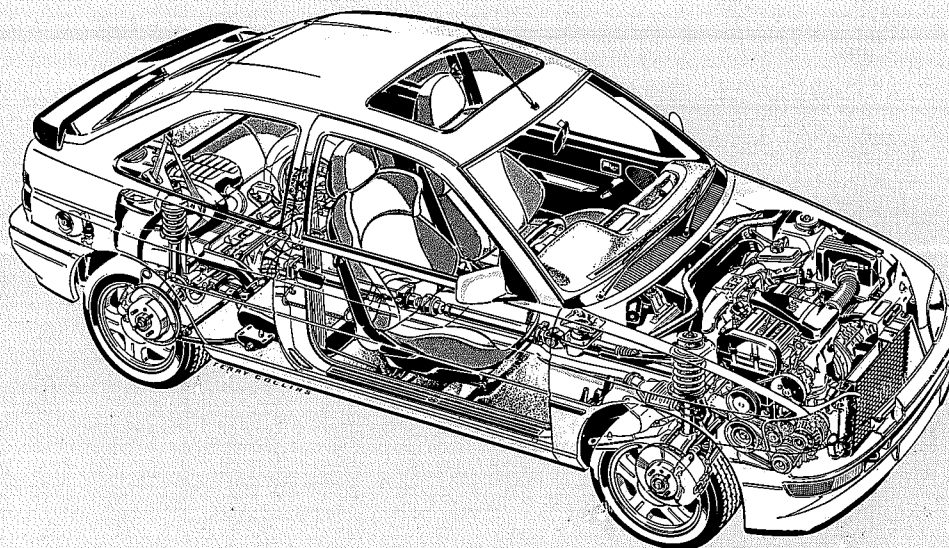


# Technical Service Training

Technicians  
Information

CG 7461 GB 3/92

New Product Introduction	
Escort 4x4	



**Service**

The Escort 4x4 is based on the Escort '91 with front-wheel drive and completes the Escort/Orion '91 model series.

The Escort 4x4 is available with three variants of the 16-valve engine:










- 1.8 DOHC 16V engine (105 PS)
- 1.8 DOHC 16V engine (130 PS)
- 2.0 DOHC 16V engine (150 PS)

The new 4x4 drive concept consists of the MTX 75 transmission in combination with a transfer box and a final drive to the rear wheels.

The rear suspension and fuel tank have been redesigned to accommodate the 4x4 drive.

This Product Introduction describes all the important modifications and innovations found in the Escort 4x4.

The colours used in coloured illustrations indicating the scope of modification have the following significance:

			New
			Modified
			Unchanged

Special functions may be depicted in this brochure by colours which have been shown previously or by other colours. The meaning of the colours is explained in such instances on the pages concerned.

Please remember that our training documentation has been prepared solely for FORD-DEALER TRAINING PURPOSES.

Repair and adjustment operations **must** always be carried out according to instructions and specifications in the workshop literature.

Please make extensive use of the training courses offered by the Ford Care Institute in order to gain extensive knowledge in both theory and practice.

# CONTENTS

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Contents	Page
FOREWORD _____	1
CONTENTS _____	2
GENERAL	
Literature Overview _____	4
At a Glance _____	5
FRONT SUSPENSION	
Shock Absorbers _____	6
STEERING	
General _____	7
REAR SUSPENSION	
General _____	8
Crossmember _____	9
Knuckle _____	9
BRAKING SYSTEM	
Front Brakes _____	10
Rear Brakes _____	10
FUEL SYSTEM	
Fuel Tank _____	11
INTERIOR TRIM	
Insulation beneath gearshift lever _____	12

## MTX 75 4x4

### GENERAL

Technical Data _____	13
Transmission Designation _____	13
Towing Vehicles with 4x4 Drive _____	13
Snow chains _____	13
At a Glance _____	14

### FUNCTION OF COMPONENTS

Transmission Design _____	15
Transfer Box _____	16
Driveshaft _____	17
Modifications to the MTX 75 Transaxle _____	18
Front Drive Differential and Side Shafts _____	18
Rear Drive and Side Shafts _____	19
Torque Split in 4x4 Concept _____	20

### SPECIAL TOOLS, DISASSEMBLING AND ASSEMBLING

Special Tools _____	21
New special tools for 4x4 drive _____	21
Disassembling and Assembling _____	21

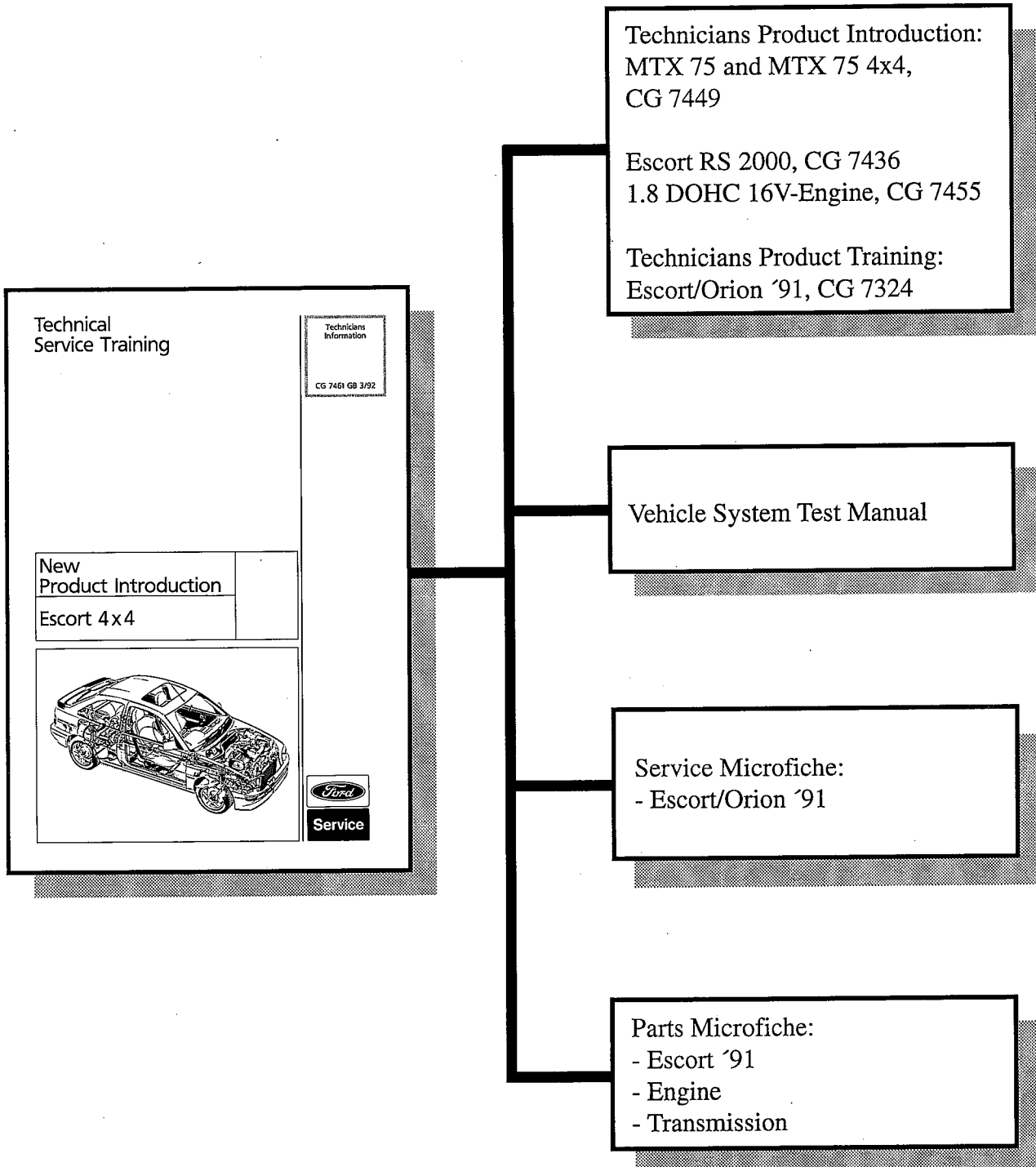
### MAINTENANCE

General _____	23
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### ELECTRICAL SYSTEM

Wiring diagram for vehicles with 4x4 drive _____	24
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## Literature Overview



ST/130/01



## At a Glance

### Vehicle weight (2.0 DOHC 16V Engine)

- Kerb weight = 1155 kg
- GVW = 1575 kg

### Wheels/Tyres

- 175/65 R 14-H tyres on 14" x 6" steel wheels for the 105 PS 1.8 Zeta engine
- 185/60 R 14-V tyres on 14" x 6" alloy wheels for the 130 PS 1.8 Zeta engine
- 195/50 R 15-V tyres on 15" x 6" alloy wheels for the 2.0 DOHC 16V engine

### Front Suspension

- New shock absorbers designed specifically for 4x4 drive

### Steering

- Steering carry-over from Escort '91 with front wheel drive
- Power steering standard on vehicles with 2.0 DOHC 16V engine

### Rear Suspension

- New twin track control arm rear axle suited to 4x4 drive concept
- New shock absorbers and springs designed specifically for 4x4 drive
- New spindle carriers
- Wheels hubs and bearings as on front axle of Fiesta '89

### Braking System

- Braking system same as on 2.0 DOHC 16V version with front-wheel drive

### Fuel System

- New plastic fuel tank
- Two in-tank fuel pumps and two fuel senders

### Interior Trim

- Additional insulation at gearshift lever

### Body

- Additional 4x4 lettering on the front fenders

# FRONT SUSPENSION

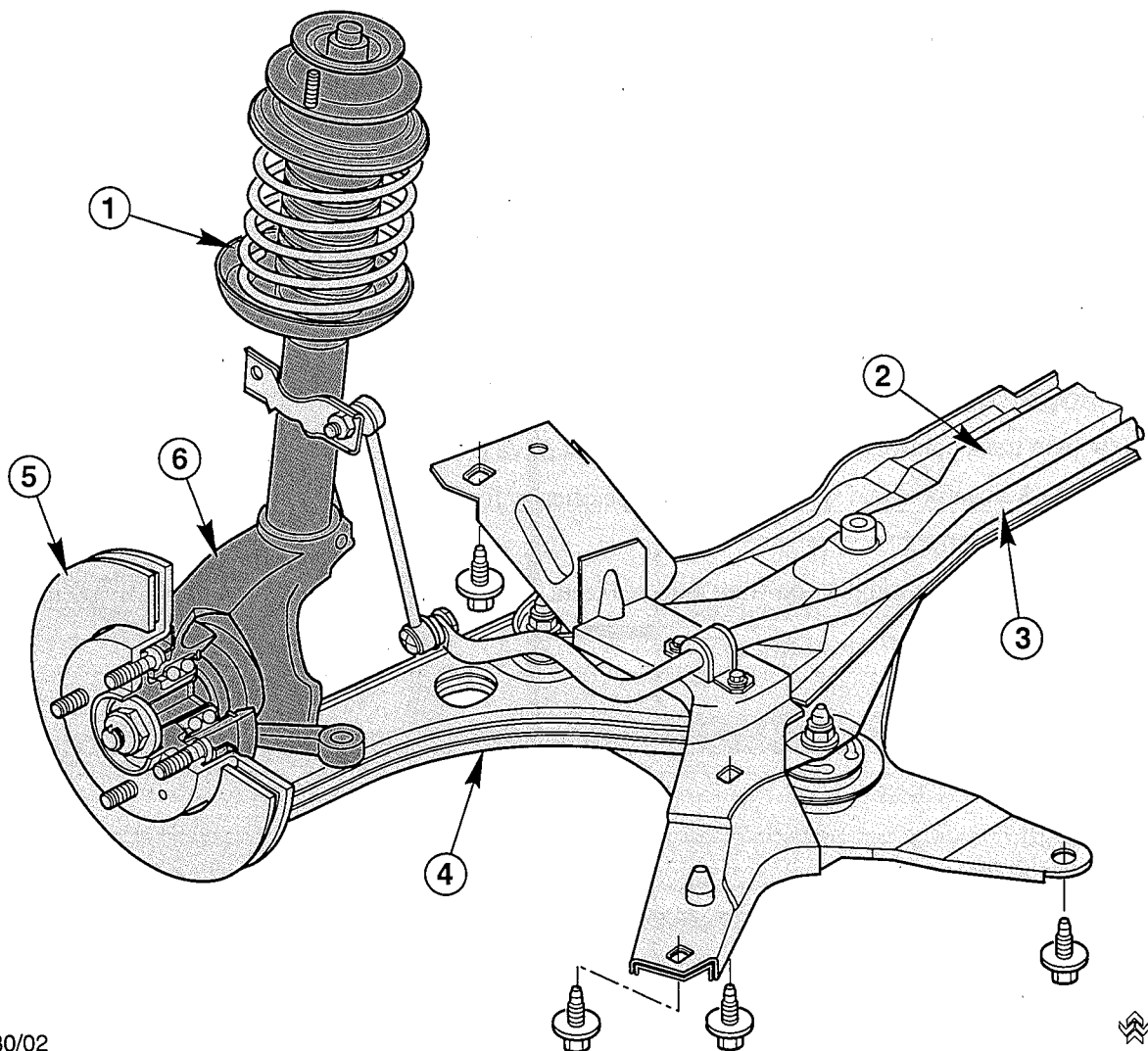
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The basic design of the front suspension is carry-over from the Escort '91, with the addition of:

- maintenance-free ball bearings.
- 16 mm stabiliser bar and
- ventilated brake discs of 260 mm diameter.

## Shock Absorbers

- New shock absorbers at the front with damping characteristics specifically calibrated for the 4x4 drive concept.



ST/130/02

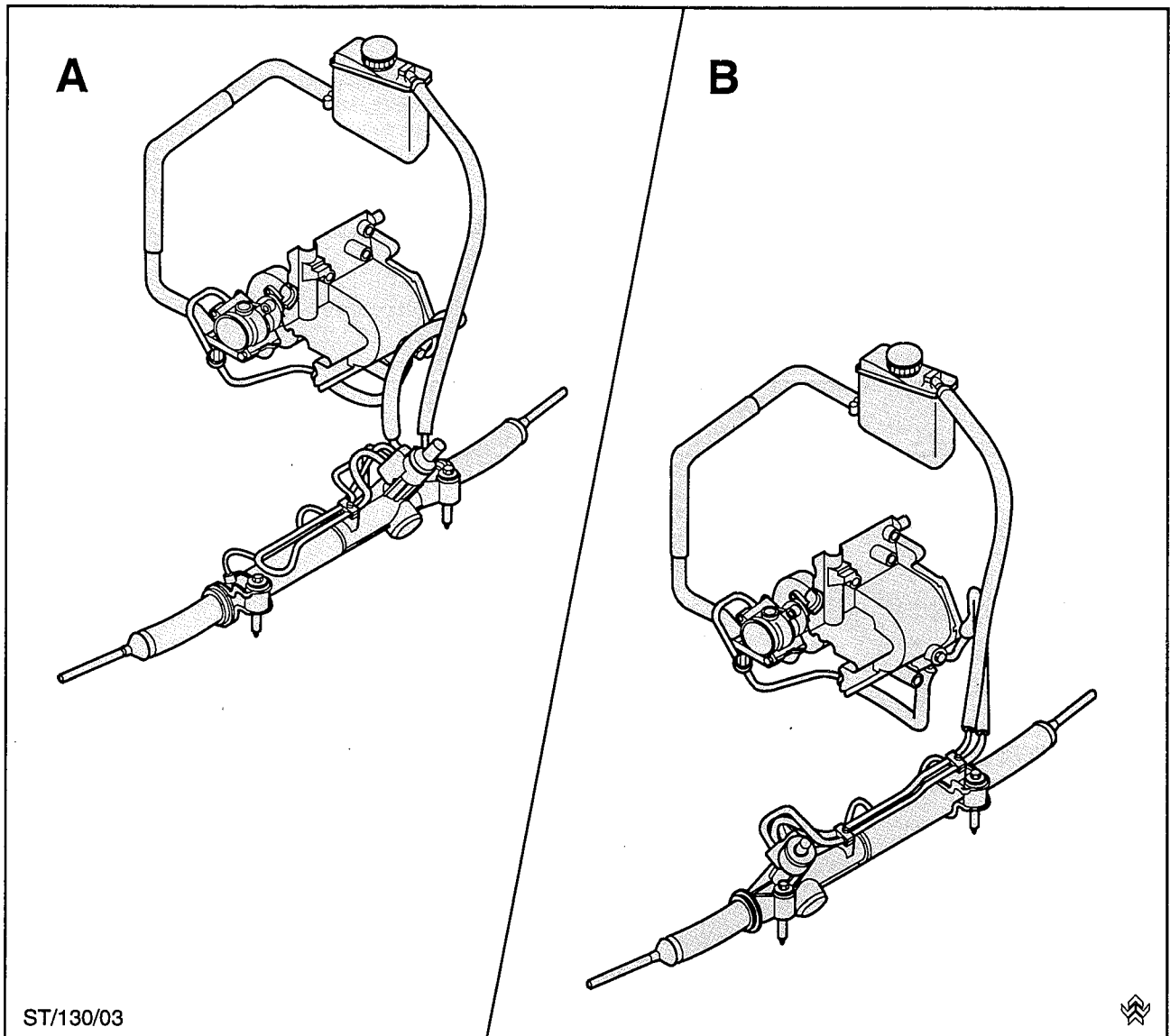
- 1 McPherson strut
- 2 Crossmember
- 3 Stabiliser bar

- 4 Track control arm
- 5 Ventilated brake discs
- 6 Spindle carrier

## General

The steering is carry-over from the Escort '91.

Power steering as standard equipment on vehicles with the 2.0 DOHC 16 V engine and is available as an option on all other 4x4 vehicles.



Power steering for vehicles with the 2.0 DOHC 16V engine

A Right-hand drive

B Left-hand drive

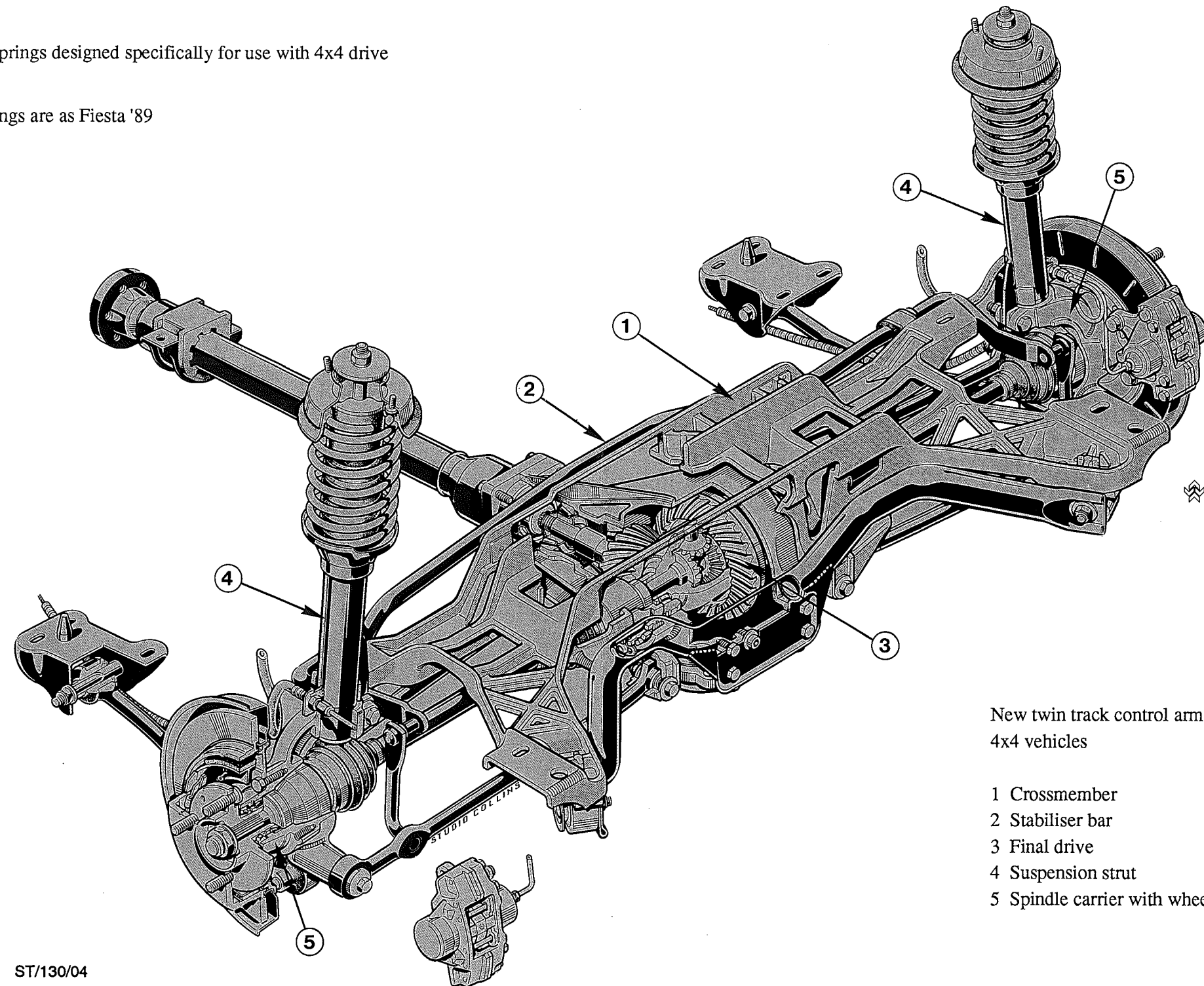


## REAR SUSPENSION

### General

The rear suspension has been redesigned as a twin track control arm design for use with 4x4 drive. This has resulted in the following changes:

- New cast light-alloy crossmember with a tie bar and two track control arms at each side
- New differential mounting
- New shock absorbers and springs designed specifically for use with 4x4 drive
- New spindle carrier
- Front wheel hubs and bearings are as Fiesta '89



New twin track control arm rear suspension for 4x4 vehicles

- 1 Crossmember
- 2 Stabiliser bar
- 3 Final drive
- 4 Suspension strut
- 5 Spindle carrier with wheel hub and bearing

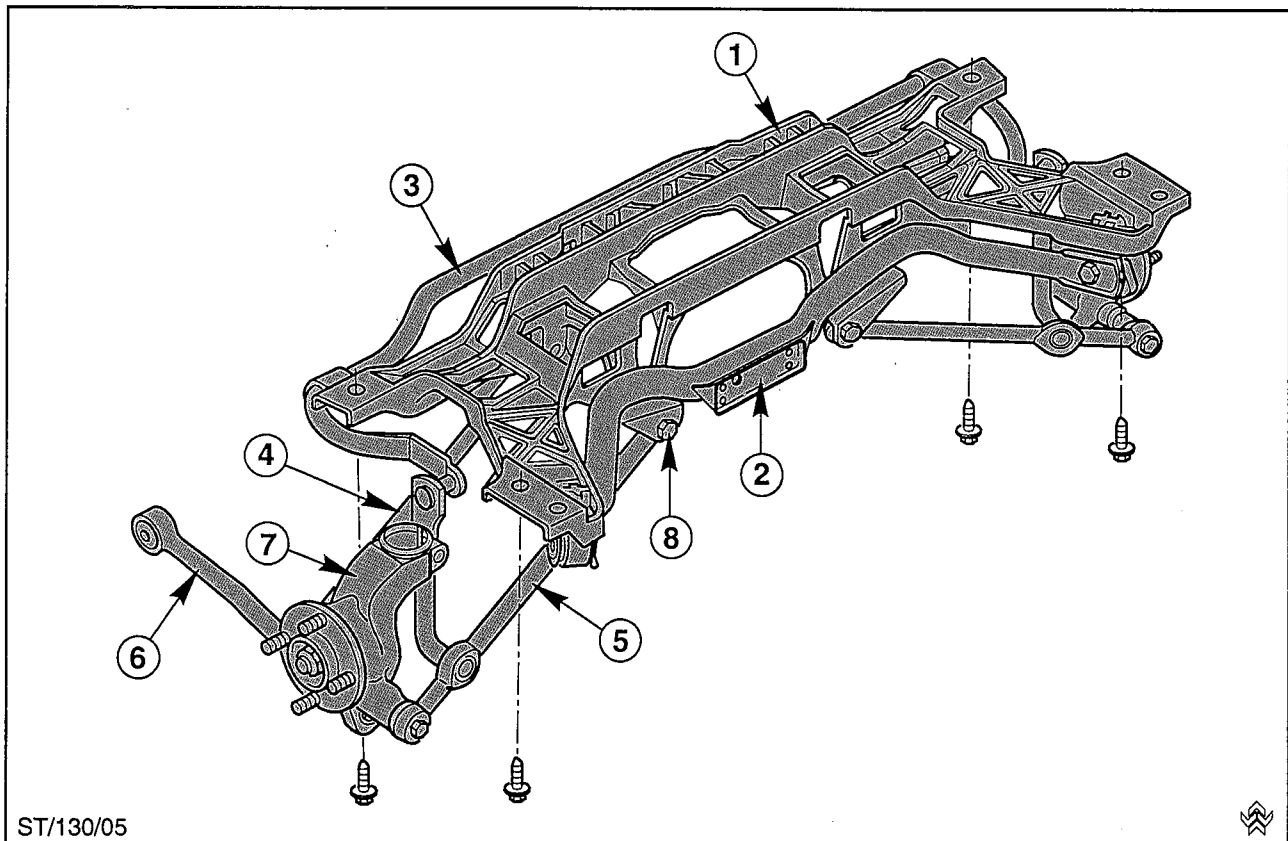
ST/130/04

## Crossmember

- New cast alloy crossmember incorporating mounting for final drive
- The crossmember is attached to the floor pan and connected to the spindle carriers via two track control arms per side
- The stabiliser bar is mounted directly on the crossmember, with attachment rods being used to connect it to the rear track control arms.

## Spindle carrier

- The new spindle carriers are equipped with the maintenance-free wheel bearings (taper roller bearings) from the Fiesta '89.
- The wheel hubs are also from the Fiesta '89.



- 1 Crossmember
- 2 Final drive mounting
- 3 Stabiliser bar
- 4 Front track control arm

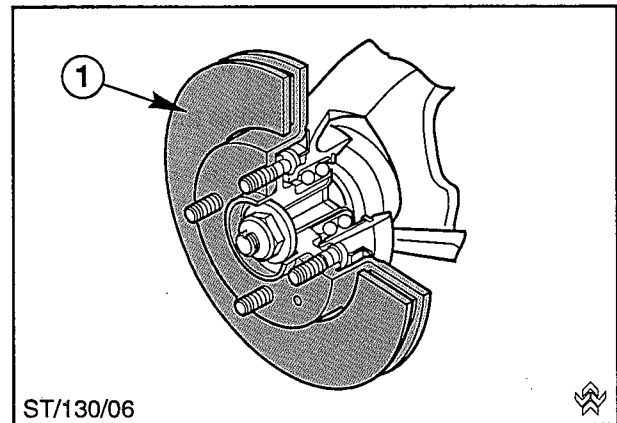
- 5 Rear track control arm
- 6 Tie bar/torque rod
- 7 Spindle carrier
- 8 Eccentric bolt for track adjustment

# BRAKING SYSTEM

The braking system for the Escort 4x4 is carry-over from the Escort '91 with 2.0 DOHC 16V engine.

## Front Brakes

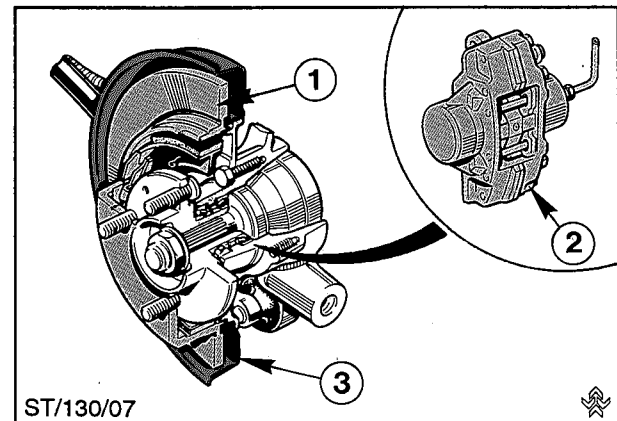
- Ventilated brake discs with 260 mm diameter.
- Carryover caliper as used on Sierra XR4 to suit new ventilated disc.



1 Ventilated brake discs

## Rear Brakes

- The discs are used for the service brake, whilst the drum is used for the parking brake. The disc and drum form a single unit.
- New brake calipers designed for use with the new brake disc/drum unit.
- New protective shield.
- New 160 x 25 mm twin leading shoe for all 4x4 vehicles with anti-lock braking system.



1 Brake disc/drum unit  
2 Brake caliper  
3 Protective shield

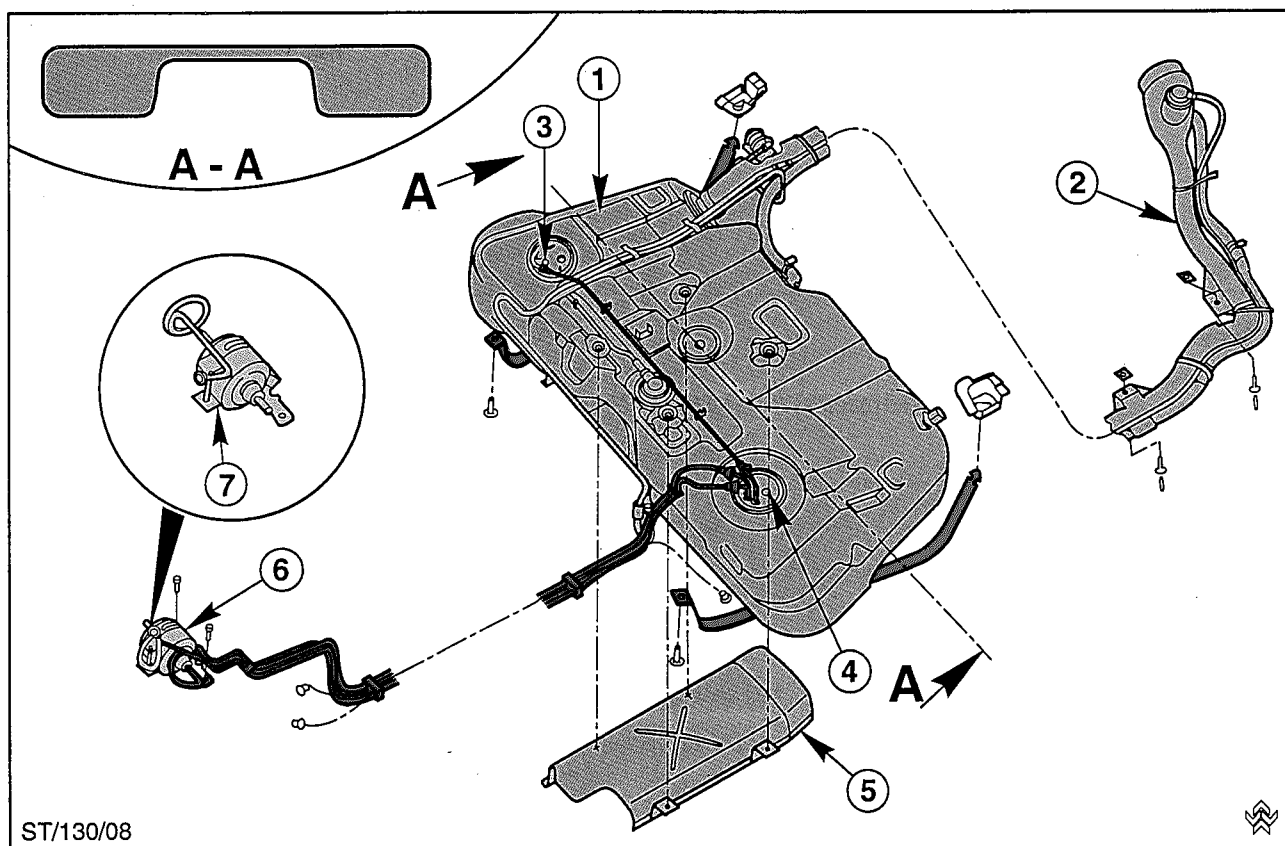
## Fuel Tank

As the floor pan for the Escort 4x4 is carry-over from the Escort '91, it was necessary to redesign the fuel tank to obtain room for the rear driveshaft. The new fuel tank consists of two compartments with a bridging section. Due to its complex shape the fuel tank is now manufactured in plastic.

Each compartment contains a fuel pump with fuel sender. The combined signal from both senders indicates the amount of fuel in the tank.

When the tank is filled, the fuel initially flows into the right compartment. When this is full, the fuel continues through the bridging section into the left compartment. As the vehicle manoeuvres, fuel continuously moves between each compartment. In the left compartment is a high pressure (3 bar) fuel pump to deliver fuel to the fuel injectors.

The right compartment contains a fuel lift pump which supplies fuel to the left compartment. This pump is controlled by a relay. The relay is actuated by a float switch which is located in the fuel tank. As soon as the fuel is below a certain level, the relay switches off the pump after a 60 second delay. The time delay ensures that always a maximum amount of fuel is pumped to the left compartment.



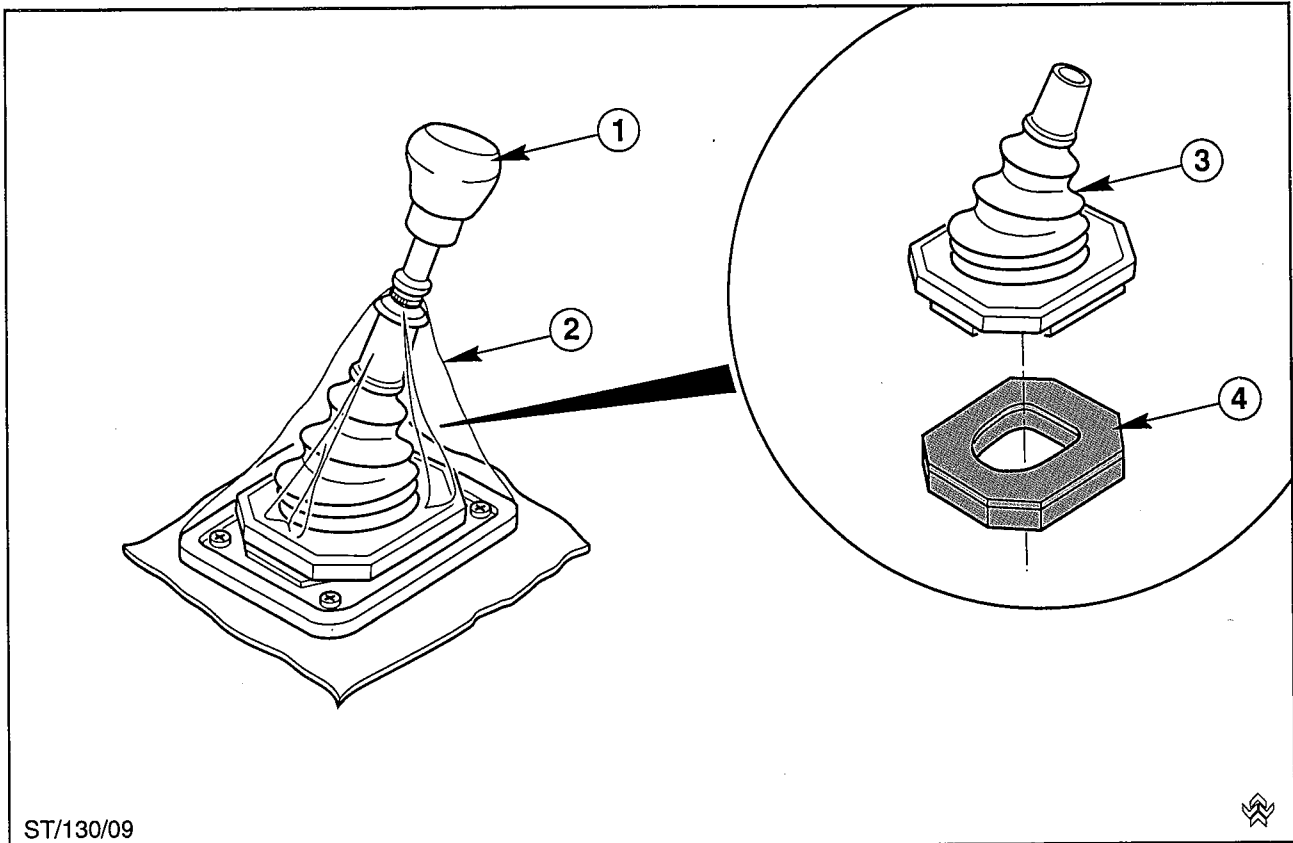
- 1 Fuel tank
- 2 Filler neck
- 3 Right fuel pump (lift pump)
- 4 Left fuel pump (high pressure pump)

- 5 Heat shield
- 6 Pressure accumulator, 2.0 DOHC 16V engine
- 7 Pressure accumulator, 1.8 DOHC 16V engine

# INTERIOR TRIM

## Insulation beneath gearshift lever

- Additional insulation material is now installed below the rubber bellows of the gearshift lever on 4x4 vehicles.



- 1 Gearshift knob
- 2 Bellows cover
- 3 Gearshift lever rubber bellows
- 4 Insulation

**Technical Data**

Make \_\_\_\_\_ FORD, GETRAG  
 Type \_\_\_\_\_ MTX 75 4x4  
 Max. input torque \_\_\_\_\_ 220 Nm  
 Max. input speed \_\_\_\_\_ 7000 rpm  
 Transmission oil \_\_\_\_\_ - MTX 75 \_\_\_\_\_ ESD-M2C186-A  
 - Transfer box \_\_\_\_\_ SAE 80  
 - Rear final drive \_\_\_\_\_ SAE 90  
 Oil filling capacity \_\_\_\_\_ - MTX 75 \_\_\_\_\_ 2.4 l  
 - Transfer box \_\_\_\_\_ 0.3 l  
 - Rear final drive \_\_\_\_\_ 1.0 l

Transmission ratios:

1st gear	3.23 : 1
2nd gear	2.14 : 1
3rd gear	1.48 : 1
4th gear	1.11 : 1
5th gear	0.85 : 1
Reverse	3.46 : 1
Final drive ratio	3.82 : 1
Transfer box	0.46 : 1
Rear final drive ratio	2.16 : 1

**Transmission Designation**

Sticker on MTX 75 transaxle with part number 92 ZT 7002 CAA (transmission ratio 3.82 : 1).  
 Metal tab on transfer box with part number 91 ZT-7L486-EA.

**Towing Vehicles with 4x4 Drive**

**Note:** 4x4 vehicles should only be towed by the following means:

- a) In the conventional way with a tow rope or tow bar
- b) Transported by loading on car transporter or trailer.

Never raise only one axle when towing.

**Snow chains**

- Snow chains of short pitch can be used on both the front and rear axle.
- However if just two chains are fitted it is advised that they are fitted to the front.

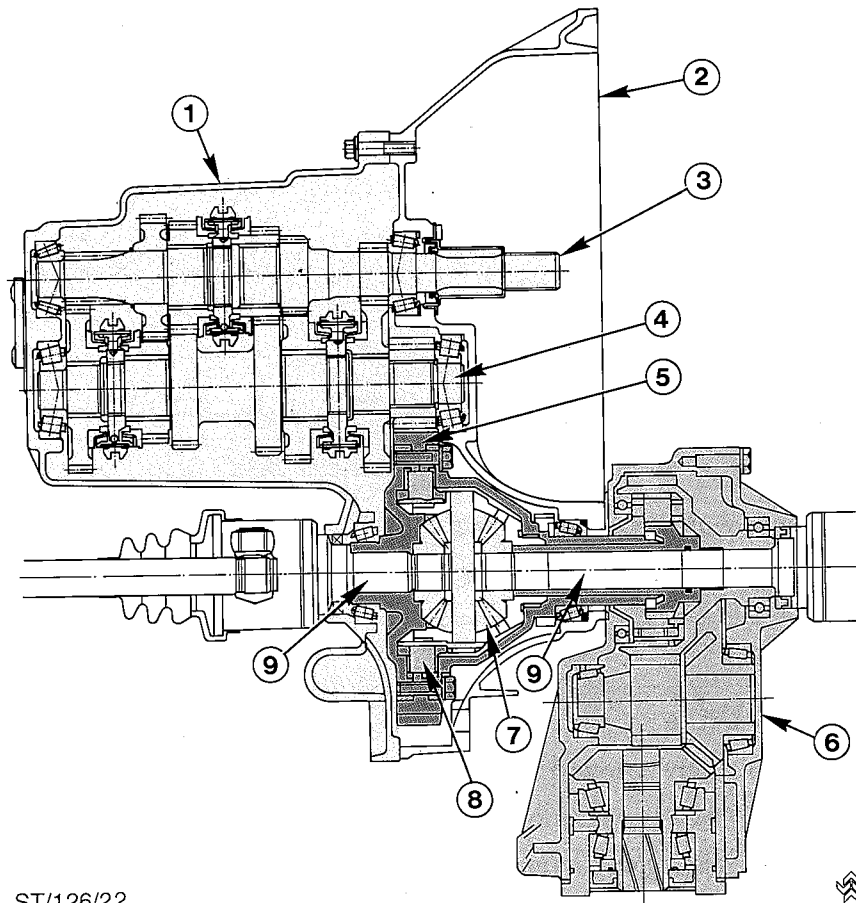
**At a Glance**

Following features are identical to the MTX 75 transaxle:

- Transmission housing (1)
- Input shaft (3) and output shaft (4)

Following features are innovations or modifications compared to the MTX 75 transaxle:

- Clutch housing (2)
- Final drive (5)
- Transfer box (6)
- Front drive differential (7)
- Viscomatic lock (8)
- Front side shafts (9)
- Input drive housing



ST/126/22

- 1 Transmission housing
- 2 Clutch housing
- 3 Input shaft
- 4 Output shaft
- 5 Final drive

- 6 Transfer box
- 7 Front drive differential
- 8 Viscomatic lock
- 9 Front side shafts

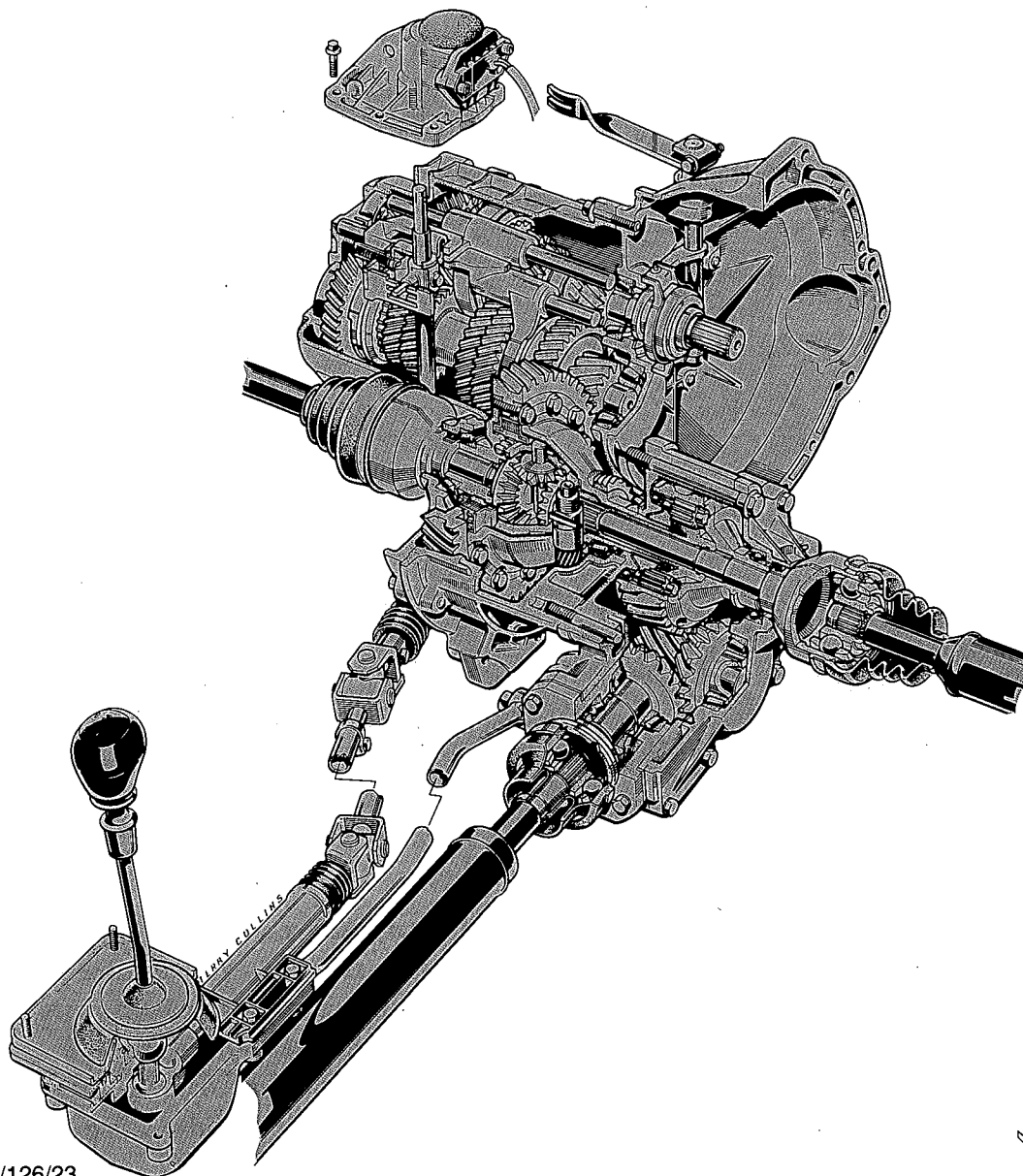
### Transmission Design

The MTX 75 transaxle is designed so that a transfer assembly for conversion to all-wheel drive can be installed without the need for extensive modifications. The planetary gear train in the transfer box transfers 40% of the torque supplied by the engine to the front axle and 60% to the rear axle.

At uniform traction of the front and rear wheels, the torque is distributed only by the planetary gear train. Differences in traction are compensated by a viscomatic lock in the front drive differential.

The torque for the front wheels is transferred via the transmission to the transfer box and from here to the front drive differential where it is transferred to the side shafts.

The torque for the rear axle is transferred via the transmission to the transfer box and from here via the two-piece driveshaft and the rear axle differential to the side shafts.



ST/126/23



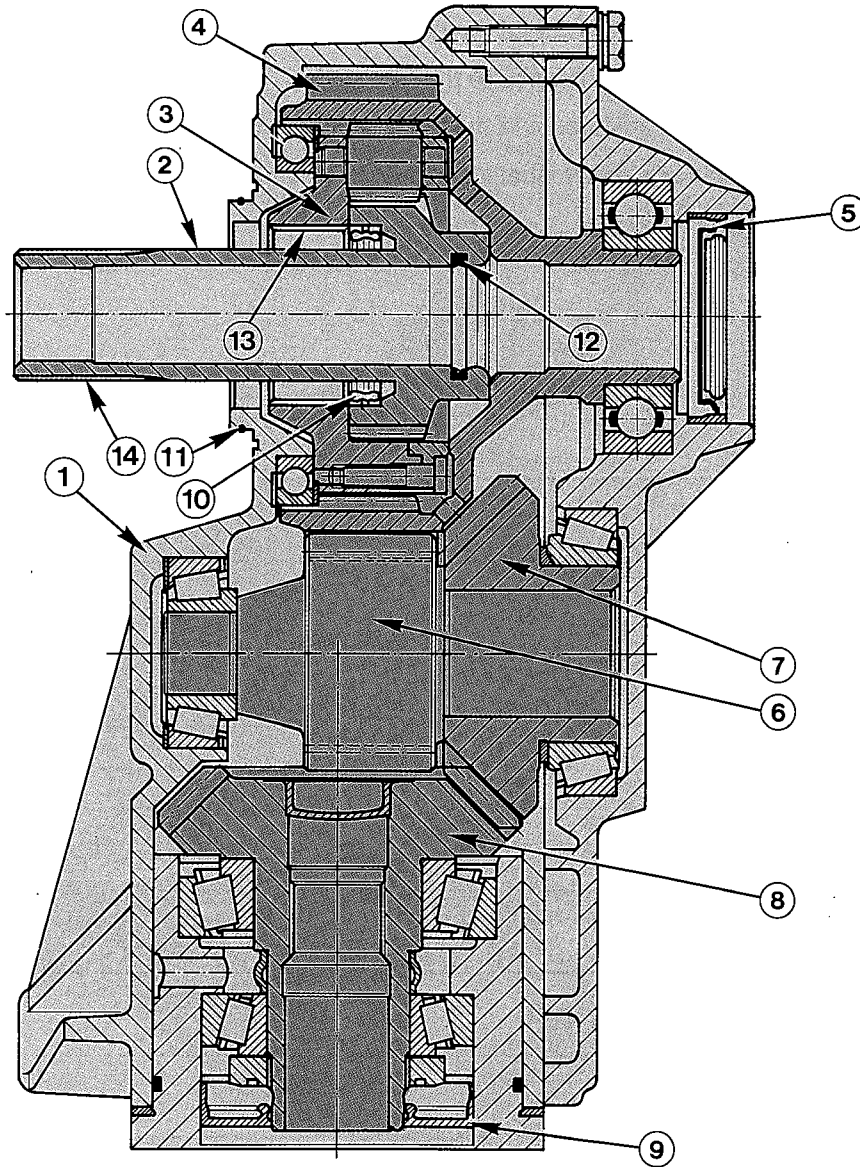


**Transfer Box**

The task of the new transfer box is to distribute the torque at a ratio of 60 : 40 to the rear and front axles.

Distribution takes place in the planetary gear train.

The total gear ratio from the ring gear (4) to the pinion shaft is 2.16 : 1, identical to the rear final drive ratio.



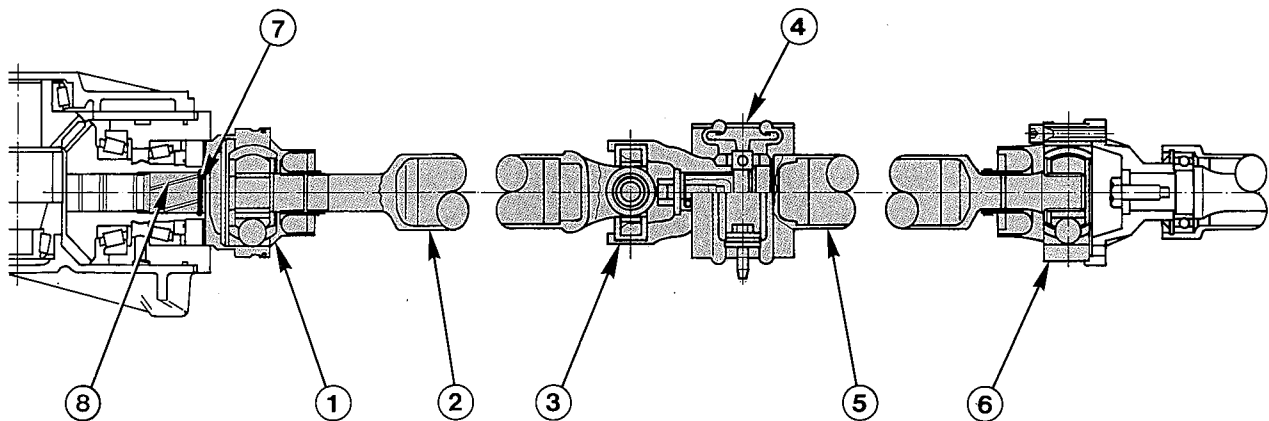
ST/126/24

- |  |   |
|--|---|
| 1 Transfer box                         | 9 Rotary shaft seal - pinion shaft        |
| 2 Sun wheel shaft                      | 10 Rotary shaft seal - drive housing      |
| 3 Planet carrier                       | 11 O-ring - transfer assembly/transaxle   |
| 4 Ring gear                            | 12 Rotary shaft seal - front side shaft   |
| 5 Rotary shaft seal - front side shaft | 13 Connection to drive housing            |
| 6 Idler gear shaft                     | 14 Connection to front drive differential |
| 7 Pinion                               |   |
| 8 Pinion shaft                         |   |

- The drive housing drives the planet carrier (3) in the transfer box.
- Here, the torque is distributed by means of the planetary gears at a ratio of 60 : 40 to the ring gear (4) and the sun wheel shaft (2).
- The sun wheel shaft transmits the torque for the front wheels to the front drive differential.
- The torque for the rear wheels is transmitted by the ring gear (4) via the idler gear (6), pinion (7) and pinion shaft (8) to the driveshaft.
- The pinion (7) is mounted on the shaft of the idler gear (6).
- The transfer box is vented via a breather hose.

**Driveshaft**

- The drive concept necessitates a 2-piece driveshaft since the rear final drive and transfer box are offset with respect to each other.
- A 2-piece driveshaft is quieter in operation.
- The front shaft stub is positively connected by means of a serration and a snap ring with the pinion shaft in the transfer box and sealed by an O-ring to prevent entry of water and dirt. The shaft stub features splines for installation in the pinion shaft.
- The centre bearing is mounted on the floor assembly.
- The rear shaft flange of the rear axle extension is bolted to the rear constant velocity joint.



ST/126/25



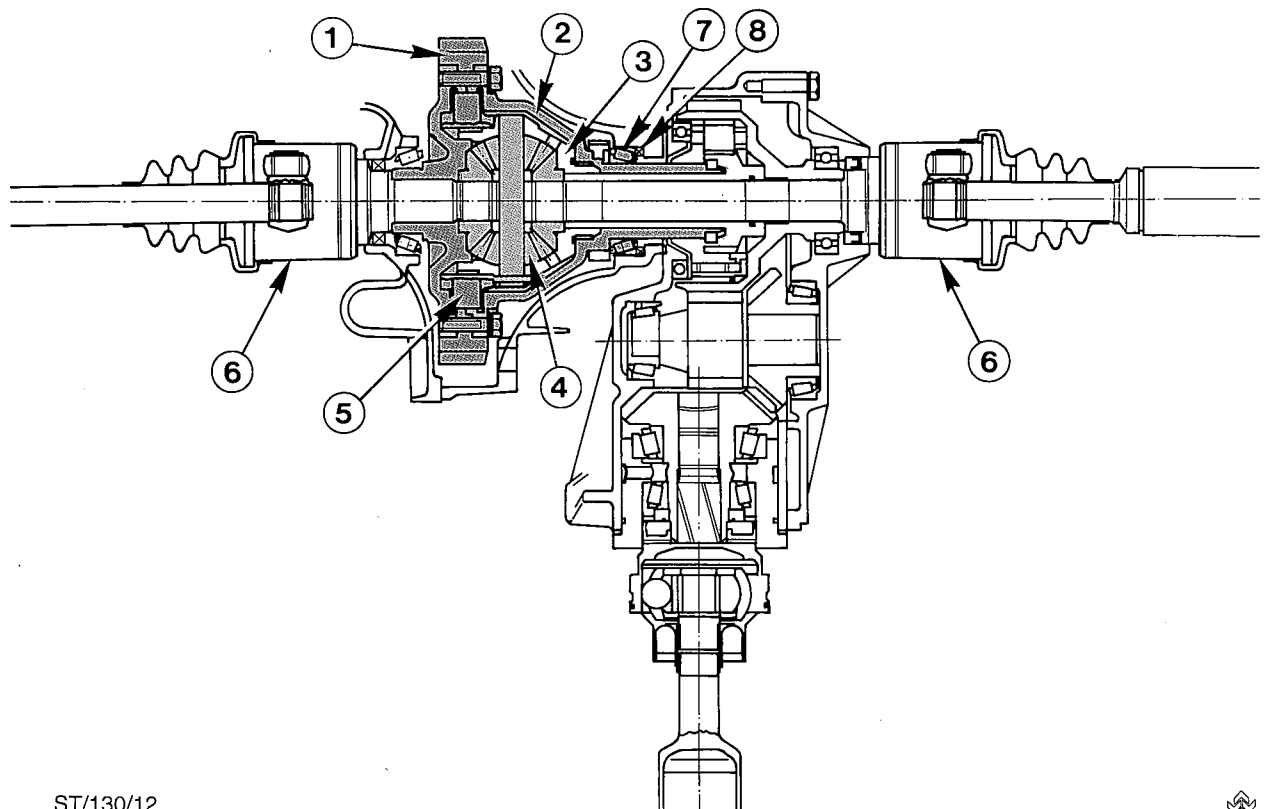
- |   |  |
|---|--|
| 1 Front shaft stub with constant velocity joint | 5 Rear driveshaft                        |
| 2 Front driveshaft                              | 6 Rear constant velocity joint           |
| 3 Universal joint                               | 7 O-ring                                 |
| 4 Centre bearing                                | 8 Vent groove to facilitate installation |

**Modifications to the MTX 75 Transaxle**

By way of the drive housing, the ring gear drives the planet carrier of the transfer box. A viscomatic lock is installed between this drive housing and the front drive differential.

**Front Drive Differential and Side Shafts**

- Spur gear (1) bolted to additional drive joint housing (2).
- Additional viscomatic lock (5) to compensate for differences in traction between front and rear drives. The function of the viscomatic lock corresponds to the function of the viscomatic locks in the 4x4 drive concepts already known on the Sierra and Scorpio (see booklet Technicians Product Training Sierra DOHC 4x4, CG 7321).
- Modified front drive differential (3). Drive takes place by means of sun wheel shaft from transfer box.
- Front drive differential components (4) unchanged.
- Front side shafts (6) modified. Right hand side shaft runs through transfer box.
- A special tool and a propriarty puller are used to remove the taper roller bearing (7).



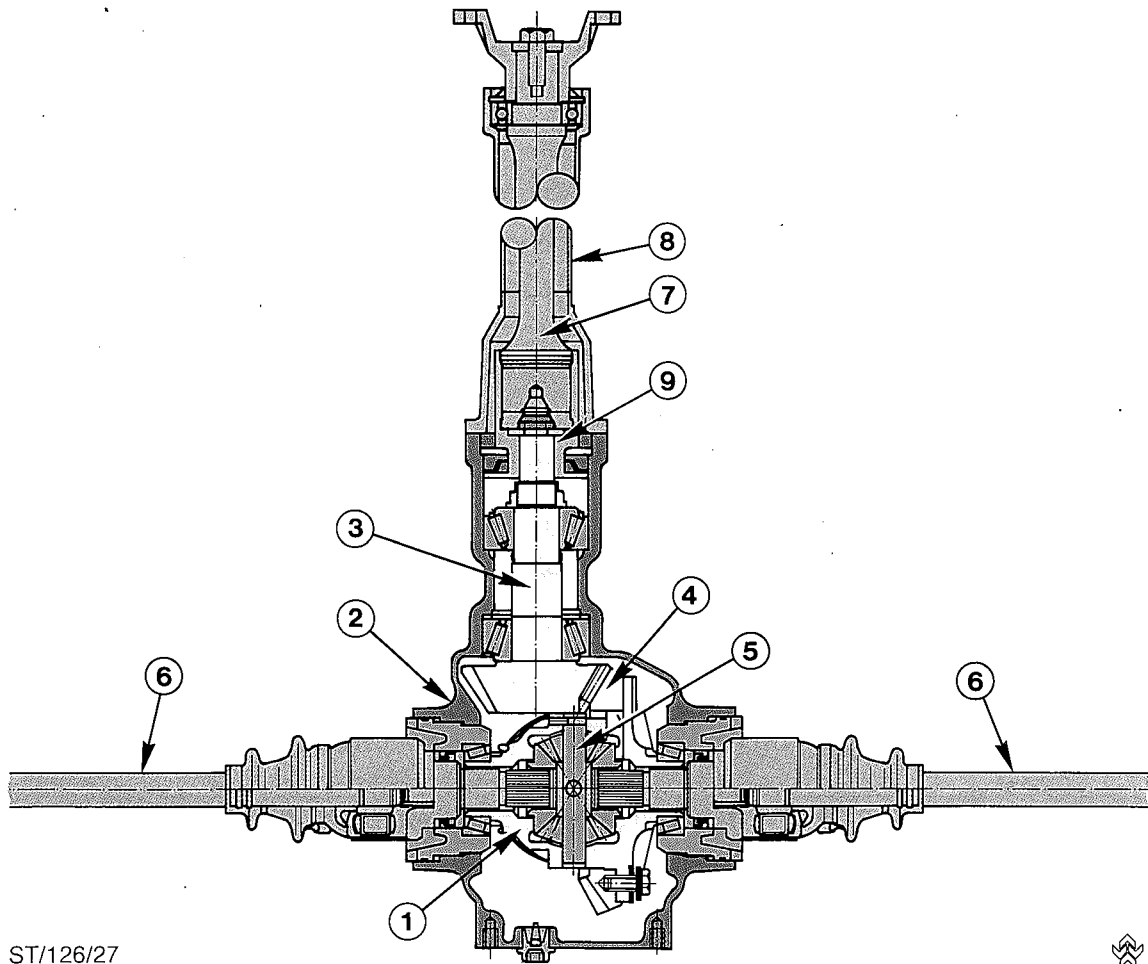
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- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| 1 Ring gear                           | 5 Viscomatic lock                     |
| 2 Drive housing                       | 6 Front side shaft                    |
| 3 Front drive differential            | 7 Taper roller bearing, drive housing |
| 4 Front drive differential components | 8 Oil seal, transmission housing      |

**Rear Drive and Side Shafts**

The rear drive consists of the drive shaft and final drive, featuring the following:

- New rear final drive housing with cover facing downward (differential is mounted from below).
- New rear final drive extension to avoid a 3-piece driveshaft.
- Differential (5), gears and bearing adopted from Sierra 6 1/2" rear axle.
- Final drive (hypoid gearing) with gear ratio of 2.16 : 1. Crown wheel mounted on right-hand side in order to compensate for reversal of direction of rotation in transfer box.
- New pinion nut (right-hand thread!) and pinion sealing ring.
- Pinion mounting and bearings as Sierra 7" rear axle.
- Side shafts new.

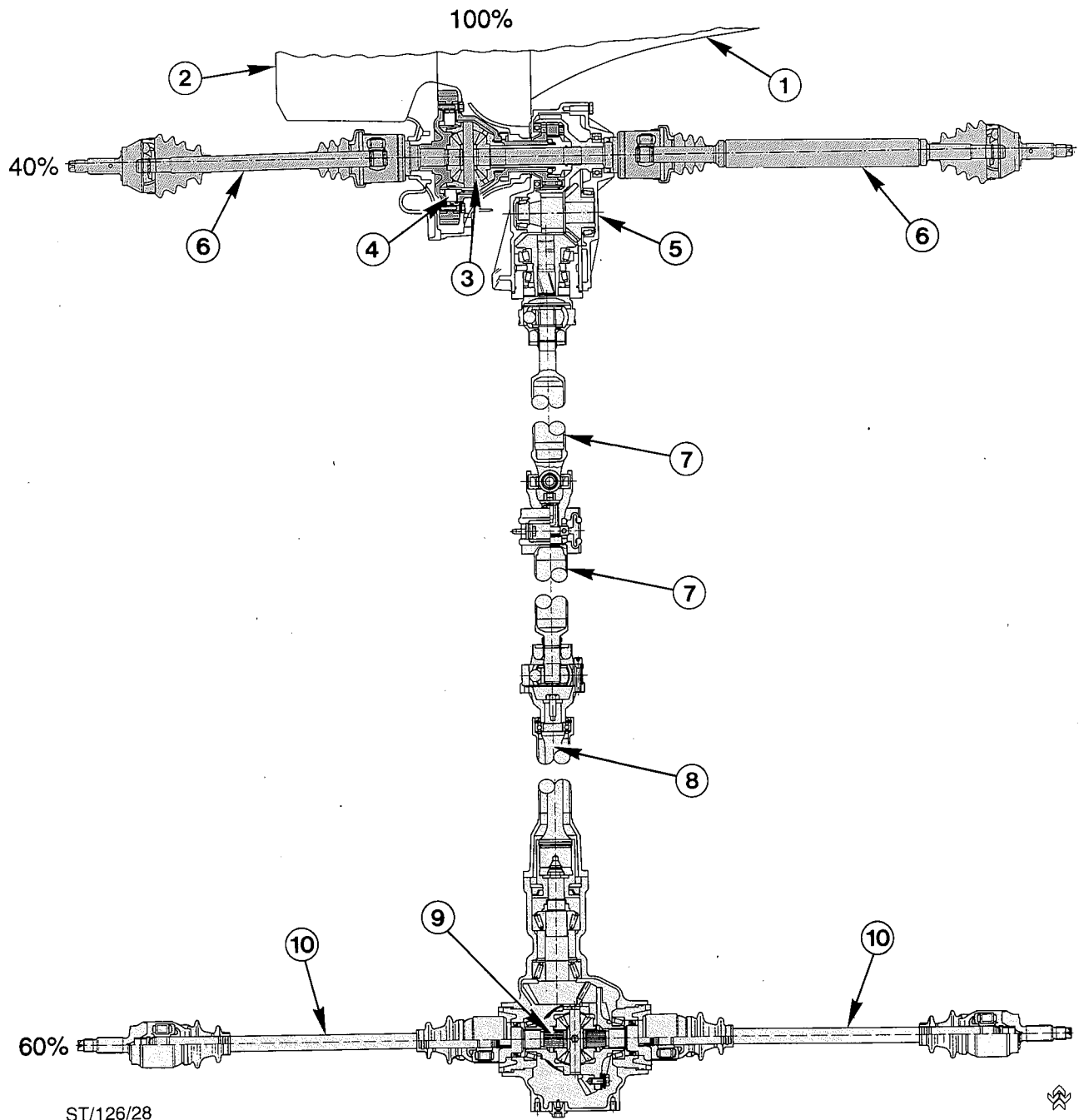


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- |                            |                     |
|----------------------------|---------------------|
| 1 Differential housing     | 6 Side shaft        |
| 2 Rear final drive housing | 7 Extension shaft   |
| 3 Pinion                   | 8 Extension housing |
| 4 Crown gear               | 9 Flange sleeve     |
| 5 Differential             |                     |

Torque Split in 4x4 Concept



ST/126/28

- Torque from engine (100 %)
- Torque to front drive (40 %)
- Torque to rear drive (60 %)

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1 Engine</li> <li>2 MTX 75 transaxle</li> <li>3 Front drive differential</li> <li>4 Viscomatic lock</li> <li>5 Transfer box</li> </ul> | <ul style="list-style-type: none"> <li>6 Front side shafts</li> <li>7 Two-piece driveshaft</li> <li>8 Extension shaft from rear final drive</li> <li>9 Rear final drive</li> <li>10 Rear side shafts</li> </ul> |
|---|---|

## Special Tools

All special tools required for performing repairs on MTX 75 transaxle with front wheel drive are used for performing repairs on the MTX 75 transaxle with transfer box. In addition, the following special tools are used:

Number	Description	Use
Proprietary tool	Puller	to remove the taper roller bearing from the drive housing
15-036	Installer	to remove the taper roller bearing from the drive housing
16-066	Guide sleeve	to install the double lip oil seal on the transmission housing
16-067	Installer	to install the double lip oil seal on the transmission housing

## New special tools for 4x4 drive

Special tools required for performing repairs on 4x4 drive:

Number	Description	Use
15-094	Mounting plate, engine stand	to mount the rear differential
15-095	Holding wrench	to hold the rear axle pinion
15-096	Installer, oil seal	to install the oil seal of the rear axle pinion
15-097	Guide pins, crossmember	to fix the rear crossmember

## Disassembling and Assembling

### Transfer Box

- At present, repairs to the transfer box should only be performed by the manufacturer except for points specified under maintenance.

### Viscomatic Lock

- The viscomatic lock cannot be disassembled, it must be replaced completely in the case of fault.

### Rear Axle Drive

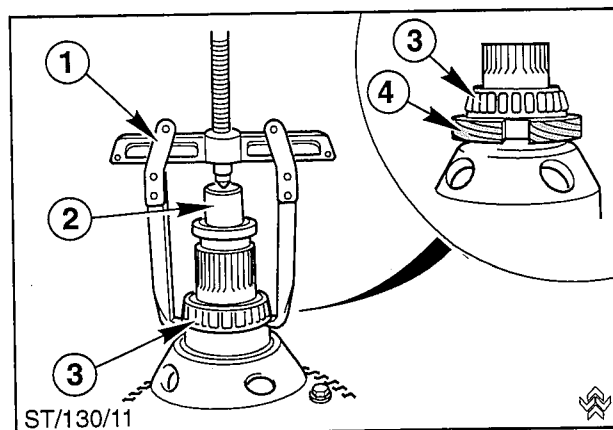
- The corresponding Sierra workshop literature should be used for disassembling and assembling the rear axle drive.

## DISASSEMBLING AND ASSEMBLING

### Replacing the Speedometer pinion

- Destroy speedometer pinion
- Fit special tool 15-036 in drive housing.
- Remove bearing using propriarty puller.

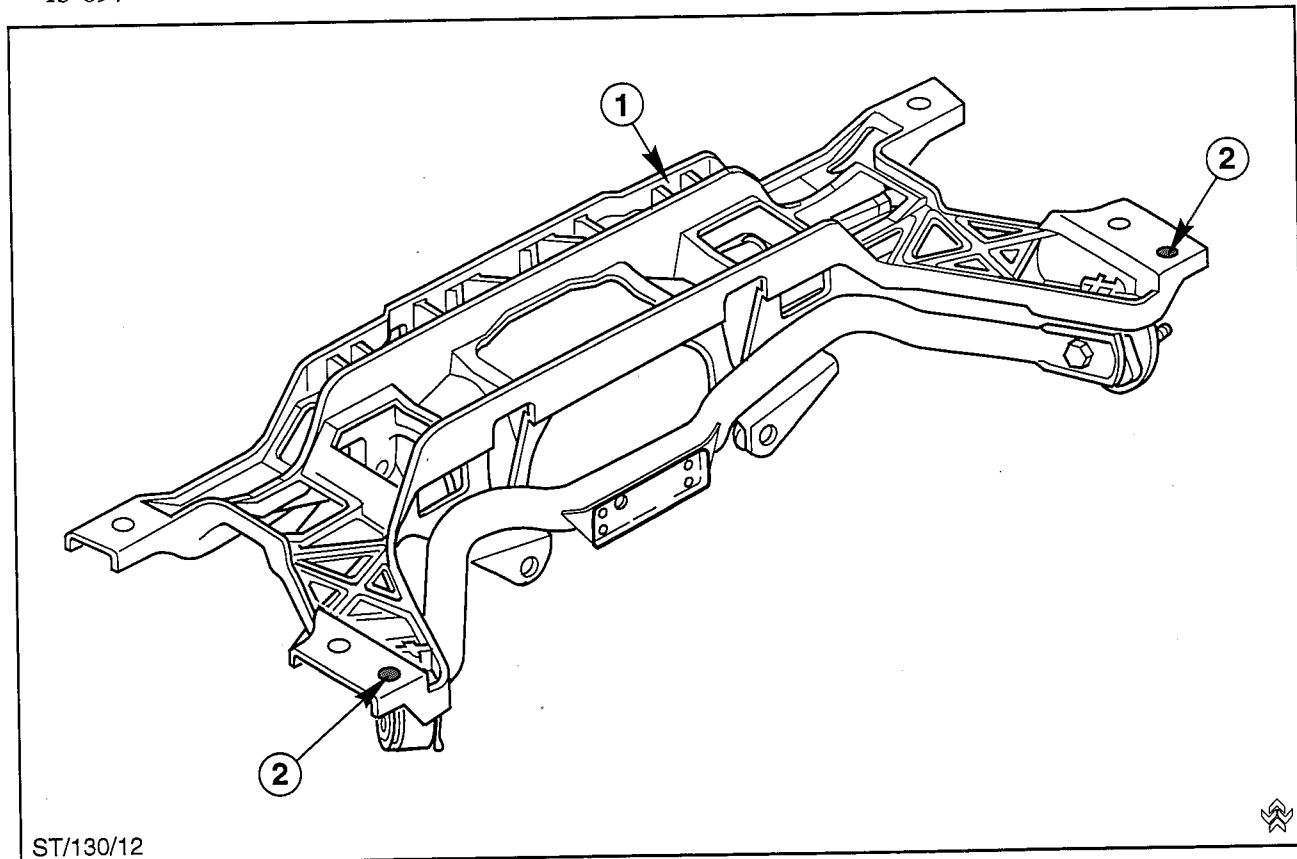
**Note:** Bearing must not be damaged since the thickness of the setting shim would have to be redetermined if a new bearing were used.



- Speedometer pinion
- 1 Propriarty puller
  - 2 Special tool 15-036
  - 3 Taper roller bearing
  - 4 Splitted speedometer pinion

### Installation of the crossmember

- To achieve the correct installation position of the crossmember use the new special tools, guide pins 15-097



- 1 Crossmember
- 2 Hole for special tool, guide pin 15-097

**General**

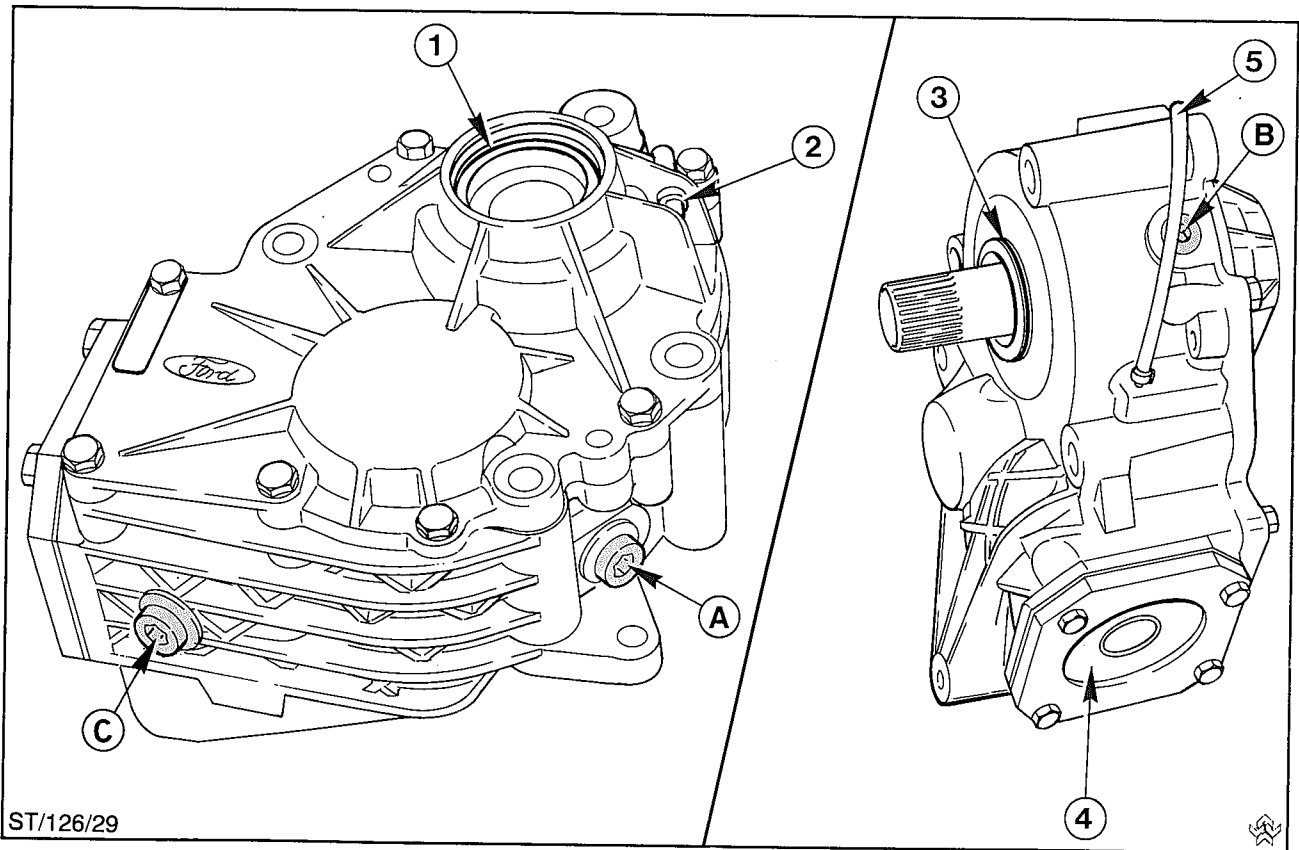
- Check the oil level in the transfer box and clean the magnetic plug during each inspection (every 15,000 km).

**Note:** The vehicle must be positioned horizontally in order to check the oil level.

- The oil in the transfer box must be drained off and renewed every 60,000 km.

Following parts can be replaced on the transfer box (see Fig.):

- Rotary shaft seal to right-hand front axle side shaft (1)
- 1-lug clamp (2)
- O-ring between MTX 75 and transfer box (3)
- Rotary shaft seal to driveshaft (4)
- Breather hose (5)



ST/126/29

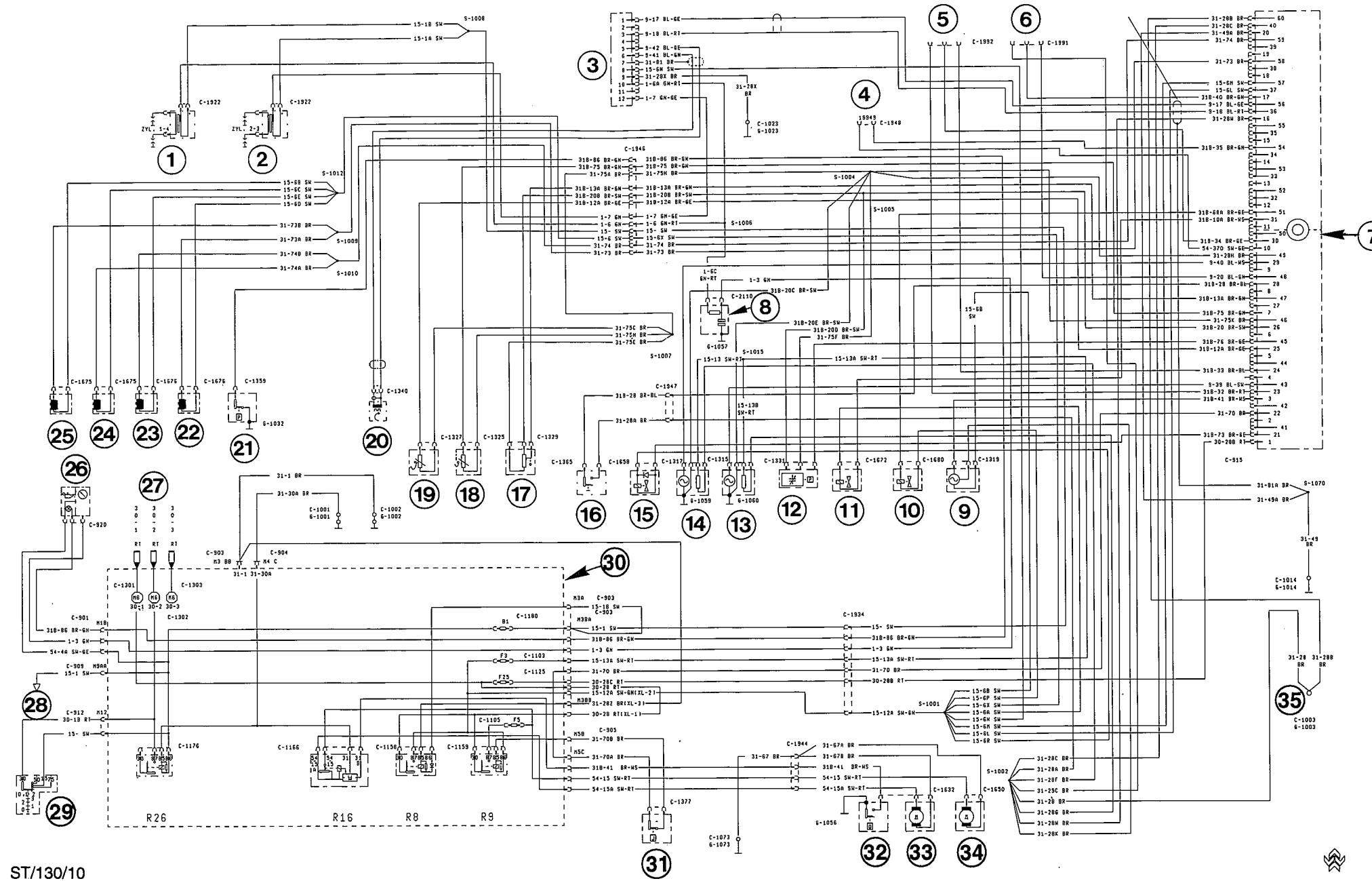
- |   |                     |
|---|---------------------|
| A Oil inspection opening with magnetic plug | 2 1-lug clamp       |
| B Oil filler opening with screw plug        | 3 O-ring            |
| C Oil drain opening with screw plug         | 4 Rotary shaft seal |
| 1 Rotary shaft seal                         | 5 Breather hose     |

Oil inspection and filling plug

Parts which can be replaced in Service



## Wiring diagram for vehicles with 4x4 drive



ST/130/10

- |                                 |  |                         |                                |
|---------------------------------|--|-------------------------|--------------------------------|
| 1 Ignition coil A               | 11 Canister purge valve                    | 21 Oil pressure switch  | 31 Inertia switch              |
| 2 Ignition coil B               | 12 Manifold absolute pressure (MAP) sensor | 22 Injector valve 4     | 32 Tanksender II 4x4           |
| 3 E-DIS module                  | 13 Lambda sensor II (HEGO)                 | 23 Injector valve 3     | 33 Fuel pump 4x4               |
| 4 A/C blower motor feed loom    | 14 Lambda sensor I (HEGO)                  | 24 Injector valve 2     | 34 Fuel pump                   |
| 5 Octane adjust and idle adjust | 15 Idle speed valve                        | 25 Injector valve 1     | 35 Battery                     |
| 6 Diagnostic connector          | 16 Power steering pressure switch          | 26 Instrument cluster   |                                |
| 7 EEC IV module                 | 17 Throttle positions sensor (TPS)         | 27 Power feed           | R 8 EEC IV power relay         |
| 8 Filter                        | 18 Engine temperature sensor               | 28 To anti-theft module | R 9 Fuel pump relay            |
| 9 Speed sensor                  | 19 Air charge temperature (ACT) sensor     | 29 Ignition switch      | R 16 Fuel pump 4x4 delay relay |
| 10 Secondary air valve          | 20 Crank position sensor (CPS)             | 30 Central electric box | R 26 Ignition switch relay     |

The illustrations, technical information, data and descriptive text in this issue, to the best of our knowledge, were correct at the time of going to print. The right to change prices, specifications, equipment and maintenance instructions at any time without notice, is reserved as part of Ford policy of continuous development and improvement.

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