

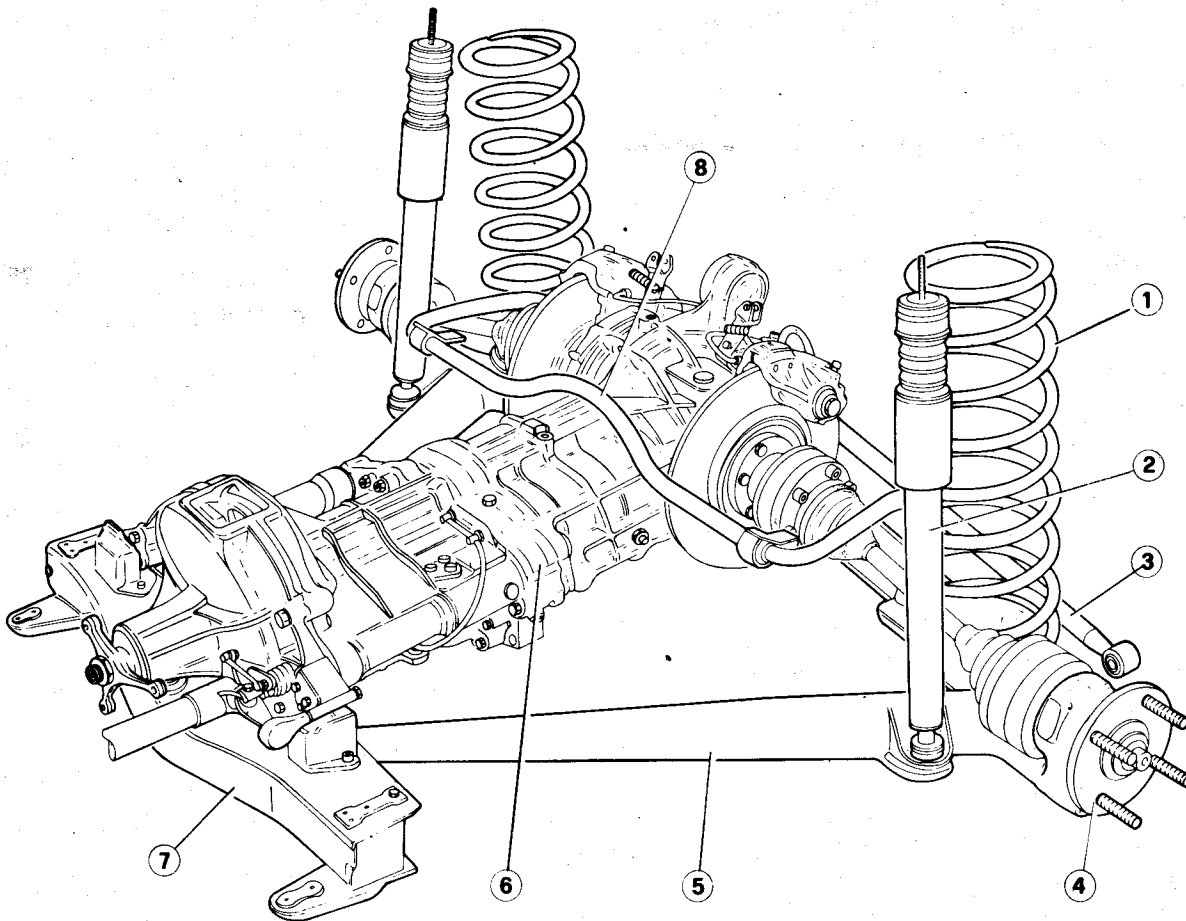
## REAR SUSPENSION

# GROUP 25

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DESCRIPTION



- |   |                 |   |               |
|---|-----------------|---|---------------|
| 1 | Coil spring     | 5 | De Dion axle  |
| 2 | Shock absorber  | 6 | Power train   |
| 3 | Transverse link | 7 | Cross member  |
| 4 | Wheel hub       | 8 | Anti-roll bar |

Rear suspension features a De Dion type axle.

This design, which combines the advantages of rigid axles and those of independent axles, permits a reduction in unsprung mass; it also improves rear wheel geometry ensuring that the wheels remain perpendicular and provide full adhesion around corners and on rough sur-

faces at all times.

Triangular De Dion tubular structure is connected at front to a cross member, bolted to body through antivibration bushing. Thrust generated by driving wheels is transmitted to body through this point. At rear, axle is anchored by a Watt's linkage hinged to axle through a rocker connected to body by means of two trans-

verse links.

Watt's linkage transverse links react in push or pull fashion with forces equal to those transmitted by wheels to axle, to prevent lateral body movement.

Rear suspension also includes coil springs, hydraulic telescopic shock absorbers and anti-roll bar.

# DE DION AXLE

## REMOVAL

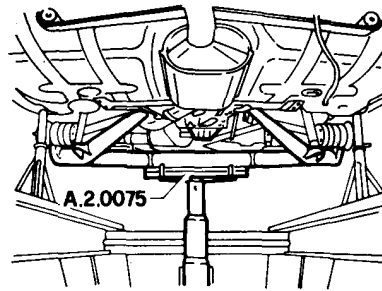
1. Place car on a lift, lock front wheels using suitable chocks and slacken rear wheel nuts.

2. Vehicles equipped with (ABS) MARK II wheel antilock system only.

a. Free the rear impulse pick-up cables from the De Dion axle.

b. Back off nuts ② and remove the impulse pick-ups ①, complete with supports, from the wheel hubs without disconnecting them electrically.

c. Put the impulse pick-ups in a safe place, taking great care to avoid damage to them, where they do not hinder operations.



4. Remove exhaust line as directed in "Group 04 - Exhaust System - Removal".

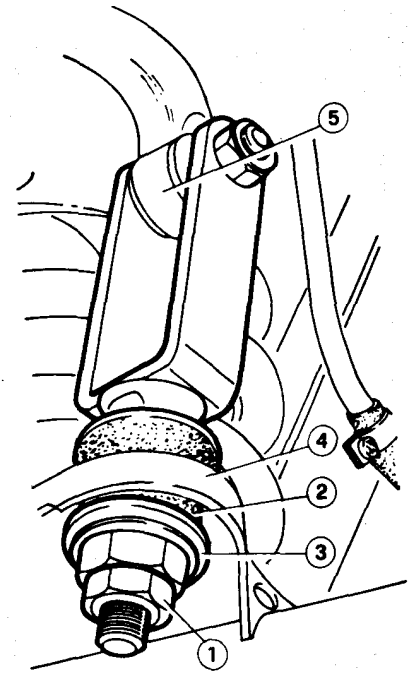
5. Remove transmission remote control rod and isostatic control as directed in "Group 13 - External controls - Complete control - Removal".

6. Back off screws ①, retrieve associated washers and lock plates and remove axle shafts ②.

### CAUTION:

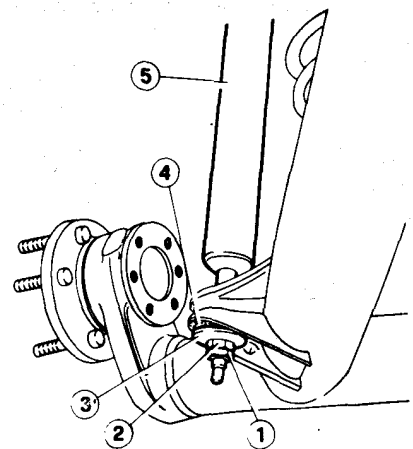
Take care not to damage joint bellows ③ during removal operation.

7. Back off lock nuts ① and associated nuts, retrieve rubber cushions ② and cups ③; disconnect anti-roll bar ⑤ from De Dion axle ④.

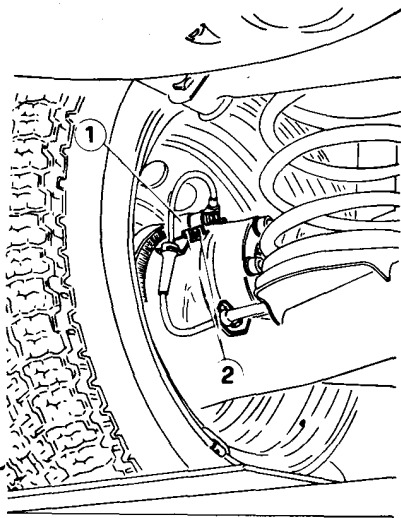


- 1 Lock nut
- 2 Rubber cushion
- 3 Cup
- 4 De Dion axle
- 5 Anti-roll bar

8. Back off lock nuts ① and nuts ②, retrieve rubber cushions ④ and cups ③ and remove shock absorber ⑤.

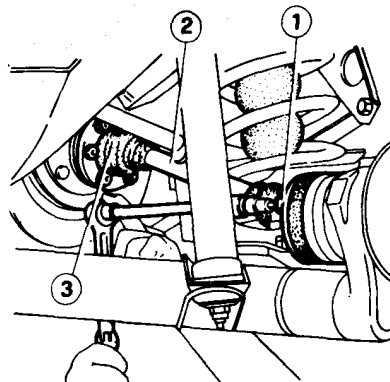


- 1 Lock nut
- 2 Shock absorber - axle retaining nut
- 3 Cup
- 4 Rubber cushion
- 5 Shock absorber



- 1 Rear impulse pick-up
- 2 Nuts securing impulse pick-up support to wheel hub

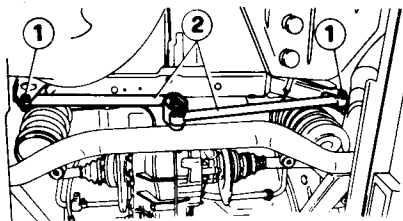
3. Install tool A.2.0075 on hydraulic lift, raise rear axle by 40 cm min. and apply support stands; remove rear wheels.



- 1 Axle shaft screw
- 2 Axle shaft
- 3 Joint bellows

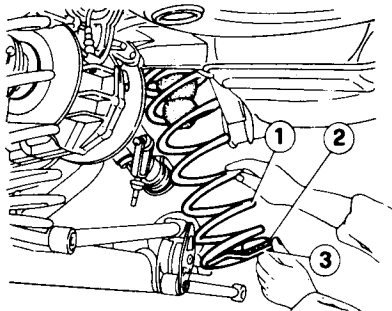
# REAR SUSPENSION

9. Back off and retrieve bolts ①; disconnect Watt's linkage transverse links ②.



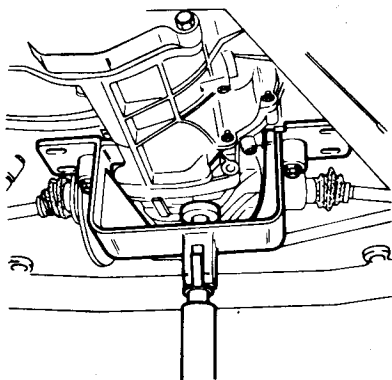
- 1 Transverse link securing bolt  
2 Watt's linkage transverse link

10. Lower hydraulic lift until coil springs are fully unloaded.  
11. Take out coil springs ① from seats along with pads ③ and seals ②.

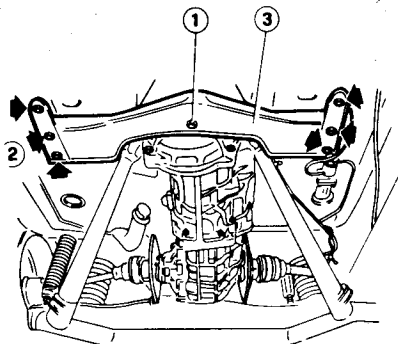


- 1 Coil spring  
2 Seals  
3 Pads

12. Disconnect speedometer and back-up light switch cables.  
13. Support power train by means of a suitable tool and hydraulic lift.

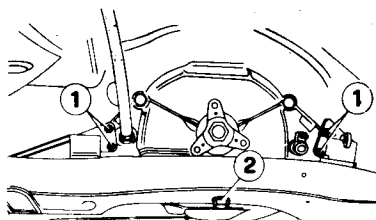


14. Back off and remove bolts securing propeller shaft joint to clutch fork.  
15. Slacken screw ① and back off screws ②.



- 1 Axle-cross member screw  
2 Cross member-body screws  
3 Cross member

16. Lower power train, back off and remove bolts ①.  
17. Back off and remove screw ② and take off cross member.  
18. Install cross member to support power train, remove supporting tool and axle with Watt's linkage.



- 1 Power train/cross member securing bolts  
2 Axle-cross member screw

## INSTALLATION

Install by reversing the removal sequence and following the instructions given below.

- Before tightening propeller shaft joint to clutch fork, lubricate centralization

seat using the recommended grease (ISECO Molykote BR 2 - see Group 15 - Transmission - Inspection Specifications - Fluids and Lubricants).

- Lubricate axle shaft screws using the grease specified above.
- Lubricate shock absorber pins and bolts securing Watt's linkage transverse links to body using antiseize lubricant (R. GORI Never Seez.).
- Adhere to the following tightening torque requirements:

### T: Tightening torques

Screw, transmission crossmember to body

39 to 44 N·m  
(4 to 4.5 kg·m)  
(28.8 to 32.5 ft·lb)

Screw, axle to transmission

88 to 108 N·m  
(9 to 11 kg·m)  
(64.9 to 79.7 ft·lb)

Bolts, Watt's transverse links to body supports

39 to 49 N·m  
(4 to 5 kg·m)  
(28.8 to 36.1 ft·lb)

- Tighten nuts securing propeller shaft joint to clutch fork to the specified torque, (see Group 15 - Transmission - Inspection Specifications - Tightening Torques).
- Tighten axle shaft/wheel shaft retaining screws to the specified torque (see Group 17 - Axle Shafts - Inspection Specifications - Tightening Torques).
- Vehicles equipped with (ABS) MARK II wheel antilock system only.
  - a. Install the impulse pick-ups in reverse order of removal, observing the following tightening torque.

### T: Tightening torque

Nuts securing impulse pick-up supports - wheel hubs

9 thru 10 N·m  
(0.9 thru 1 kg·m)  
(6.6 thru 7.4 ft·lb)

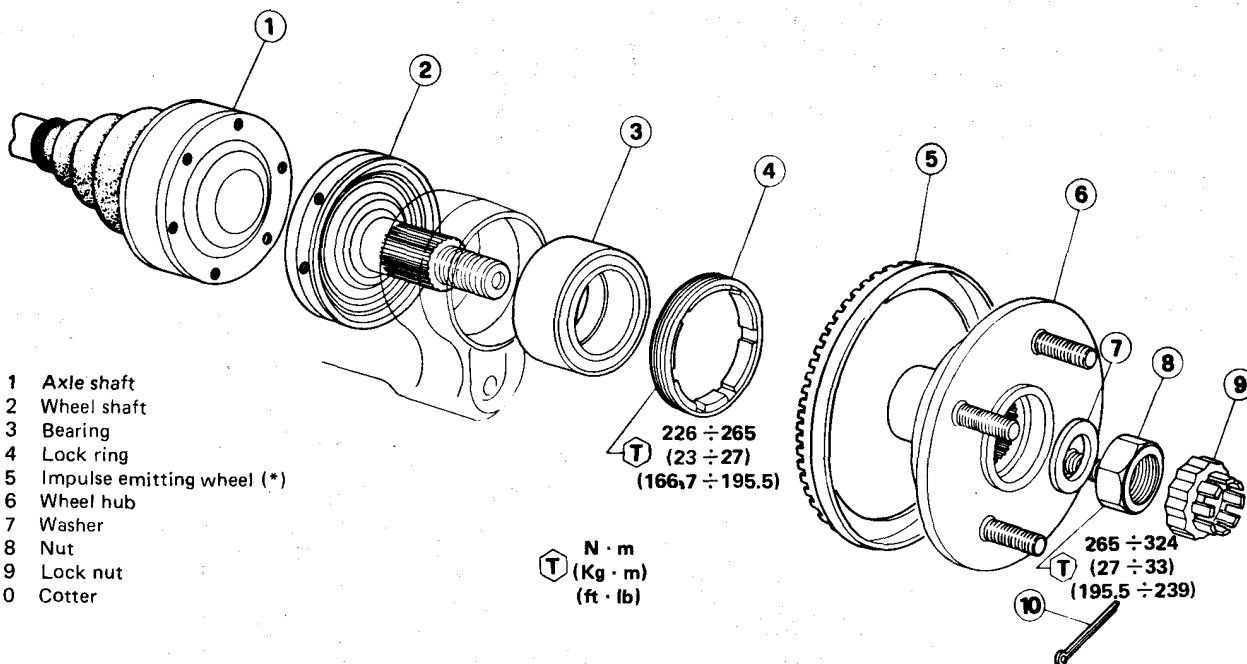
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b. Ensure that the impulse pick-up cables are well secured to their anchor points and properly fixed to the suspension unit to prevent damage when the vehicle is running.

c. Check the air gap between the impulse pick-ups and impulse emitting wheel (see: Group 22 - Inspection Specifications - Checks and Adjustments - Adjustment of the Air Gap between the Impulse Pick-ups and Impulse Emitting Wheels).

• Check car trim and rear wheel geometry (see: Group 00 - Car Model Specific Manual - Car Trim Check).

## REAR WHEEL HUBS



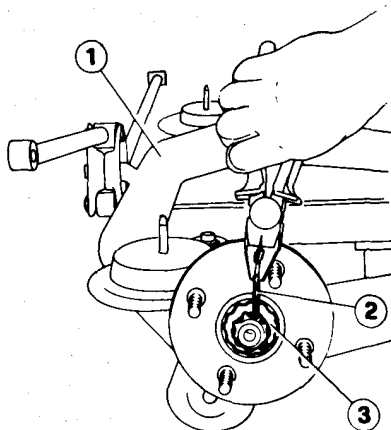
(\*) For vehicles equipped with (ABS) MARK II wheel antilock braking system only

## DISASSEMBLY

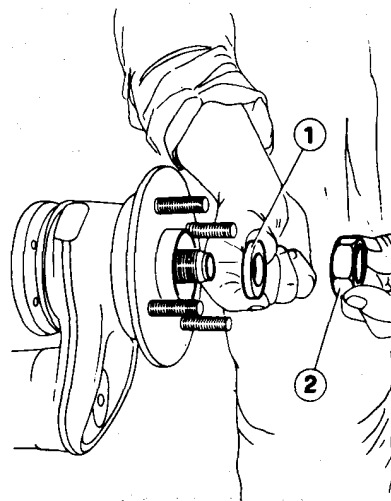
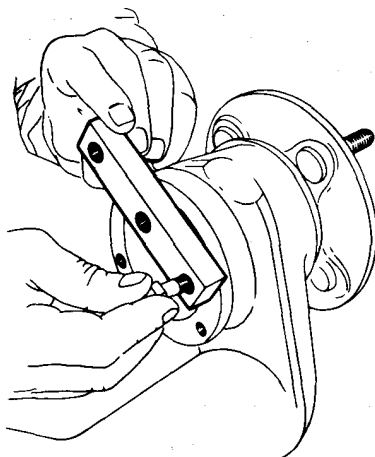
1. Place De Dion axle ① on a suitable bench. Remove cotter ② from wheel shaft and take off lock nut ③.

2. Install a retainer tool to prevent wheel shaft rotation.

3. Back off nut ② retaining hub to wheel shaft and take off associated washer ①.



1 De Dion axle  
 2 Cotter  
 3 Lock nut

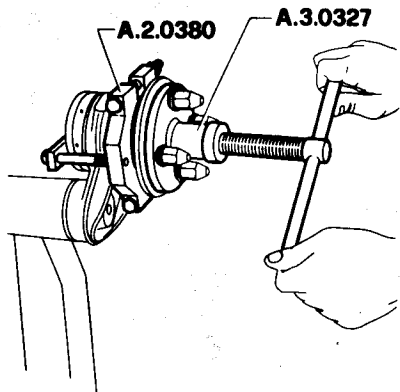


1 Washer  
 2 Nut

# REAR SUSPENSION

## 4. Wheel hub extraction.

- a. Vehicles not equipped with (ABS) MARK II wheel antilock system.  
Install tools **A.2.0380** and **A.3.0327**, remove wheel hub and remove tools.



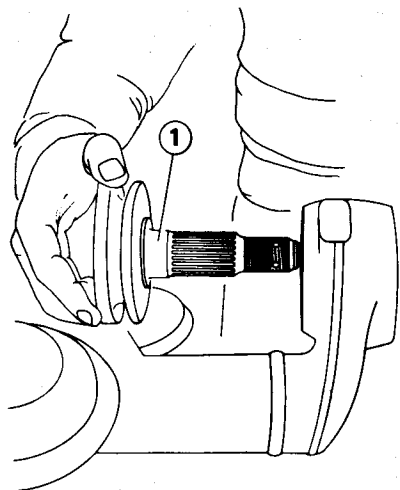
- b. Vehicles equipped with (ABS) MARK II wheel antilock system only.

Assemble percussion tool **A.3.0617** on tool **A.3.0327** then, working as per Group 22 - (ABS) MARK II Braking System with Wheel Antilock - Impulse Pick-ups and Impulse Emitting Wheels - Rear Impulse Emitting Wheels - Removal - step 5, extract the wheel hub and retrieve the tool.

5. Vehicles equipped with (ABS) MARK II wheel antilock system only.

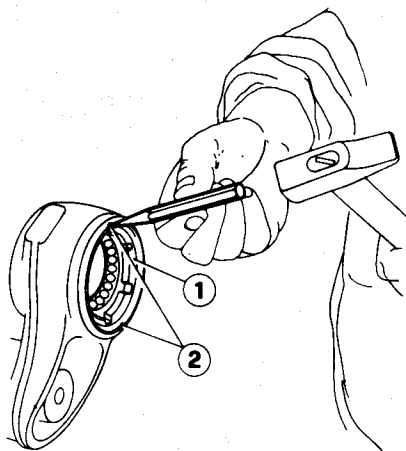
If necessary, separate the impulse emitting wheel from the wheel hub by operating as described in Group 22 - (ABS) MARK II Braking System with Wheel Antilock - Impulse Pick-ups and Impulse Emitting Wheels - Rear Impulse Emitting Wheels - Removal - step 6.

6. Take off wheel shaft ①.



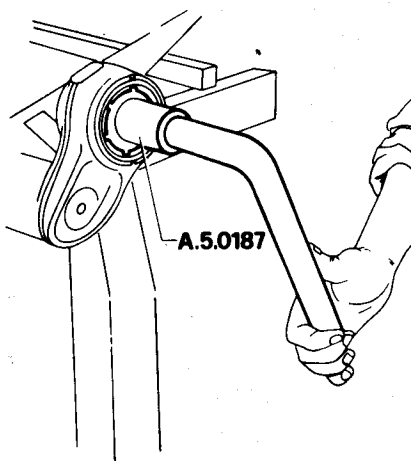
1 Wheel shaft

7. Using a punch, release two staked areas ② on bearing lock ring ①.

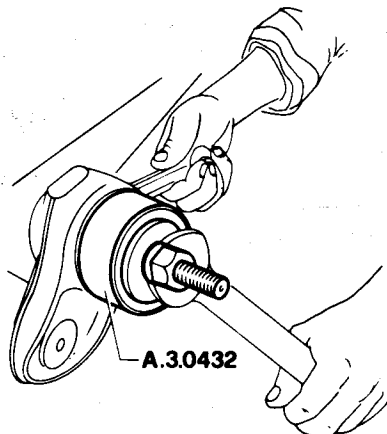


1 Lock ring  
2 Staked area

8. Using wrench **A.5.0187**, back off bearing lock ring.



9. Install tool **A.3.0432** and using two wrenches, take out bearing from hub.



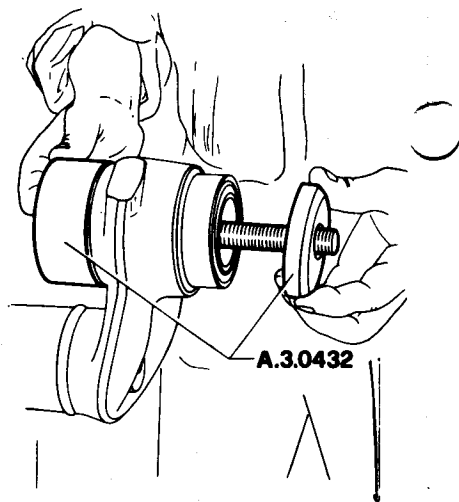
## INSPECTION

Clean all parts.

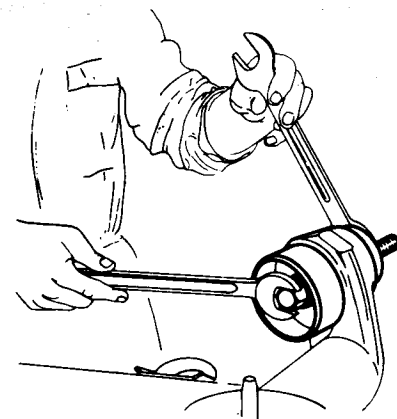
1. Check axle seat, wheel shaft and hub for damage or distortion; replace as necessary.
2. Replace hub bearing.

## ASSEMBLY

1. Install tool **A.3.0432** and install hub bearing after thorough cleaning and lubrication.



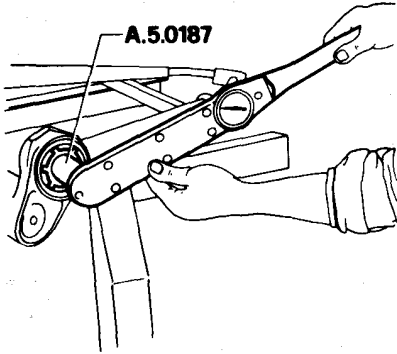
2. Using two wrenches, insert bearing fully home and remove tools.



3. Apply antiseize lubricant (R. GORI Never Seez) to bearing lock ring; tighten to the specified torque using tool **A.5.0187**.

# REAR SUSPENSION

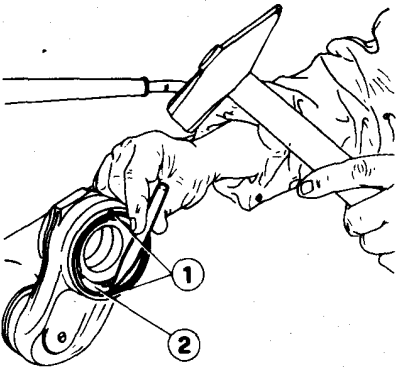
- T**: Tightening torque  
 Wheel hub bearing lock ring  
 226 to 265 N·m  
 (23 to 27 kg·m)  
 (166.7 to 195.5 ft·lb)



**CAUTION:**

Right and left bearing lock rings are not interchangeable as they are provided with opposite threads.

4. Stake lock ring (2) on seat notches (1).

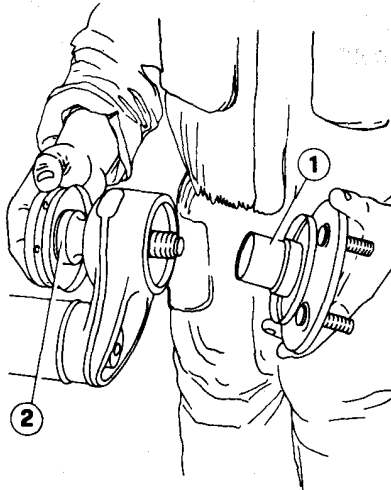


- 1 Staked area  
 2 Lock ring

5. Vehicles equipped with (ABS) MARK II wheel antilock system only.  
 If previously disassembled, reassemble the impulse emitting wheels thus.

- a. Clean the impulse emitting wheels thoroughly ensuring they are not damaged in any way.

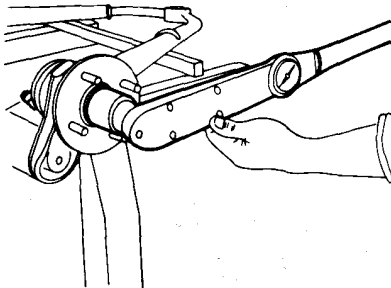
- b. With the aid of a press, fit the impulse emitting wheels on the hubs and check correct installation (see: Group 22 - (ABS) MARK II Braking System with Wheel Antilock - Inspection Specifications - Checks and Adjustments - Rear Impulse Emitting Wheels).
6. Install hub (1) and wheel shaft (2).



- 1 Hub  
 2 Wheel shaft

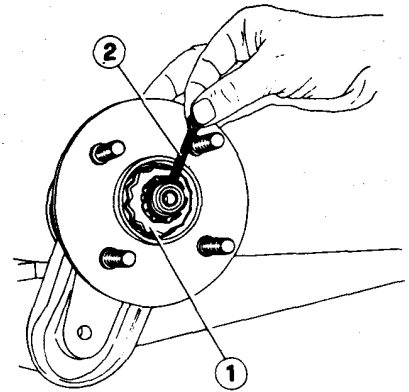
7. Install washer, tighten nut securing hub to wheel shaft to the specified torque holding wheel shaft to prevent rotation.

- T**: Tightening torque  
 Wheel hub retaining nut  
 265 to 324 N·m  
 (27 to 33 kg·m)  
 (195.5 to 239 ft·lb)



8. Using a brush, apply grease film protective fluid (MILLA Protective LT or HOUGHTON Rust Veto 1064) to wheel shaft threaded end.

9. Install lock nut (1) and insert cotter (2).

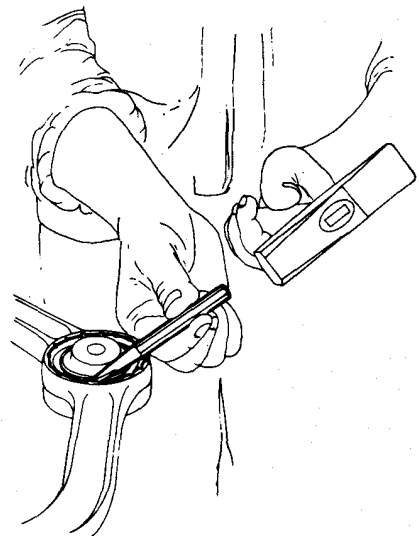


- 1 Lock nut  
 2 Cotter

## DE DION AXLE ANTIVIBRATION BUSHING

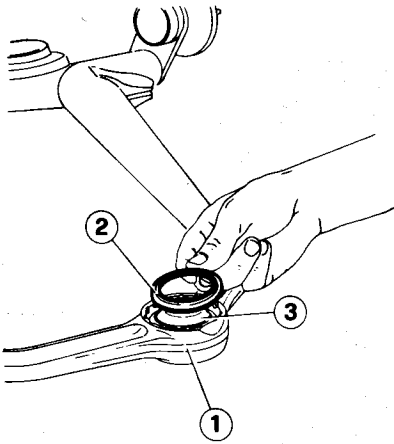
### DISASSEMBLY

1. Using a punch, release staked area in antivibration bushing seat top.



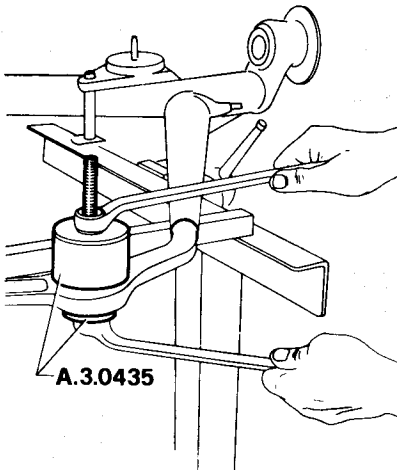
# REAR SUSPENSION

2. Take off antivibration bushing ③ upper washer ② from seat ①.



- 1 Seat  
2 Upper washer  
3 Antivibration bushing

3. Install puller A.3.0435 and remove antivibration bushing and lower washer.



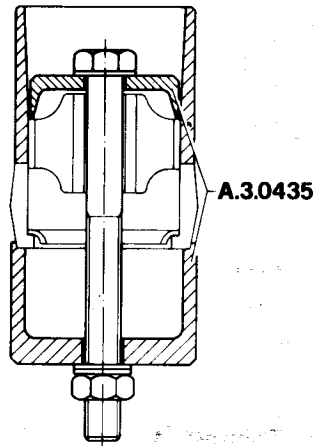
## INSPECTION

Clean antivibration bushing, seat and washers.

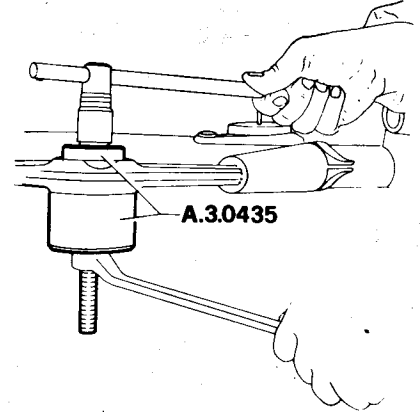
1. Check axle and antivibration bushing seat for damage or distortion; replace axle if necessary.
2. Check antivibration bushing for damage ensuring that rubber is not worn; replace if necessary.

## ASSEMBLY

1. Remove any burrs from staked area in antivibration bushing seat.
2. Insert lower washer, install tool A.3.0435 with lead-in and insert antivibration bushing; remove tool.



3. Position upper washer on antivibration bushing, install tool A.3.0435 with smaller inserter ring and operate tool until bushing is fully home.

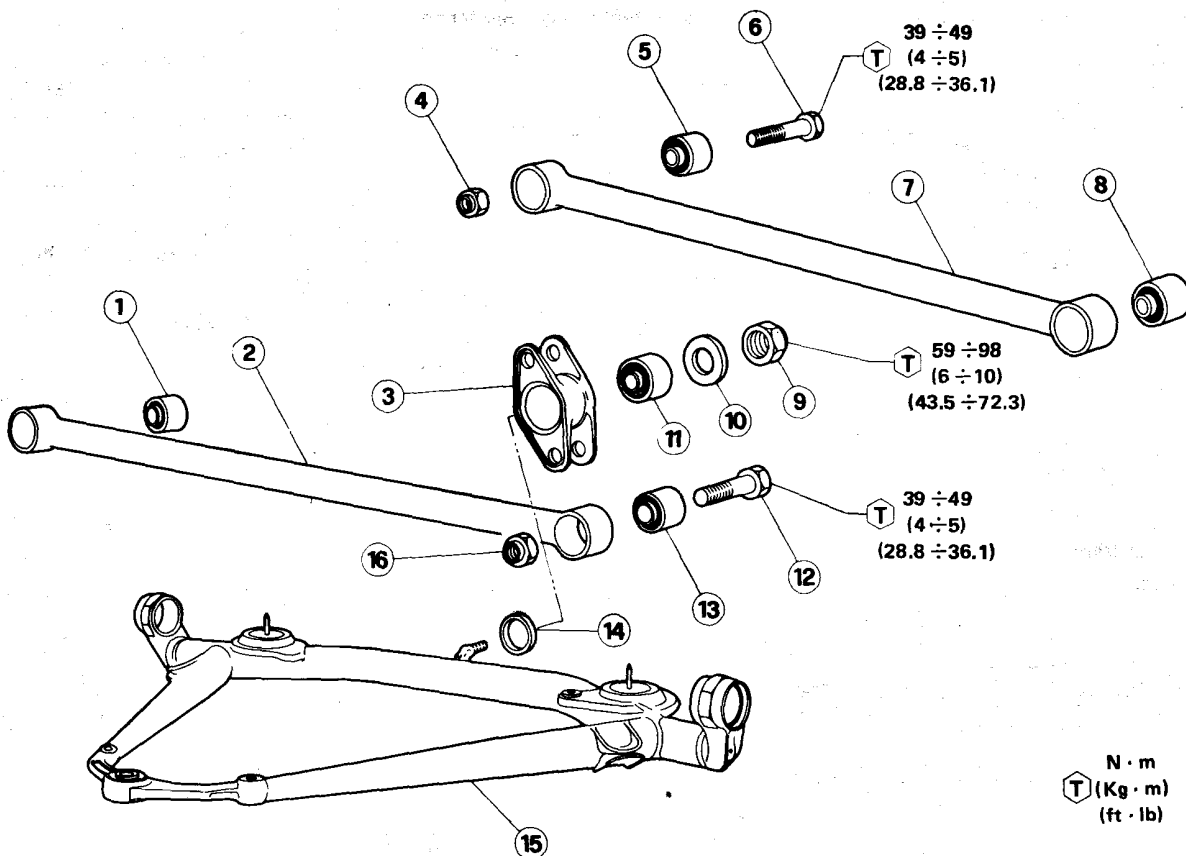


4. Using a punch, stake antivibration bushing seat at several points to prevent upper washer workout. Remove tool.



# REAR SUSPENSION

## WATT'S LINKAGE



- 1 Antivibration bushing
- 2 Transverse link
- 3 Rocker
- 4 Nut
- 5 Antivibration bushing
- 6 Screw

- 7 Transverse link
- 8 Antivibration bushing
- 9 Nut
- 10 Outer washer
- 11 Antivibration bushing
- 12 Screw

- 13 Antivibration bushing
- 14 Inner washer
- 15 De Dion axle
- 16 Nut

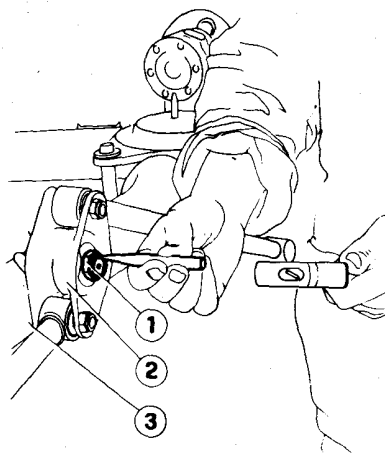
T N · m  
(Kg · m)  
(ft · lb)

### DISASSEMBLY

#### CAUTION:

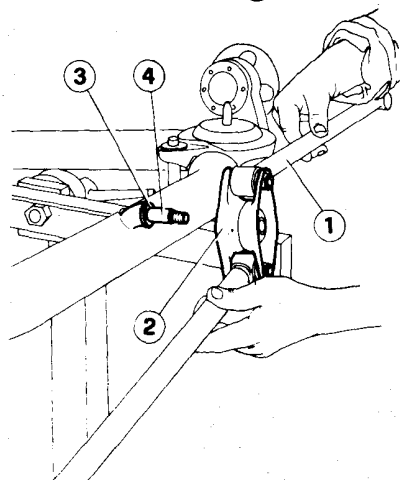
The following operations can be carried out also with De Dion axle installed on vehicle after disconnecting transverse links from body proceeding as specified in "De Dion axle - Removal", para. 9.

1. Using a punch, release staked area on nut ① retaining rocker ② to De Dion axle ③.



- 1 Nut
- 2 Rocker
- 3 De Dion axle

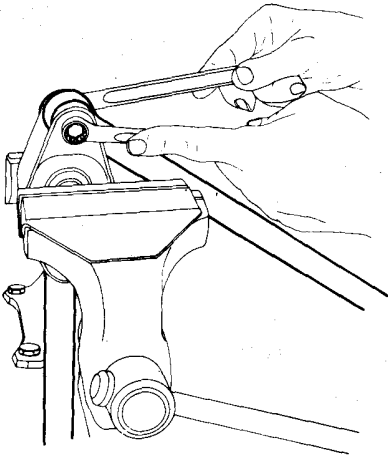
2. Back off nut, remove outer washer, take off rocker ② together with two transverse links ① from pin ④ on axle and retrieve inner washer ③.



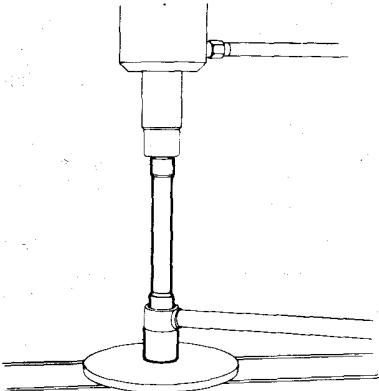
- 1 Transverse link
- 2 Rocker
- 3 Inner washer
- 4 Pin

## REAR SUSPENSION

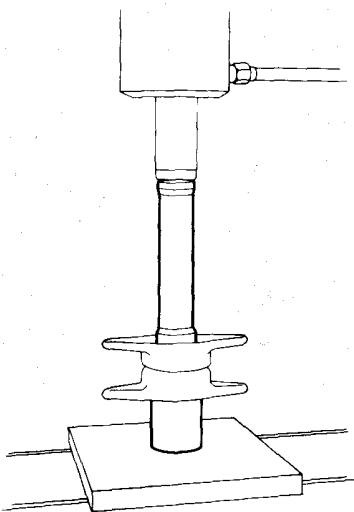
- Clamp rocker in a vice provided with protective jaw liners and disassemble transverse links by backing off bolts.



- Press out transverse link antivibration bushings.



- Press out rocker antivibration bushing.



### INSPECTION

Clean all parts.

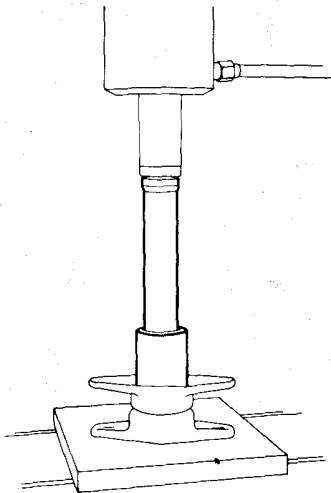
- Check transverse links, pin and ro-

cker for damage or distortion; replace if necessary.

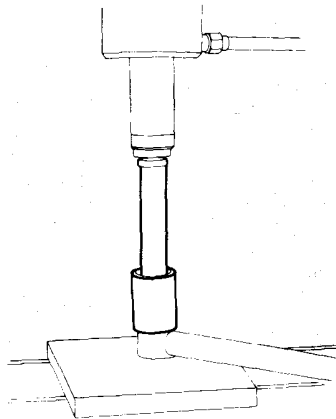
- Check antivibration bushings for damage, ensuring that rubber is not worn; replace if necessary.

### ASSEMBLY

- Press rocker antivibration bushing home, chamfered end first.



- Press transverse link antivibration bushing home, chamfered end first.



- Connect transverse links to rocker and rocker to De Dion axle, by reversing the disassembly sequence.

### CAUTION:

Do not tighten bolts and nut fully; final tightening must be carried out with static laden vehicle adhering to the torques specified below.

### T : Tightening torques

Nut, rocker to De Dion axle p.

59 to 98 N · m

(6 to 10 kg · m)

(43.5 to 72.3 ft · lb)

Bolts, transverse links to rocker and body supports

39 to 49 N · m

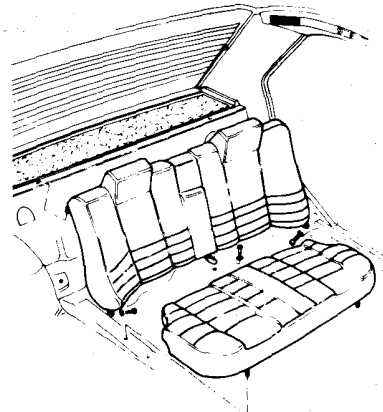
(4 to 5 kg · m)

(28.8 to 36.1 ft · lb)

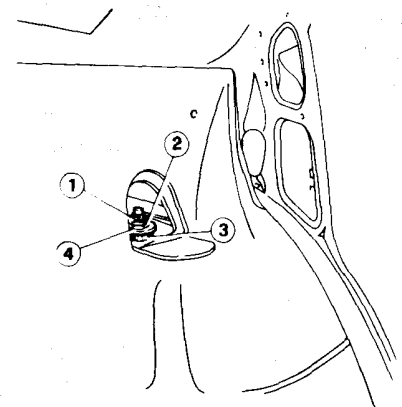
## SHOCK ABSORBERS

### REMOVAL

- Place car on a lift.
- Remove rear seat cushion.
- Back off side and center screws, and remove seat back by raising it clear.



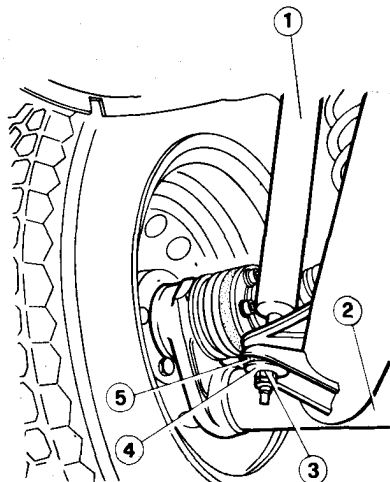
- Back off nuts ② and lock nuts ①, retrieve rubber cushions ③ and cups ④, and remove shock absorbers from body.



- Lock nut
- Shock absorber to body nut
- Rubber cushion
- Cup

## REAR SUSPENSION

5. Raise car.
6. Back off nut (3), retrieve rubber cushion (5) and cup (4), remove shock absorber (1) from axle (2).



- 1 Shock absorber
- 2 De Dion axle
- 3 Shock absorber to axle nut
- 4 Cup
- 5 Rubber cushion

### INSPECTION

1. Check shock absorber efficiency and replace in case of oil leakage.
2. If necessary, check shock absorber settings (see Group 21 - Inspection Specifications - Checks and Adjustments). Replace if necessary.

### INSTALLATION

Install by reversing the removal sequence and adhere to the following tightening torque.

#### T: Tightening torque

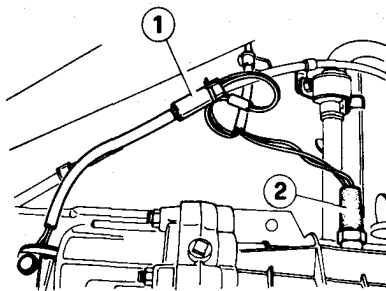
Shock absorber upper and lower lock nuts (after driving nut to end of thread)

23 to 27 N · m  
(2.3 to 2.8 kg · m)  
(17 to 19.9 ft · lb)

### ANTI-ROLL BAR

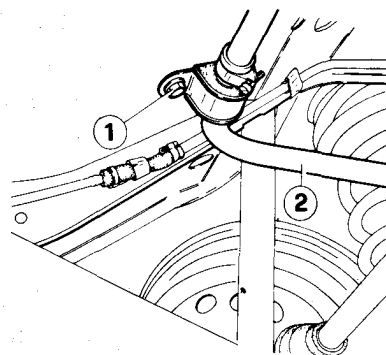
#### REMOVAL

1. Raise car on a lift.
2. Disconnect hand brake control cable, back-up light switch (2) and speedometer (1) wiring harness.



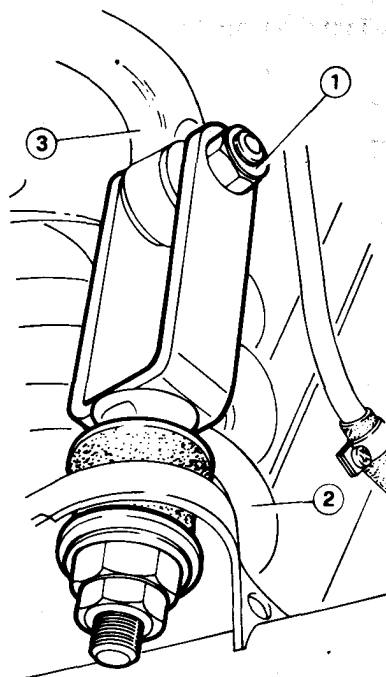
- 1 Speedometer cable connection
- 2 Back-up light cable connection

3. Back off nuts retaining anti-roll bar conn. rods to axle and retrieve associated cups and rubber cushions.
4. Back off 4 screws (1) and remove anti-roll bar (2) from body.



- 1 Anti-roll bar to body screws
- 2 Anti-roll bar

5. Back off and remove bolts (1), disconnect anti-roll bar (3) from De Dion axle (2).



- 1 Conn. rod to anti-roll bar bolt
- 2 De Dion axle
- 3 Anti-roll bar

6. Support power train using a suitable tool and hydraulic lift.
7. Back off and remove bolt securing rear power train support to body.
8. Lower lift to take out anti-roll bar.

### CAUTION:

Take care not to damage brake system pipe; disconnect from three-way connection if necessary.

### INSPECTION

1. Check anti-roll bar and conn. rods for damage or distortion; replace if necessary.
2. Check rubber cushions connecting supports to body and to conn. rods and axle for wear; replace if necessary.

### INSTALLATION

Install by reversing the removal sequence and adhering to the instructions given below.

- Wet inner surface of anti-roll bar support rubber cushions using the recommended type of grease (SPCA Spagaph or ISECO Ergon Rubber Grease no. 3).
- Adhere to the following tightening torques.

#### T: Tightening torques

Bolt, power train rear support to body

44 to 54 N · m  
(4.5 to 5.5 kg · m)  
(32.5 to 39.8 ft · lb)

Lock nuts, anti-roll bar to axle

23 to 27 N · m  
(2.3 to 2.8 kg · m)  
(17 to 19.9 ft · lb)

Screws, anti-roll bar support to body

19 to 24 N · m  
(1.9 to 2.4 kg · m)  
(14 to 17.7 ft · lb)

Adjust hand brake (see Group 22 - Hand Brake - Adjustment).

## REAR SUSPENSION

# INSPECTION SPECIFICATIONS

### GENERAL REQUIREMENTS

#### FLUIDS AND LUBRICANTS

Description	Type	Recommended product
Rear anti-roll bar support rubber cushion inner surface	GREASE	SPCA: Spagraph ISECO: Ergon Rubber Grease n. 3 Part. no. 3671-69816
Wheel hub bearing lock ring Shock absorber lower pin Transverse link screws	FLUID	Antiseizure compound R. GORI: Never Seez Part. no. 3671-69850
Wheel shaft threaded end  Apply using a brush after tightening wheel hub nut and before installing lock nut	FLUID	Grease coating MILLA: Protective LT HOUGHTON: Rust Veto 1064 Part. no. 4100-81210

### CHECKS AND ADJUSTMENTS

#### REAR SUSPENSION SPRING LOAD GRADES

Springs of equal load grade must be installed on the same axle

	<i>+ Super</i> Alfa 90 Alfa 75	Giulietta	Alfetta	GTV 2.0	GTV 625
Part. no.	16218.25.090.01	16200.25.510.00	11655.25.510.00	11646.25.510.02	11315.25.090.00
Load grade	129-130-131	106-107-108	107-108-109	104-105-106	124-125-126

Note: If a tow bar is assembled on cars **Alfa 90** and **Alfa 75**, normal springs may be replaced by the more rigid type, part. no. 162.10.25.090.00.

## REAR SUSPENSION

### REAR WHEEL GEOMETRY

For **Alfa 90** see Print no. PA36050000000 - Workshop Manual\* **Alfa 90** - Group 00 - Mechanical Components and Body Maintenance - Wheel Alignment Data.

For **Alfa 75** see Print no. PA37140000000 - Workshop Manual\* **Alfa 75** - Group 00 - Mechanical Components and Body Maintenance - Wheel Alignment Data.

	<b>Alfetta</b> <b>Giulietta</b> <b>GTV 2.0</b> <b>GTV 6 2.5</b>
Toe-in ( $\alpha$ ) (Max. difference between right and left wheels)	$0^\circ \pm 10'$ 10'
Camber ( $\beta$ ) (Max. difference between right and left wheels)	$0^\circ \pm 30'$ 20'

### VEHICLE TRIM

See Group 21 - Checks and Adjustments - Vehicle trim.

### TIGHTENING TORQUES

Description	[N·m (kg·m)] (ft·lb)
Lock ring, wheel hub bearing	226 to 265 (23 to 27) (166.7 to 195.5)
Nut, wheel hub	265 to 324 (27 to 33) (195.5 to 239)
Screws, power train cross member to body	39 to 44 (4 to 4.5) (28.8 to 32.5)
Screws, axle to power train cross member	88 to 108 (9 to 11) (64.9 to 79.7)
Boles, Watt's linkage transverse links to rocker and body supports	39 to 49 (4 to 5) (28.8 to 36.1)
Nuts securing impulse pick-up supports - wheel hubs (1)	9 to 10 (0.9 to 1) (6.6 to 7.4)
Nut, rocker to De Dion axle pin	59 to 98 (6 to 10) (43.5 to 72.3)
Lock nuts, top and bottom, shock absorber (nut on thread end)	23 to 27 (2.3 to 2.8) (17 to 19.9)
Lock nuts, anti-roll bar to axle	23 to 27 (2.3 to 2.8) (17 to 19.9)
Screws, anti-roll bar to body	19 to 24 (1.9 to 2.4) (14 to 17.7)

(1) For vehicles equipped with (ABS) MARK II wheel antilock braking system

## REAR SUSPENSION

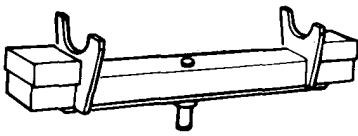
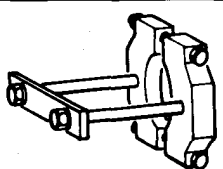
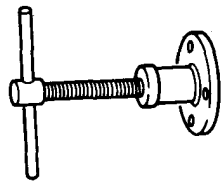
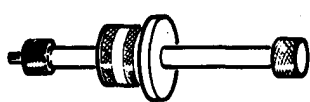
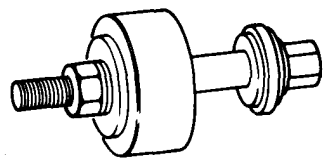
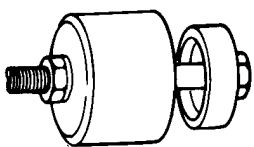
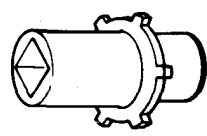
# TROUBLESHOOTING

In case of noise assumed to originate from rear suspension, carefully check to ensure that it is not caused by tyres, road surface, exhaust system, engine, power train or wheel bearings.

Trouble	Cause	Remedy
Noise	<ul style="list-style-type: none"><li>• Loose wheel screws</li><li>• One or more loose bolts</li><li>• Defective shock absorber</li><li>• Worn or damaged wheel bearing</li><li>• Wheel and tyre out of balance</li><li>• Rubber parts damaged</li></ul>	Tighten to the specified torque  Tighten to the specified torque  Replace  Replace  Balance  Replace damaged parts
<b>Instability on the move.</b> This problem is also connected to front suspensions. For troubleshooting, also refer to group 21.	<ul style="list-style-type: none"><li>• Loose wheel screws</li><li>• Defective shock absorber</li><li>• Weak coil springs</li><li>• Damaged transverse link antivibration bushings</li><li>• Loose transverse link connections</li></ul>	Tighten to the specified torque  Repair or replace  Replace  Replace  Tighten or replace

# REAR SUSPENSION

## TOOLS

Part. No.	Description	Page
A.2.0075	Support, car raising 	25-3
A.2.0380	Remover, rear wheel hub (use with A.3.0327) 	25-6
A.3.0327	Puller hubs (use with A.2.0380) 	25-6
A.3.0617	Percussion tool for rear wheel hub pulling (to be used with tool A.3.0327 without screw) (*) 	25-6
A.3.0432	Remover-replacer, hubs and rear bearings 	25-6
A.3.0435	Remover-replacer, axle antivibration bushing 	25-8
A.5.0187	Wrench, rear wheel hub bearing lock nut 	25-6 25-7

[ (\*) For vehicles equipped with (ABS) MARK II wheel antilock braking system