INTRODUCTION

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DESCRIPTION AND OPERATION

VEHICLE IDENTIFICATION NUMBER (VIN)

DESCRIPTION

The Vehicle Identification Number (VIN) plate is attached to the top left side of the instrument panel.

The VIN contains 17 characters that provide data concerning the vehicle. Refer to the decoding chart to determine the identification of a vehicle.

1

VEHICLE IDENTIFICATION NUMBER DECODING CHART

POSITION	INTERPRETATION	CODE = DESCRIPTION
1	Country of Origin	1 = United States
2	Make	J = Jeep
3	Vehicle Type	4 = MPV
4	Gross Vehicle Weight Rating	G = 5001-6000 lbs.
5	Vehicle Line	2= Grand Cherokee 4X2 (LHD) W = Grand Cherokee 4X4 (LHD)
6	Series	5 = Laredo 6 = Limited
7	Body Style	8 = 4dr Sport Utility
8	Engine	S = 4.0 Liter N = 4.7Liter
9	Check Digit	
10	Model Year	X = 1999
11	Assembly Plant	C = Jefferson Assembly
12 thru 17	Vehicle Build Sequence	

DESCRIPTION AND OPERATION (Continued)

VEHICLE SAFETY CERTIFICATION LABEL

DESCRIPTION

A vehicle safety certification label (Fig. 1) is attached to every Chrysler Corporation vehicle. The label certifies that the vehicle conforms to all applicable Federal Motor Vehicle Safety Standards. The label also lists:

- Month and year of vehicle manufacture.
- Gross Vehicle Weight Rating (GVWR). The gross front and rear axle weight ratings (GAWR's) are based on a minimum rim size and maximum cold tire inflation pressure.
 - Vehicle Identification Number (VIN).
 - Type of vehicle.
 - Type of rear wheels.
 - · Bar code.
 - Month, Day and Hour (MDH) of final assembly.
 - · Paint and Trim codes.
 - Country of origin.

The label is located on the driver-side door shut-face.

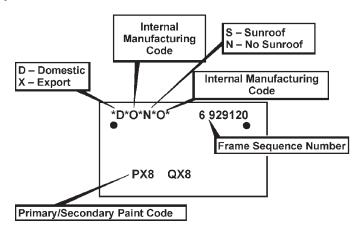


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Fig. 1 Vehicle Safety Certification Label
BODY CODE PLATE

DESCRIPTION

A metal Body Code plate is located in the engine compartment and attached to the top of the right frame rail. The information listed on the plate (Fig. 2) is used for manufacturing and service purposes.



80a5f17a

Fig. 2 Body Code Plate

SERVICE PROCEDURES

THREADED HOLE REPAIR

Most stripped threaded holes can be repaired using a Helicoil®. Follow the manufactures recommendations for application and repair procedures.

SPECIFICATIONS

INTERNATIONAL VEHICLE CONTROL AND DISPLAY SYMBOLS

The graphic symbols illustrated in the following International Control and Display Symbols chart are used to identify various instrument controls. The symbols correspond to the controls and displays that are located on the instrument panel.

FASTENER IDENTIFICATION

THREAD IDENTIFICATION

SAE and metric bolt/nut threads are not the same. The difference is described in the Thread Notation chart (Fig. 4).

INTERNATIONAL CONTROL AND DISPLAY SYMBOLS

	\$0	HEADLIGHTS,	\$		
HIGH BEAM	FOG LIGHTS	PARKING LIGHTS, PANEL LIGHTS	TURN SIGNAL	HAZARD WARNING	WINDSHIELD WASHER
WINDSHIELD	WINDSHIELD WIPER	WINDSCREEN DEMISTING AND	35	REAR WINDOW	REAR WINDOW
WIPER	AND WASHER	DEFROSTING	VENTILATING FAN	DEFOGGER	WIPER
		♣	- +	4	
REAR WINDOW WASHER	FUEL	ENGINE COOLANT TEMPERATURE	BATTERY CHARGING CONDITION	ENGINE OIL	SEAT BELT
(!)	(P)	*	*	þ	_
BRAKE FAILURE	PARKING BRAKE	FRONT HOOD	REAR HOOD (TRUNK)	HORN	LIGHTER

80a53b2d

Fig. 3

INCF	1	MEIR	IC
5/16-1	8	W8 X	1.25
THREAD MAJOR DIAMETER IN INCHES	NUMBER OF THREADS PER INCH	THREAD MAJOR DIAMETER IN MILLIMETERS	DISTANCE BETWEEN THREADS IN MILLIMETERS

PR606B

Fig. 4 Thread Notation Chart – SAE and Metric GRADE/CLASS IDENTIFICATION

The SAE bolt strength grades range from grade 2 to grade 8. The higher the grade number, the greater the bolt strength. Identification is determined by the line marks on the top of each bolt head. The actual bolt strength grade corresponds to the number of line marks plus 2. The most commonly used metric bolt strength classes are 9.8 and 10.9. The metric strength class identification number is imprinted on the head of the bolt. The higher the class number, the greater the bolt strength. Some metric nuts are imprinted with a single-digit strength class on the nut face. Refer to the Fastener Identification and Fastener Strength Charts.

FASTENER USAGE

WARNING: USE OF AN INCORRECT FASTENER MAY RESULT IN COMPONENT DAMAGE OR PERSONAL INJURY.

Figure art, specifications and torque references in this Service Manual are identified in metric and SAE format.

During any maintenance or repair procedures, it is important to salvage all fasteners (nuts, bolts, etc.) for reassembly. If the fastener is not salvageable, a fastener of equivalent specification must be used.

INTRODUCTION -- WJ

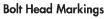
SPECIFICATIONS (Continued)

FASTENER IDENTIFICATION

Bolt Markings and Torque - Metric

Commercial Steel Class

10.9 12.9













Body Size	Torque					Tor	que			Torque					
Diam.	Cast	lron .	Alumi	num	Cast Iron Aluminum			ninum	Cas	t Iron	Alun	ninum			
mm	N•m	ft-lb	N•m	ft-lb	N∙m	ft-lb	N•m	ft-lb	N∙m	ft-lb	N∙m	ft-lb			
6	9	5	7	4	14	9	11	7	14	9	11	7			
7	14	9	11	7	18	14	14	11	23	18	18	14			
8	25	18	18	14	32	23	25	18	36	27	28	21			
10	40	30	30	25	60	45	45	35	70	50	55	40			
12	70	55	55	40	105	75	80	60	125	95	100	<i>7</i> 5			
14	115	85	90	65	160	120	125	95	195	145	150	110			
16	180	130	140	100	240	175	190	135	290	210	220	165			
18	230	1 <i>7</i> 0	180	135	320	240	250	185	400	290	310	230			

Bolt Markings and Torque Values - U.S. Customary

8 **SAE Grade Number** 5

Bolt Head Markings These are all SAE Grade 5 (3) line







Bolt Torque - Grade 5 Bolt Bolt Torque - Grade 8 Bolt

Body Size	Cas	st Iron	Alum	ninum	Cast	Iron	Alum	inum	
	N∙m	ft-lb	N∙m	ft-lb	N∙m	ft-lb	N∙m	ft-lb	
1/4 - 20	9	7	8	6	15	11	12	9	
- 28	12	9	9	7	18	13	14	10	
5/16 - 18	20	15	16	12	30	22	24	18	
- 24	23	1 <i>7</i>	19	14	33	24	25	19	
3/8 - 16	40	30	25	20	55	40	40	30	
- 24	40	30	35	25	60	45	45	35	
7/16 - 14	60	45	45	35	90	65	65	50	
- 20	65	50	55	40	95	<i>7</i> 0	<i>7</i> 5	55	
1/2 - 13	95	70	<i>7</i> 5	55	130	95	100	<i>7</i> 5	
- 20	100	<i>7</i> 5	80	60	150	110	120	90	
9/16 - 12	135	100	110	80	190	140	150	110	
- 18	150	110	115	85	210	155	1 <i>7</i> 0	125	
<i>5/</i> 8 - 11	180	135	150	110	255	190	205	150	
- 18	210	155	160	120	290	215	230	1 <i>7</i> 0	
3/4 - 10	325	240	255	190	460	340	365	270	
- 16	365	270	285	210	515	380	410	300	
7/8 - 9	490	360	380	280	<i>7</i> 45	550	600	440	
- 14	530	390	420	310	825	610	660	490	
1 - 8	720	530	570	420	1100	820	890	660	
- 14	800	590	650	480	1200	890	960	<i>7</i> 10	

FASTENER STRENGTH

HOW TO DETERMINE BOLT STRENGTH

	Mark	Class		Mark	Class
Hexagon head bolt	Bolt 6— head No. 7— 8— 9— 10— 11—	4T 5T 6T 7T 8T 9T 10T	Stud bolt	No mark	4 T
	No mark	4 T			
Hexagon flange bolt w/washer hexagon bolt	No mark	4 T		Grooved	6 T
Hexagon head bolt	Two protruding lines	<i>5</i> T			
Hexagon flange bolt w/washer hexagon bolt	Two protruding lines	6T	Welded bolt		
Hexagon head bolt	Three protruding lines	71			4 T
Hexagon head bolt	Four protruding lines	8T			

METRIC SYSTEM

6

The metric system is based on quantities of one, ten, one hundred, one thousand and one million (Fig. 5).

Mega - (M) Million Deci - (D) Tenth

Kilo - (K) Thousand Centi - (C) Hundreth

Milli - (m) Thousandth

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Fig. 5 Metric Prefixes

The following chart will assist in converting metric units to equivalent English and SAE units, or vise versa.

Refer to the Conversion Chart to convert torque values listed in metric Newton- meters $(N \cdot m)$. Also, use the chart to convert between millimeters (mm) and inches (in.)

CONVERSION FORMULAS AND EQUIVALENT VALUES

Multiply	Ву	To Get	Multiply	Ву	To Get
in-lbs	× 0.11298	= Newton-Meters (N·m)	N•m	x 8.851	= in-lbs
ft-lbs	x 1.3558	= Newton-Meters (N·m)	N•m	x 0.7376	= ft-lbs
Inches Hg (60°F)	x 3.377	= Kilopascals (kPa)	kPa	x 0.2961	= Inches Hg
psi	x 6.895	= Kilopascals (kPa)	kPa	x 0.145	= psi
Inches	× 25.4	= Millimeters (mm)	mm	x 0.03937	= Inches
Feet	x 0.3048	= Meters (M)	M	x 3.281	= Feet
Yards	x 0.9144	= Meters (M)	M	x 1.0936	= Yards
Miles	x 1.6093	= Kilometers (Km)	Km	x 0.6214	= Miles
mph	x 1.6093	= Kilometers/Hr. (Km/h)	Km/h	× 0.6214	= mph
Feet/Sec.	x 0.3048	= Meters/Sec. (M/S)	M/S	x 3.281	= Feet/Sec.
Kilometers/Hr.	× 0.27778	= Meters/Sec. (M/S)	M/S	x 3.600	= Kilometers/Hr.
mph	× 0.4470	= Meters/Sec. (M/S)	M/S	x 2.237	= mph
		COMMON METRI	C EQUIVALENTS		
1 Inch = 25 Millio	meters		1 Cubic Inch	= 16 Cul	bic Centimeters
1 Foot = 0.3 Met	er		1 Cubic Foot	$= 0.03 \mathrm{C}$	lubic Meter
1 Yard = 0.9 Me			1 Cubic Yard	= 0.8 Cu	bic Meter
1 Mile = 1.6 Kilon					

J911N-1

METRIC CONVERSION

in-lbs to Nem

Nem to in-lbs

in- lb	N∙m	in-lb	N∙m	in-lb	N∙m	in-lb	N∙m	in-lb	N∙m	N•m	in-lb	N∙m	in-lb	N•m	in-lb	N∙m	in-lb	N∙m	in-lb
2	.2260	42	4.7453	82	9.2646	122	13.7839	162	18.3032	.2	1.7702	4.2	37.1747	8.2	72.5792	12.2	107.9837	16.2	143.3882
l ā	.4519		4.9713	84		124	14.0099		18.5292	.4	3.5404	4.4	38.9449	8.4	74.3494	12.4	109.7539	16.4	145.1584
6	.6779		5.1972	86	9.7165		14.2359		18.7552	.6	5.3107	4.6	40.7152	8.6	76.1197	12.6	111.5242	16.6	146.9287
l ĕ	.9039		5.4232	88	9.9425		14.4618		18.9811	.8	7.0809	4.8	42.4854	8.8	77.8899	12.8	113.2944	16.8	148.6989
10	1.1298		5.6492	90	10.1685		14.6878		19.2071	1	8.8511	5	44.2556	9	79.6601	13	115.0646	17	150.4691
12	1.3558		5.8751	92	10.3944		14.9138		19.4331	1.2	10.6213	5.2	46.0258	9.2	81.4303	13.2	116.8348	17.2	152.2393
14	1.5818		6.1011	94	10.6204		15.1397		19.6590	1.4	12.3916	5.4	47.7961	9.4	83.2006	13.4	118.6051	17.4	154.0096
16	1.8077		6.3270	96	10.8464		15.3657		19.8850	1.6	14.1618	5.6	49.5663	9.6	84.9708	13.6	120.3753		155.7798
18	2.0337		6.5530	98	11.0723		15.5917		20,1110	1.8	15.9320	5.8	51.3365	9.8	86.7410	13.8	122.1455		157.5500
20	2.2597		6.7790		11.2983		15.8176		20.3369	2	17.7022	6	53.1067	10	88.5112		123.9157		159.3202
22	2.4856		7.0049		11.5243		16.0436		20.5629	2.2	19.4725	6.2	54.8770		90.2815		125.6860		163.7458
24	2.7116		7.2309		11.7502		16.2696		20.7889	2.4	21.2427	6.4	56.6472		92.0517		127.4562		168.1714
26	2.9376		7.4569		11.9762		16.4955		21.0148	2.6	23.0129	6.6	58.4174		93.8219		129.2264		172.5970
28	3.1635		7.6828		12.2022		16.7215		21.2408	2.8	24 . 7 831	6.8	60.1876	•	95.5921		130.9966		177.0225
30	3.3895	70	7.9088		12,4281	150	16.9475		21.4668	3	26.5534	7	61.9579		97.3624		132.7669		181.4480
32	3.6155		8.1348		12.6541		17.1734		21.6927	3.2	28.3236	7.2	63.7281		99.1326		134.5371		185.8736
34	3.8414		8.3607	_	12.8801		17.3994		21.9187	3.4	30.0938	7.4	65.4983		100.9028		136.3073		194.7247
36	4.0674		8.5867		13.1060		17.6253		22.1447	3.6	31.8640	7.6	67.2685		102.6730		138.0775		203.5759
38	4.2934	78	8.8127		13.3320		17.8513		22.3706	3.8		7.8	69,0388		104.4433		139.8478		212.4270
40	4.5193	80	9.0386		13.5580		18.0773		22.5966	4	35.4045	8	70.8090	12	106.2135	16	141.6180	25	221.2781

ft-lbs to N•m

N•m to ft-lbs

ft-lb	N∙m	ft-lb	N∙m	ft-lb	N∙m	ft-lb	N∙m	ft-lb	N∙m	N•m	ft-lb	N∙m	ft-lb	N∙m	ft-lb	N∙m	ft-lb	N∙m	ft-lb
1	1.3558	21	28.4722	41	55.5885	61	82.7049	81	109.8212	1	.7376	21	15.9888	41	30.2400	61	44.9913	81	59.7425
2	2.7116	22	29.8280	42	56.9444	62	84.0607	82	111.1 <i>77</i> 0	2	1.4751	22	16.2264	42	30.9776	62	45.7289	82	60.4801
3	4.0675	23	31.1838	43	58.3002	63	85.4165	83	112.5328	3	2.2127	23	16.9639	43	31.7152	63	46.4664	83	61.21 <i>77</i>
4	5.4233	24	32.5396	44	59.6560	64	86.7723	84	113.8888	4	2.9502	24	17.7015	44	32.4527	64	47.2040	84	61.9552
5	6.7791	25	33.8954	45	61.0118	65	88.1281	85	115.2446	5	3.6878	25	18.4391	45	33.1903	65	47.9415	85	62.6928
6	8.1349	26	35.2513	46	62.3676	66	89.4840	86	116.6004	6	4.4254	26	19.1766	46	33.9279	66	48.6791	86	63.4303
7	9.4907	27	36.6071	47	63.7234	67	90.8398	87	117.9562	7	5.1629	27	19.9142	47	34.6654	67	49.4167	87	64.1679
8	10.8465		37.9629	48	65.0793	68	92.1956		119.3120	8	5.9005	28	20.6517	48 .	35.4030	68	50.1542	88	64.9545
9	12.2024	29	39.3187	49	66.4351	69	93.5514		120.6678	9	6.6381	29	21.3893	49	36,1405	69	50.8918	89	65.6430
10	13.5582		40.6745	50	67.7909	70	94.9073		122.0236	10	7.3756	30	22.1269	50	36.8781	70	51.6293	90	66.3806
111	14.9140	31	42.0304	51	69.1467	71	96.2631	91	123.3794	11	8.1132	31	22.8644	51	37.6157	71	52.3669	91	67.1181
12	16.2698	32	43.3862	52	70.5025	72	97.6189	92	124.7352	12	8.8507	32	23.6020	52	38.3532	72	53.1045	92	67.8557
13	17.6256	33	44.7420	53	71.8583	73	98.9747	93	126.0910	.13	9.5883	33	24.3395	53	39.0908	73	53.8420	93	68.5933
14	18.9815		46.0978	54	73.2142	74	100.3316		127.4468	14	10.3259	34	25.0771	54	39.8284	74	54.5720		69.3308
15	20.3373	35	47.4536	55	74.5700	75	101.6862	95	128.8026	15	11.0634	35	25.8147	55	40.5659	75	55.3172	95	70.0684
16	21.6931	36	48.8094	56	75.9258	76	103.0422	96	130.1586	16	11.8010	36	26.5522	56	41.3035	76	56.0547	96	70.8060
11/	23.0489	37	50.1653	57	77.2816	77	104.3980		131.5144	17	12.5386	37	27.2898	57	42.0410		56.7923	97	71.5435
18	24.4047	38	51.5211	58	78.6374	78	105.7538		132.8702	18	13.2761	38	28.0274	58	42.7786	78	57.5298	98	72.2811
19	25.7605	39	52.8769	59	79.9933	79	107.1196		134.2260	19	14.0137	39	28.7649	59	43.5162	79	58.2674	99	73.0187
20	27.1164	40	54.2327	60	81.3491	80	108.4654	100	135.5820	20	14.7512	40	29.5025	60	44.2537	80	59.0050	100	73.7562

in. to mm

mm to in.

in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
.01	.254	.21	5.334	.41	10.414	.61	15.494	.81	20.574	.01	.00039	.21	.00827	.41	.01614	.61	.02402	.81	.03189
.02	.508	.22	5.588	.42	10.668	.62	15.748	.82	20.828	.02	.00079	.22	.00866	.42	.01654	.62	.02441	.82	.03228
.03	.762	.23	5.842	.43	10.922	.63	16.002	.83	21.082	.03	.00118	.23	.00906	.43	.01693	.63	.02480	.83	.03268
.04	1.016	.24	6.096	.44	11.176	.64	16.256	.84	21.336	.04	.00157	.24	.00945	.44	.01732	.64	.02520	.84	.03307
.05	1.270	.25	6.350	.45	11.430	.65	16.510	.85	21.590	.05	.00197	.25	.00984	.45	.01772	.65	.02559	.85	.03346
.06	1.524	.26	6.604	.46	11.684	.66	16.764	.86	21.844	.06	.00236	.26	.01024	.46	.01811	.66	.02598	.86	.03386
.07	1.778	.27	6.858	.47	11.938	.67	17.018	.87	22.098	.07	.00276	.27	.01063	.47	.01850	.67	.02638	.87	.03425
.08	2.032	.28	7.112	.48	12.192	.68	17.272	.88	22.352	.08	.00315	.28	.01102	.48	.01890	.68	.02677	.88	.03465
.09	2.286	.29	7.366	.49	12.446	.69	17.526	.89	22.606	.09	.00354	.29	.01142	.49	.01929	.69	.02717	.89	.03504
.10	2.540	.30	7.620	.50	12.700	.70	17.780	.90	22.860	.10	.00394	.30	.01181	.50	.01969	.70	.02756	.90	.03543
.11	2.794	.31	7.874	.51	12.954	.71	18.034	.91	23.114	.11	.00433	.31	.01220	.51	.02008	.71	.02795	.91	.03583
.12	3.048	.32	8.128	.52	13.208	.72	18.288	.92	23.368	.12	.00472	.32	.01260	.52	.02047	.72	.02835	.92	.03622
.13	3.302	.33	8.382	.53	13.462	.73	18.542	.93	23.622	.13	.00512	.33	.01299	.53	.02087	.73	.02874	.93	.03661
.14	3.556	.34	8.636	.54	13.716	.74	18.796	.94	23.876	.14	.00551	.34	.01339	.54	.02126	.74	.02913	.94	.03701
.15	3.810	.35	8.890	.55	13.970	.75	19.050	.95	24.130	.15	.00591	.35	.01378	.55	.02165	.75	.02953	.95	.03740
.16	4.064	.36	9.144	.56	14.224	.76	19.304	.96	24.384	.16	.00630	.36	.01417	.56	.02205	.76	.02992	.96	.03780
.17	3.318	.37	9.398	.57	14.478	.77	19.558	.97	24.638	.17	.00669	.37	.01457	.57	.02244	.77	.03032	.97	.03819
.18	4.572	.38	9.652	.58	14.732	.78	19.812	.98	24.892	.18	.00709	.38	.01496	.58	.02283	.78	.03071	.98	.03858
.19	4.826	.39	9.906	.59	14.986	.79	20.066	.99	25.146	.19	.00748	.39	.01535	.59	.02323	.79	.03110	.99	.03898
.20	5.080	.40	10.160	.60	15.240	.80	20.320	1.00	25.400	.20	.00787	.40	.01575	.60	.02362	.80	.03150	1.00	.03937
		L				<u> </u>												<u> </u>	

TORQUE REFERENCES

Individual Torque Charts appear at the end of many Groups. Refer to the Standard Torque Specifi-

cations Chart for torque references not listed in the individual torque charts.

TORQUE SPECIFICATIONS

SPECIFIED TORQUE FOR STANDARD BOLTS

-1						ed torque		
Class	Diameter	Pitch		Hexagon head b			exagon flange	
	mm	mm	N∙m	kgf-cm	ft-lbf	N∙m	kgf-cm	ft-lbf
	6	1	5	55	48 inlbf	6	60	52 inlbf
	8	1.25	12.5	130	9	14	145	10
4T	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83		_	
	6	1	6.5	65	56 inlbf	7.5	75	65 inlbf
	8	1.25	15.5	160	12	17.5	1 <i>7</i> 5	13
5 T	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	<i>67</i> 0	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	<u> </u>		
	6	1	8	80	69 inlbf	9	90	78 inlbf
	8	1.25	19	195	14	21	210	15
6T	10	1.25	39	400	29	44	440	32
	12	1.25	71	<i>7</i> 30	<i>5</i> 3	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	1 <i>7</i> 0	1,750	127	_	_	_
	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
<i>7</i> T	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166		_	_
	8	1.25	29	300	22	33	330	24
8T	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
	8	1.25	34	340	25	37	380	27
9T	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
	8	1.25	38	390	28	42	430	31
10T	10	1.25	78	800	58	88	890	64
101	12	1.25	140	1,450	105	155	1,600	116
	8	1.25	42	430	31	47	480	35
11T	10	1.25	87	890	64	97	990	<i>7</i> 2
	12	1.25	155	1,600	116	175	1,800	130