph). In poor weather, double the gap.

Driver Tip: Count 'one-thousand-one, one-thousand-two...' from a fixed object to measure your following distance in normal conditions.

e.g. A 60-foot vehicle needs at least 6 seconds of gap below 40 mph - more at highway speed or in rain.

10. Space to the Sides & Above

Leave extra space beside your vehicle for wind, puddles, pedestrians, and vehicles merging. Watch height limits (bridges, overpasses, wires) - know your vehicle height and the clearance before you approach.

Driver Tip: Keep a lane's width of space between your right side and parked cars; pedestrians and cyclists need the most generous margin.

e.g. A 13-foot-6-inch trailer cannot clear a 13-foot bridge - read the clearance sign low and slow, and reroute if doubtful.

11. Night Driving

At night: use low beams in fog or following traffic, dim for oncoming vehicles, watch for animals and stalled vehicles, and slow down.

A tired driver's reaction time worsens dramatically after dark.

Driver Tip: If you cannot see 250 feet ahead with low beams, slow down until you can stop within the distance you see.

e.g. Fog is the most dangerous night condition - low beams, slow speed, and extra following distance.

12. Extreme Conditions

Rain, snow, ice, and high wind all cut traction and stability: slow down, increase following distance, avoid sudden steering or braking, and use the engine brake downhill. In high wind, leave extra room beside your vehicle and slow for gusts.

Driver Tip: Ask before each winter trip: 'would I drive this route in this weather if the load were mine?' - if not, delay.

e.g. In a heavy crosswind, an empty trailer is MORE likely to blow over than a loaded one - slow down.

13. Hazardous Materials Awareness

Even without a HazMat endorsement you must know basic HM awareness: what placards look like, what classes exist (1 explosives, 2 gases, 3 flammables, etc.), and that a vehicle displaying placards has special parking and routing rules.

Driver Tip: Know the 9 hazard classes by number and the diamond-shaped placard - the awareness questions test recognition, not full HM expertise.

e.g. A truck with 'FLAMMABLE' placards cannot park near open flames or crowded areas the way an unplacarded truck can.

14. Accident Procedures

If involved in an accident: stop, secure the scene (hazard lights, flares), protect the area, call 911 / police, exchange information, do not move the vehicles unless necessary, and report to your employer immediately. Never leave the scene.

Driver Tip: Place warning devices (triangles/flares) at the right distances - 10, 100, and 200 feet behind the vehicle on a level road.

e.g. The first 60 seconds matter: hazard lights on, then flares downrange, then 911 - in that order.

15. Cargo Handling

Secure cargo so it cannot shift or fall (tie-downs, blocking, bracing). Federal rules require cargo tied down within a certain pattern; heavy cargo rides low, and loads must not exceed axle or gross weight limits.

Driver Tip: Load weight as far forward and as low as practical - a top-heavy load is a rollover waiting to happen.

e.g. A load of lumber needs multiple tie-downs fore and aft, not one strap across the middle.

16. Weight & Axle Limits

Know your gross vehicle weight rating (GVWR), gross combination weight rating (GCWR), and the legal limits (e.g., 80,000 lb gross on the interstate in most states; 34,000 lb tandem axles). Stay under your state's limits and your vehicle's ratings.

Driver Tip: Weigh early, not at the final scalehouse - fees and unloading headaches are cheaper than a fine.

e.g. A tractor-trailer weighing 82,000 lb on a 80,000-lb interstate is over gross - every pound over is a citation.

17. Hours of Service Basics

Property-carrying HOS (49 CFR 395): 11-hour driving limit after 10 consecutive hours off duty; 14-hour on-duty window; 30-minute break after 8 hours; 60/7 or 70/8 duty limits. Passenger-carrying: 10-hour driving / 15-hour window. ELD records replace paper logs for most drivers.

Driver Tip: Memorize the property numbers (11-14-30-60/70) as one chain; the passenger numbers (10-15) as another.

e.g. After 8 hours on duty, a property driver must take a 30-minute break before driving again.

18. Driver Fitness

You must be physically and mentally fit to drive: a valid medical card, no disqualifying conditions, no drugs/alcohol, and enough sleep. Federal rules set a 24-hour 'under influence' prohibition window for alcohol before driving.

Driver Tip: Treat the 24-hour alcohol rule as 'none before duty' - a 0.04% test while driving is disqualifying for a CDL holder.

e.g. A fatigued driver's impairment mimics intoxication - stop and rest before the microsleeps begin.

19. Distracted Driving

Texting is banned for CMV drivers (a stricter rule than passenger vehicles) and handheld phone use is prohibited. Violations carry fines and can lead to a CDL disqualification with repeated offenses.

Driver Tip: Keep the phone out of reach while driving - a single 'quick glance' at a text can cost you your CDL.

e.g. A driver who texts while driving is 23x more likely to crash - the rule exists because the stakes are real.

20. Seat Belts & Safety

A CMV driver must wear a seat belt; the vehicle must have a working horn, wipers, mirrors, and lights. Safety-rule questions reward knowing what the driver must verify before and during a trip.

Driver Tip: Do the 'walk-around + belt + mirror' ritual every trip - examiner scenarios always reward the safety-first answer.

e.g. A pre-trip finds a broken wiper blade on a rainy forecast - replace it before dispatch, not on the shoulder.

21. Coupling Basics (GK Level)

Even in General Knowledge you need coupling awareness for Class A: the fifth wheel, kingpin, air lines, and gladhands are the connection points. General knowledge tests may ask what to check when coupling or uncoupling.

Driver Tip: General Knowledge asks 'where are the air lines connected' and 'what is the kingpin' - learn the parts before Combination Vehicles deep-dives them.

e.g. Crossed air lines prevent brake release - the classic coupling error the written tests love to flag.

22. Basic Road Rules for CMVs

Yield to emergency vehicles, stop for school buses (depending on state law), respect railroad crossings (stop for buses and placarded hazmat within 50 feet), and use low gears on grades. CMV-specific rules differ from passenger-car rules in several ways.

Driver Tip: Railroad crossings: a school bus or placarded hazmat vehicle MUST stop before every crossing - never assume a green light clears it.

e.g. A bus driver approaching a rail crossing stops, looks, listens, and proceeds only when clear - every time.

23. Communicating Intent

Signal early and clearly with turn signals, brake lights, and (for backing or lane changes) your horn when needed. Trucks have big blind spots - make your intent obvious well before the maneuver.

Driver Tip: Use the horn in NO-ZONE situations where a passenger car cannot see you; other drivers will not know your blind spots.

e.g. Lane change: signal ON, mirror check, shoulder/belly check, then ease over - never a sudden jerk.

24. Dealing With Emergencies

If a tire blows out, hold the wheel firmly, ease off the accelerator, and brake gently after the vehicle stabilizes - do NOT slam the brakes. If brakes fail, pump them (or use the emergency/parking brake) and find an escape ramp or downgrade.

Driver Tip: Memory hook: blowout = 'hold, ease, then brake'; brake failure = 'pump, park brake, escape' - two separate drills.

e.g. A front tire blowout at 60 mph needs firm steering and NO hard braking until the vehicle is straight.

25. Steering Out of Trouble

If you must leave the road, slow gradually, avoid sharp turns, and return at a shallow angle. If the shoulder is soft, do not yank the wheel - ease back once the surface supports you.

Driver Tip: When you leave the pavement, fight the urge to jerk back - a shallow angle re-entry prevents a rollover.

e.g. Soft shoulder: brake gently, steer straight, then angle back onto the road only when speed is safe.

26. Evasion & Stopping

Knowing when NOT to swerve is a skill: swerving to avoid a small object at speed can be worse than a controlled stop. If a collision is unavoidable, choose the least-dangerous target (a bush over a pedestrian, a ditch over a car).

Driver Tip: Practice the 'two-second scan' for escape paths - always have an out, even when the lane looks clear.

e.g. A deer jumps out at night: brake hard in a straight line; do not swerve into oncoming traffic to miss it.

27. Medical Requirements Review

DOT physical valid up to 24 months (12 if certain conditions); carried on the person while driving a CMV; self-certification matches the kind of driving you actually do (interstate vs intrastate, excepted vs non-excepted).

Driver Tip: Re-certify early - a lapsed medical card is a disqualification even with a valid CDL.

e.g. Your medical card expired Tuesday; you drive Wednesday - you are operating out of compliance, full stop.

28. Drug & Alcohol Rules

CDL holders face a 0.04% BAC limit while driving (vs 0.08% for passenger cars), an OOS 24-hour rule after a positive test, and mandatory testing programs. Refusing a post-crash test has the same penalties as failing it.

Driver Tip: Treat 'one drink' as too many when you are on duty - the CDL bar is half the passenger-car limit.

e.g. A post-accident test is mandatory after a fatality or certain injuries - refusal equals failure.

29. Inspection Reports (DVIR)

After each trip, a driver fills a driver vehicle inspection report (DVIR) noting any defects; the carrier must repair defects that affect safe operation. Know what belongs on the DVIR and what a driver does when a defect exists.

Driver Tip: If the DVIR shows a brake defect, you must get it repaired - writing it down does not make it legal to drive.

e.g. End of day: walk the same route as pre-trip, mark any new defects, and sign the report.

30. Vehicle Clearance & Height

Know your vehicle's height, width, length, and weight before every trip. Overhead clearance signs state the lowest point on the route; a vehicle taller than the sign cannot pass, period.

Driver Tip: Read every clearance sign early and slow down - a 13-foot-6 trailer under a 13-foot sign is a stop-and-recalc moment, not a squeeze.

e.g. A double-decker bus route with a 12-foot-6 bridge requires a re-route before the bus leaves the yard.

31. Steering & Handling Cues

A well-adjusted vehicle tracks straight with light, even steering input. Pulling to one side, wandering, or a steering wheel that needs constant correction signals a mechanical problem (tire, brake, alignment, load shift).

Driver Tip: Ask on the pre-trip: "does the steering feel even and centered?" A pull under braking points to a brake problem, not the steering box.

e.g. A truck that pulls right only while braking likely has a grabbing right-front brake - inspect before dispatch.

32. (Vehicle) Stopping in Emergencies

In a panic stop a CMV needs maximum braking without losing control: brake firmly in a straight line, keep the wheel steady, and steer only after speed drops. With ABS, brake hard and steer; without ABS, avoid locking the wheels.

Driver Tip: The emergency-stop answer is always "straight, firm, then steer" - never a swerve at speed.

e.g. A deer jumps out at night in a truck: brake straight and hold the wheel; do not jerk around the deer into oncoming traffic.

33. Tire Care & Inflation

Under-inflated tires overheat and blow; over-inflated tires wear the center and reduce grip. Check inflation, tread depth, cuts, and bulges at the start of every trip and during stops.

Driver Tip: Tread minimums to memorize: 4/32 inch on the steering axle, 2/32 elsewhere - the steering axle is the stricter number.

e.g. A dual wheel with one flat-looking tire is a blowout risk - the partner tire will overheat trying to carry the load.

34. Mirror Adjustment & Use

Adjust all mirrors before moving (flat + convex where fitted) so the driver can see both sides of the trailer and the road behind. Check mirrors habitually: every 5-8 seconds in traffic, before any lane change, and before backing.

Driver Tip: The mirror scan cadence "5-to-8 seconds" is the tested habit - glance before the need, not at it.

e.g. A driver who changes lanes without a mirror check fails the road test scenario even if the lane is empty.

34 Terms in this section.

Part 3: Air Brakes

Required for Class A/B or air-braked vehicles - components, dual systems, checks, stopping distance

1. Air Brake System Basics

Air brakes use compressed air instead of hydraulic fluid. The system has a compressor, reservoirs (tanks), valves, brake chambers, and slack adjusters. Air pressure works the brakes via brake chambers that push a pushrod; the spring in the chamber is the parking/emergency brake.

Driver Tip: Know the air flow: compressor builds pressure -> reservoirs store it -> brake valve sends it to chambers -> pushrod applies the brakes.

e.g. When you press the brake pedal, air from the reservoir moves to the brake chamber and the pushrod applies the brake shoes.

2. Compressor & Governor

The air compressor is driven by the engine; the governor controls pressure cut-in/cut-out: it stops pumping at about 120-125 psi and restarts at about 100 psi (cut-in). This keeps reservoir pressure in the working band.

Driver Tip: Numbers to memorize: cut-in about 100 psi, cut-out 120-125 psi. If you hear the governor 'unloading' around those values, the system is healthy.

e.g. On a gauge: pressure rises to ~125, compressor stops; drops to ~100, compressor kicks back in.

3. Air Reservoirs (Tanks)

Reservoirs store compressed air for the brakes. Supply (wet) tank feeds the system; service tanks feed the brake valves. Drain tanks daily (moisture and oil collect and can freeze in cold weather).

Driver Tip: Drain ALL tanks at the end of each day - trapped water freezes and can block air flow entirely.

e.g. A tank with a drain valve you never open slowly fills with water, reducing brake air capacity every day.

4. Brake Chambers & Slack Adjusters

Each wheel has a brake chamber (diaphragm + pushrod) and a slack adjuster that converts pushrod travel into brake application. Slack adjusters keep the brakes in adjustment; automatic slack adjusters should NOT be manually adjusted except during maintenance.

Driver Tip: Manual adjustment of an automatic slack adjuster is a violation - know the difference between manual and auto systems.

e.g. A pushrod that travels more than 1-2 inches (depending on chamber type) means the brakes are out of adjustment.

5. Dual Air Brake System

Modern CMVs use a DUAL air brake system: two separate air circuits - a primary (service) and a secondary (parking/emergency) circuit, each with its own reservoir. If one circuit fails, the other still applies some braking.

Driver Tip: The dual system is why a 'low air' warning on ONE circuit still leaves you with the other - but you must stop safely and fix it.

e.g. A leak in the primary circuit drops primary pressure, but the spring brakes may still hold the vehicle.

6. Spring (Parking/Emergency) Brakes

Spring brakes apply when air pressure drops (they are held OFF by air pressure and spring ON when pressure falls below ~20-45 psi at the chamber). They work as parking brakes and emergency brakes - a total air loss sets them automatically.

Driver Tip: That is why you must NOT push the brake pedal to drain the system when stopped - it releases the service air AND the spring brakes set.

e.g. Parking on a grade: set the spring (parking) brake, then chock wheels - do not rely on the service brakes.

7. Low Air Warning

A dashboard low-air warning (buzzer and/or red light) activates when system pressure drops below about 60 psi. You must stop safely and fix the leak as soon as the warning comes on - you should never drive on the warning.

Driver Tip: Memorize: warning at ~60 psi; spring brakes begin setting at roughly 20-45 psi; safe operating band 100-125 psi.

e.g. The buzzer sounds at 58 psi during a brake check - the authentic test answer is 'stop and fix before driving'.

8. Air Gauge Readings

The dash has one or two air pressure gauges (dual systems have two). Normal operating pressure is 100-125 psi. If pressure drops while driving, or builds slowly, suspect a leak, a failing compressor, or a clogged tank - stop and inspect.

Driver Tip: Glance at both gauges at the start of every trip and after any heavy brake use - a 5 psi difference between circuits is a red flag.

e.g. A gauge that drops 20 psi in a minute while parked is a serious leak - do not drive until fixed.

9. Air Brake Check (Static & Dynamic)

The full air brake check: 1) static - with engine off, pressure steady (release ~3 psi in 1 minute for single, less for dual), 2) apply the brake and hold 1 minute (loss under ~3 psi), 3) dynamic - at 5 mph, brake firmly and confirm the vehicle stops and holds without pulling.

Driver Tip: The official sequence is: warning buzzer check, air loss rate check, applied brake loss rate check, low-pressure warning, then the moving test at 5 mph.

e.g. During the applied test, a loss of more than about 3 psi in a minute is a failure - the brakes are leaking.

10. Air Loss Rate Limits

Air loss must stay within limits: with the engine off, the pressure should not drop more than ~2 psi in 1 minute for a single vehicle, ~3 psi for a combination in the static test; with the brake applied, similar small limits (~3 psi).

Driver Tip: The '2-3 psi per minute' numbers are the test thresholds - practice timing your gauge drop on park brake.

e.g. A combination that drops 4 psi in a minute failed its static test before you even turned the key.

11. Stopping Distance & Air Lag

Air brakes have a built-in LAG: it takes up to half a second (or more) for air to travel from the pedal to the chambers, so the brakes do not apply instantly. At 55 mph, total stopping distance for a loaded combination can be around 420+ feet - longer than a passenger car.

Driver Tip: Because of brake lag, follow farther behind in an air-braked vehicle - every half-second equals real road at highway speed.

e.g. A truck at 55 mph needs roughly 419 feet to stop (driver reaction + brake lag + braking); on wet roads that stretches further.

12. Brake Fading & Overheating

Repeated or heavy braking heats the brakes and causes fade (less stopping power). Downhill, use a LOW GEAR + engine (auxiliary) brake so the brakes do not overheat - never ride the brakes down a long grade.

Driver Tip: The right downhill technique: select a low gear at the top, use engine braking, apply the brakes firmly then release (snub) to control speed.

e.g. Smoking brakes at a rest stop mean the driver rode them downhill - the fix is a lower gear, not a longer cool-down.

13. Brake Adjustment Indicators

Low-pressure indicators: when brake application is weak, air pushes a 'low pressure' light; stroke indicators show when slack adjusters are out of range. Know which indicator is which (dash light vs axle-mounted stroke indicator).

Driver Tip: If the low-air warning activates while braking, the problem may be big air loss - stop immediately and bleed down to find the leak.

e.g. A pushrod stroke indicator at 'out of adjustment' shows the brake needs a mechanic - it is not a 'drive home' situation.

14. Wet & Icy Brake Behavior

Wet brakes can pull or grab. In rain, test brakes lightly after puddles; after washing or deep water, apply the brakes intermittently to dry them. Ice reduces grip dramatically - brake gently in a straight line.

Driver Tip: After a deep puddle: 'pump the brakes' to dry the drums at low speed before normal driving.

e.g. Ice: brake BEFORE the turn, not during it - a light, steady application keeps the rig straight.

15. Emergency (Max) Braking

In a maximum-stop emergency, apply the brakes with maximum force without locking the wheels - in an air-braked vehicle without ABS, that means a firm, controlled application. With ABS (most modern), brake hard and steer; the ABS pulses the brakes for you.

Driver Tip: Know whether your vehicle has ABS - the correct emergency technique depends on it.

e.g. With ABS at 55 mph, press the brake pedal hard and keep steering; do NOT pump - the system does the pulsing.

16. Using the Engine Brake

The engine (exhaust) brake or retarder assists downhill and in heavy traffic by using engine compression. It works best in a lower gear and on dry roads; in slick conditions it can lock the drive wheels - use it carefully or not at all on ice.

Driver Tip: Downhill: pick a gear that holds your speed WITHOUT brakes, then use snubbing (firm press, release) to fine-tune.

e.g. On ice, an engine brake on the drive wheels can skid the tractor - straight-line only, and gently.

17. ABS on Air-Braked Vehicles

ABS prevents wheel lockup: you can steer while braking hard. The ABS dash light does a self-check at startup; if it stays on, the ABS is not working and you must fix it - but the vehicle still has normal brakes.

Driver Tip: An ABS warning light that stays on means get it repaired, not 'keep driving - the brakes still work'.

e.g. Your ABS light flashes off quickly at startup = system self-test passed; if it stays on, schedule a repair before loaded highway miles.

18. Towing & Air Connections (Air Brake Level)

For combination vehicles, the tractor supplies air through gladhands; the trailer has its own reservoir. Check that air lines are color-coded (red = service/brake, blue = emergency/supply) and crossed lines are the classic error.

Driver Tip: Crossed gladhands = trailer brakes release at the wrong time - the written test asks you to spot this every time.

e.g. Red line to the trailer service gladhand, blue to the emergency - mixing them is a fail on the coupling check.

19. Brake Chamber Types

Brake chambers come in sizes (type 20, 24, 30, etc. - the number is roughly the square inches of diaphragm area). Bigger chambers produce more braking force for the same air pressure.

Driver Tip: Know that chamber size affects force and that all chambers on an axle should be matched - mismatched chambers pull the vehicle.

e.g. A type-30 chamber on one side and type-20 on the other of the same axle makes the brakes apply unevenly.

20. One-Way Check Valve

The one-way (check) valve lets air flow from the compressor into the reservoir but prevents it from flowing back out if the compressor or supply line fails. A failed check valve drains the tanks backward.

Driver Tip: The one-way valve is why a compressor failure does not instantly empty the reservoirs - name it on the pre-trip.

e.g. If pressure holds when parked but drains when the compressor unloads, suspect the check valve, not a brake leak.

21. Reservoir Draining

Drain the air tanks daily (or per the manufacturer) to remove moisture and oil that condense inside. In freezing weather even a little water can freeze in the lines and block airflow.

Driver Tip: The daily drain is a pre-trip item - open each drain valve until dry air escapes, then close it tightly.

e.g. A driver who never drains the tanks finds ice-locked brakes on the first below-freezing morning.

22. Service vs Emergency Braking

Service brakes (pedal) apply the brakes through normal air pressure; the emergency/parking (spring) brakes apply when pressure drops or the valves are set. They are separate systems that fail separately.

Driver Tip: The test hook: "service = driven by the pedal; spring = held by air, applied by loss of air."

e.g. If the service brakes fail from a broken line, the spring brakes still hold the vehicle when parked - but you must stop and get repairs.

22 Terms in this section.

Part 4: Combination Vehicles

Required for Class A - coupling/uncoupling, air lines, backing, trailer handling

1. Fifth Wheel Coupling

The fifth wheel is the coupling plate on the tractor that locks onto the trailer's kingpin. Coupling: check the fifth wheel, back under the trailer, ensure the kingpin locks, and verify with a tug and a visual check.

Driver Tip: The test mantra: 'check, align, back, tug, and verify' - the tug test (pull forward gently) proves the kingpin is latched.

e.g. A kingpin not fully locked can eject the trailer on the first hard brake - the tug test catches it.

2. Uncoupling Sequence

Uncouple safely: set the parking brakes, chock the trailer wheels, lower the trailer landing gear (with the trailer slightly loaded), disconnect air lines and electrical, release the fifth wheel lock, and pull straight out slowly.

Driver Tip: Always chock FIRST, then disconnect - if the trailer rolls while you are under it, you have no second chance.

e.g. Crank the landing gear down until it touches, then a few extra turns - the trailer must not drop when the tractor pulls away.

3. Air Lines (Gladhands)

The trailer connects to the tractor with two gladhands: the SERVICE line (red, supplies air to the trailer service brakes - applied when you brake) and the EMERGENCY/supply line (blue, keeps the trailer's spring brakes released and supplies its reservoir).

Driver Tip: If the emergency line loses air (trailer breaks away), the trailer's spring brakes set automatically - that is the safety design.

e.g. A trailer that 'keeps its brakes' when you hit the pedal likely has crossed service/emergency lines.

4. Trailer Hand Valves

Many tractors have a trailer hand valve (dolly valve) that applies ONLY the trailer brakes. Use it gently - a sudden full application can lock the trailer brakes and cause a jackknife.

Driver Tip: Never use the hand valve to 'test' - a sharp application on a wet road is a jackknife waiting to happen.

e.g. Tap the hand valve lightly to settle the trailer on curves instead of a full yank.

5. Trailer Air Supply Valve

The dash valve (red knob) supplies air to the trailer and sets its spring brakes. Pull out = supply (release trailer brakes); push in = set trailer spring brakes. It operates the trailer's parking/emergency brake.

Driver Tip: A tractor-trailer parked uses BOTH the tractor spring brakes and the trailer spring brakes (red knob in).

e.g. Red knob pushed IN = trailer brakes set; pulled OUT = trailer brakes released - remember which way each way.

6. Backing a Combination

Backing a tractor-trailer is opposite-steer: to move the trailer left, turn the wheel right initially. Go slow, use mirrors, use a spotter, and take corrective 'zig-zags' to straighten the trailer.

Driver Tip: The rule: 'turn the wheel the way you want the TRAILER to go' - the tractor pivots first, the trailer follows opposite.

e.g. Backing into a dock: small steering corrections, stop and re-check mirrors constantly, never rush the angle.

7. Trailer Handling on Curves

Trailer wheels track INSIDE the tractor's path in a turn (off-track). Swing wide on right turns so the trailer does not ride over curbs or hit objects; check both mirrors as you turn.

Driver Tip: The rear trailer wheel cuts the corner - the reason a truck must swing wide into the intersection.

e.g. Right turn at a corner: pull forward, wait for the trailer to clear the curb, then turn - mirrors both sides.

8. Jackknife Prevention

A jackknife happens when the trailer pushes the tractor sideways (often from locking the trailer brakes on a slick surface). Prevent: brake gently, avoid sudden trailer-brake applications, and in a skid release the trailer brakes.

Driver Tip: If the trailer starts to swing, ease OFF the brakes and straighten the rig, do not brake harder.

e.g. On ice, a light brake tap that locks the trailer wheels can start a jackknife - brake earlier and smoother than in a car.

9. The Tug Test

After coupling, gently pull forward against the brakes (tug) to confirm the kingpin is latched; then do a visual check under the trailer to see the locking bar. The tug test is part of the official coupling procedure.

Driver Tip: Never start a loaded trip without the tug + visual - 'I tugged and checked the lock' is the examiner's pass phrase.

e.g. Tug forward gently with the trailer brakes set - a properly locked kingpin holds the trailer at the coupling point.

10. Converter Dollies (Doubles/Triples)

A converter dolly (used for doubles/triples) has a fifth wheel, coupling, and its own suspension; it connects the lead trailer to the second. Check the dolly's air lines, pintle hook, and fifth wheel before coupling.

Driver Tip: For doubles, the dolly is not a 'trailer' but it IS a coupling unit - inspect it like one.

e.g. A dolly with a cracked frame or under-inflated tire is a defect - doubles/triples questions always reward catching it.

11. Trailer Types & Loading

Different trailers behave differently: flatbeds (secure every load), vans (tall, wind-sensitive), tankers (surge), hoppers (top-heavy), etc. Loads must be centered and secured so handling stays predictable.

Driver Tip: A center-loaded trailer tracks best; an off-center load can pull the rig to one side on the highway.

e.g. A 10,000-lb load drifted to the right edge makes the trailer fight the driver on every curve - re-center before dispatch.

12. Coupling Safety Rules

Never couple without chocking the trailer first; never crank landing gear under a loaded trailer beyond its rated capacity; wear hearing/eye protection when hammering the kingpin; keep hands clear of pinch points (fifth wheel, gladhands).

Driver Tip: The 30 most testable coupling rules all reduce to one idea: chock, secure, verify, then move.

e.g. A driver who skips the chock and the trailer rolls is the scenario every safety question warns about.

13. Riding the Brakes Down Grades

For combinations, a long downgrade is managed with gears: select the right low gear at the top, use engine braking, and snub the brakes (firm apply, release) to keep speed in check without overheating the brakes.

Driver Tip: Downhill speed control = gear + engine brake + snubbing; riding the brakes is the #1 cause of runaway trucks.

e.g. A 6% grade in a loaded combination: gear down at the top, hold 25 mph with snub applications every few seconds.

14. Tire & Wheel Checks (Combos)

Check tires on BOTH tractor and trailer: inflation, tread, cuts, and lug nuts. Trailer tires are often overlooked - a blowout on any position is a serious event at speed.

Driver Tip: Walk the FULL length of the combination on the pre-trip - every tractor axle and every trailer axle.

e.g. A trailer tire with a deep cut at the drive-position can strand a loaded rig - catch it in the walk-around.

15. Hooking Air & Electrical

After coupling, hook both air lines and the electrical (7-way) connector, then verify: service brakes apply when you press the pedal, trailer springs release when you supply air, lights and turn signals work.

Driver Tip: The verification is quick and non-negotiable: 'brakes apply, springs release, lights work' - three checks before moving.

e.g. A trailer with no brake lights at night fails both the inspection and safe-operation standards - fix before dispatch.

16. Off-Tracking at Low Speed

Off-tracking (the rear wheels follow a tighter radius) is worst at low speeds and sharp turns. In tight yards, allow for the trailer swing you cannot see in the cab - mirrors only show so much.

Driver Tip: In a tight lot, get out and look before backing - the rear of the trailer is beyond the mirror's view.

e.g. Turning into a narrow gate, the trailer's inside wheels may cut over the curb - widen your approach arc.

17. Trailer Brakes on the Road

Trailer brakes must work in proportion to the trailer's weight; an empty trailer can lock its brakes easily with a light pedal. Use the trailer hand valve gently and check brake response on the first shift.

Driver Tip: On a loaded trailer, brake EARLY and smoothly; on an empty trailer, brake even more gently to avoid lockup.

e.g. An empty trailer that locks its brakes on a wet ramp can jackknife the rig - light pedal, earlier input.

18. Antilock Brakes (ABS) on Combos

ABS on the tractor and/or trailer prevents wheel lockup under hard braking. If the trailer has ABS, the trailer dash light and the tractor's ABS light communicate faults; a trailer ABS fault still leaves normal braking, but must be repaired.

Driver Tip: The combo ABS answer: "both lights self-test at startup; a staying-on light means repair, not disable."

e.g. A trailer ABS light that stays on through the trip means schedule a repair - but the trailer brakes still work in the meantime.

19. Coupling for Different Trailers

Automatic (air) fifth wheels lock and release with air; manual fifth wheels use a handle. Know which type your tractor has, how it locks, and the lever position that confirms the lock.

Driver Tip: The pre-trip coupling verification differs by type - for automatic, listen for the air release; for manual, watch the locking lever.

e.g. A manual fifth wheel whose handle does not seat fully means the kingpin is not locked - re-couple before moving.

20. Trailer Swing at Intersections

Trailer wheels cut inside the path of the tractor in every turn, and the trailer's rear swings OUTSIDE the tractor's path in the opposite direction. At intersections, the swing can cross into the oncoming lane with short wheelbases.

Driver Tip: Give intersections extra width: pull forward until the trailer clears the corner before turning the wheel.

e.g. Making a right turn, the trailer's right rear swings toward the curb while the fifth wheel cuts left - mirrors both sides.

20 Terms in this section.

Part 5: HazMat (H)

Placarding, segregation, classes 1-9, HM safety & the ERG

1. HazMat Endorsement Basics

An H endorsement is required to carry hazardous materials above certain thresholds in commerce. It requires a separate written test (usually 30 questions, 80% passing), a TSA background check, fingerprints, and a valid medical card.

Driver Tip: The H test is one of the hardest endorsement tests - study placarding, classes, segregation, and emergency response together.

e.g. You cannot get an H endorsement with a disqualifying criminal history - the TSA check is a hard gate, not a formality.

2. Hazard Classes (1-9)

Class 1 Explosives; 2 Gases; 3 Flammable Liquids; 4 Flammable/Combustible Solids; 5 Oxidizers/Organic Peroxides; 6 Toxic/Infectious; 7 Radioactive; 8 Corrosives; 9 Miscellaneous. Each has placarding, packaging, and segregation rules.

Driver Tip: Know the 9 classes in order with ONE memory anchor each (e.g., 3 = gasoline).

e.g. Gasoline is Class 3 (flammable liquid); chlorine is Class 2 (gas); batteries may be Class 8 (corrosive).

3. Placards & Labels

Placards are diamond-shaped signs on the vehicle showing the hazard class (and often the UN number). Labels are smaller diamond markers ON the package. A vehicle with 1,001+ lb of many hazmats must display placards.

Driver Tip: Placard = truck; label = package. The 1,001-pound threshold is the most-tested number on the H tests.

e.g. Three drums of diesel fuel (~1,200 lb total) over the threshold = placards required; two small cans = not.

4. Placard Placement & Specs

Placards go on all four sides of the vehicle, readable from 50 feet, in the right color for the class (e.g., red for flammables, yellow for oxidizers). When the load is a bulk container, the placard goes on the container too.

Driver Tip: The four-sided, readable-from-50-feet rule is the standard articulation examiners expect.

e.g. A placard that is torn, faded, or blocked by mud fails inspection - clean and legible at the start of every trip.

5. The 1,001-Pound Threshold

Most hazmat regulations (placarding, most HM paperwork) kick in when you carry 1,001 lb or more of a regulated material in one vehicle. Below it, some rules still apply but many ease.

Driver Tip: Use the threshold as your mental dividing line - the same load below 1,001 lb has far fewer placarding duties.

e.g. 1,000 lb of corrosives: no placard (barring state/local rules); 1,001 lb: placard by class.

6. Segregation Rules

Incompatible materials must be separated: oxidizers away from flammables, acids away from bases, etc. The segregation table tells you which classes cannot ride together. Never guess - consult the table or the shipper.

Driver Tip: The classic pair to memorize: oxidizers (Class 5) NEVER alongside flammables (Class 3) or organic materials.

e.g. Loading Class 5 oxidizers next to a leaking drum of gasoline is a segregation violation - respace the load.

7. Unloading & Loading Rules

Package handling, no smoking within 25 feet, secure the load, and keep the right documents. Some products need special loading (e.g., cylinders upright and secured, radioactive limits on proximity to people/time).

Driver Tip: No smoking within 25 feet of any hazmat package is a floor rule - questions always test the distance.

e.g. Loading cylinders: valve caps on, upright, and strapped - never laid flat where they can roll.

8. Attendance Rule

A placarded vehicle with certain hazmats must never be left unattended; if you must stop, park only where allowed and stay within a set distance/telephone reach (varies; many states require you to stay with the vehicle unless it is locked in a secure facility).

Driver Tip: Ask before a rest stop: 'can I leave this placarded load?' - the attendance rule makes some stops off-limits.

e.g. A placarded cargo tank parked at a roadside rest while the driver naps inside is often legal - but the driver must remain within the required distance.

9. Parking & Route Rules

Placarded vehicles have special parking rules (no residential or fire-risk areas, distance from buildings) and routing rules (hazmat highways, tunnel restrictions, no-bridges). Some hazmats are banned from certain tunnels and roads entirely.

Driver Tip: Know the common bans: no hazmat through many tunnels, no explosives through certain urban corridors - the route is part of the plan.

e.g. A 'No Hazmat' tunnel sign means reroute the placarded load - always check before entering a tunnel.

10. Emergency Response (ERG)

The Emergency Response Guidebook (ERG) is carried in the vehicle and used when something goes wrong: it tells responders what to do for each material by the 4-digit UN number or placard. Your job is to secure the area, call 911, and give the ERG number.

Driver Tip: The ERG is organized BY the UN number - read the orange-bordered pages first when identifying an unknown material.

e.g. A leaking drum with UN 1203 (gasoline): stop, isolate the area, call 911, and identify via the ERG.

11. Shipping Papers & Documents

Hazmat shipments carry shipping papers describing the material (proper shipping name, hazard class, UN number, quantity, emergency contact). The driver must know where the papers are and how to read them.

Driver Tip: The shipping paper order matters: the hazardous-materials description comes FIRST or is highlighted - know the basic format.

e.g. A driver with papers buried in the glove box cannot answer 'where are your hazmat papers?' - keep them within arm's reach.

12. Leak & Spill Procedures

For any leak or spill: stop moving, shut off the engine, warn others (flares), call 911 with the shipping paper info, keep people away, and do NOT touch the material. The ERG tells you evacuation distances.

Driver Tip: The universal spill protocol is: PROTECT (isolate), NOTIFY (911 + carrier), IDENTIFY (papers/ERG), and WAIT for responders.

e.g. A sulfuric acid drip from a tote: stop, isolate the area, give the UN number to dispatch, and never attempt clean-up yourself.

13. Shipping Name & UN Number

Every hazmat has a proper shipping name (e.g., 'Gasoline' or 'Gasoline, flammable liquid') and a 4-digit UN number (e.g., UN 1203). The written tests ask you to match names to numbers for common materials.

Driver Tip: Memorize the handful of most-common UN numbers (1203 gasoline, 1075 LPG...), not the whole guidebook.

e.g. UN 1203 = gasoline; UN 1017 = chlorine; UN 1267 = petroleum crude oil - three anchors for the class 3/2 pair.

14. Mixed Loads & Compatibility

Different hazard classes can ride together only if the segregation table allows it. Common sense is not enough - the table is the rule, and shippers decide the compatibility.

Driver Tip: When a question lists two classes, check the table in your head: 5 + 3 is a classic NO; 3 + 8 often requires separation.

e.g. A load of oxidizers (Class 5) with a drum of paint thinner (Class 3) must be separated or rejected - the table wins.

15. Placarding When Full VS Empty

Placard requirements apply to the LOAD. An empty tank that has NOT been purged of residue may still require placards - treat a "residue-empty" tank as loaded until it is cleaned and vented.

Driver Tip: The test hook: "empty but un-purged = still placarded" - clean, vent, and document before the placards come off.

e.g. A driver returning an unwashed gasoline tanker still displays the flammable placard until the tank is purged.

16. Shipping Paper Placement

Shipping papers must be within the driver's reach while driving (on the seat or in the door pocket) and visibly marked or on top when the load is hazardous. The driver must hand them over to responders.

Driver Tip: Keep HM papers on the seat or door - not in the glove box - and tell responders "the papers are on the seat" in an incident.

e.g. A trooper at a roadside checkpoint asks for HM papers; the driver who fumbles the glove box fails the check.

17. HM Parking Distance Rules

Placarded vehicles must not park within a set distance of open flames, buildings, or crowds (commonly 300 feet from open flames / 50 feet from buildings, but state and local rules vary). Know your state's distances.

Driver Tip: The 300/50 anchor is a good general answer, but verify your state's exact numbers before the test.

e.g. A placarded tanker parked 40 feet from a restaurant kitchen is a violation - move to the truck stop's designated area.

17 Terms in this section.

Part 6: Tanker (N)

Liquid surge, baffles, outage, loading & rollover physics

1. Liquid Surge

Fluids in a tank move with the vehicle: a sudden stop shoves the load forward (surge), and a sharp turn shifts it sideways. Surge is why tankers brake earlier and accelerate smoother than dry vans.

Driver Tip: Brake EARLIER and EASIER in a tanker - surge builds with every abrupt input, especially in a crowded tank.

e.g. A half-full tank sloshes hardest; a full tank moves as one mass, but a 3/4 tank is the classic surge case.

2. Baffles & Compartments

Many liquid tanks have BAFFLES (internal dividers) that reduce surge, and some have multiple compartments. Baffled tanks handle surge better than smoothbore tanks, but baffles do NOT eliminate movement - and a smoothbore (unbaffled) tank surges worst.

Driver Tip: Audio hook: 'baffled = braked better; smoothbore = slosh city' - know which tank type is which.

e.g. A smoothbore tank of liquid needs double the following distance of a baffled tank in the same weather.

3. Load Fill Levels

Filling rules: never fill to the very top - leave expansion space (outage) for heat expansion, especially gasoline. Overfilling can burst the tank in the sun and always causes surge/leak issues.

Driver Tip: The outage (free space) is calculated for the liquid's expansion - more for gasoline in summer, less for diesel in winter.

e.g. A full tank of gasoline sitting in 95-degree sun can overflow the vents - the outage prevents exactly that.

4. Center of Gravity

A tanker's liquid load sits high and moves - the center of gravity shifts with every surge, making a tanker far more rollover-prone than a dry van of the same weight.

Driver Tip: Corner SLOWER in a tanker - rollover risk is the #1 written-test point about liquid loads.

e.g. The same corner taken at 40 mph in a van may roll a 3/4-full tanker - slow early, keep it smooth.

5. Empty vs Partial Loads

An empty or partially filled tanker can be DANGEROUS on curves/braking because the liquid moves freely (huge surge). A full tanker behaves more predictably. Empty tankers also have less traction due to light weight.

Driver Tip: Never assume an empty tanker is 'easy' - surging liquid in a partial load is the hardest handling case.

e.g. A tanker 1/4 full of water on a wet curve at speed can push the tractor sideways - that is surge plus low traction.

6. Loading & Unloading

Loading: ground the tank, use the right fill rate, and watch the gauges; unloading: connect properly, use the right pump, and never leave product pumping unattended. Both directions have strict safety steps.

Driver Tip: Grounding kills static electricity - the #1 fire-prevention rule for flammable liquid transfer.

e.g. Ground cable clipped BEFORE the fill valve opens; unclipped only after the flow stops.

7. Tanker Braking

Longer stopping distances come with liquid load momentum. Brake gently, early, and in a straight line; avoid abrupt releases that set up 'surge slosh' cycles.

Driver Tip: The tanker braking pattern is: look far ahead, squeeze early, release slowly - never a hard stab.

e.g. A tanker that brake-snaps through a puddle can 'porpoise' as the liquid surges front-to-back repeatedly.

8. Tank Inspection Points

Inspect the tank itself: dome covers sealed, vents open, valves off, no leaks, and the undercarriage (piping, hoses, mounting) secure. A tank leak you can see is a leak you must fix, not report-and-go.

Driver Tip: On pre-trip, name each tank component (dome, vent, valve, outlet) and verify it - examiners watch for the tank-specific items.

e.g. A dripping outlet valve means the tank is not secure - close and verify before dispatch.

9. Rollover Physics

A tanker's risk of rollover rises with speed in a curve and with load height. The physics: centrifugal force exceeds the tipping point. Know the fix: slow before the curve, smooth inputs, watch the load's shift.

Driver Tip: The rollover point is a corner plus speed plus surge - remove one and you stay upright.

e.g. A 3/4-full tanker in a freeway ramp posted 35: enter at 30, not 40 - the surge on the ramp is the rollover trigger.

10. Outage & Expansion Space

A tank must not be filled to the brim; the outage (expansion space at the top) lets the liquid expand in heat without overpressurizing the tank. Gasoline expands more than diesel, so summer gasoline loads leave more outage.

Driver Tip: Know which liquid needs the bigger outage: gasoline in summer = the classic expansion case.

e.g. A "full to the top" gasoline tanker sitting in 95-degree sun can vent heavily or bulge - the outage prevents that.

11. Smoothbore vs Baffled Handling

A smoothbore (no baffles) tank surges hardest and must be braked earliest; baffled tanks brake better but still shift weight. An unbaffled tank of liquid is the most surge-prone vehicle in the CDL fleet.

Driver Tip: Match the brake plan to the tank type: smoothbore = earlier, gentler; baffled = still smooth, but less extreme.

e.g. A smoothbore water tanker that stops abruptly at a light sashes forward for several seconds - the driver must allow for it.

12. Liquid Load and Traction

A partially full tank shifts weight during acceleration and braking, which can momentarily reduce drive-axle traction in a curve. On wet or icy roads this compounds the rollover and slide risk.

Driver Tip: Brake in a straight line with a liquid load - a curve plus a braking liquid shift is the traction trap.

e.g. A 3/4-full tanker braking into a wet curve can have the rear axle unload just as the front turns - slow early, straight-line brake.

13. Tank Weight and Axle Rules

Liquid load weight sits low but must still respect axle limits: overfilling one compartment can overload an axle and change the handling. Compartment loading plans balance the axles.

Driver Tip: Use the loading plan, not the hose: each compartment filled per the chart keeps axles legal and handling predictable.

e.g. Filling only the rear compartment of a 5-compartment tanker overloads the rear axle - spread the fill per the plan.

13 Terms in this section.

Part 7: Passenger (P)

Loading, passenger safety, backing, rail crossings & bus handling

1. Passenger Endorsement Basics

A P endorsement is required to operate a bus (16+ passengers) in commerce. It needs its own knowledge test (usually 20 questions, 80%) plus, for most drivers, the ELDT module (since Feb 2022).

Driver Tip: Passenger questions split into loading, student/occupant safety, backing, and rail crossings - study those four buckets.

e.g. A city bus driver needs P; a 15-passenger van for hire in commerce may also need P and possibly a CDL.

2. Loading & Unloading Passengers

Load/unload only at designated stops, in safe areas, with the bus fully stopped and secure (brakes set). Count passengers and watch for aprons/doors; discharge passengers away from traffic when possible.

Driver Tip: The safest discharge: passenger exits toward the curb, not into the lane - 'curb-side unloading' is the tested rule.

e.g. A bus unloading on a busy street: set brakes, open the door, and wait until the passenger is clear before moving.

3. Passenger Safety Briefings

Before departure, tell passengers about emergency exits, seat belts (where fitted), and safe behavior. On school buses, the driver performs (or supervises) the safety message and a periodic drill.

Driver Tip: The briefing rule: 'explain the exits and rules before you move' - even if no one asks.

e.g. A headed-out charter driver covers exits and no-standing rules in 60 seconds before pulling away.

4. Backing a Bus

Backing a bus is risky because the driver cannot see the rear close-up. Use a spotter or 'get out and look'; mirrors help but have blind spots; consider a rear camera if fitted.

Driver Tip: NEVER back a bus without confirming the space - a passenger or child behind the bus is invisible from the seat.

e.g. A bus backing into a terminal with a spotter: stop when the spotter signals, even if the mirror looks clear.

5. Railroad Crossings (Buses)

A bus (and any placarded hazmat vehicle) MUST stop within 50 feet but not less than 15 feet before every railroad crossing, look and listen, then proceed only when clear. NEVER shift gears while crossing the tracks.

Driver Tip: The rail-crossing drill: stop 15-50 feet out, open the door, look both ways, listen, close the door, and cross without shifting.

e.g. A bus that rolls through a crossing without stopping fails the rule instantly - stop EVERY time, even at a green light.

6. Passenger Height & Weight

Buses are tall and heavy: the winds are a factor, and the center of gravity is high. Corner slower, leave more space, and expect sway. Know your bus's height for low bridges and wires.

Driver Tip: A tall bus hits wind on every open stretch - slow down and grip the wheel in gusts.

e.g. A 12-foot-6 bus under a 12-foot bridge: stop, measure mentally, and reroute - clearance is non-negotiable.

7. Stopping Distances (Buses)

A loaded bus needs substantially more stopping distance than a car, and passengers standing can be thrown. Brake smoothly and early; avoid panic stops that injure standees.

Driver Tip: Anticipate stops well ahead so the bus comes to a gentle, predictable halt - standing passengers depend on it.

e.g. A bus driver who brakes hard for a yellow light risks injury to standees - choose to go through only if it is clearly safe.

8. Passenger Conduct Rules

The driver is responsible for safe passenger conduct: no blocking the aisle, no standing beyond capacity, doors clear before closing, and no distracting the driver. Unsafe passengers may be refused or discharged.

Driver Tip: The test-answer reflex: 'if it puts passengers in danger, the driver acts - refuse, stop, or discharge safely.'

e.g. A standing passenger ahead of the standee line: stop and seat them before moving - a hard brake would injure them.

9. Emergency Exits & Equipment

Know all emergency exits (doors, windows, roof hatches), the fire extinguisher location, first-aid kit, and how to evacuate. Passenger questions test knowing where the equipment is as much as how to use it.

Driver Tip: Count exits and their release mechanisms on EVERY bus before you take it out - routes change daily.

e.g. A roof-hatch release stuck in the annual inspection is a defect - fix before the bus carries the school run.

10. Bus Weight & Load Limits

Buses have GVWR limits and passenger capacity limits based on seating + approved standing. Overloading changes braking and stability - never exceed rated capacity.

Driver Tip: The capacity is a hard number: count passengers at the door and stop at the limit.

e.g. A charter that loads 3 standees beyond capacity handles like a different (worse) vehicle - it is also a citation.

11. Passenger Loading Counts

The driver counts passengers in and out, uses approved stops, and never exceeds the seating or approved standing capacity. Over-capacity is both a safety and a citation issue.

Driver Tip: Count at the door and again at the curb - the count protects the driver and the passengers.

e.g. A charter that boards 2 over the approved standee count must refuse the extras or send another bus.

12. Loading Area Hazards

Loading zones hide hazards: moving vehicles, curbs, aprons, and pedestrians. Watch the apron (the space between the bus and the doorway), and do not pull away until the last passenger is safely on the sidewalk.

Driver Tip: The apron check is a tested item: look at the door area, curb, and mirrors before closing the door and moving.

e.g. A bus pulling away while a passenger is still in the step-well fails the scenario - wait for the clear apron.

13. Bus Emergencies & Evacuation

In a bus emergency (fire, smoke, crash, unsafe area), evacuate passengers away from traffic and hazards, using the exits that open safely. The driver directs the evacuation and stays until passengers are clear.

Driver Tip: Know every exit type on your bus (door, windows, roof hatch) and the release mechanism for each.

e.g. Smoke in the cabin: stop, open the exits away from the smoke, evacuate to a safe distance, and call 911.

14. Passenger-Carrying Hours

Passenger-carrying CMV drivers face stricter hours: 10-hour driving limit and a 15-hour on-duty window (vs 11/14 for property). ELD rules and log requirements apply to most passenger operations too.

Driver Tip: The passenger numbers 10/15 are the two anchors - memorize them as a pair to avoid mixing with property 11/14.

e.g. A motorcoach driver at hour 16 of on-duty time has exceeded the 15-hour window - stop and rest.

14 Terms in this section.

Part 8: School Bus (S)

Student loading, danger zone, stop arm, rail crossings & evacuation

1. School Bus Endorsement Basics

The S endorsement is for operating a school bus. It needs its own knowledge test (usually 20 questions, 80%) and, since Feb 2022, the ELDT module. The driving rules for students are stricter than passenger rules.

Driver Tip: S-test themes: student loading, the crossing arm, stop-arm operations, and rail crossings - dominate the question bank.

e.g. A district driver needs S even if they also hold P - the two endorsements are separate.

2. Student Loading & Unloading

Load students only at designated stops; never load/unload across the road unless absolutely necessary; use the red flashing lights + stop arm; unload students toward the curb away from traffic.

Driver Tip: The golden rule: students NEVER cross in front of or behind the bus without the driver's direct supervision.

e.g. At a stop with the red lights flashing and the stop arm out, traffic must halt in BOTH directions (where required by law).

3. The Danger Zone

The 'danger zone' is the area around the bus where students are invisible to the driver: 10 feet in front, 10 feet on each side, and the entire area behind the bus. The driver must watch it constantly; students must stay out of it when possible.

Driver Tip: The 10-foot rule: if a student is within 10 feet of the bus, the driver may not see them - use mirrors and the crossing gate.

e.g. A student walking behind the bus on the driver's blind side is the classic fatality scenario - always check mirrors before moving.

4. Stop Arm & Flashing Lights

Activate the amber lights well before stopping, then the red lights + stop arm while loading/unloading. Drivers approaching must stop at the arm in both directions (state-dependent); never move until the arm is in and students are clear.

Driver Tip: Order matters: AMBER (warning) then RED (stop) - the written tests always place the sequence.

e.g. Move off only after the stop arm retracts and the last student is on the sidewalk - not when the door closes.

5. Railroad Crossings (School Bus)

A school bus must stop at every railroad crossing (15-50 feet before the track), open the door, look and listen, and cross only when clear - never shift gears while on the tracks.

Driver Tip: This is the strictest crossing rule in the CDL system: EVERY crossing, EVERY time, with the door open.

e.g. A school bus at a quiet rural crossing still stops, opens the door, and listens - no exceptions.

6. Student Behavior Management

The driver manages conduct: no standing, no head/hands out of windows, no loud distractions, seat belts as fitted. A driver cannot coach students AND drive - stop the bus before handling a behavior issue.

Driver Tip: The tested protocol: stop the bus safely, THEN address the behavior - never discipline while rolling.

e.g. Two students fighting in row 4: pull over, set the brake, and settle it before moving on.

7. Mirrors & Blind Spots (School Bus)

School buses have mirrors designed to let the driver see the danger zone: crossover mirrors, side mirrors, and the rear-view. Know what each mirror is for and how to use them before moving.

Driver Tip: The crossover mirror looks at 10 feet in front where young students are shortest and hardest to see.

e.g. Before a stop, check the crossover mirror for the small student who runs ahead of the line.

8. Emergency Evacuation (School Bus)

Evacuate students in a fire, crash, or other danger: use the front door normally, the rear door for rear-exit models, and hatches. Students evacuate in a pattern (front exits first where safe, away from traffic).

Driver Tip: The drill phrase: 'evacuate away from traffic, up the hill, upwind' - rescue/evac positioning protects students.

e.g. A smoke-smelling bus at a crossing: evacuate students to a safe distance upwind, call 911, and do not reopen the bus.

9. School Bus Vehicle Condition

The pre-trip for a school bus adds: the stop arm works, the red/amber lights work, the crossing gate extends, student seats secure, and the emergency exits function. Inoperable safety equipment grounds the bus.

Driver Tip: On the S pre-trip, name the bus-specific gear (arm, lights, gate, exits) or you lose the section.

e.g. A stop arm that does not deploy fails the pre-trip - no students may ride until it is repaired.

10. Student Count & Accountability

The bus driver is accountable for every student on board: count at pickup, count at drop-off, check the bus after the last stop (sweep for sleeping or hiding students). A lost student is a driver failure scenario.

Driver Tip: The end-of-day bus sweep is mandatory - check under seats and behind the last row before locking up.

e.g. A driver who drops off 22 but picked up 23 must stop, recount, and search before leaving the route.

11. Crossover Mirror Use

The crossover mirrors (front, just below the windshield) show the area 10 feet in front of the bus where young students are shortest and hardest to see. Check them before every move and at stops.

Driver Tip: The crossover mirror is the "small-student mirror" - looking only at the side mirrors misses the child at the bumper.

e.g. A kindergartner runs ahead of the line toward the bus: the crossover mirror is where the driver sees and stops.

12. Emergency Flasher Rules

School bus flashers: amber first to warn, red to stop traffic while students load/unload. Never use red flashers except for actual loading/unloading - misuse dilutes the signal to motorists.

Driver Tip: The order is amber-then-red and the reds only for actual student transfers - the test checks both.

e.g. A driver running red flashers down the highway (no students) erodes the stop signal and invites a violation.

13. Post-Stop Clearance

After students unload, wait until the stop arm retracts and every student is on the sidewalk or safely away before pulling out. Traffic may be passing once the arm retracts - reassemble your mirrors before moving.

Driver Tip: The post-stop sequence: arm in, students clear, mirrors set, then move - never on the door close alone.

e.g. A student bends to tie a shoe at the curb while the bus pulls out - the driver must wait for the student to be fully clear.

14. Railroad Crossing Signal Failure

If the crossing signals are flashing or the gates are down, stop and wait - never drive around lowered gates. If a signal is dark but the crossing is active, stop, look, and listen before proceeding.

Driver Tip: For a school bus the answer is always "stop, look, listen, then proceed only when clear" - gates and lights never override that.

e.g. A driver late for a route who eases around a lowered gate has committed the single most tested school-bus violation.

14 Terms in this section.

Part 9: Doubles/Triples (T)

Converter dollies, coupling order, off-tracking, sway & stability

1. Doubles/Triples Basics

The T endorsement allows towing more than one trailer. It requires its own knowledge test (20 questions, 80%). States that allow doubles/triples vary; some ban triples on certain highways.

Driver Tip: T-test themes: converter dollies, coupling order, off-tracking, and stability - the physics of two trailers.

e.g. A driver running doubles on the interstate needs T even if they already drive Class A singles.

2. The Converter Dolly

A converter dolly supports the front of the second trailer and has a fifth wheel, coupling, and air/electrical connections. Its tires are small and easy to overlook; its pintle or fifth wheel must be inspected like a coupling.

Driver Tip: Check the dolly's wheels, frame, and coupling EVERY time - a dolly tire blowout at speed whips the whole rig.

e.g. Dolly tires at 4/32 tread and 60 psi are a defect - inspect them with the same standard as tractor tires.

3. Coupling Doubles

Coupling a double: align the dolly with the rear of the first trailer, back the dolly under, lock the pintle or fifth wheel, attach air/electrical, then back the team under the second trailer. Verify every latch before moving.

Driver Tip: The coupling sequence is a checklist: align, lock, air, verify - each step is a named test item.

e.g. Coupling the second trailer before the dolly is fully locked is the classic doubles accident - verify first.

4. Uncoupling Doubles

Uncouple in reverse order: release the second trailer from the dolly, then release the dolly from the first trailer - with chocks under every trailer you separate.

Driver Tip: The chock rule applies per trailer: any trailer that can roll gets a chock before you disconnect it.

e.g. On a slope, even a 'flat' lot can roll an uncoupled trailer - chock both axles, then uncouple.

5. Off-Tracking in Doubles

Each trailer in a double tracks slightly inside the one ahead - the rear trailer cuts the tightest radius. In turns, the second trailer can hit curbs or objects the cab cleared.

Driver Tip: The rear trailer cuts the most - swing wider in every turn and use both mirrors, not just the driver's side.

e.g. A 90-degree right turn with doubles: the rear trailer can mount the curb if the swing is too tight - widen early.

6. Trailer Stability & Sway

Doubles are more prone to sway (buffeting by air, gusts) because a second trailer acts like a lever on the first. Slow down in wind, avoid abrupt steering, and never let the rear trailer start oscillating.

Driver Tip: If the rear trailer begins to sway, ease off the accelerator and steer straight - do not brake hard or fight it with the wheel.

e.g. A gust on a flatbed double can set the rear trailer oscillating - straight-line slow is the recovery.

7. Backing Doubles

Backing doubles is the hardest backing maneuver: the converter dolly makes the rear trailer turn opposite to the front. Practice slowly with a spotter; many drivers avoid backing doubles by planning dock approach.

Driver Tip: Reverse very slowly and stop at the first sign of the dolly jackknifing - the dolly angle is your tell.

e.g. A dolly that starts to fold while backing: pull forward, straighten, and reposition - never power through it.

8. Air Lines on Doubles

Each trailer has its own air lines through the dolly connections. Verify brake application on BOTH trailers, and know which gladhands go where on the dolly.

Driver Tip: Air-line check for doubles: apply the brakes and confirm both trailers brake - a dead line to the second trailer is a fail.

e.g. A rear trailer that does not brake when you press the pedal: the dolly's service connection is crossed or disconnected.

9. Triples Stability Limits

Triples amplify every hazard: longer sway lever, more off-tracking, slower reaction. Many states restrict triples to specific highways and speeds; some forbid them entirely.

Driver Tip: If your state allows triples, the speed/stability limits are even tighter - know the routes and the rules before dispatch.

e.g. A triple in a crosswind is the least stable legal combination on the road - reduce speed and gap generously.

10. Weight Distribution (Doubles)

Weight distribution matters: put the heaviest trailer first and keep the center of gravity low and centered. An overloaded rear trailer destabilizes the whole train.

Driver Tip: Load heavy-axle weight forward; never exceed any single axle rating on the dolly or trailers.

e.g. Two trailers with a 10,000-lb differential shift the pivot point - reweigh or re-stow before dispatch.

11. Dolly Pintle Hook

The dolly connects to the lead trailer with a pintle hook (like a trailer hitch) plus safety chains. The pintle must be closed and locked; the safety chains catch the trailer if the pintle fails.

Driver Tip: Verify the pintle is closed AND the safety chains are attached - the chains are the backup for the hook.

e.g. A dolly whose pintle is open but chains are on is still unsafe - close and lock the hook before coupling the second trailer.

12. Doubles Air Supply

Each trailer brakes off its own supply through the dolly; a leak in the second trailer's line can drop the whole system's pressure. Check both trailers' brake application and listen for hisses at every connection.

Driver Tip: The doubles air check: apply the brakes and confirm BOTH trailers respond - a silent second trailer is a leak or crossed line.

e.g. A hiss at the dolly connection while braking means a service-line leak - find and fix before the road.

13. Weight & Sway Control

A heavy second trailer or a light first trailer makes the rear trailer swing more. Distribute weight so the rear trailer is lighter than the front and the fifth-wheel load stays in range.

Driver Tip: The distribution goal: "heavy first, light last" - the pivot stays stable and the last trailer tracks.

e.g. Doubles with a 12,000-lb rear trailer and 6,000-lb lead trailer sway violently - swap the loads or re-stow.

14. Braking Doubles

Doubles need longer braking distance than singles: two trailers mean more momentum and more brake lag. Brake early and smoothly; a hard stop can fold the dolly or jackknife the rear trailer.

Driver Tip: Plan stops as if the brakes are two steps behind - the rear trailer is still pushing when the cab has stopped.

e.g. A hard panic stop with doubles on a wet road can fold the lead trailer into the dolly - brake early, squeeze gently.

14 Terms in this section.

Part 10: Final Review

The highest-yield concepts across the tests in rapid-review form

1. CDL 'Core' Priority

The foundation for every CDL is General Knowledge - master it before Air Brakes or Combination Vehicles. Most written-test failures happen on core knowledge, not endorsements.

Driver Tip: Score 85%+ on GK practice tests before adding endorsements - the endorsement nuances build on the core.

e.g. A Class A driver who aces Combination but fails GK fails the whole attempt - GK first, always.

2. The 80% Per-Test Rule

Every CDL knowledge test is passed independently at 80% (typical): 40/50 for GK, 20/25 for Air Brakes, 16/20 for Combos, 24/30 for HazMat, 16/20 for the rest. A high score on one never rescues another.

Driver Tip: Before the test, know your exact counts: 'I need 40 of 50 on GK' - that number focuses the effort.

e.g. Passing GK at 46/50 and Air Brakes at 18/25 still means retaking Air Brakes - each test stands alone.

3. Air Brake Numbers

The memorized air numbers: governor cut-in ~100 psi, cut-out 120-125 psi, low-air warning ~60 psi, spring brakes set 20-45 psi, safe band 100-125 psi, air loss under ~2-3 psi/min (static) and under ~3 psi (applied).

Driver Tip: Anchor the five numbers on one timeline and recite them while checking your own rig.

e.g. A gauge hanging at 95 psi with the compressor running is a problem - you should be hearing the governor cut-out near 125.

4. Stopping Distance Reality

Air-braked combinations need long distances: about 419-450 ft at 55 mph for a loaded combination in ideal conditions (with reaction + lag + braking), and far more on wet roads.

Driver Tip: For the test: estimate with the 'one second per 10 feet' rule and assume you need double in wet weather.

e.g. The extra half-second air lag alone adds road before the brakes grip - follow distance matters more in a truck.

5. ELDT Timeline

Since Feb 7 2022, first-time Class A/B drivers, Class B-to-A upgrades, and new HazMat/Passenger/School Bus endorsement seekers must complete FMCSA-registered ELDT before the SKILLS test - not the knowledge tests.

Driver Tip: ELDT is verified via the TPR when you book the skills exam - if you have not finished it, you cannot schedule.

e.g. Knowledge tests + CLP can happen before ELDT; the skills test cannot happen without it.

6. CLP Rules

Hold the CLP at least 14 days (49 CFR 383.25), valid 180 days (renewable once in most states), and never drive solo - a CDL holder of the same class and endorsements must ride along.

Driver Tip: Plan the 14-day minimum into your training calendar - it gates when you can take the skills test.

e.g. A CLP driver caught alone in a CMV faces a serious violation - the rider rule is absolute.

7. Skills Test Three Parts

Pre-trip inspection (vehicle + coupling), basic control (straight/offset backing, parallel parking, alley dock), and the road test. Fail one part, retake that part - but each part is a hard pass/fail.

Driver Tip: Practice the pre-trip script until it is automatic - it is the most commonly failed part.

e.g. An applicant who can drive but cannot talk through the inspection still fails the pre-trip section.

8. Medical & Self-Certification

A DOT medical card valid up to 24 months (12 for certain conditions) + a self-certification on file with the state. HazMat adds a TSA background check.

Driver Tip: Certify to the type of driving you actually do (interstate/intrastate, excepted/non-excepted) - a mismatch is a compliance error.

e.g. An intrastate-only driver who self-certifies interstate must now keep an interstate-level medical card - certify correctly.

9. Surge & Sway Physics

Tankers surge (liquid movement); doubles sway (second-trailer lever). Both are written-test fixtures: slow early, brake smoothly, steer straight, and never stab the brakes.

Driver Tip: One line for both: 'gentle inputs = stable rig; abrupt inputs = surge or sway.'

e.g. A 3/4 tank + a gust + a hard brake = the written-test scenario that fails half the applicants.

10. Placard Threshold

1,001+ lb of a regulated material in one vehicle triggers most placarding and HM rules; 1,000 lb and under eases most but not all. The H-test numbers live and die on that threshold.

Driver Tip: When a question gives a weight, compare it to 1,001 before anything else - the answer hinges on it.

e.g. A driver loading 1,050 lb of a Class 8 corrosive knows the placard requirement starts there.

11. Endorsement Quick Map

H = hazard classes/placards/segregation; N = surge/outage/baffles; P = passenger loading/safety/rail crossings; S = student danger zone/stop arm/rail; T = converter dollies/off-tracking/sway.

Driver Tip: Match the endorsement to its theme and you can predict what a question will test before you read it.

e.g. A question about a converter dolly belongs to T; one about liquid surge belongs to N; one about stop arms belongs to S.

12. Ride-the-Brake Trap

Riding the brakes downhill overheats them into fade or failure. The fix is a low gear + engine brake + snubbing. Every braking-heavy question rewards the gear-down-first answer.

Driver Tip: If the answer involves a long grade, the correct move is 'gear down and snub' - not 'feather the brakes'.

e.g. A runaway truck ramp exists because brakes fade - choose the gear at the top, not the ramp at the bottom.

13. Inspect, Point, Name

In every inspection question (real or written), the winning answer is the one that checks, names, and verifies - 'check the air lines, verify pressure, and test brakes.'

Driver Tip: Written inspection questions reward completeness, not cleverness - include the verification step.

e.g. Answer 'inspect the coupling and verify the kingpin lock' beats 'look at the hitch' every time.

14. Safety Before Speed

Speed limits are ceilings; safe speed depends on load, weather, and road. The safest answer is almost always the slower, smoother one with more space.

Driver Tip: When two answers both sound safe, pick the one with more margin - the tests reward margin.

e.g. A 55-mph limit in fog at 45 with low beams is the defensible answer - not 'I can make up time'.

15. Test-Day Reset

The morning of the knowledge tests: re-review the air-brake numbers, the 80% per-test targets, the class/endorsement map, and the FMCSA manual's inspection section - your weakest areas first.

Driver Tip: Do not cram new material the night before - lock in what you know with flashcards and a full night of sleep.

e.g. Ten minutes on stopping distance, placard threshold, and surge physics beats a full re-read.

16. The 100/125/60/20-45/419 Chain

The five air-brake numbers: governor cut-in 100 psi, cut-out 120-125 psi, low-air warning 60 psi, spring brakes set 20-45 psi, and roughly 419-450 ft stopping distance at 55 mph for a loaded combination (plus brake lag).

Driver Tip: Recite the chain in order until it is automatic - it answers the majority of air-brake scenario questions.

e.g. A question about a buzzer at 58 psi maps to the 60-psi anchor: stop and fix.

17. Placard Threshold 1,001

1,001+ lb of a regulated hazmat in one vehicle triggers most placarding and HM rules. Below 1,001 the load eases most requirements - but the question always tests the boundary.

Driver Tip: Whenever a HM question states a weight, compare to 1,001 before choosing - it is the hinge of the answer.

e.g. 1,000 lb of corrosive: no placard (most cases); 1,001 lb: placard by class.

17 Topics in this section.

Part 11: Test-Day Strategy

Pacing, the 80% rule, scenario logic & retest planning

1. Confirm Your Tests

On test day you sit ONLY the tests for your class + chosen endorsements. Bring your CLP paperwork (or application), ID, medical card, and fee. Confirm at the desk which tests you are taking before the clock starts.

Driver Tip: A Class A applicant should see exactly three tests (GK, Air Brakes, Combos) - if the screen shows something else, ask.

e.g. State systems list tests individually; verify your set at registration so you do not sit (or miss) the wrong one.

2. Pace Each Test

Typical pacing: General Knowledge 50 questions in 50-60 minutes (about a minute each); Air Brakes 25 in 30; endorsements 20 in 30. Work steadily and do not burn all your time on one question.

Driver Tip: At the halfway mark, check your progress: halfway through the questions at halfway through the time.

e.g. A 50-question GK test at minute 25 should be around question 25 - adjust if you are behind.

3. 80% Is the Floor, Not the Goal

Passing is 80% per test - aim for 90%+ so a couple of errors still clear the bar. Flag uncertainty and come back; computer tests usually let you review before submitting.

Driver Tip: Treat '40 of 50' as the minimum, not the target - target 45+ and the pass is cushiony.

e.g. Miss two and you have room; miss eight and you are retesting. Aim high per question.

4. Multiple-Choice Elimination

Eliminate the obvious wrongs first (absurd numbers, unsafe shortcuts, 'always/never' extremes), then compare the remaining two for the one that matches FMCSA doctrine.

Driver Tip: FMCSA answers are almost always the SAFEST, most complete, most verified option - not the fastest.

e.g. A choice that says 'brake hard and steer sharply' is a trap - the doctrine answer is 'brake smoothly in a straight line.'

5. Inspection Questions

When a question asks 'what should you check before driving,' the answer lists a FULL sequence (fluids, lights, tires, brakes, coupling) with a verification step - never a single item.

Driver Tip: Write the pre-trip order on scratch paper before starting the test - it anchors every inspection question.

e.g. An inspection answer that includes 'verify the brakes work' is better than one that just checks the gauge.

6. Air Brake Scenario Questions

Air-brake scenarios test the numbers and the response: low-air warning = stop and fix; braking while running = never ride them; a leak at 60 psi = stop immediately; downhill = gear down + engine brake.

Driver Tip: Map every air-brake question to one of the five numbers (100/125/60/20-45/419 ft) and the response is automatic.

e.g. A question about running a 4% grade with air brakes: the answer is gear down and snub, always.

7. HazMat Questions

HazMat questions reward the regulation over the convenience: placard at 1,001+ lb, segregate incompatible classes, keep shipping papers accessible, use the ERG in an incident, and secure the area first.

Driver Tip: When a HM question gives a weight, compare to 1,001 immediately; when it gives two classes, check compatibility.

e.g. A leak with a placarded load: stop, isolate, call 911, identify - never attempt cleanup yourself.

8. Endorsement Question Reframe

Put yourself in the seat: 'would YOU do this with 15 passengers / school children / a 3/4 tank?' The safest, most careful option is the endorsement-test answer.

Driver Tip: The endorsement questions are judgment questions in disguise - safety and pupils always beat schedule.

e.g. A school bus running 4 minutes late must still stop at every crossing and every stop arm - safety wins.

9. Watch the Wording

CDL tests use precise wording: 'must,' 'should,' 'may,' 'at least,' 'within' - a single word flips the answer. Read the last line twice; know what is being asked (check, prevent, first, safest).

Driver Tip: Underline the operative verb: first step? best? required? Each changes the correct choice.

e.g. 'What is the FIRST thing to do' vs 'what SHOULD you do' have different correct answers - read carefully.

10. Between Tests

Between knowledge tests, reset: breathe, re-anchor on the next test's theme (Air Brakes = numbers; Combos = coupling; HazMat = classes/placards). Do not dwell on the test you just finished.

Driver Tip: Use the break to re-run the air-brake numbers and the coupling checklist from memory.

e.g. Finished GK and moving to Air Brakes: recite 100/125/60/20-45/419 while you walk to the next station.

11. After You Pass

Passing all knowledge tests earns the CLP (fastest states print it immediately). Then: finish ELDT if not done, practice with a CDL holder for 14+ days, and schedule the skills test.

Driver Tip: Book the skills test EARLY - wait times at busy DMVs stretch weeks past the 14-day CLP minimum.

e.g. A passed GK does not expire on CLP issue in most states, but your CLP window (180 days) is the real clock.

12. Retest Plan

If you fail one test, you retake only that test (state fee applies) - passed sections stay valid. Use the gap to drill the failed test's practice questions until you hit 90% twice.

Driver Tip: A failed Air Brakes is a signal to re-learn the numbers AND the scenarios, not just re-read the section.

e.g. Retake Air Brakes within the week while the material is fresh - schedule before you lose momentum.

12 Topics in this section.

Appendix A: Complete Test & Format Reference (2026-Current)

1. General Knowledge

~50 questions / 50-60 minutes / 80% pass (40 correct). Required for ALL CDL classes. Content: vehicle inspection, basic control, shifting, backing, speed & space management, night/extreme conditions, hazardous materials awareness, accident procedures, cargo, weight, HOS basics, driver fitness.

2. Air Brakes

~25 questions / 30 minutes / 80% (20 correct). Required for Class A, Class B, and anyone operating an air-braked vehicle. Content: system components, compressor/governor, reservoirs, dual systems, brake checks, air loss, stopping distance, ABS, engine brakes.

3. Combination Vehicles

~20 questions / 30 minutes / 80% (16 correct). Required for Class A. Content: fifth wheel, coupling/uncoupling, gladhands, trailer hand valves, tug test, backing, off-tracking, jackknife prevention, converter dollies.

4. HazMat (H)

~30 questions / 80% (24 correct). Content: classes 1-9, placarding, the 1,001-lb threshold, segregation, shipping papers, ERG, attendance, parking/routing, spills.

5. Tanker (N)

~20 questions / 80% (16 correct). Content: liquid surge, baffles, outage/expansion space, loading/unloading, center of gravity, rollover physics.

6. Passenger (P)

~20 questions / 80% (16 correct). Content: loading/unloading, passenger safety briefings, backing, railroad crossings, bus weight/height, emergency equipment.

7. School Bus (S)

~20 questions / 80% (16 correct). Content: student loading/unloading, danger zone, stop arm/flashing lights, railroad crossings, evacuation, bus-specific pre-trip.

8. Doubles/Triples (T)

~20 questions / 80% (16 correct). Content: converter dollies, coupling/uncoupling doubles, off-tracking, sway/stability, backing, weight distribution.

9. Passing & Retakes

80% per test; a high score on one test does not offset a low score on another. Failed sections are retaken individually (state fee applies); passed sections stay valid per state policy.

10. ELDT & Skills

ELDT (49 CFR 380 Subpart F, since Feb 7 2022) before the skills test for first-time A/B, B-to-A upgrades, and new H/P/S endorsements. CLP held 14+ days. Skills test = pre-trip + basic control + road.

Appendix B: Air Brake Numbers & Stopping Quick Reference

1. Governor Cut-In / Cut-Out

Compressor restarts at ~100 psi (cut-in) and stops at ~120-125 psi (cut-out).

2. Low-Air Warning

Activates below ~60 psi - stop and fix immediately; never drive on the warning.

3. Spring Brakes Set

Spring (parking/emergency) brakes begin setting around 20-45 psi when air pressure falls.

4. Safe Operating Band

Keep system pressure in the 100-125 psi band during normal operation.

5. Air Loss Limits

Static (engine off, brakes released): drop under ~2 psi/min (single) / ~3 psi (combination). Applied: under ~3 psi/min hold.

6. Brake Lag

Air brakes take up to ~0.5 second to apply after the pedal - the reason following distance must be generous.

7. Stopping Distance

A loaded combination at 55 mph needs roughly 419-450 ft total in ideal conditions (reaction + lag + braking); wet roads stretch it further.

8. Downhill Technique

Select a low gear at the top, use the engine brake, and snub (firm apply, release) - never ride the brakes.

9. ABS Note

ABS prevents wheel lockup and lets you steer while braking hard; a stuck ABS light means get it repaired - normal braking still works.

10. Wet/icy

Test brakes after puddles, dry them with light applications, and brake gently in a straight line on ice.

Appendix C: Endorsement Quick Map & HazMat Numbers

1. H - HazMat

Classes 1-9, placards (4 sides, readable 50 ft), 1,001-lb threshold, segregation table, shipping papers, ERG, TSA background check.

2. N - Tanker

Liquid surge, baffled vs smoothbore, outage (expansion space), grounding for loading, high center of gravity, rollover risk.

3. P - Passenger

Curb-side unloading, passenger briefings, backing with a spotter, rail-crossing stops, bus height/weight, emergency exits.

4. S - School Bus

Danger zone (10 ft around), amber-then-red lights + stop arm, crossing gate, rail-crossing stop with door open, evacuation drills.

5. T - Doubles/Triples

Converter dolly coupling, chock every separated trailer, rear-trailer off-tracking, sway recovery (ease off, steer straight), heavy trailer first.

6. Hazard Classes 1-3

1 Explosives, 2 Gases, 3 Flammable Liquids (gasoline = Class 3).

7. Hazard Classes 4-6

4 Flammable/Combustible Solids, 5 Oxidizers/Organic Peroxides, 6 Toxic/Infectious.

8. Hazard Classes 7-9

7 Radioactive, 8 Corrosives, 9 Miscellaneous (e.g., lithium batteries).

9. UN Number Anchors

UN 1203 gasoline, UN 1075 LPG, UN 1017 chlorine, UN 1267 crude petroleum - common HM test anchors.

10. Segregation Rule

Class 5 oxidizers never ride with Class 3 flammables or organics - check the segregation table before loading.

Appendix D: 4-Week Study Plan (Class A + Endorsements)

1. Week 1 - General Knowledge

One section per day: inspection, control/shifting, braking, speed & space, conditions, cargo, HOS, safety. Score 85%+ on GK practice tests.

2. Week 2 - Air Brakes + Combos

Air Brakes: components, dual systems, checks, numbers (100/125/60/20-45/419 ft), ABS. Combination: coupling, air lines, tug test, backing, off-tracking.

3. Week 3 - Endorsements

Only the endorsements you need: H (classes/placards/segregation), N (surge/outage), P/S (loading/rail/evacuation), T (dollies/sway). Drill endorsement tests to 90%.

4. Week 4 - Format + Test-Day

American practice exams at state question counts (GK 50, Air 25, Combo 20, endorsements 20-30). Re-run the numbers, the test map, and the pre-trip script. Verify state fees, CLP rules, ELDT status.

5. After Knowledge Tests

Finish ELDT if not done, practice with a CDL holder for 14+ days, and book the skills test early (pre-trip + basic control + road).

6. Test-Day Reset

Cite the air numbers, the 80% targets, the class/endorsement map, and the test map before walking in.

7. Retest Plan

Failed a section? Drill that exact test's question bank to 90% twice, then retake within the week.

Appendix E: 20 Practice Questions with Answers

1. 1. Minimum following distance below 40 mph for a 60-ft vehicle

At least 6 seconds (one second per 10 ft of vehicle length). | Tip: Count 'one-thousand-one' pairs from a fixed object to verify.

2. 2. Governor cut-in / cut-out

Compressor restarts ~100 psi (cut-in) and stops ~120-125 psi (cut-out). | Tip: Hear the governor unload near 125 - healthy system.

3. 3. Low-air warning activation

The buzzer/light comes on below ~60 psi - stop and fix immediately. | Tip: Never drive on the warning - it is a failure point.

4. 4. Spring brakes set pressure

Spring (parking) brakes begin setting around 20-45 psi as air falls. | Tip: That is why you never pump a system dry while parked.

5. 5. Air loss tolerance (static, single vehicle)

No more than ~2 psi in 1 minute with the engine off. | Tip: Combinations allow ~3 psi; applied test ~3 psi.

6. 6. Brake lag

Air takes up to ~half a second to reach the chambers after the pedal - following distance must be generous. | Tip: At 55 mph that lag adds road before the brakes grip.

7. 7. Loaded combo stopping distance at 55 mph (ideal)

Roughly 419-450 feet total (reaction + lag + braking); much more on wet roads. | Tip: Estimate with one second per 10 ft and double it in wet weather.

8. 8. ELDT timing

Required BEFORE the skills test (since Feb 7 2022) for first-time A/B, B-to-A upgrades, and new H/P/S endorsements. | Tip: Knowledge tests and CLP can come first; the skills test cannot.

9. 9. CLP minimum hold

Hold the CLP at least 14 days before the skills test; valid 180 days. | Tip: Never drive solo on a CLP - a same-class CDL holder must ride.

10. 10. Placard threshold

1,001+ lb of a regulated material in one vehicle triggers most placarding/HM rules. | Tip: Compare every HM weight question to 1,001 first.

11. 11. Hazard classes 1-3

1 Explosives; 2 Gases; 3 Flammable Liquids (gasoline). | Tip: Anchor: gasoline = Class 3.

12. 12. Class 5 oxidizer rule

Never load Class 5 oxidizers with Class 3 flammables or organics. | Tip: Check the segregation table before loading.

13. 13. Tanker outage

Leave expansion space (outage) at the top of a tank for heat expansion - gasoline needs the most in summer. | Tip: A 'full to the top' tank of gasoline can overpressure in heat.

14. 14. School bus rail crossing

Stop 15-50 feet before every crossing, open the door, look and listen, then cross without shifting. | Tip: Every crossing, every time - no exceptions.

15. 15. School bus danger zone

Roughly 10 feet in front, 10 feet on each side, and behind the bus - the driver cannot see students there. | Tip: Use the crossover mirror and the stop arm for that zone.

16. 16. Doubles sway recovery

If the rear trailer starts to sway, ease off the accelerator and steer straight - do not brake hard or fight the wheel. | Tip: Straight-line slow is the recovery.

17. 17. Converter dolly

Couples the lead trailer to the second; has its own fifth wheel, pintle, and small tires that must be inspected. | Tip: Check dolly tires like any axle - a blowout whips the train.

18. 18. Passenger-carrying hours

10-hour driving limit / 15-hour on-duty window (vs 11/14 for property). | Tip: Memorize 10/15 as a passenger pair.

19. 19. Pre-trip scoring

The pre-trip is scored: point to and NAME components in a fixed order (engine, cab, lights, tires, brakes, coupling). | Tip: Speak every category aloud or you lose the points.

20. 20. Passing per test

80% per test (typically): 40/50 GK, 20/25 Air, 16/20 Combo, 24/30 HazMat, 16/20 others. | Tip: A high score on one test does not rescue a failed one.

Appendix F: Quick Glossary of Key CDL Terms

1. CDL

Commercial Driver's License - required for vehicles over 26,000 lb GVWR, vehicles towing over 10,000 lb, or vehicles carrying 16+ passengers / hazardous materials.

2. GVWR

Gross Vehicle Weight Rating - the manufacturer's maximum weight for the vehicle.

3. GCWR

Gross Combination Weight Rating - max weight for the combination (truck + trailer + load).

4. CLP

Commercial Learner's Permit - earned after knowledge tests; must be held 14+ days and never used solo.

5. ELDT

Entry-Level Driver Training - FMCSA-registered training (theory + behind-the-wheel) required before the skills test.

6. Pre-Trip Inspection

The first part of the skills test: a scored walk-around demonstrating the vehicle is safe.

7. Basic Control Skills

Second skills-test part: off-road maneuvers (straight/offset backing, parallel parking, alley dock).

8. Road Test

Third skills-test part: on-street driving evaluating control, observation, and safety.

9. Air Brakes

Braking system using compressed air - the test with the most memorized numbers (100/125/60/20-45).

10. Spring Brakes

Parking/emergency brakes held off by air and applied by loss of pressure (set around 20-45 psi).

11. Gladhands

The couplers joining the tractor's air lines to the trailer (red = service, blue = emergency).

12. Fifth Wheel

The tractor's coupling plate that locks onto the trailer kingpin.

13. Kingpin

The trailer's coupling pin that locks into the fifth wheel for towing.

14. Converter Dolly

Coupling unit with a fifth wheel that connects a second trailer in doubles/triples.

15. Placard

Diamond-shaped sign showing a hazmat class, displayed on all four sides when the load is over 1,001 lb.

16. ERG

Emergency Response Guidebook - carried on hazmat vehicles to identify materials and guide response.

17. Outage

Expansion space left at the top of a liquid tank so the product can expand in heat.

18. No-Zone

Blind spots around a CMV where other vehicles disappear - check mirrors before every move.

19. Surge

Liquid movement in a tank that shifts weight during acceleration, braking, and turns.

20. Off-Tracking

The rear wheels following a tighter radius than the front in a turn - worst at low speed in doubles.

Appendix G: The 3-Part Skills Test in Depth

1. Part 1 - Pre-Trip Inspection

Walk-around you must perform OUT LOUD with examiners: engine area (fluids, leaks, belts), cab (gauges, mirrors, steering, horn), lights/reflectors, tires/wheels (tread, lug nuts, inflation), brakes (air check sequence), and for Class A the coupling (fifth wheel, kingpin, gladhands, air lines). You must point to AND name each item. It is scored - silence earns nothing.

2. Part 2 - Basic Control Skills

Off-road maneuvers at a test lot: straight-line backing, offset backing (left and right), parallel parking, and alley docking. You may use a spotter; you lose points for pulling up to reposition, hitting cones, or taking too long.

3. Part 3 - Road Test

On-street driving: left/right turns, lane changes, intersections, curves, railroad crossings, and stop/start control. Evaluators score observation (mirrors, blind spots), vehicle control (smooth braking/shifting), and safety (signals, speed, following gap).

4. Common Pre-Trip Failures

Skipping a category entirely, not checking air-brake function, failing to name components, not draining tanks, not demonstrating brake checks, and rushing the walk-around. The fix: a MEMORIZED order you rehearse aloud until automatic.

5. Common Road-Test Failures

Curb strikes on turns, no mirror check before lane changes, following too close, braking late/hard, stalling on shifting, not yielding at intersections, and rolling stops.

6. Test-Day Logistics

Bring your CLP, ID, and medical card. The skills test is a separate appointment from the knowledge test in most states; the vehicle you test in must be street-legal, insured, and exactly match your license class.

7. If You Fail One Part

You retake only the failed part (state fees apply). Most states allow the retake after a waiting period; practice the failed maneuver specifically before rebooking.

Appendix H: General Knowledge Blueprint (50-Question Map)

1. Vehicle Inspection (GK)

~6-8 questions: pre-trip order, fluids, tires/rims, brakes, lights, coupling basics, and what to do if a defect is found (repair before driving).

2. Basic Control & Shifting

~5-7 questions: smooth starts/stops, gear selection, clutch use, backing safely, and steering technique.

3. Speed & Space Management

~6-8 questions: following distance (1 sec/10 ft, 4-sec rule), safe speed in curves/weather, space to sides and above, and passing.

4. Night & Extreme Conditions

~4-6 questions: low beams, fog, rain/snow/ice, high wind, animals, and slowed reaction at night.

5. Hazardous Materials Awareness

~3-5 questions: placard recognition, the 9 classes, parking and route restrictions, and basic HM safety WITHOUT an H endorsement.

6. Accidents & Emergencies

~4-6 questions: accident procedures, warning-device placement (10/100/200 ft), brake failure, blowouts, and leaving the road.

7. Cargo & Weight

~3-5 questions: tie-downs, load shifting, axle/gross limits, and cargo securement rules.

8. Driver Fitness & HOS

~4-6 questions: medical card, self-certification, alcohol (0.04%)/drug rules, texting/phone ban, fatigue, and the 11-14-30 HOS basics.

9. Road Rules & Communication

~4-6 questions: yielding, railroad crossings, school buses, signaling, and the No-Zone.

10. Total

About 50 questions; passing at 80% (40 correct). Master the blueprint and the real test is familiar territory.

Appendix I: Class-by-Class Road Map

1. Class A Path

Tests: General Knowledge + Combination Vehicles (+ Air Brakes if the vehicle has them, + any endorsements). CLP -> ELDT -> 14-day hold -> skills test on a Class A combination. From there, add endorsements as needed (T, N, H, P, S).

2. Class B Path

Tests: General Knowledge (+ Air Brakes + endorsements as applicable). Skills test on a Class B rig straight truck (not a trailer). Class B is enough for most buses and straight trucks; many drivers start B then upgrade to A by taking Combination + a Class A skills test.

3. Class C Path

Tests: General Knowledge (+ Air Brakes + endorsements). For vehicles that do not meet Class A/B thresholds but transport 16+ passengers OR placarded hazmat (e.g., a 24-passenger van or a small hazmat truck). Skills test on the Class C vehicle.

4. Endorsement Order

Most drivers add T (doubles/triples) and N (tanker) first - cheap, knowledge-only. Then P (passenger) or S (school bus) if driving buses, and H (hazmat) only after the TSA background check and fingerprinting.

5. Dual Endorsements

P + S usually come together (school bus requires the passenger endorsement); H + N are common on tanker routes. Each endorsement is its own knowledge test at 80%.

6. Common Mistakes to Avoid

Booking the skills test before ELDT is verified; skipping the air-brakes test on an air-braked vehicle; forgetting the medical card on test day; driving solo on a CLP; and assuming one high knowledge score offsets another test.

7. Recovery After a Fail

Retake only the failed test after the state waiting period (often 1 day for knowledge, longer for skills). Drill the exact blueprint section you missed (e.g., Air Brake numbers) to 90% twice before rebooking.

8. State Variation

Exact fees, wait periods, appointment systems, and whether tests are computerized vary by state - always confirm current requirements with your DMV/DPS. The FMCSA CDL Manual is the common content source.

9. Final Check Before Booking

1) CLP earned, 2) ELDT completed and TPR-verified, 3) 14-day hold satisfied, 4) medical card current, 5) self-certification filed, 6) vehicle matches class, 7) fees and prepaid endorsement tests settled.

Appendix J: Numbers to Memorize Before Test Day

1. Class A Threshold

Tractor-trailer: GCWR 26,001+ lb AND towed unit over 10,000 lb -> Combination Vehicles test required.

2. Class B Threshold

Single vehicle over 26,000 lb, or same vehicle towing a trailer under 10,000 lb -> no Combination test needed.

3. Class C Threshold

Single vehicle under 26,000 lb that carries 16+ passengers OR requires hazmat placards -> General Knowledge + endorsements.

4. Passing Score Is 80% Per Test

Memorize your exact numbers: GK 40/50, Air Brakes 20/25, Combination & endorsements 16/20, HazMat 24/30. One high score never rescues another test.

5. BAC Limit

0.04% for ALL commercial drivers - half the 0.08% passenger limit. One drink can put a CDL holder over the line.

6. ELDT Timing

FMCSA-registered entry-level driver training required BEFORE the skills test (not the knowledge tests) since Feb 7, 2022, for first-time A/B, B-to-A, and new H/P/S endorsements.

7. CLP Rules

Hold the Commercial Learner's Permit 14 days before the skills test (49 CFR 383.25); valid 180 days (one extension in most states); NEVER drive solo on a CLP.

8. Air Governor Numbers

Compressor cut-in ~100 psi, cut-out ~120-125 psi, low-air warning ~60 psi, spring brakes begin setting 20-45 psi.

9. Stopping Distance @ 55 mph

About 419-450 feet total (perception + reaction + braking) in a loaded tractor-trailer - roughly 6 car-lengths.

10. HazMat Placard Threshold

Any shipment of 1,001+ lb (or any quantity of certain materials) requires placards and the H endorsement adds a TSA background check + fingerprinting.

11. Medical Card + Self-Certification

Interstate drivers must carry a current DOT medical card and file a self-certification (non-excepted interstate, excepted interstate, non-excepted intrastate, excepted intrastate) with the state.

12. Skills Test = 3 Parts

Pre-trip inspection (scored, say it out loud) + basic control skills (backing, offset, parallel, alley dock) + road test. Fail one, retake only that part.

13. Whatever Your State Says Wins

Fees, wait periods, and exact counts vary by state. The FMCSA CDL Manual is the common content source; your DMV/DPS sets the final rules.

CDL Study Guide

185+ high-yield terms and concepts for the Commercial Driver's License knowledge tests - General Knowledge, Air Brakes, Combination Vehicles, and the HazMat, Tanker, Passenger, School Bus, and Doubles/Triples endorsements. Includes the Class A/B/C breakdown, ELDT requirements, the medical card and self-certification, and the 3-part skills test.

Independent study aid - not affiliated with or endorsed by the FMCSA, USDOT, any state DMV/DPS, or any training provider. Verify current requirements with your state and the official FMCSA Commercial Driver's License Manual.