RENAULT

N.T. 3247A

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Belt tension using tool Mot. 1505

77 11 204 959 MAY 1999 Edition Anglaise

This note contains:

- **a presentation of the new tool for measuring belt tension Mot. 1505,**
- **the procedure for using the tool,**
- **recommendations for fitting timing belts and accessories belts,**
- **tension values (SEEM units/Hertz).**

A Technical Note will be issued later to show the tension values (in Hertz) for accessories belts on C - G - J - S and Z engines.

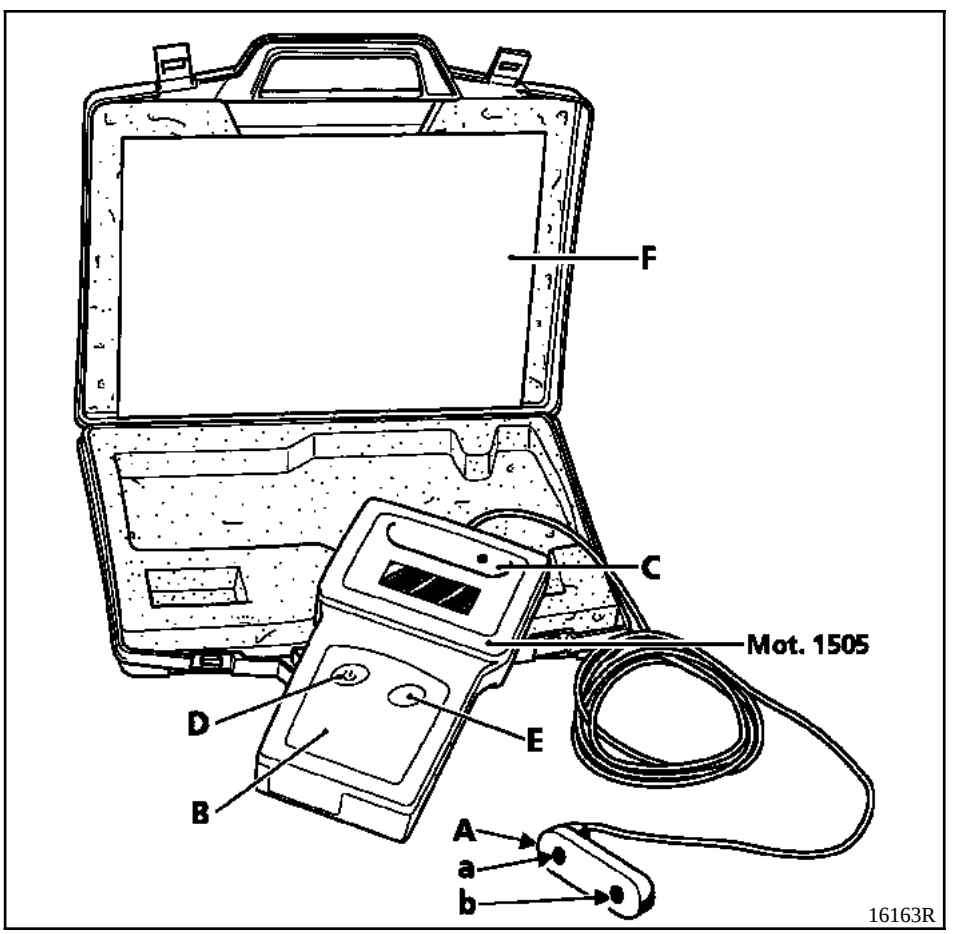
Contents

IMPORTANT

The procedure for tensioning a belt is an important operation since it determines the length of the belt's life.

The use of the frequencymeter Mot. 1505 is therefore essential in order to apply the correct fitting tension in accordance with the manufacturer's recommendations and to eliminate the risk of overtensioning (or undertensioning), noise and problems resulting from incorrect belt tensioning.

If this tensioning procedure using Mot. 1505 is not strictly observed, the engine may be damaged.



A Reading head with two sensors (a) and (b)
B Display unit
C Standard frequency generator (**512±1 Hertz**) integral in display unit
D Equipment on / off button
E Test button to check the unit is correctly calibrated
F Instructions for the equipment

OPERATING PRINCIPLE

This equipment measures the frequency of the belt.

The frequency is a physical value which in this instance reflects the belt tension level with a high degree of accuracy.

The units used are **Hertz** (**Hz**).

The reading head (A) comprises two sensors (a) and (b) which measure the vibrations in the belt after it has been moved.

Measurement takes place using only one sensor, as the other sensor is for reference purposes and must be outside the measuring area (see instructions).

Each of the sensors may be used as either a measuring sensor or a reference sensor.

SPECIFICATIONS

Measuring range: **30** to **520 Hz**
Accuracy: ±**1 Hz < 100 Hz and** ± **1 % > 100 Hz**

CHECKING THE EQUIPMENT

The standard frequency generator (C) integrated in the display unit allows the correct operation of the equipment to be checked.

Refer to the instructions for the checking procedure.

If the value read on the two sensors differs by more than **512** ± **1 Hz**, the equipment must be returned to SEEM.

Refer to your After Sales Head Office for further details.

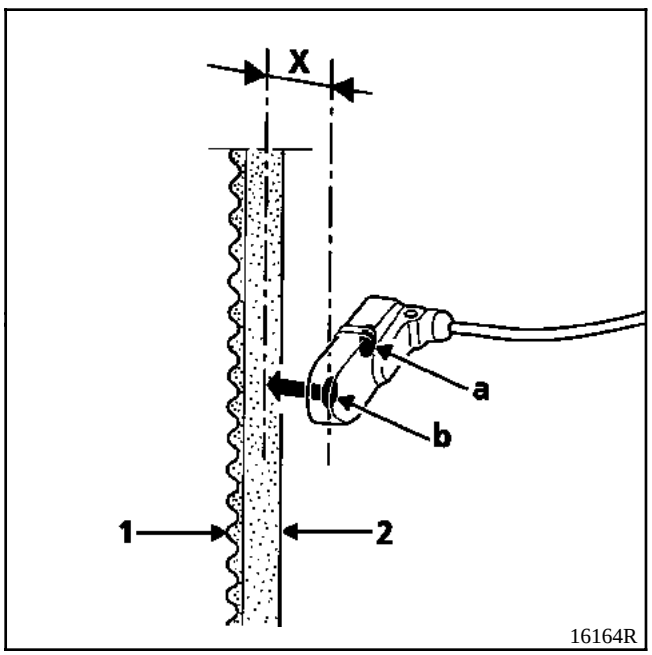
USING THE EQUIPMENT

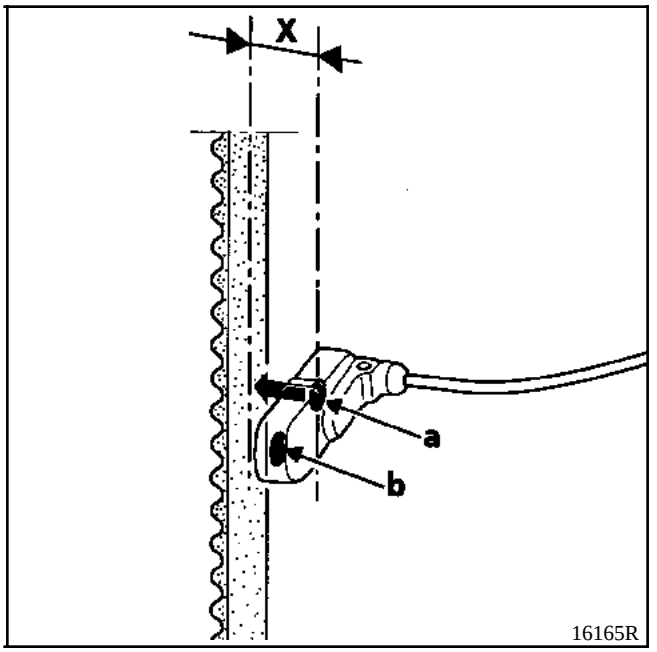
Turn the equipment on (button D) and bring the measuring head (A) up to the part of the belt to be measured.

Position the measuring head at distance (X) approximately **5** to**10 mm** from the belt.

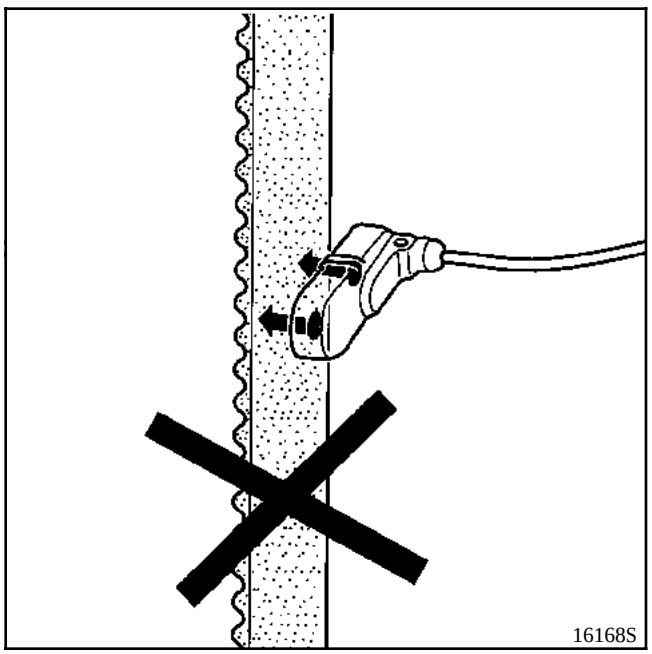
Measurements can be taken on either side (1) or side (2) of the belt, depending on which gives better access.

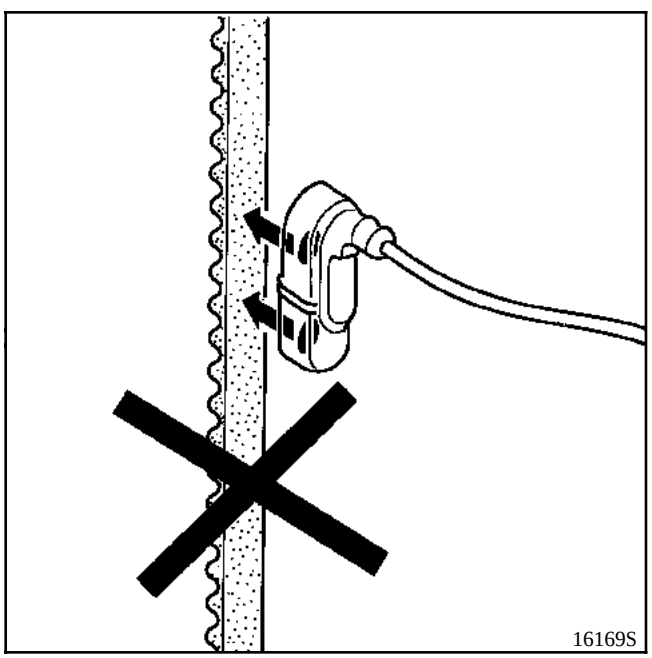
Sensor (a) or sensor (b) may be used, as long as the sensor being used for reference purposes is out of the measuring area.





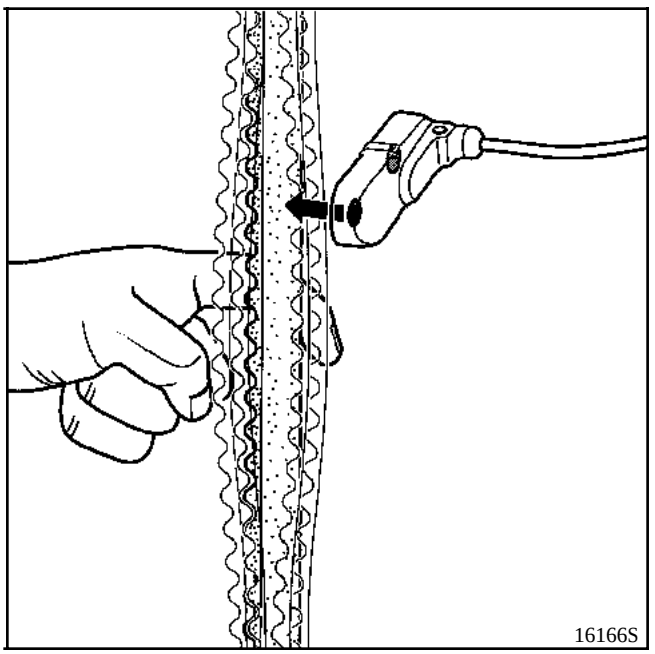
Both sensors may not be opposite the belt at the same time when the measurement is taken.

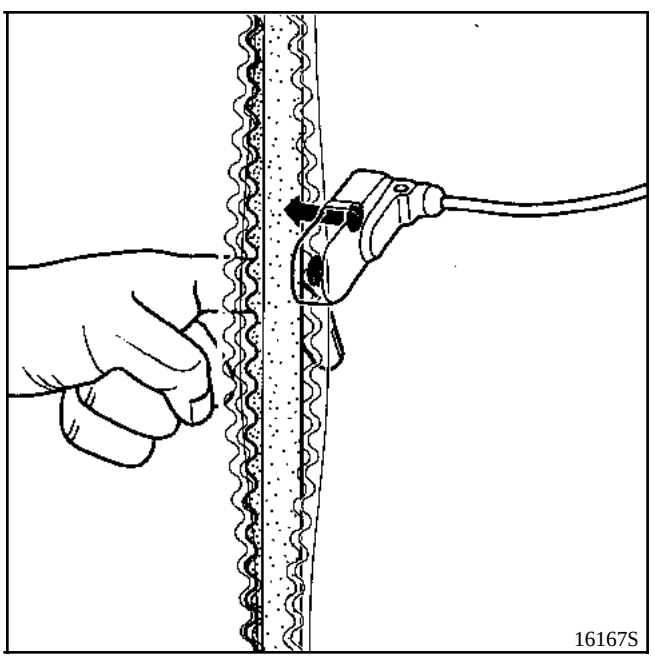




The measurement is taken by vibrating the belt using your finger.

The measurement is complete when a beep is heard.





INSTRUCTIONS FOR FITTING TIMING BELTS

Depending on the family of engine, there are three separate procedures which must be observed:

Certain engines require:
- pretensioning (using a specific tool depending on the engine type) of the section of belt to be measured in order to compensate for all play relative to the belt
- pretensioning T1 slightly above the final fitting tension T2.

Both of these operations aim to stabilise the internal tension of the belt in order to give a reliable tension measurement.

TENSIONING PROCEDURE

J engines, all types (no pretensioning)

Engine cold, ambient temperature.

Fit the new belt, with the timing at the setting point (TDC).

Set the tension wheel against the belt using tool **Mot. 1135-01** or tool **Mot. 1384** depending on the type of tensioner and tension the belt to obtain the recommended fitting tension.

Lock the tension wheel.

Turn the crankshaft four times and reposition the timing at TDC.

Position the reading head of tool **Mot. 1505** and carry out the measurement, check if it is in the fitting tension tolerance range, otherwise adjust it using the tool for adjusting the tension wheel.

Torque tighten the tension wheel nut.

NOTE :this procedure is only valid for engines fitted with a dynamic tension wheel. For tensioners with a spring just check the fitting tension after fitting the tensioner.

D - E and K7M engines (with pretensioning)

Engine cold, ambient temperature.

Fit the new belt, with the timing at the setting point (TDC).

Set the tension wheel against the belt using tool **Mot. 1135-01** and tension the belt to obtain the recommended fitting tension.

Lock the tension wheel.

Pretension using the special tool (**Mot. 1386** for D engines and tool **Mot. 1501** for E engines and K7M), using a torque wrench **set to a torque of 1 daN.m**, on the part of the belt to be measured (refer to the belt diagrams below).

Position the reading head of tool **Mot. 1505** and carry out the measurement, check if it is in the fitting tension tolerance range, otherwise adjust it using **Mot. 1135-01**.

Lock the tension wheel.

Turn the crankshaft four times and reposition the timing at TDC.

Pretension using the special tool (**Mot. 1386** for D engines and tool **Mot. 1501** for E engines and K7M), using a torque wrench **set to a torque of 1 daN.m**, on the part of the belt to be measured (refer to the belt diagrams below).

Check the tension value is in the fitting tension tolerance range, otherwise readjust it by repeating the procedure.

Torque tighten the tension wheel nut.

F engine, all types
(with and without pretensioning)

Engine cold, ambient temperature.

Fit the new belt, with the timing at the setting point (TDC).

Set the tension wheel against the belt by tightening a bolt on the inner timing cover.

Pretension using the special tool (**Mot. 1543-02** with intermediate shaft and **Mot. 1543-03** without intermediate shaft), using a torque wrench **set to a torque of 1.1 daN.m**, on the part of the belt to be measured (refer to the belt diagrams below).

Position the reading head of tool **Mot. 1505,** carry out the measurement, then adjust the tension using the bolt against the tension wheel to obtain the **pretension value T1**.

Lock the tension wheel.

Turn the crankshaft four times and reposition the timing at TDC.

Pretension using the special tool, using a torque wrench **set to a torque of 1.1 daN.m**, on the part of the belt to be measured (refer to the belt diagrams below).

Position the reading head of tool **Mot. 1505,** carry out the measurement, then adjust the tension using the bolt against the tension wheel to obtain the **pretension value T2**.

NOTE : do not re-use a belt once it has been removed - RENEW IT.

ENGINE TYPE	FITTING TENSION IN SEEM UNITS	MINIMUM OPERATING TENSION IN SEEM UNITS	FITTING TENSION IN HERTZ
D7F	20	10	*
E5F 710 - 716 **E6J** 700 - 701 - 706 - 707 - 712 - 713 - 718 - 734 - 738 - 742 - 745 - 760 - 761 - 790 - 791 **E7F** 700 - 704 - 706 - 708 - 730 - 750 **E7J** 601 - 700 - 706 - 707 - 710 - 711 - 716 - 717 - 718 - 719 - 720 - 724 - 726 - 728 - 742 - 745 - 754 - 756 - 757 - 764 - 770 - 771 - 773 - 790 - 791 **K7M** 702 - 703 - 790	30	26	144±5
E7J 780 **K7M** 704 - 720 - 744 - 745	30	26	162±5
F8M 700 - 720 - 730 - 736 - 760	41	37	T1 = 68±3 T2 = 61±5
F8M 700 - 720 - 730 - 736 - 760 **F8Q** 610 - 620 - 706 - 710 - 740 - 742 - 744 - 764 - 766 - 768 - 784	38	36	
F8Q 640 - 646 - 676 - 678 - 714 - 722 - 724 - 730 - 732 - 774	28	25	
F8Q 630 - 640 - 644 - 646 - 648 - 662 - 676 - 678 - 680 - 682 - 684 - 714 - 730	47	36	
F8Q 600 - 606 - 620 - 624 - 784 - 786 - 788	47	36	
F9Q 716 - 720 - 730 - 731 - 734 - 736	T1 = 42 T2 = 37	36	
F1N - F2N - F3N - F3P	25	22	T1 = 91±3 T2 = 82±5
F3R	29	27	T1 = 83±3 T2 = 77±5
F7P - F7R	32	19	74±7

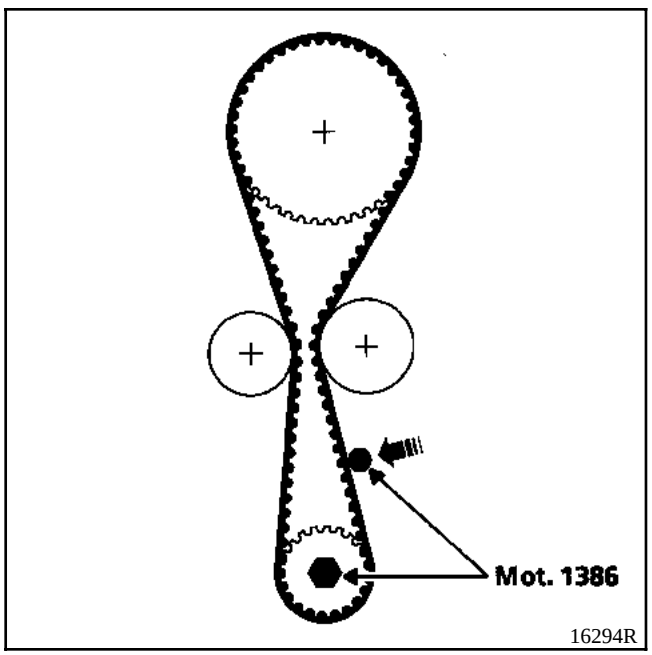
*The tension values in **Hertz** for these engines will be available in the next update.

ENGINE TYPE	FITTING TENSION IN SEEM UNITS	MINIMUM OPERATING TENSION IN SEEM UNITS	FITTING TENSION IN HERTZ
852 **J8S** (all types except J8S 760)	45	26	*
J8S 760	50	26	104±4
J7R 752 - 756	41	31	*
J5R - J6R - **J7R** (all types except J7T 752 - 756)	39	26	73±4
J7T	36	24	69±4
8144 -S8U 762	45	28	*
N7Q - N7U	Automatic tensioner	Check between 36 and 46	-
L7X	83±2	-	*
F4P - F4R - F5R **G8T** **K4M - K4J** **S8U** (all types except S8U 762) **S9U** - S9W	Automatic tensioner	-	-

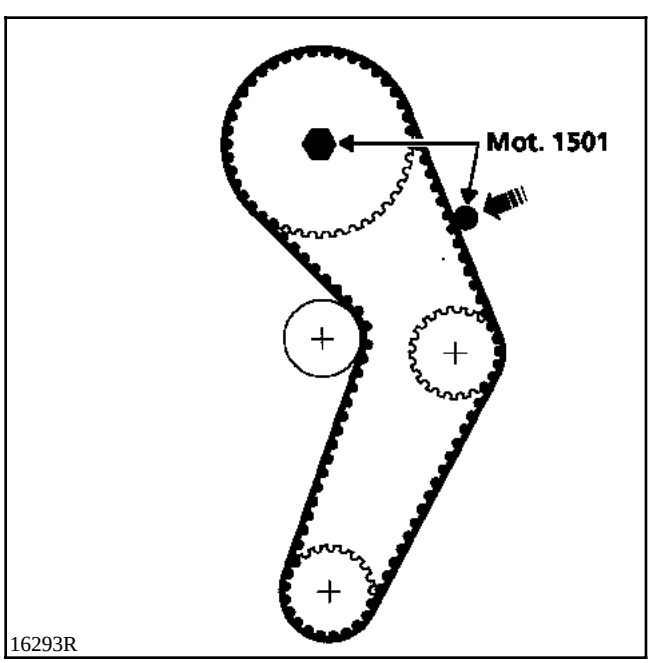
*The tension values in **Hertz** for these engines will be available in the next update.

Diagram of timing belts showing points for measurement and for pretensioning using the special tool.

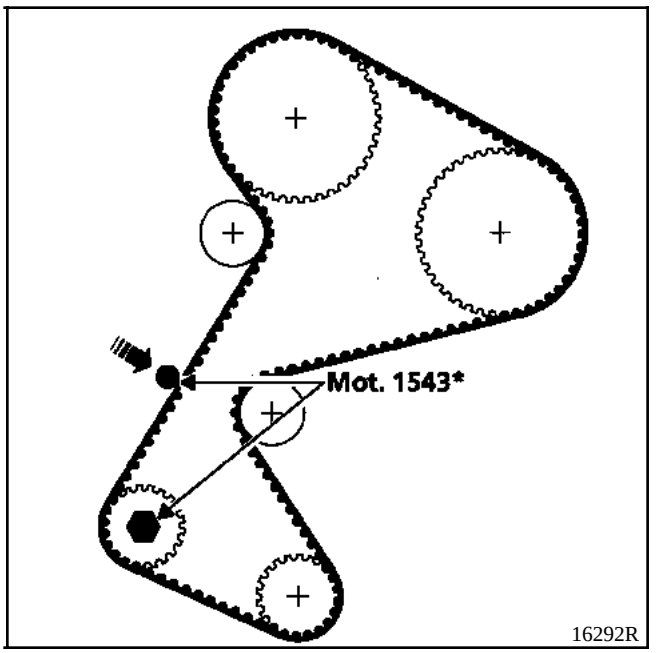
D7F engine



E and K7M engines

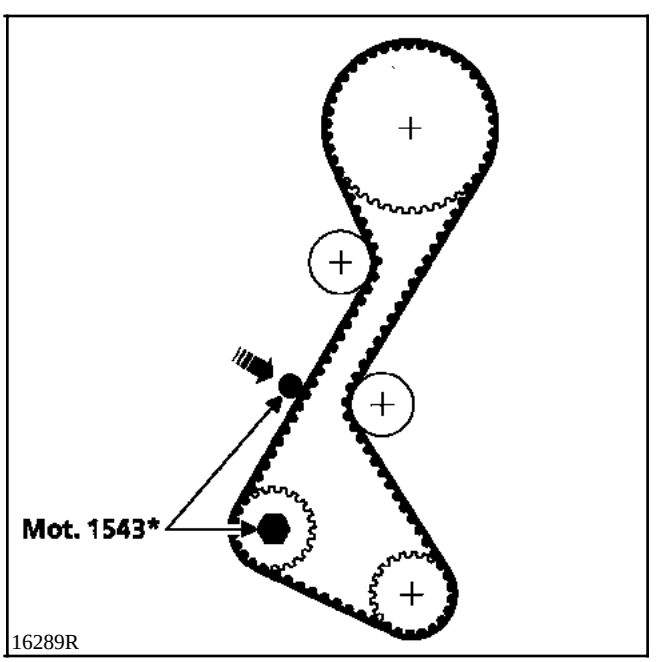


F8M - F8Q - F9Q engines



* **Mot. 1543-02** with intermediate shaft
Mot. 1543-03 without intermediate shaft

F1N - F2N - F3N - F3P - F3R engines

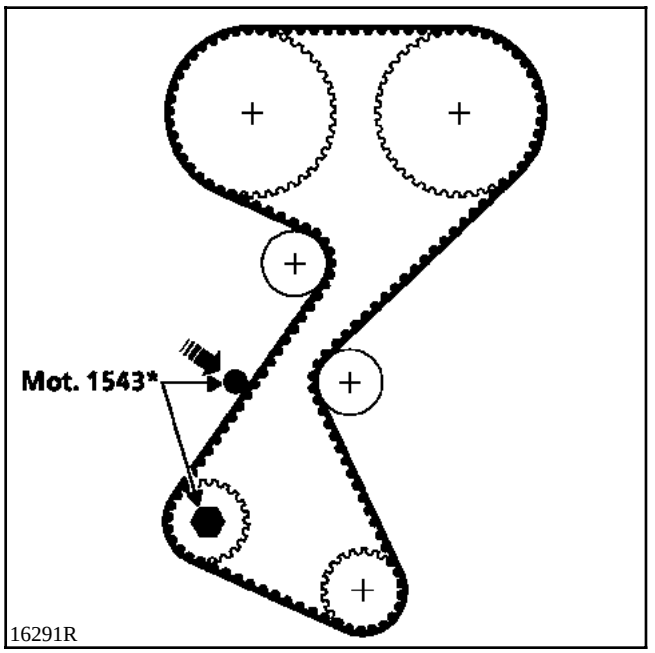


* **Mot. 1543-02** with intermediate shaft
Mot. 1543-03 without intermediate shaft

➡ Point for pretensioning and / or checking belt tension

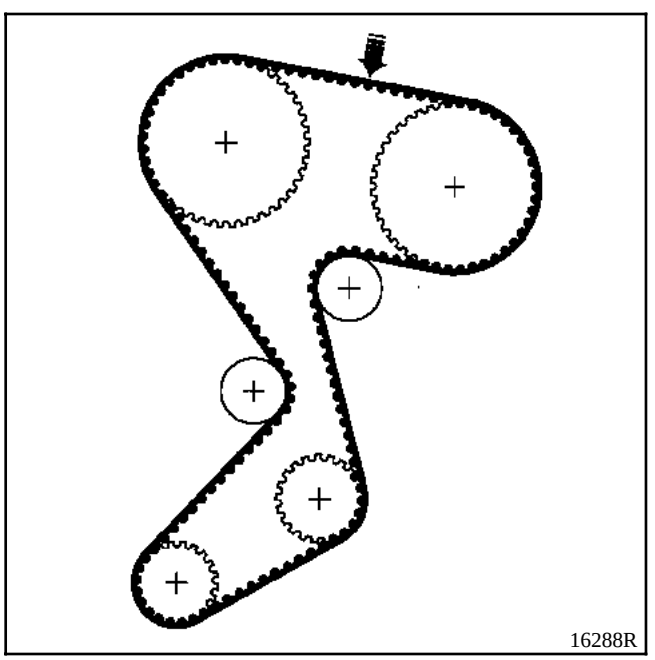
⬢ Point for applying pretensioning tool

F7P - F7R engines

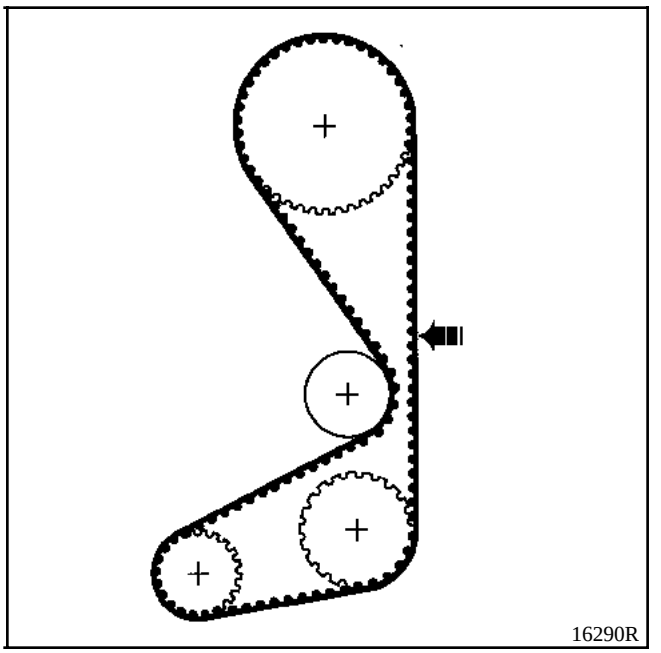


* **Mot. 1543-02** with intermediate shaft
Mot. 1543-03 without intermediate shaft

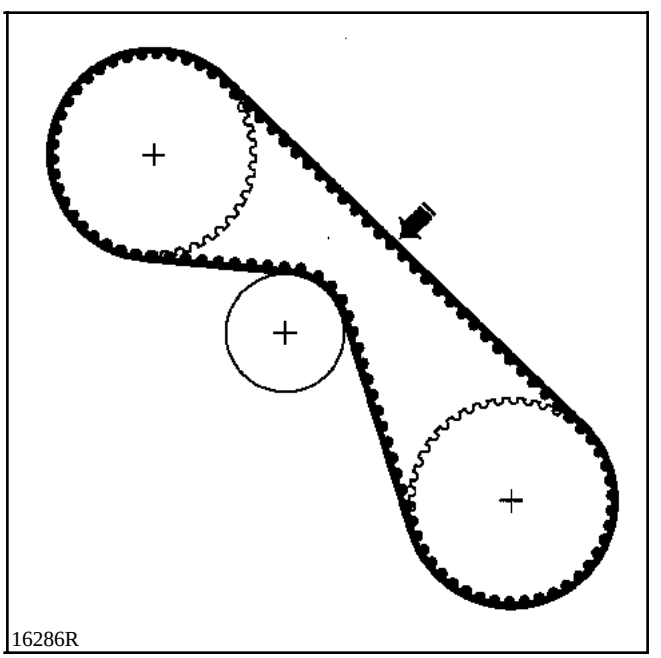
852 - J8S engines



J5R - J6R - J7R - J7T engines



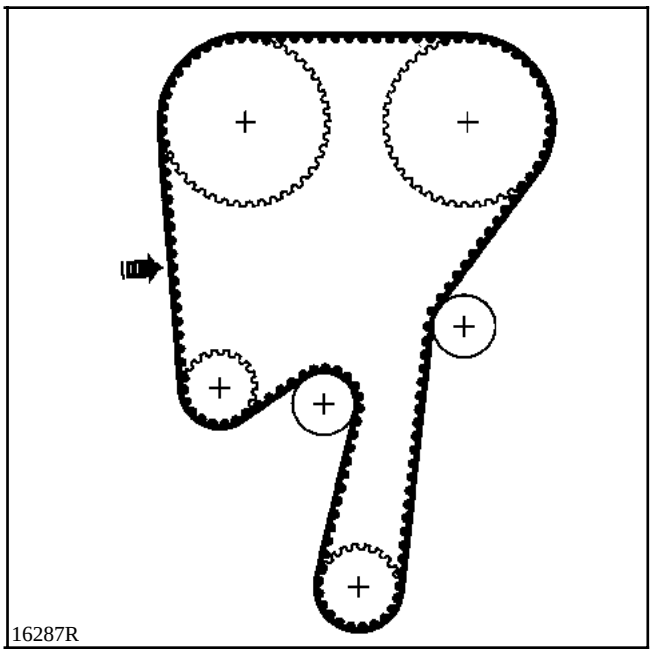
8144 - S8U 762 engines



➡ Point for pretensioning and / or checking belt tension

⬣ Point for applying pretensioning tool

N7Q - N7U engines



➡ Point for pretensioning and / or checking belt tension

INSTRUCTIONS FOR FITTING ACCESSORIES BELTS

TRAPEZOIDAL BELT

- **Procedure for tensioning a new belt**

Engine cold, ambient temperature

Fit the new belt.

Set the tension wheel against the belt and tighten to obtain the recommended fitting tension.

Lock the tension wheel.

Turn the crankshaft **three times**.

Position the reading head of tool **Mot. 1505** and carry out the measurement, check to see if it lies **in the fitting tension tolerance range, otherwise readjust it.**

- **Procedure for tensioning a belt which has been used**

Engine cold, ambient temperature

Fit the belt.

Set the tension wheel against the belt and tighten to obtain **80 % of the recommended fitting tension value**.

Lock the tension wheel.

Turn the crankshaft **three times**.

Position the reading head of tool **Mot. 1505** and carry out the measurement, check to see if it lies **in 80% of the fitting tension tolerance range, otherwise readjust it.**

NOTE : the trapezoidal belt is replaced **according to condition or noise.**

RIBBED BELT

- **Procedure for tensioning the belt**

Engine cold, ambient temperature

Fit the new belt.

Set the tension wheel against the belt and tighten to obtain the recommended fitting tension.

Lock the tension wheel.

Turn the crankshaft **three times**.

Position the reading head of tool **Mot. 1505** and carry out the measurement, check to see if it lies **in the fitting tension tolerance range, otherwise readjust it.**

NOTE : DO NOT RE-USE A BELT ONCE IT HAS BEEN REMOVED- RENEW IT.

Accessories belt tension

4 TOOTH RIBBED BELT

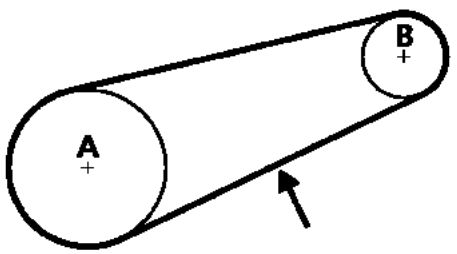
ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
D7F 700 - 701 - 702 - 706 - 710 - 720 - 722 - 730	Alternator	102±7	53	244±5	1

5 TOOTH RIBBED BELT

ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
D7F 702 - 722	Alternator Power assisted steering	96±5	43	177±5	2
D7F 700 - 701 - 702 - 720	Alternator Air conditioning	104±6	56	191±5	3
D7F 720	Alternator Power assisted steering Air conditioning	101±6	51	180±4	4

Accessories belt tension

1



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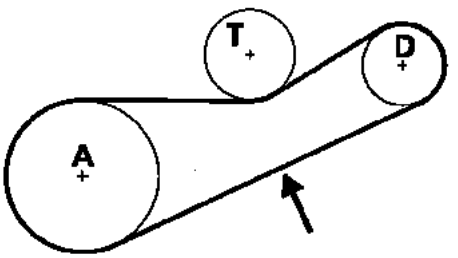

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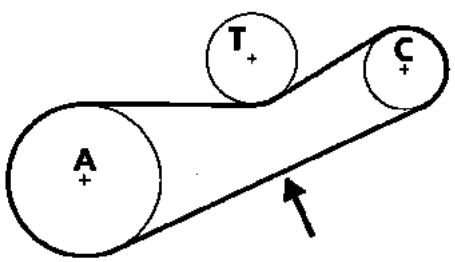

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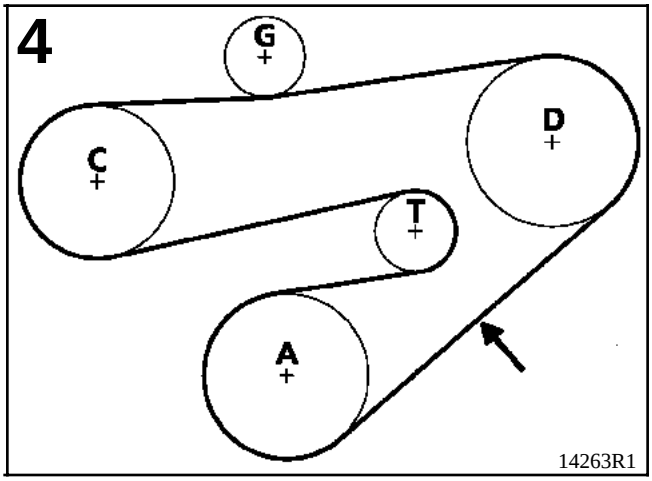

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A	Crankshaft
B	Alternator
C	Power assisted steering pump
D	Air conditioning compressor
G	Pulley
T	Tension wheel
→	Point for checking tension

Accessories belt tension

TRAPEZOIDAL BELT

ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
E5F 710 - 716 **E7J** 601 - 700 - 706 - 707 - 710 - 711 - 716 - 717 - 718 - 719 - 720 - 724 - 728 - 742 - 745 - 754 - 773 **E7F** 700 - 704 - 706 - 708 - 730 - 750 **E6J** 700 - 701 - 706 - 712 - 713 - 718 - 734 - 738	Alternator	83±7	70	237±10	1
E6J 700 - 701 - 706 - 707 - 742 - 745 - 790 - 791	Air conditioning	90±6	72	143±5	2

3 TOOTH RIBBED BELT

ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
E5F 710 - 716 **E6J** 700 - 701 - 706 - 712 - 713 - 718 - 734 - 760 - 761 **E7J** 601 - 700 - 706 - 707 - 710 - 711 - 716 - 717 - 718 - 719 - 720 - 724 - 728 - 742 - 745 - 754 - 773 - 790 - 791 **E7F** 704 - 708 - 750 **K7M** 702 - 703 - 720	Alternator	84±6	52	263±10	1
E7J 780 **K7M** 744 - 745	Alternator	101±6	52	161±9	3
E7J 764 **K7M** 702 - 703 - 720 - 790	Alternator Power assisted steering	84±6	52	186±9	4

Accessories belt tension

4 TOOTH RIBBED BELT

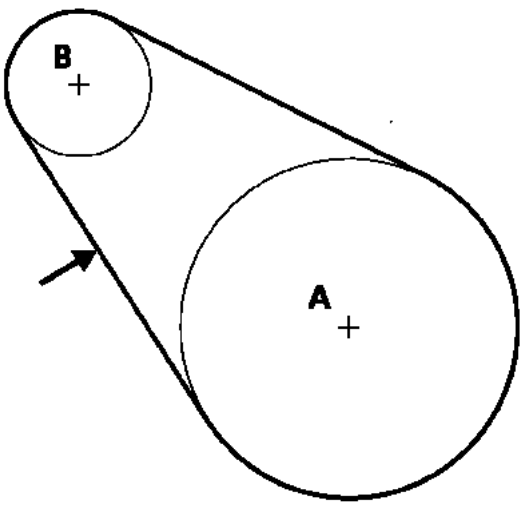
ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
E5F 710 - 716 **E6J** 712 - 718 - 760 **E7F** 704 - 706 - 708 - 750 **E7J** 601 - 710 - 711 - 718 - 719 - 754	Alternator Air conditioning	103±4	77	141±7	5
E6J 734 **E7J** 720 - 724 - 726 - 728 - 773	Air conditioning	102±6	55	222±10	6
E6J 712 - 713 - 718 - 734 - 760 - 761 **E7J** 601 - 710 - 711 - 717 - 718 - 719 - 720 - 724 - 726 - 728 - 754 - 756 - 757 - 770 - 771- 773	Air conditioning Power assisted steering	110±7	75	222±8	7
E6J 700 - 701 - 706 **E7J** 700 - 707 - 710 - 742 - 745 - 764 - 790 - 791 **K7M** 702 - 703 - 720 - 790	Air conditioning Power assisted steering	106±5	59	174±9	8
E7J 780 **K7M** 744 - 745	Power assisted steering	106±6	59	189±9	9

5 TOOTH RIBBED BELT

ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
K4M **K4J**	Alternator Power assisted steering	108±6	60	190±10	10

Accessories belt tension

1



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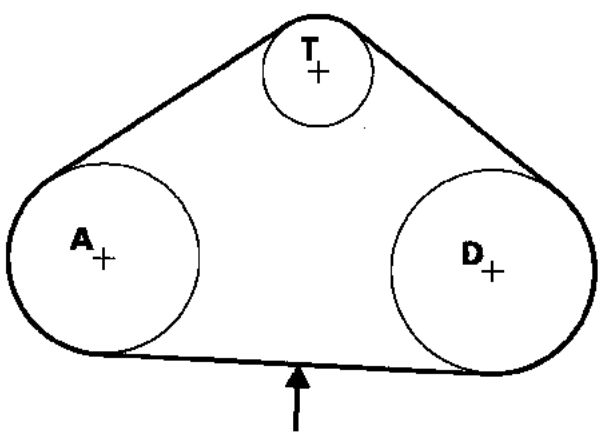

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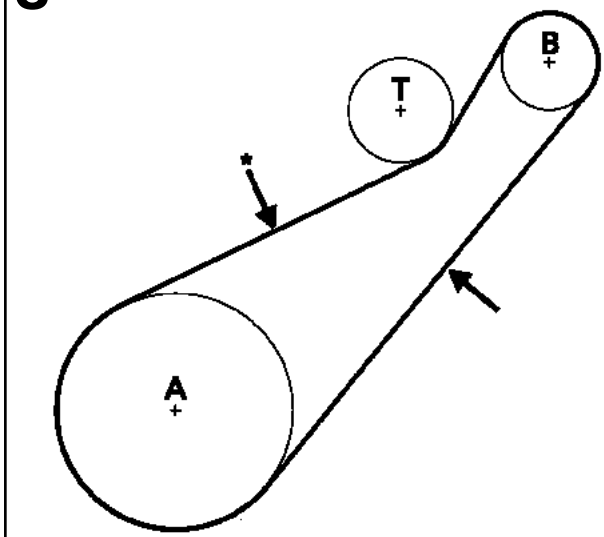

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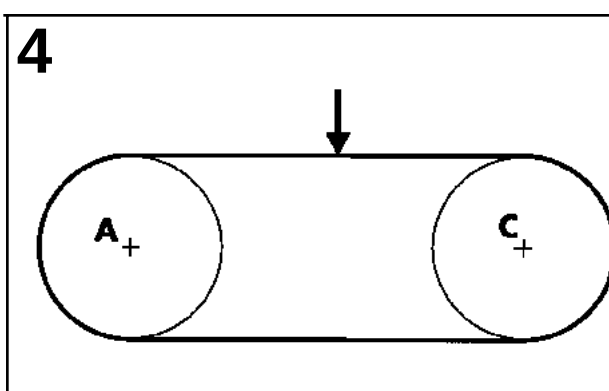
* Checking point only to be used for SEEM tool **Mot. 1273**

4



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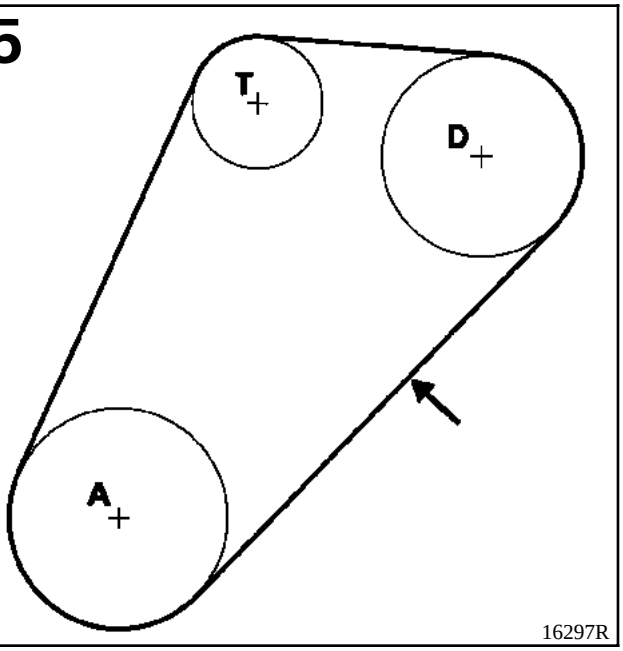
A Crankshaft
B Alternator
C Power assisted steering pump
D Air conditioning compressor
G Pulley
T Tension wheel
→ Point for checking tension

Accessories belt tension

5



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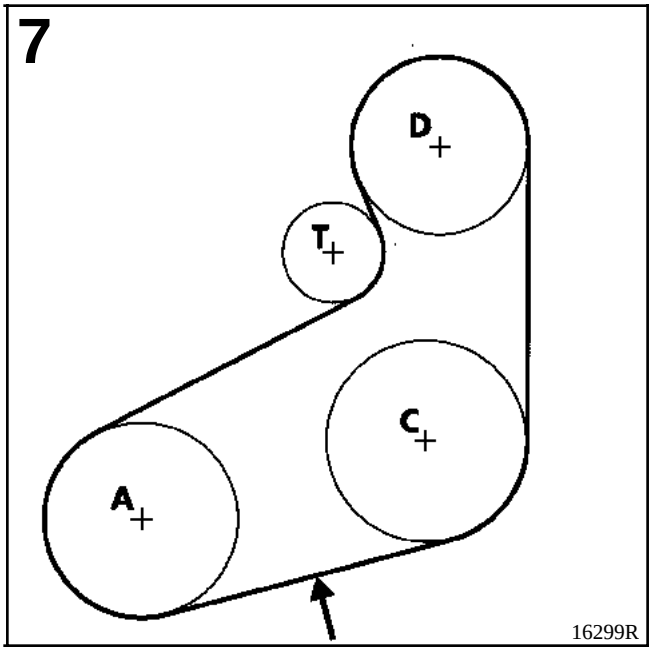

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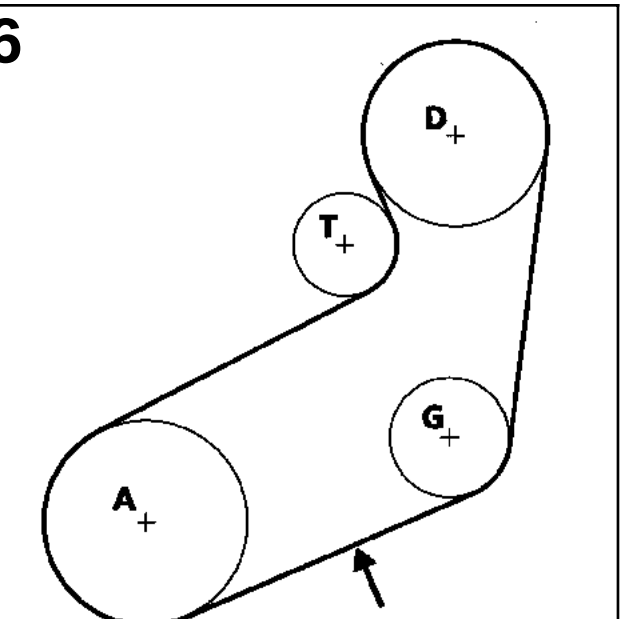
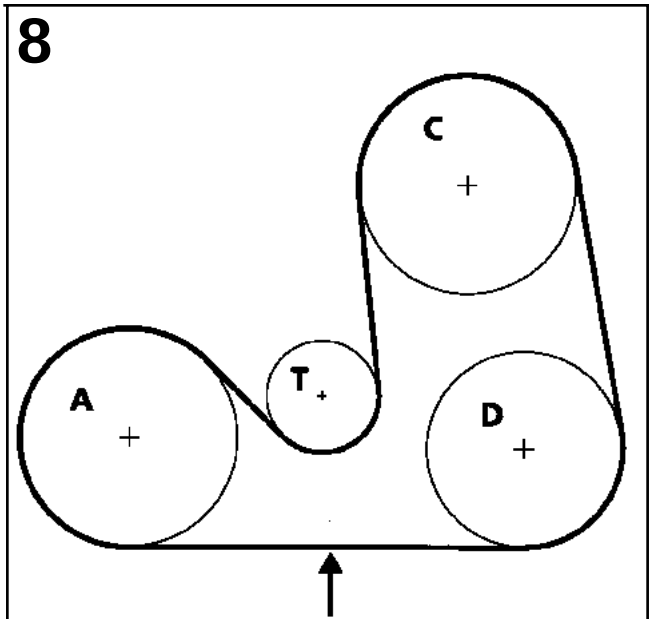


16302R

8

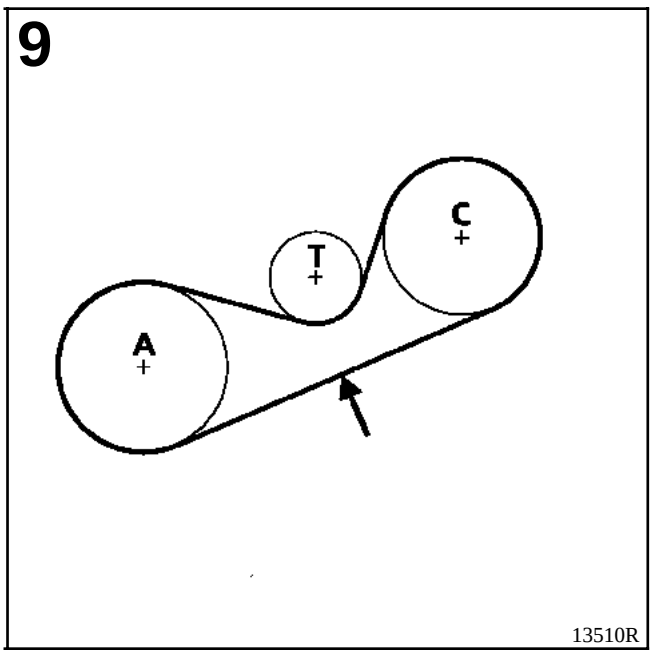


98707R3

A Crankshaft
B Alternator
C Power assisted steering pump
D Air conditioning compressor
G Pulley
T Tension wheel
→ Point for checking tension

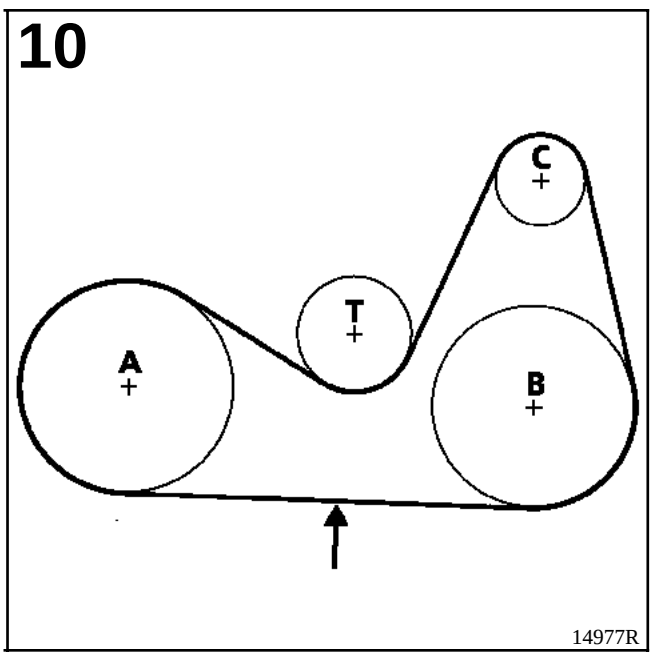
Accessories belt tension

9



13510R

10



14977R

A Crankshaft
B Alternator
C Power assisted steering pump
D Air conditioning compressor
G Pulley
T Tension wheel
→ Point for checking tension

Accessories belt tension

5 TOOTH RIBBED BELT

ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
F1N 720 - 722 - 724 **F2N** 702 - 712 - 716 - 720 - 721 - 724 - 726 - 727 - 728 - 754 - 758 - 770 **F3N** 722 - 726 - 740 - 741 - 742 - 743 **F3P** 704 - 706	Alternator Water pump	94±5	60	172±5	1
F8M 720 - 730 - 736 - 760	Alternator Water pump	109±7	72	161±5	1

6 TOOTH RIBBED BELT

ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
F8M 730	Alternator Water pump	118±6	83	161±5	1
F8M 730	Alternator Power assisted steering	104±6	71	165±5	2
F1N 722 - 724 **F2N** 720 - 721 - 726 - 727 - 754 - 758 -786 - 798 **F3N** 722 -726 - 740 -741 - 742 - 743 - 746 **F3P** 704 - 706 - 708 - 710 - 712 - 714 - 758 - 760	Alternator Water pump	83±6	57	120±5	1
F2N 720 - 721 - 726 - 727 - 754 - 758 -786 **F3N** 722 - 723 - 740 -741 - 742 - 743 - 746 **F3P** 682 - 700 704 - 705 - 706 - 707 - 760 - 764 - 765	Alternator Power assisted steering	98±6	73	150±5	2

Accessories belt tension

6 TOOTH RIBBED BELT

ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
F3P 710 - 712 - 714 - 754 - 755 - 758	Alternator Water pump Power assisted steering	94±5	60	290±5	3
F3R 750 - 751 - 752	Alternator Water pump Power assisted steering	107±3	62	173±5	2
F3P 678 - 720 - 724 **F3R** 722 - 723	Alternator Water pump Power assisted steering	107±3	62	132±5	4
F2N 716 - 720 - 721 - 724 -726 - 754 - 758 -786 **F3N** 740 -741 - 742 - 746	Alternator Air conditioning	112±8	59	130±5	4
F3P 710 - 712 - 714 - 754 - 755 - 758	Alternator Air conditioning	104±7	55	261±5	3
F2N 720 - 721 - 726 -727 - 754 - 758 -786 **F3N** 722 - 723 - 742 - 743 - 746 **F3P** 682 - 684 - 700 704 - 705 - 706 - 707 - 708 - 760 - 764 - 765	Alternator Air conditioning Power assisted steering Water pump	106±6	71	143±5	5
F3P 670 - 678 - 720 - 724 **F3R** 722 - 723 - 728 - 729 - 742 - 750 - 751 - 752 - 769 - 791 - 796 - 797 - 798	Alternator Air conditioning Power assisted steering Water pump	109±3	62	132±5	5
F7P 700 - 704 - 722	Alternator Power assisted steering	95±5	57	155±5	6
F7P 704 - 720 - 722 **F7R** 700	Alternator Power assisted steering	111±6	64	319±5	7
F7R 704	Alternator Air conditioning	91±5	58	169±5	2

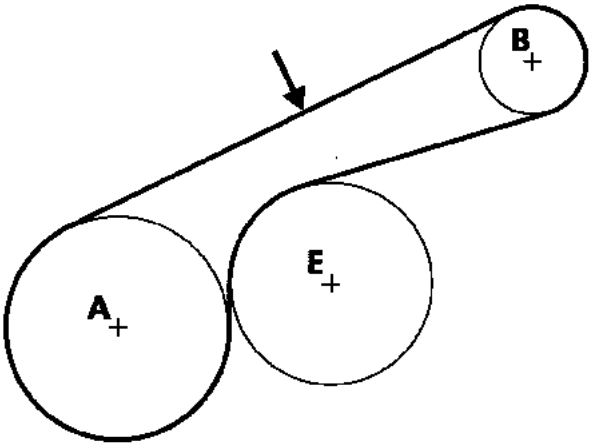
Accessories belt tension

6 TOOTH RIBBED BELT

ENGINE TYPE	BELT FUNCTION	FITTING TENSION SEEM UNITS	MINIMUM OPERATING TENSION SEEM UNITS	FITTING TENSION HERTZ	DIAGRAM
F8Q 620 - 706 - 710 - 740 - 742 - 744 - 764 - 766	Alternator	97±3	67	134±5	1
F8Q 630 - 640 - 644 - 464 - 672 - 676 - 678 - 714 - 718 - 722 - 724 - 730 - 732 - 774 - 776 - 778	Alternator	106±4	74	127±5	1
F8Q 610 - 710 - 740 - 742 - 744 - 764 - 766 - 768	Alternator Power assisted steering	99±5	68	165±5	2
F8Q 610 - 740 - 744 -768	Alternator Air conditioning	101±5	67	145±5	2
F8Q 706 belt Part No.: 77 00 271 648	Alternator Air conditioning Power assisted steering Water pump	112±4	67	164±5	8 or 9
F8Q 706 belt Part No.: 77 00 272 741	Alternator Power assisted steering Water pump	116±7	67	164±5	8
F8Q 630 - 662	Alternator Power assisted steering Water pump	104±5	62	174±5	6
F8Q 620 - 624 - 784 - 786 - 788 **F9Q** 716 - 720 - 734	Alternator Power assisted steering Water pump	109±7	68	188±5	2
F8Q 630	Alternator Air conditioning Water pump	115±7	82	177±5	2
F4P **F4R**	Alternator Power assisted steering Water pump	102±6	48	175±5	2

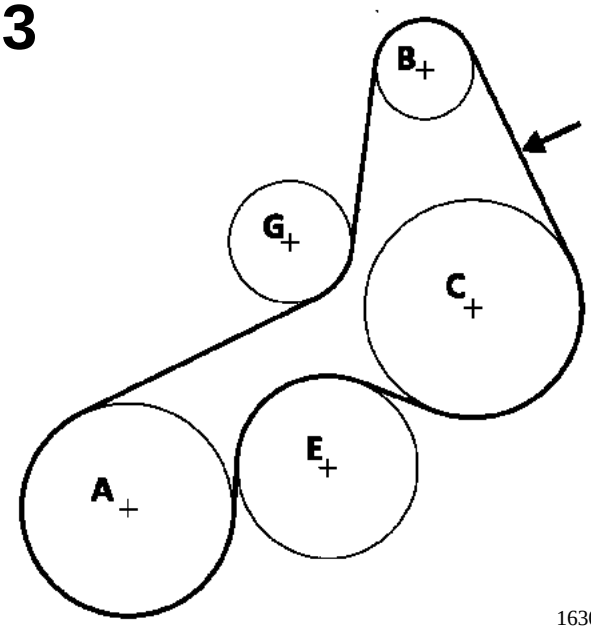
Accessories belt tension

1



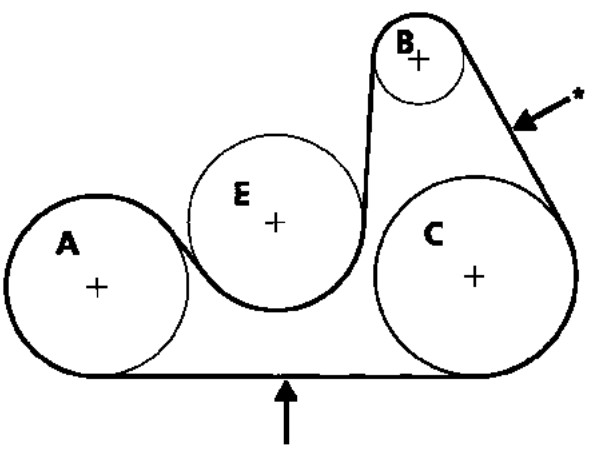
16304R

3



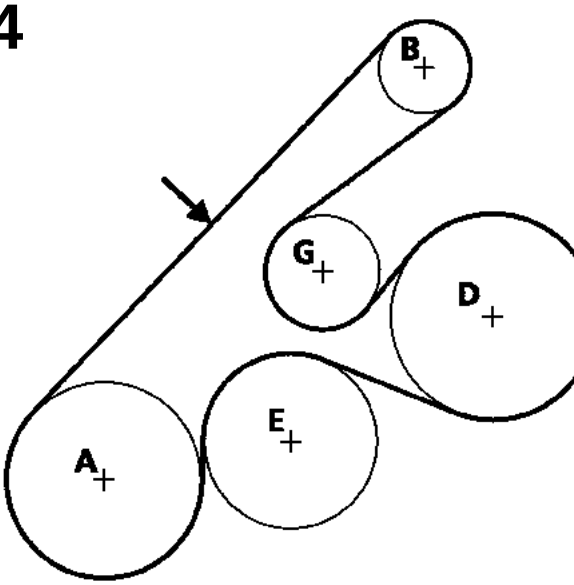
16303R

2



98751R3

4



16296R

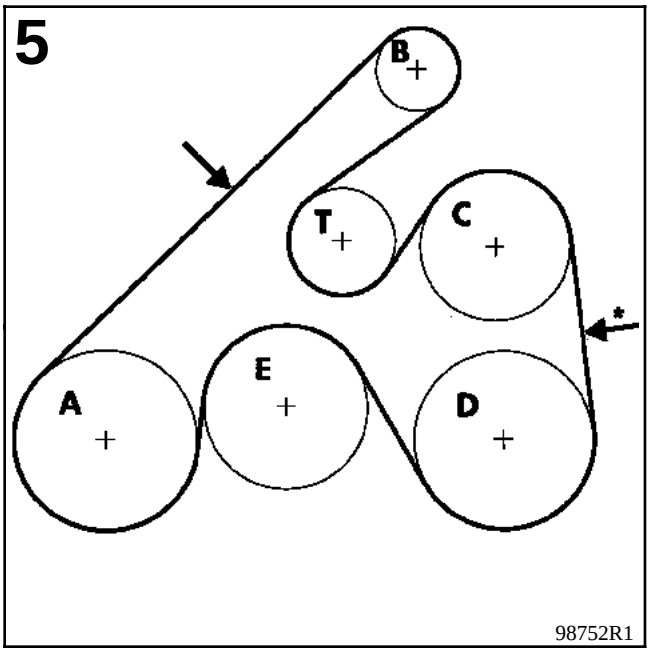
* Checking point only to be used for SEEM tool

Mot. 1273

A Crankshaft
B Alternator
C Power assisted steering pump
D Air conditioning compressor
E Water pump
G Pulley
T Tension wheel
→ Point for checking tension

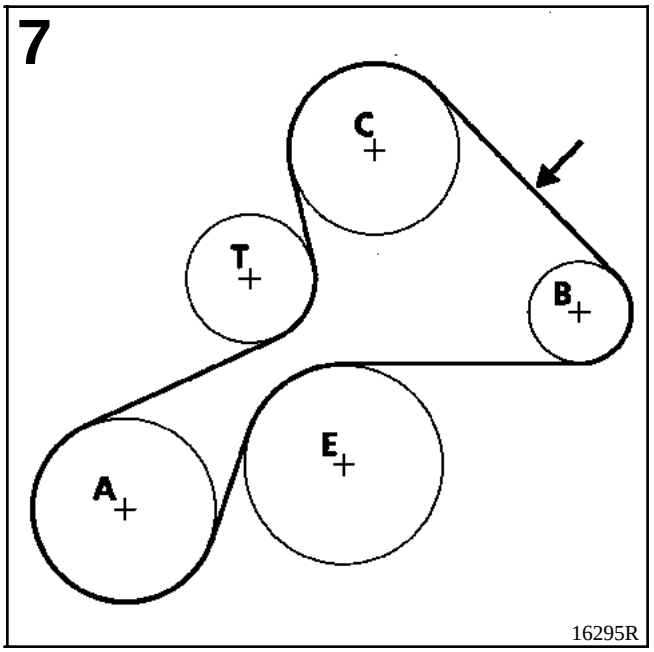
Accessories belt tension

5



98752R1

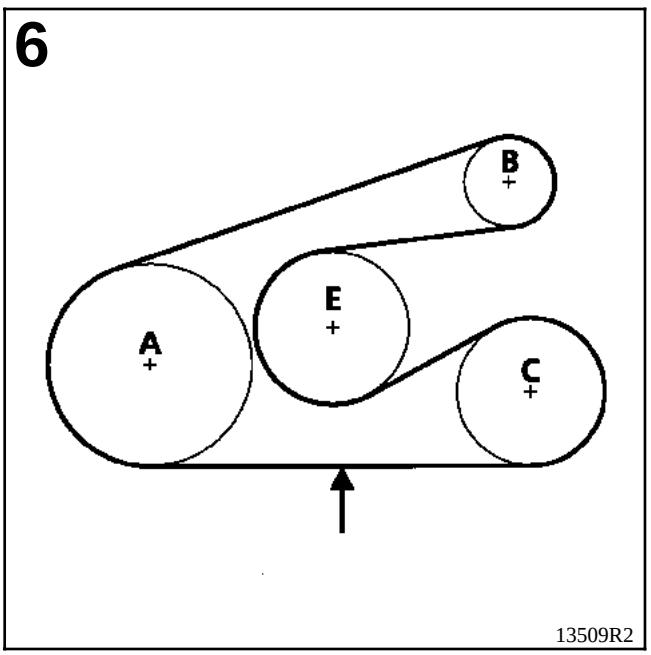
7



16295R

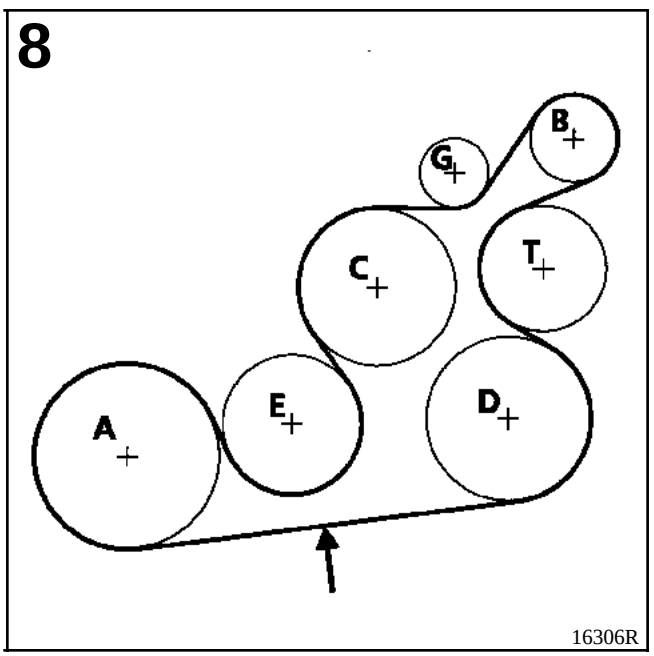
* Checking point only to be used for SEEM tool **Mot. 1273**

6



13509R2

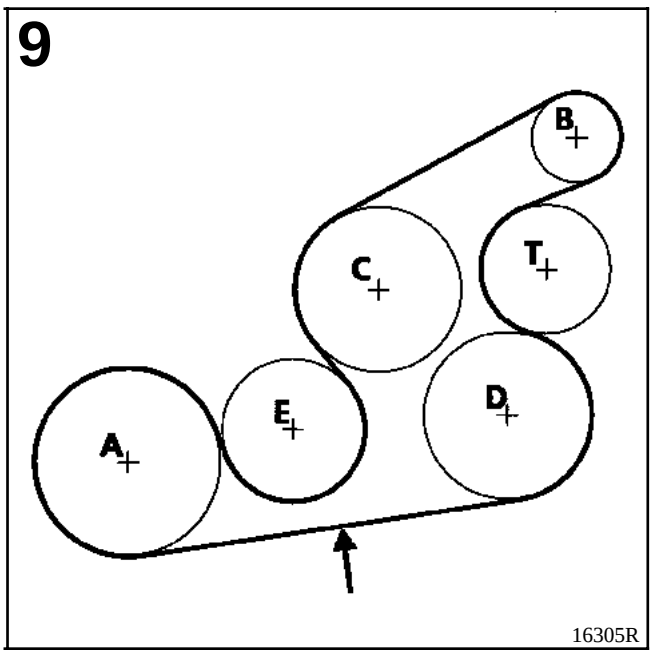
8



16306R

A Crankshaft
B Alternator
C Power assisted steering pump
D Air conditioning compressor
E Water pump
G Pulley
T Tension wheel
→ Point for checking tension

Accessories belt tension



A Crankshaft
B Alternator
C Power assisted steering pump
D Air conditioning compressor
E Water pump
G Pulley
T Tension wheel
→ Point for checking tension