

# 30 - MANIFOLD AND EXHAUST SYSTEM

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# 30 - MANIFOLD AND EXHAUST SYSTEM

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## CATALYTIC CONVERTERS

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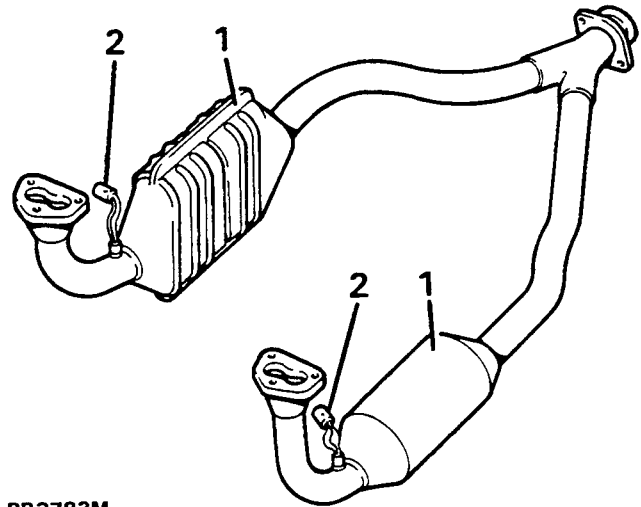
### Description

Catalytic converters which form part of the engine emission control system, are designed to 'clean' the exhaust gases, by closely controlling the fuel air ratio delivered to the engine and converting the residual exhaust compounds into products more acceptable to the environment.

The front section of the exhaust system to each cylinder bank contain the ceramic elements of the catalytic converters. The oxygen sensors which transmit information to the fuel ECU for control of the mixture, are located in the exhaust down pipes.

The Hydrocarbons (HC), Nitrogen oxides (NO<sub>x</sub>) and Carbon monoxide (CO) emitted by the engine react with the catalytic element and exhaust temperature to convert the toxic gas, into Nitrogen (N), Carbon dioxide (CO<sub>2</sub>) and water vapour.

Should the engine be supplied with a rich mixture causing high CO in the exhaust gas, the ceramic element will become coated and the useful life of the catalyst reduced. If the mixture is too weak, excess oxygen in the exhaust gas will cause the catalysts to burn out.



RR3783M

1. Catalysts
2. Lambda oxygen sensors

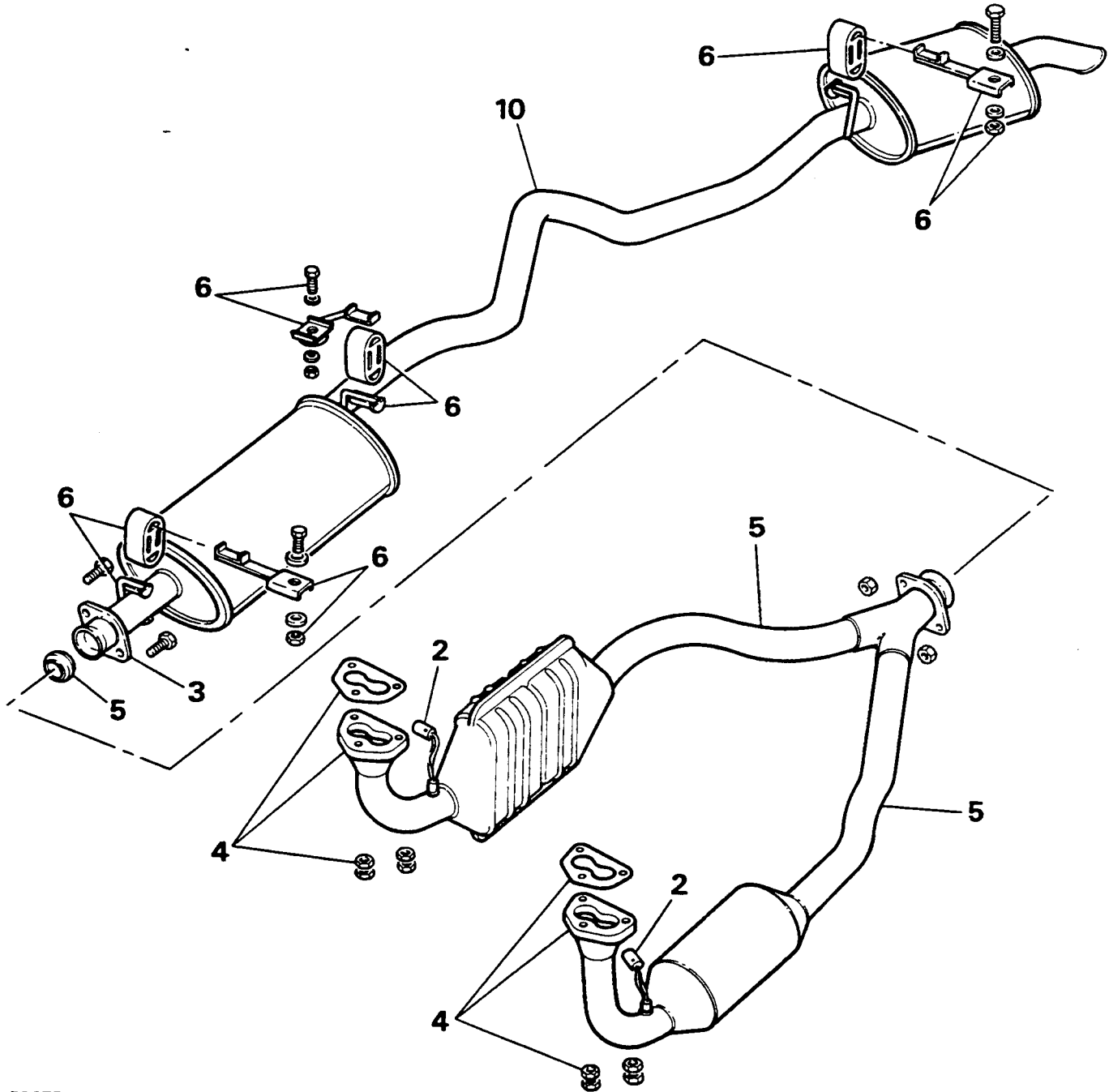
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**EXHAUST SYSTEM COMPLETE**

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Service repair no - 30.11.01

Remove and refit.



RR2777M

To improve sealing and accuracy of assembly, a two piece exhaust system is fitted.



**NOTE:** Ensure no exhaust leaks are evident in either a new or old exhaust system, as this will affect vehicle performance.



**WARNING:** To prevent personal injury occurring from a hot exhaust system, DO NOT attempt to disconnect any components until exhaust system has cooled down.

## Remove

## Catalysts - remove and refit 1 to 5

1. Raise vehicle on suitable ramp, apply parking brake.
2. **Catalyst vehicles only:** Disconnect two lambda sensor wiring connectors.
3. Remove two bolts securing rear exhaust assembly to front exhaust assembly.
4. Remove nuts and release front downpipes from manifolds. Discard gaskets.
5. Lower front exhaust assembly with catalysts (if fitted), retain olive.



**NOTE: Assistance is required for removing and refitting rear exhaust assembly.**

6. Remove bolts securing three hanger brackets to chassis. Lower exhaust assembly onto rear axle. Detach rubbers from hanging brackets.
7. Place extended axle stands underneath chassis, in front of chassis mounted rear towing brackets.
8. Lower ramp until vehicle weight is supported securely on stands.
9. Lower ramp until rear shock absorbers are **ALMOST** fully extended.
10. Move rear exhaust to a diagonal position, centre silencer to right of vehicle.
11. Facing rear of vehicle, twist assembly anti-clockwise clear of rear axle.
12. Remove rear exhaust assembly from vehicle.

## Refit

13. Position rear exhaust assembly over rear axle in a diagonal position, as for removing.
14. Twist assembly clockwise until it is in mounting position.
15. Reverse removal procedure. 1 to 9 using new manifold gaskets and applying exhaust sealer to system joint.
16. Examine system for leaks, ensuring that system does not foul underbody components. Rectify if necessary.

## EXHAUST MANIFOLD

Service repair no - Left hand - 30.15.10

Service repair no - Right hand - 30.15.11

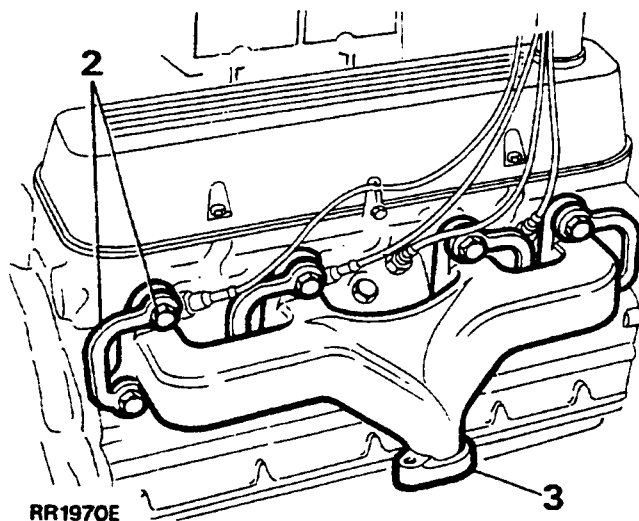
## Remove and refit

## Left hand

## Right hand

## Remove

1. Disconnect front exhaust pipe(s) from manifold(s).
2. Tap back bolt locking tabs and remove eight bolts, lock tabs and washers.
3. Remove manifold(s) and old gaskets.



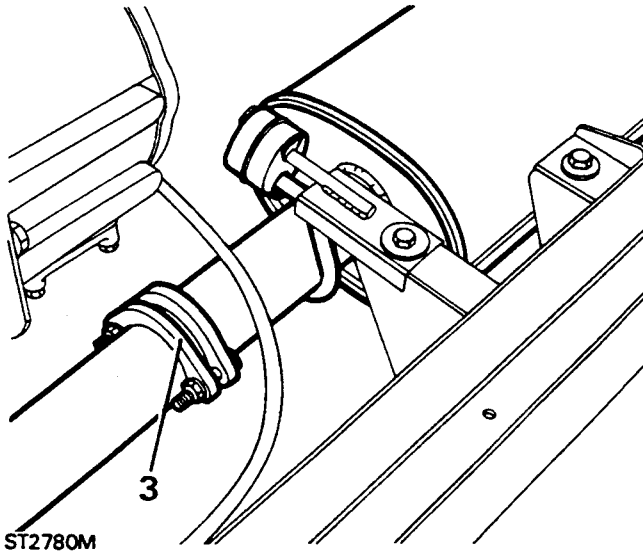
## Refit

4. Ensure that mating surfaces of cylinder head and exhaust manifold are clean and smooth.
5. Coat threads of each bolt with anti-seize compound.
6. Place manifold and new gaskets in position on cylinder head and fit securing bolts, new lockplates and plain washers. Plain washers are fitted between manifold and lockplates.
7. Evenly tighten manifold bolts to **20 Nm** bend over lockplate tabs.
8. Reconnect front exhaust pipe, using new exhaust flange gaskets.

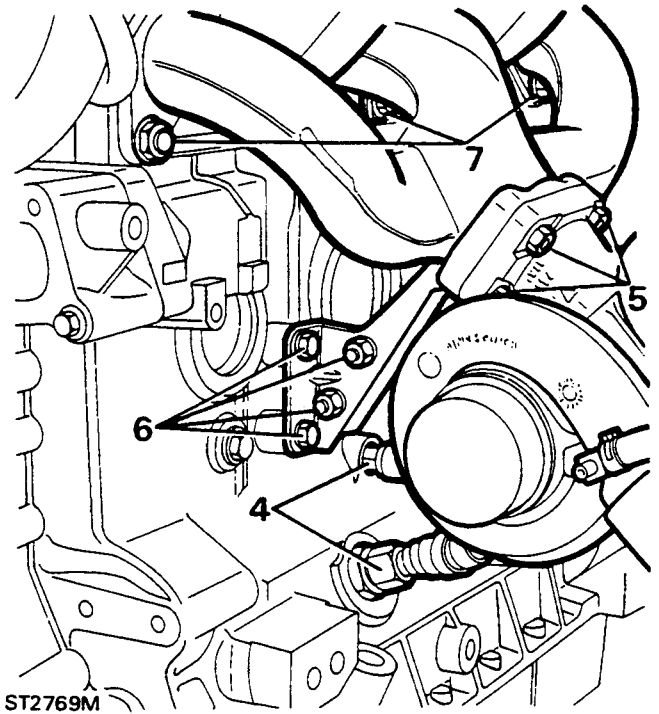
## EXHAUST MANIFOLD

### Remove

1. Disconnect the battery negative lead.
2. Remove the air intake manifold *See Air Intake Manifold*

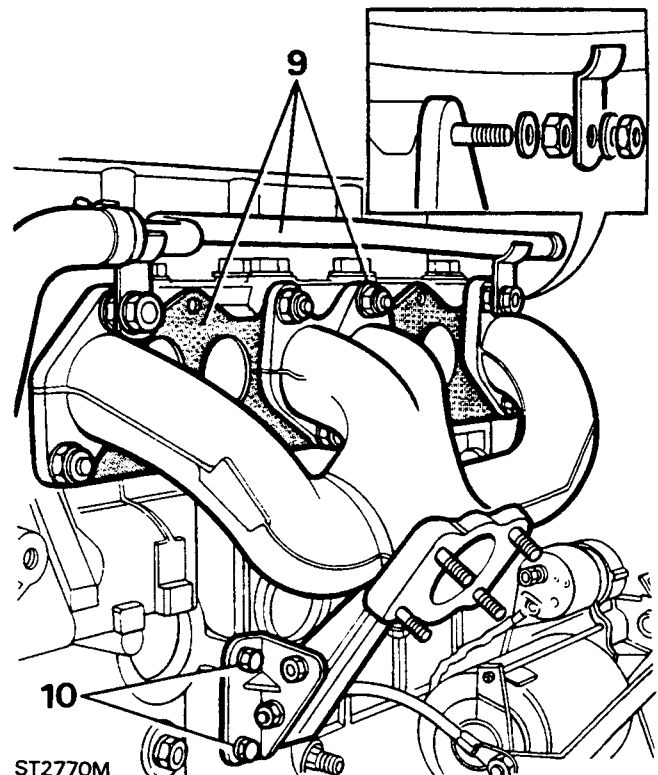


3. Loosen front exhaust pipe fixings at the silencer end.
4. Release turbocharger oil pipes from cylinder block.
5. Remove the four nuts securing turbocharger to exhaust manifold, move turbo away from manifold.
6. Remove nut securing support bracket to manifold. Loosen the two support bracket nuts and bolts. Remove bolts retaining bracket to cylinder block, remove support bracket.
7. Remove seven bolts securing manifold. Release heater rail, remove manifold and gasket.



### Refit

8. Fit support bracket to manifold with single nut.
9. Fit gasket and manifold and heater rail to cylinder head. Secure with the seven bolts tightening evenly to **25 Nm**.
10. Fit support bracket to cylinder block and tighten support bracket to **25 Nm**.

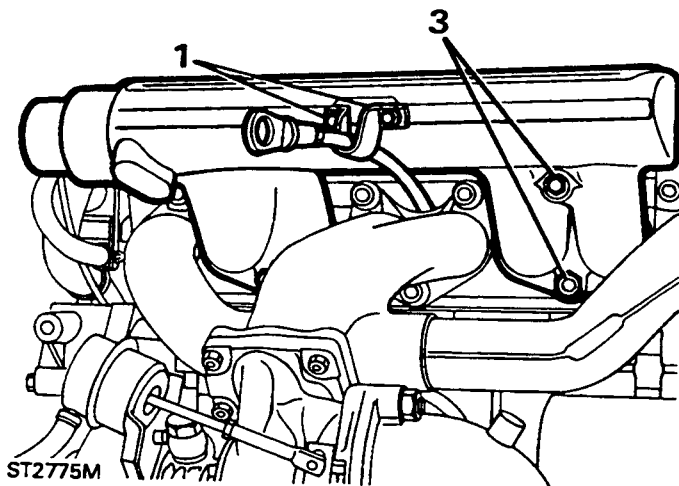


11. Secure turbocharger to manifold with steel gasket and four nuts. Tighten to **25 Nm**.
12. Connect the turbo oil pipes to the cylinder block.
13. Prime turbocharger *See ENGINE, Overhaul, Fitting Manifolds And Turbocharger*
14. Fit air inlet manifold. Connect hose. Secure dipstick tube at top and bottom.
15. Tighten exhaust front pipe connection.
16. Reconnect the battery negative lead.
17. Start engine and check for leaks.

### AIR INTAKE MANIFOLD

#### Remove

1. Release dipstick tube attachment to air intake manifold.
2. Disconnect intake hose from manifold.
3. Remove two bolts and two nuts securing intake manifold to cylinder head. Remove manifold.



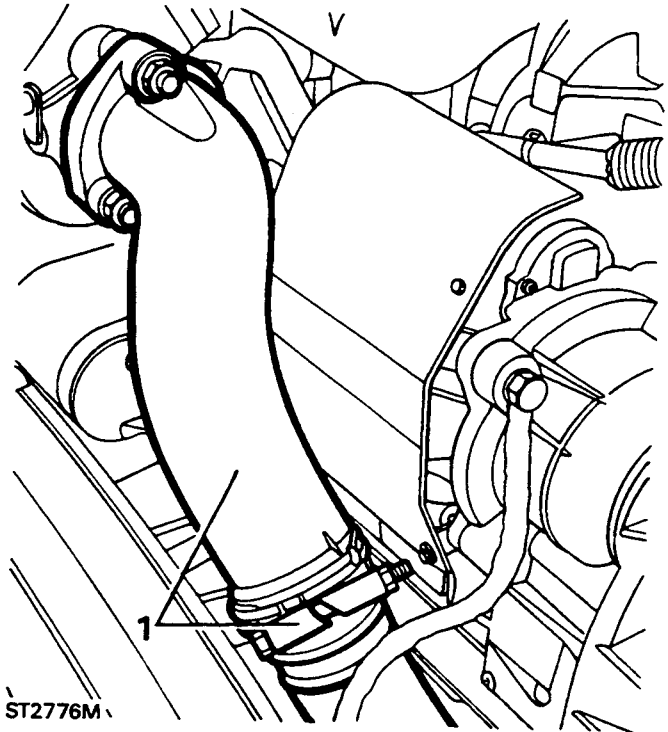
#### Refit

4. Check that the manifold gasket is in good condition. Secure air intake to cylinder head. Tighten the two nuts and two bolts evenly to **25Nm**.
5. Connect inlet hose to manifold.
6. Secure dipstick tube to manifold.

### EXHAUST SYSTEM FRONT PIPE

#### Remove

1. Release the clamp securing front pipe to turbocharger elbow.



2. Remove the two flange bolts and nuts connecting front pipe to silencer.
3. Release front silencer from the support bracket.
4. Release silencer from rear support bracket to prevent straining the system.
5. Separate front pipe from the silencer. Remove front pipe from the elbow.



## Refit

6. Apply Holts "Firegum" to the outside of the elbow and to the inside of the front pipe.
7. Slide clamp over the front pipe, fit pipe to elbow. Loosely secure the joint with the clamp.
8. Connect front pipe to silencer with the olive, loosely secure joint with the bolts and nuts.
9. Connect silencer to front and rear support brackets with new rubbers, if necessary.
10. Tighten all fixings evenly.

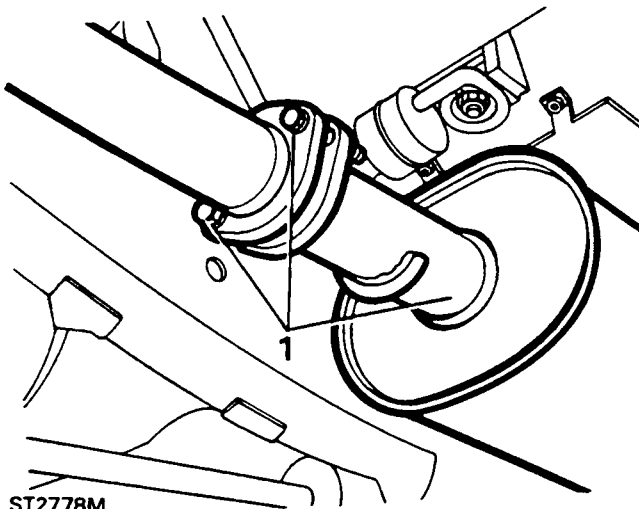
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## REAR PIPE AND SILENCER

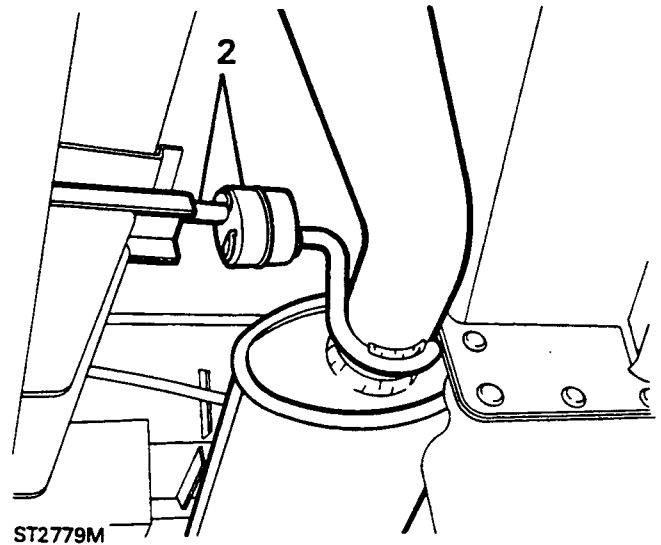
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### Remove

1. Remove the two flange bolts and nuts connecting rear pipe section to front silencer.



2. Release rear pipe from rear support bracket, remove the section from the vehicle.



### Refit

3. Fit rear pipe section to rear support bracket, with new rubbers if necessary.
4. Connect rear pipe to front silencer with olive and two flange bolts and nuts, tighten evenly.



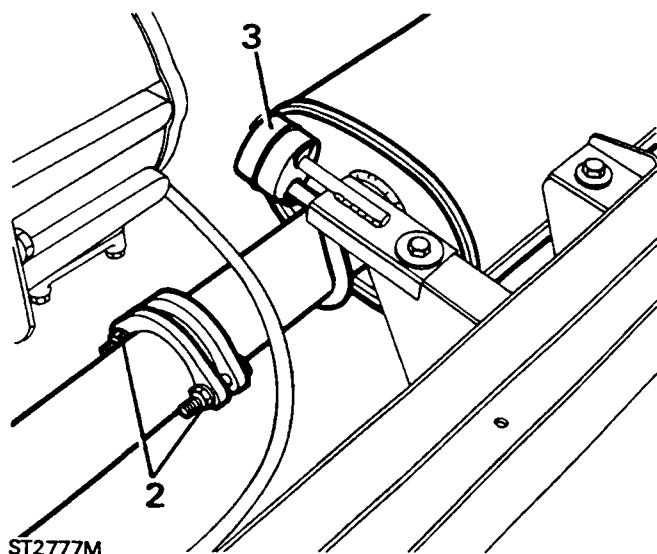
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**FRONT SILENCER**

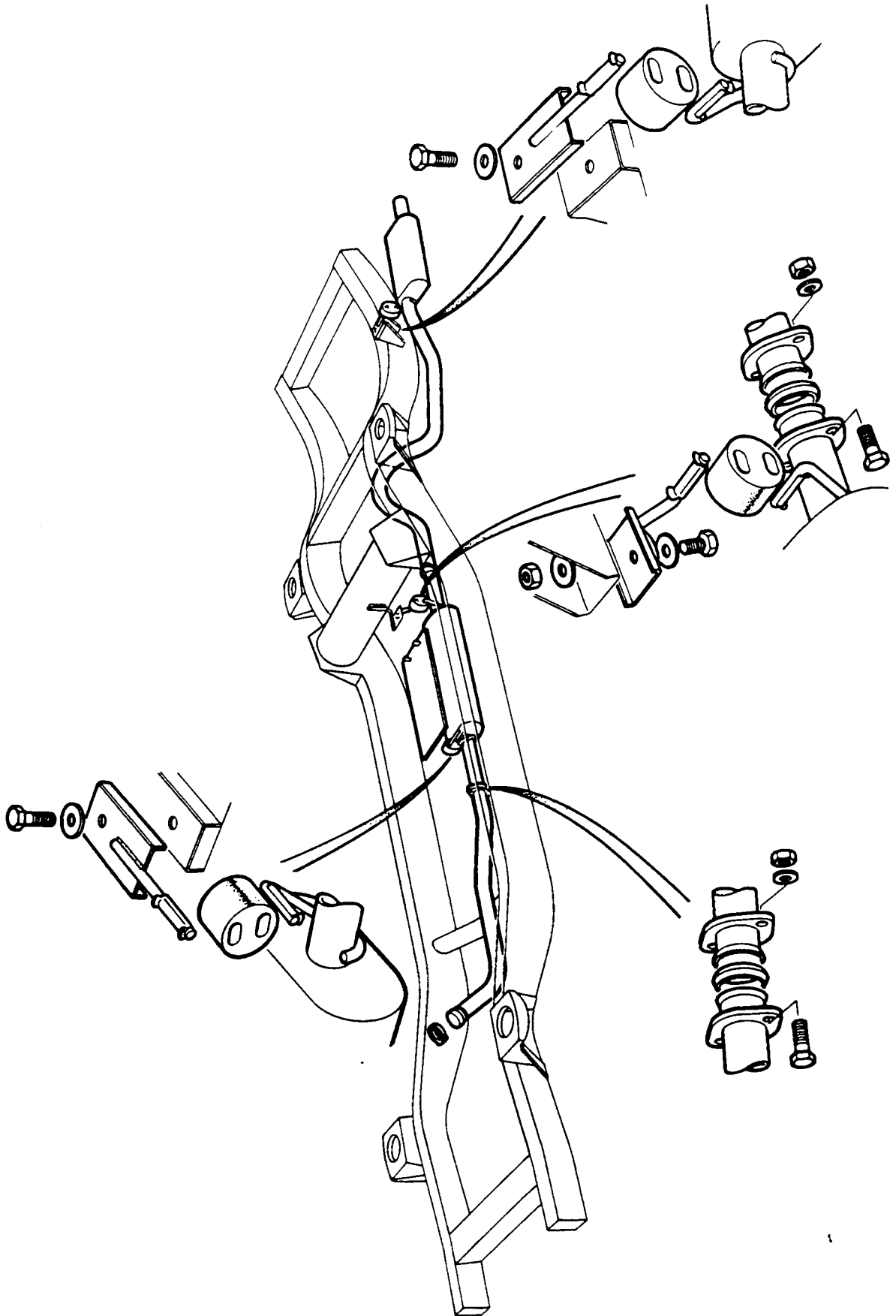
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**Remove**

1. Remove rear pipe and silencer *See Rear Pipe And Silencer*
2. Remove two flange nuts and bolts retaining front pipe to silencer.
3. Release silencer from front support bracket, remove it from the front pipe.

**Refit**

4. Loosely secure olive and two bolts and nuts.
5. Attach silencer to front support bracket. Evenly tighten the two flange bolts.
6. Fit rear pipe and silencer into position, attach to rear support bracket.
7. Connect rear pipe to silencer with the olive and two bolts, evenly tighten the two nuts.



ST2623M

Diesel Engine Exhaust System