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Speedflow AN hose & fitting guide

Thank you for downloading this guide. I want to give you the information you need to decide what hose to use on what application, how to fit the hose ends and how the finished hose assemblies will fit to your project - all in one simple to read booklet.

Almost everything you read here can be applied to AN hose and fittings that are supplied by all the well known names, not just Speedflow.

We want to make it easier for you to use AN hose on your project and be proud of the finished job. Our objective is to help you be informed, knowledgeable and confident.

This is not the ‘be all & end all’ of AN hose & fitting guides, but it does give you all the information you need to get started and do a good job. We have all the important information right here.

Speedflow has become the supplier of choice for many high performance and race related organisations as well as many thousands of individuals around the World. We are a leading supplier and manufacturer of performance automotive plumbing parts and accessories.

We have a reputation for being helpful, knowledgeable and consistently delivering high levels of customer service, coupled with a product range that has a technically superior hose end design and manufacturing process.

Fay Fischer

Fay Fischer
Managing Director, Speedflow Products Ltd.

Fay Fischer racing at Santa Pod in 1999
Introduction

The fluid systems of any high performance vehicle are as essential as any other component and careful attention to detail, good preparation and maintenance are necessary to ensure consistent performance. The plumbing of this type of vehicle should be carefully planned and undertaken only when all the major components have been located in the chassis. Although hose lines can be routed almost anywhere careful planning can reduce the amount of wasted hose and result in a tidier, more easily maintained system that should not let you down.

When building a modified or high performance vehicle the chances you will have any factory-issued hose or plumbing that will transfer to the new project is slim. To help explain why your project needs to use a bespoke AN hose system I want to first look at the hose and plumbing you get on a mass-produced car and understand why it is made the way it is. A car manufacturer will be guided by a number of key factors, primarily these are:

- Cost
- How long does it need to last

Each and every part is designed to meet a budget and this includes all the hoses, plumbing and fittings. It is often said that the accountant manages the design team. As a result the majority of parts are made to be fitted once at the factory and last the duration of the cars life - all this at a cost that is as low as they can achieve and within budget.

OEM (original equipment manufacturer) hose is not made or designed to:

- Be adapted
- Have the ability to be fitted and removed a number of times.
- Offer any increase in specification that you will probably need to match the modifications made elsewhere on your project.

Sourcing the right high performance hose & fittings and as importantly getting sound advice is the dilemma faced by today’s car enthusiast. At Speedflow we recognise that unbiased advice, helpful support and guidance, and customer service is as important as the products themselves.
What is it & how does it work?

All high performance hose systems being manufactured and sold by the market leading companies use a common thread and seat (sealing method) on the hose ends. This is the AN (Airforce Navy) specification system that is sometimes referred to as AN or JIC/AN. More information is set out below in the section ‘Understanding AN fittings’.

There are a choice of AN hose types, each has different qualities and they cover a wide range of applications, details can be seen on pages 8, 9, 10, 11 & 12. Once the type of hose has been decided upon, it is cut to length and at each end a ‘hose end’ is fitted. The hose end (AN hose end) allows the hose to be mechanically fitted (it screws on) to the equipment. The AN hose ends can be straight or angled to help ensure the hose itself is not under stress or kinked. High performance hose in most cases is not a push on item. It uses the threaded hose ends for a mechanical fit, this is shown in detail in the ‘How hose ends fit to the hose’ pages 15, 16 & 17.

The equipment the AN hose assembly is fitting onto will sometimes require an adaptor to replace the original fitting. If the original fitting protrudes from the equipment, we recommend it is unscrewed and replaced with the correct AN adaptor. In equipment where a female fitting exists we recommend an AN adaptor is fitted. Both of these activities will result in a male AN fitting being installed on the equipment to allow the AN hose end to fit. We give some information on Adaptors on page 24.

If you are fabricating an item such as a fuel tank or reservoir you should consider having an AN fitting (called a Weld-on) incorporated into the design and fabrication. These can be male or female and are made in Aluminium, Steel and Stainless Steel. This will allow for a neater connection to the new item and give a professional appearance.
Understanding AN fittings

All AN fittings have a mating flare seat at 37 degrees. This guide will use the “AN” name to refer to these fittings.

AN fittings come in a range of sizes, they are called the ‘dash size’ because it has a dash followed by two digits. Here is an AN size chart that confirms thread information along with its AN dash size and a visual guide to what that means in actual size.

### AN Thread & Size Information

<table>
<thead>
<tr>
<th>AN Size</th>
<th>JIC Size</th>
<th>UNF Thread</th>
<th>MALE UNION</th>
<th>FEMALE UNION</th>
</tr>
</thead>
<tbody>
<tr>
<td>-03 AN</td>
<td>3/8 JIC</td>
<td>3/8-24</td>
<td>9.52</td>
<td>0.375”</td>
</tr>
<tr>
<td>-04 AN</td>
<td>7/16 JIC</td>
<td>7/16-20</td>
<td>11.11</td>
<td>0.4375”</td>
</tr>
<tr>
<td>-06 AN</td>
<td>9/16 JIC</td>
<td>9/16-18</td>
<td>14.28</td>
<td>0.5625”</td>
</tr>
<tr>
<td>-08 AN</td>
<td>3/4 JIC</td>
<td>3/4-16</td>
<td>19.05</td>
<td>0.750”</td>
</tr>
<tr>
<td>-10 AN</td>
<td>7/8 JIC</td>
<td>7/8-14</td>
<td>22.22</td>
<td>0.875”</td>
</tr>
<tr>
<td>-12 AN</td>
<td>1-1/16 JIC</td>
<td>1-1/16-12</td>
<td>26.99</td>
<td>1.0625”</td>
</tr>
<tr>
<td>-16 AN</td>
<td>1-5/16 JIC</td>
<td>1-5/16-12</td>
<td>33.33</td>
<td>1.3125”</td>
</tr>
<tr>
<td>-20 AN</td>
<td>1-5/8 JIC</td>
<td>1-5/8-12</td>
<td>41.28</td>
<td>1.625”</td>
</tr>
</tbody>
</table>

**DIMENSION A**

**DIMENSION B**

Measure the outside of the male UNF thread (Dimension ‘A’). This is the correct way to confirm thread size.

If you do not have a Male thread to check Measure inside of the Female (Dimension ‘B’).
Which hose, which fittings?

Just where do you start?

First of all plan ahead to define what you want to achieve. Operating problems and unnecessary expense can be avoided by choosing the most direct yet practical routing of each particular run. The choice of fittings and adaptors should allow for bends and for the flexibility required in the runs themselves. Consider things like passing through bulkheads and firewalls and allowing for the movement of an engine in relation to the chassis/body. Ease of future maintenance should always figure high in your designs and bear in mind the necessity to remove filters, covers, carburettors, brake pads, draining fuel and even changing gearboxes and engines. Good planning takes the pain out of maintenance and repair work. If you are unsure of any aspects consult your supplier or contact Speedflow.

Any hose line run should incorporate as few joints as possible to reduce the risk of leaks. An angled hose end provides a neater and more compact bend than a long run of hose and is particularly useful where space is at a premium.

First we are going to look at the different hose types. There is information to help you decide which may be the best option. We include details on:

- Aeroquip Startlite Hose (100 series)
- Black Nylon Braided Hose (100 series)
- Stainless Steel Braided Hose (100 series)
- PTFE Hose (200 series)
- Push On Hose (400 series)

The following five pages set out important technical details and tells you what the applications are for each AN hose type.
Aeroquip Startlite Hose
100 Series

Construction
Smooth bore neoprene inner tube with a Kevlar & Nomex outer reinforcing weave.

Temperature range
-44°F to +300°F

Applications
Coolant, Fuel, Oil, Alcohol and Air.

Compatible hose ends
Speedflow 100 series hose ends and all properly manufactured cutter style hose ends. Can also have a crimped in lightweight hose end fitted.

<table>
<thead>
<tr>
<th>AN Hose part no.</th>
<th>Inner dia Inches</th>
<th>mm</th>
<th>Outer dia Inches</th>
<th>Working Pressure</th>
<th>Weight kg/m</th>
<th>Bend radius Inches (min)</th>
<th>AN size</th>
</tr>
</thead>
<tbody>
<tr>
<td>STL-04</td>
<td>0.22 (3/16)</td>
<td>5.6</td>
<td>0.44</td>
<td>200</td>
<td>0.07kg/m</td>
<td>2.00</td>
<td>-04</td>
</tr>
<tr>
<td>STL-06</td>
<td>0.34 (5/16)</td>
<td>8.6</td>
<td>0.55</td>
<td>200</td>
<td>0.12kg/m</td>
<td>2.50</td>
<td>-06</td>
</tr>
<tr>
<td>STL-08</td>
<td>0.44 (7/16)</td>
<td>11.1</td>
<td>0.64</td>
<td>200</td>
<td>0.16kg/m</td>
<td>3.50</td>
<td>-08</td>
</tr>
<tr>
<td>STL-10</td>
<td>0.56 (9/16)</td>
<td>14.2</td>
<td>0.80</td>
<td>200</td>
<td>0.20kg/m</td>
<td>4.00</td>
<td>-10</td>
</tr>
<tr>
<td>STL-12</td>
<td>0.69 (11/16)</td>
<td>17.5</td>
<td>0.94</td>
<td>200</td>
<td>0.24kg/m</td>
<td>4.50</td>
<td>-12</td>
</tr>
<tr>
<td>STL-16</td>
<td>0.88 (7/8)</td>
<td>22.3</td>
<td>1.16</td>
<td>200</td>
<td>0.37kg/m</td>
<td>5.50</td>
<td>-16</td>
</tr>
<tr>
<td>STL-20</td>
<td>1.13 (1-1/8)</td>
<td>28.7</td>
<td>1.44</td>
<td>200</td>
<td>0.40kg/m</td>
<td>5.50</td>
<td>-20</td>
</tr>
</tbody>
</table>

To find out more about this hose view this page... http://speedflow.co.uk/aeroquip-startlite-hose/
Black Nylon Braided Hose
100 Series

Construction
Smooth bore CPE neoprene inner tube with integral partial stainless steel brad weave. Outer layer of black nylon braiding.

Temperature range
-40°C to +149°C

Applications
Coolant, Fuel, Oil, Alcohol and Air.

Compatible hose ends
Speedflow 100 series hose ends and all properly manufactured cutter style hose ends.

<table>
<thead>
<tr>
<th>AN Hose part no.</th>
<th>Inner dia Inches</th>
<th>Outer dia Inches</th>
<th>Working Pressure</th>
<th>Weight kg/m</th>
<th>AN size</th>
</tr>
</thead>
<tbody>
<tr>
<td>G210-04</td>
<td>0.22 (3/16)</td>
<td>0.44</td>
<td>500</td>
<td>0.14kg/m</td>
<td>-04</td>
</tr>
<tr>
<td>G210-06</td>
<td>0.34 (5/16)</td>
<td>0.55</td>
<td>500</td>
<td>0.16kg/m</td>
<td>-06</td>
</tr>
<tr>
<td>G210-08</td>
<td>0.44 (7/16)</td>
<td>0.64</td>
<td>500</td>
<td>0.18kg/m</td>
<td>-08</td>
</tr>
<tr>
<td>G210-10</td>
<td>0.56 (9/16)</td>
<td>0.80</td>
<td>500</td>
<td>0.24kg/m</td>
<td>-10</td>
</tr>
<tr>
<td>G210-12</td>
<td>0.69 (11/16)</td>
<td>0.94</td>
<td>350</td>
<td>0.32kg/m</td>
<td>-12</td>
</tr>
<tr>
<td>G210-16</td>
<td>0.88 (7/8)</td>
<td>1.16</td>
<td>350</td>
<td>0.41kg/m</td>
<td>-16</td>
</tr>
</tbody>
</table>

To find out more about this hose view this page... http://speedflow.co.uk/black-nylon-braided-hose/
Stainless Steel Braided Hose
100 Series

Construction
Elastomeric synthetic tube, partial stainless steel wire inner braid, full stainless steel outer braid reinforcement.

Temperature range
-49°C to +150°C

Applications
Automotive and marine fuel, oil and coolant system hoses requiring lightweight flexibility, strength and heat resistance. The most widely used hose in motor sport.

Compatible hose ends
Speedflow 100 series hose ends and all properly manufactured cutter style AN hose ends.

<table>
<thead>
<tr>
<th>AN Hose part no.</th>
<th>Inner dia Inches</th>
<th>Outer dia Inches</th>
<th>Operating PSI (max)</th>
<th>Burst PSI (min)</th>
<th>Bend radius Inches (min)</th>
<th>AN size</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-04</td>
<td>0.22 (3/16)</td>
<td>0.44</td>
<td>1000</td>
<td>6000</td>
<td>2.00</td>
<td>-04</td>
</tr>
<tr>
<td>100-06</td>
<td>0.34 (5/16)</td>
<td>0.55</td>
<td>1000</td>
<td>6000</td>
<td>2.50</td>
<td>-06</td>
</tr>
<tr>
<td>100-08</td>
<td>0.44 (7/16)</td>
<td>0.64</td>
<td>1000</td>
<td>5000</td>
<td>3.50</td>
<td>-08</td>
</tr>
<tr>
<td>100-10</td>
<td>0.56 (9/16)</td>
<td>0.80</td>
<td>1000</td>
<td>5000</td>
<td>4.00</td>
<td>-10</td>
</tr>
<tr>
<td>100-12</td>
<td>0.69 (11/16)</td>
<td>0.94</td>
<td>1000</td>
<td>4000</td>
<td>4.50</td>
<td>-12</td>
</tr>
<tr>
<td>100-16</td>
<td>0.88 (7/8)</td>
<td>1.16</td>
<td>750</td>
<td>3000</td>
<td>5.50</td>
<td>-16</td>
</tr>
<tr>
<td>100-20</td>
<td>1.13 (1-1/8)</td>
<td>1.44</td>
<td>500</td>
<td>2000</td>
<td>8.00</td>
<td>-20</td>
</tr>
</tbody>
</table>

To find out more about this hose view this page... http://speedflow.co.uk/stainless-steel-braided-hose/
PTFE Hose (PTFE Hose)
200 Series

Construction
PTFE tube with a single stainless steel braided cover.

Temperature range
-73°C to +232°C

Applications
Brake and clutch hoses, instrument hoses, nitrous oxide hoses, fire extinguisher lines, turbo oil feed and boost hoses. All fuels including petrol ethanol mixtures, any application subjected to high pressure and temperatures.

Compatible hose ends
Speedflow 200 Series hose ends or any properly manufactured PTFE hose ends.

<table>
<thead>
<tr>
<th>AN Hose part no.</th>
<th>Inner dia Inches</th>
<th>Outer dia Inches</th>
<th>Operating PSI (max)</th>
<th>Burst PSI (min)</th>
<th>Bend radius Inches (min)</th>
<th>AN size</th>
</tr>
</thead>
<tbody>
<tr>
<td>200-03</td>
<td>0.125 (1.8)</td>
<td>0.250</td>
<td>3000</td>
<td>12000</td>
<td>1.50</td>
<td>-03</td>
</tr>
<tr>
<td>200-04</td>
<td>0.188 (3/16)</td>
<td>0.312</td>
<td>3000</td>
<td>12000</td>
<td>2.00</td>
<td>-04</td>
</tr>
<tr>
<td>200-06</td>
<td>0.313 (5/16)</td>
<td>0.466</td>
<td>2500</td>
<td>9000</td>
<td>4.00</td>
<td>-06</td>
</tr>
<tr>
<td>200-08</td>
<td>0.42 (7/16)</td>
<td>0.54</td>
<td>2000</td>
<td>8000</td>
<td>5.25</td>
<td>-08</td>
</tr>
</tbody>
</table>

To find out more about this hose view this page... http://speedlow.co.uk/PTFE-hose/
Push On Hose
400 Series

![Image of hose](image)

**Construction**
Synthetic tube, textile braid reinforcement with added synthetic cover.

**Temperature range**
-40°C to +93°C

**Applications**
Compatible with fuel, oil and hydraulic fluids.
Used in systems where the properties of 100 and 200 Series hose is not required.

**Compatible hose ends**
400 Series

<table>
<thead>
<tr>
<th>AN Hose part no.</th>
<th>Inner dia Inches</th>
<th>Outer dia mm</th>
<th>Operating PSI (max)</th>
<th>Burst PSI (min)</th>
<th>Bend radius Inches (min)</th>
<th>AN size</th>
</tr>
</thead>
<tbody>
<tr>
<td>400-04</td>
<td>0.25 (1/4)</td>
<td>6.3</td>
<td>0.52</td>
<td>200</td>
<td>700</td>
<td>-04</td>
</tr>
<tr>
<td>400-06</td>
<td>0.38 (3/8)</td>
<td>9.6</td>
<td>0.60</td>
<td>200</td>
<td>700</td>
<td>-06</td>
</tr>
<tr>
<td>400-08</td>
<td>0.50 (1/2)</td>
<td>12.7</td>
<td>0.75</td>
<td>200</td>
<td>700</td>
<td>-08</td>
</tr>
<tr>
<td>400-10</td>
<td>0.63 (5/8)</td>
<td>16.0</td>
<td>0.88</td>
<td>200</td>
<td>500</td>
<td>-10</td>
</tr>
<tr>
<td>400-12</td>
<td>0.75 (3/4)</td>
<td>19.0</td>
<td>1.03</td>
<td>200</td>
<td>500</td>
<td>-12</td>
</tr>
</tbody>
</table>

To find out more about this hose view this page... [http://speedflow.co.uk/push-on-hose-aeroquip-aqp/](http://speedflow.co.uk/push-on-hose-aeroquip-aqp/)
AN hose ends

At each end of the AN hose you will require a ‘hose end’, this is what we call the fittings that are fitted onto the end of the AN hose. The hose end mechanically fits to the hose in a way that is secure and leak free (the following pages show detailed cut through images). The finished AN hose assembly is then ready to be installed.

All Speedflow fittings are re-usable; this means they can be removed from the hose and used again, this is a desirable feature and may save you expense at a later time should you need to make any changes.

These different angle options allow the hose to fit easier and reduce any stress or load on the actual hose. It is important to use the hose ends that make the best use of space, gives economical use of hose and allow access to other equipment (if required).
Our unique design

Speedflow has invested heavily in the design, testing and manufacturing resources to create swept-angled hose ends that are one-piece from 37 degree seat to the hose insert. This design is used on majority of our hose ends. These are the most compact and strongest swept hose ends available. The majority of other manufacturers rely on brazing different parts of the hose end together and means their hose ends are physically bigger and the joins between the different parts, if not in alignment or if gaps exist, may affect the flow of liquid.

This design ensures:

• Very compact swept section
• Excellent flow characteristics
• One piece design from seat to insert

Speedflow hose ends have some or all of the following features:

• Piloted nipple and cutter ensure maximum sealing
• Compression socket ensures maximum hose retention and adds to seal security
• Stainless steel lock wires to prevent galling
• Internal Viton O rings for additional sealing reliability
• Double swivel joint to allow realignment after assembly and prevent stresses and damaging the hose assembly
How hose ends fit to the hose

Each of the five hose types have a different design of hose end. They all retain the AN thread and seat but vary in the method they use to attach to the hose. These cut away images show why they need to be different and how they work.

100 Series - Aeroquimp Startlite, Black Nylon Braided and Stainless Steel Braided Hose

These three AN hose types use a nipple and cutter style of fitting to the hose. This method has a section that cuts into the end of the rubber hose and gives a double sealing effect to the hose when fitted into the hose end.

Stainless Steel Braided Hose shown.
Details are the same for all three hose types.

Double seal created by the cutter ensures rubber is forced in between the cutter and nipple as primary seal, and then a layer of rubber and all the stainless steel braid is forced tightly to the outside face of the cutter to give secondary seal.

The mechanical fixing of the hose occurs when the stainless steel braid is trapped under the socket nut. The stepped internal face grabs and holds the braid.

- Outer weave of stainless steel braid
- Inner weave of stainless steel braid
- Nipple inserts into the hose
- Cutter cuts into the hose
- Internal Viton O ring seals the nipple insert on this straight hose end. Most angled hose ends are one piece from seat to nipple insert.
200 Series - PTFE Hose (PTFE Hose)

The stainless steel braided PTFE AN hose uses an olive that fits over the end of the PTFE liner with care taken to ensure all of the stainless steel braid remains outside of the olive and not trapped. The securing nut pulls this tight to the hose end and at the same time closes the olive slightly to seal the PTFE liner onto the hose end.

When the outer nut is tightened the olive is forced to close in onto the PTFE liner, this ensures the PTFE is held by the ribbed internal features of the olive and creates a seal on the nipple. The stainless steel braid is trapped and held under the fixing nut as it tightens onto the olive.
400 Series - Push On Hose

Reinforced rubber AN hose is pushed onto the hose end. The hose end has a unique design that stops the hose from working loose or coming off and ensures it is sealed. This design is quoted as having a maximum operating pressure of 200psi.

These raised edges stop the hose from sliding off. Once fitted the hose cannot work free from the hose end, removal will require the hose to be cut.

The outline of the three raided edges can be seen. They force the hose to expand slightly and hold itself in place.

Aluminium hose cover collar. Designed for the hose to slide under and protect the end of the hose.
Have your hose ends fitted by Speedflow

Speedflow has a policy of fitting AN hose ends to AN hose at no cost and often without delaying the despatch of goods. The only qualifying factor is that they have been purchased from us, Speedflow Products Ltd. We do not and never have charged for this service.

Customers take up this service in different ways:

- If hose length is confirmed with an order we can fit both hose ends.
- Sometimes we fit one of the hose ends to allow the customer to ‘mock up’ the hose on the vehicle. The customer can then finalise the precise position of the other hose end; it can be fitted by the customer or returned for us to fit.
- Due to our hose ends being re-usable, customers who make changes to hose layouts can return a used hose for Speedflow to remove them and refit to a new hose that has a different length.
How to fit your hose ends

Fitting a hose end to a hose is a straight forward task and should be undertaken using the right tools in a clean and tidy environment. Tools you will require are:

- Bench mounted vice
- Imperial sized spanners with a polished face (to avoid marking the anodised finish)
- Light oil, 3 in 1 or similar
- Hose shears or disc cutter with thin cutting disc or junior hacksaw
- Masking tape
- Pliers, long nosed pliers and snips
- Hobby knife
- Personal protective equipment (gloves, glasses etc.)
- Cloth to wipe off any excess oil
- Vice jaws, Speedflow supplies these free with hose end purchases over £60.00 net

Before making a hose, it is important to check and be sure of the length of the hose and that the correct hose ends (straight or angled) are being used. Ideally you should ‘mock up’ the hose in situ. The mantra ‘measure twice, cut once’ should be observed.

Generally:

- Have the correct adaptors fitted to the parts you are connecting to.
- Screw the hose ends onto the adaptors (no hose attached).
- Place the hose between the two hose ends.
- Mark the hose where it meets the very end of the hose end, this will identify the length of hose. LESS THE AMOUNT HELD IN THE HOSE END. SEE BELOW BEFORE CUTTING.

When mocking up the hose to identify the length be sure the hose is not forced or kinked. It should be a natural run without undue load or force being exerted on the hose. Consider how and where the hose will be held. ‘P’ clips can be used to fix the hose to the vehicle and if you are running a pair of hoses (to an oil cooler for example) a hose clamp could be used to hold the two hoses in a uniform position.

To mark the length on the hose we suggest wrapping some masking tape over the hose and then using a pencil to mark the length from the very back face of each hose end. This will give you a measurement THAT MUST HAVE EXTRA ADDED TO IT to allow for the amount of hose that will go into the hose end. The image below shows how to take the measurement from the hose end that will need to be doubled and added to the hose length.

\[ 2 \times 'A' + \text{hose length} = \text{cut length} \]
How to cut hose

There are a number of ways to cut AN hose. The most popular and easiest and probably safest way to cut AN hose is to use a fine tooth blade in a ‘Junior Hacksaw’ frame. Saw through, allowing the blade to cut and without exerting excessive pressure. Other options could be to use a disc cutter with the narrow ‘slitter’ style blade or using professional parrot beak shears.

It is important to mark the cut position by wrapping masking tape around the hose and drawing a line with pencil or pen. The masking tape also helps to stop the stainless steel braiding from flaring out or coming apart. Once cut, you are ready to make up your hose.

Hose end fitting guides for the AN hose types are on the following three pages.
100 series hose end fitting instructions
Aeroquip Startlite, Black Nylon Braided and Stainless Steel Braided Hose

Step 1
Wrap masking tape around the area to cut and mark the exact position of where the cut should be. There are a number of ways to cut the hose - hose shears, a disc cutter with a narrow ‘slitter’ blade or a junior hacksaw with a fine toothed blade. It is important the hose is cut square and straight. If using a Junior Hacksaw do not exert pressure or the braiding may fray and may prove difficult to push into the hose end socket. Any frayed pieces of braid may be trimmed back with snips. Once cut remove the masking tape.

Step 2
Insert the newly cut hose into the socket using a twisting and pushing motion until the hose reaches the back of the socket threads. If you push too far it will not be possible to thread the hose end together. If you do not push far enough the hose seal and grip properties will be compromised.

Step 3
Mark the position of the hose once it has been inserted into the socket. Wrap a piece of masking tape on the hose braid where it meets the socket; you will use this as a marker to check if the hose is being pushed out when you assemble the hose end.

Step 4
We find it is useful to oil (3 in 1 or similar light oil) the inside of the hose and the threads of the socket, then insert some long nosed pliers gently into the end of the hose to open out the hose - this will make inserting the hose end an easier task. Apply oil to the threads and nipple of the hose end.

Step 5
Carefully insert the nipple into the socket and hose until the socket engages with the hose end threads. Keep everything square to avoid cross threading and hold the hose to prevent it from being pushed out of the socket.

Step 6
Tighten the hose end into the socket using the correct size spanner. Ensure there is oil on the threads as you tighten up the union. Tighten the hose end into the socket until you have a gap of approximately 1mm. Align the flats for a professional finish.

Step 7
It is important to check for any signs of the hose being pushed out.
200 series hose end fitting instructions

PTFE Hose (PTFE Hose)

Step 1
Wrap masking tape around the area to cut and mark the exact position of where the cut should be. There are a number of ways to cut the hose - hose shears, a disc cutter with a narrow ‘slitter’ blade or a junior hacksaw with a fine toothed blade. It is important the hose is cut square and straight. If using a Junior Hacksaw do not exert pressure or the braiding may fray. Any frayed pieces of braid may be trimmed back with snips. Remove any burrs from the end of the tube with a suitable knife and ensure it is clean and rounded.

Step 2
Ensure the hose is round by gently squeezing with pliers. At this stage slide the hose end socket nut over the hose. Insert the hose end into the PTFE hose to ensure the I.D. is round. Remove the hose end and masking tape.

Step 3
Using a small screw driver or pick to gently expand the stainless steel braid away from the PTFE tube all the way around. Care should be taken to ensure the PTFE tube is not damaged in any way.

Step 4
Push the olive/ferrule onto the end of the tube and under the braid, ensure no braiding lies between the tube and the olive/ferrule. Complete the locating of the olive/ferrule by pushing it squarely against a flat surface such as a piece of wood as it will not mark or damage the ferrule. Inspect to ensure the tube butts up squarely and fully against the inside shoulder of the ferrule.

Step 5
Lubricate the threads on the hose end and the socket nut and also lubricate the hose end nipple. Insert the hose end into the tube by holding the hose and pushing the hose end nipple into the tube with a pushing/twisting action until it is fully engaged.

Step 6
Hold the socket nut in the vice jaws and, keeping the assembly square, start to engage the socket and hose end threads. It will be possible to engage enough turns to be ensure the threads are correctly aligned.

Step 7
Tighten the hose end into the socket using the correct size spanner. Ensure there is oil on the threads as you tighten up the union. Tighten the hose end into the socket until you have a gap of approximately 1mm. Align the flats for a professional finish.

IMPORTANT - Do not undo or re-tighten an assembly without first replacing the ferrule, they can be used only once.
400 series hose end fitting instructions

Push On Hose

Step 1
Cut the hose square, remove any debris and ensure it is clean.

Step 2
Use the vice jaws to hold the hose end. The design of the vice jaws will allow for angled hose ends to be held.

Step 3
400 series hose will not readily slide onto the hose end and achieve complete insertion to the collar. This can be helped by warming the hose in hot but not boiling water for a few minutes. Use hand gloves. Do not use oil of any kind as this will maintain reduced friction between the hose and hose end and compromise the security.

Step 4
Check the hose is on as far as possible and tight inside the collar.
Adaptors

An adaptor is a threaded union that connects the AN hose assembly to a piece of equipment. It allows the two items to be compatible. In broad terms it ensures a standard hose system - in this case AN hose assemblies - to be compatible with all the various components and equipment on your vehicle.

The subject of adaptors and the variations in style, thread and sealing methods is an area that is without limit. They are generally straight, but could be angled, allow three hoses to join, or even be a combination of these styles.

Many ancillary and engine components will require an appropriate adaptor to mate to the AN system. These adaptors will have AN (sometimes called JIC) on one side and will have one of the many thread types and styles being commercially used on the other. These could be any one of the following:

- Metric
- NPT
- UNF
- BSP (parallel or taper)
- SAE

Once the thread has been confirmed or identified we then need to ensure we have the correct sealing method. Some styles seal on a seat that is a machined detail on the adaptor and some require a washer. If washers are required we have a wide range for different applications including:

- Copper
- Dowty (metric, bsp, jic)
- Aluminium
- Rubber O ring

This may sound alarming, it isn’t and it need not be an obstacle. Speedflow has a database created through years of experience with all types of equipment (fuel pumps, carburettors, gear boxes etc) and may be able to confirm the thread over the phone. We can also identify the requirements quickly if we have the part or an existing fitting delivered to us. Sometimes customers have something that fits and send it in for us to identify. We can even supply a range of steel fittings to the customer to be trialled ‘on site’ if no easier method can be found. Helping to sort out this fine detail is part of what we do.
Vice Jaws

Speedflow have vice jaws made from recycled plastic. They are designed to hold your hose end in the vice without marking or damaging them and make the job of fitting them much easier. Historically these jaws have been made in aluminium and due to the specialist nature and relatively high cost, were not widely used. Our objective was to make a specialist workshop tool available to every user at little or even NO cost.

These are free with hose end orders of £60.00 net or more (correct 01.2013).

Hose Maintenance

Maintenance
Hose assemblies in operation should be inspected frequently for leakage, kinking, abrasion, corrosion or any other signs of wear or damage. Worn or damaged hose assemblies should be replaced immediately.

Cleaning
Clean assembly by blowing through with clean compressed air. Assemblies may be rinsed through with mineral spirit as long as the hose is compatible with oil.

Inspection
Examine the hose assembly for cuts or bulges, obstructions and cleanliness. Check for proper gaps between the nut and socket. Check the hose assembly is not twisted. Cap the ends of a hose assembly when it is not being used to keep them clean.
More tips

Swivel hose ends will relieve the problem of hose twisting, either as a result of the vehicle operation or merely during tightening of the hose ends or fittings. It is best to run lines together if possible but consider the relative temperature of fluids being carried; they should be of similar temperature. Cooling fluids should not be routed close to heat sources (exhausts, turbo, inter-cooler etc.) For hoses run in areas of the car vulnerable to high temperature a heat reflective sleeving should be considered; this will fit over the hose. Care should also be taken not to run lines in vulnerable areas (under the chassis etc); it may look safe on a stationary car in the workshop but under racing conditions, loading or unloading from a trailer or on a chassis stand, line runs may prove to have suffered extensive damage.

Although performance plumbing appears to be a complex and often confusing aspect of engineering, if approached logically and with our help and advice, it is possible for you to produce your own fluid transfer systems to a very high standard.

Safety considerations

When assembling a plumbing system always allow sufficient bend radius in the hose to avoid kinking, particularly when used on moving parts (steering etc.) Check the hose chart information for hose bend radius details.

Never allow a component (i.e. brake caliper) to hang by its hose during maintenance as once a ‘kink’ appears in a hose it may be unsafe to use. You may also damage the hose end, the adaptor or strip the thread in the caliper itself.

Any damaged fitting should be replaced and a new olive/ferrule should always be fitted when re-using fittings with PTFE hose.

When re-using or re-fitting any hose line always ensure that it is kept perfectly clean whilst removed, both to avoid dirt and grit fouling the fitting seat and thread, also to avoid contaminating the fluid. Various types of plugs and bungs are available for this application.
Summary

And that, as they say, is that. Like I said at the beginning, this is not meant to be the ‘be all & end all’ of AN hose & fitting guides, and I really hope it has provided you with some useful practical tips. Please remember that having great looking high performance hose on your project isn’t difficult, just follow the processes we have described, plan ahead, use the right tools and invest in good quality parts.

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