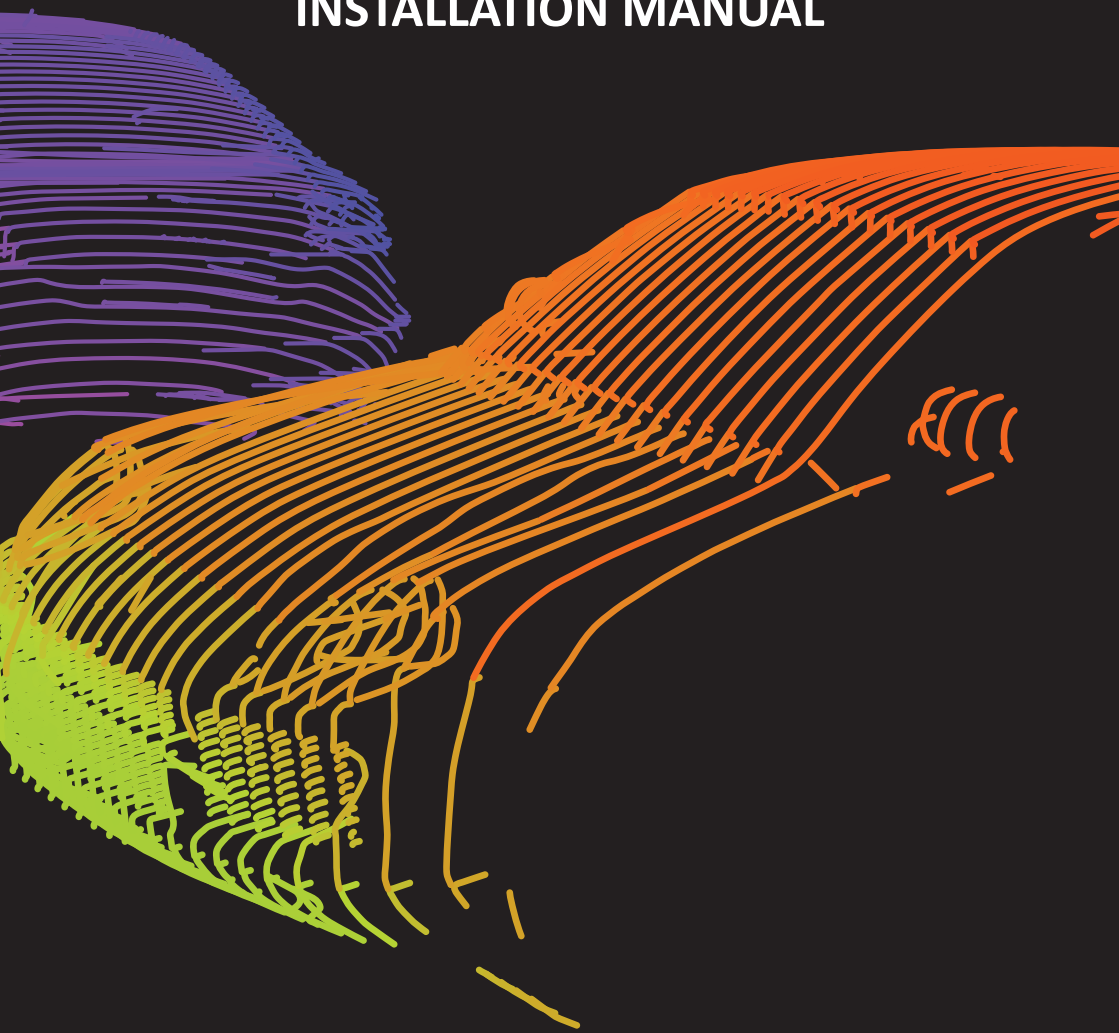




Indústria de Artefatos de Borracha

# INSTALLATION MANUAL



Edition 01



## OBJECTIVE

### **Maintenance and installation tips.**

The preventive maintenance has as its objective to assure the proper functioning of the cooling system. This way the indication is that this inspection is performed every 12 months, in order to prevent failures and leaks. The correct installation of the hoses is also fundamental for the good functioning of the system. In a general way the automotive hoses are installed basically the same way, being attached to a tube or fitting (entry or exit) and fixed with the use of clamps and quick couplings.



## 1 - APPLICATION

Proper assembly of the engine component or vehicle radiator.

## 2 - MATERIALS

Nut driver, vaseline, degrippant, elastic or pressure clamp pliers, fork wrench, pipe wrench, steel brush and sandpaper.

Clamps: elastic or spring clamp, tappet groove clamp and tappet clamp.

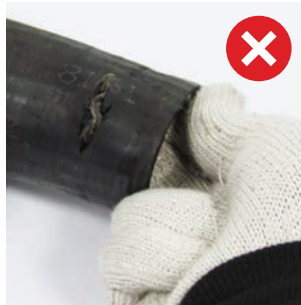
## 3 - ASSEMBLY PROCESS



3.1 – Take off the clamp from the hose that will be changed, in case there is difficulty to take off the hose from the surface, the hose must be turned on both sides until it loosens, without forcing the surface.

**In every substitution of the hose, we recommend you exchange the clamp.**

3.2 - Check the diameter of the nozzle (radiator/turbine/expansion vessel or tube) and of the hose that will be installed, because both must have the same diameter.



*In case of differing measures between the hose component and nozzle, excess length and diameter of the nozzles, do not carry out the adjustment to the hose, cutting or over-tightening it.*

3.3 – Check the plastic or metal nozzle of the component in which the hose is installed (radiator/turbine/expansion vessel or tube), if there is any kind of corrosion or dirt, caused by rust.

3.4 – If necessary proceed to the cleaning of the nozzle, use the steel brush or sandpaper for the metal nozzle.

*Note: for the plastic nozzles take all due care while cleaning.*

*Check if the component is clean, before starting the assembly, in case the hose is installed with residues, the proper sealing will not occur, causing a possible leakage.*



*vaseline application*

3.5 – To carry out the assembly without damaging the hose, there must be applied a lubricant (vaseline) to the nozzles.

3.6 – Before starting the installation, pass the clamp through the hose which can be:

- Elastic or spring clamp: use the clamp pliers to loosen and ease the passage through the hose until the bounce or until the fitting limit.



When installing the hose in the component (radiator/turbine/expansion vessel or tube), recoil the clamp until the nozzle region. Use the plier to relieve the pressure, finishing the installation of the hose.

- Thread clamp: alleviate the clamp to ease the passage through the hose until the bounce or until the fitting limit.



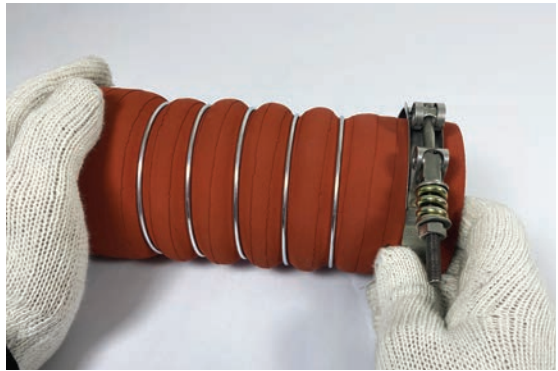
*Alleviating the clamp*



When installing the hose in the component (radiator/turbine/expansion vessel or tube), recoil the clamp until the nozzle region, centralize it. Start the tightening using the nut driver, checking the hose resistance in order not to damage it.



- Tappet clamp: alleviate the clamp, pass through the hose, until the bounce or until the fitting limit.



When installing the hose in the component (radiator/turbine/expansion vessel or tube), recoil the clamp until the nozzle region and perform the necessary tightening using fork wrench or pipe wrench, ensuring the hose attachment.



*Note: performing the final tightening, it must be observed in order not to have excessive tightening, compromising, cutting or weakening the hose structure. Make sure that the hose will not suffer any mechanical interference, by belts or engine components with sharp points.*



## 4 - QUICK CONNECTION

4.1 - Before starting the installation, check the nozzle of the vessel/radiator, analyzing if there is any irregularity, such as: crack, wear and hole.



*steel brush*

4.2 – Use the steel brush to perform the cleaning of the nozzle surface where the quick connection will be installed, when it is a metal nozzle. When it is a plastic nozzle, use only a dry cloth.



4.3 – Apply a lubricant (vaseline) on the internal surface of the connection, to ease its fitting.

In case it is not done, there will be difficulty to perform the coupling, thus compromising its sealing.

4.4 – To ease the assembly process, direct the quick connection aligning the nozzle of the vessel/radiator, being careful not to stress the rubber, only the quick connection.

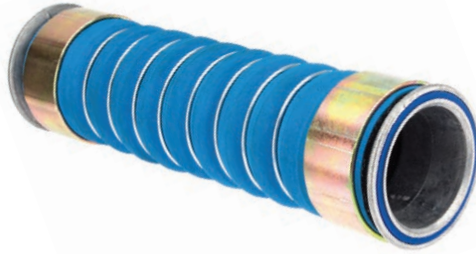


*quick connection*

4.5 – When inserting the quick connection passing through the fitting lock end, coupling to the nozzle of the vessel/radiator, when the lock click triggers, the installation will be concluded.



## 5 - INTERCOOLER NOZZLE HOSE



5.1 – To remove the intercooler nozzle hose, use a fork wrench or nut driver. In case of difficulty to loosen the clamp (tappet groove), due to rust, apply the degrippant, until you can loosen the clamp completely.

5.2 – Make sure the nozzle of the engine component is not damaged, cracked or broken.

5.3 – Perform the cleaning of the surface using the steel brush, eliminating any existing residue. Thus avoiding difficulty to unite the nozzles.

5.4 - Before starting the installation, alleviate and pass the tappet groove clamp through the hose, aligning the nozzles.



5.5 – Uniting the nozzles, fit the tappet groove clamp and start the tightening using the fork or pipe wrench, performing the tightening until the clamp is fully closed.



*Uniting the nozzles*

Note: there cannot be any gaps between the ends, so that there is no leakage.



## RUBBER HOSES ENEMIES

HEAT is one of the most dangerous enemies for the hoses in the vehicle engine compartments. A damaged hose by excessive heat becomes hard and shiny, which leads to the advent of cracks, most of the times irregular, wider and deep.

OZONE causes micro-cracks under small parallel lines all over the hose.

CRACKS in the edges of the hose are a result of excessive tight clamps or put in a wrong way over the nozzle due to failures in the installation process.

OIL is an extremely aggressive agent for the EPDM rubber hose. A hose contaminated with oil turns up swollen and softened. In this case there must be identified the reason for the oil leakage and immediate substitution of the hose.

## IDENTIFYING PROBLEMS

### DAMAGE BY HEAT

**Aspect:** damages caused by heat can occur internally and are difficult to be detected by physical appearance, a sign of internal damage is the swelling. The hose can also become hardened, shiny and present cracks most of the times irregular, wide and deep.

**Possible causes:** overheating can overburden the fibers, through the dilation inside the hose, causing its deterioration.

**Form of prevention:** periodical inspection of the vehicle cooling system, checking of the levels of fluids and being able to display possible security alerts in the panel that indicate possible anomalies.

## DAMAGE BY OZONE

**Aspect:** parallel micro-cracks in the cover all over the hose.

**Possible causes:** degradation caused by air pollution, which harms directly the rubber compounds. This degradation forms small cracks mostly in curves and fixation places weakening the hose.

**Form of prevention:** use our Hoses manufactured in EPDM that are resistant to this kind of degradation.

## DAMAGE BY ABRASION

**Aspect:** tears, rips or wears.

**Problem:** a bad fixing of the hose can cause its abrasion with other hoses and engine components compartment such as the belt-driven, fan blade or even a pulley which can cause its rupture.

**Form of prevention:** the periodical inspection of all the system is extremely important to detect possible clearances and uncouplings. In case there are identified damaged hoses, these must be substituted.

## DAMAGE BY OIL

**Aspect:** the EPDM hose, contaminated and damaged becomes soft, sticky or spongy to the touch and presents swelling.

**Possible causes:** anomalies can cause the contamination of the hoses with oil, weakening their internal and external structure. Making the hose to soften, swell and separate in layers leading to the failure.

**Form of prevention:** the periodical inspection will always be the most important ally in any situation, this way in case the hose presents any kind of anomaly, the first step is to identify any source of leakage and promote the hose substitution. In cases of internal contamination, besides the hose substitution, it is recommended to perform the change of the vehicle cooling fluid as well. Tip: always use the type of fluid recommended by the manufacturer for its application.

## DAMAGE BY LEAKAGE

**Aspect:** moisture, crystallization of the liquid in the coupling nozzle of the hoses and drips are formed around the clamps.

**Possible causes:** deteriorated hoses, torque insufficiency while placing the clamps in the assembly process or excessive torque that cause some type of crack or rip.

**Form of prevention:** change of the damaged or deteriorated hose and correct assembly of the hoses when there is the need for replacement. Tip: whenever substituting a hose also substitute the clamps ensuring this way a perfect execution of the services.



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