ABSTRACT

The present invention provides an intercooler tank for an automobile engine bay, said tank having an enclosed volume bounded by tank walls with an upper portion having a filling port which can be closed by a cap, and an inlet port and an outlet port, said tank being characterised by having a tapering cross section or profile which taper in at least two directions.

AN IMPROVED INTERCOOLER TANK AND OR RESERVOIR

Field of the invention

[001] The present invention relates to an improved intercooler tank and or reservoir, that has been found to be particularly useful in improving the reservoir capacity of an intercooler system and thus of the functioning of the intercooler system per se.

Background of the invention

[002] Prior art intercooler tanks, such as those as illustrated in Figures 9 to 11, generally can be described to have, when in an in use orientation as illustrated in Figure 9, a generally rectangular based construction, that is, if a series of horizontal sectional planes are taken through a number of height locations through the tank of figure 9, then the cross sectional plane will generate a square or rectangular profile.

[003] Any reference herein to known prior art does not, unless the contrary indication appears, constitute an admission that such prior art is commonly known by those skilled in the art to which the invention relates, at the priority date of this application.

Summary of the invention

[004] The present invention provides an intercooler tank for an automobile engine bay, the tank having an enclosed volume bounded by tank walls with an upper portion having a filling port which can be closed by a cap or other closure means, and an inlet port and an outlet port, the tank being characterised by having a tapering cross section or profile which taper in at least two directions.

[005] The tank can be convergent or convergingly taper in a rear to front direction in plan view.

[006] The tank can be convergent or convergingly taper in an upper to lower direction.

[007] An upper portion of the tank can be convergent or convergingly taper in one or two sections, from the front to rear of the tank when viewed from a rear view.

[008] The base of the tank can be of a truncated triangular surface.

[009] The inlet port can be located at an upper region of the tank.

[010] The outlet port can be located near to a base of the tank.

[011] The truncated triangular surface can include the outlet port.

[012] The inlet port and the outlet port can have an associated barbed hollow through spigot to allow connection of respective hoses.

[013] The tank can have a capacity of approximately 9 to 12 litres.

[014] The external surfaces of the tank can have insulation panels applied to them.

Brief description of the drawings

[015] A detailed description of a preferred embodiment will follow, by way of example only, with reference to the accompanying figures of the drawings, in which:

Figure 1 illustrates a rendered rear and lower perspective view of an embodiment of an intercoooler tank;

Figure 2 illustrates a rendered underneath perspective view of the intercooler tank of Figure 1;

Figure 3 illustrates a rendered plan view of the intercooler tank of Figure 1;

Figure 4 illustrates a rendered rear side upper perspective view of the intercooler tank of Figure 1;

Figure 5 illustrates a drawn plan view of the intercooler tank of Figure 1, prior to assembly with a fittings and cap;

Figure 6 illustrates a drawn underneath view of the tank of Figure 5;

Figure 7 illustrates a drawn front side view of the tank of Figure 5;

Figure 8 illustrates a drawn right side view of eth tank of Figure 5;

Figure 9 illustrates a drawn right side view of a tank of the prior art;

Figure 10 illustrates a rendered underneath view of the tank of Figure 9;

Figure 11 illustrates a rendered right side underneath perspective view of the tank of Figure 9;

Figure 12 illustrates the tank of figures 1 to 8, positioned in an engine bay of a motor vehicle.

Detailed description of the embodiment or embodiments

[016] Illustrated in Figures 1 to 8 and 12 is an intercooler tank 10 for an automobile engine bay. In general terms the tank 10 has an enclosed volume bounded by tank walls 12, 14, 16, 18, 20, and 22 with an upper portion having a filling port 28 which can be closed by a cap 28.1 or other closure means, and an inlet port 26 and an outlet port 24. The tank 20 as best illustrated in Figures 2, 3 and 4 has a tapering cross section or profile which tapers in at least two directions.

[017] The tank 10 is converegent, or convergingly tapers, in a rear to front direction in plan view, and simultaneously tapers converging in a left hand side to right hand side direction, as is also visible in the plan view of figures 3 and 5.

[018] The tank 10 is also convergent, or convergingly tapers, in an upper to lower direction as is best seen from Figure 4, and this is achieved in part by the stepped left hand side panel 14, which has an upper portion 14.1, an angled portion 14.2 and lower portion 14.3 which results in the width at the top being wider than the width at the bottom as illustrated in Figure 4.

[019] As is also best illustrated in Figure 4, the upper section of the tank 10 has its upper portions of the tank which are convergent, or convergingly taper, from the surface 18 by the surface 18.1 being angled and decreases the height of the tank 10, from the middle of the tank 10 to the right hand side extremity, being right to left when viewed from a rear view as in Figure 4.

[020] As is also best illustrated in Figure 5, the upper section of the tank 10 has its upper portions of the tank which are convergent, or convergingly taper, by the surface 18 and the surface 18.1 being convergent, or convergingly tapered or angled which decreases in front to rear depth, when viewed in the plan view of Figure 5, from the left hand side to the right hand side of the tank 10, when viewed from the front when in use.

[021] In use the upper surface 18, which contains the filling port threaded spigot to receive the cap 28.1, will generally be in a generally horizontal direction, with every other surface taking its orientation from this surface 18.

[022] The base of the tank 10 has a truncated triangular surface 16 in which is mounted the outlet port 24. It will be noted the that the outlet port spigot as best illustrated in Figure 2, is at an angle of approximately 20 to 30 degrees to the planar surface 16.

[023] The inlet port 26 is located at an upper region of the tank 10 as best illustrated in Figure 1 and 8.

[024] The inlet port 26 and the outlet port 24 each have an associated barbed hollow through spigot to allow connection of respective hoses.

[025] Preferably the tank 10 has a capacity of approximately 9 to 12 litres, and more preferably an enclosed volume which holds of the order of 12 litres of coolant.

[026] The tank 10 is preferably constructed from aluminium sheets of 2mm to 3mm thick, with all seams or edge joins being welded so as to fully seal the joins. Additionally the spigots associated with the cap 28.1 and the ports 24 and 26, are also of barb ended aluminium tubing which is also welded and sealed to the respective tank 10 walls. While the tank 10 is preferably made from aluminium, it will be understood that the tank 10 can be made from integrally formed by injection or blow moulding from polyethylene, or made from components or parts which can be plastic welded together to form the tank 10.

[027] As the tank 10 will have coolant in use, which is maintained at a relatively cool temperature by the intercooler, in some climatic conditions this will lead to condensation forming on the outside of the tank 10. To assist in the prevention of this, the surfaces of the tank 10 can have applied to them foam or other types of insulation sheets, such as the ones covering the surfaces 18 and 18.1 in Figure 12. Such insulation sheets can be pre-cut to the shapes of the panels of the tank 10, and applied by the installer at installation or preparatory to installation. Alternatively they can be applied to the tanks 10 at the factory. Preferably foam insulation is used which is a peel and stick type foam where it is cut to shape then users peel off the protective film and apply it to the tank 10.Preferably the insulation panels used will overlap each other when assembled on the tank 10, so that joins between adjacent panels of the tank 10 will be covered by insulation. It will be readily understood that the insulation sheets used can also be of the type that are glued in place.

[028] The construction of the tank 10 of the embodiment described above advantageously provides a 12 litre reservoir of coolant, and this ensures that any intercooling system will maintain a relatively cool coolant such that coolant will only cycle through intercooler circuit once every 55 seconds rather than a much faster rate as would result from the prior art 6 litre tank of Figures 9 to11.

[029] Illustrated in Figure 12 is the tank 10 of Figures 1 to 8 shown in position in the right hand (when viewed from the front) rear corner of the engine bay of a VE or VF Holden Commodore. The tank 10 is installed by the process described in the following description.

[030] To install the tank in a VE or VF Commodore brand of vehicle, the following seventeen step by step process can be used:

1. remove wiper blades
2. remove black plastic cowl cover
3. remove black alloy water channel plate
4. remove black plastic funnel which forms the outside air inlet for cabin aircon/air
5. trim funnel down until it only holds filter screen in place
6. place tank 10 in cavity, line up to drill hole in engine bay side
7. remove passenger side front wheel
8. remove passenger side wheel liner
9. fit a 90 degree fitting to the outlet 24 at the base of tank 10
10. route hose from 90 degree fitting back into the engine bay to the intercooler pump (when routing all hoses care needs to be taken to ensure airlocks in the coolant circuit do not occur. This can be avoided by priming hose sections with coolant before clamping hoses into the circuit)
11. fit 45 degree fitting to top inlet 26 of tank 10
12. route hose from intercooler to top 45 degree fitting
13. fill tank 10 with fluid
14. ensure fluid is circulating
15. re-install black alloy water channel plate
16. re-install black plastic cowl cover
17. re-install wiper blades

[031] Where ever it is used, the word “comprising” is to be understood in its “open” sense, that is, in the sense of “including”, and thus not limited to its “closed” sense, that is the sense of “consisting only of”. A corresponding meaning is to be attributed to the corresponding words “comprise”, “comprised” and “comprises” where they appear.

[032] It will be understood that the invention disclosed and defined herein extends to all alternative combinations of two or more of the individual features mentioned or

evident from the text. All of these different combinations constitute various alternative aspects of the invention.

[033] While particular embodiments of this invention have been described, it will be evident to those skilled in the art that the present invention may be embodied in other specific forms without departing from the essential characteristics thereof. The present embodiments and examples are therefore to be considered in all respects as illustrative and not restrictive, and all modifications which would be obvious to those skilled in the art are therefore intended to be embraced therein.

Claims

1. An intercooler tank for an automobile engine bay, said tank having an enclosed volume bounded by tank walls with an upper portion having a filling port which can be closed by a cap or other closure means, and an inlet port and an outlet port, said tank being characterised by having a tapering cross section or profile which taper in at least two directions.
2. An intercooler tank as claimed in claim 1 wherein said tank convergingly tapers in a rear to front direction in plan view.
3. An intercooler tank as claimed in claim 1 or 2 wherein said tank convergingly tapers in an upper to lower direction.
4. An intercooler tank as claimed in any one of claims 1 to 3, wherein an upper portion of said tank convergingly tapers in one or two sections, from the front to rear of said tank when viewed from a rear view.
5. An intercooler tank as claimed in any one of the preceding claims wherein the base of said tank is of a truncated triangular surface.
6. An intercooler tank as claimed in any one of the preceding claims wherein said inlet port is located at an upper region of said tank.
7. An intercooler tank as claimed in any one of the preceding claims, wherein said outlet port is located near to a base of said tank.
8. An intercooler tank as claimed in claim 5, wherein said truncated triangular surface includes said outlet port.
9. An intercooler tank as claimed in any one of the preceding claims, wherein said inlet port and said outlet port have an associated barbed hollow through spigot to allow connection of respective hoses.
10. An intercooler tank as claimed in any one of the preceding claims wherein said tank has a capacity of approximately 9 to 12 litres.
11. An intercooler tank as claimed in any one of the preceding claims wherein external surfaces of said tank have insulation panels applied to them.

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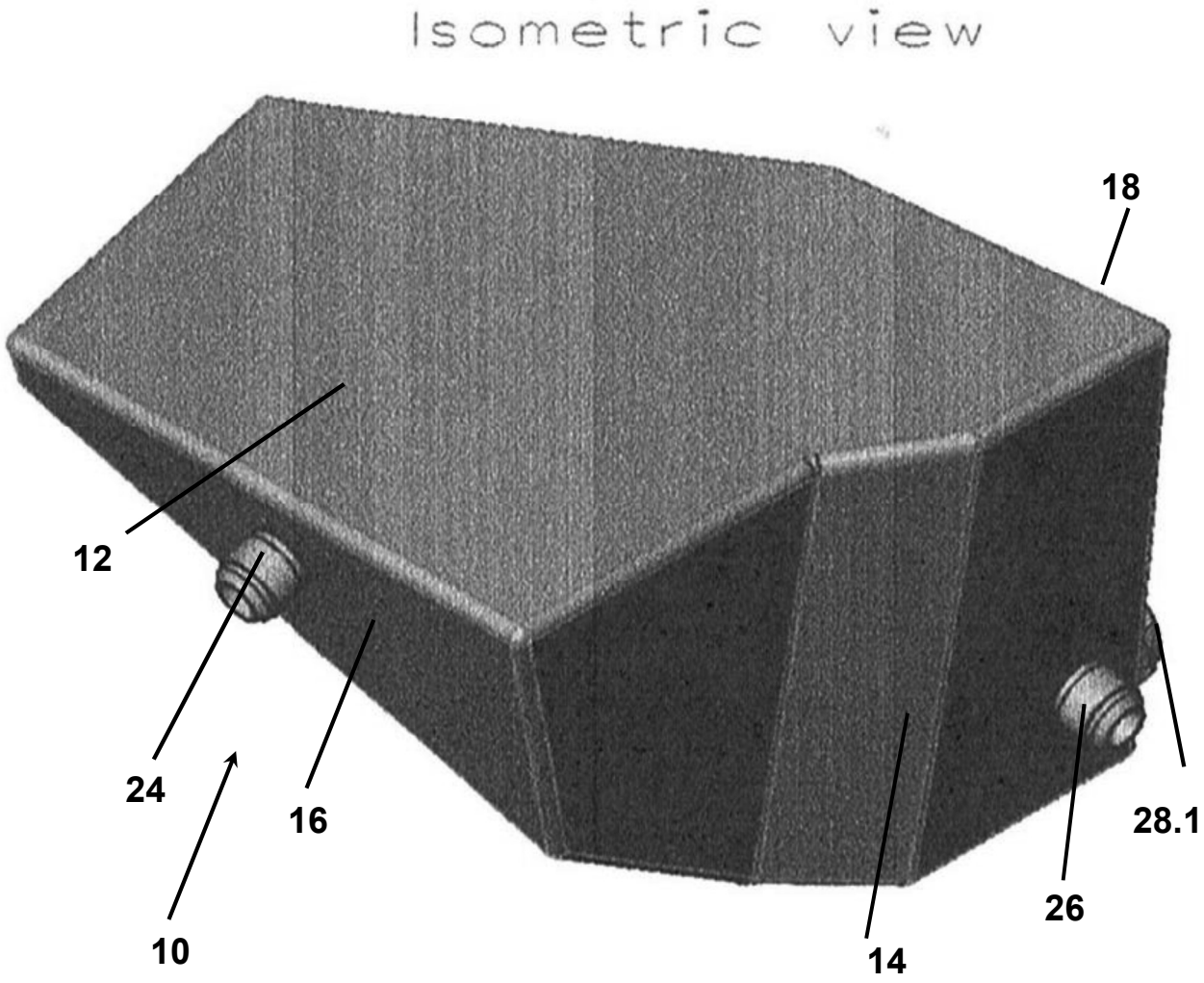

FIGURE 1

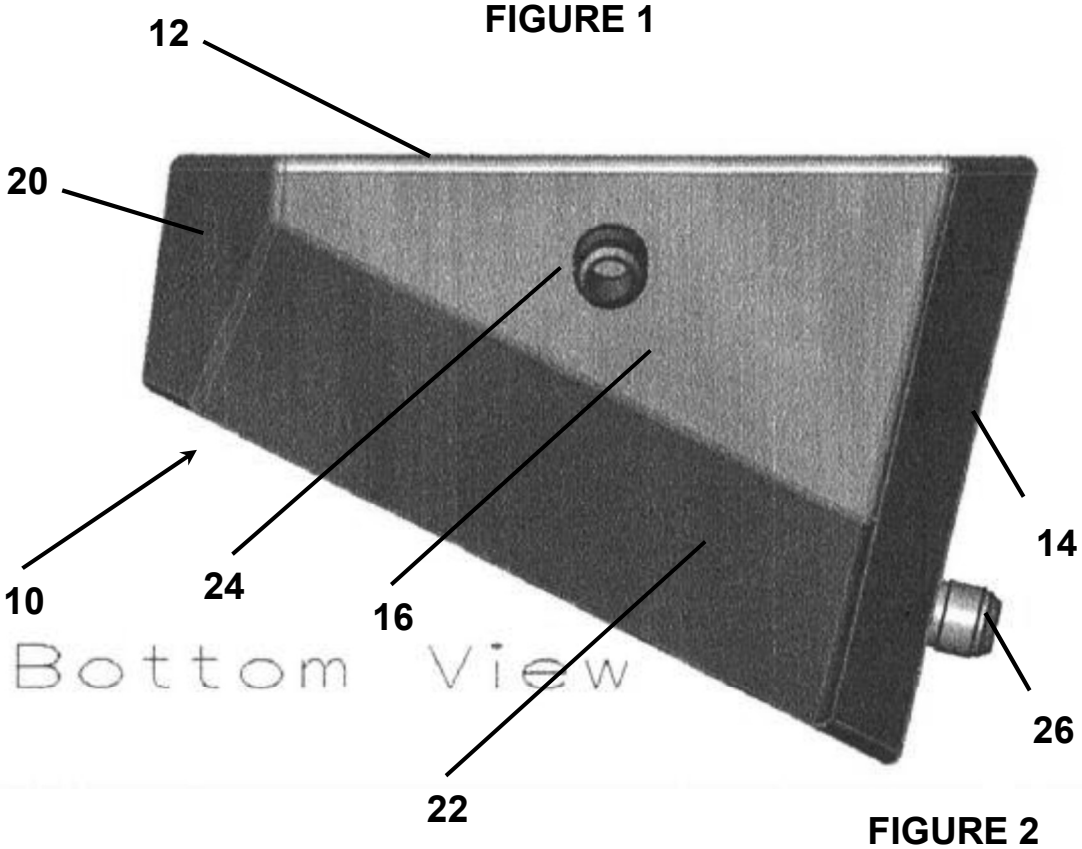

FIGURE 2

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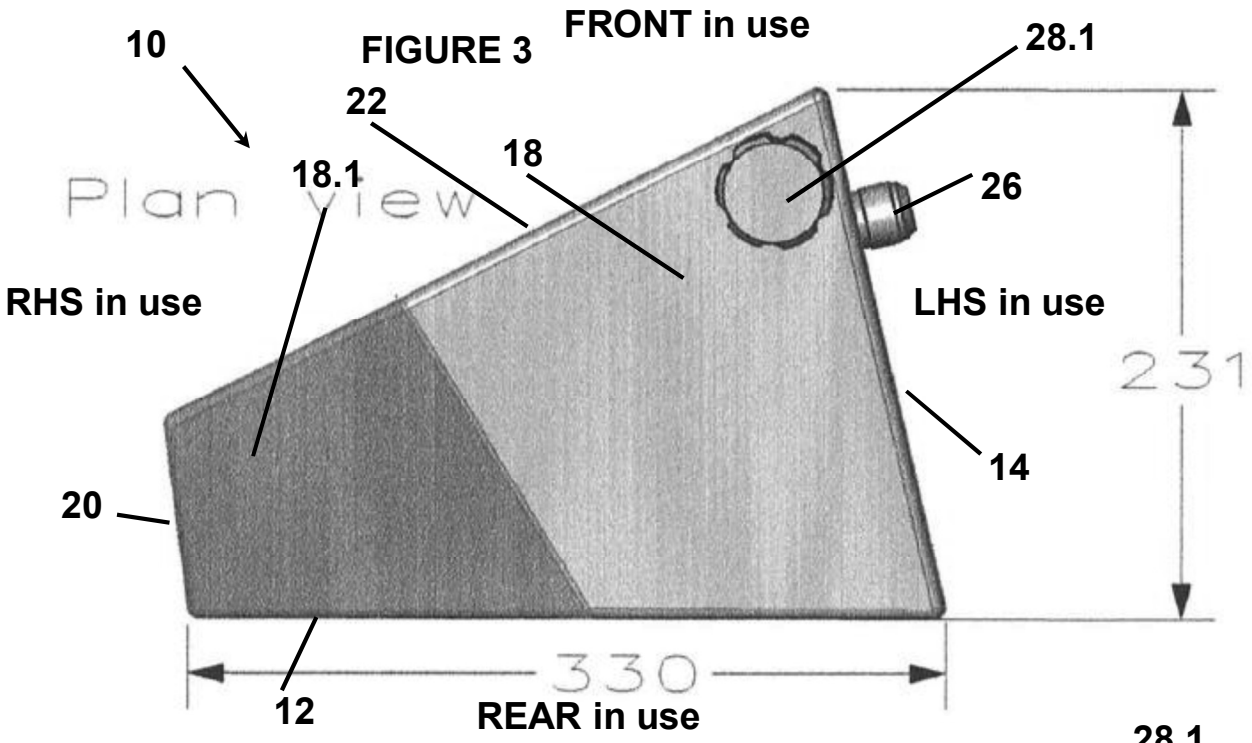
FIGURE 3



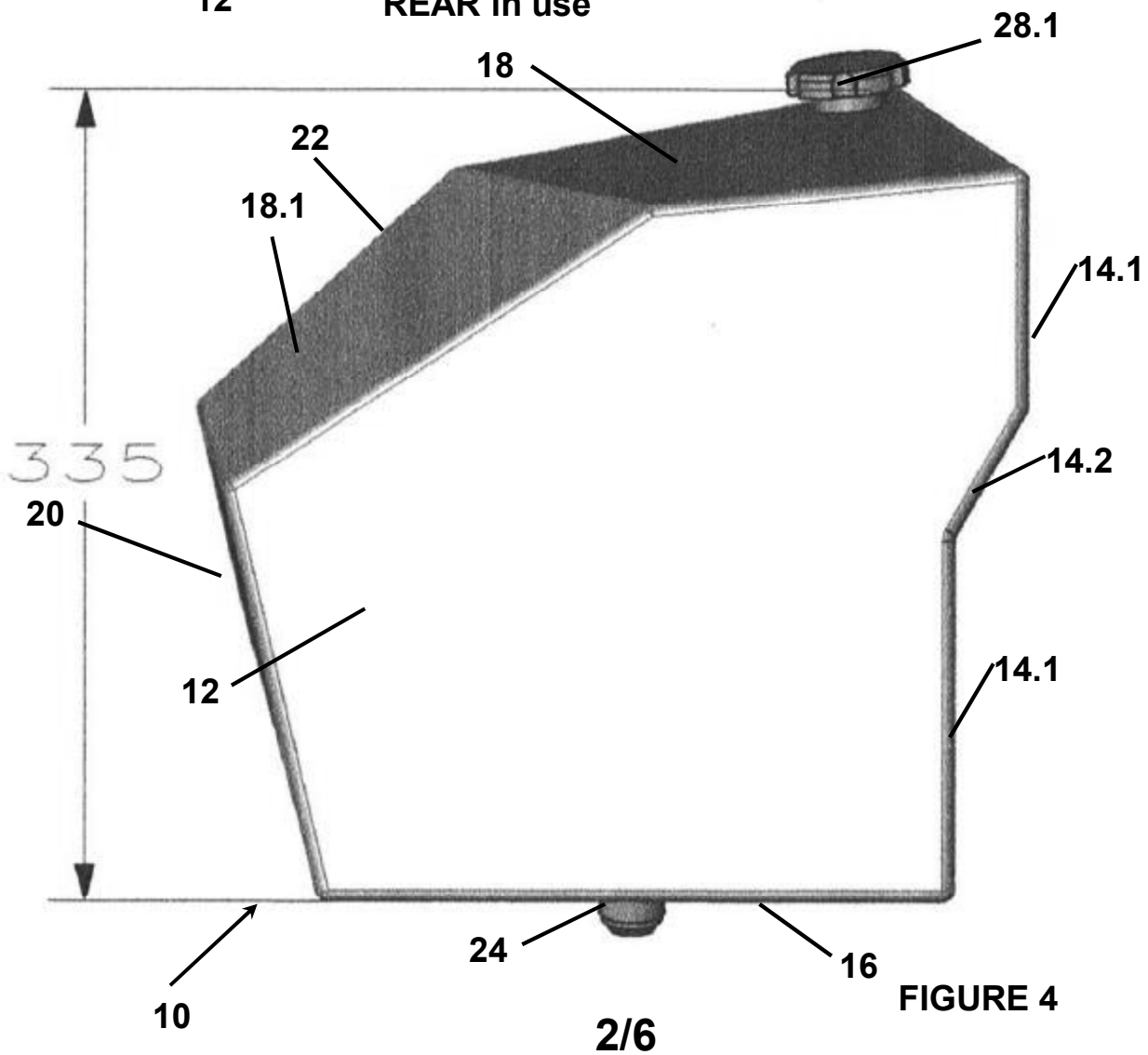


FIGURE 4

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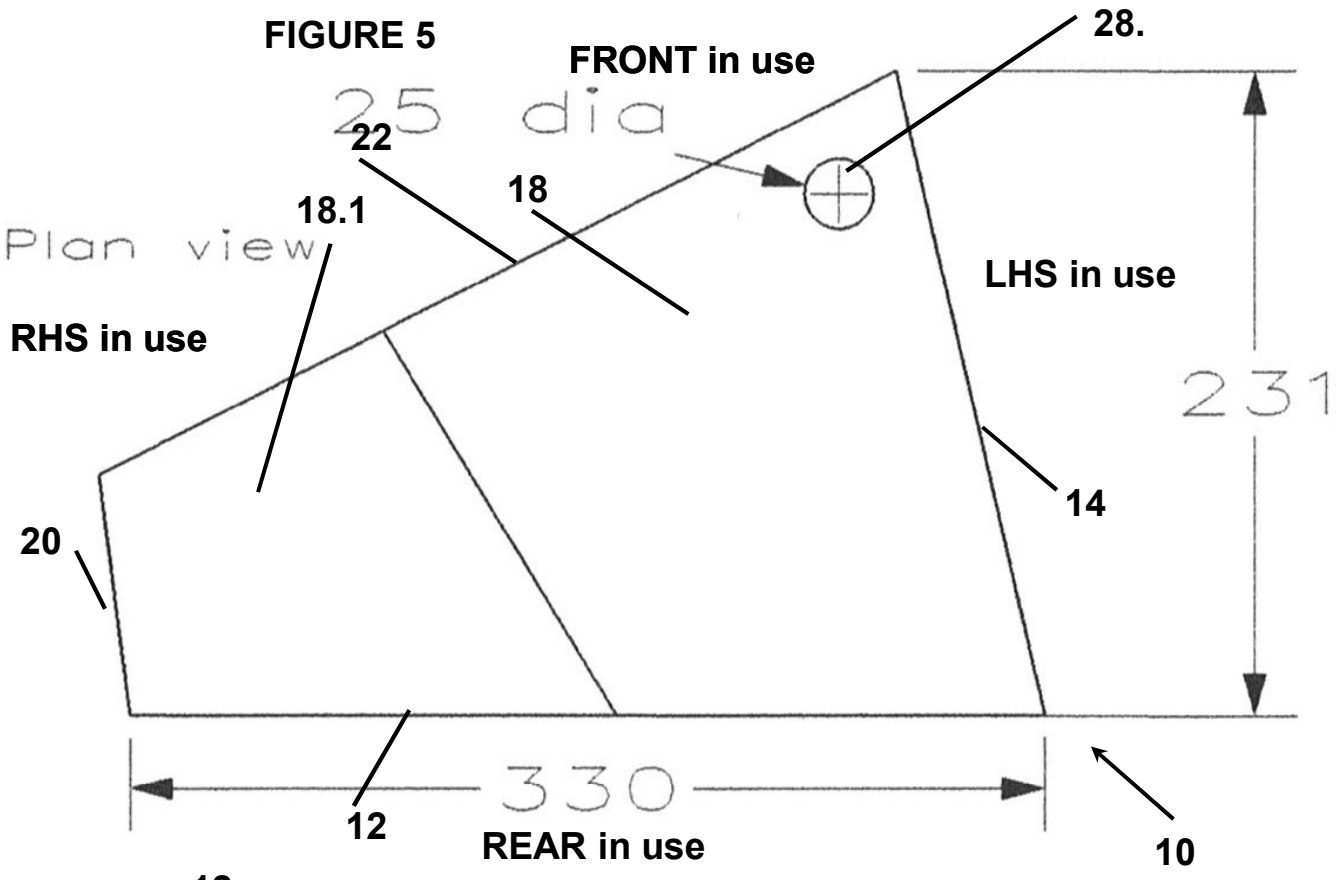
FIGURE 5



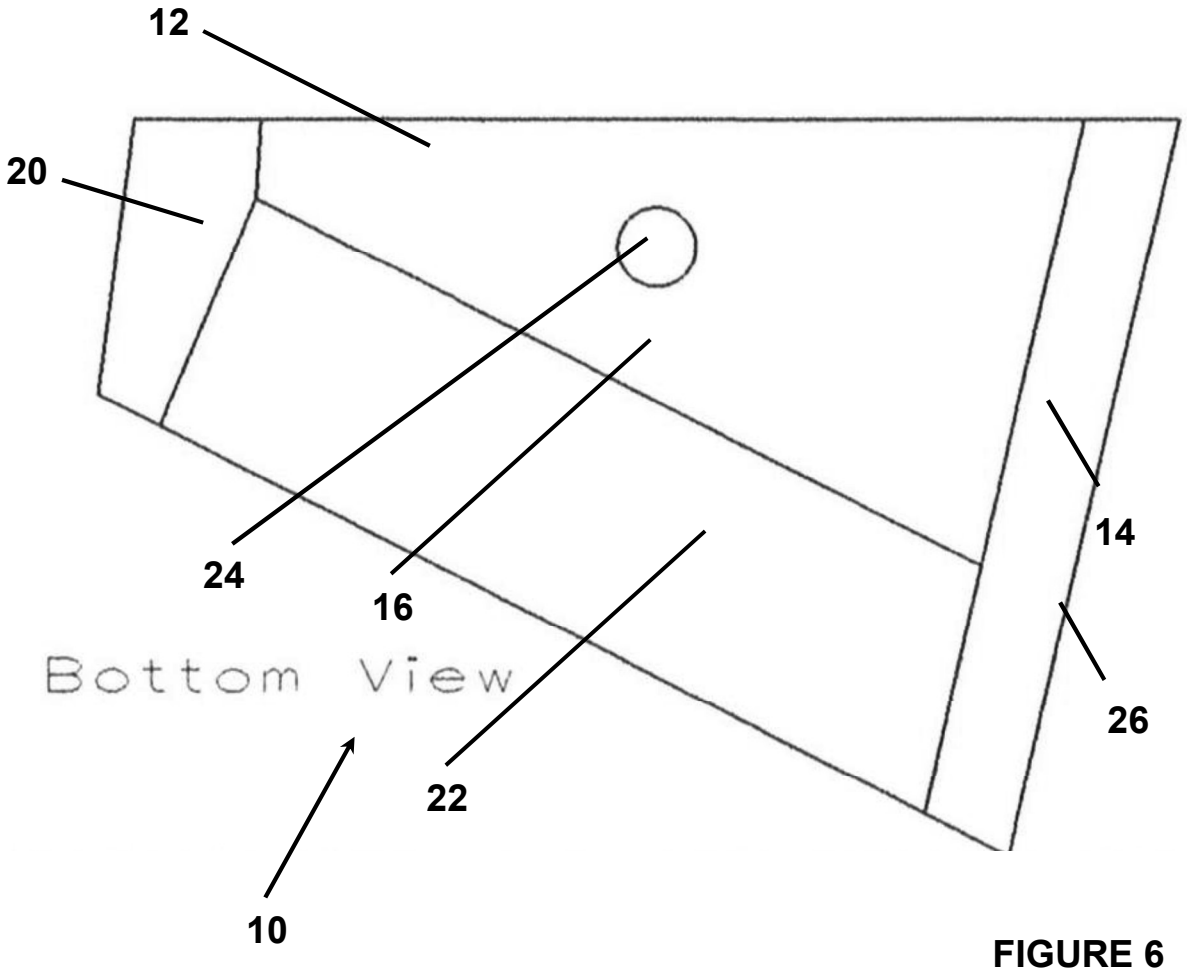


FIGURE 6

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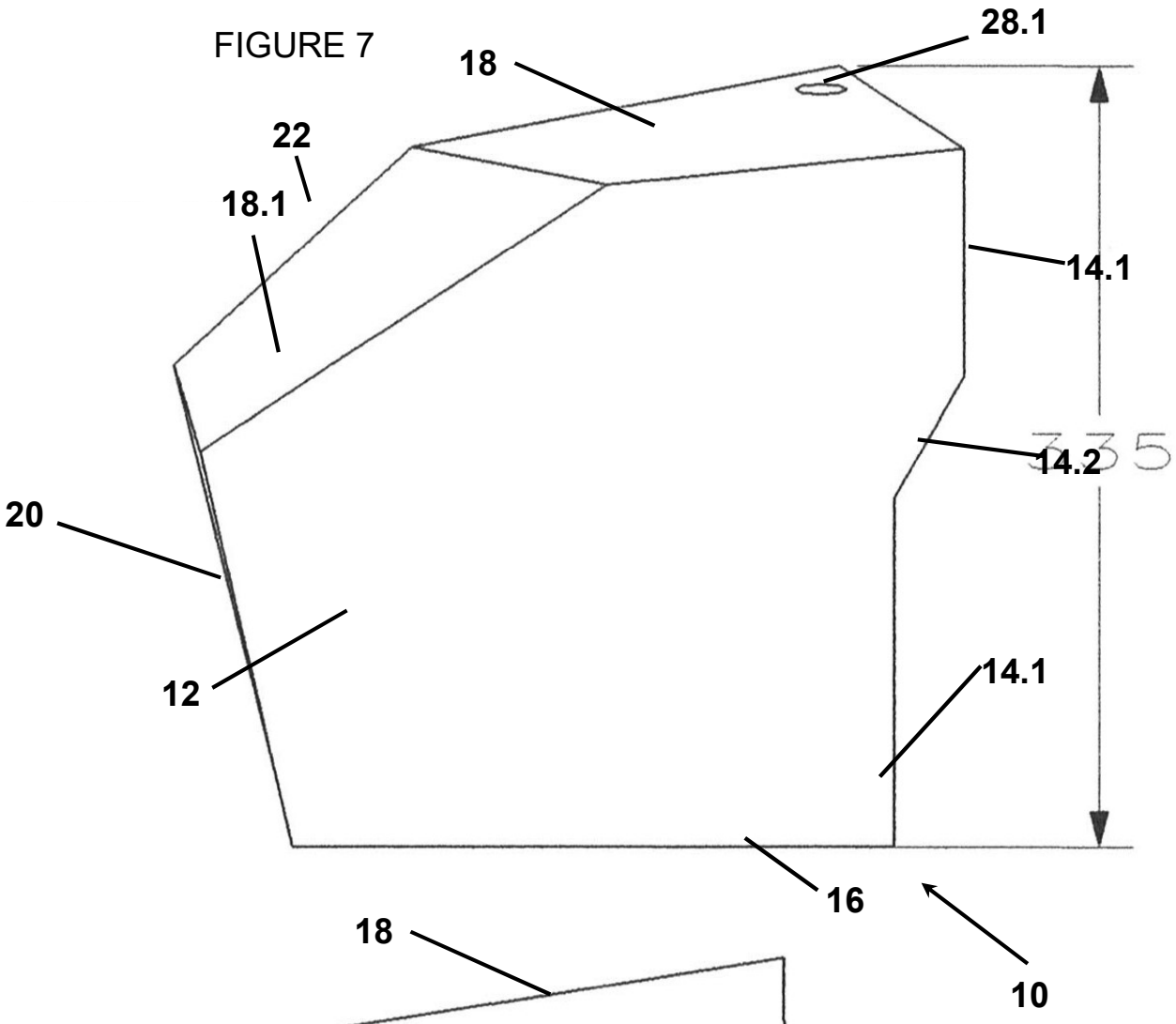
FIGURE 7



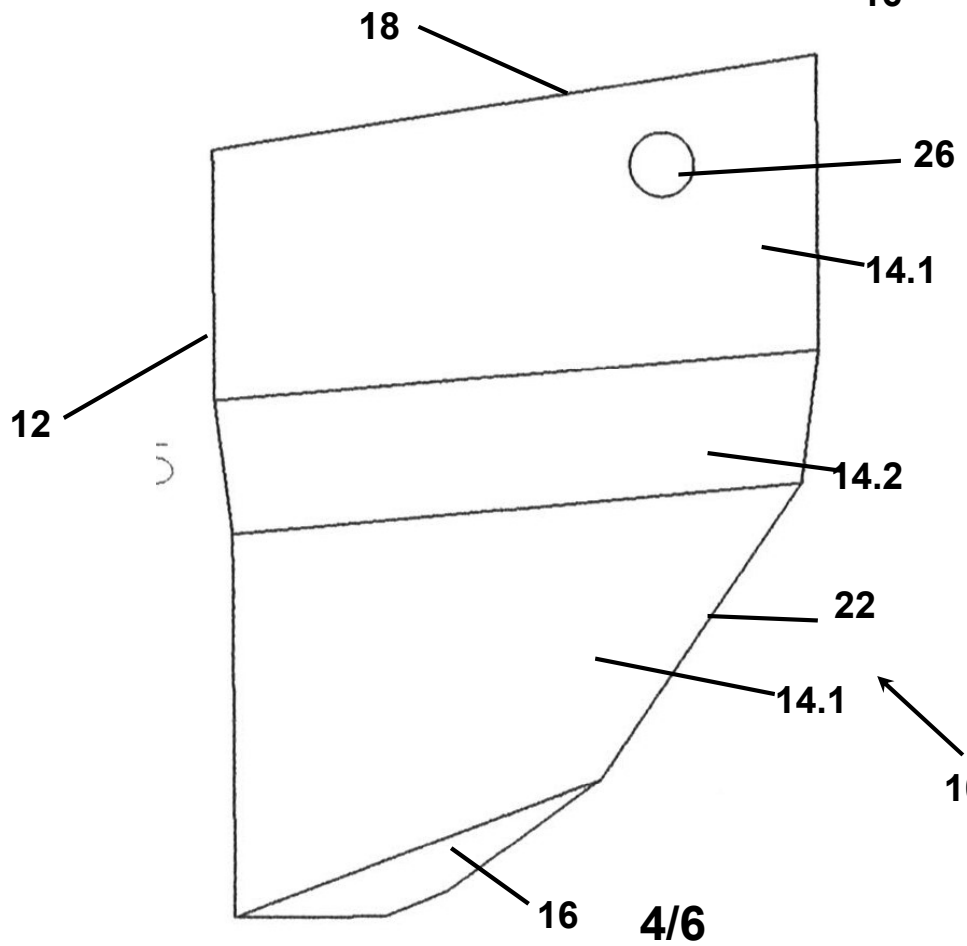
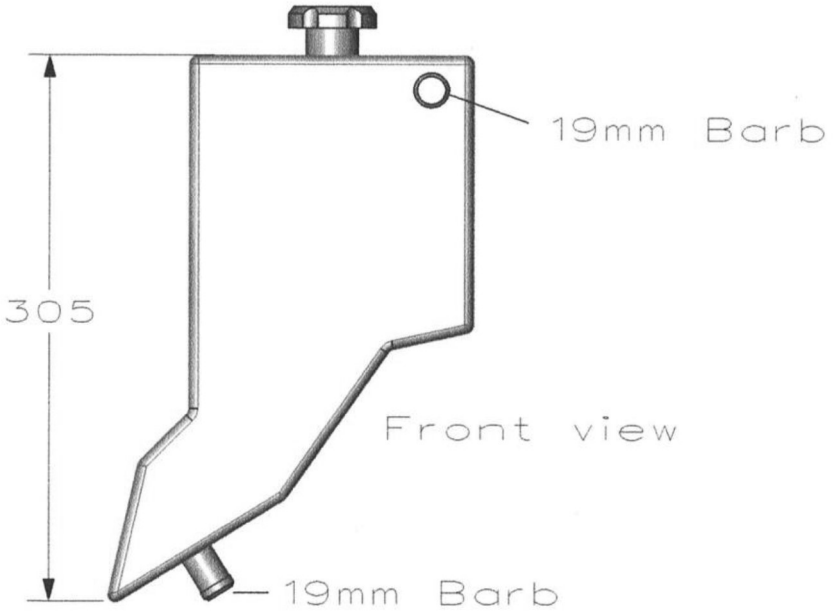
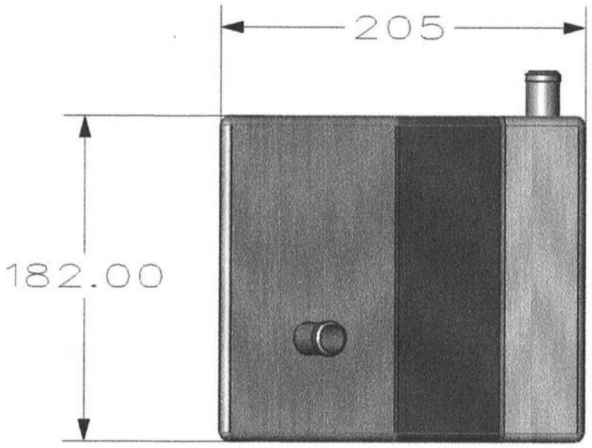


FIGURE 8

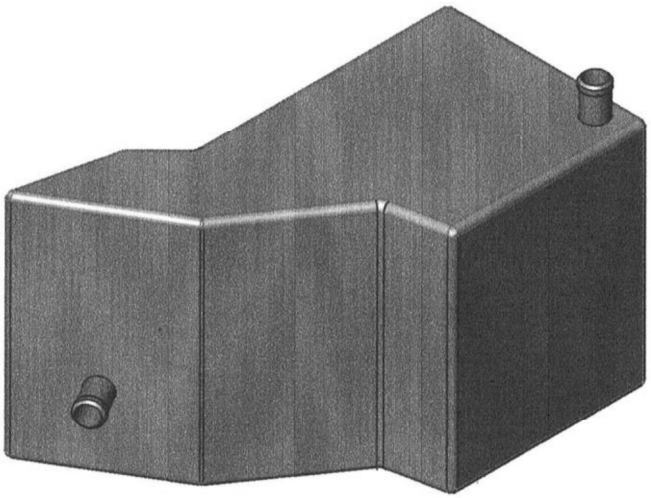
FIGURE 9





Bottom view

FIGURE 10



Isometric view

FIGURE 11

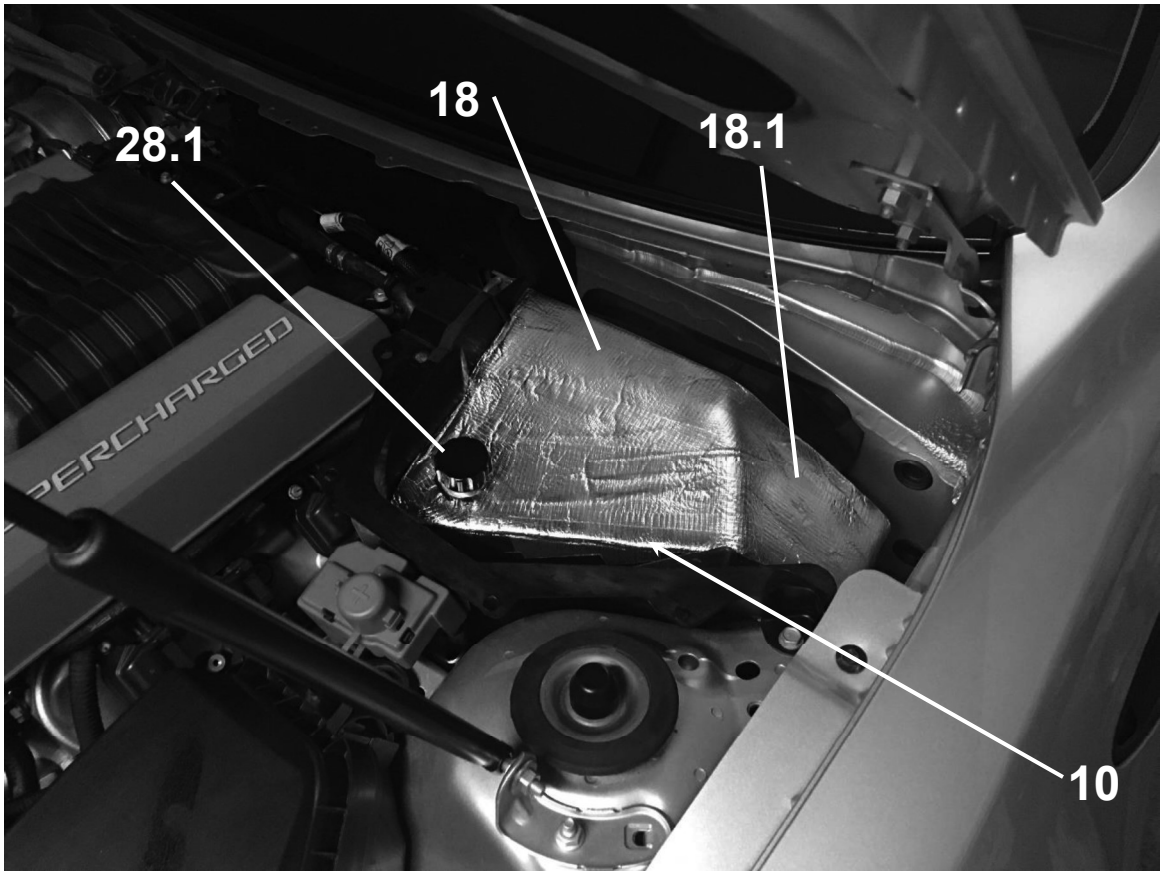


FIGURE 12