



1965



[www.GTOAA.org](http://www.GTOAA.org)

**CHASSIS**

**SHOP MANUAL**

# 1965 PONTIAC TEMPEST CHASSIS SHOP MANUAL

## GENERAL

This shop manual applies to 1965 Pontiac Tempest models. It contains information on all components of the car with the exception of the air conditioning system and body which are covered in separate manuals. New Vehicle Warranty and other information pertaining to Pontiac Tempest models is contained in the Owner Protection Plan booklet and Owner's Guide which accompanies each vehicle.

## CONTENTS

Arrangement of the material is shown by the table of contents on the right-hand side of this page. Black tabs on the first page of each section can be seen on the edge of the book below the section title. A more detailed table of contents precedes each section, and an alphabetical index is included in the back of the manual.

## AIR CONDITIONING CAUTION

*It is extremely important that proper methods and precautions be observed when disconnecting any refrigerant lines or units. Check information published concerning air conditioning prior to performing operations of this nature. Failure to observe this caution may result in injury to personnel or cause extensive damage to the air conditioning system.*

**PONTIAC MOTOR DIVISION  
GENERAL MOTORS CORPORATION  
PONTIAC 11, MICHIGAN  
www.GTOAA.org**

S-6504 T

August 1964

Litho In U.S.A.

©August 1964 Pontiac Motor Division, General Motors Corporation

## TABLE OF CONTENTS

TITLE	SECTION
GENERAL INFORMATION	1
FRAME AND BODY MOUNTINGS	1A
GENERAL LUBRICATION	2
SUSPENSION	3
WHEELS AND TIRES	3A
REAR AXLE	4
PROPELLER SHAFT	4A
BRAKES—STANDARD	5
BRAKES—POWER	5A
ENGINE MECHANICAL	6
ENGINE COOLING AND LUBRICATION	6A
ENGINE FUEL	6B
ENGINE TUNE-UP	6C
ENGINE CLUTCH	6D
3-SPEED SYNCHRO-MESH TRANSMISSION	7
4-SPEED SYNCHRO-MESH TRANSMISSION	7A
AUTOMATIC TRANSMISSION	7B
FUEL TANK AND EXHAUST	8
STEERING—STANDARD	9
STEERING—POWER	9A
CHASSIS SHEET METAL	10
ELECTRICAL AND INSTRUMENTS	11
ACCESSORIES	12
INDEX	13

## GENERAL INFORMATION CONTENTS OF THIS SECTION

SUBJECT	PAGE	SUBJECT	PAGE
General Information . . . . .	1-1	Lifting and Towing . . . . .	1-3
Car Model Information . . . . .	1-1	Speedometer Gear Usage . . . . .	1-3
Serial Number . . . . .	1-2	Basic Dimensions . . . . .	1-5
Lock Coding . . . . .	1-2	Miscellaneous Data . . . . .	1-6

### GENERAL INFORMATION

General information and general specifications appear in this section. Detailed specifications are given on major units at the end of each section of this manual.

#### VEHICLE IDENTIFICATION PLATE

Serial, assembly plant and model year identification can be made from the Manufacturer's Motor

Vehicle Identification Number Plate. This plate is a metal strip which is fastened to the left front hinge pillar post, visible when the left front door is open. The plate has embossed numerals as shown in Fig. 1-1.

#### BODY IDENTIFICATION PLATE

Identification as to body style, body number, trim and paint is carried on a plate (Fig. 1-2) attached to the left side of the cowl just under the rear edge of the hood.

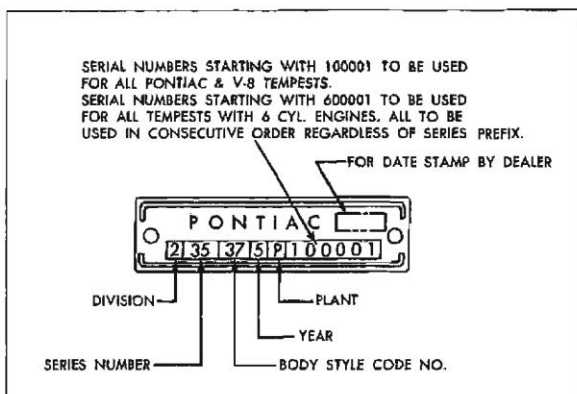


Fig. 1-1 Vehicle Identification No. Plate

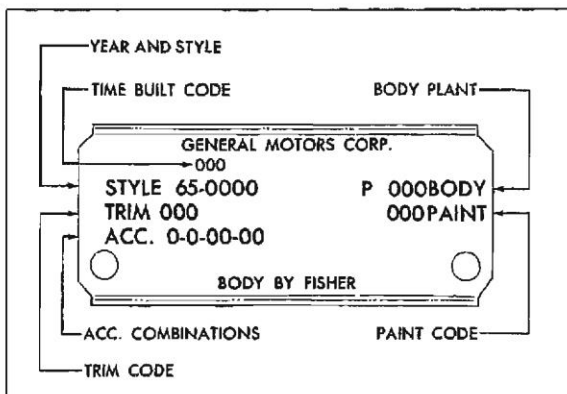


Fig. 1-2 Body Identification Plate

SERIES	MODEL	STYLE NUMBER
<u>Tempest</u> 233	Sports Coupe	23327
	Four Door Sedan	23369
	Safari	23335
<u>Tempest Custom</u> 235	Sports Coupe	23527
	Hardtop Coupe	23537
	Four Door Sedan	23569
	Convertible	23567
	Safari	23535
<u>Tempest LeMans</u> 237	Sports Coupe	23727 *
	Hardtop Coupe	23737 *
	Four Door Sedan	23769
	Convertible	23767 *

\* GTO Option on 237 Series Only.

Fig. 1-3 Car Model Identification

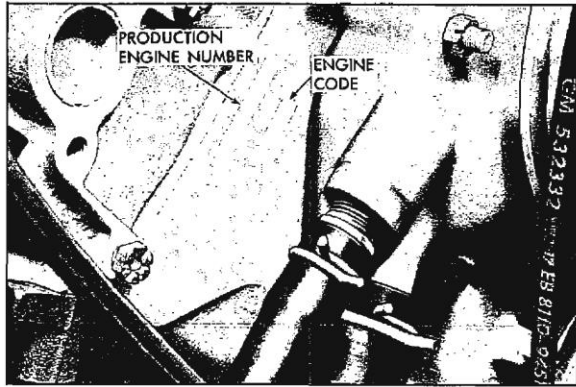


Fig. 1-4 Engine Serial Number Location

**CAR MODEL IDENTIFICATION**

Certain publications carry "series" numbers to identify models and others carry sales department names. Figure 1-3 shows both methods of identification.

**ENGINE SERIAL NUMBERS**

The engine production number and engine code are located on the front of the right-hand bank of the block (Fig. 1-4).

**CODING SIDE BAR LOCK**

The side bar lock is used on the ignition, front door and rear deck lid lock. Uncoded side bar locks may be coded to match the keys used on the car. Locks are received without tumblers, springs or retainers which are available separately. Four different tumblers are available, only approved parts should be used.

Before the lock may be coded the code of the key must be determined. If the numbered blank surrounding the hole in the key head has not been removed the code may be determined by consulting

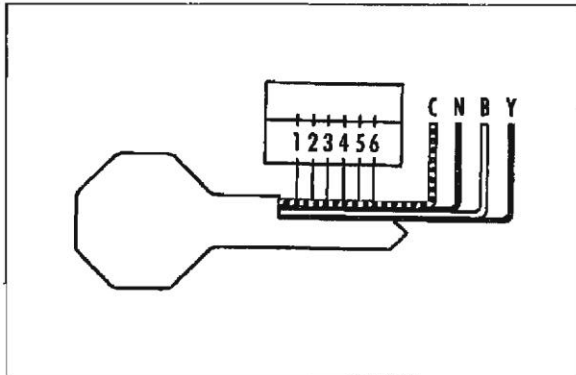


Fig. 1-5 Key Coding Diagram

lock manufacturers code book. Should the blank be missing from the key the coding sequence may be readily determined as follows:

1. Place key on diagram (Fig. 1-5) with bottom, head and point aligned.
2. Starting at the head of the key, code each of six cuts either C-N-B or Y by recording which area the bottom of the cut leaves exposed. Example: If the first line from the top is the only line exposed, the cut would be coded C.

After the key code has been determined the correct tumblers should be installed as follows:

1. The letters determined from coding the key indicate different colored tumblers to be installed in slots of the lock (Fig. 1-6).
2. Beginning with slot next to head (number one position) install tumbler of color coinciding with letter determined from key code. Install correct tumblers in remaining five slots.

LETTER	COLOR	DEPTH SET AT
C	Copper	.000
N	Nickel	.025
B	Black	.050
Y	Yellow	.075

Fig. 1-6 Tumbler Color Chart

3. Insert spring in each round cavity in each tumbler lock between slots.

*NOTE: Do not pull springs apart, twist them apart.*

4. Install spring retainer over springs with ends inserted in slots.
5. Side bar will now drop in place when key is inserted if correct tumblers have been installed.
6. Stake spring retainer in place using screwdriver and light hammer.

<u>PLANT CODE</u>	<u>PLANT</u>	<u>CARS BUILT TEMPEST</u>
P	Pontiac, Michigan	X
K	Kansas City, Missouri	X
Z	Fremont, California	X
B	Baltimore, Maryland	X

**LIFTING AND TOWING**

**LIFTING**

The Tempest may be lifted at any accessible point on the frame rail. It can also be lifted at the front cross member or at either the front or rear lower control arms. When lifting on the lower control arms, use care to avoid the lower shock absorber brackets.

Under no circumstances should lift adapters be used on the bumpers, propeller shaft, axle shafts, transmission, rear axle or engine.

The propeller shaft and the exhaust system are lower than the side rails. Lift adapters must provide adequate clearance height for these parts.

**TOWING PRECAUTIONS**

Always place a rubber mat or other suitable material between the bumper and the tow chains or

cables. For front end lifting, place the chains or cables around the ends of the frame side rails at both sides. All models can be towed without disconnecting the propeller shaft except in cases where the transmission or propeller shaft has possibly been subject to failure or damage. In such cases, the propeller shaft must be disconnected from the differential and wired to the tail pipe or the car must be towed with the rear wheels off the ground. If the propeller shaft is disconnected and the "U" joint bearing retaining strap is broken, wrap tape around the bearing caps to prevent loss. When towing with the rear wheels off the ground, the steering wheel must be centered and held in position by a steering wheel holding clamp or by tying it to the window division channel. Tire to ground clearance should not exceed 6 inches while towing the car and speeds should not exceed 35 mph. for distances up to 50 mph.

*CAUTION: Power steering-equipped cars should be towed with caution, since there is no power assist with the engine off.*

**SPEEDOMETER GEAR USAGE CHART**

**3-SPEED SYNCHRO-MESH TRANSMISSION**

Rear Axle Ratio	Tire Size				No. Drive Gear Teeth	No. Driven Gear Teeth	Color Driven Gear	Adaptor Ratio	Adaptor Color
	6.95 x 14	7.35 x 14	7.75 x 14	8.15 x 15					
43:10 (4.30)	x	x	x		8	21	Blue	.7692	Yellow
					6	20	Red	.7692	Yellow
39:10 (3.90)	x	x	x		8	21	Red	.8653	Blue
					6	20	Blue	.8653	Blue
41:11 (3.73)	x	x	x		8	20	Blue	.8653	Blue
					8	19	Natural	.8653	Blue
39:11 (3.55)	x	x	x	x	8	19	Natural	.8653	Blue
					8	18	Brown	.8653	Blue
					8	21	Red	-	-
37:11 (3.36)	x	x	x	x	8	21	Red	-	-
					8	20	Blue	-	-
42:13 (3.23)	x	x	x		8	20	Blue	-	-
					8	19	Natural	-	-
40:13 (3.08)	x	x	x		8	19	Natural	-	-
					8	18	Brown	-	-

**4-SPEED SYNCHRO-MESH TRANSMISSION**

Rear Axle Ratio	Tire Size				No. Drive Gear Teeth	No. Driven Gear Teeth	Color Driven Gear	Adaptor Ratio	Adaptor Color
	6.95 x 14	7.35 x 14	7.75 x 14	8.15 x 15					
43:10 (4.30)	x	x	x		8	20	Yellow	-	-
					6	19	Orange	-	-
39:10 (3.90)	x	x	x		8	18	Green	-	-
					8	17	Black	-	-
41:11 (3.73)	x	x	x		8	18	Green	-	-
					6	17	Black	-	-
39:11 (3.55)		x	x		8	21	Red	-	-
37:11 (3.36)		x	x	x	8	21	Red	-	-
					8	20	Blue	-	-
42:13 (3.23)	x	x	x		8	20	Blue	-	-
					8	19	Natural	-	-
40:13 (3.08)	x	x	x		8	19	Natural	-	-
					8	18	Brown	-	-

**SPEEDOMETER GEAR USAGE CHART CONT'D**  
**6-CYLINDER ENGINE—AUTOMATIC TRANSMISSION**

Rear Axle Ratio	Tire Size				No. Drive Gear Teeth	No. Driven Gear Teeth	Color Driven Gear	Adaptor Ratio	Adaptor Color
	6.95 x 14	7.35 x 14	7.75 x 14	8.15 x 15					
39:11 (3.55)	x	x	x		18	43	Purple	.8653	Blue
					18	41	Yellow	.8653	Blue
37:11 (3.36)	x				18	41	Purple	.8653	Blue
					18	41	Purple	.9705	Black & Yellow
42:13 (3.23)	x	x	x	x	18	45	Lt. Blue	-	-
					18	43	Purple	-	-
40:13 (3.08)	x	x	x	x	18	43	Purple	-	-
					18	41	Yellow	-	-
41:14 (2.93)	x	x	x		18	41	Yellow	-	-
					18	39	Brown	-	-
41:16 (2.56)	x	x	x		18	36	White	-	-
					18	35	Orange	-	-

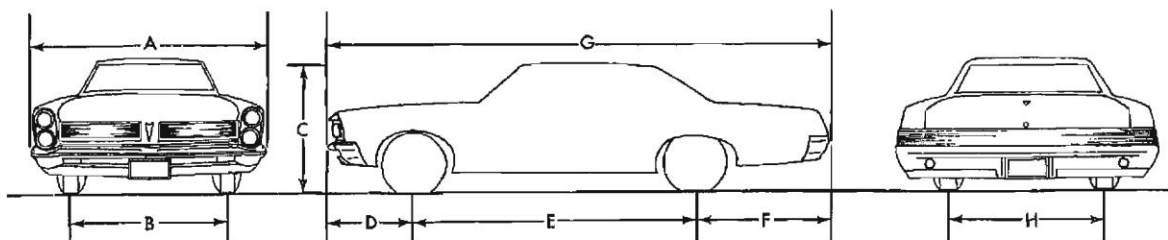
**V-8 LOW COMPRESSION ENGINE EXCEPT A/C AUTOMATIC TRANSMISSION**

Rear Axle Ratio	Tire Size		No. Drive Gear Teeth	No. Driven Gear Teeth	Color Driven Gear	Adaptor Ratio	Adaptor Color
	7.35 x 14	7.75 x 14					
37:11 (3.36)	x	x	18	40	Black	.8653	Blue
42:13 (3.23)	x	x	18	40	Black	.8653	Blue
			18	38	Blue	-	-
40:13 (3.08)	x	x	18	42	Green	-	-
41:14 (2.93)	x	x	18	40	Black	-	-
41:16 (2.56)	x	x	18	35	Orange	-	-

**H. O. ENGINE, GTO AND ALL V-8 ENGINES WITH A/C—AUTOMATIC TRANSMISSION**

Rear Axle Ratio	Tire Size				No. Drive Gear Teeth	No. Driven Gear Teeth	Color Driven Gear	Adaptor Ratio	Adaptor Color
	6.95 x 14	7.35 x 14	7.75 x 14	8.15 x 15					
39:10 (3.90)		x	x		16	41	Yellow	.8653	Blue
39:11 (3.55)		x	x		16	43	Purple	-	-
37:11 (3.36)		x	x		16	41	Yellow	-	-
42:13 (3.23)		x	x		16	39	Brown	.8653	Blue
				16	41	Yellow	-	-	
				16	40	Black	-	-	
40:14 (3.08)		x	x		16	37	Red	-	-
41:14 (2.93)		x	x		16	37	Red	-	-
				16	36	White	-	-	
				16	35	Orange	-	-	

**1965 BASIC DIMENSIONS**



Series	KEY	233			235					237			
		27	35	69	27	35	37	67	69	27	37	67	69
Over-All Length	G	206.1	204.4	206.1	206.1	204.4	206.1	206.1	206.1	206.1	206.1	206.1	206.1
Width	A	← 73.1 →					← 73.4 →						
Height (Unloaded)	C	53.5	55.2	54.0	53.5	55.2	53.5	53.6	54.0	53.5	53.5	53.6	54.0
Wheelbase	E	← 115.0 →											
Tread Front	B	← 58.0 →											
Tread Rear	H	← 58.0 →											
Overhang Front	D	← 35.4 →											
Overhang Rear	F	55.7	54.0	55.7	55.7	54.0	55.7	55.7	55.7	55.7	55.7	55.7	55.7
Tire Size	-	(a)	(b)	(a)	(a)	(b)	(a)	(a)	(a)	(a) (c)	(a) (c)	(a) (c)	(a) (c)

(a) 6.95 x 14 except 7.35 x 14 with optional oversize tires or V-8 engine option.

(b) Station Wagon standard tire size is 7.35 x 14.

(c) 7.75 x 14 standard with GTO Option.

## MISCELLANEOUS INFORMATION

### DECIMAL EQUIVALENTS

1/64 . . . . .015625	17/64 . . . . .265625	33/64 . . . . .515625	49/64 . . . . .765625
1/32 . . . . .03125	9/32 . . . . .28125	17/32 . . . . .53125	25/32 . . . . .78125
3/64 . . . . .046875	19/64 . . . . .296875	35/64 . . . . .546875	51/64 . . . . .796875
1/16 . . . . .0625	5/16 . . . . .3125	9/16 . . . . .5625	13/16 . . . . .8125
5/64 . . . . .078125	21/64 . . . . .328125	37/64 . . . . .578125	53/64 . . . . .828125
3/32 . . . . .09375	11/32 . . . . .34375	19/32 . . . . .59375	27/32 . . . . .84375
7/64 . . . . .109375	23/64 . . . . .359375	39/64 . . . . .609375	55/64 . . . . .859375
1/8 . . . . .125	3/8 . . . . .375	5/8 . . . . .625	7/8 . . . . .875
9/64 . . . . .140625	25/64 . . . . .390625	41/64 . . . . .640625	57/64 . . . . .890625
5/32 . . . . .15625	23/32 . . . . .40625	21/32 . . . . .65625	29/32 . . . . .90625
11/64 . . . . .171875	27/64 . . . . .421875	43/64 . . . . .671875	59/64 . . . . .921875
3/16 . . . . .1875	7/16 . . . . .4375	11/16 . . . . .6875	15/16 . . . . .9375
13/64 . . . . .203125	29/64 . . . . .453125	45/64 . . . . .703125	61/64 . . . . .953125
7/32 . . . . .21875	15/32 . . . . .46875	23/32 . . . . .71875	31/32 . . . . .96875
15/64 . . . . .234375	31/64 . . . . .484375	47/64 . . . . .734375	63/64 . . . . .984375
1/4 . . . . .25	1/2 . . . . .5	3/4 . . . . .75	1 . . . . .1.

### WEIGHTS AND MEASURES

#### LINEAR MEASURE

1/12 foot (ft.) . . . . .	1 inch (in.)
12 inches . . . . .	1 foot
3 feet . . . . .	1 yard (1 yd.)

#### AERA MEASURE

1/144 square foot (sq. ft.)	14 . . . . .1 square inch (sq. in.)
144 square inches . . . . .	1 square foot
9 square feet . . . . .	1 square yard (sq. yd.)

#### LIQUID MEASURE

1/16 pint (pt.) . . . . .	1 ounce (oz.)
1 pint . . . . .	16 ounces
2 pints . . . . .	1 quart (qt.) 32 ounces
4 quarts . . . . .	1 gallon (gal.)
31-1/2 gallons . . . . .	1 barrel (bbl.)

#### DRY MEASURE

1/2 quart (qt.) . . . . .	1 pint (pt.)
2 pints . . . . .	1 quart (qt.)
8 quarts . . . . .	1 peck (pk.)
4 pecks . . . . .	1 bushel (bu.)
105 quarts . . . . .	1 barrel

#### CUBIC MEASURE

1,728 cubic inches . . . . .	1 cubic foot
27 cubic feet . . . . .	1 cubic yard

#### COMMON WEIGHT

16 ounces . . . . .	1 pound
100 pounds . . . . .	1 hundred weight (cwt.)
200 pounds . . . . .	1 ton

#### COMMON U.S.A. EQUIVALENTS LENGTH

1 inch . . . . .	25.4001 millimeters
1 millimeter . . . . .	0.03937 inches
1 foot . . . . .	0.304801 meters
1 meter . . . . .	3.28083 feet
1 yard . . . . .	9.914402 meters
1 meter . . . . .	1.093611 yards
1 mile . . . . .	1.609347 kilometers
1 kilometer . . . . .	0.621370 miles

#### LIQUID CAPACITY

1 quart . . . . .	0.94633 liters
1 liter . . . . .	1.05671 quarts
1 gallon . . . . .	3.78533 liters
1 liter . . . . .	0.26418 gallons

#### DRY CAPACITY

1 quart . . . . .	1.1012 liters
1 liter . . . . .	0.9081 quarts
1 peck . . . . .	3.310 liters
1 liter . . . . .	0.11351 pecks



---



---

**DRILL SIZES**


---

Letter Sizes	Drill Diam. Inches	Wire Gage Sizes	Drill Diam. Inches	Wire Gage Sizes	Drill Diam. Inches	Wire Gage Sizes	Drill Diam. Inches
Z	0.413	1	0.2280	28	0.1405	55	0.0520
Y	0.404	2	0.2210	29	0.1360	56	0.0465
X	0.397	3	0.2130	30	0.1285	57	0.0430
W	0.386	4	0.2090	31	0.1200	58	0.0420
V	0.377	5	0.2055	32	0.1160	59	0.0410
U	0.368	6	0.2040	33	0.1130	60	0.0400
T	0.358	7	0.2010	34	0.1110	61	0.0390
S	0.348	8	0.1990	35	0.1100	62	0.0380
R	0.339	9	0.1960	36	0.1065	63	0.0370
Q	0.332	10	0.1935	37	0.1040	64	0.0360
P	0.323	11	0.1910	38	0.1015	65	0.0350
O	0.316	12	0.1890	39	0.0995	66	0.0330
N	0.302	13	0.1850	40	0.0980	67	0.0320
M	0.295	14	0.1820	41	0.0960	68	0.0310
L	0.290	15	0.1800	42	0.0935	69	0.0292
K	0.281	16	0.1770	43	0.0890	70	0.0280
J	0.277	17	0.1730	44	0.0860	71	0.0260
I	0.272	18	0.1695	45	0.0820	72	0.0250
H	0.266	19	0.1660	46	0.0810	73	0.0240
G	0.261	20	0.1610	47	0.0785	74	0.0225
F	0.257	21	0.1590	48	0.0760	75	0.0210
E	0.250	22	0.1570	49	0.0730	76	0.0200
D	0.246	23	0.1540	50	0.0700	77	0.0180
C	0.242	24	0.1520	51	0.0670	78	0.0160
B	0.238	25	0.1495	52	0.0635	79	0.0145
A	0.234	26	0.1470	53	0.0595	80	0.0135
		27	0.1440	54	0.0550		

---