

Essential to the Safe Fueling and the Control of Fugitive Emissions to meet EPA Requirements for Gasoline or Diesel Powered Vehicles and /or Equipment

Meet EPA 40- CFR Part 89 - "Control Emissions from Non-Road Large Spark-Ignition Engines, and Recreational Engines - Evaporative Emissions"



- Specifically designed to meet the requirements outlined in Section 26 of Standard UL 558 - "Industrial Truck, Internal Combustion Engine - Powered"
- Reduce fire hazards during refueling
- Minimize fuel tank contamination
- Protect against theft or vandalism
- Control fuel tank pressure and vacuum build-up
- Facilitate uniform fuel flow
- Provide spillage and evaporative emission control
- Underwriter' Laboratories Listed, Patent #8,317,049 B2

OBJECTIVE:



The Protectoseal combination safety fill cap, flash arrester and pressure / vacuum relief device is designed for installation in fuel tank openings of gasoline or diesel-powered equipment. The flash arrester keeps a flame from entering the tank, thereby preventing explosion of the confined vapors within the tank. Safety fittings provide sufficient pressure relief to prevent tank rupture and sufficient vacuum relief

to facilitate gas flow from the tank. Spring-loaded, self-closing cap protects against evaporation losses.

CONSTRUCTION FEATURES:

□ Available in various sizes for mounting to standard 1½" through 4" NPS and NPT male and female fill pipe connections, quarter-turn, easy-on flange connections, as well as a variety of common mechanical threads.



- Wide-opening hinge mechanism minimizes interference with nozzles, etc. during fill operations.
- Caps are die cast aluminum or cast brass construction.



□ Each Fuel Tank Safety Cap is designed to accommodate an optional perforated metal flash arrester screen which allows flow of liquid into the tank during filling but prohibits entry of an external flame into the connected fill pipe. Screen also serves as a strainer to prevent particulate matter from entering the tank minimizing fuel contamination.

- Vacuum relief is provided by a resealing vacuum breaker that controls fugitive emissions at positive pressures below the relief setting.
- Padlock opening provides lockability to prevent theft or unauthorized access. Use of padlock does not impair the automatic pressure relief capability of the spring loaded cap assembly.
- Perforated plated steel, replaceable arrester screens are available in straight and/or tapered configurations.
- Durable lead-free finish, color coded to indicate a specific industry standard storage application: Red designates gasoline; Green designates diesel.
- Underwriters' Laboratories Listed, Patent #8,317,049 B2.
- Gasoline / fuel resistant fluoroelastomer compound gasket.
- Self-closing tension spring insures against leaving the tank opening exposed to atmosphere.



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Protectoseal Fuel Tank Safety Caps

EPA Compliance Required January 1, 2007

EPA 40 CFR PARTS 89 et al, pertain to the Control of Evaporative Emissions from Nonroad Large Spark Ignition Engines and Recreational Engines

Overview: This rule addresses air pollution concerns by adopting national standards for several types of nonroad engines and vehicles that are currently unregulated. These include large spark-ignition engines used in industrial and commercial applications such as those used in forklifts, airport ground service equipment and farm equipment. These emission standards and requirements will go into effect for the 2007 model year.

Regulated Entities: This action will affect companies that manufacture or introduce into commerce any of the engines or vehicles subject to the emission standards. There are also requirements that apply to those who rebuild any of the affected nonroad engines. Included among the regulated categories and entities are:

SIC CODE	REGULATED ENTITY
3519	Manufacturers of new nonroad spark-ignition engines, new marine engines
3523	Manufacturers of farm equipment
3531	Manufacturers of construction equipment, recreational marine vessels
3537	Manufacturers of industrial trucks
7699	Engine repair and maintenance

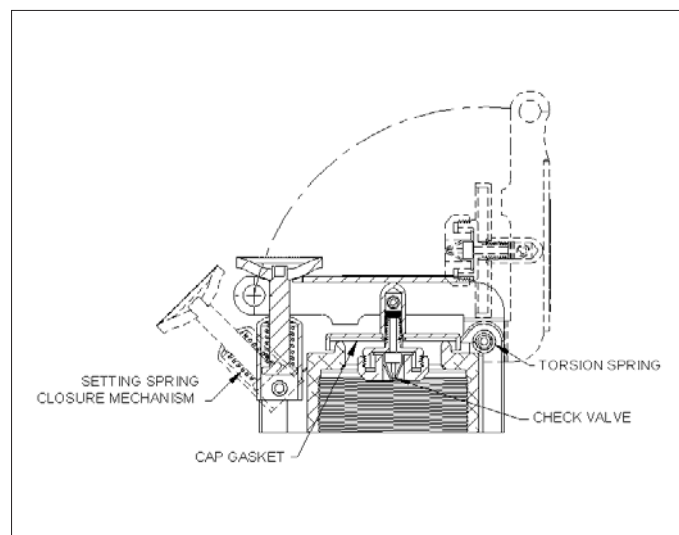
Note: This list is not intended to be exhaustive but rather provides a guide regarding entities likely to be regulated by this action. To determine whether this action regulates particular activities you should carefully examine the regulations.

Evaporative Emissions: Among the sources of emissions included in the regulations, effective as of the 2007 model year, are "evaporative emissions". Evaporative emissions occur when fuel evaporates and is vented into the atmosphere. They can occur while a vehicle is operating and even while it is not being operated. Among factors that may affect evaporative emissions are: 1) the proximity of the fuel tank to the exhaust system or other heat sources; 2) whether the fuel system is sealed; and 3) the pressure at which the fuel vapors are ventilated. Such evaporative emissions can represent a significant part of the overall hydrocarbon emissions from such regulated engines. Engine manufacturers are responsible for ensuring that their gasoline-fueled large spark ignition engines are designed to function within the strict emission limitations specified by the Environmental Protection Agency.

Among the design alternatives available to engine manufacturers in their efforts to minimize emissions is the use of a pressurized fuel tank system. Pressurized fuel tanks help control evaporative emissions by suppressing vapor generation. One key element of such a pressurized fuel system is the fuel cap. The cap must be

able to seal against a defined fuel tank pressure and must also be able to provide some level of vacuum relief (make-up air) as the fuel tank is emptied. In addition, the cap should be self-closing so that the fuel tank is not inadvertently left open to the atmosphere.

Protectoseal's line of Fuel Tank Safety Caps are specifically designed to help engine manufacturers meet the stringent EPA fugitive emission requirements. The caps are available in a number of sizes and styles to meet the fill pipe configurations of large spark ignition engines. When properly mounted and closed the spring-loaded Protectoseal Safety Caps provide an effective seal against emissions (leakage) past the cap gaskets when the fuel tank pressures are as high as 3.5 PSIG. The caps are designed to start relieving at fuel tank pressures between 3.5 PSIG and 4.5 PSIG. At pressures above the set venting point, the caps allow vapors to relieve into the atmosphere - helping to protect engine components against over-pressurization. The cap is also equipped with a check valve that seals against positive pressure but allows the entry of air into the fuel tank should a vacuum develop in the tank's vapor space.



Even if the setting spring closure mechanism is not properly engaged, the Protectoseal Fuel Tank Safety Cap closes automatically by the action of a torsion spring. This eliminates the possibility of the fuel tank being left completely open to the atmosphere. In order to realize the full set point for the safety cap, the setting spring closure mechanism must be engaged.

Protectoseal Fuel Tank Safety Caps are Listed by Underwriters' Laboratories to the requirements specified in Standard UL558 ("Industrial Trucks, Internal Combustions Engine Powered").

Vacuum relief is provided by a resealing vacuum breaker

Cap is die cast aluminum or cast brass construction

Handle facilitates release of compression spring

Padlock opening provides lockability to prevent theft or unauthorized access

Compression spring assures a positive tight seal

Spring loaded cap automatically relieves pressure build-up within the tank



Available in red for gasoline storage or green for diesel storage

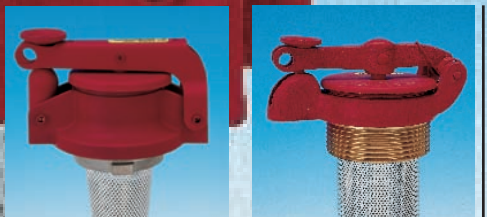
Self-closing cap is hinged for easy opening

Torsion spring keeps cap closed at all times except when filling

Ball and socket joint assures even distribution of spring tension

Replaceable arrester screen is made from perforated plated steel

Flash arrester screens are available in straight or tapered configuration on some models



Available with male threads, female threads or quarter-turn, easy-on flange connections

Flash arrester design quenches flame and prevents ignition of tank contents

Perforations in arrester screen act as strainers to prevent particulate matter from entering fuel tank

**Listed by Underwriter's Laboratories
Patent #8,317,049 B2**

SPECIFICATIONS

Standard sizes are shown in the chart below. If replacement screens are required, please contact factory.

THREADED CONNECTIONS

FEMALE FITTINGS (mate w/ male threads on tank)

Thread	Cap Material	Screen Length / Type	Model No. - Red		Model No. - Green	
			Cap w/ Screen	Cap Only	Cap w/ Screen	Cap Only
1½" NPS	Aluminum	7" / Tapered	1272EPA/7T	1272EPA-39	1272EPAG/7T	1272EPAG-39
2-18UNS-2B	Aluminum	6¾" / Tapered	1256EPA/6.3/4T	1256EPA-39	1256EPAG/6.3/4T	1256EPAG-39
2" NPS	Aluminum	5" / Straight	1273EPA/5	1273EPA-39	1273EPAG/5	1273EPAG-39
2" NPS	Aluminum	6¾" / Tapered	1273EPA/6.3/4T	1273EPA-39	1273EPAG/6.3/4T	1273EPAG-39
2" NPS	Aluminum	8" / Straight	1273EPA/8	1273EPA-39	1273EPAG/8	1273EPAG-39
2" NPS	Aluminum	10" / Straight	1273EPA/10	1273EPA-39	1273EPAG/10	1273EPAG-39
2" NPS	Aluminum	12" / Straight	1273EPA/12	1273EPA-39	1273EPAG/12	1273EPAG-39
2" NPS	Aluminum	12" / Tapered	1273EPA/12T	1273EPA-39	1273EPAG/12T	1273EPAG-39
2" NPS	Aluminum	16" / Straight	1273EPA/16	1273EPA-39	1273EPAG/16	1273EPAG-39
2½-8UNS-2B	Brass	6" / Straight	1265EPA/6	1265EPA-39	1265EPAG/6	1265EPAG-39
2½" NPT	Brass	6¾" / Tapered	1274EPA/6.3/4T	1274EPA-39	1274EPAG/6.3/4T	1274EPAG-39
2½" NPT	Brass	8" / Straight	1274EPA/8	1274EPA-39	1274EPAG/8	1274EPAG-39
2½" NPT	Brass	10" / Straight	1274EPA/10	1274EPA-39	1274EPAG/10	1274EPAG-39
2½" NPT	Brass	12" / Tapered	1274EPA/12T	1274EPA-39	1274EPAG/12T	1274EPAG-39
3" NPT	Brass	8" / Straight	1275EPA/8	1275EPA-39	1275EPAG/8	1275EPAG-39
3" NPT	Brass	10" / Straight	1275EPA/10	1275EPA-39	1275EPAG/10	1275EPAG-39
3" NPT	Brass	12" / Straight	1275EPA/12	1275EPA-39	1275EPAG/12	1275EPAG-39
3" NPT	Brass	12" / Tapered	1275EPA/12T	1275EPA-39	1275EPAG/12T	1275EPAG-39
3" NPT	Brass	14" / Straight	1275EPA/14	1275EPA-39	1275EPAG/14	1275EPAG-39
4" NPT	Brass	10" / Straight	1277EPA/10	1277EPA-39	1277EPAG/10	1277EPAG-39

MALE FITTINGS (mate w/ female threads on tank)

Thread	Cap Material	Screen Length / Type	Model No. - Red		Model No. - Green	
			Cap w/ Screen	Cap Only	Cap w/ Screen	Cap Only
2½-14UNS-2A	Brass	6¾" / Tapered	1257EPA/6.3/4T	1257EPA-39	1257EPA/6.3/4T	1257EPAG-39
1½" NPS	Aluminum	6¾" / Straight	1282EPA/6.3/4	1282EPA-39	1282EPA/6 3/4	1282EPAG-39
1½" NPS	Aluminum	12" / Straight	1282EPA/12	1282EPA-39	1282EPA/12	1282EPAG-39
2" NPS	Brass	6¾" / Tapered	1283EPA/6.3/4T	1283EPA-39	1283EPA/6.3/4T	1283EPAG-39
2½" NPS	Brass	6¾" / Tapered	1284EPA/6.3/4T	1284EPA-39	1284EPA/6.3/4T	1284EPAG-39
2½" NPS	Brass	8" / Straight	1284EPA/8	1284EPA-39	1284EPA/8	1284EPAG-39
3" NPS	Brass	8" / Straight	1285EPA/8	1285EPA-39	1285EPA/8	1285EPAG-39
3" NPS	Brass	10" / Straight	1285EPA/10	1285EPA-39	1285EPA/10	1285EPAG-39
3" NPS	Brass	12" / Straight	1285EPA/12	1285EPA-39	1285EPA/12	1285EPAG-39
4" NPT	Brass	10" / Straight	1287EPA/10	1287EPA-39	1287EPA/10	1287EPAG-39

EASY-ON FLANGE CONNECTIONS (Double Lug - Quarter Turn)

Mounting	Cap Material	Screen Length / Type	Model No. - Red		Model No. - Green	
			Cap w/ Screen	Cap Only	Cap w/ Screen	Cap Only
2¾" to 2½" O.D. 1½" to 1¼" I.D.	Brass	6¾" / Tapered	2073EPA/6.3/4T	2073EPA-39	2073EPAG/6.3/4T	2073EPAG-39
2¾" to 2½" O.D. 1½" to 1¼" I.D.	Brass	10" / Tapered	2073EPA/10	2073EPA-39	2073EPAG/10	2073EPAG-39
2½" to 2¼" O.D. 1¾" to 1½" I.D.	Brass	6¾" / Tapered	2062EPA/6.3/4T	2062EPA-39	2062EPAG/6.3/4T	2062EPAG-39
2½" to 2¼" O.D. 1¾" to 1½" I.D.	Brass	6¾" / Tapered	2068EPA/6.3/4T	2068EPA-39	2068EPAG/6.3/4T	2068EPAG-39
2¾" to 3" O.D. 2" to 2¼" I.D.	Aluminum	6¾" / Tapered	2069EPA/6.3/4T	2069EPA-39	2069EPAG/6.3/4T	2069EPAG-39

