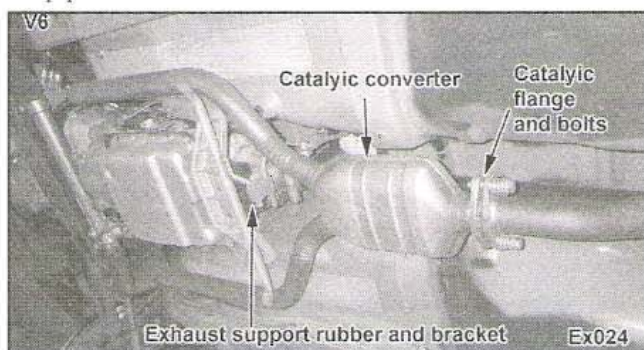


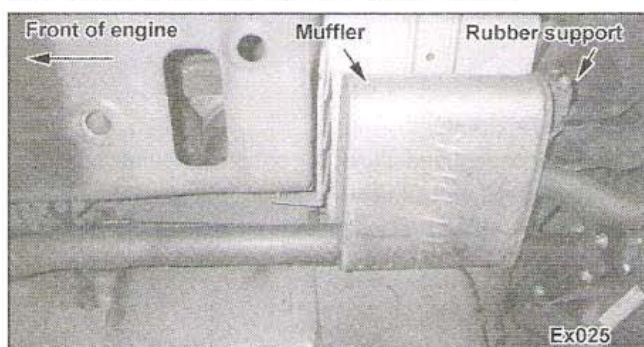
# EXHAUST SYSTEM

## GENERAL DESCRIPTION - V6

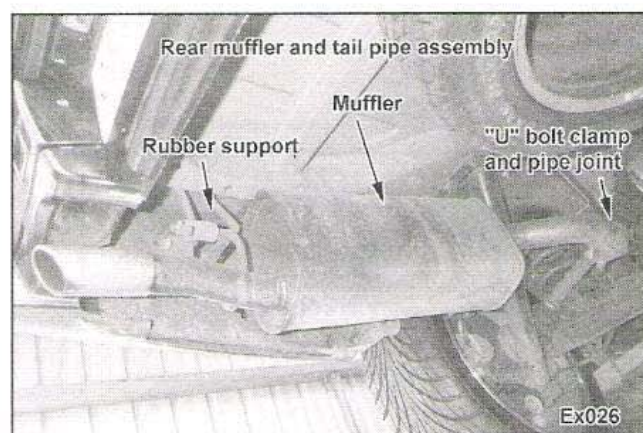
V6 engines are fitted with a single pipe exhaust system, dual pipes from the engine to the catalytic converter then to a single pipe. Supported by a rubber insulator at the rear of the transmission, at the end of the muffler and at the rear of the tail pipe.



Exhaust manifolds are connected to a split system front pipe which feeds into one pipe just before the catalytic converter joining flange. After the catalytic converter a centre pipe and muffler assembly is bolted via a flange, this assembly takes the exhaust fumes towards the rear of the car.



A tail pipe fits onto the centre pipe, this pipe goes over the differential and has a muffler just prior to the back bumper bar assembly. It is this pipe and muffler assembly which most frequently requires replacing due to condensation and rust



within the muffler. Each type of body style has its own specific tail pipe and muffler assembly.

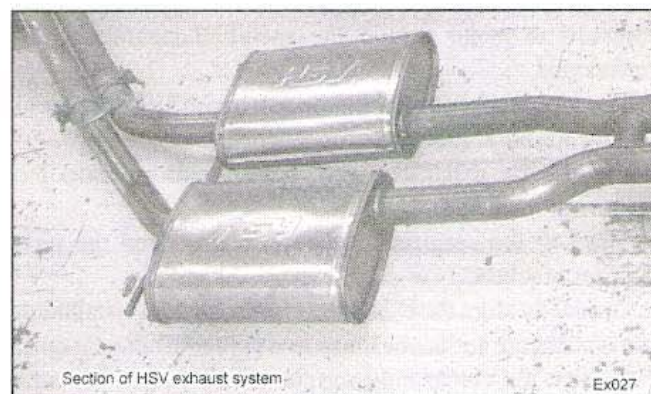
## GENERAL DESCRIPTION - V8

VT SerI V8 powered vehicles have a split system to the rear pipe and muffler.

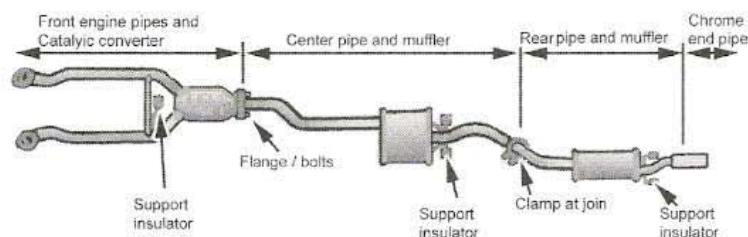
V8 Gen III have a similar system to VT SerI, however there are differences.

## GENERAL DESCRIPTION - HSV

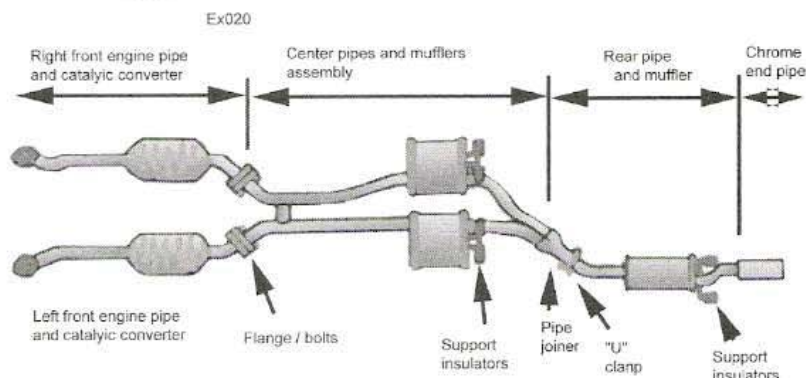
HSV Vehicles have their own separate exhaust systems, including special mufflers and exhaust pipes.



## EXHAUST SYSTEM

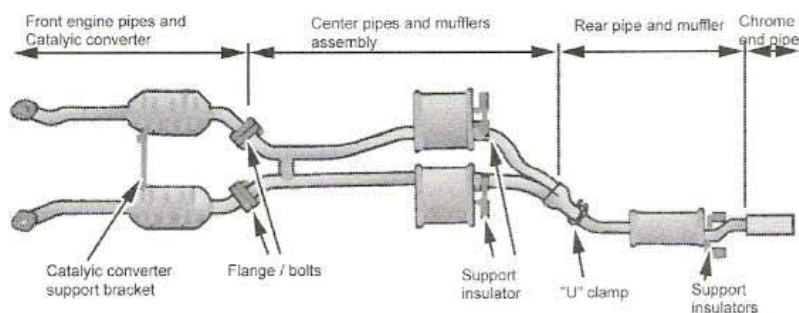


V6 Engines



Supercharged V6 and V8

Ex021



V8 Gen III

Ex022

These components can be ordered through HSV or special GM Holden suppliers.

### MAINTENANCE

#### Exhaust System Alignment

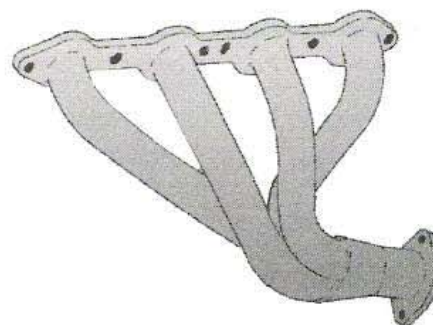
The exhaust system must not have any leaks, binds, grounding and excessive vibration. If these occur they are usually caused by: loose, broken or improperly aligned clamps, insulators or brackets or improperly connected pipes. Any of these mentioned could alter the clearances of the exhaust system components. If any of these conditions occur, the exhaust system components must be checked, adjusted or replaced to make certain the specified clearances are maintained.

All the pipe joints have a peg and a notch which must be equal to gain correct alignment.

To adjust the exhaust system components perform the following procedure:

1. Slacken the securing hardware, clamps and the pipe support brackets.
  2. Gradually align the exhaust system so that all installation dimensions are within the limits and tighten all attachments.
- \* Tighten the clamp nuts and the exhaust manifold nuts

HSV - one of the header designs fitted to LS1 (GenIII) engines (left side)



Ex023

evenly and alternately.

3. Start the engine and check the exhaust system for leaks.
- \* Mufflers, inlet pipes and outlet pipes, brackets, clamps and insulators should be replaced if they are defective or become badly corroded. Do not attempt repair of these parts.

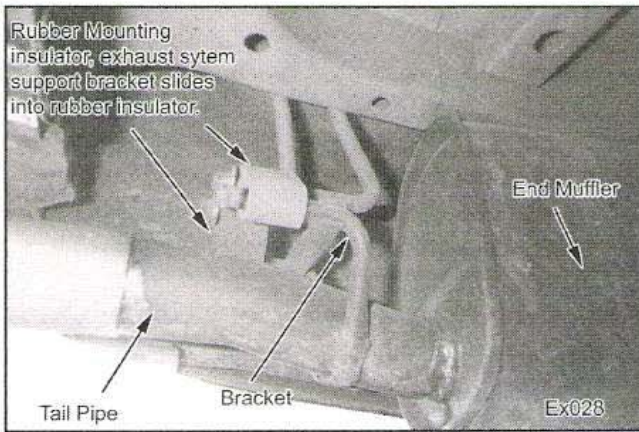
### INSPECTION

#### Exhaust System

##### Inspection

Check the inlet pipe, outlet pipe, and muffler for cracked joints, broken welds and corrosion damage (holes) that would cause a leaking exhaust system. Check the clamps, brackets

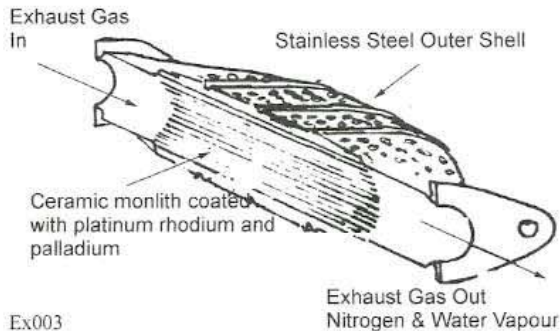




and insulators for cracks and stripped or badly corroded bolt threads. When pipe clamp(s) are eased, and/or removed to replace a pipe or muffler, replace the clamp(s), if there is reasonable doubt that its service life is limited.

### CATALYTIC CONVERTER

Catalytic Converter



Ex003

Catalytic converters and mufflers look very similar. Except a catalytic converter when operating properly will convert carbon monoxide and hydrocarbons, that is exhaust gas into carbon dioxide which is a harmless gas that is present in our environment.

The outside consists of a stainless steel housing, the converter internal components consist of a ceramic monolith which has small holes to allow the exhaust gasses to flow through. The converter housing has gauze packed in between the housing and the honeycombed ceramic monolith. (this creates the chemical reaction necessary to oxidize carbon monoxide and hydrocarbons to harmless carbon dioxide).

The catalytic converter normally operates at approximately 600°C. The catalytic material is very sensitive to the effects of a rich or lean fuel mixture which causes the temperature of the converter to rise rapidly to the temperature at which the ceramic material melts.

**Caution:** Excessively rich or lean fuel mixture can cause sudden failure of the catalytic converter.

The catalytic converter is also sensitive to the use of leaded petrol. This causes deposits to form in the converter which restrict the exhaust flow and prevent the catalyst from working.

\* The use of unleaded petrol results in black tail pipe deposits rather than the grey colour most people are familiar with. The black colour does not therefore, indicate a state of poor engine tune.

## Problem Diagnosis

### Problem: Leaking exhaust system!

#### Possible Causes and Remedies:

- \* Leaks at exhaust pipe joins. Remedy - Check for broken or loose clamps or clamp nuts and joint bolts.
- \* Gaskets damaged. Remedy - Replace gasket.
- \* Muffler, catalytic converter or exhaust pipe burnt out or rusted out. Remedy - Replace faulty items.

### Problem: Excessive noise!

#### Possible Causes and Remedies:

- \* Muffler, catalytic converter or exhaust pipe burnt out or rusted out. Remedy - Replace faulty items.
- \* Leaks at exhaust pipe joins. Remedy - Check for broken or loose clamps or clamp nuts and joint bolts.
- \* Gaskets damaged. Remedy - Replace gasket.
- \* Exhaust manifold loose at cylinder head. Remedy - Torque exhaust studs or replace if necessary.

### Problem: Poor fuel economy!

#### Possible Causes and Remedies:

- \* Blocked catalytic converter. Remedy - Replace catalytic converter.
- \* Exhaust pipe damaged. Remedy - Replace exhaust pipe.

## Torque Specifications Nm

V6 Exhaust manifold to cylinder head studs .....	40 - 60
V8 Exhaust manifold to cylinder head studs .....	20 - 28
V6 and V8 engines	
Oxygen sensors .....	38 - 46
Front exhaust pipe flange to exhaust manifold flange	20 - 35
Catalytic converter flange to exhaust pipe bolts .....	30 - 50
Exhaust clamp nuts .....	20 - 30
Tailpipe bracket to rear hanger bolts .....	20 - 25