FUEL SUPPLY

Homologation regulations regarding fuel supply - and, in particular, concerning fuel tanks - changed during 1987. The following now applies:

For Group N cars, the standard pump and supply line layout must be retained. Different safety tanks, however, may be used.

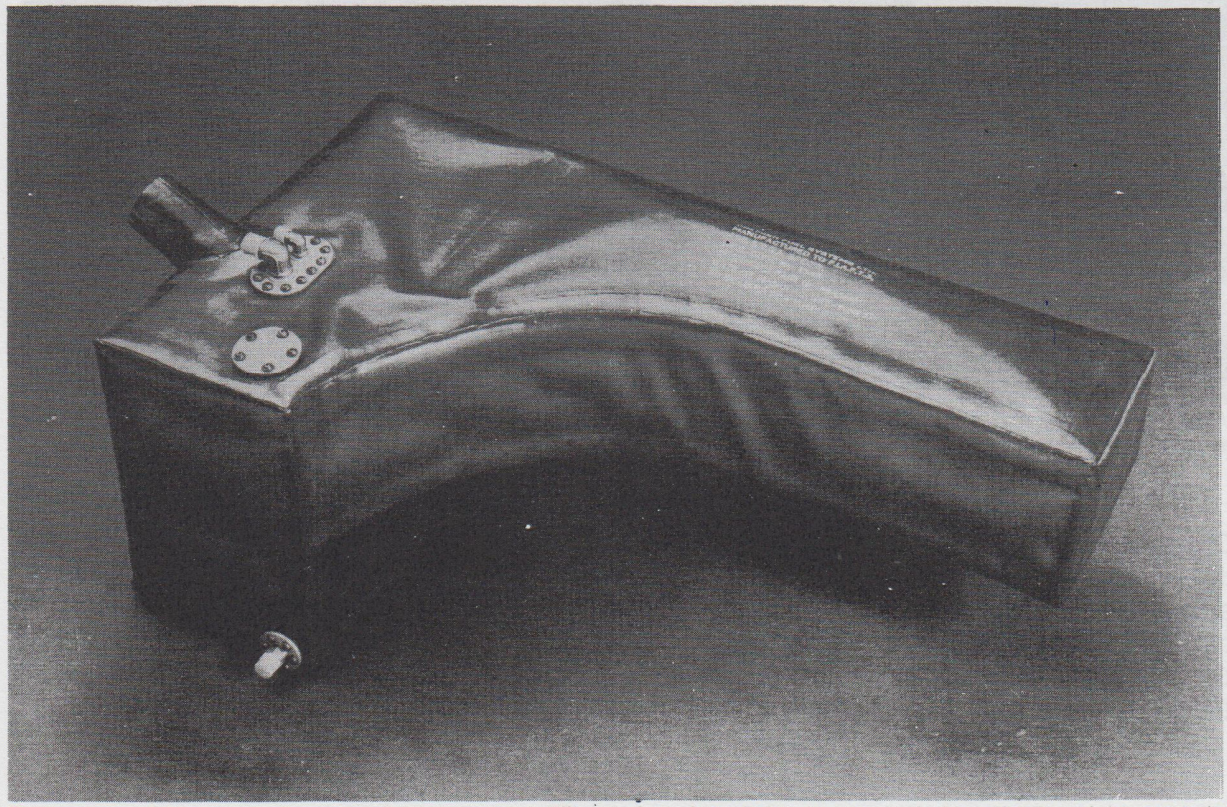
For Group A cars, alternative fuel tanks and different supply circuits may be fitted.

Group N cars: Either the standard 14.3 galls/65 litre fuel tank may be retained, a foam-filled version of that tank may be used, or a rubber bag tank may be substituted.

If the standard tank, or its foam-filled equivalent, is retained, it should always be shielded from possible damage (see **Skid Shields**). In addition to the normal skid shield, we recommend that a guard be fitted to stop the right-side rear wheel throwing stones at the front of the tank.

The foam filled tank (Finis Code: 9092452) not only provides enhanced protection against fire, but it also helps minimise fuel swirl in the tank when the car is changing direction. This tank is also eligible for Group A use.

Although the use of a rubber bag tank (Type FT3) is authorised, there are complications. The tank and its supply pipes must be connected to the standard fuel pump and fuel line system. The tank must also be sealed off from the rest of the passenger compartment; this adding weight to the assembly. Fuel lines must be changed for aviation type lines if an FT3 tank is used, the route of these lines being free. (Should a series production tank be used, this change is optional). The cutting of a new fuel filler access in the bodywork, on the side of the car, is authorised.

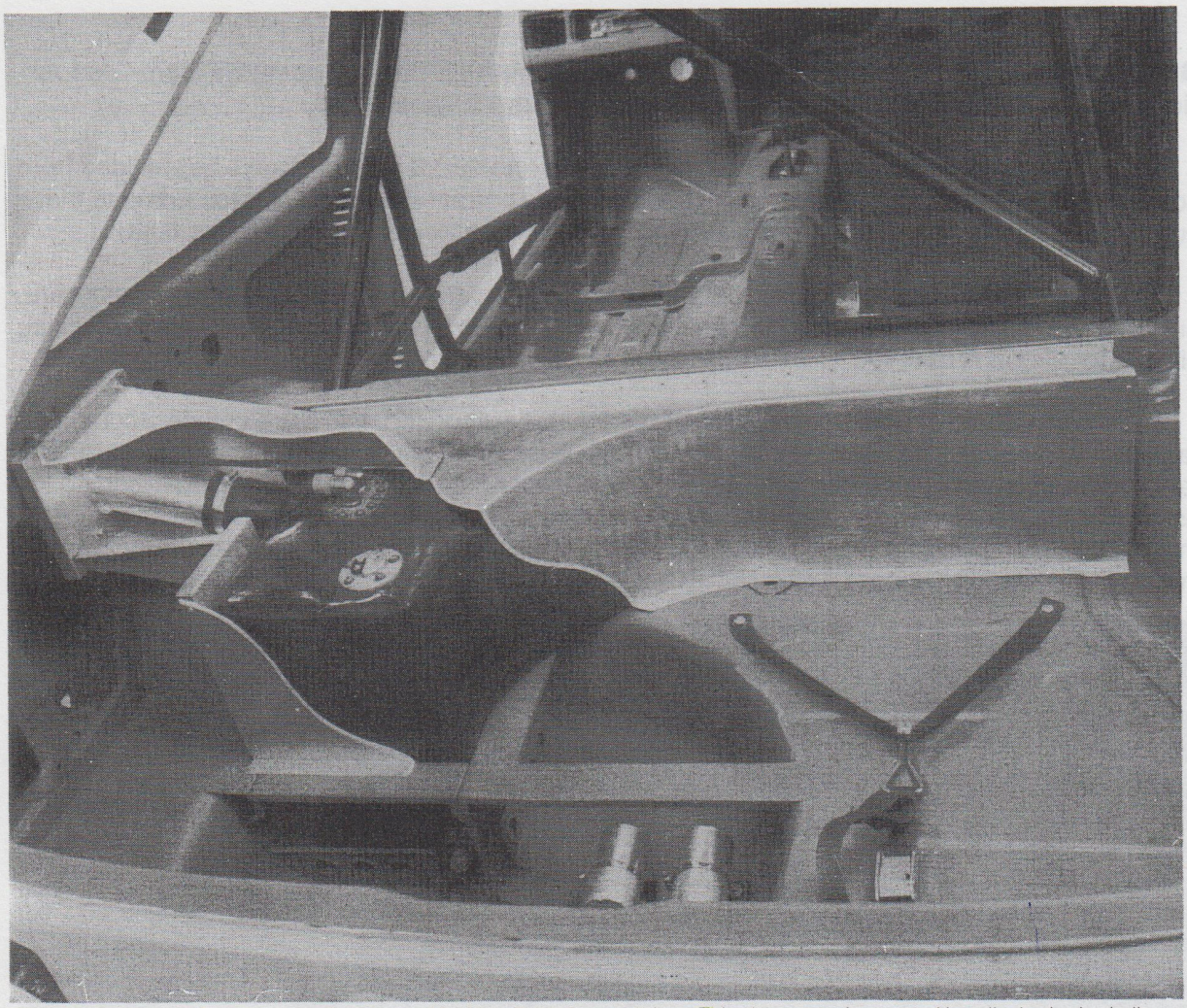


Rubber bag safety petrol tanks are available in several different sizes, intended to be mounted above the line of the rear axle.

Group A cars: For any of the SIERRA models used in motorsport, Ford has developed special installations, incorporating a foam-filled rubber bag tank mounted inside the rear of the car (but sealed off from the passenger compartment), along with double high-pressure pumps and filters. Details of the installation and the recommended 'plumbing' of the system, are shown in the accompanying diagram.

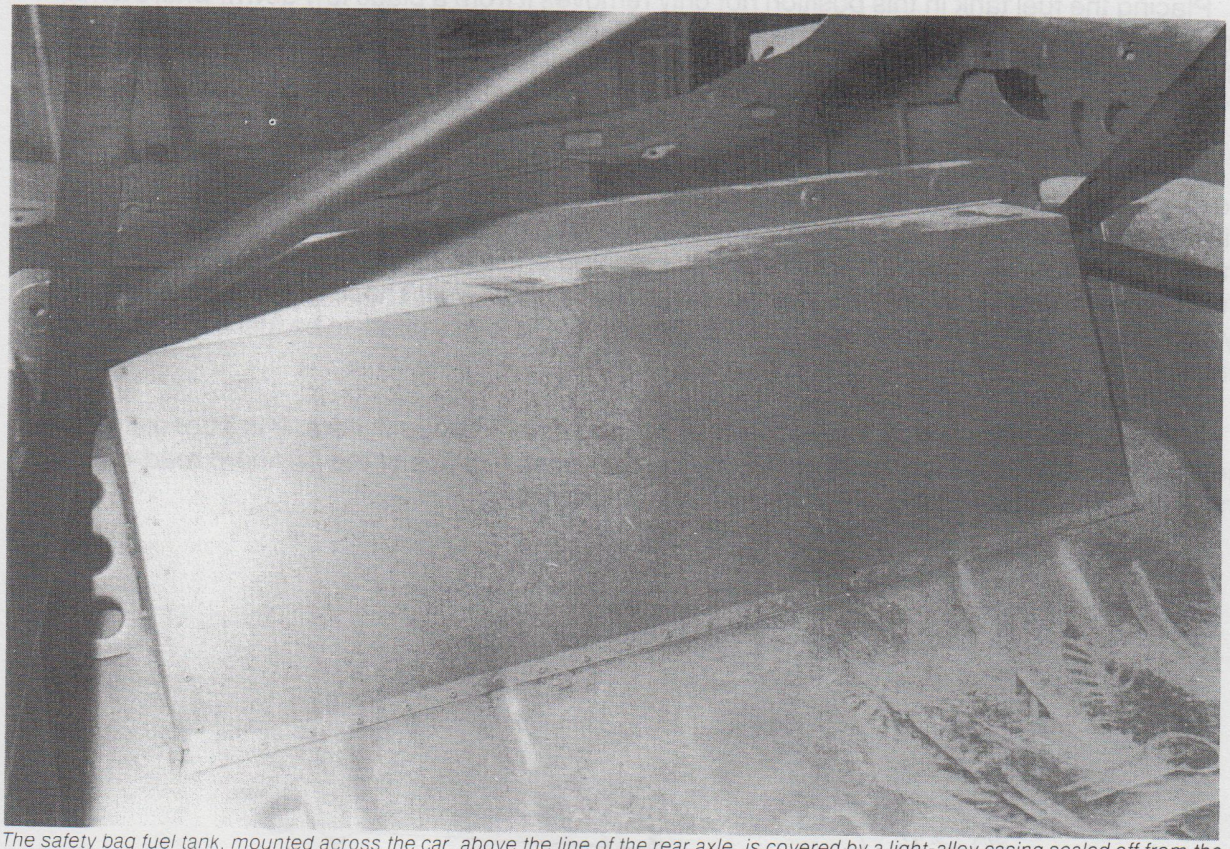
Several capacities of foam-filled rubber bag tanks are available. The smallest tank is intended for short races, or for rallies where there is ample opportunity to refuel. The largest tank is intended for use in long-distance events, or for very long-distance rallies where there is little opportunity for service or refuelling.

In each case, the bag tanks are intended to be mounted inside the body shell, above the line of the final drive and drive shafts, between the rear damper pillars, behind the line of the rear seat position (this is because of FIA homologation requirements specifying an acceptable location).

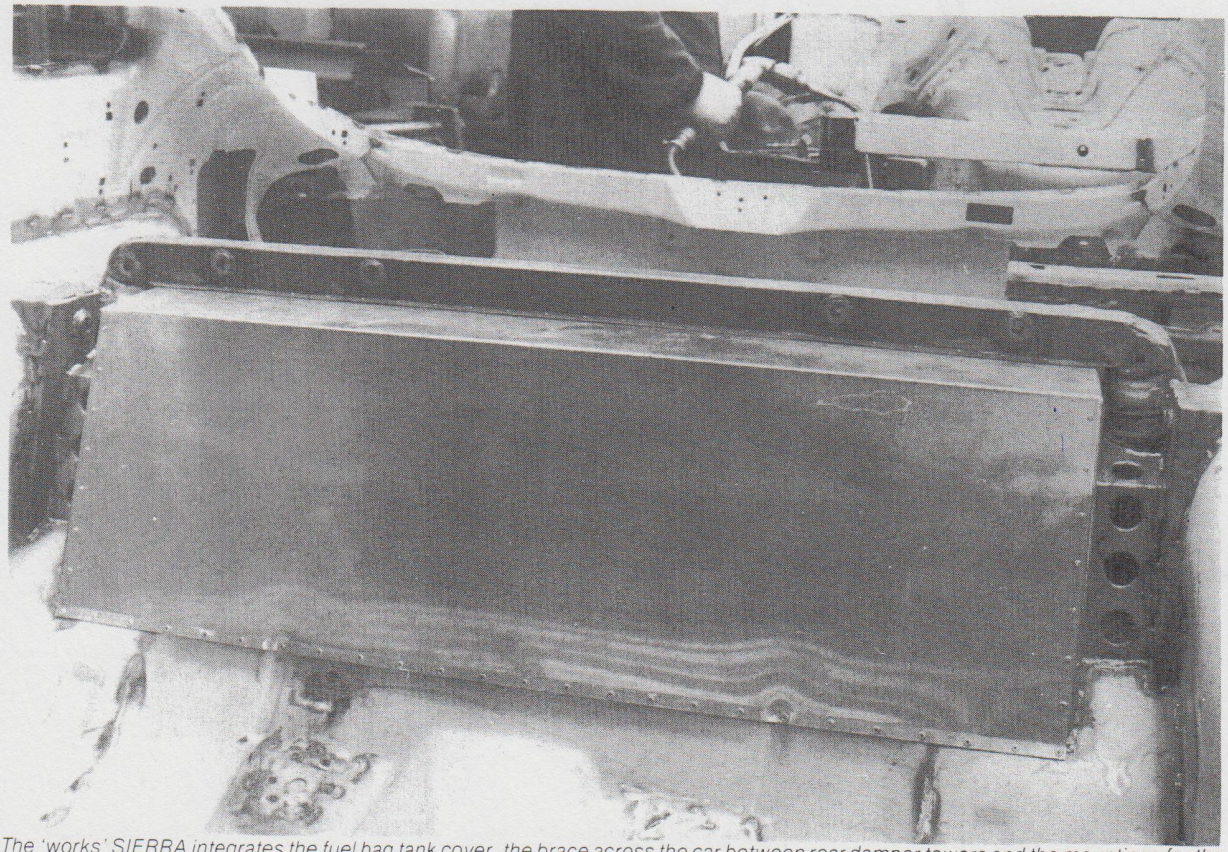


If fitted, a rubber bag fuel tank must be mounted inside a light alloy container. This shows a tank mounted in a display body shell, supported on a bracing structure placed inside the spare wheel well.

This must be mounted in a light-alloy metal container (this is not sold by the Motorsport Parts Division), which completely isolates it from the passenger compartment. In the 'works' rally cars, this container has been integrated with the cross-bar between the rear damper towers, which also acts as a pick-up point for safety belt mountings. The tank's filler neck points to the left side of the car. It is necessary to cut an access hole for the filler neck, into the left side of the body shell, under the rear quarter window. For safety reasons, the snap action filler cap should be recessed inside the plane of the rear quarter panel, so as to minimise chances of damage in an accident.



The safety bag fuel tank, mounted across the car, above the line of the rear axle, is covered by a light-alloy casing sealed off from the interior of the car.

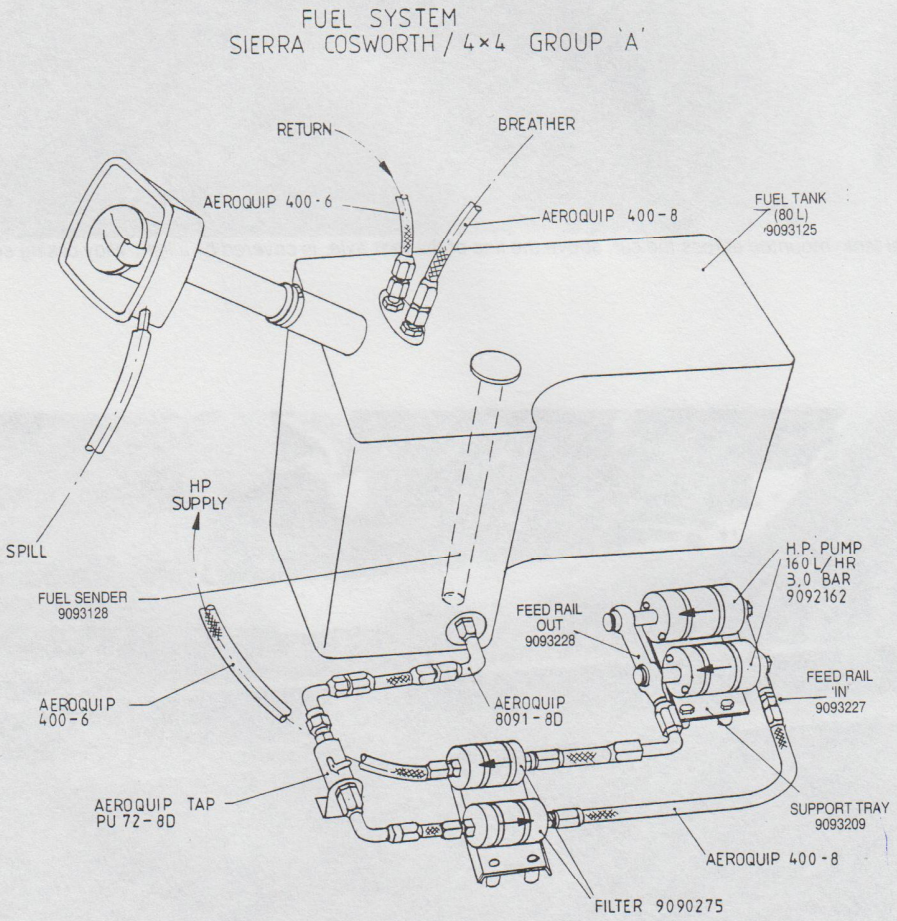


The 'works' SIERRA integrates the fuel bag tank cover, the brace across the car between rear damper towers and the mountings for the full-harness safety belts, into one neat assembly.

Placing the fuel tank in this position not only removes it from a place low down, where it might suffer from impact or accident damage, but it also places it squarely over the rear wheels where the effect on weight distribution between full and empty tank is minimised. Note, for instance, that 80 litres of petrol weighs 63kg/140lb.

Many Group A SIERRA models have their spare wheels mounted on pylons ahead of the line of the rear suspension, inside the passenger compartment, to improve the car's weight distribution. If this has been done, the original spare wheel well (which must not be cut out, or modified) is left empty. For a Group A fuel system, therefore, it is recommended that twin high-pressure fuel pumps and twin filters should be grouped together in the spare wheel well. These should be covered over by a lightweight top to the well itself. This top should have its joint sealed, to be fuel and flame resistant.

Although the standard tank position may be retained in Group A cars, it is strongly recommended that the foam filled variety of tank should be fitted in place of the standard road-car tank and that it should thoroughly be protected by skid-shielding.



Recommended fuel system for SIERRA models, using the spare wheel well to instal filters and pumps.

EXHAUST SYSTEM

Recent changes in Homologation regulations have provided more freedom for Group N cars. As far as Group A cars are concerned, exhaust systems are free, provided they meet all relevant noise and outlet positioning requirements.

Group N cars: The standard road-car system must be retained from the engine exhaust manifolds to the front of the first silencer. The exhaust exit must be situated in the same place as that of the standard production car. Silencers are free, but the maximum dimension of the exhaust pipes must be those of the pipe joining the engine to the first silencer. No bodywork modifications are allowed.

When modifying the system for Group N use, be sure to check that newly-designed and/or re-aligned sections (particularly those passing close to the drive shafts, wheels and the semi-trailing arms of the rear suspension) have been provided with shielding and suitable skid-plates to protect them against damage from flying stones, debris or damage from rough tracks.

Group A cars: If the engine has been tuned to take full advantage of Group A regulations, it will not only produce more power and torque than standard, but there will be an extra volume throughput of exhaust gas from the engine. It is essential, therefore, that the exhaust system is compatible with the improved power output and gas generation capacity of the engine.

This is particularly crucial in the case of the SIERRA RS/RS500 COSWORTH models, which have turbocharged engines. Excessive exhaust-gas back pressure will affect the performance of the exhaust driven turbocharger itself, which will in turn reduce the power which the engine can develop.

Please note, too, that air leaks in the exhaust system, down-stream of the turbocharger, tend to cause surging and shock waves in the turbocharger itself. Such derangements eventually destroy the thrust bearings in the turbocharger.

In Group A cars, the exhaust system is free and may be completely re-aligned if necessary. However, no matter where or how the tail pipe has been relocated, it must not protrude outside the perimeter of the car when viewed from above. Please note that homologation rules also state that the car's floorpan may not be remodelled to allow the exhaust system to be carried higher off the ground (this applies especially to cars being used in gravel or rough-road, rallying or rallycross).

For the SIERRA RS COSWORTH, two different types of stainless steel exhaust systems are available - one exhausting to the rear of the car, the other exhausting under the right-side passenger door. Basically, these have a 3 in/7.6 cm internal pipe diameter from the turbocharger to the exhaust exit. The rearward-exiting system has a flattened, oval section over the area of the rear suspension. Noise levels are not a problem with the SIERRA RS COSWORTH and one expansion chamber is sufficient for silencing purposes. Check noise levels before each event, as 'old' units may exceed the allowed noise levels.

Be sure to check with your own national scrutineer, in whichever country you intend to compete, before fitting the side-exhaust system. The advantages of this system are that it is shorter and lighter than the full-length system and has different torque characteristics; the disadvantage is that it is not 'road-legal' in all countries.

SIERRA XR4 × 4: At this time, the Motorsport Parts Division does not market special exhaust systems for fully-tuned V6 engined XR4 × 4s.

These, however, are the basic dimensions used in the 'works' rally cars during 1987 and 1988:

The primary downpipes, attached to the exhaust manifolds, should be 'coned out' over a short distance, to mate with 60 mm/2.375 in. internal diameter pipes. The pipes from each branch should then be joined together at a system length of 1200mm/47 in., as measured from the **exhaust port face** of No. 1 cylinder. The tail pipe should be of 76.2mm/3 in. diameter.

Such systems should always be used where the 2.8 litre engine has been tuned to produce 200 bhp or more.