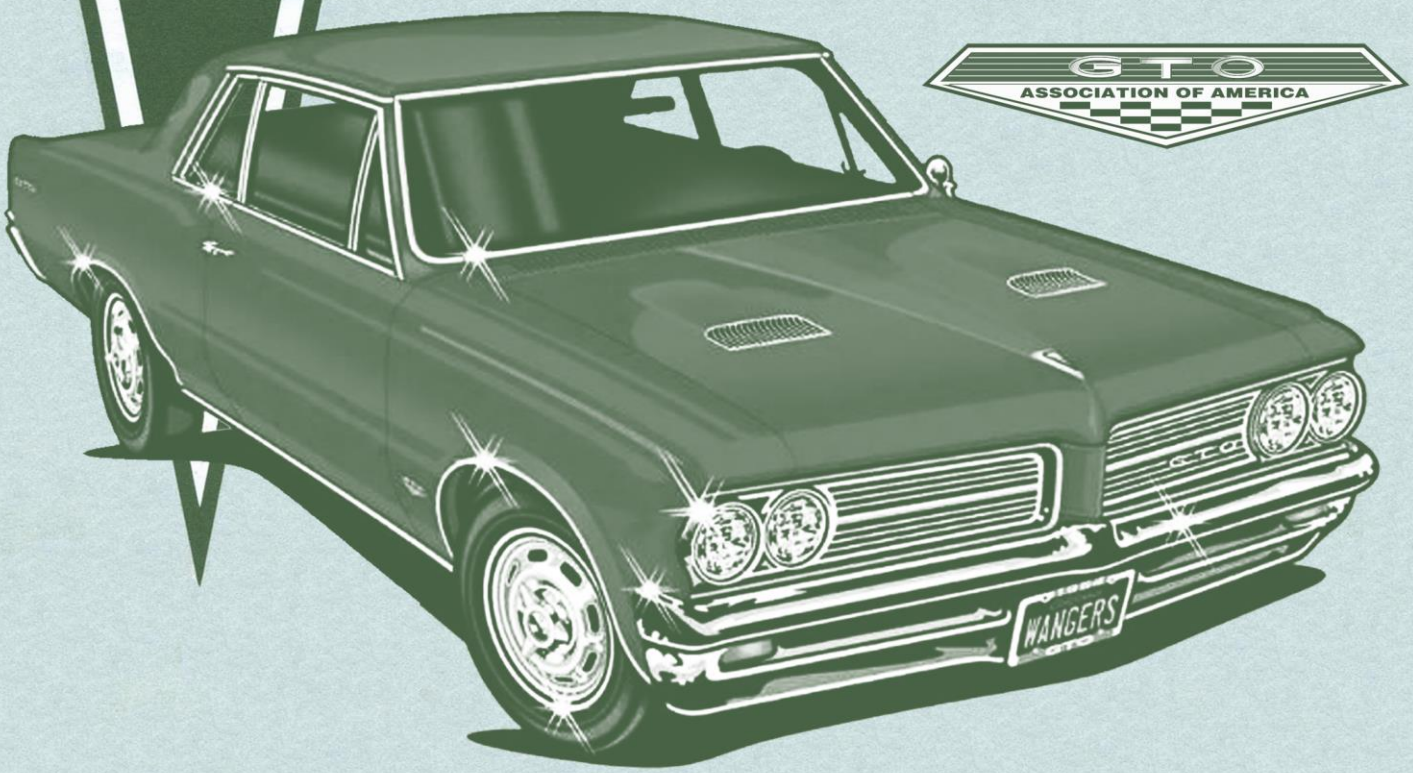
1964



CHASSIS MANUAL

TEMPEST/LEMANS/GTO

1964 PONTIAC TEMPEST

CHASSIS SHOP MANUAL

GENERAL

This shop manual applies to 1964 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 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 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

S-6404 T August 1963 Litho in U.S.A.

TABLE OF CONTENTS

GENERAL INFORMATION

CONTENTS OF THIS SECTION

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.

CAR MODEL IDENTIFICATION

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

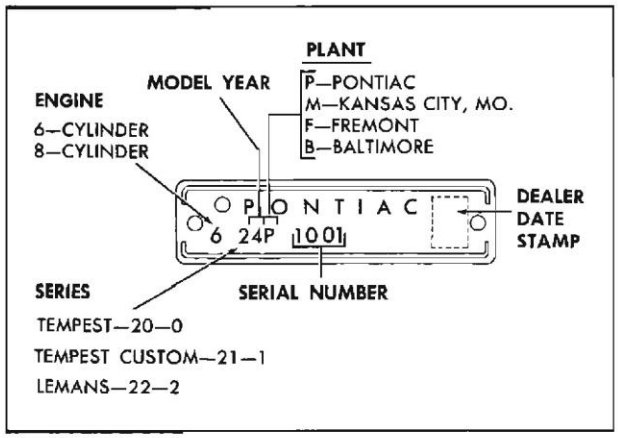


Fig. 1-1 Vehicle Identification Number Plate

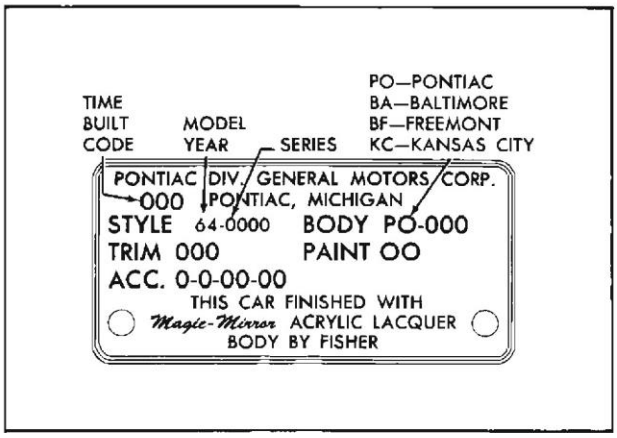


Fig. 1-2 Body Identification Plate

Series	Model	Style Number
2000	Tempest Sports Coupe	2027
	Tempest 4-Door Sedan	2069
	Tempest Safari	2035
2100	Tempest Custom Sports Coupe	2127
	Tempest Custom 4-Door Sedan	2169
	Tempest Custom Convertible	2167
	Tempest Custom Safari	2135
2200	Le Mans Sports Coupe	2227
	Le Mans Convertible	2267

Fig. 1-3 Car Model Identification

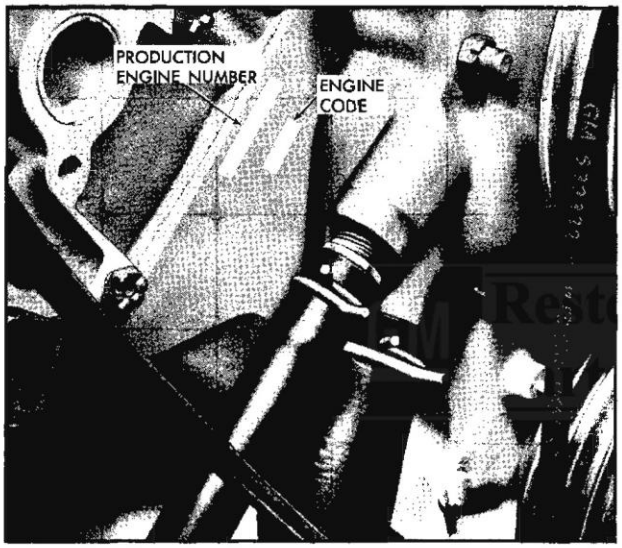


Fig. 1-4 Engine Serial Number Location

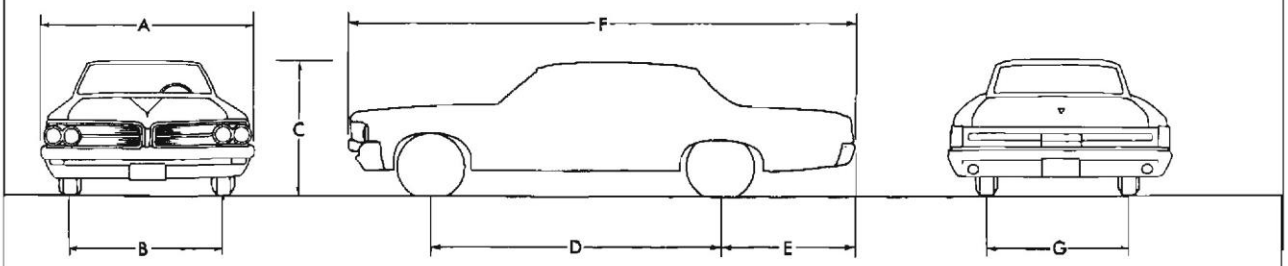
ENGINE SERIAL NUMBERS

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.

GENERAL SPECIFICATIONS



DIMENSION	KEY	Two Door Coupes 2027, 2127, 2227	Four Door Sedans 2069, 2169	Convertibles 2167, 2267	Four Door Station Wagon 2035, 2135
Over-All Length	F		203"		
Width	A		73.3"		
Height (Unloaded)	C	53.6"	54.0"	54.2"	55.3"
Wheelbase	D		115"		
Tread Front	B		58"		
Tread Rear	G		58"		
Road Clearance	-	6.05"	6.30"	6.05"	7.55"
Overhang Front	-		33.2"		
Overhang Rear	E		54.5"		
Tire Size	-		6.50 x 14		7.00 x 14
6 Cylinder w/o A.C.					
Tire Size 8 Cylinder and A.C.	-		7.00 x 14		

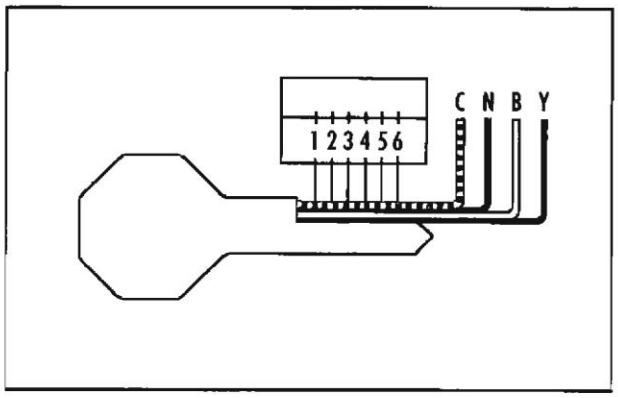


Fig. 1-5 Key Coding Diagram

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 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.

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, propellor shaft, axle shafts, transmission, rear axle or engine.

The propellor 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 30 MPH.

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

SPEEDOMETER GEAR USAGE

REAR AXLE RATIO	TIRE SIZE 6.50 x 14	7.00 x 14	7.50 x 14	NO. DRIVE GEAR TEETH	NO. DRIVEN GEAR TEETH	DRIVEN GEAR COLOR	ADAPTER RATIO	ADAPTER COLOR
AUTOMATIC TRANSMISSION								
41:11 (3.73)	X	X		18	45	Lt. Blue	.8653	Blue
			X	18	43	Purple	.8653	Blue
39:11 (3.55)	X	X		18	43	Purple	.8653	Blue
			X	18	41	Yellow	.8653	Blue
37:11 (3.36)	X	X		18	41	Yellow	.8653	Boue
			X	18	39	Brown	.8653	Blue
42:13 (3.23)	X	X		18	45	Lt. Blue	-	-
			X	18	43	Purple	-	-
40:13 (3.08)	X	X		18	43	Purple	-	-
			X	18	41	Yellow	-	-
51:14 (2.93)	X	X		18	41	Yellow	-	-
			X	18	39	Brown	-	-
39:14 (2.78)	X	X		18	39	Brown	-	-
			X	18	37	Red	-	-
41:16 (2.56)	X	X		18	36	White	-	-
			X	18	34	Lt. Green	-	-
3-SPEED SYNCHROMESH TRANSMISSION								
43:10 (4.30)	X			8	21	Red	.7692	Yellow
		X	X	8	20	Blue	.7692	Yellow
41:11 (3.73)	X	X		8	20	Blue	.8653	Blue
			X	8	19	Natural	.8653	Blue
39:11 (3.55)	X	X		8	19	Natural	.8653	Blue
			X	8	18	Brown	.8653	Blue
39:10 (3.90)	X	X		8	21	Red	.8653	Blue
			X	8	20	Blue	.8653	Blue
42:13 (3.23)	X	X		8	20	Blue	-	-
			X	8	19	Natural	-	-
40:13 (3.08)	X	X		8	19	Natural	-	-
			X	8	18	Brown	-	-
37:11 (3.36)	X	X		8	21	Red	-	-
			X	8	20	Blue	-	-
4-SPEED SYNCHROMESH TRANSMISSION								
43:10 (4.30)		X		6	20	Yellow	-	-
	X			6	20	Yellow	-	-
			X	6	19	Orange	-	-
41:11 (3.73)	X			6	18	Green	-	-
		X	X	6	17	Black	-	-
39:11 (3.55)		X	X	8	21	Red	-	-
39:10 (3.90)	X	X		6	18	Green	-	-
			X	6	17	Black	-	-
42:13 (3.23)	X	X		8	20	Blue	-	-
			X	8	19	Natural	-	-
40:13 (3.08)	X	X		8	19	Natural	-	-
			X	8	18	Brown	-	-
37:11 (3.36)	X	X		8	21	Red	-	-
			X	8	20	Blue	-	-

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.)

AREA MEASURE

1/144 square foot (sq. ft.) . =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.)
2000 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

DRY CAPACITY

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

LIQUID CAPACITY

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

GTO ASSOCIATION OF AMERICA

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		

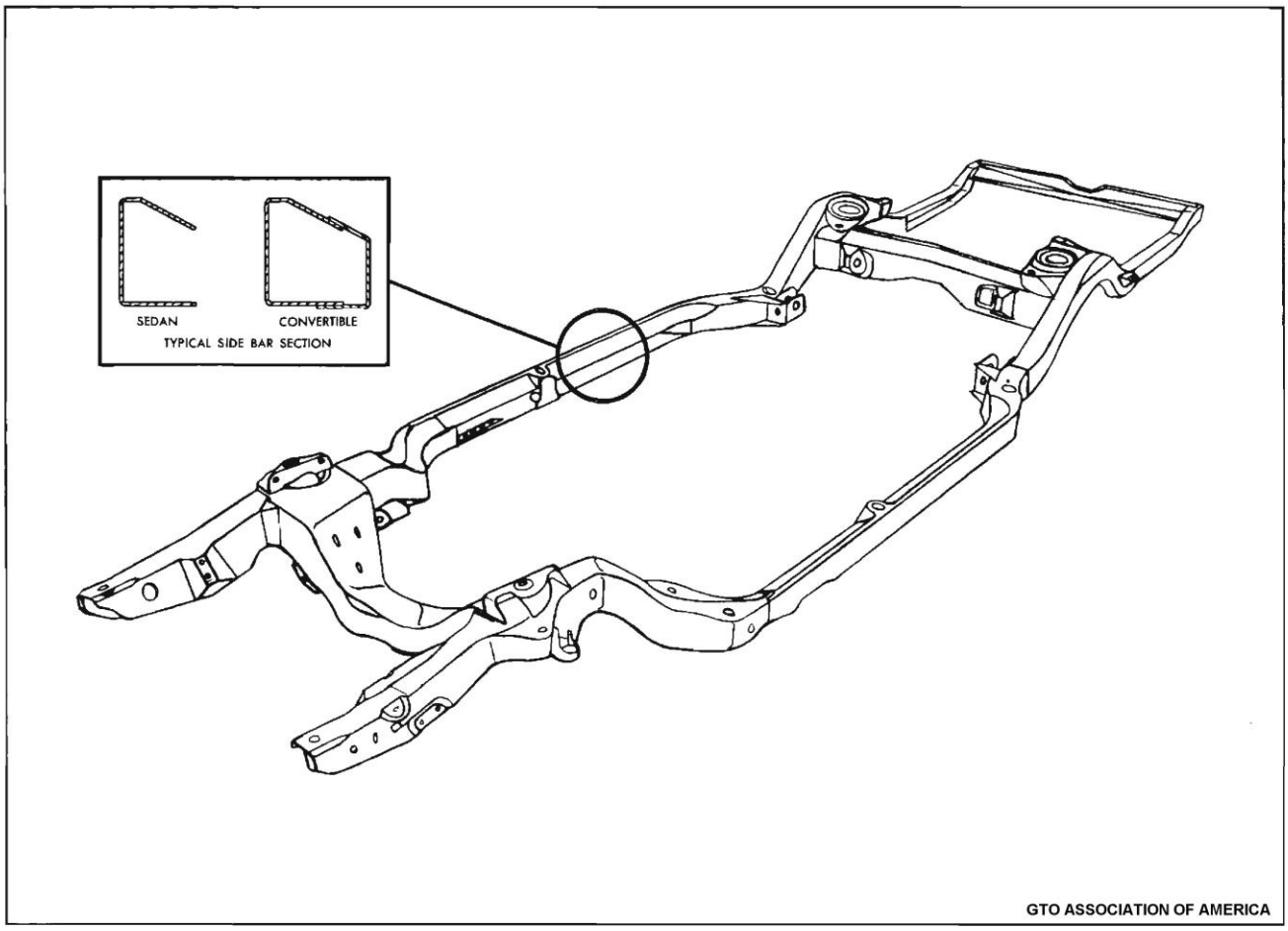


Fig. 1A-1 Perimeter Design Frame

FRAME AND BODY MOUNTINGS

GENERAL DESCRIPTION

FRAME

The Tempest swept hip perimeter design frame (Fig. 1A-1) is a basic box configuration with parallel side rails extending just under the inside edges of the body rocker panels. The side rails move inboard front and rear through blended swept hips forming a full box section for front suspension and engine mounting and a kick-up for clearance over the rear suspension.

Three major crossmembers are an integral part of the frame. The rear-most crossmember provides for impact bar attachment provisions and added rear end structural rigidity. The crossmember at the rear kick-up provides for rear suspension mounting and the front crossmember provides for engine and front suspension mounting and over-all structural rigidity. An additional crossmember, mounted in rubber, supports the rear of the transmission. The rubber mounting permits only a minimum transmission of drive train disturbances to the passenger compartment. The radiator baffle and lower support assembly mounts to the extreme front end of the frame through rubber cushions. The main function of this crossmember is to provide support for the sheet metal, but it also adds some structure to the frame assembly.

Two frames designed for optimum tuning are used for all Tempest series models (Fig. 1A-1). The basic frame for the sedans and station wagons has a fully boxed front section and open "C" section center side rails extending to the rear hip area. The convertible frame is of heavier metal thickness and has a boxed section front and center side rail with an additional inner side bar stiffener (boxed section) beginning at the rear end of the rear wheelhouse (number six body bolt) and extending rearward to the rear impact bar attaching bolts.

The dimensions given in Fig. 1A-2 may be used in checking frames.

Dimensions for X, Y and Z are not given, but are used merely to illustrate the points for taking diagonal measurements for checking the squareness of a frame. Holes are located on the frame at the approximate terminal point of the arrowheads, and can be used for this purpose.

LIFTING PONTIAC CARS WITH HOISTS

Lifting can be accomplished without adapters with drive-on type or twin post type hoists, or with hoists or lifts making contact with the front suspension lower arms or rear axle. Since the frame is the perimeter type, some hoists designed to contact side rails require adapters to raise the car without damage to parts of the exhaust system, body, floor, etc. Suppliers of the original lifting equipment should have information on adapters to use with Pontiac cars.

Fig. 1A-3 shows the proper location for placing adapters so that they correctly contact the perimeter

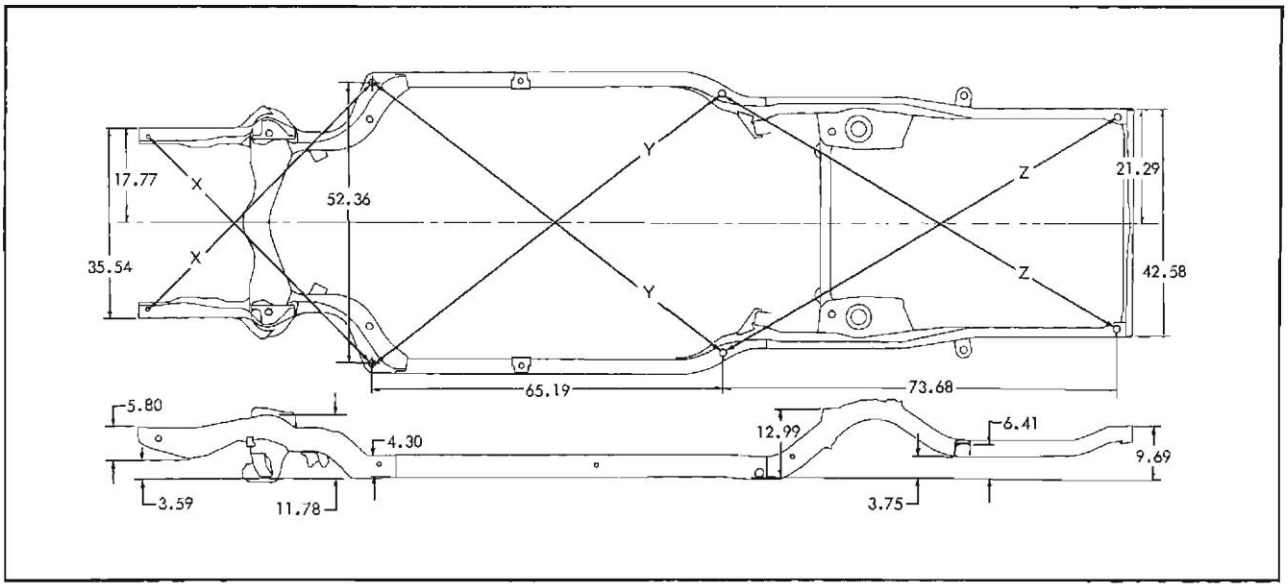


Fig. 1A-2 Frame Checking Chart

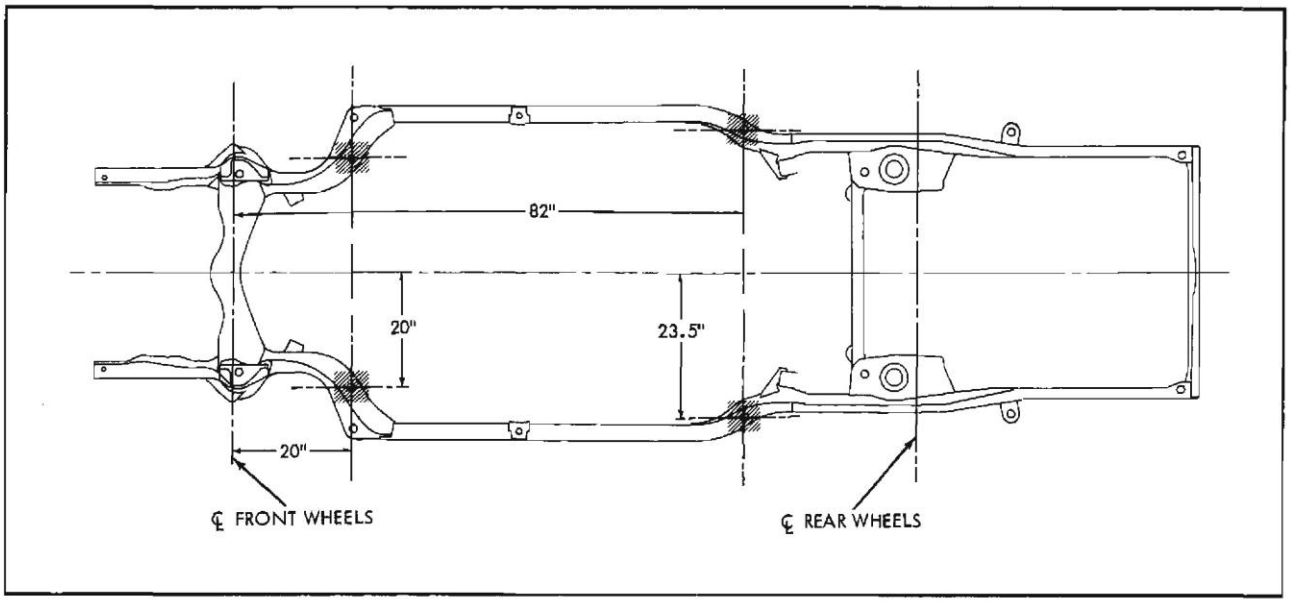


Fig. 1A-3 Proper Location for Adapters

type frame. At front of car, the supports should be 20" behind the center line of the front wheels and 20" to each side of the center line of the car. The rear supports should be placed 82" from the center line of the front wheels and 23.5" to each side of the center line of the car. The clearance at these points is 6.2" at front and 6.3" at rear.

BODY TO FRAME MOUNTINGS

Total isolation of noise to body interior is accomplished with thick soft butyl rubber mounts (Fig. 1A-4). Seven mounts are used on each side of the body for a total of fourteen mounts per car. All body mounts are the same except the chassis sheet metal mounting and No. 3 mount. The No. 3 body cage nut has a special "T" nut and requires a specific design cushion to accommodate the "T" nut.

A 2-3/16" x 7/16" - 14 hex bolt is used at position No. 3 and a 2-3/8" x 7/16" - 14 hex bolt is used at remaining positions.

All body bolts should be tightened to 25-40 lb. ft. torque.

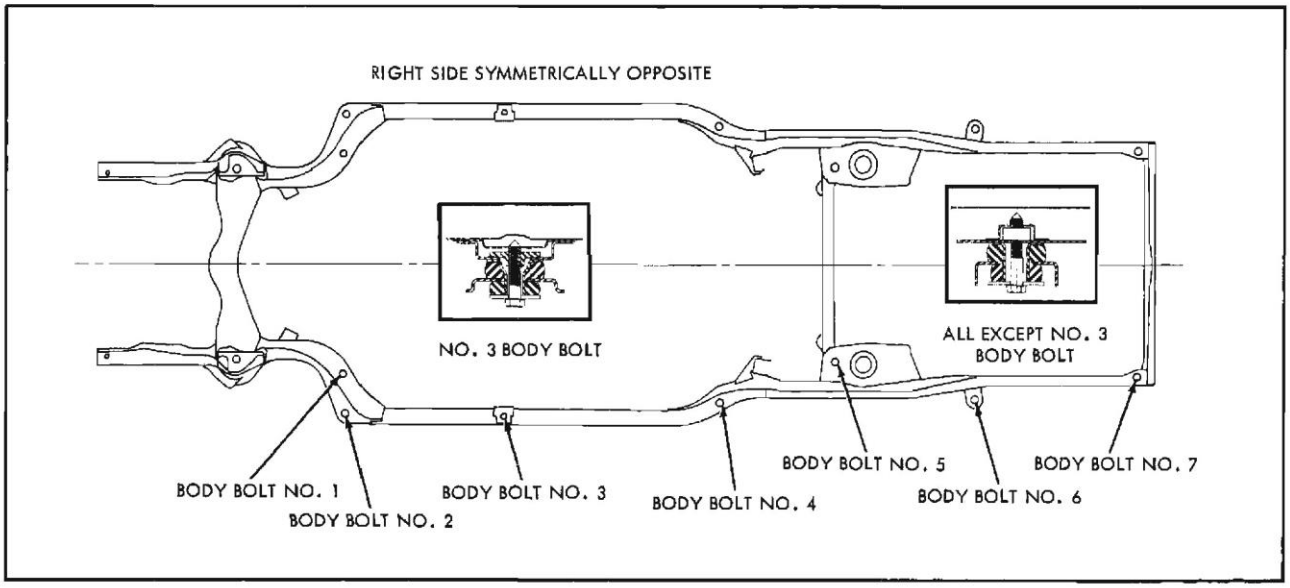


Fig. 1A-4 Location of Body Bolts on Frame