



LIGHT UP FOR FOG

FOG, CREEPING in on cat feet, may seem very poetic, but the trans-continental trucker or European rally driver bucking a tight time schedule doesn't like fog a bit. Neither do police officers who must untangle chain collisions involving half a hundred vehicles or more.

Fog plagues highways on both coasts of the U.S. and in many inland areas. Traffic slows, tempers rise and accidents occur more often when the fog is in.

The problem for drivers is to see through the white stuff in order to stay out of one of those chain accidents and off the sidewalks. Even more important is to protect himself from being rammed.

The ideal solution would be to clear the fog off all the roads. However, years of experimentation and study at airports have not yielded a cheap, easy way to clear fog from thousands of miles of city streets, freeways and country lanes.

The driver who must venture into a fog is still very much dependent on special equipment and tricks which make it easier to live with the fog.

Fog is just water particles suspended in air, nearly the same thing as a cloud. In addition to being cool and damp, fog absorbs a great deal of light and scatters other light in all directions. This makes seeing difficult. A lamp aimed into fog will create light, but most of the light getting back to the driver's eyes is glow from the illuminated fog, not light reflected off the road, signs or other vehicles. Fog doesn't care what color light is used—it is equally opaque to some high frequency radar, visible light and ultra-violet.

Engineering attacks on highway fog have been concerned both with road lighting and vehicle lighting.

Early street lights hung in the middle of the road sent light in all directions. Quite a lot of that light went toward the driver and lighted up the fog in front of his nose. That made seeing anything other than the glow from the street lamp fairly difficult.

Lighting took a major stride when lamps were moved to the edges of roadways. The new lamps were designed to throw a low beam straight across the road with no stray light aimed at the driver's eyes. Because color doesn't matter, engineers concentrated on producing plenty of light. The result is the modern high-powered mercury vapor lamp, with its weird greenish light, so common on recently

constructed highways and urban streets.

The driver must leave street lights up to the highway department, but his own equipment is his own concern.

Primary hazard in fog is being struck from behind. If a driver can't see, he can stop, but that doesn't do anything about traffic coming from behind.

If the car already has large, brilliant taillights and a 12-v. electrical system, the owner's main concern should be to keep lenses clean and unbroken, wires in good shape, bulbs actually working and sockets clean.

If the owner doesn't have an outstanding taillight system and must travel in fog, he should consider adding a pair of auxiliary taillights.

In clear weather large taillights are desirable. They are easier to see. In fog, any taillight looks big from a few yards away, and the best bet for economy and style probably is a truck marker light, "beehive" or similar type. A pair of the handsome chromium plated ones, such as Signalstat's ultra fancy E13M1r is fine.

The chromium reflector inside the lamp makes the light a little brighter so don't skimp on style.

Put in the largest bulb the law allows. Four candlepower is legal everywhere because it is the standard 12-v. taillight. Bulb number is 67 in 12 volts.

Better is six candlepower, bulb No. 89. That should be legal most places, but not everywhere. Best would be 15 candlepower, a bulb coded 93 in the 12-v. size, if legal.

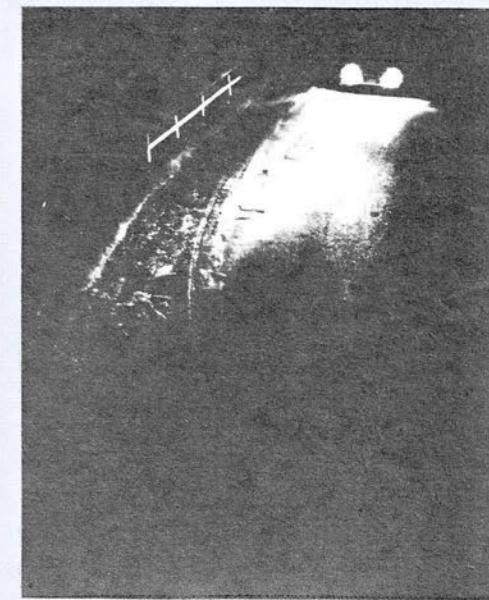
THEN MOUNT THE lamps high and wide. On top of fenders, if possible, to get them above the glare from the headlights on a car behind. The wide mounting is to keep cars out of the trunk. Putting the lights close together near the center of the car makes other drivers think the car is farther away than it really is—until too late.

With the larger bulbs, wire the new lamps to operate only when the foglights are on. They would be mighty bright on a clear night.

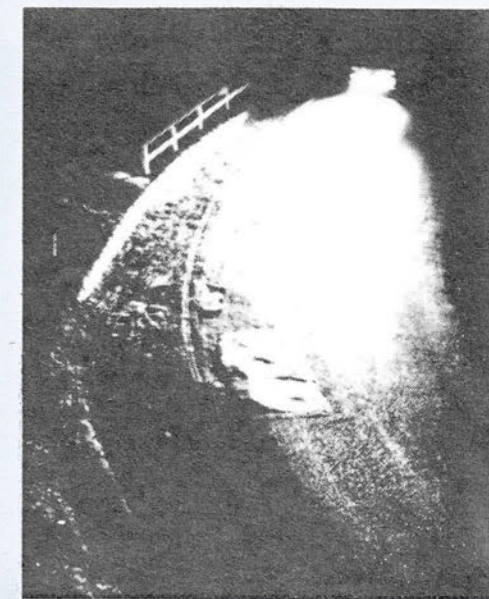
And don't cheat on the wiring. For 12 volts, use 14-gauge wire, even though 16 is cheaper. The larger diameter wire will permit full current flow to the bulbs and they'll burn a little brighter.

For seeing through the fog, it's what's up front that counts.

Good foglights can help. Back glow, the reflection off the fog



NORMAL LAMPS fail to penetrate dip as car breaks over a rise, above, but vanned auxiliary lights beam illumination downward, below.



which obscures the road, is at a minimum if the lamps are aimed straight across the driver's line of sight.

Mounting the foglights on long poles in front of the vehicle so they can go across the driver's line of sight is impractical. But they can be mounted as low as possible and as far out at the edges of the vehicle as possible.

Truck drivers sit high enough to be above most back glow from lights hung under the bumper. Sports car drivers can't get them much below eye level, but they can mount the lamps far out at the sides.

Foglights should be aimed a bit toed in, or cross-eyed. That way more back glow goes beside the driver instead of at him.

What lights to use? A decade ago that was simple. Only two sizes of fog-

Some New Illumination on an Opaque Subject

BY MARTIN ALLAN JACKSON

LIGHTS

lights, in barely half a dozen styles, were on the U.S. market in quantity. They were so much alike a prospective buyer could flip a coin or shop for the best price.

First important new arrivals came from Europe. The Lucas lamps use a huge bulb shield and block lens to give a broad fan shaped beam with a sharp cutoff at the top of the beam. The Marchal line is similar in results. Those pioneers from Europe have now been joined by a half dozen other brands, all similar in effect.

U.S. truckers travel more miles in fog than anybody and they've developed some good equipment of their own.

First was the brute force approach.

In thin fog, aircraft landing lights sometimes used as high-speed lights throw enough light for the driver to see in spite of back glow.

Second was the use of spotlight bulbs. Spotlights have narrow beam patterns with only a little light outside the pattern. A pair of spotlights aimed down at the road turned out to give a lot better seeing distance than standard foglight bulbs. They were cheap and easy to replace.

And a pair of spotlight bulbs aimed down toward the road 200 ft. in front of the car or truck still is a pretty good fog lighting system. Spotlight bulbs with a filament cap, a metal cup shielding the front of the filament, have as sharp a beam edge cutoff as most good foglights.

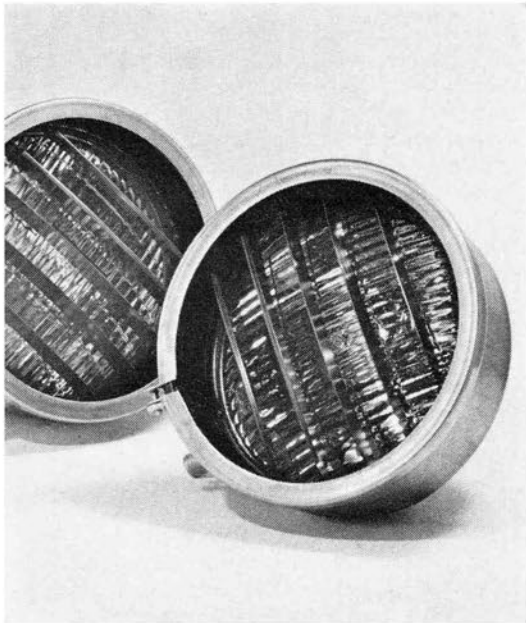
Today a third system has taken the trucking industry by storm. The new system is the vaned foglight.

A big, hot, broad beamed bulb is



RAYDYOT QUARTZ-iodine lamps are distributed by Vilem B. Haan Inc., P. O. Box 54, Beverly Hills, Calif. The Raydyot lamp concentrates high intensity light in a circular pattern as is shown in the **CAR LIFE** test photo, below.





TRUCK STYLE Per-Lux Weather Lights, sold by Light Distribution Inc., P. O. Box 634, West Covina, Calif., are special sealed beam units, vanned to trim beam tops, as test photo shows, to prevent blinding of oncoming motorists.

sunk into the back of an extra deep housing. Horizontal metal vanes are put in front of the bulb, directing the light down on the road and cutting off nearly all stray light going upward.

In light fog the driver who approaches a truck using these lamps can't even see a glow from the lamps. Little light escapes toward the eyes of oncoming drivers. The beam top is cut off, as if with a ruler.

With no light going upward, there is very little back glow and trucks can roll 35-40 mph in fogs which once would have held them to 15-20 mph. So the Per-Lux weather light, the vanned foglight, is on nearly 80% of the highway freighters in some heavy fog areas.

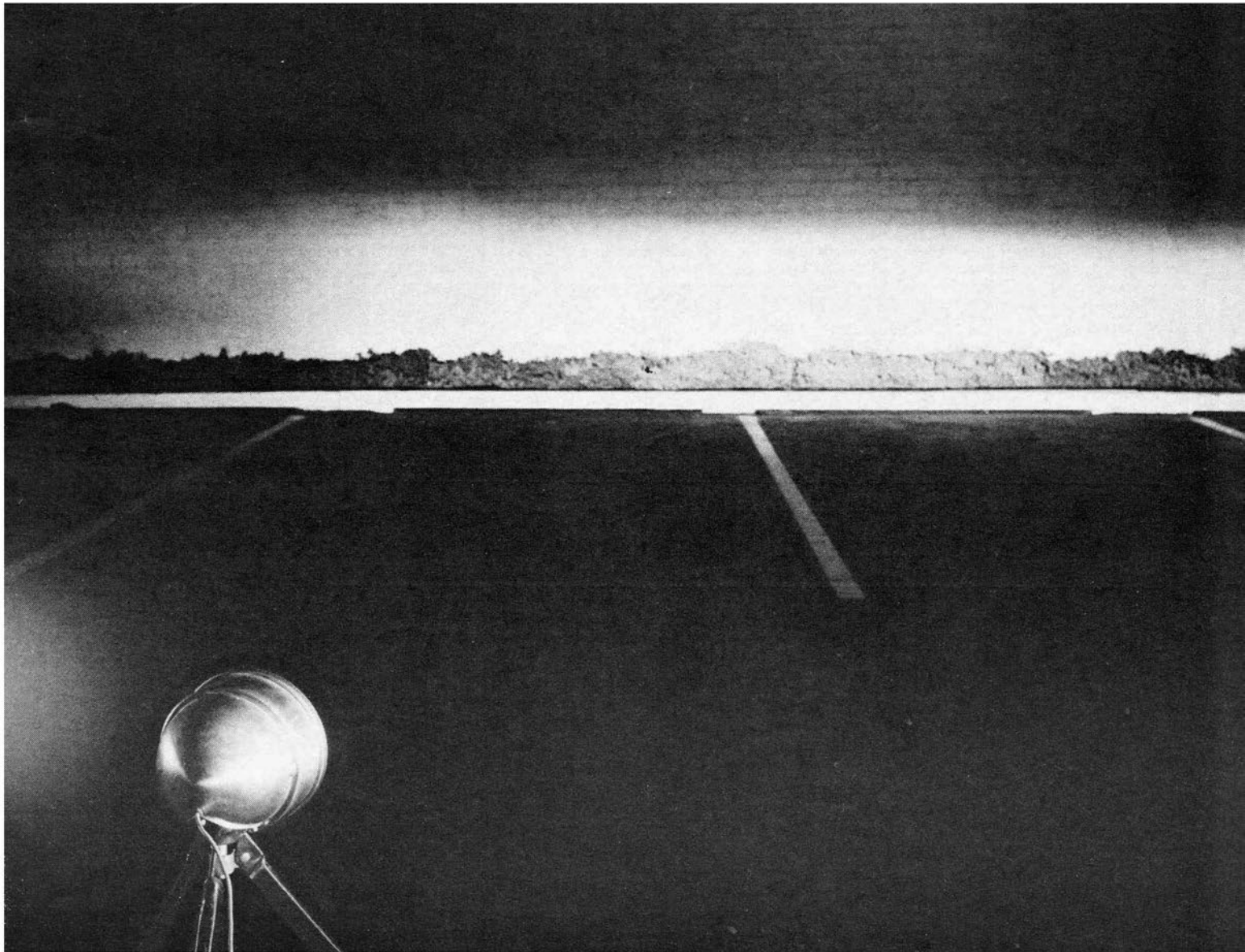
The weather light is fairly large for passenger cars—6 in. deep and nearly 8 in. high. African Safari Comets used them a year or two ago and a few other passenger car installations

can be seen, but they aren't very attractive.

For frequent fog drivers today, only three systems really are worth consideration. In light fog the spotlights aimed low probably have an advantage as fill-in lights used with headlights. The best (and most expensive) European foglamps are bright enough to be used alone in dense fog. However, the vanes of Per-Lux lamps make them the best in the real pea soup fog, if one doesn't mind their looks.

In any case, white lamps, not yellow ones, should be used. Fog doesn't care about color and the yellow lenses cut down light output.

A new development, still not readily available in the U.S., is the "Iode." That slang term, from European rallying, refers to a lamp using a tungsten filament at very high temperature inside a small quartz bulb containing a trace of iodine.



LIGHTS

The quartz-iodine bulbs don't get black on the inside as do high temperature lamps such as aircraft landing lights. Those landing lights start getting black inside in an hour or two and have a life expectancy of only 6 to 12 hours. But the quartz-iodine bulbs can run even hotter, put out more light and don't get black. They last well, too. As foglights, they are a return to the brute force approach.

Perhaps someone someday will combine the Per-Lux vanes with the quartz-iodine bulb in a lamp small enough for passenger cars.

But the real hope from the Iodes is in another direction.

Polarized lamps and a polarizing visor or viewing filter in the cab add up to a major reduction in back glow problems. Polarized light bouncing off fog doesn't change polarization, but when the light bounces off a solid object, some of it does change polarization. If the filter in the cab is crossways of the lamp filter, most of the light getting through is from solid objects such as the road, slow moving trucks and the like.

There are some other requirements. The plane of polarization of the lamp

filter, for example, should pass through the center of the lamp and through the driver's eyes. And lamps should have fairly narrow beam patterns, because wide ones lose the advantages of polarization.

Polarization, however, allows only 40% of source light to be transmitted. Until now 60% has been too much light to give up. Iodine cycle lamps promise fantastic amounts of light. So 60% could be given away and still leave enough to see with.

One trouble is that most of the 60% turns into heat in the polarizing filter on the lamp. For a good bright iodine cycle lamp, the filter would be required to dissipate the heat of a 100- or 150-watt room heater. If the cooling problem is solved, those quartz-iodine lamps could turn out to be the source of light for a much improved fog lighting system for automobiles.

AND MAYBE SOME genius will develop a good \$50 radar set one of these days—one working on a frequency too low to be bothered by fog.

Until then, car owners will have to make do with what is available.

Lights are the major items of fog equipment. But in heavy fog, a worn out set of windshield wipers smearing up the glass can make the best lights nearly useless. Wiper blades are cheap and easy to replace, too.

Driving technique plays a part, too.

First thing a driver must do is to choose a safe speed for his car.

If a driver wishes to determine if 45 mph is safe in a particular light fog, he should choose a moment when nobody is behind his car, then pick the farthest white lane stripe he can see and try to stop before he reaches it. If he can't stop well short of the stripe, imagine what would happen if a fog-gray painted jalopy with no lights was parked by the stripe. It would be harder to see than the white stripe and when he sailed past the stripe, he would be sailing through the parked car.

If the car can stop with plenty of space to spare in front of the test target, then a safe speed has been chosen. That should be top speed until the fog thins out. If traffic is moving more slowly, however, the traffic speed should be maintained. If other cars will permit, a driver should stay far enough behind the car ahead so he can't see it, but can see its lights. That way, if the leading car stops he can stop, too, and still leave room to move up a little for somebody behind who needs an extra few yards to stop.

When forced to stop, it is best to pump the brake pedal or turn on the emergency warning system to flash both rear lights at cars approaching until they have stopped. A blinking brake light gets more attention than taillights or steady brake lights.

STANDARD SEALED beam headlamps, even on low beam, (A) project light upward with pronounced back scatter. Spotlights (B) project narrow, sharp-edged beam with less scatter. Modern foglights (C) project flat-topped, low, broad beam.

