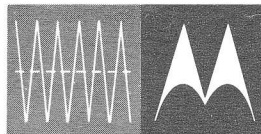


VOLKSWAGEN
4TMV SERIES

MOTOROLA



service manual

GENERAL INFORMATION

TYPE

Automotive type all-transistor superheterodyne AM radios; operate from 6 volt negative ground system. Designed for custom installation in the following vehicles:

Model 4TMVG - Karmann-Ghia

Model 4TMVT - Volkswagen - Transporter

Model 4TMVW - Volkswagen Sedan

These receivers contain 6 transistors, 2 diodes and a plated chassis board; they differ from each other in mounting hardware only.

**SERVICE STATION
PROCEDURE**

1. A defective in-guarantee radio must be accompanied by the Customer's Guarantee Policy Tag. This tag must be properly filled in by the Volkswagen dealer at the time of radio purchase. Accept as guarantee repairs only those radios within the 1 year or 12,000 miles (whichever occurs first) guarantee period. The removal or re-installation of this receiver is customarily performed by the Volkswagen dealer and is not covered by this guarantee. Also, the removal of motor noise, tire static, electrical interference, faulty installations and aerial repairs are not considered as guarantee repairs and, therefore, expenses related to such services should be handled by the car dealer.

2. Fill in Motorola Guarantee Labor Claim, Part Number 68P60016A30 and mail Green and Pink copies to:

Motorola Guarantee Service
Motorola Automotive Products, Inc.
9401 West Grand Avenue
Franklin Park, Illinois.

3. The yellow copy of the Motorola Guarantee Labor Claim is to be retained by the authorized service station for his files.

4. Defective parts for guarantee repairs made on this model are to be sent to your Motorola Distributor for free replacement supported with the defective parts return tag which you are now using.

5. Only those service shops authorized by their Motorola Distributor can perform guarantee repairs on a no-charge basis to the customer. If you are not already authorized as a Motorola Service Station and you are interested in handling this service, please contact your Motorola Distributor for complete details.

TO SET PUSHBUTTONS

Unlock pushbutton by pulling it out about 1/2" forward of its normal position. Tune in station and lock the pushbutton to the station by pushing it in firmly.

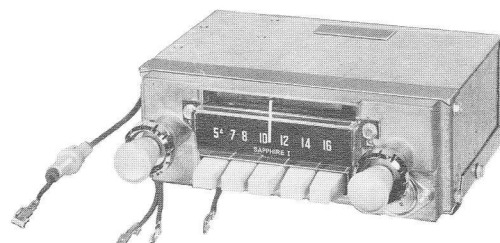
SERVICE NOTES

1. RADIO POLARITY - WHEN SERVICING THIS RECEIVER, THE "A" LEAD MUST BE CONNECTED TO THE POSITIVE SIDE OF POWER SOURCE. IF CONNECTED OTHERWISE, RECEIVER WILL NOT OPERATE AND DAMAGE TO COMPONENTS MAY RESULT.

2. POWER SUPPLY REQUIREMENTS - It is preferable to use a storage battery (without a battery charger) in place of a battery eliminator. If a battery eliminator is used, it must be well filtered and regulated and adjusted for 7.2 volts.

3. IMPORTANT SERVICE NOTE - It is important that the tape removed from the outside of the radio during servicing be replaced in the same location as originally found; this is necessary to prevent air leaks.

4. PLATED CHASSIS REMOVAL - (NOTE: Before removal of plated chassis, note location of wires and cables; they should be dressed the same when the chassis board is re-installed later.)



To remove the plated chassis for servicing, unsolder the plated chassis mounting bracket (see photo on Page 2) bend the ears straight, then spread the housing so that the bracket ears will be free of the housing. Lift chassis and bracket to a more servicable position.

NOTE: Since the bracket serves as a chassis ground, an external wire must be connected from the bracket to the radio housing.

After servicing is performed, re-install plated chassis board and bracket, then bend the bracket mounting ears over and solder to housing.

5. When replacing a power output transistor, remember to use the transistor specified in the parts list; coat both sides of the transistor insulator with DC-4 grease (Motorola Part No. 11M490487) and securely tighten the transistor mounting screws. When replacing all other transistors, use long-nose pliers as a heat sink, i. e., grasp transistor leads close to transistor base with the pliers to dissipate heat while soldering.

6. Servicing techniques applicable to these models can be found in the following Motorola publications: "Profitable Transistor Radio Servicing" (Motorola Part Number 68P60011A53) and "A Discussion of Transistorized Car Radios" (Motorola Part No. 68P64980A51).

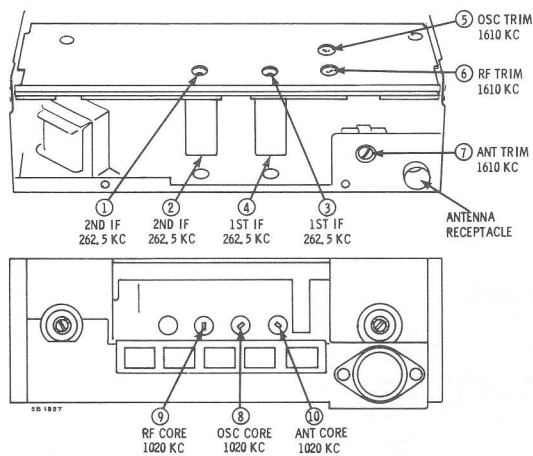
auto radio MANUAL 68P40056A86
VOLKSWAGEN
4TMV SERIES

ALIGNMENT

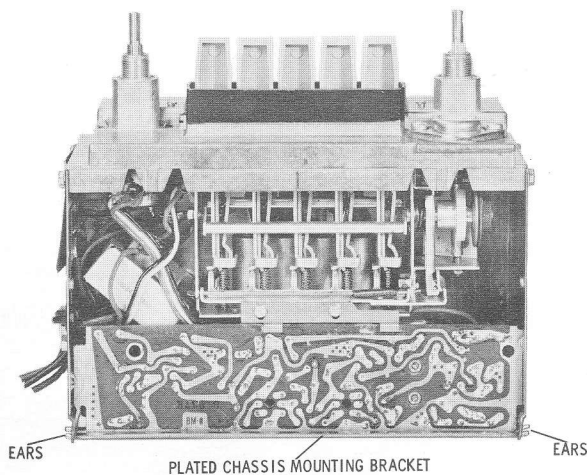
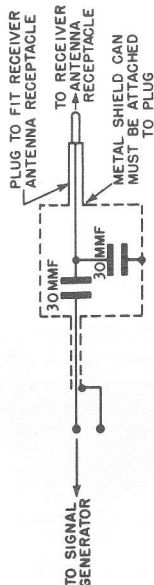
Connect an output meter across the speaker voice coil. Set volume to maximum and tone to treble. Attenuate signal generator output to maintain 2.45 volts (1 watt across 6 ohm load) on output meter at all times to prevent receiver overloading. Cover must be removed to gain access to some of the adjustments.

STEP	GENERATOR CONNECTION	GENERATOR FREQUENCY (400 cycle mod)	TUNER SET TO	ADJUST	REMARKS
IF ALIGNMENT					
1.	Antenna receptacle thru .1mf and chassis	262.5Kc	High end stop	1, 2, 3 & 4	Adjust for maximum.
RF ALIGNMENT					
2.	Antenna receptacle thru dummy (see Figure)	1610Kc	High end stop	5, 6 & 7	Adjust for maximum.
NOTE: Do not perform Steps 3, 4, 5 and 6 unless tuner has been tampered with or components have been replaced. Before proceeding with Step 3, backtuning cores as far as possible out of coil forms to eliminate their effect on trimmer adjustment. Remove dial scale, dial background, then loosen pilot light bracket mounting screw and turn bracket down to gain access to core screws.					
3.	Antenna receptacle thru dummy (see Figure)	1610Kc	High end stop	5, 6 & 7	Adjust for maximum.
4.	"	1020Kc	Tuner carriage 9/16" from high end stop	8, 9 & 10	Adjust for maximum. Use alignment tool such as GC type 9050-L.
5.	"	1610Kc	High end stop	5, 6 & 7	Adjust for maximum.
6.	Repeat Steps 4 and 5 until no further increase; Step 5 should be last step. Then cement cores in place.				
7.	Final adjustment, align antenna trimmer thru a 53mmf series capacitor	1610Kc	High end stop	7	Adjust for maximum. (NOTE: The 53mmf capacitor approximates the car antenna capacity.)
ANTENNA TRIMMER ADJUSTMENT IN CAR (IF NECESSARY)					
8.	-	--	High end stop	7	Adjust for maximum noise with radio installed in car, antenna fully extended and volume control at maximum, if needed.

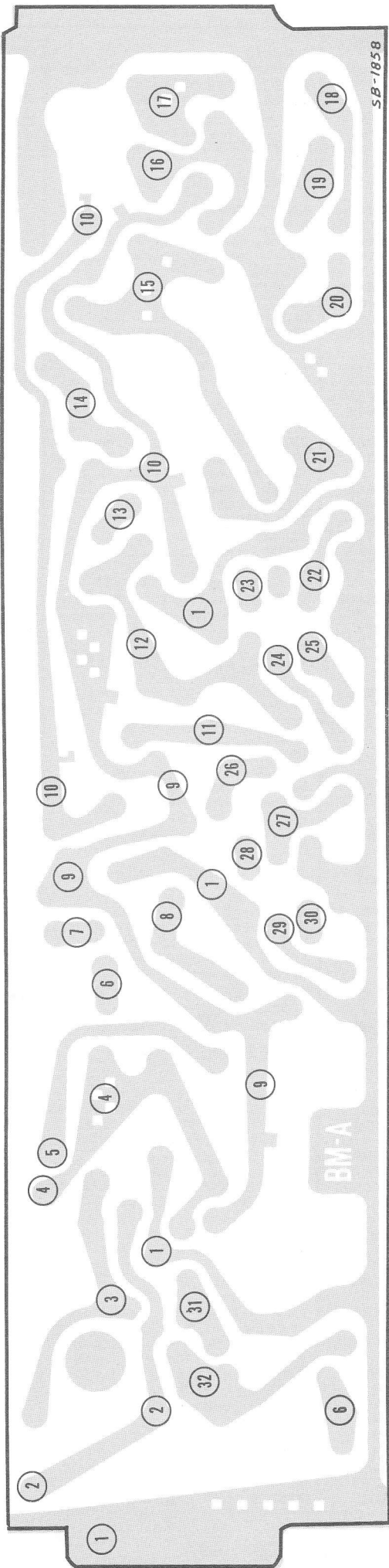
TO CALIBRATE POINTER - Tune radio to 1000Kc signal and bend pointer until center of pointer coincides with the center of the 100Kc mark on dial scale.



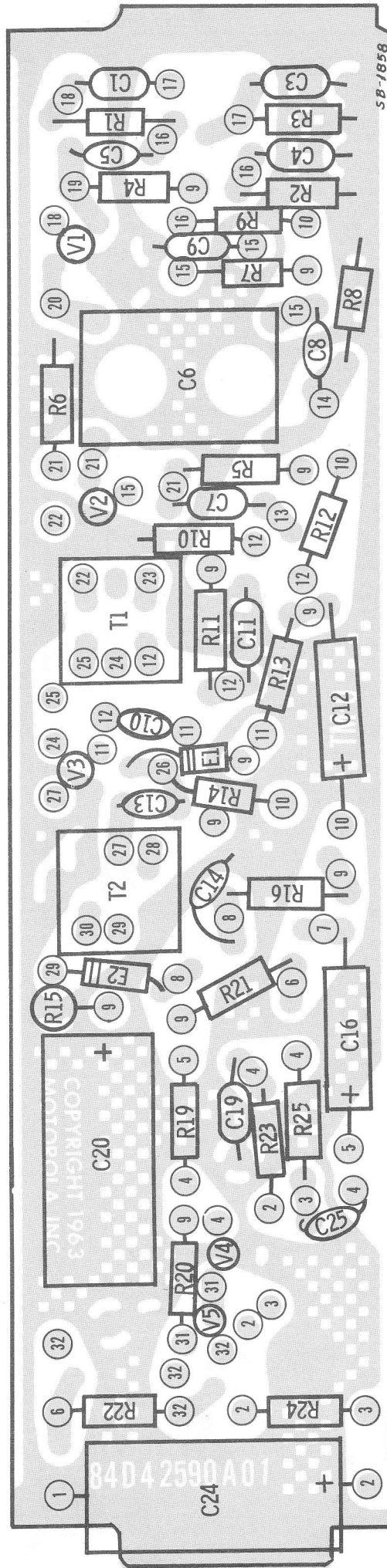
ALIGNMENT POINTS LOCATION DETAIL



PLATED CHASSIS REMOVAL



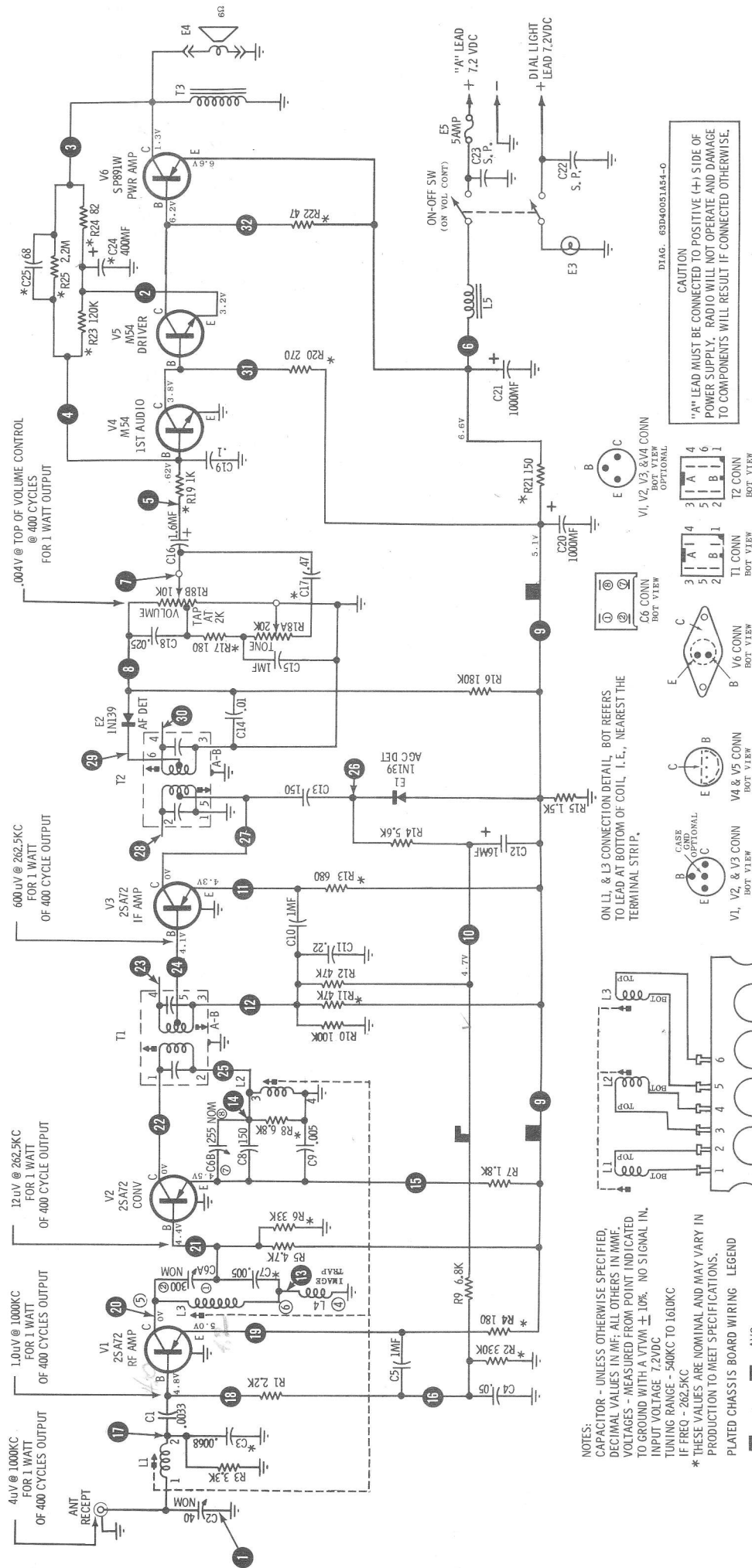
PLATED CHASSIS REFERENCE POINTS (BOTTOM VIEW)



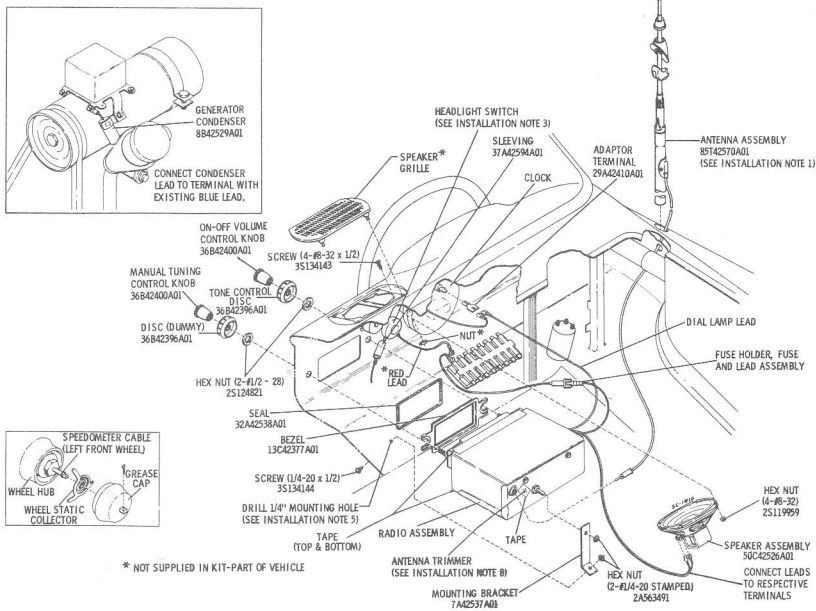
PLATED CHASSIS PARTS LOCATION & REFERENCE POINTS (TOP VIEW)

PLATED CHASSIS REFERENCE SYSTEM

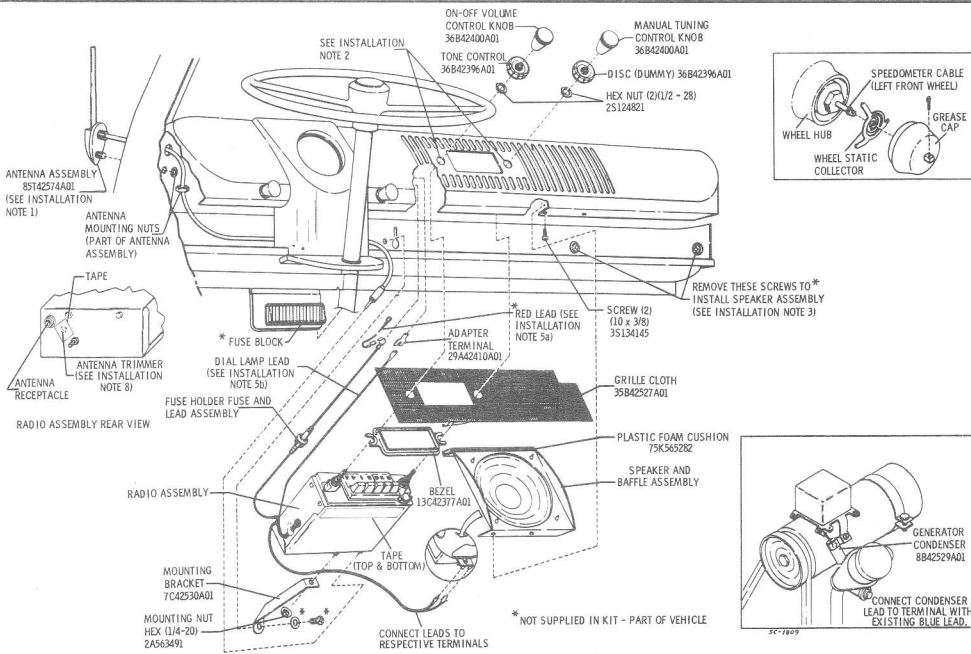
All service points accessible on the bottom of the plated chassis have been cross-referenced to the schematic by the circled reference numbers. To check the voltage at the base of the driver transistor, 1) locate the driver transistor base on schematic, 2) check reference number on schematic, 3) locate reference number on bottom view of plated chassis. To locate any specific part of the plated chassis, use the plated chassis parts location photo.



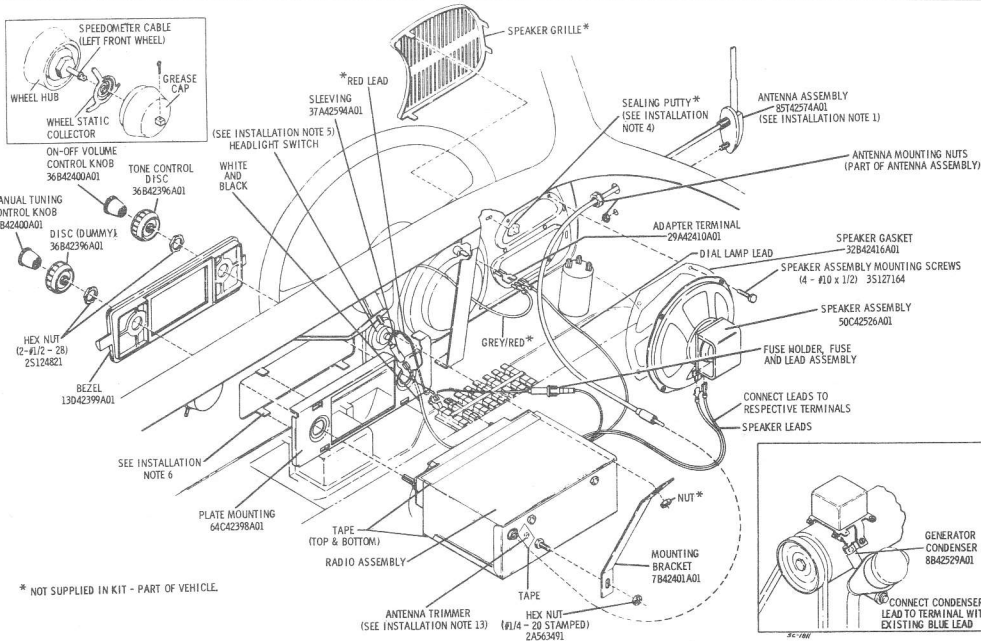
SCHEMATIC DIAGRAM



MODEL 4TMVG RADIO INSTALLATION



MODEL 4TMVT RADIO INSTALLATION



MODEL 4TMVW RADIO INSTALLATION

REPLACEMENT PARTS LIST

Ref. No.	Part Number	Description	List Price	Ref. No.	Part Number	Description	List Price
ELECTRICAL PARTS							
CAPACITORS - NOTE: The capacitors in this list are recommended replacement types for the original equipment; all are ceramic disc type unless otherwise specified.				V-2	48K134600	2SA72 (USE 48K134601).....	2.05
				V-3	48K134602	2SA72 (USE 48K134601).....	2.05
				V-4	48R134667	M54.....	2.25
				V-5	48R134667	M54.....	2.25
				V-6	48R134647	SP891 (USE 48R134646).....	5.30
C-1	21C40906A31	.0033 mf 100V (USE 21R10052A10).....	1.30	MECHANICAL PARTS			
C-2	*20B40944A06	5 to 60 mmf trimmer.....	.60	*64B42344A01	BACKGROUND, dial.....		.95
C-3	21C40906A16	.0068 mf 100V.....	.35	*13C42377A01	BEZEL, radio (4TMVG, VT)....		1.50
C-4	21C40906A02	.05 mf 100V (USE 21C40906A12).....	.35	*13D42399A01	BEZEL, radio (4TMVG).....		2.95
C-5	21K564763	1.0 mf 3V (USE 21R10003A02).....	.70	*84D42590A01	BOARD, plated chassis: less components.....		2.35
C-6	20C40481A07	C6A 250 to 390 mmf; C6B 240 to 350 mmf dual trimmer.....	1.45	*7B41644A02	CHANNEL, chassis support....		.15
C-7	21C40906A25	.005 mf 100V (USE 21C40906A15).....	.40	*15D42348A01	COVER, bottom.....		.90
C-8	21D40536A31	150 mmf 100V N750 (USE 21R124608).....	.25	*32A42538A01	GASKET, bezel (4TMVG).....		.10
C-9	21C40906A01	.005 mf 100V (USE 21B40789A01).....	.30	*32B42688A01	GASKET, bezel (4TMVG).....		.15
C-10	21K564763	1.0 mf 3V (USE 21R10003A02).....	.70	*5K611519	GROMMET, insul (radio hsg)....		.05
C-11	21C40906A08	.22 mf 100V.....	.50	14A543810	INSULATOR, trans mtg.....		.10
C-12	23C41928A13	16 mf 16V lytic (USE 23C41928A06).....	.90	*36B42400A01	KNOB, on-off, vol & tuning..		.35
C-13	21D40339A44	150 mmf 100V.....	.20	*36B42396A01	KNOB, tone & dummy.....		.40
C-14	21D40339A08	.01 mf 100V.....	.20	29A541679	LUG, terminal: blade type (spkr lead).....		.05
C-15	21K564765	1.0 mf 3V (USE 21K565267).....	.45	29C41506A01	LUG, terminal (fuse recept)....		.90
C-16	23C41928A09	1.6 mf 25V lytic (USE 23C41928A05).....	.90	29K534326	LUG, terminal (pilot light & spkr lead).....		.05
C-17	21K564764	.47 mf 3V (USE 21R10003A01).....	.45	*64C42398A01	PLATE, adaptor mtg.....		.35
C-18	21D40339A64	.025 mf 100V.....	.35	9A531066	RECEPTACLE, ant.....		.15
C-19	21C40906A06	.1 mf 100V (USE 21B40789A03).....	.35	*9C41095A14	RECEPTACLE, fuse.....		.90
C-20	*23C41928A10	1000 mf 10V lytic.....	1.40	*3C42349A01	SCALE, dial.....		.80
C-21	23C41928A10	1000 mf 10V lytic.....	1.40	3K560695	SCREW, trans mtg.....		.03
C-22	*64A41668A01	PLATE, spark.....	.08	*3S134015	SCREW, tpg: #8 x 5/8 (spkr to spkr plate - 4TMVT)....		.05
C-23	64A41668A01	PLATE, spark.....	.08	3B40245A02	SCREW, mach: 4-40 x 5/16 (pilot socket).....		.03
C-24	23C41928A16	400 mf 10V lytic (USE 23C41928A15).....	1.55	9K564923	SOCKET, pilot light.....		.90
C-25	21D40536A44	68 mmf 100V N750 (USE 21D40536A32).....	.25	INSTALLATION PARTS & ACCESSORIES			
MISCELLANEOUS ELECTRICAL PARTS				*85T42570A01	ANTENNA, radio: compl. (4TMVG).....		9.90
E-1	48C134587	DIODE, 1N139.....	.70	*85T42574A01	ANTENNA, radio: compl. (4TMVG, VT).....		7.50
E-2	48C134587	DIODE, 1N139.....	.70	3A40730A01	BOLT, rec mtg: 1/4-20 x 23/32.....		.03
E-3	65S125595	LAMP, pilot: 6.3V-.15A.....	.30	*7A42537A01	BRACKET, rec mtg (4TMVG)....		.15
E-4	*50C42526A01	SPEAKER, 5" PM (4TMVG,W)....	7.50	*7B42530A01	BRACKET, rec mtg (4TMVT)....		.20
	*50C42529A01	SPEAKER, 6" PM (4TMVT)....	8.35	*7B42401A01	BRACKET, rec mtg (4TMVG)....		.20
E-5	65R122345	FUSE, 5 amp.....	.03	*8B42529A01	CAPACITOR, generator.....		.90
COILS & CHOKES				*29A42410A01	LUG, adaptor (pilot light lead).....		.08
L-1,2,3		SEE TUNER PARTS		2A563491	NUT, hex: 1/4-20 (brkt to rec mtg).....		.03
L-4	*24C40788A11	IMAGE TRAP.....	.05	2B521926	NUT, hex: 1/4-20 (bolt mtg)....		.03
L-5	*25D42032A07	FILTER.....	1.95	*2S119959	NUT, hex: 8-32 (spkr mtg)....		.05
RESISTORS - NOTE: All resistors are insulated composition type unless otherwise specified.				*2S124821	NUT, hex: 1/2-28 (rec mtg)....		.03
R-1	6R129875	2200 10% 1/2W.....	.17	*3S134144	SCREW, mach: 1/4-20 x 1/2 (rec mtg - 4TMVG).....		.05
R-2	6R128227	330K 10% 1/2W.....	.17	*3S134145	SCREW, tpg: 10-20 x 3/8 (spkr mtg - 4TMVT).....		.05
R-3	6R124506	3300 10% 1/2W.....	.17	*41B42528A01	SPRING, static coil: wheel..		.40
R-4	6R129662	180 10% 1/4W.....	.17	TUNER PARTS			
R-5	6R121847	4700 10% 1/2W.....	.17	43K471633	BEARING, ball.....		.03
R-6	6R127632	33K 10% 1/2W.....	.17	*38B42343A01	BUTTON, push.....		.15
R-7	6R122445	1800 10% 1/2W.....	.17	1V564641	CLUTCH DISC: incl set screw.		.25
R-8	6R119930	6800 10% 1/2W.....	.17	*1V42300A95	COILS & PLATE ASSEM: incl L-1,2,3 & mtg plate.....		1.75
R-9	6R119930	6800 10% 1/2W.....	.17	76K563223	CORE, iron: osc.....		.30
R-10	6R125534	100K 10% 1/2W.....	.17	76C40706A02	CORE, iron: RF & ant.....		.30
R-11	6R125892	47K 10% 1/2W.....	.17	*1B40220A03	GEAR, BUSHING & DISC ASSEM..		.55
R-12	6R125892	47K 10% 1/2W.....	.17	5B562438	GROMMET, core mtg.....		.10
R-13	6R129101	680 10% 1/2W.....	.17	*45A41454A01	LINK, connecting.....		.05
R-14	6R127005	5600 10% 1/2W.....	.17	*52B42600A01	POINTER & ARM ASSEM.....		.20
R-15	6R127513	1500 10% 1/2W.....	.17	49A562480	ROLLER, clutch release.....		.05
R-16	6R125531	180K 10% 1/2W.....	.17	1V562830	SCREW & NUT ASSEM: adj.....		.15
R-17	6R128952	180 10% 1/2W.....	.17	3A563128	SCREW, ret: 4-40 x 5/16 (clutch disc).....		.10
R-18	*18C42340A01	VOLUME, tone & sw.....	3.05	3S132220	SCREW, tpg: #4 x 5/16 (to secure coils & plate assem)		.05
R-19	6R121301	1000 10% 1/2W.....	.17	*1B42375A01	SHAFT, manual tuning; assem: incl "C" washers.....		.75
R-20	6R131179	270 10% 1/2W.....	.17	41A562449	SPRING, anti-rattle.....		.05
R-21	6R124797	150 10% 1/2W.....	.17	41A562447	SPRING, clutch release.....		.03
R-22	6R127542	47 10% 1/2W.....	.17	41A41255A01	SPRING, conn link.....		.03
R-23	6R127540	120K 10% 1/2W.....	.17	41B41805A01	SPRING, pointer tension.....		.15
R-24	6R127516	82 10% 1/2W.....	.17	*77D42372A01	TUNER, AT-468: complete.....		24.85
R-25	6R127001	2.2 meg 10% 1/2W.....	.17	4A562431	WASHER, cup.....		.03
TRANSFORMERS				4K692188	WASHER, "C" (pointer).....		.03
T-1	*24D42517A01	1ST I.F.....	1.60	4K501364	WASHER, "C" (tuning shaft)....		.03
T-2	*24D42517A02	2ND I.F.....	1.40	4A501015	WASHER, "C" (tuning shaft)....		.03
T-3	*25D42101A06	OUTPUT.....	2.75				
TRANSISTORS							
V-1	48K134601	2SA72.....	2.05				

*NEW ITEM, APPEARS IN ANY LIST FOR FIRST TIME.