## Cargo Tank Motor Vehicles

**Disclaimer:** This checklist is not intended to be a definitive or exhaustive listing of all statutes, safety rules, regulations or codes that may be applicable. It is intended as a general guideline for assisting licensees and stakeholders in complying with state statutes, the Commission's safety rules and adopted national and federal codes that are specific to CARGO TANK MOTOR VEHICLES. The officially published statute, rule or code shall prevail in the event of a conflict with those referenced in the checklist. The checklist may be used to verify compliance prior to placing equipment in service or for routine maintenance audits to ensure continued compliance with applicable safety requirements.

<table>
<thead>
<tr>
<th>Painting / Lettering / Markings</th>
<th>Code Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Upper $\frac{2}{3}$ of cargo tank painted a heat reflective color</td>
<td>178-337-1(d)</td>
</tr>
<tr>
<td>□ Licensee/Ultimate Consumer Name (2&quot;–each side and rear)</td>
<td>9.211</td>
</tr>
<tr>
<td>□ Nature of contents (2&quot;–each side and each end)</td>
<td>172.328(b)(1)</td>
</tr>
<tr>
<td>□ QT or NQT (2&quot; near nameplate)</td>
<td>172.328(c)(1)(2)</td>
</tr>
<tr>
<td>□ Emergency Shutoff ( $\frac{3}{4}$&quot; letters)</td>
<td>172.328(d)</td>
</tr>
<tr>
<td>□ 1075 placard diamond on point (each side and each end of the unit)</td>
<td>172.504(a)</td>
</tr>
<tr>
<td>□ Placard must be readily visible</td>
<td>172.516(a)</td>
</tr>
<tr>
<td>□ Placard maintained in good condition</td>
<td>172.516(c)(6)</td>
</tr>
<tr>
<td>□ Test Marking</td>
<td>172.516(c)(6)</td>
</tr>
<tr>
<td>P = pressure test (hydrostatic test) – 5 years</td>
<td>180.407(a)(1)</td>
</tr>
<tr>
<td>I = internal visual test—5 years for tanks with manholes</td>
<td>178.337-9(c)</td>
</tr>
<tr>
<td>V = external visual inspection – 1 year</td>
<td>180.407(d)(2)(vi)</td>
</tr>
<tr>
<td>K = leakage test – 1 year (in English with month and year the test was performed in letters 1¼&quot; in height, near the nameplate or forward head)</td>
<td>9.202(c)(1)</td>
</tr>
<tr>
<td>□ Do not fill container if out of test or inspection date</td>
<td>180.407(d)(2)(vi)</td>
</tr>
<tr>
<td>□ Inlets and outlets marked “liquid” or “vapor” except for gauging devices, thermometer wells, pressure relief valves/valves/fill line communicating with vapor space may be marked “spray fill”</td>
<td>178.337-9(c)</td>
</tr>
<tr>
<td>□ Markings required by 49 CFR are legible</td>
<td>180.407(d)(2)(vi)</td>
</tr>
<tr>
<td>□ LPG Form 4 decal properly affixed</td>
<td>9.202(a)</td>
</tr>
<tr>
<td>□ Unit properly registered</td>
<td>9.202(a)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manifest and Discharge Control Documentation</th>
<th>Code Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Amount and type odorant/vapor pressure at 100°F net gals/load temp/specific gravity 60°F Type product/UN# (not required for loads covered by permanent shipping papers per DOT)</td>
<td>9.212(a)-(c)</td>
</tr>
<tr>
<td>□ Odorization-ethyl or amyl mercaptan, thiophane</td>
<td>173.315(b)(1)</td>
</tr>
<tr>
<td>□ Description must be in English</td>
<td>172.201(a)(2)</td>
</tr>
<tr>
<td>□ Emergency response number required</td>
<td>172.201(d)</td>
</tr>
<tr>
<td>□ Hazard class or division</td>
<td>172.202(a)(3)</td>
</tr>
<tr>
<td>□ Material identification number</td>
<td>172.202(a)(1)</td>
</tr>
<tr>
<td>□ Total quantity</td>
<td>172.202(a)(5)</td>
</tr>
<tr>
<td>□ LPG identified as NONCORROSIVE OR CORROSIVE on shipping papers</td>
<td>172.203(h)(2)</td>
</tr>
<tr>
<td>□ Discharge control documentation on unit or in cab</td>
<td>177.840(l)</td>
</tr>
</tbody>
</table>
## CONTAINER AND MOUNTING
- ASME (non-spec) and/or DOT MC 330 or 331
  - 9.4.1.1
- Turnbuckles, tie-down bolts, including stops, anchors or other means to prevent container motion
  - 178.337-13(a)
- Transporting mounting (120° arc)
  - 178.337-13(b)
- Supports and bumpers to be attached to a pad welded to container. No welding directly to the tank
  - 178.337-13(c)
- Remount requiring modification must have approval of design certifying engineer
  - 180.413(d)(1)

## MAINTENANCE
- Corrosion, dents, defects in weld or any condition which might render cargo tank unsafe
  - 180.407(d)(2)(i)
- Damaged or leaking piping, valves or gaskets
  - 180.407(d)(2)(ii)
- Missing or loose bolts on manhole covers or leakage around manhole covers
  - 180.407(d)(2)(iii)
- Nonoperative or damaged emergency devices and valves, including self-closing stop valves, excess flow valves and remote closure devices
  - 180.407(d)(2)(iv)
- Missing or loose bolts, nuts or fusible links
  - 180.407(d)(2)(v)
- Damage or corrosion to all major appurtenances on cargo tank such as suspension system (spring hangers) and those elements of the upper 5th wheel assembly
  - 180.407(d)(2)(viii)
- Maintenance and mounting of lower half of 5th wheel (fish plate) loose or missing bolts, cracks or other defects
  - 393.70(b)(1)(i)
- Maintenance of vehicles
  - 9.204
- Mounting and maintenance upper 5th wheel (rub plate assembly and king pin) loose, missing bolts, cracks or other defects
  - 393.70(b)(1)(ii)
- Fifth wheel assembly, locking mechanism, excessive play between fish plate and rub plate
  - 393.70(b)(2)
- Spring hangers and suspension
  - 396.3(a)(1)

## PIPING, FITTINGS, AND VALVES
- Threaded pipe and fittings must be schedule 80 or better
  - 178.337-9(b)(2)
- Welded or brazed pipe and fittings must be schedule 40 or better
  - 9.4.3.2(7)
- Piping supported/secured against damage from expansion, vibration
  - 178.337-9(b)(4)
- Hydrostatic relief for closed sections of liquid piping hose
  - 173.315(i)(11)
- Vapor and liquid discharge outlets less than 1¼” may be equipped with excess flow valve and manual shutoff valve
  - 178.337-8(a)(5)(i)
- Piping, valves, hoses, fittings must have burst pressure of 4 times container W.P.
  - 178.337-9(b)(1)
- Primary valves and fittings shall be steel, malleable, or ductile iron construction
  - 9.4.3.8
- Pipe, tubing, fittings, flex connectors minimum equipment design pressure
  - 9.4.3.2(8)
- Minimum design pressure and approved materials for valves: shutoff, excess flow, back check and remotely controlled
  - 9.4.3.4(3)
- Liquid discharge valves, except for engine fuel, must be closed while unit is in transit
  - 177.840(g)
- Unused inlet and discharge opening must be closed with a cap, plug or flange
  - 178.337-8(a)(2)
### Valve and Tank Guards
- Metal protective guard minimum $\frac{3}{16}$" thick
- Rear bumper to protect tank and piping
- Pumps protected against breakage by collision, kept in good condition, equipped with bypass
- Valves in tank openings for pump by-pass

### Hose Specs / Flex Connector
- Each delivery hose assembly permanently marked with ID number and maximum W.P.
- Hose assembler must mark hose assembly with month and year of original pressure test
- Operator must assure new or repaired delivery hose assembly is pressure tested and permanently marked with month and year of test
- Hose continuously marked with manufacturer’s name or trademark, 350 WP, LP-Gas, propane, continuously marked
- Manual stop valve required between internal valve and hose connection
- Flex connectors limited to 3 feet
- Rubber flex connections marked as to date of original installation/replaced after 10 years

### Hose Rejection Criteria
- Damage to hose cover exposing reinforcement
- Wire braid reinforcement kinked or flattened
- Soft spots when not under pressure, bulging under pressure, loose outer covering
- Damaged, slipping or excessively worn hose coupling
- Loose or missing bolts or fasteners on hose coupling

### Cargo Tank to Be Removed From Service If Piping Has Any of the Following
- Any external leak identifiable without instruments
- Bolts missing, loose, severely corroded
- Manual stop valves will not actuate
- Rubber hose flex connectors damaged
- Stainless steel connectors with damaged braid
- Internal self-closing stop valves that fail to close or permit leakage detectable without instruments
- Pipes or joints severely corroded
- Unsafe operations forbidden
- Valves in liquid discharge system must be closed, and system free of leaks or the unit must not be driven

### Equipment
- Pumps, compressors, meters, dispensers, regulators, strainers comply with NFPA 58, 6.17
- Installation of liquid meters/protected against excessive strain/flex connectors permitted
- Differential regulator required between pump discharge and hose connection where wet hose is connected during transit
### MISCELLANEOUS
- Fire extinguisher – 18 lb. with B-C rating readily accessible and mounted on power unit \(9.4.7\)
- Visual determination of charged extinguisher \(393.95(a)(3)\)
- Chock blocks to be used when parked or loading and unloading \(9.4.8\)
- No smoking on or within 25 feet of vehicle, points of liquid transfer, delivering or connecting to containers \(9.4.10(1)/397.13\)
- Parking – not on street (with exceptions), not in congested areas, 50 feet from building used for assembly, institutional or multiple residential occupancy \(9.7.2.3/397.7\)
- Electrical wiring in a workmanlike manner \(393.28\)
- Exhaust system – leaking, not secured \(393.83\)
- Tires damaged, flat, bald \(393.75\)
- LP-gas motor fuel system must comply with NFPA 58, Ch. 11 \(393.69\)

### EMERGENCY CONTROL EQUIPMENT
- Each vapor and liquid discharge outlet 1¼" and larger internal valve equipped with manual and thermal remote closure \(178.337-8(a)(4)\)
- More than 3,500 WC installed diagonally opposite – manual and thermal remote shutoff at ends of tank \(178.337-8(a)(4)(i)\)
- Less than 3,500 WC: thermal closure @ internal valve – on-truck mechanical remote closure tank end furthest from transfer connection \(178.337-8(a)(4)(ii)\)
- Non-metered – passive shut down – stop flow without human intervention – 20 seconds – if hose separation \(173.315(n)(2)\)
- Metered delivery – 3,500 WC or less, off-truck remote to 150 feet; close internal valve and stop all motive and auxiliary power – liquid only \(173.315(n)(3)\)
- Compliance dates: passive shut-down on non-metered. Off-truck remote on metered delivery 3,500 WC or less by first pressure test after July 1, 2001 – MC 330, 331, and non-spec – all by July 1, 2006 \(173.315(n)(5)\)
- Metered delivery – More than 3,500 WC passive shut-down and for obstructed views either off-truck remote or query system \(173.315(n)(2)(3)(4)\)
- Compliance date: metered delivery, more than 3,500 WC – by July 1, 2003 \(173.315(n)(5)\)
- Fusible element 250°F or less \(178.337-8(a)(4)\)
- Fusible element for each internal valve \(173.315(p)\)

### PRESSURE RELIEF VALVES (PRV) / LIQUID AND PRESSURE GAUGES / THERMOMETER WELLS
- PRV start-to-discharge, design, constructed and marked for rated pressure not less than tank WP \(173.315(i)(3)\) and \(178.337-9(a)(3)\)
- PRV protected so as to open unrestricted in an overturn on hard surface \(178.337-10(a)\)
- One or more spring-loaded relief valves required \(173.315(i)\)
- PRV requirements: markings, rain caps, communicate with vapor space, etc. \(173.315(i)(1)\)
- Approved liquid level gauges: rotary tube, adjustable slip tube, fixed length tube \(173.315(h)\)
- Dip tube gauging device intake orifice no larger than .060" diameter \(173.315(h)(3)\)
- Pressure gauge opening restricted to .060" diameter \(173.315(h)(4)\)
- Thermometer well/thermometer required if using adjustable liquid level gauge \(173.315(e)\)
- One or more fixed liquid level gauge required \(173.315(h)\)
### DAILY/MONTHLY/YEARLY INSPECTIONS AND RECORDKEEPING

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-transfer safety check of discharge system</td>
<td>177.840(m)</td>
</tr>
<tr>
<td>Monthly inspection or testing recordkeeping by operator for: delivery hose assembly, piping system, emergency discharge system, internal valves, etc.</td>
<td>180.416(d)(5)</td>
</tr>
<tr>
<td>Annual unattached delivery hose assembly test</td>
<td>180.416(e)</td>
</tr>
<tr>
<td>Record documenting test and inspection of new or repaired delivery hose</td>
<td>180.416(f)(3)</td>
</tr>
<tr>
<td>Owner’s record retention: MDR, manufacturer’s certificate, other certification including emergency discharge control systems for the life of ownership + 1 year</td>
<td>180.417(a)(1)</td>
</tr>
<tr>
<td>User’s record retention for use in excess of 30 days: MDR, manufacturer’s certificate, other certification including emergency discharge control system for entire time used + 1 year</td>
<td>180.417(a)(2)</td>
</tr>
<tr>
<td>Test or inspection reporting must be in English, must contain information required in 180.417(b)(1); must be retained until next test or inspection of same type is completed</td>
<td>180.417(b)(2)</td>
</tr>
</tbody>
</table>

### CRYOGENICS UNITS

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>One or more fixed liquid level gauge required</td>
<td>178.338-14(a)(1)</td>
</tr>
<tr>
<td>Pressure gauge required</td>
<td>178.338-14(b)</td>
</tr>
</tbody>
</table>