

## Haynes S40 & V40 Petrol (1996 - March 2004)

# Haynes Volvo S40 & V40 Petrol (1996 - March 2004) Repair Manual

## 1. INTRODUCTION

This manual provides comprehensive repair and maintenance procedures for Volvo S40 and V40 petrol models manufactured between 1996 and March 2004. It covers various aspects of vehicle servicing, from routine checks to detailed engine and system repairs, designed to assist vehicle owners in performing their own maintenance and repairs.

# VOLVO S40 & V40



1996 to Mar 2004 (N registration onwards) Petrol

## Haynes **Service and Repair Manual**



Includes **Roadside Repairs** and **MOT Test Checks**

*Figure 1.1: Front cover of the Haynes Volvo S40 & V40 Petrol Repair Manual, indicating the models and years covered.*

## 2. VEHICLE COVERAGE

This manual specifically covers Volvo S40 and V40 Saloons equipped with normally-aspirated petrol engines, including special and limited editions. The detailed procedures are applicable to the following engine types:

- 1.8 litre (1850cc) petrol engines
- 2.0 litre (1997cc) petrol engines
- 2.3 litre (2256cc) petrol engines

*Note: This manual does not cover diesel engines or models outside the specified production years (1996 -*

### 3. SAFETY PRECAUTIONS

Always prioritize safety when performing any maintenance or repair work on your vehicle. Adhere to the following general safety guidelines:

- Disconnect the battery's negative terminal before working on electrical systems to prevent accidental shorts or injury.
- Allow the engine and exhaust system to cool completely before working on hot components to avoid burns.
- Use appropriate personal protective equipment (PPE) such as safety glasses, gloves, and sturdy footwear.
- Ensure the vehicle is securely supported on jack stands on a level surface before working underneath it. Never rely solely on a jack.
- Dispose of used fluids, filters, and other components responsibly according to local environmental regulations.

## 1•18 Every 80 000 miles or 8 years

reconnected correctly. On completion, refit the plastic cover panel securely.

12 Reconnect the battery. Run the engine and check that there are no fuel leaks.



**Warning:** Dispose of the old filter safely; it will be highly flammable, and may explode if thrown on a fire.

### 31 Timing belt renewal

Refer to the information given in Chapter 2A or 2B.

### 32 Auxiliary drivebelt renewal

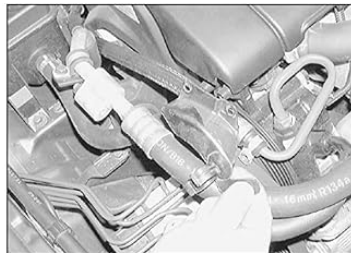


#### Except GDI engine

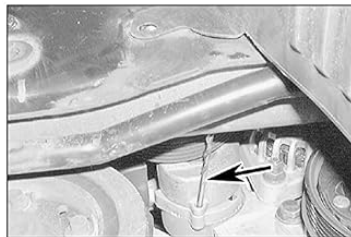
1 The correct drivebelt tension is continually maintained by an automatic adjuster and tensioner assembly. This device is bolted to the front of the engine and incorporates a spring-loaded idler pulley.

2 Unbolt and remove the metal guard from the power steering pump casing, to expose the top of the power steering pump pulley (see illustration).

3 The tensioner idler pulley must be released to allow removal of the drivebelt. To do this, fit a ring spanner to the idler pulley centre bolt



32.2 Unbolt and remove the metal guard from the power steering pump casing, to expose the top of the pump pulley



32.4 Pass a metal rod (arrowed) through the locking holes to hold the tensioner pulley in the released position – a drill bit is ideal

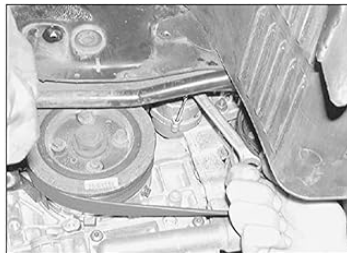


30.11 Push the fuel pipe couplings firmly back on the filter outlets

and pivot it clockwise until the locking holes on the tensioner body line up (see illustrations). **Note:** Access is very limited; if you find it difficult to reach the tensioner, try supporting the front of the car on axle stands and removing the left-hand front roadwheel. If the wheel arch liner is then removed, access to the side of the engine can be gained via the wheel arch.

4 Hold the pulley in the released position using the spanner, then pass a metal rod through the locking holes to hold the tensioner pulley in the released position – a twist drill bit is ideal for this purpose (see illustration). The spanner can be removed once the tensioner has been locked in position.

5 The drivebelt can now be slipped the belt off all the pulleys and removed from the engine compartment (see illustration).



32.3a Fit a ring spanner to the idler pulley centre bolt and pivot it clockwise until the locking holes on the tensioner body line up



32.5 The drivebelt can now be slipped off all its pulleys

6 Fit the new belt over each pulley in turn, ensuring that it is properly seated. Fit the ring spanner to the pulley centre bolt and apply pressure in a clockwise direction, then carefully remove the drill bit/locking tool and release the tensioner gradually. Do not allow the tensioner to fly back unchecked, as damage to spring mechanism may result.

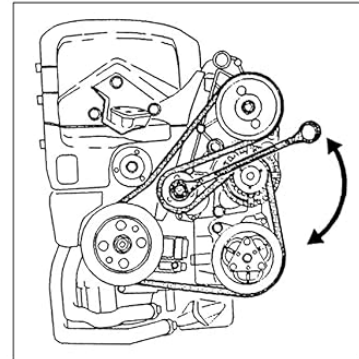
7 The tensioner mechanism should automatically take up the free play in the drivebelt; rotate the engine using a socket and wrench on the crankshaft sprocket to ensure that the belt is correctly located on all the pulleys.

8 On completion, refit the metal guard over the power steering pump pulley, and tighten the bolts securely.

#### GDI engine

#### Power steering pump/air conditioning compressor drivebelt

9 Loosen the right-hand front roadwheel nuts, then jack up the front of the car, and support on axle stands (see *Jacking and vehicle support*). Remove the wheel. For better access to the drivebelts from below, remove the wheel arch access panel, which is secured by three bolts (one in front of the washer reservoir, which will require the front undershield to be partially removed also) (see illustrations).



32.3b End view of the auxiliary drivebelt and pulleys – except GDI engine



32.9a Remove a total of three bolts . . .

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Figure 3.1: An example page from the manual showing a safety warning. The text warns: "Dispose of the old filter safely; it will be highly flammable, and may explode if thrown on a fire."

## 4. ROUTINE MAINTENANCE

Regular maintenance is crucial for the longevity and reliable operation of your Volvo S40 or V40. This section outlines routine checks and servicing procedures to keep your vehicle in optimal condition.

### 4.1 Weekly Checks

Perform these basic checks regularly to monitor your vehicle's condition:

- Engine oil level
- Coolant level
- Brake and clutch fluid level
- Power steering fluid level
- Battery condition and fluid level (if applicable)
- Tyre condition and pressure
- Screen washer fluid level
- Wiper blades inspection

Refer to the manual for detailed instructions on performing these checks and recommended intervals.

## **4.2 Lubricants and Fluids**

This section provides specifications for various lubricants and fluids required for your vehicle, including capacities and recommended types.



## 1.2 Servicing specifications

**Lubricants and fluids** ..... Refer to end of *Weekly checks* on page 0•17

### Capacities

#### Engine oil (including filter)

Models up to 1997 .....	5.3 litres
Models from 1998, except GDI engine .....	5.4 litres
GDI engine models .....	3.8 litres

#### Cooling system

From dry:

Non-turbo models, except GDI engine .....	6.3 litres
GDI engine models .....	6.0 litres
Turbo models .....	5.7 litres
Drain and refill (approximate) .....	5.0 litres

#### Manual transmission

Non-turbo models, except GDI engine .....	3.4 litres
GDI engine models .....	2.2 litres
Turbo models .....	2.1 litres

#### Automatic transmission

4-speed:

Total (including fluid cooler and hoses) .....	7.7 litres
Torque converter only .....	2.5 litres
Difference between MAX and MIN levels on dipstick .....	0.5 litres

5-speed:

Total (including fluid cooler and hoses) .....	7.5 litres
Difference between MAX and MIN levels on dipstick .....	0.2 litres

#### Washer fluid reservoir

Without headlight washers .....	3.5 litres
With headlight washers .....	4.5 litres

**Fuel tank** ..... 60 litres

### Cooling system

Antifreeze mixture:

50% antifreeze .....	Protection down to -37°C (5°F)
55% antifreeze .....	Protection down to -45°C (-22°F)

**Note:** Refer to antifreeze manufacturer for latest recommendations.

### Ignition system

	Spark plug type	Gap
1.6 litre models .....	Bosch FGR 7 DQE 0	1.4 mm
1.8 litre models:		
Except GDI .....	Bosch FGR 7 DQE 0	1.4 mm
GDI .....	Bosch FR 7 DTC	0.8 mm
1.9 litre models .....	Bosch FR 7 DPP 10	0.7 mm
2.0 litre:		
Non-turbo models .....	Bosch FGR 7 DQE 0	1.4 mm
Turbo models .....	Bosch FR 7 DPP 10	0.7 mm

### Brakes

Brake pad material minimum thickness (front/rear) ..... 2.0 mm

### Torque wrench settings

	Nm	lbf ft
Alternator pivot nut .....	44	32
Engine sump drain plug:		
Except GDI engine .....	35	26
GDI engine .....	39	29
Ignition coil mounting bolts .....	10	7
Oil filter (models with renewable filter cartridge):		
Except GDI engine .....	25	18
GDI engine .....	14	10
Manual transmission drain plug:		
Non-turbo models, except GDI .....	22	16
GDI models .....	32	24
Turbo models .....	35	26
Manual transmission filler/level plug:		
Non-turbo models except GDI (plastic plug) .....	Finger-tight	Finger-tight
GDI models .....	32	24
Turbo models .....	35	26
Roadwheel nuts .....	110	81
Spark plugs .....	25	18

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Figure 4.1: A page from the manual detailing engine oil capacities, transmission fluid types, cooling system antifreeze mixtures, and spark plug specifications. It also includes torque wrench settings for various components.

## 5. ENGINE REPAIRS & OVERHAUL

This section covers detailed procedures for engine-related repairs, adjustments, and overhaul processes for the specified Volvo S40 and V40 petrol engines.

### 5.1 Timing Belt Renewal

Instructions for timing belt replacement are provided, including steps for removing and installing the belt

and associated components such as tensioners and pulleys.

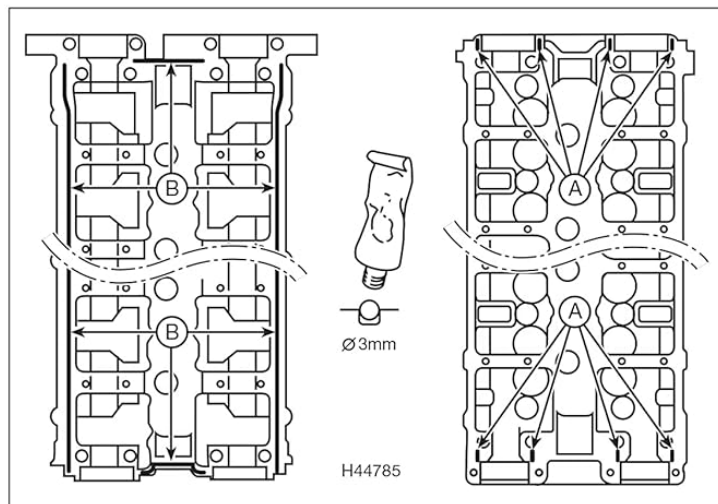
The manual details the correct procedure for positioning the crankshaft pulley and removing the old tensioner, ensuring proper timing during reassembly.

## **5.2 Auxiliary Drivebelt Renewal**

Procedures for replacing auxiliary drivebelts are outlined, with specific guidance for both GDI (Gasoline Direct Injection) and non-GDI engines, covering different engine configurations.

## **5.3 GDI Engine In-Car Repair Procedures**

Specific repair steps for Gasoline Direct Injection (GDI) engines are included, such as the removal and installation of the power steering pump/air conditioning compressor drivebelt.



5.26 Application points for Volvo sealant on cylinder head upper (A) and lower (B) sections

illustration, apply a continuous 3 mm bead of Volvo sealant (part number 1161231) to the grooves in the lower section of the cylinder head. Also apply a small amount of sealant to the positions shown on the upper section (see illustration).

27 The cylinder head upper section must now be fitted and fully tightened down before the sealant hardens. Fit a new rubber gasket to the centre of the cylinder head, then carefully align the upper section and lay it in place. Fit all the bolts in their correct positions, and tighten them by hand initially to pull the upper section down evenly. Keep the upper section as level as possible until it is fully seated on the lower section.

28 Working in sequence, tighten the bolts progressively to the specified torque, noting that a different torque applies to the two different bolt sizes (see illustration).

29 Refit the two retaining plates fitted at the timing belt end of the head, tightening the bolts to the specified torque.

30 Refit the camshaft cover(s), using a new

gasket (or gaskets), and tighten the bolts from the middle outwards. Refit the crankcase breather hose and the wiring plug bracket.

31 Fit new camshaft oil seals as described in Section 4.

32 Refit the inlet manifold, fuel pump and camshaft position sensor housing as described in Chapter 4B.

33 Refit the spark plugs and refill the cooling system as described in Chapter 1.

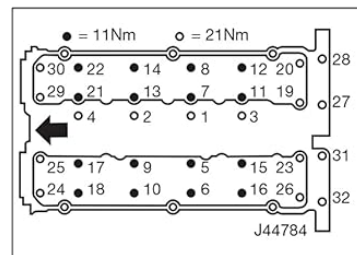
## 6 Cylinder head – removal and refitting

### Removal

1 With reference to Chapter 1, drain the cooling system and remove the spark plugs.

2 Depressurise the fuel system as described in Chapter 4B, then disconnect the battery negative lead (see *Disconnecting the battery*).

3 Referring to Chapter 5A if necessary,



5.28 Cylinder head upper section bolt tightening sequence (timing belt end arrowed)

remove the battery and battery tray (this isn't absolutely essential, but it does provide greater working room).

4 Referring to Chapter 4B if necessary, remove the air cleaner and air inlet duct.

5 Noting carefully how it is clipped in place and routed, work around the top of the engine and disconnect all the relevant wiring from it. In particular, there are several earth points to disconnect (see illustrations). Move the wiring harness to one side.

6 Place some absorbent rags or paper towel around and under the fuel supply and return connections to the fuel pump (at the transmission end of the head). Carefully remove the fuel pipes, including the small hose to the charcoal canister.

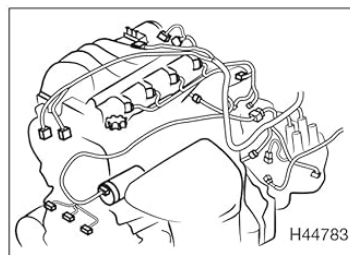
7 Loosen the hose clamps for the radiator top and bottom hoses on the front of the engine, and for the heater hoses at the rear of the engine compartment. Anticipating some spillage of residual coolant, carefully disconnect the hoses, noting that some manipulation might be needed to break the seal at each connection.

8 Remove the inlet manifold as described in Chapter 4B.

9 Using the information in Chapter 10, unbolt the power steering pump from the engine, and move it to one side without disconnecting the hoses.

10 Remove the timing belt as described in Section 3.

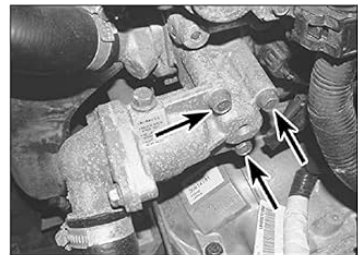
11 Remove the three bolts securing the thermostat housing to the cylinder head, and tap the housing to release it (see illustration).



6.5a Wiring harness layout around the cylinder head



6.5b Earth strap attached to throttle housing



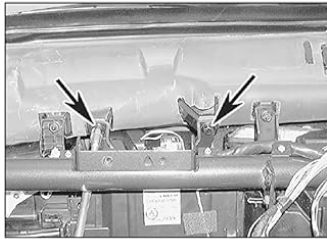
6.11 Thermostat housing bolts (arrowed)

Figure 5.1: This image details application points for Volvo sealant on the cylinder head (upper and lower), and steps for cylinder head removal and refitting. It also shows the wiring harness layout and earth strap attachment points.

## 6. COOLING, HEATING, AND VENTILATION SYSTEM

This section provides instructions for maintaining and repairing the vehicle's cooling, heating, and ventilation systems, including component removal and installation.





9.22a On models with air conditioning, unscrew the evaporator housing upper ...

23 On models not fitted with air conditioning, disconnect the wiring connector from the blower motor resistor. Remove the fasteners (press out the centre pins then remove the fastener clip) securing the duct to the blower motor and heater/ventilation housing and ease the duct out of position.

24 Unclip the upper outlet and remove it from the top of the heating/ventilation housing (see illustration).

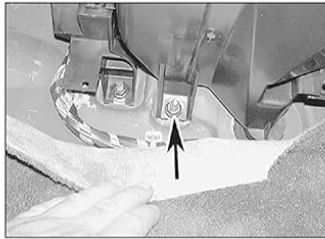
25 Slacken and remove the retaining screw, then detach the footwell vent outlet from the base of the heating/ventilation housing. Push down on the footwell vents and manoeuvre the outlet out of position (see illustrations).

26 Slacken and remove the housing retaining nuts, then free the assembly from the bulkhead and remove it from the car (see illustrations). As the unit is removed, make sure all the necessary clips and ties have been released, and try and keep the heater matrix unions uppermost to prevent coolant spillage. Mop up any spilt coolant immediately.

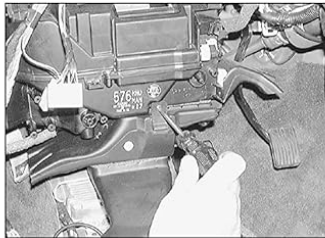
**Caution:** On models with air conditioning, take great care not to place any strain on the evaporator housing refrigerant pipes as the housing is removed.

27 Slacken and remove the screws securing the matrix coolant pipe retaining bracket to the heating/ventilation housing. Free the pipe bracket from the housing, and slide the pipe and matrix assembly carefully out of the housing (see illustrations).

28 Slacken the clamps and separate the pipe assembly from matrix unions (see

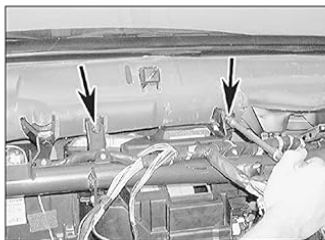


9.22b ... and lower retaining nuts (arrowed)

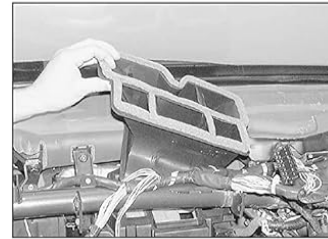


9.25a Remove the retaining screw ...

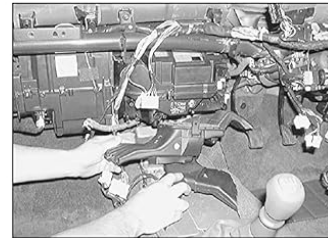
illustration). Recover the sealing ring from each union and discard them – new ones must be used on refitting. Inspect the matrix seal for signs of damage, and renew if necessary.



9.26a Unscrew the heating/ventilation housing upper ...



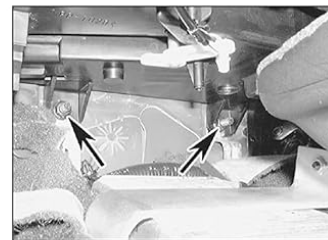
9.24 Unclip the upper outlet from the heating/ventilation housing



9.25b ... then unclip the footwell vent outlet from the base of the housing

29 Prior to refitting, inspect all seals for signs of damage and renew/repair as necessary.

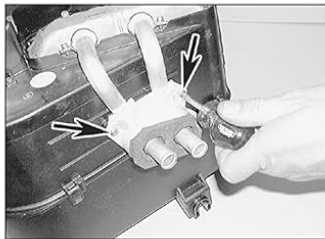
30 Fit new sealing rings and reassemble the coolant pipe and matrix, tightening the clamps lightly only. Slide the assembly into



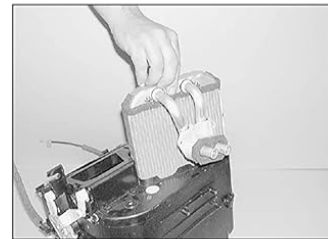
9.26b ... and lower retaining nuts (arrowed) ...



9.26c ... then manoeuvre the housing out of position



9.27a Slacken and remove the pipe bracket retaining screws (arrowed) ...



9.27b ... then slide the matrix assembly out of position

3

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Figure 6.1: The image illustrates steps for working on the heating/ventilation housing, including unscrewing retaining screws, unclipping outlets, and removing components for access and repair.

## 7. ELECTRICAL SYSTEMS AND WIRING

This section includes information on the vehicle's electrical systems and detailed wiring diagrams to assist with fault finding, diagnosis, and repairs of electrical components.

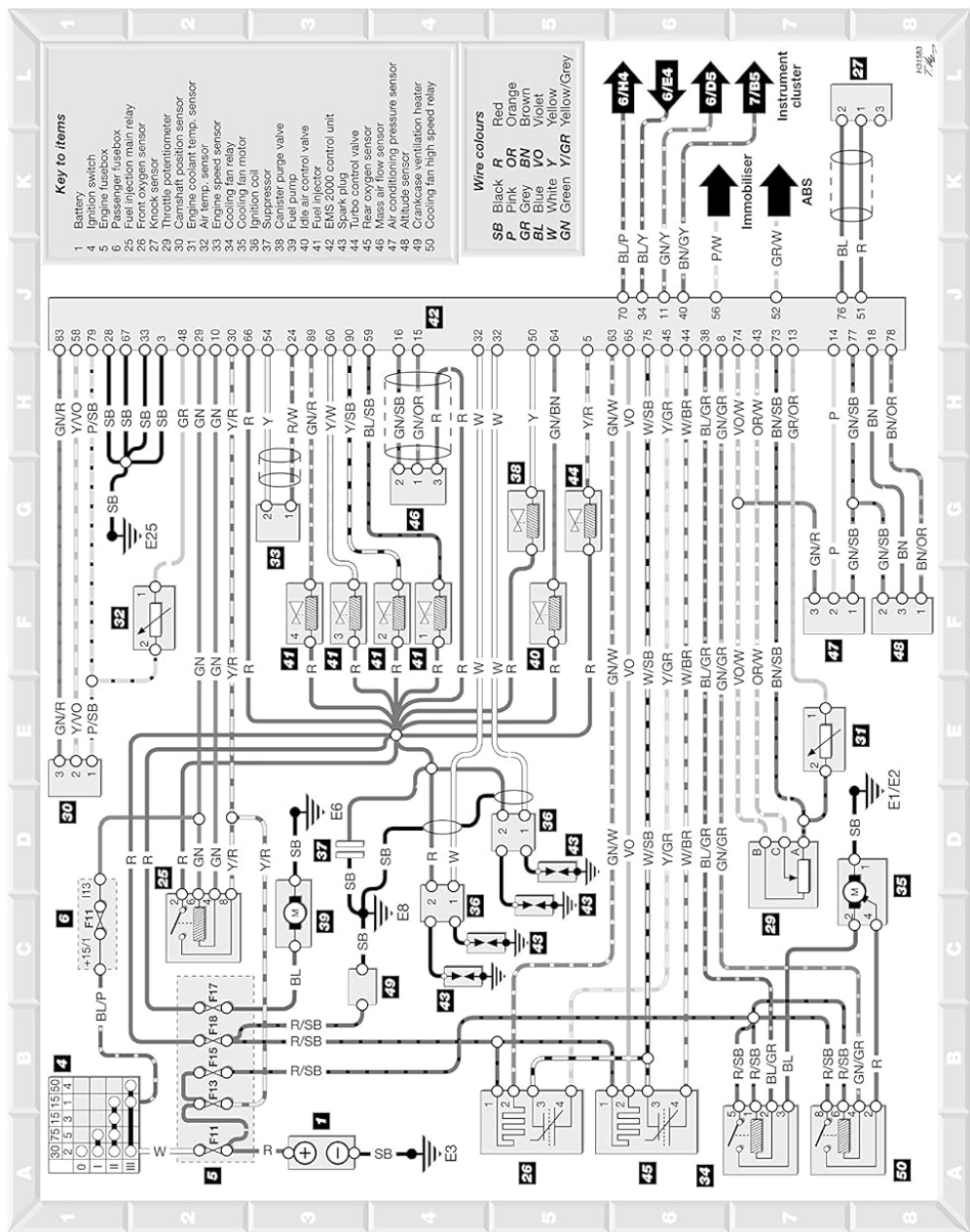


Diagram 5 : EMS 2000 fuel injection

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Figure 7.1: The image displays a comprehensive wiring diagram for the EMS 2000 fuel injection system, indicating various components and their connections with color codes for easy identification.

8. TECHNICAL SPECIFICATIONS

Detailed technical specifications for the Volvo S40 and V40 models covered by this manual are provided to aid in maintenance and repair tasks.

Category	Detail
Engine Oil Capacities (up to 1997)	1.8 litre: 5.3 litres, 2.0 litre: 5.4 litres, 2.3 litre: 3.8 litres

Category	Detail
Engine Oil Capacities (from 1998, except GDI)	1.8 litre: 5.4 litres, 2.0 litre: 5.4 litres, 2.3 litre: 3.8 litres
GDI Engine Oil Capacities	1.8 litre: 5.4 litres, 2.0 litre: 5.4 litres, 2.3 litre: 3.8 litres
Cooling System Capacity	6.5 litres (non-turbo, except GDI), 6.0 litres (GDI), 5.7 litres (Turbo), 5.0 litres (Drain and refill approx.)
Manual Transmission Fluid	3.4 litres (non-turbo, except GDI), 2.7 litres (GDI), 2.1 litres (Turbo)
Automatic Transmission Fluid	7.7 litres (total), 2.5 litres (torque converter only), 0.8 litres (difference between MAX and MIN levels)
Washer Fluid Reservoir	3.5 litres (without headlight washers), 4.5 litres (with headlight washers)
Fuel Tank Capacity	60 litres
Antifreeze Mixture	50% antifreeze for protection down to -37°C (5°F)
Spark Plug Gap	1.4 mm (1.6 litre models), 1.4 mm (1.8 litre models), 0.8 mm (GDI), 0.7 mm (2.0 litre non-turbo), 1.4 mm (2.0 litre turbo), 0.7 mm (2.3 litre turbo)
Spark Plug Torque	25 Nm (18 lbf ft)
Wheel Nut Torque	110 Nm (81 lbf ft)
Manual Dimensions	8.27 x 0.75 x 10.71 inches
Manual Weight	1.09 pounds
Language	English
Print Length	320 pages

*Note: Always refer to the manual for the most accurate and complete specifications for your specific vehicle variant, as details may vary.*

## 9. TROUBLESHOOTING

The manual includes a dedicated "Fault Finder" section designed to assist users in diagnosing common issues. This section provides structured guidance on identifying problems based on symptoms and outlines step-by-step solutions to resolve them, helping to avoid unnecessary repairs.

## 10. PUBLISHER INFORMATION

This repair manual is published by Haynes, a recognized provider of automotive repair information known for its detailed, step-by-step guides.

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For further assistance or inquiries regarding the content of this manual, please refer to the contact information provided within the manual itself or visit the official Haynes website.