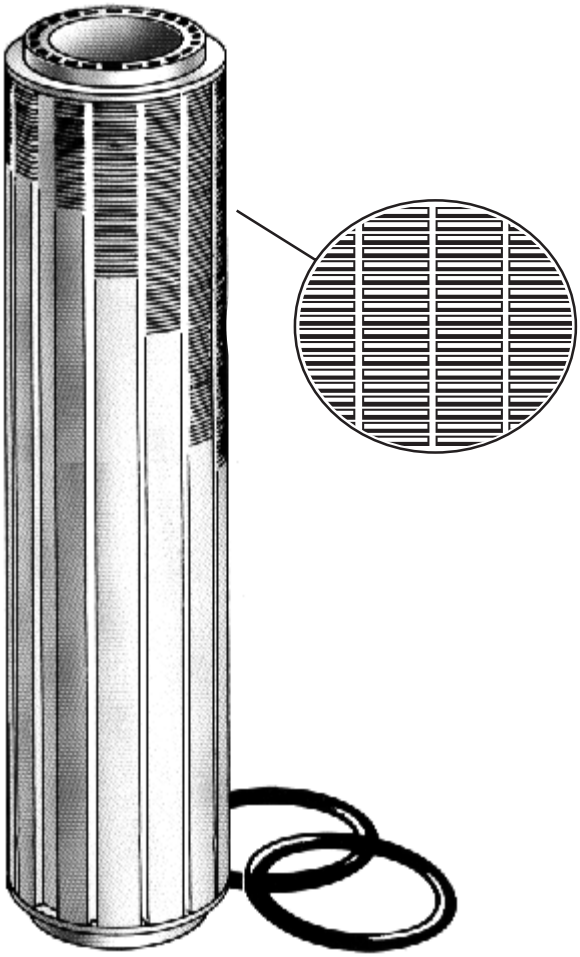
LAMINAR FLOW
OIL TO WATER
HEAT EXCHANGERS

MOCAL
oil control systems

BAT Inc. ◆ 7630 Matoaka Road., Sarasota, FL. 34243 ◆ (941) 355-0005 fax (941) 355-4683



- *High heat transfer- three times higher than conventional exchangers.*
- *Low pressure drop- advanced flow patern allows full heat dissipation while sacrificing a minimum of pressure.*
- *No solder joints- o'rings seal the two piece modular design instead of stacks of pipes and plates.*

Laminova Heat Exchangers

The Laminova heat exchanger consists primarily of two pieces of extruded aluminum profiles, the core and the shell. The inner surface of the core is optimized for efficient water flow rates, low pressure drop and minimum risk of fouling. The outer surface of the core is optimized for maximum liquid (oil) to surface contact, laminar flow, low pressure drop and high heat transfer. The assembly of both sections is sealed with o-rings, ensuring that the unit is resistant to vibration and pressure pulsation.

Laminova Theory

The Laminova concept can be best described as an almost infinite number of interconnected laminar cooling fins. Each fin is 3mm in height by only 0.2mm thick. The oil flow gap between the fins is 0.3mm. By this arrangement the oil flow is continuously interrupted and restarted after an optimized flow length. Normally such restrictive finning would cause a huge pressure drop, but by introducing channels in the finning, the oil is kept laminar (as opposed to turbulent as in other cooler designs) and pressure drop remains low.

Laminova Application

Ideally, all engine water (coolant) should pass through the unit. If this is not possible a partial flow may be obtained by teeing off and running in parallel with the water radiator/ heater core. In this case we can supply a partial restrictor or plug to divert more water through the annular water ducts in the core. This will restrict the overall flow of water in the main cooling system and is more likely to be beneficial in partial flow installations. We suggest experimenting with restrictors only when more cooling is required. Oil flow to the unit may be obtained by using a take off plate between the engine block and filter or plumbing in with the remote filter or drysump circuit. BAT stocks a large selection of MOCAL oil plumbing components for ease of installation. In application Laminova coolers offer real advantages in ease of installation where space is limited, also the cooler does not consume precious under hood air flow and their robust construction protects from oil leakage and possible fire in crash situations. The modular construction allows for easy disassembly for cleaning or service.

Recommended Sizing

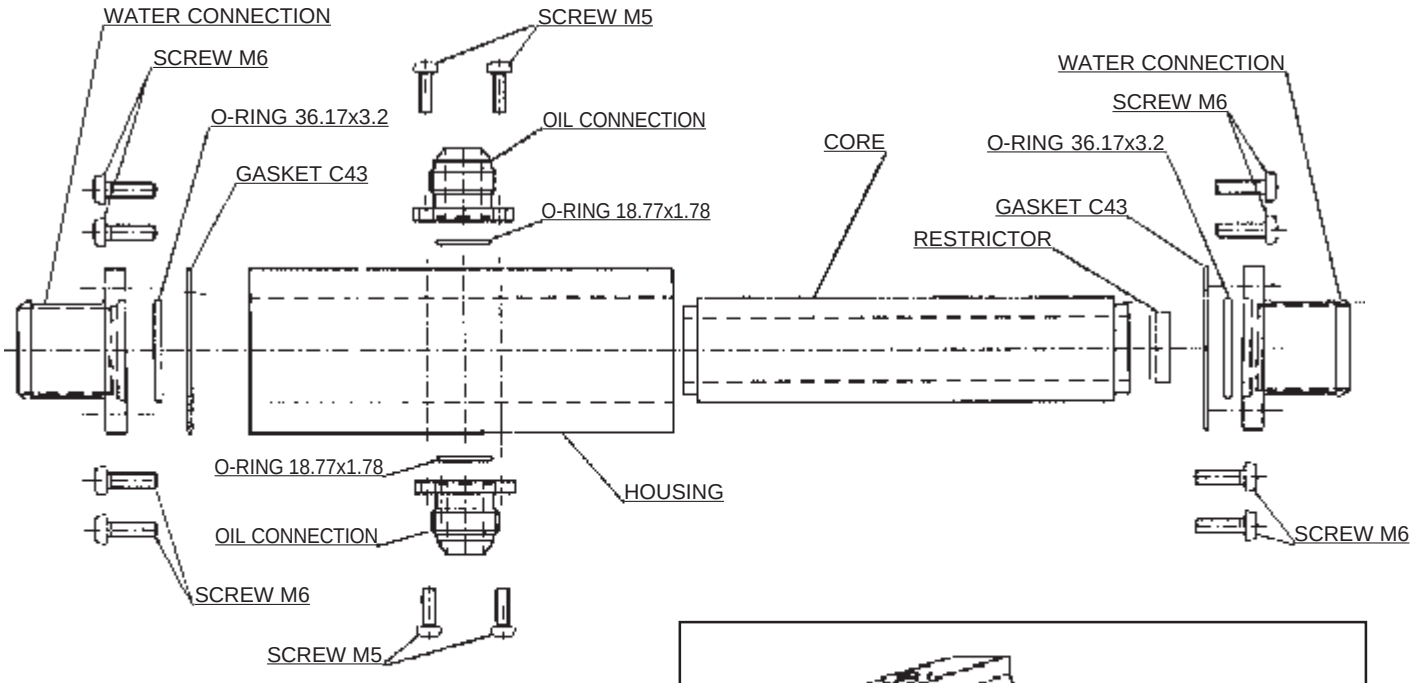
It is difficult to come up with meaningful "real world" performance figures as these are dependent on oil and water flow and size and efficiency of the water radiator as variables. In application we have found that a Laminova 90mm (small) core will perform similar to a typical 10 to 13 row air to air 235 matrix cooler, a 180mm (medium) to a 16 to 19 row and 330mm (large) to a 25 to 30 row.

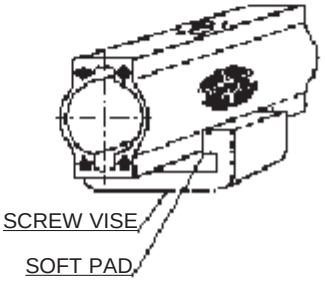
ASSEMBLY INSTRUCTIONS

All pads have to be clean and free of particles.

1. Fasten housing in a screw vice or equivalent using padding to avoid scratching. It is important the housing is fastened in a proper way as shown below.
2. Insert core into the middle of the housing with the large outside grooves aligning with the oil connection holes on each side.
3. Next put a gasket and a vaseline greased O-ring (36.17 x 3.2mm) on one of the O-ring seats on the core
4. Gently press on one water connection over the 0-ring. Match the screw holes on the connection with the ones in the housing.
5. Fasten water connection by mounting the M6 screws and tighten them clockwise to 12Nm.
6. Turn the cooler and mount the other water connection by repeating steps 3 to 5.
7. Put one small 0-ring (18.77x1.78mm) in the 0-ring groove on one of the oil connections.
8. Place the oil connection (with O-ring in groove) over the oil feed hole in the housing aligning the screw holes.
9. Mount two M5 screws in their respective holes on the oil connection. Tighten first just enough to get the oil connection in contact with the housing making sure not to pinch the O-ring, then tighten to 6 Nm.
10. Rotate the cooler and mount the second oil connection by repeating steps 7 to 9.

Any questions contact BAT Inc. (941) 355-0005





This illustration shows the recommended way of securing the housing during assembly. No other way is accepted.

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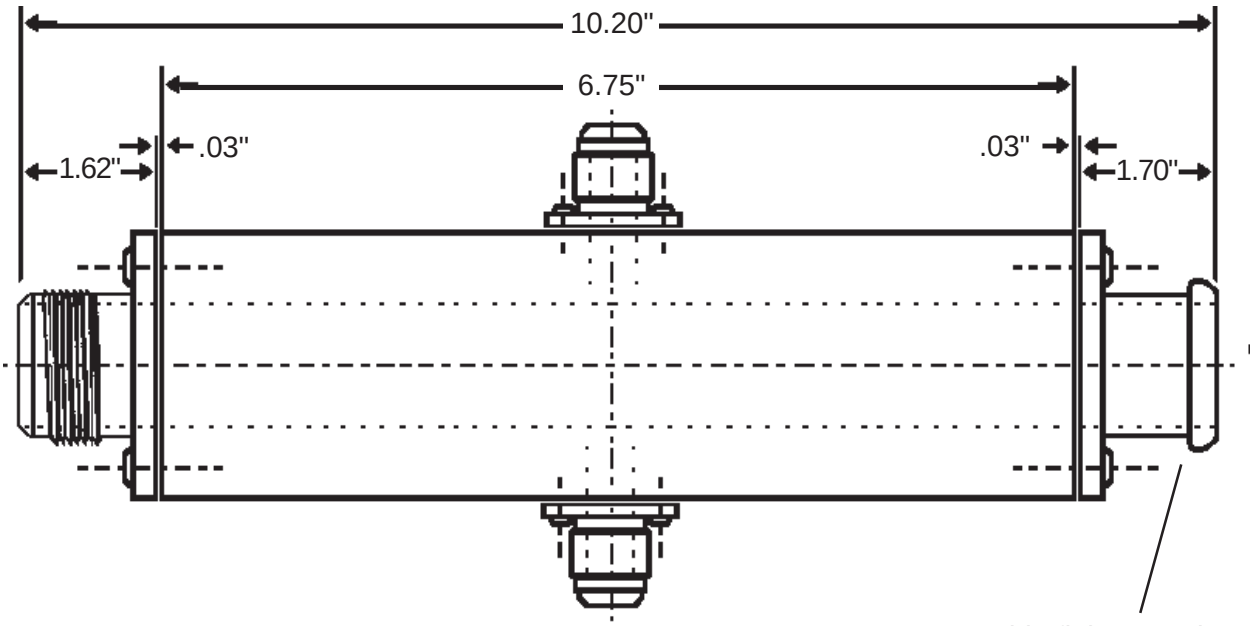
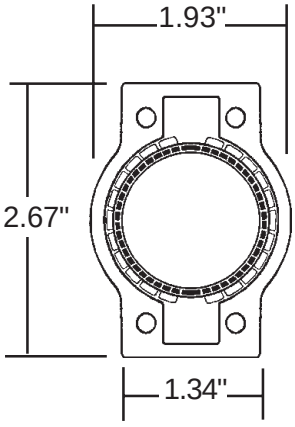
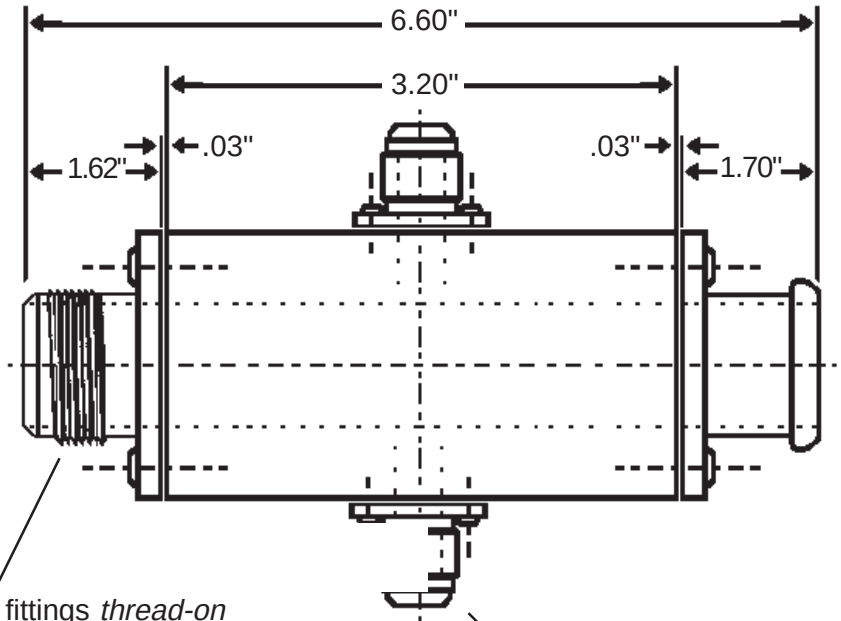


waterside fittings push-on
(5/8", 3/4" 1.10", 1.25", 1.50" 1.75")





waterside fittings *thread-on*
(-16AN, -20AN, -24AN / JIC)

oilside flange fittings *thread-on*
(-8AN, -10AN, -12AN, -16AN / JIC)

Laminova Heat Exchangers
A43-180 Cooler (top)
A43-90 Cooler (bottom)

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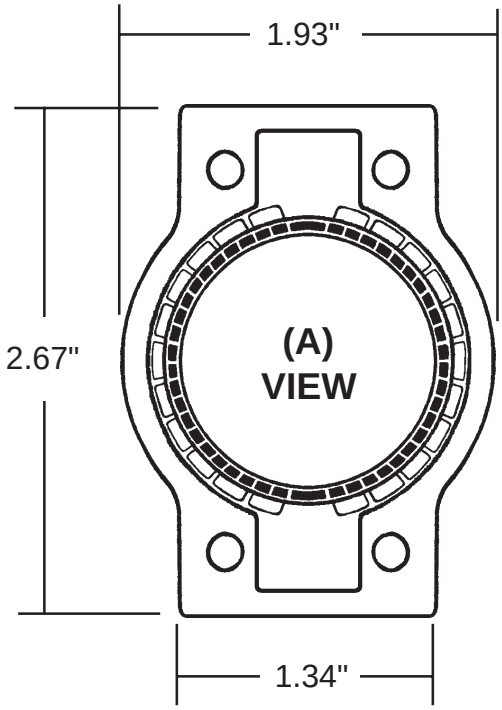

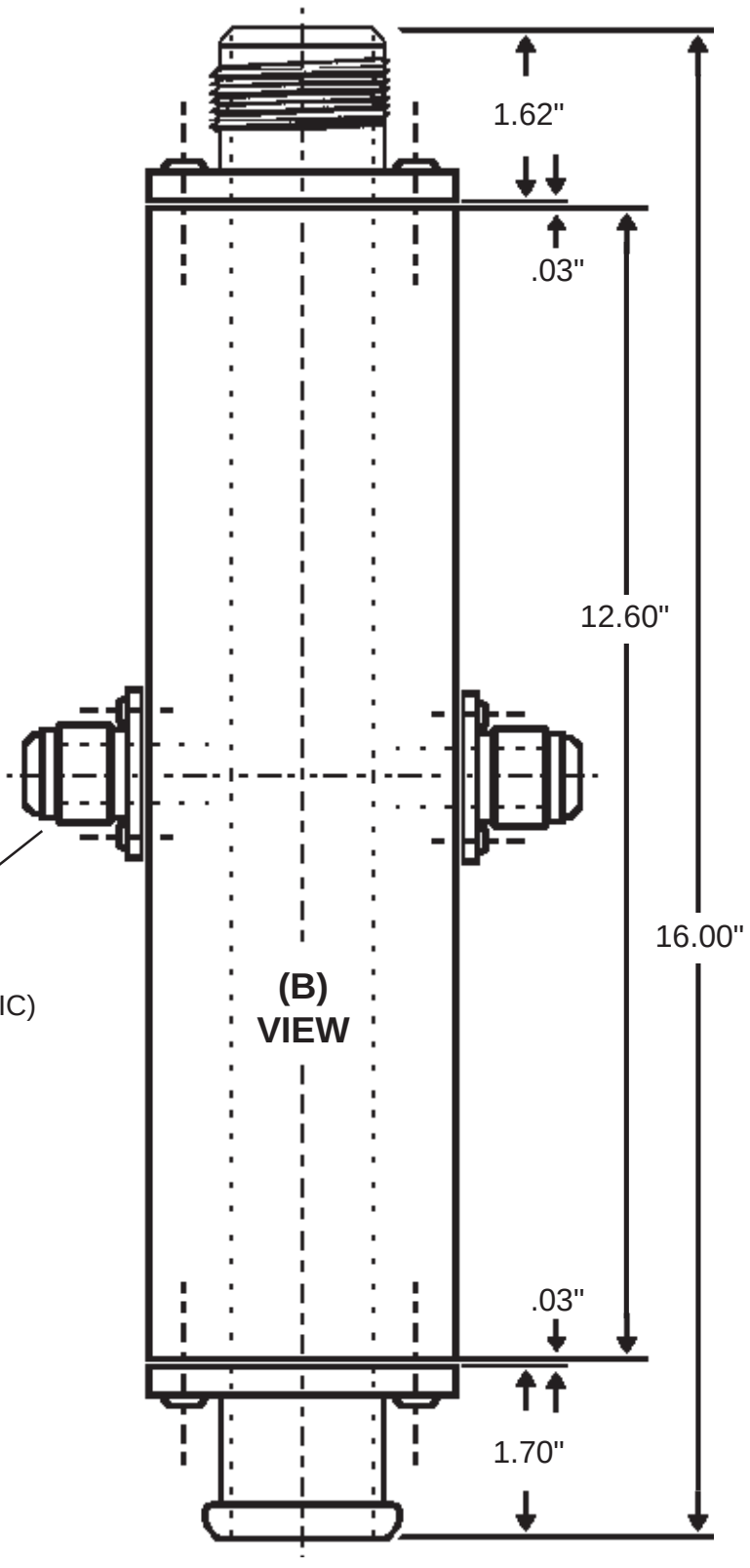

Laminova Heat Exchangers
Cooler Cutaway (A View) *same all sizes*
A43-330 Cooler (B View)

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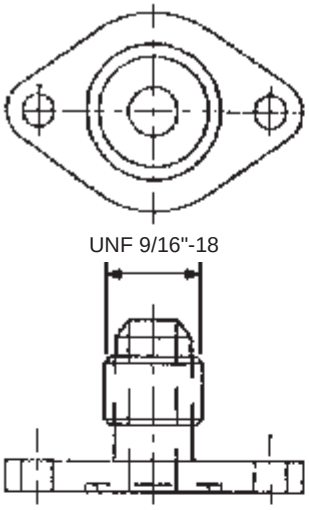
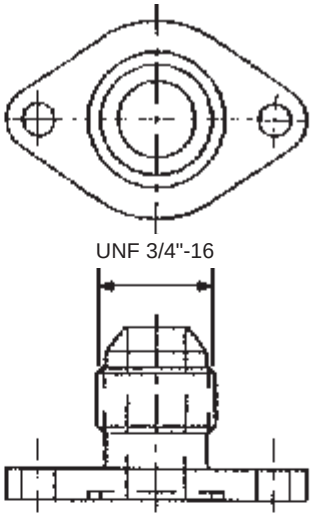
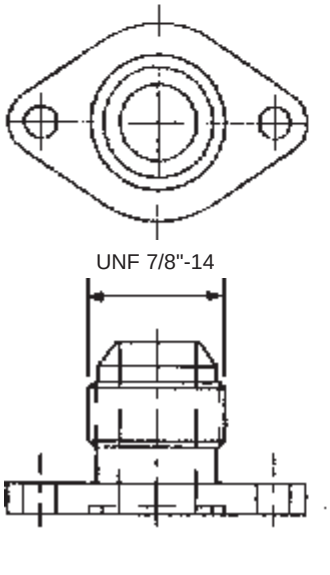


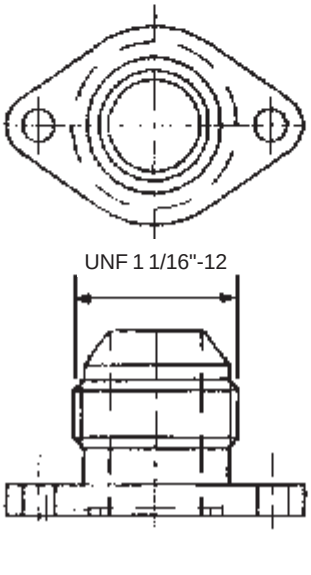
JIC 6 (-6AN)



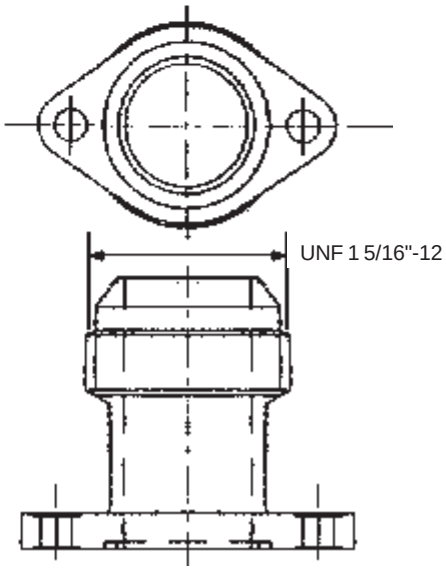
JIC 8 (-8AN)



JIC 10 (-10AN)



JIC 12 (-12AN)



JIC 16 (-16AN)

Laminova Oil Side Fittings
(top row) -6AN, -8AN
(bottom row) -10AN, -12AN, -16AN

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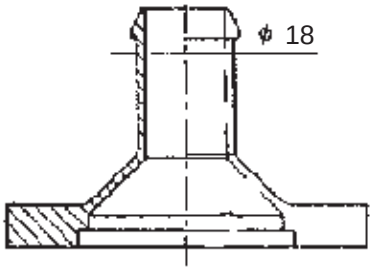
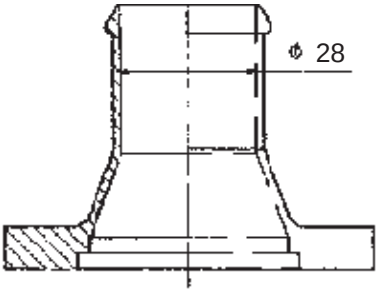
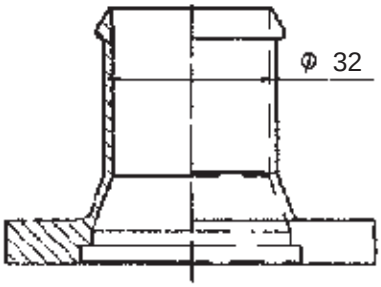


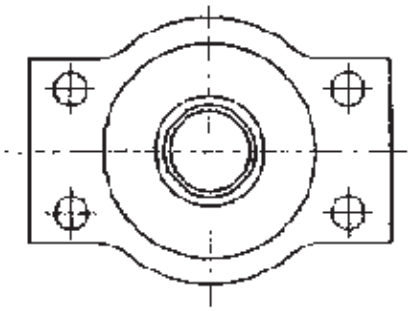
18mm (.70") push-on

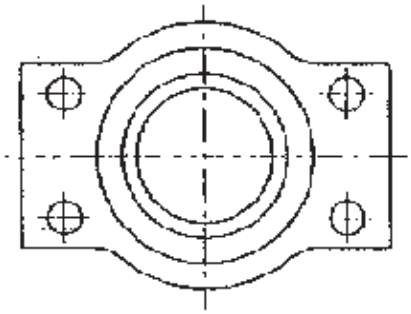


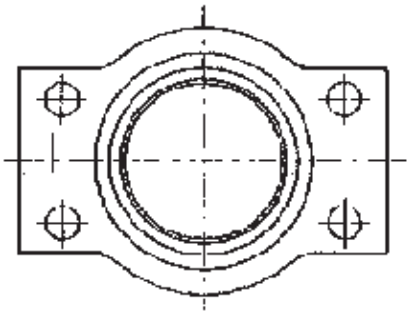
28mm (1.10") push-on

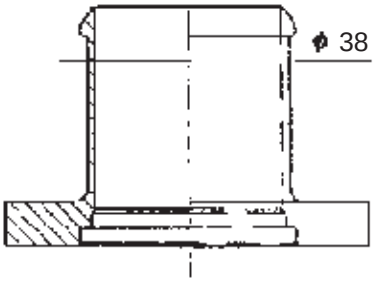


32mm (1.25") push-on

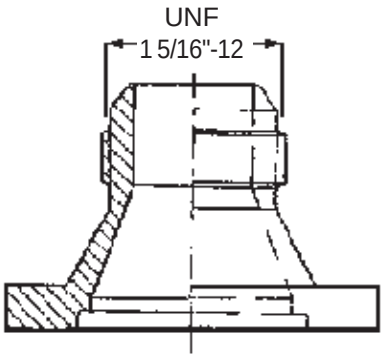




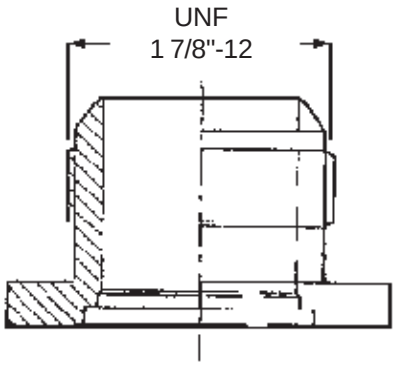




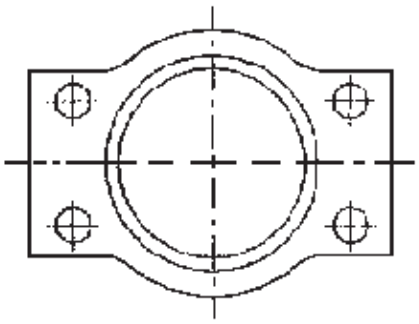
38mm (1.5") push-on

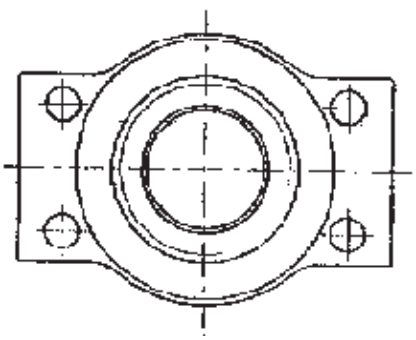


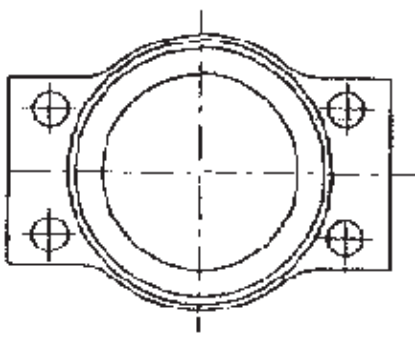
JIC 16 (-16AN) thread-on



JIC 24 (-24AN) thread-on







Laminova Water Side Fittings

(top row) 18mm, 28mm, 32mm

(bottom row) 38mm, -16AN, -24AN

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