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**How to
Check, Adjust
& Replace a
COOLANT HOSE
& COOLANT**



This workshop procedure guide contains:

Step-by-step instructions on how to check, adjust and replace a coolant hose and Coolant.

Personal safety:

Whenever you perform a task you must use personal protective clothing and equipment that is appropriate for the task. Among other items, this may include:

- Work clothing, such as overalls and steel-capped footwear.
- Eye protection, such as safety glasses and face masks.
- Ear protection, such as earmuffs and earplugs.
- Hand protection, such as rubber gloves and barrier cream.
- Respiratory equipment, such as face masks and valved respirators.

TIPS FOR CHECKING & REPLACING A COOLANT HOSE

Safety check:

- Never try to assess the serviceability of a coolant hose while the engine is hot. Let it cool down so that you can handle the hoses comfortably and safely.
- Always ensure the engine is turned off before attempting to check the radiator hoses.
- Always make sure that you wear the appropriate personal protection equipment before starting the job. It is very easy to hurt yourself even when the most exhaustive protection measures are taken.
- Always make sure that your work area/environment is as safe as you can make it. Do not use damaged, broken or worn out workshop equipment.
- Always follow any manufacturer's personal safety instructions to prevent damage to the vehicle that you are servicing.

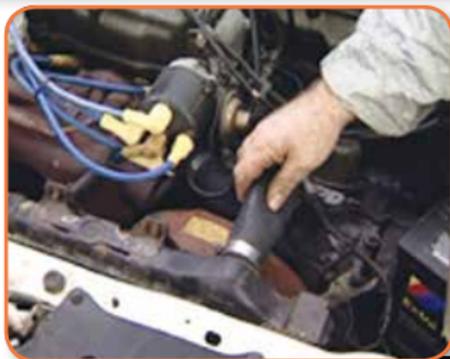
Points to note:

- If you find one defective hose, the chances are that the other hose(s) may be deteriorating in the same way and will soon need to be replaced. For this reason, most technicians will generally replace both hoses at once as a sensible precaution.
- You may need to use a torch to inspect the coolant hoses so that you can clearly see if the surface is starting to crack.
- Radiator hose problems:
 - Swollen hose. This hose has lost its elasticity and is swelling under pressure. It may soon rupture.
 - Hardened hose. This hose has become brittle and will break and leak.
 - Cracked hose. This hose has cracked and will soon start to leak.
 - Soft hose. This hose has become very weak and may collapse and close up completely.
- Clamp types:
 - Gear or worm-type clamp: adjust with a screwdriver.
 - Banded or screw-type clamp: adjust with a screwdriver.
 - Wire clamp: this spring clamp is not adjustable, and is fitted and removed with a special hose clamp pliers, which has grooved jaws.
- Clamps are not expensive, so it is good practice to fit new ones at the same time as new hoses. Even if not corroded, the old clamps may become distorted when being removed from an unserviceable hose.

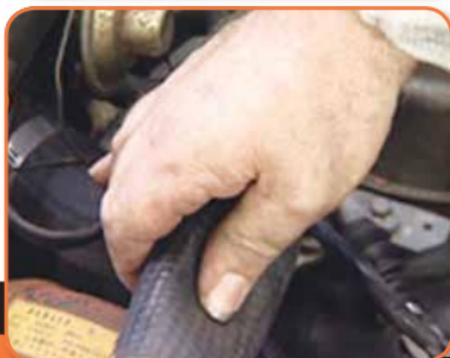


Checking & Replacing a Coolant Hose

1. Inspect hoses and clamps



Locate both the hoses that carry coolant between the radiator and the engine. One is at the top and the other is at the bottom of the radiator.



Squeeze each hose. It should feel pliable and springy. If it feels very soft and weak, or very hard and brittle, it will need to be replaced.



Look for signs of swelling or cracking, particularly on the vulnerable underside of the lower hose.



Check that the clamps hold the hoses firmly in position and are not corroded.





2. Remove the hose



Drain the coolant from the system before removing either of the hoses.



Remove the clamp using the appropriate tool. If the hose is stuck and won't pull off easily, be careful you do not damage the radiator fitting by using too much force.

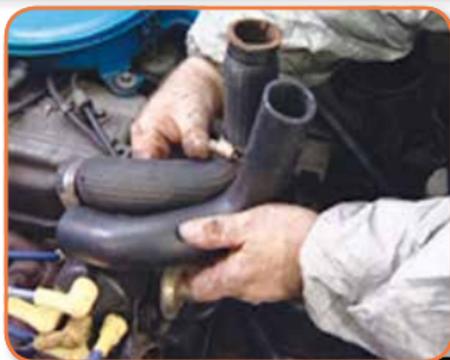


It is better to cut the hose in several places so that you can remove it easily.



Clean the hose fittings thoroughly on both the engine and the radiator with fine sandpaper, so that it will make a good seal with the new hose.

3. Verify replacement hoses



Obtain new hoses and compare them with the removed hoses to make sure that they are the same length and diameter.



If the hose is a molded type, the new one must also have the same pre-formed curve.

4. Refit the hose



Apply some sealing compound to the hose fittings and...



...place the loosened clamps over the hose ends before sliding the hose into position on the block and radiator fittings.



Tighten the clamps securely, about 6mm from the end of the hose.



Be careful not to over tighten and damage the hoses however it is important they do not fall off once the pressure in the cooling system increases.

5. Refill cooling system and check



Refill the cooling system and...



...then run the engine for a few minutes.



Check the hose connections to make sure that there are no leaks.



When the engine is at its normal operating temperature, check the tightness of the clamps again, as the clamps and hoses will both expand at different rates as they heat up and the pressure increases in the system.

TIPS ON CHECKING & ADJUSTING COOLANT

Objective:

Check and adjust coolant levels and test coolant quality in a vehicle with a recovery reservoir.

Safety check:

- Always be very careful when opening a radiator cap, because the cap keeps the coolant under pressure to raise its boiling point. Sometimes, even the pressure in a warm engine can force the coolant to spurt out when the cap is released.
- Always cover the radiator cap with a rag to catch any hot spray.
- Always wear eye protection.
- NEVER open a radiator cap on an overheated engine; wait for it to cool down first.
- Always make sure that you wear the appropriate personal protective equipment before starting the job. It is very easy to hurt yourself even when the most exhaustive protection measures are taken.
- Always make sure that your work area/environment is as safe as you can make it. Do not use damaged, broken or worn out workshop equipment.
- Always follow any manufacturer's personal safety instructions, to prevent damage to the vehicle you are servicing.

Points to note:

- There are two correct level marks on the reservoir, because the coolant in the system expands and contracts in volume, depending on how hot it is. The coolant level should be at the lower mark, when the vehicle is cold. The coolant level should be at the upper mark when the vehicle is hot.
- If the reservoir is completely empty, add coolant until the level is up to the appropriate mark for the engine temperature. Then run the engine until

it is at its normal operating temperature, and check the level again. You will probably need to adjust the level again.

- For each 10 kPa increase in the radiator cap operating pressure, it will increase the boiling point of the coolant by 2°C



Checking & Adjusting Coolant

1. Check fluid level



Most modern vehicles have a coolant system that uses a transparent recovery tank as a coolant reservoir.



Check the level of coolant in the reservoir. If the engine is hot, the level should be visible at the upper mark.



If the engine is cold, it should be at the lower mark.

2. Check protection level with a hydrometer



Before adding new coolant, check the specific gravity of the coolant in the system with a coolant hydrometer.



Draw some coolant up into the hydrometer and read the mark on the float at the level of the fluid in the chamber.



This will indicate the freezing point of the coolant mixture in the system, so you can tell if it has the right proportions of anti-freeze and water.

3. Adjust fluid level



Check the service manual for the recommended type and mixture of coolant that will produce an appropriate level of protection for the conditions where the vehicle will be used.



Use a funnel to add enough coolant to bring the level up to the appropriate mark.



Replace the coolant reservoir cap.





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