2.3

The door locks operate only from the outside and are actuated by a quarter turn of the key.

LOCK

UNLOCK

2.4

The front access cover can be opened by pulling a control knob located generally under the steering post or alternatively located on the lower left side of the dash panel.

ALTERNATE LOCATION

NORMAL LOCATION
INCLUDED IN THIS MANUAL ARE SAFETY PRECAUTIONS AND TOWING PROCEDURES FOR YOUR BRADLEY GT ELECTRIC.

WE RESERVE THE RIGHT TO MAKE MODIFICATIONS OR REVISIONS IN EQUIPMENT OR ACCESSORIES WITHOUT PRIOR NOTIFICATION.
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BRADLEY AUTOMOTIVE 14414 21ST AVENUE NORTH, PLYMOUTH, MN 55441
2.1

KEYS

YOUR BRADLEY GT ELECTRIC IS SUPPLIED WITH THREE (3) KEYS. ONE KEY TO FIT THE IGNITION AND ONE KEY FOR EACH DOOR LOCK.

2.2

THE IGNITION KEY IS OPERATED BY INSERTING THE KEY INTO THE SWITCH AND TURNING TO THE SPRING LOADED POINT IN THE SWITCH.

AS YOUR SWITCH IS TURNED TO THE "ON" POSITION, ALL OF YOUR ACCESSORIES WILL OPERATE (WIPERS, RADIO, ETC.) AND ALSO THE STEERING WHEEL WILL BECOME UNLOCKED, IF EQUIPPED.
1.3

THE SERIAL NUMBER OF YOUR CONTROLLER IS LOCATED ON THE LEFT SIDE.

PLEASE RECORD YOUR SERIAL NUMBERS IN THE SPACES PROVIDED.

BODY MODEL NO.

SERIAL NO.

CHASSIS NO.

CONTROLLER NO.
1.1.

THE MODEL AND SERIAL NUMBER OF THE BODY IS LOCATED ON THE LEFT FRONT DOOR POST WITH IN EASY VIEW OF THE DRIVER WITH THE LEFT DOOR OPEN.

1.2

THE CHASSIS NUMBER IS LOCATED UNDER THE REAR CARPET JUST IN FRONT OF THE ACCESS COVER FOR THE SHIFTER. (6" BEHIND FRONT SEATS, ON TOP OF TUNNEL).

PLEASE QUOTE THE MODEL NUMBER IN ORDERING ALL PARTS AND ACCESSORIES REQUIRED FOR YOUR VEHICLE.
2.5

THE REAR ACCESS CONTROL AND REAR WINDOW CONTROL HANDLES ARE LOCATED ON THE LEFT REAR DOOR POST.

THE UPPER CONTROL HANDLE IS FOR THE REAR WINDOW

THE LOWER CONTROL HANDLE IS FOR THE REAR ACCESS TO CONTROLLER

2.6

TO OPEN THE FRONT AND REAR ACCESS OR REAR WINDOW PULL ON THE CORRECT KNOB AND THE COVER OR WINDOW SHOULD "POP" UP. IF THE APPROPRIATE COVER DOES NOT OPEN, PULL THE KNOB SLIGHTLY AND LEAVE IN THIS POSITION, NOW, LIFT GENTLY ON THE COVER OR WINDOW YOU WOULD LIKE OPENED.
DIAGRAM 2.7 GAUGES

POWER CONTROL SWITCH
"UP POSITION" - 48V CRUISE
"DOWN POSITION" - 96V BOOST
- CHARGE BATTERIES

A
SPEEDOMETER
REGISTERs MPH AND KPH,
ODOMETER SHOWS TOTAL MILES
TRAVELED, TRIP METER SHOWS
MILES DRIVEN PER MOST RECENT
BATTERY CHARGE

B
MOTOR VOLTS
SHOWS AT A
GLANCE WHICH
POSITION 48V/
96V IS IN

C
ACCESSORY VOLTS
SHOWS CHARGE OF
ACCESSORY 12 VOLT
BATTERY NORMALLY
11.5 TO 13.2 VOLTS

D
STATE OF CHARGE
REGISTERs ONLY IN 96V
POSITION.
SHOWS REMAINING ENERGY
IN BATTERIES

E
MOTOR CURRENT
SHOWS CURRENT DRAW OF
MOTOR.
SHOULD NOT EXCEED
125 AMPS

FOR FURTHER INFORMATION CONCERNING THESE GAUGES, REFER TO
THE FOLLOWING PARAGRAPHS.
MAKE SURE THAT ALL CONTROL KNOBS ARE IN THE
CLOSED OR PUSHED IN LOCATION WHEN THE VEHICLE
IS IN MOTION.

2.7

DASH LAY OUT

LOCATED ON THE INSTRUMENT PANEL OF YOUR BRADLEY GT
ELECTRIC ARE FIVE (5) GAUGES AND FIVE (5) ROCKER
SWITCHES. ALSO, YOU WILL FIND A POWER CONTROL
SWITCH LOCATED ON THE DASH PANEL BETWEEN THE
STEERING COLUMN POST AND INSTRUMENT PANEL

(SEE DIAGRAM 2.7)
2.76

MOTOR VOLTS

THIS INDICATES, AT ALL TIMES, THE BATTERY VOLTS AVAILABLE AND IN SOME WAYS PROVIDES SIMILAR INFORMATION TO THE STATE - OF - CHARGE METER.

2.77

POWER CONTROL SWITCH

THIS IS A TWO POSITION SWITCH WHICH IN THE UP OR "CRUISE" MODE OPERATES THE DRIVE MOTOR AT 48 VOLTS. IN THIS MODE EXTENDED MILEAGE IS GAINED AND BATTERY LIFE IS EXTENDED. IN THE 96V POSITION, ADDITIONAL POWER IS DELIVERED TO THE MOTOR, RESULTING IN FASTER ACCELERATION, BUT FASTER BATTERY DRAINAGE. THIS SWITCH MUST BE IN THE 96V POSITION TO PROPERLY CHARGE THE BATTERIES.
2.72

**SPEEDOMETER**

Reading 0 to 85 MPH or 0 - 115 KPH

The instrument also indicates the vehicle mileage and the mileage of your last trip, if you set the knob on the instrument to zero before starting out.

2.73

**ACCESSORY VOLTS**

This meter records the voltage across your 12 volt lighting and accessory battery. This battery is automatically charged when you charge your main 96 volt battery.

2.74

**STATE OF CHARGE METER**

This meter indicates if you are in the 96 volt mode the remaining energy in your battery. A battery which is considered empty (E) provides only 75 volts and should be recharged as soon as possible. Do not be concerned if your battery indicates "overfull" when fully charged, this is quite normal.

2.75

**MOTOR CURRENT**

This indicates the instantaneous current drawn by the motor. The meter itself is reading directly across a shunt on the motor terminals. Generally, when driving, if the motor current exceeds 125 amps a driver normally changes down a gear.
2.8 SWITCHES

B HEAD LAMP SWITCH 2 POSITION
FIRST POSITION - TURNS ON ALL LIGHTS EXCEPT FOR HEADLIGHTS
SECOND POSITION - TURNS ON ALL LIGHTS INCLUDING HEAD LAMPS MUST BE IN THIS POSITION FOR HEADLIGHTS TO OPEN.

A HEAD LAMP DOOR SWITCH
OPERATES HEAD LAMP DOORS ONLY AFTER HEAD LAMPS ARE TURNED ON.
INDICATOR LIGHT SHOWS WHEN HEAD LAMPS ARE OPEN
- HIGH/LOW BEAMS ARE CHANGED BY TAPPING TURN SIGNAL ARM TOWARD DRIVER, INDICATOR IS BLUE LIGHT BETWEEN SPEEDOMETER AND MOTOR VOLTS

C HAZARD WARNING SIGNAL SWITCH
ALL DIRECTIONAL LIGHTS FLASH WHEN THIS SWITCH IS DEPRESSED.
THIS SWITCH MUST BE USED ONLY WHEN VEHICLE IS STALLED OR OBSTRUCTING TRAFFIC.
2.9 FOOT CONTROLS

A. ACCELERATOR: DEPRESS TO INCREASE MOTOR RPM (REVOLUTION PER MINUTE)

B. BRAKE PEDAL: DEPRESS TO APPLY BRAKES

C. CLUTCH PEDAL: DEPRESS TO DISENGAGE CLUTCH

2.10 HAND BRAKE

IS LOCATED BETWEEN THE BUCKET SEATS WITH A RELEASE BUTTON ON THE TOP OF HANDLE

RELEASE BUTTON

TO APPLY: LIFT HANDLE AND PULL UP TIGHTLY

TO RELEASE: LIFT HANDLE SLIGHTLY, AND PUSH RELEASE BUTTON. LET HANDLE PULL ITSELF DOWN TOWARD THE FLOOR BOARDS.

CAUTION: HANDBRAKE MUST BE APPLIED AT ALL TIMES WHEN VEHICLE IS LEFT UNATTENDED, AS THE MOTOR WILL NOT STOP THE VEHICLE FROM MOVING EVEN IF LEFT IN GEAR.
(D) WIPER SWITCH 2 POSITION
FIRST POSITION - OPERATES WIPERS ON LOW SPEED
SECOND POSITION - OPERATES WIPERS ON HIGH SPEED

(E) HEATER SWITCH (OPTIONAL 48V/96V SWITCH)
TURNS OFF AND ON HEATER FOR DEFOG.
THIS IS NOT A 12V FUNCTION AND WILL NOT TURN OFF WITH THE IGNITION KEY.
PLEASE READ AND UNDERSTAND THIS ENTIRE SEQUENCE BEFORE PROCEEDING AS YOU WILL FIND THAT LATER INSTRUCTIONS ARE VERY DEPENDENT UPON CORRECTLY COMPLETING PRIOR STEPS.

3.1 PRELIMINARY TESTING

A. COMPLETE 12V BATTERY TEST OUTLINED IN ACCESSORIES PART OF STRUCTURAL PLANS.

1. THESE FIRST 6 STEPS SHOULD BE PERFORMED BEFORE CONNECTING ANY 48V BATTERY PACKS TOGETHER OR CONNECTING THE CONTROLLER TO MOTOR CONNECTIONS.

2. RECHECK ALL OF YOUR BATTERY CONNECTIONS FOR PROPER ROUTING AND WIRING OF BATTERY PACKS. PLEASE MAKE SURE THAT ALL CABLES ARE NOT KINKED SHARPLY OR THAT THEY ARE NOT RUNNING AGAINST ANY SHARP CORNERS. CORRECT THESE PROBLEMS NOW, BEFORE THEY CAUSE ANY FUTURE MALFUNCTIONS.

3. DISCONNECT THE FOLLOWING ELECTRICAL PARTS (REFER TO DIAGRAMS IF NECESSARY).

A. THE STATE OF CHARGE GAUGE ON DASH PANEL (BOTH WIRES) (DIAGRAM 2.7).

B. BOTH LARGE 400 AND FUSES BY LOOSENING END BOLTS AND SWINGING ONE END AWAY FROM STUD MOUNTING TERMINAL (MAKING SURE THAT THE END THAT HAS BEEN SWUNG DOES NOT TOUCH ANY METAL PARTS).

C. SMALL FUSE ON LEFT REAR OF CONTROLLER 15 AMP SLOW BLOW (WHITE IN COLOR) (SEE DIAGRAM 3.1).
PROCEDURE:

1. MAKE SURE TO DISCONNECT 2 LARGE FUSES 1 SMALL FUSE.

2. OBTAIN A VOLT-METER WITH SCALES UP TO 125V D.C.

3. CONNECT THE VOLT-METER TO THE FRONT BATTERY PACK, OBSERVING PROPER POLARITY. THE VOLTAGE SHOULD READ 45 TO 55 VOLTS D.C. DEPENDING ON BATTERY CHARGE. SEE DIAGRAM 3.1b.

4. CONNECT THE VOLT-METER TO THE REAR BATTERY PACK. THE VOLTAGE SHOULD ALSO BE 45-55V D.C. WITH PROPER POLARITY. SEE DIAGRAM 3.1b.
DISCONNECT BOTH FUSES

DISCONNECT SMALL 15 AMP FUSE
DIAGRAM 3.1 C IN 48V POSITION
PROCEDURE CONTINUED:

5. DOUBLE CHECK THE POLARITY AND CORRECT ANY OTHER DEFECTS BEFORE CONNECTING THE BATTERY PACKS TO THE CONTROLLER.

6. NOW CONNECT THE BATTERY PACKS TO THE CONTROLLER, AND OBSERVE FOR ANY WIRING PROBLEMS OR DIRECT SHORTING TO ANY COMPONENTS.

7. DISCONNECT BATTERY PACKS AND RECONNECT BOTH 400 AMP FUSES MAKING SURE THAT ALL MOUNTING HARDWARE IS TIGHTENED SECURELY. ALSO AT THIS TIME CHECK ALL OTHER CONNECTIONS ON THE CONTROLLER AND RETIGHTEN ALL WIRE SCREW TERMINALS.

8. MOVE 48/96V SWITCH TO 48V CRUISE POSITION.

9. RECONNECT THE BATTERY PACKS AND TAKE THE FOLLOWING VOLTAGE READINGS:

A. LOCATE "NEG" TERMINAL IN CONTROLLER (USE THIS AS COMMON OR NEUTRAL) (REFER TO DIAGRAM 3.1 C IF NECESSARY).

B. MEASURE VOLTAGE FROM "NEG" TERMINAL TO ONE 400 AMP FUSE. THIS SHOULD BE 45-55 VOLTS DEPENDING AGAIN ON BATTERY CHARGE (WITH CORRECT POLARITY).

C. MEASURE FROM THE OTHER 400 AMP FUSE TO THE "NEG" TERMINAL AND AGAIN THIS SHOULD BE 45-55 VOLTS WITH PROPER POLARITY.
D. SWITCH 48/96V SWITCH TO 96V POSITION. NOW CONNECT VOLTOMETER TO "NEG" TERMINAL AND HIGHER PLACED 400 AMP FUSE. THE VOLTAGE SHOULD BE BETWEEN 90 TO 110V D.C. WITH PROPER POLARITY, WITH 45 TO 55V ON LOWER 400 AMP FUSE. SEE DIAGRAM 3.1 D.
10. REINSTALL SMALL 15 AMP FUSE IN CONTROLLER, AND PERFORM THE FOLLOWING CHECKS:

A. TURN ON IGNITION SWITCH. AN AUDIBLE CLICK SHOULD BE HEARD. IF NOT, CHECK THE FOLLOWING:
   a. 12V BATTERY CONNECTIONS
      1. PROPER FUNCTIONING OF IGNITION SWITCH
      2. PROPER WIRING OF HARNESS ON CONTROLLER, DASH OR MAIN HARNESS
      3. FUSE THAT IS "BURNED" OUT
      4. GROUNDING OF CONTROLLER
      5. CORRECT ANY OR ALL PROBLEMS BEFORE PROCEEDING
   b. USING A VOLTOMETER ON A 0-20V SCALE, CHECK THE VOLTAGE FROM GROUND TO TERMINAL #15 ON THE RELAY WITH PROPER POLARITY. SHOULD READ 11.5 TO 13.2 VOLTS. IF NOT, CHECK: (DIAGRAM 3.1 E)
      1. LOW CHARGE 12V BATTERY
      2. FAULTY WIRING CONNECTIONS
      3. INADEQUATE GROUND OF CONTROLLER BOARD.
2. Locate the current limit adjustment "pot" (Diagram 4.2) and turn to a maximum of the 5 on the setting scale.

3. Locate the "creep or crawl" adjustment pot, and proceed as follows (in 48V position) (Diagram 4.2).
   
   A. Have your assistant depress clutch and then turn on ignition switch.
   
   B. An audible click will be heard.
   
   C. After waiting about 3 seconds have your assistant depress accelerator.
   
   D. As the accelerator is depressed, another click will be heard and the motor will have a faint growl upon start up.
   
   E. Without further pressing of accelerator pedal, switch into 96V position. Another click will be heard with a noticeable difference in motor noise.
   
   F. Release accelerator pedal and switch back to 48V position.
   
   G. Have your assistant depress the accelerator again while adjusting "creep" pot. The sound
ADJUSTMENTS TO CONTROLLER UNIT.

A. BEFORE PROCEEDING, MAKE SURE OF THE FOLLOWING:

1. SECTION III ON TESTING OF 48V/96V COMPONENTS ARE COMPLETED CORRECTLY.

2. VEHICLE IS IN NEUTRAL WITH THE EMERGENCY BRAKE APPLIED.

3. 48/96V SWITCH IS IN THE 48V POSITION.

4. AN ASSISTANT SHOULD BE AVAILABLE TO FACILITATE ADJUSTMENTS OF THE CONTROLLER.

5. A JEWELERS FLAT SCREWDRIVER IS ON HAND.

B. PROCEDURE.

1. OPEN CONTROLLER CARD COVER BY LIFTING ON BEVELLED SURFACE AND OPENING COMPLETELY (SEE DIAGRAM 4.1).

NOTE:
OPEN COVER PLATE BY GENTLY PRYING OPEN WITH A SCREW DRIVER.
PROCEDURE CON'T.

THAT SHOULD BE HEARD IS A VERY SLOW GROWL JUST WHEN THE ACCELERATOR IS DEPRESSED AND RELAY OPENS.

H. THE ADJUSTMENT FOR THE "CREEP OR CRAWL" POT IS GENERALLY AT JUST AT OR OVER ITS MINIMUM COUNTER CLOCKWISE (CCW) POSITION.

I. AFTER COMPLETING THESE ADJUSTMENTS AND CLOSING THE COVER, YOU ARE NOW READY TO ROAD TEST THE VEHICLE.
5.4 ENSURE GEAR SELECTOR IS IN NEUTRAL.

5.5 DEPRESS CLUTCH AND TURN IGNITION KEY FULLY TO THE RIGHT (ON).

NOTE: DO NOT DEPRESS ACCELERATOR WHILE TURNING "IGNITION" ON OR THE SYSTEM WILL AUTOMATICALLY LOCK ITSELF IN A "NON-START" MODE.

5.6 WITH CLUTCH DEPRESSED SLOWLY INCREASE ACCELERATOR PRESSURE AND THE DRIVE MOTOR WILL START TO TURN.

5.7 SELECT 1ST GEAR AND WITH ACCELERATOR STILL SLIGHTLY DEPRESSED, SLOWLY RAISE CLUTCH PEDAL AND VEHICLE WILL MOVE FORWARD.

5.8 AT ABOUT 15 MPH (20 KPH) LIFT FOOT FROM THE ACCELERATOR AND DEPRESS CLUTCH FULLY, MEANWHILE SELECTING 2ND GEAR (BOTTOM LEFT).

5.9 LIFT CLUTCH SLOWLY. AT THE SAME TIME DEPRESS THE ACCELERATOR. A SMOOTH TRANSITION IS ACCOMPLISHED IN THIS WAY.

5.10 CARRY ON ACCELERATING THE VEHICLE UP THROUGH THE GEARS IN THIS MANNER USING THE FOLLOWING APPROXI-
WHEN DRIVING YOUR ELECTRIC VEHICLE, THE 48V MODE POSITION SHOULD BE USED AT ALL TIMES FOR ECONOMY AND ELIMINATION OF EXCESSIVE JERKING OF VEHICLE ON INITIAL ACCELERATION OF VEHICLE UNDER POWER FROM A STANDSTILL.

THE OPERATION OF YOUR ELECTRIC VEHICLE IS VERY SIMILAR TO THAT OF A GAS POWERED VEHICLE IN REGARDS TO CLUTCH OPERATION AND SELECTION OF GEAR IN FORWARD AND REVERSE.

PROCEDURE:

5.1 ENSURE THE WALL SOCKET POWER SUPPLY IS DISCONNECTED FROM THE VEHICLE.

5.2 WHEN DRIVING THE VEHICLE FOR THE FIRST TIME, SIT IN SEAT AND ADJUST IT FOR A COMFORTABLE POSITION BY MEANS OF SMALL 6 INCH LEVER AT THE REAR LEFT HAND SIDE OF DRIVER'S SEAT.

5.3 SELECT "POWER CONTROL SWITCH" ON THE DASH ADJACENT TO RIGHT HAND SIDE OF THE STEERING WHEEL TO 48V CRUISE. (THIS IS MERELY AN OPTION, FOR SMOOTHER FIRST-TIME DRIVING.)
MATE GEAR CHANGE/SPEEDS:

2ND GEAR SELECTION AT 15 MPH (20 KPH)
3RD GEAR SELECTION AT 30 MPH (40 KPH)
4TH GEAR SELECTION AT 40-45 MPH (55-60 KPH)

THESE GUIDELINES ARE FOR AVERAGE DRIVING CONDITIONS ONLY, WITH VARIANCES, CONTINGENT UPON CLIMATE, ROAD AND TERRAIN CONDITIONS AND ACCELERATION NEEDED.

5.11 WHEN MEETING HILLS OR GRADIENTS, CHANGE DOWN AND
NORMALLY SELECT "BOOST" MODE OF DRIVING IF CAR
SPEED FALLS DOWN TO THE ABOUT GEAR CHANGE/SPEEDS.

WHEN IT BECOMES NECESSARY TO DOWN SHIFT BY EXCESSIVELY HIGH
AMPERAGE READING OVER 125 AMPS, DOWNSHIFT IN THE SAME MANNER
AS IN A GAS VEHICLE. BY DOING THIS, THE LIFE EXPECTANCY OF
BOTH THE MOTOR AND BATTERIES WILL BE EXTENDED.

5.12 USEFUL HINTS

5.121 IF WITHIN STARTING IN THE 48V POSITION A
NOTICEABLE JERK IS FELT RATHER THAN SMOOTH
5.13 BOOST AND CRUISE SELECTION

5.131 THIS CAR IS DESIGNED TO OPERATE CONTINUOUSLY FROM A 96 VOLT BATTERY, CALLED THE "BOOST" MODE. HOWEVER, IF A LOWER ACCELERATION RATE IS ACCEPTABLE FOR THE ROAD CONDITIONS, SELECTING THE "CRUISE" MODE ACTUALLY PLACES TWO HALF-BANKS OF BATTERIES IN PARALLEL AND DRIVES THE MOTOR FROM 48 VOLTS, INSTEAD. THE EFFECT, AS STATED, IS A SLIGHTLY LOWER ACCELERATION AND TOP SPEED, BUT OVER TWICE THE MILEAGE FROM A SINGLE BATTERY CHARGE.

5.132 BETTER STILL, IF "BOOST" IS MANUALLY SELECTED ONLY AS REQUIRED, SUCH AS ON A FREEWAY ENTRY RAMP, OR BUSY INTERSECTION, OR AGAIN TO GET UP TO TRAFFIC SPEED, THE LONGEST POSSIBLE RANGE AND BEST VEHICLE PERFORMANCE RESULTS.

5.133 GENERALLY, THE "CRUISE" MODE PROVIDES A TOP SPEED RANGING FROM 50 MPH TO 62 MPH, DEPENDENT UPON THE GRADIENT.

5.134 THE "BOOST" MODE WILL PROVIDE A CONTINUOUS TOP
ACCELERATION, READJUST THE CREEP OR CRAWL POT IN A FURTHER COUNTER CLOCKWISE DIRECTION (SEE SECTION 4.2, ADJUSTMENTS TO CONTROLLER). (ALSO SECTION 2, ACCELERATOR BOX ADJUSTMENTS)

5.122 IF OVER "REVVING" OF THE MOTOR DOES HAPPEN DURING SHIFTING OR TOTAL SHUTDOWN BY THE IGNITION SWITCH, CHECK FIRST THE ACCELERATOR CABLE ADJUSTMENT SO THAT THE ACCELERATOR BOX ARM IS GOING TOTALLY TO THE REST POSITION WITH A SMALL AMOUNT OF SLACK IN THE CABLE (1/16 TO 1/18")

5.123 IF MORE POWER IS NEEDED, SWITCH INTO THE 96V POSITION FOR QUICKER ACCELERATION OR ADDITIONAL POWER IN CLIMBING HILLS, PASSING, ETC. TRY TO USE THIS POSITION SPARINGLY AS IT ADVERSELY AFFECTS DRIVING RANGE AND WILL CAUSE EXCESSIVE JERKING ON VEHICLE ACCELERATION FROM A STAND- STILL.

5.124 WHEN DRIVING THE ELECTRIC VEHICLE, ABNORMAL SOUNDS OR NOISES SHOULD BE TAKEN CARE OF IMMEDIATELY WITH QUALIFIED MECHANICS EMPLOYED ON EITHER THE MECHANICAL OR ELECTRIC PORTIONS OF YOUR VEHICLE.
SPEED OF 55 MPH REGARDLESS OF GRADIENT WITH
SPEEDS OF UP TO 75 MPH MEASURED ON THE TEST-
TRACK.

5.135 A TYPICAL METHOD OF DRIVING LONGER DISTANCES IS
DEMONSTRATED BELOW:

5.136 START 1ST GEAR IN "BOOST" TO 15 MPH.

5.137 CHANGE TO 2ND GEAR IN "BOOST" TO 30 MPH.

5.138 CHANGE TO 3RD GEAR IN "BOOST" TO 42 MPH.

5.139 CHANGE TO 4TH TOP IN "BOOST" TO 55 MPH.

5.1310 SELECT "CRUISE".

5.1311 WHEN HILLS OR GRADIENTS DROP THE SPEED TO 45
MPH, CHANGE TO 3RD AND SELECT "BOOST" UNTIL
GRADIENT IS REDUCED AND SPEED REACHES 50 MPH.

5.1312 AS BEFORE, CHANGE TO 4TH (TOP) IN "BOOST" TO
55 MPH.

5.1313 SELECT CRUISE.

NOTE 1: THIS CAR DOES PERMIT BRAKING DOWN TO A STANDSTILL
WITHOUT TOUCHING THE CLUTCH. IT WILL ALSO SIT AT THE LIGHTS
YOUR BATTERY CHARGER

6.1 THIS IS A RELIABLE DUAL OUTPUT BATTERY CHARGER CAPABLE OF OPERATING FROM 110 VOLTS 60HZ OR 220 VOLTS 60HZ.

6.2 WHEN CONNECTED BETWEEN THE VEHICLE AND THE POWER SOCKET ON YOUR WALL, IT AUTOMATICALLY CHARGES THE 12-VOLT ACCESSORY BATTERY IN YOUR CAR AND THE 96-VOLT MAIN POWER PACK.

6.3 IN ORDER FOR THE CHARGER TO COMMENCE ITS CHARGING CYCLE, YOU MUST SET THE VEHICLE POWER CONTROL SWITCH ON THE DASH AT THE RIGHT OF THE STEERING WHEEL, TO 96 VOLTS OR "BOOST".

6.4 WHEN YOUR BATTERIES ARE FULLY CHARGED, THE CHARGER WILL SWITCH ITSELF OFF AUTOMATICALLY PROVIDING YOU HAVE SELECTED SUMMER-CHARGER ON THE CHARGER FRONT PANEL.

6.5 BEFORE CONNECTING THE CHARGER TO THE ON-BOARD CONNECTIONS, CHECK THE CONNECTIONS ON THE CAR SIDE BY USING A VOLTMETER. ONE SIDE OF THE ON-BOARD CONNECTORS SHOULD BE 96V WITH SWITCH ON 96V MODE WITH PROPER POLARITY TO MATCH THE CHARGER PLUGS, AND THE OTHER CONNECTOR SHOULD BE 12V WITH PROPER POLARITY (SEE DIAGRAM 6.5).
IN GEAR AND MOVE OFF (IF RIGHT GEAR IS SELECTED) WITHOUT
THE DRIVER USING A CLUTCH. HOWEVER, SMOOTHER DRIVING RESULTS
FROM USING THE CLUTCH AS IN A NORMAL STICK SHIFT, GASOLINE-
POWERED VEHICLE.

NOTE 2: A NOVICE DRIVER MIGHT START IN 2ND OR EVEN 3RD
AND MERELY SPIN THE CLUTCH TO GET THE VEHICLE UP TO DRIVING
SPEED; HOWEVER, THIS DOES INCREASE CLUTCH WEAR AND IS NOT
RECOMMENDED, AT ALL, ONCE A DRIVER HAS MASTERED THE CORRECT
DRIVING METHOD.

DIAGRAM 5.10  GEAR CHANGING
PROCEED ONLY WHEN THE CLUTCH IS FULLY DEPRESSED

(IF EQUIPED WITH A HURST SHIFTER, PULL LOCKOUT LEVER UP
TOWARDS KNOB, THEN SHIFT INTO REVERSE)
6.65 OBSERVE AMPERAGE GAUGE FOR 96V (GAUGE ON LEFT WHEN FACING CHARGER SHOULD BE 5-30 AMPS).

6.66 IF LEFT GAUGE DOES NOT MOVE, PUSH RESET BUTTON ON CHARGER.

6.67 IF LEFT GAUGE DOES NOT MOVE, RECHECK THE FOLLOWING:
   a. 96V POSITION SELECTED.
   b. CHARGER PROPERLY CONNECTED TO WALL OUTLET.
   c. CHARGER PROPERLY CONNECTED TO VEHICLE.

6.7 IN WINTER IN THE COLDER CLIMATES, IT IS ADVISABLE TO SET THE CHARGER SWITCH TO "WINTER" AND, THUS LEAVE A SMALL TRICKLE CHARGE FLOWING THROUGH THE BATTERIES.

6.8 ON YOUR FIRST FEW TRIPS WITH YOUR ELECTRIC VEHICLE, THE BATTERY RANGE WILL BE VERY LIMITED AS IT REQUIRES 5-8 TOTAL RECHARGES OF THE BATTERIES TO REACH MAXIMUM DRIVING DISTANCES.

6.9 ON YOUR FIRST ONE, TWO OR THREE TRIPS, LIMIT YOUR DISTANCE TO NEAR YOUR HOME OR WORKSHOP. DRIVE THE CAR UNTIL THE BATTERIES ARE COMPLETELY "FLAT" OR DEAD.
These checks are imperative as if not done, damage to charger will occur and is not covered by warranty.

6.6 When attaching the charger to your vehicle, make sure to follow these steps exactly (see Diagram 4):

6.61 Switch to 96V mode.

6.62 Plug charger into socket on vehicle.

6.63 Connect charger to 110V or 220V outlet.

6.64 Select proper position of switch for summer/winter conditions.
WAIT 15-20 MINUTES FOR BATTERIES TO REGENERATE THEMSELVES, DRIVE VEHICLE TO CHARGER AND CHARGE FOR A MINIMUM OF 8 TO 10 HOURS. REPEAT THIS PROCESS FOR A MINIMUM OF 2 TRIPS WITH THE THIRD TRIP RUNNING THE BATTERIES ALMOST COMPLETELY DOWN. RECHARGING THE BATTERIES FULLY AFTER EACH TRIP WILL ALLOW YOU TO NOTICE A MARKED IMPROVEMENT IN DRIVING RANGE AND PERFORMANCE, WITH MAXIMUM POWER AND DRIVING DISTANCES TO OCCUR AFTER 5-8 TOTAL RECHARGES.

6.10 GAUGE ON RIGHT SIDE WHEN FACING SHOULD BE 1-2 AMPS WITH MAXIMUM OF 10 AMPS DEPENDING ON DISCHARGE OF 12V BATTERY.
DESCRIPTION AND CARE

8.1 BODY REPAIRS

THE BODY SHELL CAN BE REPAIRED EITHER BY REPLACEMENT OF COMPLETE PARTS OR BY MENDING THE DAMAGED PIECE, DEPENDING ON THE EXTENT OF THE DAMAGE. AS TWO CASES OF DAMAGE ARE NEVER EXACTLY ALIKE, ALL THAT CAN BE DONE HERE IS TO GIVE SOME TYPICAL EXAMPLES OF HOW TO DEAL WITH BODY DAMAGE.

WHEN MENDING LOCAL DAMAGE, THE DAMAGED PIECE SHOULD BE GROUND AWAY. PREFERABLY, BOTH SIDES SHOULD BE GROUND AS PER ALTERNATIVE A, BUT IF THIS IS DIFFICULT IT WILL SUFFICE TO GRIND THE OUTSIDE ONLY AS PER ALTERNATIVE B. THE CAVITY IS THEN REINFORCED WITH FIBERGLASS MATTING OR FIBERGLASS CLOTH, WHICH IS IMPREGNATED WITH PLASTIC AND MOULDED TO THE RIGHT SHAPE. AFTER CURING, THE PLASTIC CAN BE GROUND, FILLED WITH PUTTY AND ENAMELLED. IN AN EMERGENCY, DAMAGE CAN BE REPAIRED IN THE MANNER ILLUSTRATED BY FIG. C IN WHICH A REINFORCEMENT CONSISTING OF FIBERGLASS CLOTH AND PLASTIC HAS BEEN APPLIED TO THE REAR SIDE. NOTE THAT THE SURFACE TO BE COATED MUST BE SMOOTHED WITH SANDPAPER. SMALL HOLES OR PORES CAN BE DRILLED OUT AND THEN FILLED WITH PLASTIC PUTTY. SEE FIG. D.

MATERIALS

PLASTIC: ALWAYS USE A HIGH-QUALITY POLYESTER-BASE PLASTIC WITH GOOD PERMANENCE OF FORM.

PUTTY: THE PUTTY MUST BE OF GOOD QUALITY AND MADE ON A POLYESTER BASE.

FIBERGLASS: ORDINARY COMMERCIAL FIBERGLASS MATTING OR FIBERGLASS CLOTH CAN BE USED.

Typical examples of plastic body repairs

FIG.D
PROPER MAINTENANCE OF BATTERIES SHOULD INCLUDE THE FOLLOWING:

ON ALL 6 VOLT BATTERIES AND ACCESSORY 12V BATTERY

1. KEEP ELECTROLYTE TO PROPER LEVEL (CHECK EVERY 1-2 WEEKS). FILL WITH DISTILLED WATER IF POSSIBLE.

2. KEEPING BATTERIES CLEAN AND DRY (USUALLY WEEKLY).

3. CLEANING OF ALL BATTERY POSTS AND CABLE CONNECTIONS (3-6 MONTH INTERVALS).

4. PREVENTING OVER CHARGING OF BATTERIES BY CONTINUOUS USE OF BATTERY CHARGER.

5. CHECK OFF "SPECIFIC GRAVITY" WITH BATTERY HYDROMETER (SEE DIAGRAM 7.5 and 7.6).

[Diagram 7.5: A battery hydrometer for measuring the specific gravity of battery electrolyte.

Diagram 7.6: Various specific gravity readings.]

BRADLEY AUTOMOTIVE 14414 21ST AVENUE NORTH, PLYMOUTH, MN 55441
9.1 JACKING OF VEHICLE

THE JACKING OF THE ELECTRIC VEHICLE IS A RELATIVELY SIMPLE OPERATION, BUT SHOULD BE DONE WITH THE UTMOSt SAFETY PROCEDURES KEPT IN MIND.

PROCEDURE:

1. OBTAIN A SCISSORS-TYPE SCREW JACK (AVAILABLE AT ALL AUTO PARTS STORES).
2. MAKE SURE CAR IS ON A RELATIVELY FLAT SURFACE.
3. BLOCK THE WHEEL DIAGONAL FROM ONE BEING LIFTED.
4. PLACE JACK UNDER APPROPRIATE AREAS AND LIFT VEHICLE. (SEE DIAGRAMS 9.11 JACKING IN FRONT, 9.12 JACKING IN REAR).
8.5 TEXTILE CARPETS

These should be cleaned with a brush or sponge and carpet shampoo and then rinsed thoroughly with water. Stubborn grease or oil stains can be removed with trichloroethylene.

8.6 CARE OF UPHOLSTERY

The cloth upholstery may be effectively cleaned with a cloth moistened in soap solution. Use lukewarm water. If soiled, plastic surfaces may be easily cleaned with lukewarm water and a synthetic detergent. A semistiff brush may be used.

8.7 SEAT BELTS (IF EQUIPPED)

Clean the seat belts regularly with soap and lukewarm water.
LARGE HOLES RIGHT THROUGH THE BODY SHELL CAN BE REPAIRED BY FIRST TRIMMING AND CHAMFERING THE EDGES, WHEREUPON A RUBBER OR WOODEN MOULD TO WHICH RELEASE AGENT OR PLASTIC FILM HAS BEEN APPLIED IS SECURED TO THE OUTSIDE OF THE PANEL. AFTER THIS, PLASTIC AND FIBERGLASS CLOTH AND/OR FIBERGLASS MATTING IS APPLIED TO THE INSIDE.

8.2 CARE OF FINISH

TO PRESERVE THE FINISH AND DURABILITY OF THE PAINTWORK THE CAR SHOULD BE SUITABLY MAINTAINED.

SHOULD THE FINISH BE DAMAGED BY A FLYING STONE, FOR EXAMPLE, THE SPOT CAN BE CLEANED AND THEN COATED WITH A SUITABLE AIRDRYING TOUCH-UP-PAINT. SMALL CANS CONTAINING SUCH PAINT ARE AVAILABLE IN ALL BRADLEY COLORS FROM BRADLEY AUTOMOTIVE.

8.3 WASHING

A NEW CAR SHOULD BE WASHED FREQUENTLY. IT IS BEST TO USE ONLY WATER, AS ADDITIVES DRY OUT THE PAINTWORK; BUT IF WATER ALONE IS NOT EFFECTIVE YOU CAN USE A MILD DETERGENT. IT IS MOST IMPORTANT, HOWEVER, TO REMOVE ALL TRACES OF DETERGENT FROM THE PAINTWORK, SO HOSE THE CAR DOWN AFTER WASHING, USING PLENTY OF WATER. NEVER WASH THE CAR IN STRONG SUNLIGHT, AND ALWAYS WIPE IT DRY WITH A CLEAN CHAMOIS. IF THE CAR IS LEFT TO DRY IN THE SUN, THE LIME IN THE WATER MAY LEAVE STREAKS ON THE PAINTWORK.

THE GLASS SURFACES SHOULD PREFERABLY BE CLEANED WITH A CHAMOIS LEATHER OR A LINEN RAG MOISTENED IN WATER.

8.4 MAINTENANCE OF UNDERCOATING

IN ADDITION TO ITS RUSTPROOFING PROPERTIES, UNDERCOATING HAS AN IMPORTANT SOUNDPROOFING FUNCTION. TO PRESERVE ITS EFFECTIVENESS IT SHOULD BE REGULARLY INSPECTED AND TOUCHED UP IF NECESSARY. IF THE COMPOSITION HAS WORN OR FLAKED OFF, THE STEEL MUST BE THOROUGHLY CLEANED AND DRIED BEFORE A FRESH COAT IS APPLIED. THE CLEANING IS BEST DONE WITH A SCRAPER AND A STEEL WIRE BRUSH, FOLLOWED BY WASHING WITH GASOLINE. APPLY THE NEW COATING THINLY, AS OTHERWISE IT MAY RUN OFF OR FALL OFF WHEN DRY.
9.11 JACKING OF FRONT OF VEHICLE

DRIVER'S SIDE OF VEHICLE VIEWED FROM FRONT
(REVERSE FOR PASSENGER'S SIDE)

TIRE AND WHEEL ASSEMBLY
JACK PLACEMENT BETWEEN BATTERY PACKS AND WHEEL/TIRE ASSEMBLY LIFTING DIRECTLY ON TORSION BAR

CAUTION: DO NOT GO UNDER VEHICLE, UNLESS THE VEHICLE IS ADEQUATELY SUPPORTED BY SAFETY STANDS

DO NOT LIFT ON BOTTOM OF BATTERY PACKS AS IRREPAIRABLE DAMAGE WILL RESULT.
9.12 JACKING OF REAR OF VEHICLE

DRIVER'S SIDE VIEWED FROM REAR

**A** LOWER SHOCK ABSORBER SUPPORT

**JACK PLACEMENT:**

: BETWEEN BATTERY PACK AND TIRE/WHEEL ASSEMBLY

: LIFT ON LOWER SHOCK ABSORBER MOUNTING

**CAUTION:** DO NOT LIFT ON BATTERY PACKS OR IRREPAIRABLE DAMAGE WILL RESULT.

: MAKE SURE TO USE SAFETY STANDS IF WORKING UNDER VEHICLE.

: NO JACKING OPERATION SHOULD BE DONE WHICH COULD CAUSE INJURY TO BYSTANDERS, OTHER MOTORISTS OR OPERATOR.
Dear Customer:

The following electrical diagrams will enable you to properly wire your electric car. Each diagram is self explanatory and covers a different phase of the wiring process.

There are four separate harnesses (controller harness, main electrical harness, underdash harness and instrument panel harness). These 4 harnesses together make up the entire electrical system. There are no schematics enclosed in this section for the underdash harness because that harness remains the same and is interchangeable in an electric and a gas car. The schematic in the GT II structural plans for the underdash harness is to be used and installation remains the same.

In most cases hooking up the electrical system involves just plugging in a harness or connector. Wire your car a step at a time and double check everything to avoid problems. Should problems arise, call Customer Service at 800-328-3546.

Sincerely,

Bradley Automotive
BRADLEY AUTOMOTIVE

BATTERY HOOK-UP DIAGRAMS

TOP VIEW OF BATTERY POSITIONING

FRONT BATTERY PACK

REAR BATTERY PACK

RED 350 AMP ANDERSON CONNECTORS

TERMINALS INDICATE POLARITY

<table>
<thead>
<tr>
<th>REF</th>
<th>CABLE DESCRIPTION</th>
<th>Length</th>
<th>QTY.</th>
<th>PART NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Front to Rear Cables</td>
<td>150&quot;</td>
<td>2</td>
<td>32000</td>
</tr>
<tr>
<td>B</td>
<td>Short Cables</td>
<td>7 1/2&quot;</td>
<td>12</td>
<td>32001</td>
</tr>
<tr>
<td>C</td>
<td>Medium Cable</td>
<td>10 1/2&quot;</td>
<td>1</td>
<td>32002</td>
</tr>
<tr>
<td>D</td>
<td>Long Cable</td>
<td>27&quot;</td>
<td>1</td>
<td>32003</td>
</tr>
<tr>
<td>E</td>
<td>Rear Pack Hook-Up Cable</td>
<td>18&quot;</td>
<td>1</td>
<td>32004</td>
</tr>
<tr>
<td>F</td>
<td>Rear Pack Hook-Up Cable</td>
<td>36&quot;</td>
<td>1</td>
<td>32005</td>
</tr>
</tbody>
</table>

Accessory Battery (12 Volt)

CONNECTS TO
GREEN LEAD
ON 12 VOLT UNDER-DASH HARNESS AND
GREEN & BLACK LEADS
ON INSTRUMENT PANEL HARNESS

(SEE DRAWING NUMBER E-8457)
NOTE: BATTERY CABLES AND
350 AMP ANDERSON PLUGS
FOR THE CONTROLLER PACKAGE
ARE INSTALLED ON THE
CONTROLLER PRIOR TO BEING
SHIPPED FROM THE FACTORY.

REAR BATTERY
PACK HOOK-UP

NEGATIVE CABLE

RED ANDERSON
CONNECTOR

POSITIVE CABLE

FRONT BATTERY
PACK HOOK-UP

NEGATIVE CABLE

RED ANDERSON
CONNECTOR

POSITIVE CABLE
NOTE: INSTALL THE SHUNT BETWEEN THE ELECTRIC MOTOR CONTACT POINTS A1 & S1
BRADLEY AUTOMOTIVE
CONTROLLER HOOK-UP POINTS

FLOATING HARNESS FROM THE CONTROLLER

1. Small white clip on right
2. Larger white clip on left
3. Hot wire on charging harness
4. Ground wires together on brass plate
5. Leads 4, 13, 15 on right
   Back Anderson Red
   Motor Anderson Grey
6. FAN MOTOR

2 - MOTOR VOLTS POSITIVE CONTACT POINT
3 - STATE OF CHARGE POSITIVE CONTACT POINT
4 - ALL NEGATIVE HOOK-UPS
5 - GOES TO KEY SWITCH IN 12 VOLT SYSTEM
6 - GO TO THE 48/96 VOLTS SWITCH

55 VOLT CHARGER LEADS:
   NEGATIVE TO 13 A & B
   POSITIVE TO 8
BRADLEY AUTOMOTIVE

CONTROLLER HARNESS

Part Number 30949

CODE

BROWN  POSITIVE MOTOR VOLTS
WHITE  POSITIVE MOTOR CHARGE
YELLOW  NEGATIVE MOTOR CHARGE & VOLTS
BLUE  No. 15 KEY SWITCH
GREEN  48/96 VOLT SWITCH
GREEN  48/96 VOLT SWITCH

NOTE: Number 6 & 8 leads on the floating harness from the controller are not used.

RING TERMINALS
HOEk-UP POINTS

A = NEGATIVE (YELLOW LEAD)
B = POSITIVE (WHITE LEAD) which is on the same harness as 4, 13, 15
C = POSITIVE (BROWN LEAD)

A & B ARE ALSO THE POSITIVE & NEGATIVE CONTACT POINTS FOR THE 96 VOLT BATTERY CHARGER. USE 10 GAUGE WIRE.
(THE OPPOSITE END OF THE 96 VOLT CHARGER LEADS CONNECT TO A 50 AMP ANDERSON CONNECTOR)
Because you have an electric car, different instrumentation is needed to monitor your electrical system. The same dash panel, switches, indicator lights, and speedometer that are used in the standard GT-II will also be used in the GTElectric car.

The following gauges, tachometer, amperes, oil pressure, and fuel gauge are not used and are substituted with these electrical monitoring gauges: motor volts, accessory amps, motor current and state of charge.

The electrical gauges are installed in the dash in the same procedure as the standard instrumentation. The speedometer switches, and indicator lights that are used in both cars can stil be wired according to the schematic appearing in the interior trim (12) section of the assembly manual. A schematic is enclosed to show how the modified GT-II harness hooks up the electrical monitoring gauges.
Dear Customer,

You represent one of the first pioneers in our, "component electric vehicle concept." Due to the lead time in development and production required to achieve the best possible product, the EVI Drive Unit will be delivered to you at a later date. This will afford the time you require to assemble your body kit.

Supplemental instructions are enclosed to assist you in the construction of your Bradley GTE. As always, Customer Service is available to assist you in your construction venture at 800-328-3546.

We thank you for your understanding and anticipate an early delivery of your EVI Drive Unit.

Sincerely,

BRADLEY AUTOMOTIVE
For your convenience, the assembly procedure for the GT Electric will be distributed to you in 4 separate sections. Each of these sections will cover a different phase of the building process to enable you to complete your electric car.

The first of these sections cover the modifications that make our standard Bradley GT-II body suitable for the electric car conversion. It will inform you section-by-section what information in the Bradley GT-II structural plans still applies, and what does not. Remember that if a change in plans is indicated in this, the first sub-section, but is not elaborated on, it is because detailed information will follow in a more appropriate time in the building sequence.

The sections to follow will cover:

2nd The mounting of the Battery storage and drive components to the W chassis.

3rd The necessary Electrical Diagrams for the entire car.

4th Final preparation details which will enable you to complete your electric car.

The engineering department at Bradley Automotive has determined that sending the assembly procedure in sub-sections at this time, is the most efficient way to insure the same attention to detail and quality craftsmanship is maintained through the complete building sequence. Bradley Automotive wants our customers to have a structurally sound, safe and dependable electric automobile.
Note: The following components are not used in the assembly of your Bradley GTE. Please prepare them for exchange upon delivery of your EVI Drive Unit.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10654</td>
<td>Rear Bumper Bracket</td>
<td>2</td>
</tr>
<tr>
<td>10653</td>
<td>Backing Plate</td>
<td>2</td>
</tr>
<tr>
<td>10261</td>
<td>Front Access Cover</td>
<td>1</td>
</tr>
<tr>
<td>10903</td>
<td>Instrument Panel</td>
<td>1</td>
</tr>
<tr>
<td>10905</td>
<td>Speedometer</td>
<td>1</td>
</tr>
<tr>
<td>10909</td>
<td>Tachometer</td>
<td>1</td>
</tr>
<tr>
<td>10906</td>
<td>Ampmeter</td>
<td>1</td>
</tr>
<tr>
<td>10907</td>
<td>Fuel Gauge</td>
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</tr>
<tr>
<td>10908</td>
<td>Oil Pressure Gauge</td>
<td>1</td>
</tr>
<tr>
<td>10921</td>
<td>Instrument Panel Kit</td>
<td>1</td>
</tr>
<tr>
<td>10620</td>
<td>Front Bumper Kit</td>
<td>1</td>
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<tr>
<td>10271</td>
<td>Gas Tank Kit</td>
<td>1</td>
</tr>
<tr>
<td>10051</td>
<td>2(\frac{1}{2})&quot; Dia. Hose 30&quot;</td>
<td>2</td>
</tr>
<tr>
<td>236</td>
<td>Hose Clamp</td>
<td>4</td>
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<tr>
<td>10084</td>
<td>Battery Tie Down Kit</td>
<td>1</td>
</tr>
<tr>
<td>10555</td>
<td>Heater Tube</td>
<td>2</td>
</tr>
<tr>
<td>10557</td>
<td>Left Heater Plenum</td>
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</tr>
<tr>
<td>10058</td>
<td>Right Heater Plenum</td>
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<tr>
<td>232</td>
<td>Retainer Tubes</td>
<td>4</td>
</tr>
<tr>
<td>10559</td>
<td>Ribbon Sealer</td>
<td>1</td>
</tr>
<tr>
<td>10561</td>
<td>Heater &amp; Defroster Kit</td>
<td>1</td>
</tr>
<tr>
<td>10606</td>
<td>Front Bumper Bracket</td>
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<tr>
<td>10254</td>
<td>Mounting Strap</td>
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<td>10609</td>
<td>Bumper Clamp</td>
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<tr>
<td>10253</td>
<td>Rear Bracket</td>
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</tr>
<tr>
<td>10252</td>
<td>Front Mounting Bracket</td>
<td>1</td>
</tr>
<tr>
<td>10250</td>
<td>Gas Tank</td>
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<tr>
<td>10618</td>
<td>Bumper Extension Tube</td>
<td>2</td>
</tr>
<tr>
<td>134</td>
<td>Oil Pressure Sending Unit</td>
<td>1</td>
</tr>
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</table>
The asterisk (*) denotes the assembly operations within the GT-II structural plans that are affected by the Electric Vehicle Revision:

<table>
<thead>
<tr>
<th>Operation Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>1</td>
<td>*Body Preparations</td>
</tr>
<tr>
<td>2</td>
<td>*Headlight System</td>
</tr>
<tr>
<td>3</td>
<td>*Front Access</td>
</tr>
<tr>
<td>4</td>
<td>*Rear Bumper &amp; Tail Lights</td>
</tr>
<tr>
<td>5</td>
<td>*Under Dash Assembly</td>
</tr>
<tr>
<td>6</td>
<td>*Front Access Cover</td>
</tr>
<tr>
<td>7</td>
<td>Hard Top</td>
</tr>
<tr>
<td>8</td>
<td>Door Assembly</td>
</tr>
<tr>
<td>9</td>
<td>Hatchback Window</td>
</tr>
<tr>
<td>10</td>
<td>Hard Top Upholstery</td>
</tr>
<tr>
<td>11</td>
<td>Engine Cover</td>
</tr>
<tr>
<td>12</td>
<td>*Interior Trim</td>
</tr>
<tr>
<td>13</td>
<td>*Exterior Trim</td>
</tr>
<tr>
<td>14</td>
<td>*Front Bumper &amp; Body Mounting</td>
</tr>
<tr>
<td>15</td>
<td>*Steering and Gas Tank</td>
</tr>
<tr>
<td>16</td>
<td>*Engine Connections</td>
</tr>
<tr>
<td>17</td>
<td>Seats &amp; Console</td>
</tr>
<tr>
<td>18</td>
<td>*Complete Car</td>
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<tr>
<td>Operation Number</td>
<td>Title</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Section 3</td>
<td>Front Access</td>
</tr>
<tr>
<td></td>
<td>Sub Heading-</td>
</tr>
<tr>
<td></td>
<td>Heater &amp; Defroster System</td>
</tr>
<tr>
<td>Section 4</td>
<td>Rear Bumper &amp; Tail Lights</td>
</tr>
<tr>
<td></td>
<td>Sub Heading-</td>
</tr>
<tr>
<td></td>
<td>Install the Rear Bumper Brackets</td>
</tr>
</tbody>
</table>

Builders Note:

Because of the packaging of the electric vehicle, another means for mounting the rear bumper to the automobile has been devised. The installation procedure will be expanded upon in a later section. The rear bumper will bolt to the body after the body is mounted. The position at the holes for the rear bumper brackets in the body will change, do not drill at this time.

Builders Note:

On the GT-II electric, there is an optional position for mounting the license plate assembly. The license plate assembly can be installed on the tail panel extension. The installation of the tail panel extension will be covered in a later section. The information for installing the license plate in the optional position will be covered at that time.

Section 4 Sub Heading-
Installing Rear Bumper Do not install rear bumper.

Section 4 Engine insulation Engine insulation in engine compartment is not needed on the electric car.
Electric Vehicle Revisions:

<table>
<thead>
<tr>
<th>Operation Number</th>
<th>Title</th>
<th>Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td>Body Preparation</td>
<td>Step #1 Drilling the two 2-7/8&quot; holes in the face of the dash is optional in the electric car. (At this point they are not used for heater vents)</td>
</tr>
</tbody>
</table>

Builders Note:

It is necessary at this stage of construction to modify the body. This involves cutting out the front access cover and cutting out a section from the front and rear body panels for battery clearance. Refer to the separate detailed retrofit instructions & illustrations included in this section to complete each revision.

Section 2

Headlight System

Steps 2 & 3 Limit Switch Bracket
Motor installation

Builders Note:

Because of the front access cover modification to the body, there is a different method of mounting the Limit Switch bracket. An additional bracket is used to position the Limit Switch bracket in the same location as before. By retaining this same location, the Limit Switch functions as before and all steps referring to the hook-up and operation of this assembly still apply. See "Open Access Cover View" illustration to determine where the mounting bracket for the Limit Switch mounting bracket is fastened.

Section 3

Front Access
Sub Heading-
Head Light & Reservoir
Bracket

See Builders Note

Builders Note:

The instructions in the manual for this operation still apply, however, the wiring harness itself has been modified for use in the electric car. The installation procedure for the harness itself remains the same as does any reference to the color coded wires and the hook up connections for the headlight assembly.
<table>
<thead>
<tr>
<th>Operation Number</th>
<th>Title</th>
<th>Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 14</td>
<td>Front Bumper &amp; Body Mount</td>
<td></td>
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<tr>
<td></td>
<td>Sub Heading-</td>
<td></td>
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<tr>
<td></td>
<td>Front Bumper Brackets</td>
<td>Do not install front</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bumper brackets</td>
</tr>
<tr>
<td>Section 14</td>
<td>Sub Heading-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gas Tank Preparation</td>
<td>Gas Tank is not</td>
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<tr>
<td></td>
<td></td>
<td>used. Overlook</td>
</tr>
<tr>
<td></td>
<td></td>
<td>section.</td>
</tr>
<tr>
<td>Section 14</td>
<td>Sub Heading-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Install Bumper</td>
<td>Do not install</td>
</tr>
<tr>
<td></td>
<td>(Temporarily)</td>
<td>front bumper,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overlook section.</td>
</tr>
<tr>
<td>Section 14</td>
<td>Sub Heading-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chassis &amp; Engine</td>
<td>Overlook any</td>
</tr>
<tr>
<td></td>
<td>Preparation</td>
<td>reference to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the VW Engine steps 5 through</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.</td>
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<tr>
<td>Section 14</td>
<td>Sub Heading-</td>
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<tr>
<td></td>
<td>Body Mount</td>
<td>Omit step 9 of the</td>
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<tr>
<td></td>
<td></td>
<td>body mounting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>instructions.</td>
</tr>
</tbody>
</table>

Builders Note:

Under no circumstances should the body be attached to the VW Chassis at this time. The VW Chassis must be modified for the electric car conversion. The modifications to the VW Chassis is the next phase in building your electric car and will be covered in the next section you receive.

Section 15        | Steering & Gas Tank     | Omit any reference to the gas |
|                  |                          | tank.                         |
Section 5
Under Dash Assembly
Sub Heading-
Fresh Air Assembly Fresh Air Assembly is optional.

Builders Note:
At this time, an Air conditioning unit is not available for our electric car. The fresh air assembly is optional. Should you choose to have the fresh air package installed in your car, then the instructions in the assembly manual still apply. Route the ventilation ducts according to the illustration included in this section.

Section 6 Front Access Cover See Builders Note

Builders Note:
Additional detailed front latch cover retrofit instructions are included in this section. The "Access cover Latch & Striker" instructions in the assembly manual still apply with the exception that the latch is mounted on an additional bracket (the position of the additional bracket is indicated in the included illustrations) in the front nose of the car. The Striker is to be fitted on the access cover. The striker mounting screws will be concealed by the Bradley medallion on the front access cover. Both covers use the same hinge rod.

*ALL INFORMATION IN STRUCTURAL PLANS FOR SECTIONS 7-11 STILL APPLY.*

Section 12 Interior Trim
Sub Heading-
Instrument Panel Do not assemble the instrument panel.

Builders Note:
It takes different instrumentation to monitor the electrical system of your electric car than what is indicated in the assembly manual. You will receive further information on the types of gauges (and wiring schematics) that will be used in your electric car in a future section.

Section 13 Exterior Trim Bradley medallion will now appear on front access cover.
<table>
<thead>
<tr>
<th>Operation Number</th>
<th>Title</th>
<th>Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 16</td>
<td>Engine Connections Sub Heading - Heater connections &amp; Engine wiring</td>
<td>Delete Heater Connection &amp; Engine Wiring information steps 1-6.</td>
</tr>
<tr>
<td>Section 16</td>
<td>Sub Heading - Battery Mounting</td>
<td>See Builders Note</td>
</tr>
</tbody>
</table>

 Builders Note:

The instructions in the assembly manual no longer apply to mounting the 12 volt battery. On the electric car, the battery is mounted in an entirely different location with a specially made bracket. The installation procedure will be discussed in a later section. Save the battery brackets and clamps from the VW chassis, they may be used to secure the battery in its new location.

Section 16 | Sub Heading - Test the electrical system | System test will be covered in a later section. |

Section 18 | Complete Car Sub Heading - Front Wheel Well Panels | Optional on an Electric Car. |
Panel Section Removal for Battery Clearance

With the addition of the Bradley sub-frame to the VW Chassis additional clearance is required in the front & rear sections of the GT-II body before it will fit down over the body. (Refer to the illustration) It becomes necessary to cut out and remove a small section of the lower front and rear body panels. Dimensions are given on the illustrations.

Prior to cutting the area that is to be removed the area should be indicated with a marker to ensure a precise fit. The area marked to be cut out should then be outlined with masking tape, then cut on the inside of the masking tape. The masking tape prevents the fiberglass gel coat from chipping. The fiberglass body panels cut very easily and should be done so slowly. A key hole saw or saber saw works the best.
FRONT ACCESS COVER

1. Cut out existing deck panel.
   A. Set front access cover in place, mark perimeter.
   B. Cut line should be inside line drawn in step (1 A)
   C. Cut line outer perimeter at cut line with masking tape to prevent
      chipping of gel-coat when cutting.
   D. Fit Cover- file or grind perimeter to allow clearance for cover
      (gap allowance is 1/16 to 1/8 perimeter.

2. Install Side Hood Support brackets on bulkheads as necessary to assure
   contact with cover (see illustration).

3. Refer to operations 6 (step 2 thru 6) for cover installation.

4. Drill holes for installation of latch mounting bracket.
   A. Determine center point of front nose.
   B. Draw parallel line 1/1/2" (beneath seam line).
   C. From Nose center point measure 1 1/2" on each side and mark points
      on parallel line.
   D. Drill 1/4" holes at these 2 points.

5. Install latch mounting bracket in front nose interior.

6. Proceed with operations 6 (steps 6 thru 11).

7. Cut and fit closed cell sponge for the hood support brackets.

8. Install the limit switch mounting bracket.

9. Fit striker in front hood—bolt to hood with (2) countersunk 10x24 bolts
   - Conceal bolt heads with Bradley medallion.
Latch Mounting Bracket Dimensions
A - 1 1/2"
B - 3"

SECTION VIEW
CUT
FENDER & DECK

SECTION VIEW - NOSE
APPROXIMATE
THE ANGLE
OF THE CUT
BRADLEY AUTOMOTIVE-GTE
UNDER DASH FRESH AIR ASSEMBLY

NOTE: PLUG FRESH AIR OUTLET HOLES, IF ANY, AND COVER WITH SOFT TRIM.

CONNECT TO DEFROSTER OUTLET HOLES
THE BRADLEY GT AND GT II

The Sports Car Kit you achieve by easy step-by-step assembly instructions.

SIDE VIEW

REAR VIEW

BRADLEY GT II
STRUCTURAL PLANS
PRICE $25
PART NO. 15050

BRADLEY AUTOMOTIVE
14414 21st AVENUE NORTH
PLYMOUTH, MN 55441
INTERIOR TRIM

INSTRUMENT PANEL

FRONT BUMPER & BODY MOUNT 3
BODY MOUNTING AND FRONT BUMPER INSTALLATION
FRONT BUMPER & BODY MOUNT

FRONT BUMPER PREPARATION

1. Remove the bumper. The body bolts are 9/16" nuts and require 4mm Allen wrench. The nuts must be removed carefully to avoid damaging the bumper. This procedure may require the use of a 9/16" wrench or even a hammer and chisel.

ENGINE CONNECTIONS

The engine is connected to the body by bolts through the engine mount. The mount is secured by two nuts on the front and one on the rear.

HEATER CONNECTIONS AND ENGINE WIRING

1. Remove the heater. Start by disconnecting the electrical connections to the heater. This may require a 7/16" wrench or even a hammer and chisel.

2. Remove the bolts securing the heater to the firewall. These are usually 5/16" bolts.

3. Carefully pull the heater out of the firewall. This may require the use of a hammer and chisel.

4. Install the new heater and reverse the removal process. Ensure all connections are securely tightened and the heater is centered.
PLEASE NOTE:
This folder represents a miniaturization of the Bradley structural plans catalog which actually measures 14" x 17" and contains over 125 pages, incorporating 18 different operations all fully explained, photographed and illustrated. A complete set of structural plans is included with your Bradley GTII car kit.
MEMORANDUM

BRADLEY GTE PERFORMANCE ESTIMATES

The Bradley GTE incorporates a design that no other electric vehicle has at this time. This design allows the vehicle to be driven in either a 96-volt series mode or a 48-volt parallel mode through a manual switch located on the dash of the car.

When traveling in the 96-volt series, our initial tests showed acceleration of 0 to 30 in 8 seconds and maximum speed of 75 mph. Range has not been tested in this mode. However, estimates of range cannot be expected to exceed 70 miles. The actual range will vary depending on how and where you drive, the car's condition and equipment, and the climate in which the car is driven. The actual range in the 96-volt series could be substantially affected by these factors. Remember, these are estimates.

In the 48-volt parallel mode, maximum speed is 40-45 mph. The car was driven in the city for 2 hours and 59 minutes with 44 stops for an equivalent of 70 miles. The 48-volt parallel system means that the vehicle is more efficient because it is using 50% of the power at any given time.

These tests were conducted with General Electric equipment, lead-acid 120/amp-hour batteries, and Goodyear 205/75R14 tires.

We have been advised that our initial test results would be improved by as much as 8-10% once the batteries have been broken in by 40 to 50 cycles. Furthermore, 10 to 15-amp/hour stronger batteries could also improve performance by an additional 5-10%. Expected battery life is two to three years depending upon individual driving habits and adequate maintenance. Warranties from battery companies vary from 90 days to 12 months.

Presently, Bradley Automotive is using a battery charger manufactured by Lester chargers, which will accept either 110 or 220 outlets. If electricity is available at your driving destination, by carrying your battery charger with you, range could be extended considerably. Estimated recharge time from dead to full charge is seven to fourteen hours. Of course, if the battery is only 50% discharged, charging time would be reduced considerably.

Up to an additional 10% improvement in range could also be obtained for every 100-pound reduction in weight achieved with a starting base of 2900 pounds.
Bradley Automotive is conducting additional battery tests incorporating various types of batteries. Presently we have a GTE equipped with nickel-zinc batteries. Projected range is more than double. We are scheduling tests for tubular lead-acid and nickel-chloride batteries. Within the next 2 to 3 years we expect to see batteries that will have a 5-10 year life expectancy and will double and triple existing ranges.

Because of the excellent performance potential the GTE affords, Bradley Automotive has been asked by many other companies to install their advanced equipment in the GTE.

Additionally, in today's era of oil shortages and rising gasoline prices, the GTE's cost of 1¢ to 2¢ per mile depending upon your local electric rates is a value-added benefit.

Thank you for becoming a Bradley customer. We are sure you will enjoy driving your Bradley GTE.
BRADLEY GT GOES ELECTRIC — Our Electric Vehicle Systems Operation (EVSO), Charlottesville, Va., has adapted a Bradley GT II sports car — built on a standard VW chassis, primarily by do-it-yourself auto fans, using complete kit including fiberglass body, interior, instruments, etc., furnished by Bradley Automotive, Plymouth, Minn. — to electric operation, with GE motor, controls, etc.

Result, according to Stu Scott, Systems Sales & Planning Specialist, EVSO: "GE has completed first stage of developing the finest electric vehicle on America's streets. Initial test data from the Bradley GT II is impressive. I have driven it in excess of 75mph, and clocked acceleration from 0 to 30mph in 8 seconds. And all data thus far has been provided with new batteries. Performance should improve once the batteries have been recycled 30-50 times."

The Bradley Electric car will join line of sports cars built by Bradley for adaptation to standard VW chassis, which includes replicas of 1957 Thunderbird, MG convertible, others. EVSO will provide GE elements required for quiet, energy-conserving driving.

Incentive to Build Electric Cars — A little-publicized amendment, passed as part of the Chrysler bailout bill and proposed by Senator James A. McClure (R-Idaho), will provide best incentive ever to mass production of electric vehicles. It practically guarantees that we will see electric cars built/bought in the 80s in significant quantities.

Sen. McClure announced: "My amendment allows manufacturers to include electric vehicles in their corporate average fuel economy requirements. Although it will be on an evaluation basis for the next few years, this will give big automakers genuine incentives to produce electric vehicles."

His amendment, if capitalized on by major auto builders, will dramatically reduce overall fleet gasoline consumption ratings. According to the Senator: "I don't think the general public realizes that over 25% of our oil consumption is used for private transportation, or that 90% of our everyday driving needs can be met by electric vehicles. In big cities, electric vehicles would drastically reduce air and noise pollution, while freeing up enormous amounts of petroleum for rural areas and agricultural needs."

Excerpt from:
U.S. Department of Energy
Electric & Hybrid Vehicle Program
DOE/CS-0026-8, November 1979 Issue
Quarterly Report, July-Sept. 1979

Based on trip lengths, an electric vehicle with a 40 mile range between re-chargings could be used for 91.5% of all private automobile trips and could dis-place 67.0% of the automobile's fuel consumption. Forty mile electric vehicles are available today. An electric vehicle with a 75 mile range could be used by 98.1% of all automobile commuters and could dis-place 86.0% of the commuter vehicle fuel consumption. Such electric vehicles have been developed under DOE contract and could be in mass production by the mid-1980's. The electric automobile is ideally suited for the commuter automobile, second-car market.

H&D CENTER TO BUILD HYBRID CARS — Our Corporate R&D Center, Schenectady, has been awarded a $7 million, 30-month contract by DOE to design/build two experimental hybrid — electric and gasoline-powered — cars.

Load Currents is published by General Electric Company.
Volkswagens from all aspects appear relatively unchanged. This is definitely not the case. Volkswagens and their related parts actually have changed considerably and constantly over the years. These changes allow and restrict mechanical and electrical interchange of many VW components. These guidelines provide sufficient information to avoid pitfalls when mating various VW components together to be used in the Bradley GT & GTII.

CHASSIS

Definition: The chassis as required for a Bradley is defined as a VW floor pan/tunnel frame with front and rear suspension, steering gear (including steering column), brake system, transaxle, starter motor and battery.

Chassis Facts:

1. The only chassis that can be used without modification is the VW standard Beetle type 1 sedan, 1968 and later, with serial numbers beginning with 118. Automatic stick can be used but requires minor changes to accept the additional components associated with the automatic stick shift.

2. Additional components must be saved from the chassis and the VW body to be used with the Bradley. See the structural plans in the Volkswagen Disassembly section for complete details.

3. 1967 and earlier chassis can be used, but due to the forward location of the shift lever, the shift lever must be bent or cutting and welding must be done on the tunnel to move the shift location rearward 2" or more. In all later models, the stock shift lever must be replaced by a curved shifter lever such as the Hurst model we sell as an option.

4. The 12 volt electrical system is required for the GT-II as the 6 volt system will not work. All 1967 and later chassis are equipped to accept 12 volt engines. If an earlier (pre-1967) 6 volt chassis is used, it can be changed by modifying the transaxle and installing a 12 volt starter motor.

5. The VW bus or transporter type 2 chassis cannot be used in any way for the Bradley.

6. The 411 and 412 square back or fastback type 3 chassis can be modified to fit the Bradley. Instructions are not available to do this modification.
Presenting the return of the electric

DRIVE THE FUTURE NOW!

BRADLEY GTE ELECTRIC

The Bradley GTE Electric sports car kit was conceived and developed with one specific goal in mind... to set a new standard of sports car excellence with an electrical powered drive system that is a production reality. An unswerving commitment to quality of design, workmanship and engineering has enabled Bradley Automotive to achieve that goal. We present the all new GTE Electric with great pride because we believe it to be the newest and most advanced electric car on the streets of America.

To reserve your Bradley GTE Electric now, call 1-612-475-2990, or toll free 1-800-328-7141.
Bradley GTE Electric is the Renaissance of today. The first vehicle since the horseless carriage was the electric, now it's the future. Economical sports car motorizing integrated between European styling and an electric power system. The low drag coefficient of the aerodynamic body design and the high performance electric power train combination results in the finest international transportation. Free from pollution, fuel consumption, and engine maintenance, the battery charged electrical motor and computer-run system cannot be surpassed.

Sixteen power system batteries distributed over the chassis conform weight control to aid the drag coefficient of the vehicle design. The GTE Electric cannot be undersold by the gasoline operated vehicles. The battery system is recharged within 8 hours for a cost as low as 40c. Depending upon driving habits, the Bradley GTE Electric has a top speed up to 75 m.p.h. at 96 V direct current, quick acceleration of 0-30 in eight seconds, and driving range of up to 100 miles inner city, 70 miles highway.

The Bradley GTE Electric is delivered complete for easy, step-by-step assembly on a standard chassis and electric power drive system. Unlike other cars on the market, the Bradley GTE Electric includes all components, hardware, fasteners, weather-seals, and edge trim.

Unitized reinforced fiberglass body, including all fiberglass components.
Cowl type door and window design
Tinted safety glass windshield
Removable sunroof panels
Light Group
Lucas stop/lamp and sealed beam headlight system
Tail lights, turn signals, parking lights, safety light and reflectors
Complete Interior Group
Chrome rally steering wheel
Interior mirror
Deluxe cut pile carpeting
Deluxe padded seat upholstery, dash, overhead, side and back panels
Front and rear bumpers
Complete electrical system and color-coded wiring harness
Jet cockpit Cluster
SPEEDOMETER
Amperage gauge
Voltage gauge
Key door lock
Windshield wipers
Headlight/defroster system
Chrome Appearance Group
Dual custom fender mirrors
Deluxe license plate frame
Chrome edge trim
Light/dark line stripe accent package
The Electric Power System Group
Traction motor
Controller
Batteries
Batteries recharge unit

Bradley GTE Electric Design - pound for pound, stronger than steel. Ultra-tight reinforced proof-fug inclusive fiberglass body, including all fiberglass components. Brilliant exterior finish is bonded directly into the fiberglass.

The Classic Full Size Cowl Wing Doors are automatically operated by high-compression gas pistons. These extrathick, side opening doors also feature push button door handles, two key door locks and safety tested double lock latches for rock solid closing.

Bradley GTE Electric Hardtop design with steel structure support has tinted windshield, safety glass all around and European-styled vent windows. Removable tinted sunroof panels let the sun shine in.

The Electric GTE Interior Decor Group includes center console and armrest, pile carpeting extending to interior sides, full-width padded dash, total interior upholstery and contoured twin bucket seats.

The Full-Width Upholstered Dash Instrumentation Panel is set off by a European GTE leather-covered steering wheel, glare-resistant rearview mirror and glove box. Electronic instrumentation cluster strikingly conveys vital speed, power resource, and system check information to the driver. Grouped in the cluster are speedometer, voltage and amp gauge, four European-type rocket switches, control headlights, headlight lock, windshield wipers, blower and hazard switches.

The Power Drive System is a heavy-duty direct current traction motor. A motor costing that resists water, acid and corrosive fumes. The traction motor is designed to provide maximum performance with a minimum of battery drain. The entire motor that is 19 inches long by 9 inches in diameter bolts directly to a standard Volkswagen four-speed transmission and transaxle drive system.

Electronically Balanced Power Controller is the brain of the GTE Electric. The controller provides high performance with smooth operation, high starting torque, quick acceleration and high current rating. Accessible adjustments are for speed, current limit, and controlled acceleration. The high efficiency controller initiates motor and controls protection, operator safety features, and a sealed printed circuit board.

The Built-in Battery Power Recharge Unit accepts standard 110 volt electric house current via a receiver-connection located on the outside of the driver's door. The recharge unit allows quick convenient hook-up for recharging and overrides system to the car will not run until the recharge cord has been disconnected. The average time of the recharge is only seven to eight hours.

Sixteen 660-volt batteries make up the power source that are mounted in a series of six in the front and ten in the rear of the Volkswagen chassis. The battery compartment design allows easy access for maintenance.

The Chassis, Suspension and Tires are especially designed for the GTE Electric. The standard VW chassis with modifications is converted to carry sixteen 660-volt batteries. Heavy duty overload shocks and rear suspension. Special steel belted radial tires (P-200 75 R-14) at 41 lbs. air pressure give friction-free roll and traction driving efficiency. Bradley Automotive will mount and balance these radial tires with the GTE Electric magnesium wheels.

Bradley GTE Electric options include:
- Gasoline heater is added for added heat for the passenger comfort package
- Huyn Chrome Shifter with easy grip reverse gear pulling. This race style shifter complements the interior design and provides smooth, easy shifting through all four gears
- Windshield washer kit, simple to install; blends in with the hood design
- Seat Belts, Custom sport seat belts assure maximum passenger comfort

The Bradley GTE Electric is also available as assembled kits. The assembly of your car is done with skill and care by independent craftsmen. Every component is thoroughly checked by professional mechanics during each step of fabrication. All new tools or special tools required to complete the assembly. Just bolt down the body on your existing VW chassis, install the steering, upholstered seat and carpeting, connect the wiring of the battery system to the motor control center...and quietly drive away. Factory assembly is optional and available at additional cost.

CUSTOMER SERVICE
Our customer service begins the minute one of our own specially-trained drivers delivers your new Bradley GTE Electric. The driver will personally check each item in the package, make sure that all parts are included and in good condition. Complete customer service is only a toll-free phone call away.

Bradley Automotive assembly instructions are simple and easy. There is also a staff of assembly specialists available when you have questions on any phase of assembly. A simple, toll-free phone call is all it takes to get the answers: TOLL FREE NUMBER 1-800-328-3546.

LIMITED WARRANTY
Bradley Automotive warrants to the purchaser of its products that its products will be free from defects in workmanship and materials when received by the customer. Bradley Automotive will repair or replace at its cost all of its products which are defective when received by the customer. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY. THIS WARRANTY LIMITS Bradley Automotive's LIABILITY FOR BREACH OF ANY WARRANTIES, EXPRESS OR IMPLIED, TO THE REMEDIES PROVIDED HEREIN AND EXCLUDES LIABILITY FOR CONSEQUENTIAL DAMAGES. The above provisions are subject to applicable state and federal laws.

Bradley Automotive reserves the right to change any price, specifications, parts or equipment at any time without incurring any obligation to alter the price, specifications, parts or equipment on any Bradley kits shipped prior to the date of such change.
HOW TO: BUILD the ULTIMATE 1800cc BUG ENGINE!

VOLKSWAGEN Greats

EXCLUSIVE: THE PORSCHE CLUB PARADE

SUPER COVERAGE: VINTAGE & CUSTOM VWs

WILD NEW VW-BASED GULL-WING KIT CAR!

DECEMBER 1976

$1.25
THE BRADLEY GT-II--

This latest offering from the nation's largest kit car company might prove to be the best VW-based kit ever marketed.

Kit cars are for dreamers on limited budgets, automotive enthusiasts who've been stranded by spiraling inflation with small economy cars instead of ones of more sporting genders, or those who are mechanically inclined, good with their hands and need something to occupy their time.

But instead of seeing their dreams realized, the only thing many of these people wind up with when they purchase a kit car is a nightmare. A nightmare of frustration, anger and, more often than not, considerable monetary loss. Why? Because numerous kit car manufacturers are themselves run by dreamers—dreamers with little or no business sense, who envision a day when they'll be building cars in competition with the Big Three. These are the guys who haven't the foggiest notion of how to build enough cars to meet demand, or supply customers with the parts they paid for, let alone assemble a complete automobile. But while many of these manufacturers remain no more than small garage and backyard operations barely capable of producing a dozen cars a year, one such firm has risen from such meager beginnings to become a major corporation.
You’ve made your mark.

Now make your Bradley GT.

Make it with the Bradley GT sports car kit. The sleek, classic Bradley GT is custom-designed for assembly on a Volkswagen chassis. So you enjoy the economy and dependability that comes from the world’s most popular compact... and the style and performance that comes from the world’s finest car kit. You’ve made your own mark. Isn’t it time to make your own sports car?

Bradley Automotive
14414-21st Avenue North,
Plymouth, Minnesota 55441

☐ Send $1.00 for brochure or
☐ $7.00 for Assembly Manual

Name
Age

Address

City

State
Zip

Business Phone ( )

Home Phone ( )

This Assembly Manual and Bradley GT may be charged to your BankAmericard.

Account No
A new luxury sports car kit!

Bradley Automotive, a Minneapolis-based firm, is no ordinary kit car company. Since Gary Bradley introduced the first Bradley GT in 1972, more than 5000 have been sold. In 1977, the company expects to do more than $8 million worth of business! Bradley's success, as he'll quickly admit, is not so much a result of his kit car, as it is the way it has been marketed. Like many other kits, the GT consists of a fiberglass twoseat body and related components, designed to be bolted to a standard Beetle chassis and use the Beetle's engine and running gear. Where the GT differs is how the buyer first learns of it, buys and finally receives it.

Gary Bradley learned, after a stab at selling dune buggies, that what a customer wanted most was a complete vehicle. He would rather pay more and get all of the ingredients than save a few dollars and have to fabricate many of the parts himself. For a marketable kit car, Gary turned to Dave Fuller. Together they designed a kit that could be mated to a Beetle (or Ghia) chassis, had a sports car body that could be fashioned from lightweight fiberglass, was easy to assemble and had all the parts necessary for completion. The result was, of course, the GT, a kit that comes only one way: with virtually everything needed to put it on the road, except the guts from a wrecked VW.

Once Gary had a kit he felt was what his customers wanted, he placed advertising in countless publications that covered every topic, only a handful of which were automotive related. Next he worked on making sure all inquiries from these advertisements were answered promptly by mail and phone. He then saw to it that when a customer ordered a Bradley, he got it complete and within 10 days of receipt of his deposit. The former is most important, as it's common for kit car manufacturers to send out kits with parts missing. Bradley prides himself on the fact that when a customer orders a car from him, he gets absolutely everything he paid for, right down to the last washer and bolt.

There's another interesting side to Bradley Automotive, the manufacturing side—or rather, the lack of it. Bradley, it turns out, is really not a manufacturer at all. Instead, they buy all of the components for their kits, including the bodies, from outside suppliers. This, says...
Fiberglass reinforced bumpers are supplied with the kit and are mounted on hydraulic cylinders. The wire wheels are an option. The GT-II measures 178 inches long, 69 inches wide and 46 inches high.

Gary, not only permits him to devote more time to selling the kit (Bradley has 35 salespeople working on toll-free WATS lines), but it also means he can have components mass produced in whatever numbers demand warrants without having to get involved in the labor and materials end of manufacturing. In addition, should quality not meet Bradley's specifications, all Gary need do is turn to another manufacturer.

Speaking of quality, this seems to be another area in which Bradley Automotive excels. The company is continually improving and refining their kits so that today, four years after the first GT was shipped to a customer, few, if any, problems with the quality of the kits are ever encountered. However, should there be any problems, or should assembly-related difficulties arise (such as how to fit a certain part, or what year VW chassis to use to avoid emission certification problems), there's a toll-free customer service line staffed by Bradley employees familiar with all phases of the kit's construction.

It would seem at this point that Bradley could and should go blissfully on selling 200-225 $3000 GT kits a month. But, according to John Meegan, marketing director of Bradley, his company is out to capture a bigger share of what he claims is a market which Bradley has barely even scratched. To do this, Bradley is introducing a new kit car called the Bradley GT-II. The GT-II is billed as a "luxury sports car kit" and it will carry a higher (by around $1200-$1500) price tag. Compared with the GT, which will continue to be sold, the new car is indeed more luxurious and comes even closer to a production sports car.

The GT-II is a totally new car. Although it was designed by Dave Fuller, now vice president of research and development at Bradley, it uses almost none of the existing GT hardware. The GT-II is designed to bolt onto an unaltered Beetle chassis, but is not confined to using only a Type 1 motor. Any Volkswagen or Corvair engine can be installed, and, if you're looking for still more power, there are a couple of optional chassis modification kits that'll allow you to use a Porsche 914 or a 911 motor. The GT-II is also unique in that it is fitted with inside releases and gas-filled struts on all opening doors and hatches.

The body on the GT-II will at first be made of fiberglass laid up in a conventional manner, but after production is up sufficiently, they may use a new process by which an outer skin of vacuum-formed ABS plastic is bonded to an inner fiberglass shell, a la Bricklin. Another interesting feature of the GT-II is that it uses tinted safety and tempered glass in all windows, including the sldow-down windows in the gull-wing doors. A single frameless piece of glass serves as a
rear window and hatch that allows access to a storage area behind the front seats.

The cockpit of the new Bradley is quite large and legroom is more than adequate even for those over six-feet tall. The seats are specially designed for the GT-II and are, along with every other portion of the interior, pieces that are supplied with the kit. A complete set of VDO Jet Cockpit gauges are mounted in a center console and, though not directly below the driver’s line of sight, are easily read. There’s even storage bins in the doors, a glovebox and a padded center armrest. The gull-wing doors on the prototype we saw are some of the best we’ve ever come across. They utilize AMC Pacer pushbutton and Rabbit locks and have deep inner rain gutters, strong hinges and can be lifed easily and slammed hard. Gary says he and Dave Fuller spent quite a bit of time with ex-Bricklin designers in an effort to come up with a door that wouldn’t leak or malfunction. It was time well spent.

The headlights on the new car are the pop-up kind and are operated by a single electric motor. They raise and lower quickly and remain solidly in place in either position. Up front there’s a small louvered hatch that hides the master brake cylinder reservoir and gas cap. Fuller even had the foresight to leave a space underneath the cowl for an air conditioner. We’ve been told Bradley is having a firm make special A/C units for the GT-II and that they’ll be offered as optional equipment with the kit.

Being only 46 inches tall, the GT-II is not the easiest car to get into or out of, but it’s infinitely better than most kit cars we’ve seen. All of the cockpit controls are neatly laid out in a row of rocker switches on the center console and, of course, there’s the usual VW stalks for headlights and turn signals and wipers/washer (the latter if a ‘72 or later VW steering column is used). Visibility seems to be good, though with the low seating position, backing up will have to be done cautiously. Fresh air ventilation is provided by four VW Bus swivel outlets, two on the dash and two on the footwells. The upholstery used on the dash, seats, console and door and side panels appears to be of excellent quality, as is the carpeting. We didn’t get a chance to drive the GT-II while in Minnesota, but as soon as a production model is available for testing, we’ll bring you a complete report.

The final coup de grace for Bradley Automotive is something that every kit car manufacturer has been trying to do since the Beetle first landed on our shores—buy brand new VW engine/chassis assemblies. Gary has informed us that Volkswagen de Mexico is under a $300,000 contract to supply his company with complete new Beetle running gear. The first shipment of 108 chassis/engine combinations (which include everything from brakes to steering columns) should be arriving at Bradley as you read this. The chassis and engines will meet U.S. safety and EPA emission regulations. The chassis will be available for approximately $1900 and a chassis with a new Type 1 powertrain will cost about $2900.

The buyer of a GT or GT-II will thus be able to build a complete car, just as it is delivered to his door by one of Bradley’s own 18-wheelers. Bradley has indeed made its mark in the kit car business and the automotive world.
BEAUTY IS MORE THAN SKIN DEEP . . .
BENEATH THE BRADLEY EXTERIOR,
BEATS THE HEART OF A BUG.

If you want the kind of performance that
goes with your Bradley GT-II's styling—
then there's only one magazine for you:

VOLKSWAGEN
Greats

VW GREATS is devoted strictly to the
care and feeding of VWs and related
vehicles. You'll learn how the racers get
more performance from their VWs, how
to keep that motor alive—tuning it for
maximum fuel economy and making it a
show winner.

But VW GREATS is more than just a
magazine filled with tech tips on engines.
It has valuable articles on how to tune
a suspension, what wheels and tires will
fit your chassis, how to sort out
electrical systems (including switching
from six to 12 volts), and much more.

In short, VW GREATS presents insights
into VWs (and the Bradley) not offered in
any other publication. VW GREATS is an
absolute must for anyone contemplating
building a Bradley GT-II.
Introducing an exciting new concept in autodynamics.

The Bradley GT II.

Nothing in the motoring world so dramatically combines the style and performance of the finest European sportscars with the economy and dependability of a VW. Each component of the GT II car kit is custom-designed for precision fit and easy assembly on a Volkswagen chassis. The totally-engineered, finely-crafted finished product is a reflection of your own good taste and individuality. A product with unique autodynamic properties that provide significantly improved performance. And with styling so reminis-cent of the most expensive and lavish European sportscars.


The all-new Bradley GT II car kit. An exciting new concept in autodynamics. Available in a choice of beautiful colors, all with color coordinated interior.

Send $1.00 for the 4/color Bradley brochure: write Bradley, 14414-21st Avenue North, Plymouth, Minnesota 55441.

Bradley Automotive
14414-21st Avenue North,
Plymouth, Minnesota 55441

☐ Send $1.00 for Bradley GT-I & GT-II brochure
☐ $7.00 for Bradley GT-I Assembly Manual
☐ $25.00 for Bradley GT-II dimensional structural plans

Name_______________________ Age________
Address_____________________
Cty________________________
State________________________ Zip________
Business Phone ( ) Home Phone ( )
The above materials may be charged to these credit cards: Bank Americard, American Express, Diners, Carte Blanche and Master Charge.

Account No.____________________ Expiration date:____________________
1- Position bumper bracket.
2- Mark then drill holes.
3- Mount with bolts provided.

Drill with 2 3/8 inch hole saw
BRADLEY AUTOMOTIVE GT II ELECTRIC

FRONT BUMPER SUPPORT POSITION

1- Position bumper bracket.
2- Mark then drill holes.
3- Mount with bolts provided.
Bradley GT kit cars have been around since 1972 when Gary Bradley introduced the Bradley GT to the general public. At that time, Gary felt that he had a good concept that could eventually lead to a very special car and successful business venture. Time has proven Gary right as Bradley Automotive has sold over 5000 GTs in various stages of completion and now has annual sales of $8 million. While this doesn't make Bradley Automotive a threat to General Motors, it does make them perhaps the most successful manufacturer of kit cars around.

However, as successful as the original GT was, Bradley knew it was only a matter of time before the competition would catch up with him, so Gary put his designer and chief engineer, Dave Fuller, to work designing and planning a replacement for the GT. After years of research and development by Fuller and his staff the end result is a new stylish effort from Bradley, called the Bradley GT-II.

Like its predecessor the GT, the new Bradley GT-II fits on a VW chassis and can utilize either VW or Porsche power. The GT-II has a wheelbase of 94.5-in., overall body length of 178-in., and is 69-in. wide and 46-in. tall. Total weight of a completed Bradley GT-II is near the 1900 lb. mark. It should, therefore, deliver excellent fuel economy when powered by a stock engine because of the bodies' aerodynamic shape. In fact, Bradley claims a top speed of nearly 100 mph and up to 30 mpg with a stock engine.

The GT-II body is built of fiberglass reinforced plastic with a gel-coat finish and is attached to the pan over the entire interface flange which provides for inherent structural integrity. Other safety features include a steel reinforced roof, tinted safety glass all around, and steel reinforced fiberglass bumpers.

Gull-wing style doors are used for entrance and exit from the GT-II, and the doors are assisted by gas cylinders which make opening and closing an easy task.

Within the gull-wing doors is an interior that Bradley claims is rich and comfortable and color coordinated to the choice of exterior colors. The GT-II also features more head and seating room than the earlier GT, as well as adjustable bucket seats, a padded dash with an instrument cluster canted toward the driver, and plush carpeting. Strict adherence to quality control also make the interior weather tight, and European style slide vent windows in the doors help provide for a steady flow of fresh air when needed. The engine cover, front access cover and hatchback are all latched.

Above left, gull wing doors are assisted by air cylinders. Headlights are electrically operated and are of the pop up variety. Above right, engine compartment door is also air assisted. There's plenty of room inside for just about any option. This GT-II is equipped with air conditioning.
1) Cut wire rope to length with cutting torch and fuse rope end to prevent fraying of strands.
2) Install wire rope thru drum cross hole from side opposite cast-in groove.
   Insert rope back thru hole. Position rope end just inside of drum barrel surface and tighten set screw.
3) Pull rope into cast-in groove.
4) Maintain at least 3 wraps of rope on drum at all times.

Note: Holes 2 and 3 are interchanged on Model "C" ratchet hoist drums from that shown.

Keep tension on rope when rewinding.
PREVIEWING THE 1977 VWs

ADVANCED BASICS: REBUILDING THE 40 HORSE
BUG-IN 17 • ARABIAN DUNE BUGGY
SUPER VEE & SCIROCCO RACING ACTION

THE BRADLEY GT-II
and operated from inside the car and are all lockable as are the doors.

According to Fuller, one of the prime requisites he had to consider when designing the GT-II was keeping the car simple so that the average consumer could put it together with a minimum of difficulty. Fuller also feels that the assembly of a Bradley GT-II is simple enough to be undertaken successfully by anyone with a modicum of mechanical ability. It is a good family project which requires only normal home workshop tools to build. To date the only difficulties encountered were from owners who got overconfident and skipped a step or two. A call to the Bradley factory is usually all that’s required to get the builder back on the right track.

Options for the Bradley include air conditioning, steel belted radial tires and a choice of radios. There are also a number of different engine options available as well as an automatic transmission. Pre-assembled kits are available, and new VW chassis may be obtained from Bradley Automotive through a special arrangement with VW of Mexico.

For a total expenditure of $5500-$6000, Fuller estimates, (depending on what is paid for the chassis and drive train) a Bradley owner can be ready to hit the highways and have some fun. Information on the Bradley GT-II kit car may be obtained by writing Bradley Automotive, 14414-21st Avenue North, Plymouth, Minn. 55441.

Top left, brake fluid reservoir is cleverly hidden beneath louvers on hood. Top right, instrument panel is canted towards the driver. Bottom right, interior is roomy and is color coordinated. Left center, this Bradley GT-II uses an I.R.S. transaxle which is mated to a late, dual port 1600cc engine that provides plenty of push for the aerodynamic car. Bottom left, styling of the new GT-II is very pleasing to the eye.
BRADLEY

GT-11

THE LATEST EFFORT FROM ONE OF AMERICA'S OLDEST KIT CAR MANUFACTURERS

BRADLEY AUTOMOTIVE

14414-21st Avenue North • Plymouth, Minnesota 55441
(612) 475-2990 • Toll Free: 1-800-328-7141
Dear Customer,

This is the second section in a series of 4 that will enable you to construct an electric car. It was preceded by the general body modification section and will be followed by wiring and cabling schematics information. Do not attempt to hook up the battery cables or any wiring until you receive specific instructions. An incorrectly wired car could result in damage to the entire system. This section will enable you to mount the hardware and components to your VW chassis for electrical storage and drive systems.

At this stage in the construction sequence the GT II body preparation should be nearing completion. The body will be mounted to the chassis at a later time and that information will be covered in the 4th Sub Section.

All components in this section appear on the outline in the correct installation sequence. You should become familiar with each component by reading the brief description of its function and by looking at the various illustrations. A VW owner manual for your particular year chassis could be of some assistance in preparing your chassis.

Should any problems arise Customer Service is available to assist you at 1-800-328-3546.

Sincerely,

Bradley Automotive
Section #2

A. Chassis Preparation
B. Suspension Modifications
C. Subframe
D. Shock Absorber
E. Clutch & Flywheel
F. Starter Dust Cover
G. Electric Motor
H. Controller Brackets
I. Controller
J. Accelerator Switch
K. Batteries
L. Accessory Battery Mount

Note: All components appear in the correct installation sequence.
B. SUSPENSION MODIFICATIONS

Two additional modifications not listed in these sections but will need to be done are as follows:

The first modification involves increasing the spring rate of the rear suspension. The rear torsion bars must be reloaded. (See photo & illustration)

A. Raise the rear wheels and support with jack stands on the rear torsion tube.

B. Loosen rear wheel mounting bolts and remove rear wheels. Remove the front and rear shock absorbers.

C. The rear shock absorbers must be removed to complete this operation.

D. Take out bolts at axle shaft bearing housing; 3 per side.

E. Swing rear axle up towards the rear until it clears spring plate.

F. Remove bolts that attach spring plate hub cover; 4 per side. Take off cover.

G. Torsion arm is resting on a stop—pry the arm off the stop to unload the tension—do not disengage spline on torsion arm.

H. Note the location of the stock unloaded position.

I. There are 44 splines at the outer end of the torsion bar. This provides a vernier adjustment for setting the spring plate angle. By rotating the bar down 1 spline, 8 degrees approximately on each side, you will have the spring tension needed for the additional weight.

J. This operation is now complete.

K. Reassemble unit with remaining parts in the reverse order of removal. Do not re-install standard shock absorbers, they will be replaced with overload units after the subframe has been installed.
A. VW CHASSIS PREPARATION

CHASSIS

Remember your bradley Electric Car is a conversion in kit form. Prior to the assembly of the VW chassis to the Bradley Electric car subframe certain modifications to the chassis must be made to ensure maximum safety and long trouble-free operations.

These VW chassis modifications are listed "The VW Information for GT II". Particular attention must be made to the "Inspect the Chassis" and the "Chassis Preparation" sections. Disregard any reference to the Volkswagon engine, starter, and electrical systems as they will not be needed for your electric kit.

<table>
<thead>
<tr>
<th>RECOMMENDED CHASSIS MAINTENANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Replace steering dampener</td>
</tr>
<tr>
<td>2. Replace front tubes if rusted</td>
</tr>
<tr>
<td>3. Rebuild steering box</td>
</tr>
<tr>
<td>4. Install new front wheel bearings</td>
</tr>
<tr>
<td>5. Check ball joints and tie rod ends</td>
</tr>
<tr>
<td>6. Install new front brake shoes</td>
</tr>
<tr>
<td>7. Replace or rebuild front wheel cylinders</td>
</tr>
<tr>
<td>8. Replace or rebuild master cylinder</td>
</tr>
<tr>
<td>9. Check transaxle (replace or rebuild if necessary)</td>
</tr>
<tr>
<td>10. Replace transaxle fluid</td>
</tr>
<tr>
<td>11. Check all brake lines—replace if necessary</td>
</tr>
<tr>
<td>12. Clean and regrease CV joints on drive axles, &quot;IRS&quot;</td>
</tr>
<tr>
<td>13. Grease shifter tube joint</td>
</tr>
<tr>
<td>14. Clean &amp; lubricate accelerator, brake, and clutch pedals</td>
</tr>
<tr>
<td>15. Replace rear brake shoes</td>
</tr>
<tr>
<td>16. Replace or rebuild rear wheel cylinders</td>
</tr>
<tr>
<td>17. Undercoat entire chassis</td>
</tr>
</tbody>
</table>
C. Subframe

Bradley Automotive has manufactured a complete subframe that evenly distributes the weight of the 16 batteries over the entire VW chassis. There are 8 batteries ahead of the front torsion tube and a total of eight batteries (in two racks on each side of the electric motor) just behind the rear axle. The subframe must be installed prior to the electric motor being bolted to the transaxle.

**Subframe Parts List**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Main Subframe</td>
<td>1</td>
<td>35003</td>
</tr>
<tr>
<td>2. 5/8&quot; U-Bolts</td>
<td>2</td>
<td>35094</td>
</tr>
<tr>
<td>3. 5/8&quot; U-Bolts</td>
<td>2</td>
<td>35093</td>
</tr>
<tr>
<td>4. Subframe Hardware Kit</td>
<td>1</td>
<td>31166</td>
</tr>
<tr>
<td>5. Transaxle Carrier tabs</td>
<td>2</td>
<td>35076</td>
</tr>
<tr>
<td>6. Starter dust cover</td>
<td>1</td>
<td>35084</td>
</tr>
<tr>
<td>7. Accelerator switch mounting bracket</td>
<td>1</td>
<td>35081</td>
</tr>
<tr>
<td>8. Accessory battery bracket</td>
<td>1</td>
<td>35080</td>
</tr>
<tr>
<td>9. Studs for Accessory battery bracket</td>
<td>2</td>
<td>36006</td>
</tr>
<tr>
<td>10. Accessory hold down bracket</td>
<td>1</td>
<td>35016</td>
</tr>
<tr>
<td>11. Front Controller mounting bracket</td>
<td>1</td>
<td>35082</td>
</tr>
<tr>
<td>12. Rear Controller mounting bracket</td>
<td>1</td>
<td>35083</td>
</tr>
<tr>
<td>13. Controller Hardware kit</td>
<td>1</td>
<td>31161</td>
</tr>
<tr>
<td>14. Battery Hold down clamps</td>
<td>4</td>
<td>35092</td>
</tr>
<tr>
<td>15. Battery Hold Down Racks - Right</td>
<td>1</td>
<td>35091</td>
</tr>
<tr>
<td>- Left</td>
<td>1</td>
<td>35090</td>
</tr>
<tr>
<td>16. Rear Stabilizing bracket - Right</td>
<td>1</td>
<td>35086</td>
</tr>
<tr>
<td>- Left</td>
<td>1</td>
<td>35085</td>
</tr>
<tr>
<td>17. Bumper Brackets - Front</td>
<td>2</td>
<td>30606</td>
</tr>
<tr>
<td>- Rear</td>
<td>2</td>
<td>30654</td>
</tr>
<tr>
<td>18. Extension tubes</td>
<td>4</td>
<td>30618</td>
</tr>
</tbody>
</table>
TORSION BAR HUB COVER MUST BE REMOVED TO COMPLETE ADJUSTMENT

SHOCK TOWER

TORSION ARM

STOCK POSITION (UNLOADED)

NEW POSITION (UNLOADED)

 Pry torsion arm out to clear torsion arm stop
 Do not disengage spline on torsion bar
1. Slide the sub frame under the VW chassis. There are two holes drilled in each sub frame rail just behind the front battery compartment. Position these holes just below the lower front torsion tube.

2. Lift the sub frame up until the sub frame rail makes contact with the lower front torsion tube.

- Center the holes on the sub frame rail directly beneath the lower front torsion tube.

- Prop an object under the battery rack to maintain positioning.
3 Install the front 5/8 inch U-Bolts over the front lower torsion tube into holes in the frame rail.

- Turn lock nuts on until snug.
- Do not completely tighten the lock nuts.
- Now remove the support objects from underneath the sub frame.

**note:**
Center the subframe on the torsion tube. There must be an equal distance between the U-Bolts and the shock towers on both sides of the front axle assembly.

X = equal distance
5) Insert 3/8 inch U-Bolts over the rear torsion tube into the holes intended on the frame rail step.

- Install lock nuts.
- Tighten the lock nuts you have just installed on the rear torsion tube U-Bolts.
- Tighten the lock nuts on the front torsion tube U-Bolts.
4. Raise the rear of the subframe until the subframe rail step makes contact with the rear torsion tube. Prop a support object under the rear of the subframe to maintain positioning.

**Note:** Make sure the subframe rail steps are centered on the torsion tube. There should be an equal distance between the subframe rail steps and the shock towers at each end of the rear torsion tube.
6. Remove the transaxle carrier bolts. The transaxle may shift position but should easily be re-aligned.

7. Install the transaxle carrier mounting tabs
   - replace the carrier bolts
   - position the carrier mounting tabs as shown on the subframe crossmember at approximately a 45° angle.
   - mark then drill a 1/2" hole at each side of the crossmember.
   - install a 1/2" bolt 1" long in the lower hole on the tab into the subframe crossmember.
   - tighten the 1/2" bolts and the transaxle carrier bolts.
8 Remove the rear shock absorbers. Install the rear stabilizer support bracket between the shock mount and the shock absorber on the top and to the subframe on the bottom. The stabilizer support bracket must be bolted to the forward hole in the subframe mounting talo. The rear two holes in the talo are used to mount the bumper support bracket. Be sure to install Air-Lift shocks instead of the original equipment shock absorbers.
D. SHOCK ABSORBER INSTALLATION

Second Suspension Modification

Suspension revision is necessary on all GT-II Electric vehicles due to the packaging of the electric vehicle. Special overload shock absorbers must be installed on the front to compensate for the weight of the forward battery pack. In addition Bradley Automotive has determined that front shock absorber extensions installed on top of the overload shock absorbers delivers the best handling performance and weight distribution.

At the rear of the car the standard shock absorbers must be replaced with air - assist shock absorbers. To save time and work a good time to install the air - assist shock absorbers would be when installing the rear subframe stabilizing brackets. Also, when installing the air - assist shock absorbers, the air inlet on both right and left shocks......... must point toward the passenger side of the car. This insures there will be sufficient room to install an on board charger in its correct position without interfering with the air lines or inlet.

If not familiar with the correct shock absorber installation, consult a VW technical manual for your particular year chassis. Do not hook up the air shock lines at this time -- they will be installed at a later date. Bradley Automotive can provide you with the special shock absorbers needed.
F. STARTER DUST COVER

The starter dust cover must be mounted prior to the mounting of the electric motor to the transaxle. Its purpose is to seal off the hole previously occupied by the starter which no longer is needed. It can be secured in place by means of the lower starter bolt. The top bolt is also an engine mounting bolt and should be installed at that time. Refer to photograph for correct installation.

parts list reference – 6
E. FLYWHEEL CLUTCH DISC & PRESSURE PLATE INSTALLATION

The electric motor that Bradley Automotive will provide you for your electric car conversion will come with a specially designed adaptor that will already be installed to the electric motor. This adaptor will bolt up to any standard 4-speed VW Beetle transaxle.

Before the electric motor can be mounted to the transaxle, a flywheel, clutch disc, and pressure plate must be installed. The same flywheel, clutch disc and pressure plate used for the VW gas engine will bolt up to the electric motor. There is already installed on the electric motor a special adaptor to mount a flywheel. The same procedure used to mount the flywheel & clutch assembly to a VW gas motor will still apply to mounting the flywheel & clutch assembly to an electric motor.

NOTE:
Refer to a VW technical manual for your particular year chassis for precise mounting instructions, if needed. The same basic procedure applies to all VW flywheel & clutch & pressure plate installations. Be sure that prior to mounting the flywheel & clutch & pressure plate, each is thoroughly cleaned and inspected, to ensure top mechanical operation. Replace components if necessary.
G. ELECTRIC MOTOR

Once the flywheel & clutch assembly is properly installed to the electric motor, the assembly is ready to mount to the W transaxle. Because of the adaptor plate previously installed on the electric motor, the motor will bolt to the transaxle with the same 4 bolts used to mount a gas engine.

The top engine mounting bolts once installed should have approximately 1" of excess thread behind the hex head lock nut. Lock nuts must be used to prevent the possibility of the nuts loosening. When installing the electric motor, put the transmission in gear. Lift the motor in place. Rotate rear wheels so that clutch plate hub lines up with the drive shaft splines and glides into place. Align the mounting holes and slightly tighten upper motor mounting bolts and lower mounting bolts. Then tighten all bolts evenly.
H. CONTROLLER BRACKETS

Installation—The controller brackets mount the EV-1 control package to the electric motor. The front controller bracket utilizes the excess top thread on the engine mounting bolts. Refer to photo for correct installation. The rear controller bracket mounts to the rear of the electric motor casing. Bolt to the previously drilled holes in the electric motor with bolts provided. The center bolt hole in the rear of the electric motor should be top dead center.
I. EV-1 CONTROL PACKAGE

The EV-1 General Electric control package is a self-contained electrical control panel that monitors and distributes electrical power. It is an electrical component and must be handled with care. The controller is pre-assembled and pre-wired and requires no modifications.

Mount the controller to the controller brackets that have been previously installed on top of the electric motor with the bolts provided.

The controller is grounded to the motor by the mounting brackets and is protected from vibrations by the rubber transaxle mounts. Do not install the controller dust cover at this time.

NOTE: MATCH LETTERS WITH CORRESPONDING LETTERS ON THE CONTROLLER BRACKETS TO DETERMINE THE CORRECT POSITIONING.
Preliminary preparation

1. Remove the two screws securing the plastic cover.
2. Remove the cover.
3. Obtain a OHMETER with scales of RX100, RX1
4. "O"OHMETER on the RX100 scale.
5. Connect the leads of the OHMETER to wires #20 & #29.
6. Move the accelerator switch lever (located on side of the accelerator switch) slowly and observe the reading -
   at the first click at the switch the reading should be
   1700 - 1900 ohms
7. If the reading you get is not between 1700 - 1900 ohms -
   A. Locate the "pot" on the side of the accelerator switch (its on the opposite side of the accelerator switch lever)
   B. Remove the two screws that secure the "pots" plastic mounting bracket to the side of the accelerator switch
   C. Move the right hole in the plastic mounting bracket to the left screw position.
   D. Insert a screw in the left screw hole securing the pot. Do not tighten the screw completely.
   E. The pot will now be positioned at an angle. Shift the pot in a counter clockwise direction until the correct reading on the OHMETER is obtained. (The 1 screw is all that is needed to secure the pot in a fixed position).
   F. Now "O" OHMETER in the RX1 scale and fully move the accelerator switch lever, the reading should now be less than 50 ohms.
8. Remove the OHMETER, tighten the screw on the "pot" mounting bracket
9. Locate the floating harness leads coming out of the accelerator box, cut wires #4 & #13 in the middle and tape all 4 ends as not to contact any metal parts or other wires.
J. ACCELERATOR SWITCH

The accelerator switch sends a variable signal to the controller.
The controller monitors the speed in which the vehicle accelerates.
Mount the accelerator switch to the accelerator bracket with the bolts provided. Drill two 5/16" holes in the transmission support tubes. Refer to the illustration for the location of these holes. Now secure the accelerator switch bracket to the transmission support tube with the bolts provided.
Hook up the W accelerator cable to the arm on the side of the accelerator switch. In its proper position the arm should be pointing down. If mounted correctly, the arm will swing forward in an unrestricted motion as the accelerator pedal is pushed down. An additional return spring must be hooked up to the accelerator switch arm.
10. Remove the 2 screws securing the metal plate the wires come through on the accelerator switch.

11. Remove the 2 screws on the other plate on the opposite side of the accelerator switch.

12. Reverse the two plates. This moves the floating harness to the top of the accelerator box when mounted in its correct position on the car.

13. Replace the screws in both brackets.

14. Replace accelerator box cover.

15. Replace screws to secure the cover to the accelerator switch.

---cut wires 4 & 13
K. BATTERIES

Installation

There are a total of 17 batteries needed for electrical storage in your electric car. There are sixteen 6-volt batteries needed to propel the car and one 12-volt accessory battery. The battery acid level should be checked to ensure maximum power output. Refer to the illustration for the proper battery positioning. After batteries are installed the rear hold-down brackets can be secured.
HOW DOES A BATTERY WORK

An electric vehicle (E.V.) battery is an electrochemical energy storage device. It stores chemical energy which can be converted and released as electrical energy. When the battery is connected to an external load, such as the drive motor of an electric vehicle, the chemical energy is converted into electrical energy and current flows through a circuit to energize the motor.

The lead-acid E.V. battery uses three basic chemicals to produce electrical energy.

1. Lead Dioxide (PbO₂) is the active material on the positive plates.
2. Sponge Lead (Pb), the active material on the negative plates.
3. The electrolyte, a solution of sulfuric acid (H₂SO₄) and water (H₂O).

When the assembled battery is filled with electrolyte and properly conditioned, a potential difference (voltage) is developed. The actual voltage is approximately 2 volts per cell. Electrical energy is produced from the chemical reactions that take place between the plate active materials and the electrolyte. Inside the battery current flows in the form of charged chemical particles called ions. In the external circuit current flows as electrons.

Lead-acid E.V. batteries are designed with the utmost concern for safety in handling and operation. Still, the basic chemical nature of the battery presents some very real dangers. These are:

1. The electrolyte:
   The electrolyte is an extremely corrosive chemical that will burn skin, mucous membranes, and destroy clothing. Protective goggles and clothing should always be worn when working on or near lead-acid batteries. Also, avoid leaning over and looking directly into the cells of a battery that has any vent caps
removed. The vent caps should only be removed from the battery when absolutely necessary, i.e., for water additions and/or for specific gravity tests. The vent caps must be in place when the battery is recharging.

2. Evolution of Gases:
During recharge or overcharge, the electrochemical reactions taking place within the lead-acid battery result in the evolution of hydrogen and oxygen gas. Together, these gases form an extremely explosive mixture. Therefore, all possible ignition sources should be kept away from a lead-acid battery during recharge or overcharge. Since these batteries evolve small amounts of hydrogen and oxygen gas during self-discharge, ignition sources, such as open flame or smoking materials should be kept away at all times.

3. Connection of batteries in a circuit:
Whenever a connection is made and a circuit is completed, it is quite common for a spark to occur at the completion point. To reduce the danger of ignition of gases, the last connection in the circuit should take place as far away from the battery(ies) as possible.

Every lead-acid E.V. battery manufactured by Globe Battery Division of Johnson Controls, Inc., has a warning label attached to it. This label reads as follows:

<table>
<thead>
<tr>
<th>DANGER -- EXPLOSIVE</th>
<th>ACID -- POISON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can cause blindness or severe injury. Protect eyes. Sparks flames, cigarettes can cause explosion. Tools and cable clamps can cause sparks. Do not use without instruction. Keep vent caps tight and level.</td>
<td>Causes severe burns. Contains sulfuric acid. In event of contact flush with water and see a doctor. Keep out of reach of children.</td>
</tr>
</tbody>
</table>
II. BASIC RULES FOR LONGER LIFE EXPECTANCY

The useful life of lead-acid E.V. batteries can be maximized by following procedural guidelines for charging, discharging, and maintenance.

1. Charging: There are three key factors to consider when establishing the charging profile that is most beneficial to battery life.

   1. Current
   2. Voltage
   3. Duration of charge

When charging always use the current levels suggested by the battery manufacturer. Excessive charging currents may overheat the battery and shorten its life. The maximum allowable on-charge voltage should be adhered to per battery manufacturer's instructions and be temperature compensated. The duration of charge is also very important. Again, follow battery manufacturer's recommendations. Overcharging shortens battery life by corroding the positive grid structure and deteriorating the active materials. Undercharging causes cell imbalances that hamper operating performance and shorten cycle life.

Watering:
The sulfuric acid portion of the electrolyte does not evaporate, but the water component of the solution must be periodically replaced due to evaporation and losses during charging. Electrolyte levels should be checked and water added after the battery is recharged. It is extremely important that electrolyte levels do not drop below the top of the plates. If this occurs the capacity of the battery will be irreversibly reduced. Add water only to the ring that is visible inside the splash barrel. NEVER overfill a battery. This will result in loss of electrolyte during charging. For maximum battery life only distilled water should be added. Tap water can be used if absolutely necessary, but creek or well water that has a high level of mineral impurities in it should not be used.
Maintenance:

Battery Cleaning - Terminals and Cover

During the normal service life of a lead-acid E.V. battery, a corrosion product may occur at the terminal posts. Also, the cover may become dirty and coated with a thin layer of electrolyte. Both of these conditions reduce the performance efficiency of the battery. Regular maintenance is required to alleviate these situations. When these conditions exist the terminal connectors should be carefully removed and cleaned. The posts should also be cleaned. Tools are available for cleaning both the terminals and connections. The cover can be cleaned and rinsed with a dilute baking soda solution to neutralize any electrolyte film that may be present. Do not allow any baking soda solution to enter battery.

After the battery is dry the connectors can be reattached taking care not to apply unnecessary force to the posts.

Follow any specific instructions by the manufacturer for cleaning of batteries.

It is often necessary to lift E.V. batteries in order to service them. Here are some DO's and DON'T's:

1. DO use a battery carrying handle whenever possible.
2. DO hold the battery at the bottom if a handle is not available.
3. DO wear gloves, goggles and protective clothing.
4. DO NOT lift and transport a battery with the vent caps removed.
5. DO NOT hold the battery at the sides of the container. This may force electrolyte out of the vent caps.
6. DO NOT lift an E.V. battery by the terminal posts.
7. NEVER smoke while lifting a battery.

Useful battery life is extremely dependent on the discharge profile. The optimum profile for an E.V. battery is one where the average current level is low enough to eliminate overheating of the battery. Depth of discharge is another major factor in determining battery cycle life. Batteries that undergo deep discharges during cycling will generally fail sooner than batteries that undergo shallow discharges.
From the standpoint of the E.V. as a system, the design of electronic components and vehicle usage patterns that minimize current draw and the frequency of high current peaks will ultimately extend maximum battery life.

III. E.V. BATTERY TROUBLESHOOTING

Below is a brief listing of the most common problems involved with E.V. batteries along with the probable cause, and the suggested corrective action.

1. **Problem:** Battery or battery pack has a low capacity.
   **Cause:** Undercharged battery pack resulting in low electrolyte specific gravity.
   **Corrective Action:** Low rate equalization charge to bring batteries up to 100% state of charge.

2. **Problem:** Battery(ies) have consistently low electrolyte levels even though they are watered frequently.
   **Cause:**
   1. Battery container is cracked and electrolyte is leaking out.
   2. Battery is being overcharged and excessive amounts of water are being electrolyzed to hydrogen and oxygen.
   **Corrective Action:** If battery container is cracked and leaking, the battery must be replaced. If there are no leaks, then overcharging is the problem and the charging profile must be adjusted to follow the manufacturer’s recommendation.

3. **Problem:** Electrolyte spillage out of vent caps, especially noticeable during recharge.
   **Cause:** Cells have been overfilled during watering and the gases produced during recharge are pushing the excess electrolyte out through the vent caps.
   **Corrective Action:** Remove vent caps and carefully remove enough electrolyte so that levels are proper. Use a syringe that is resistant to sulfuric acid.
4. **Problem:** Battery or battery pack self discharges quite rapidly while standing.

**Cause(s):**
1. If the battery(ies) are stored for long periods of time at high temperatures, the batteries self-discharge quite fast.
2. Dirty and corroded terminal posts can result in charge "leakage" and subsequently, accelerated self-discharge.

**Corrective Action:** Move to a cooler environment or boost batteries frequently.

**Cause:**
2. Dirty and corroded terminal posts can result in charge "leakage" and subsequently, accelerated self-discharge.

**Corrective Action:** Refer to the maintenance paragraph on Page 4.

5. **Problem:** Low battery voltage:

**Cause:** Low electrolyte specific gravities or a bad cell(s).

**Corrective Action:** Charge to bring specific gravities up to proper levels. If one or more cells are bad the battery must be replaced.

6. Consult operator manual for usage of hydrometer (i.e., low specific gravity in cells of battery).

### IV. BASIC CHARGING APPLICATIONS FOR E.V.BATTERIES

Charging profiles as they relate to battery life have already been discussed. This section expands on this in greater detail.

Battery charging current rates and voltage levels should never exceed those recommended by the manufacturer.

There are two basic types of charging procedures used.

**CONSTANT VOLTAGE**

The first type is a constant voltage method. The battery is charged at a predetermined voltage level and the current acceptance depends on the internal resistance of the battery. The charge current will slowly decline as the battery becomes fully charged.

**CONSTANT CURRENT**

Constant current charging is the second basic type. The battery is charged at a recommended constant current level. As the battery charges its voltage will increase. To make sure that the maximum allowable voltage is not exceeded, the charger should have a voltage limit feature which automatically tapers the current once the maximum voltage is reached. If this feature is not available then a timer must be used to protect against overcharge.
Product Features

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IV. BASIC CHARGING APPLICATIONS FOR E.V. BATTERIES

The most frequently recommended charging procedure is a combination of the first two. The battery is charged at constant current until the manufacturer's recommended voltage limit is reached. Then the battery is charged at constant voltage to insure 100% state of charge.

Optimum recharge efficiency is obtained by charging batteries on an ampere-hours in versus ampere-hours out basis. Since the charging process is never 100% efficient the number of ampere-hours put back into the battery must exceed the number removed. Again, consult the manufacturer for the correct overcharge factor.

The capability of the charger being used is very important. It is recommended that the peak to average current ratio of the charger output be a maximum of three to one. A ratio of one to one is ideal. A good charging unit should have temperature compensation circuits to maintain proper voltage levels. Temperature sensors to avoid battery overheating are desirable. Consult the manufacturer's specification for maximum allowable temperatures.

Equalization Charging

To obtain optimum performance from lead-acid E.V. batteries, the amount of plate active materials in the "charged" condition must be maximized. During the normal charge-discharge duty cycle of lead-acid batteries active mass utilization may be reduced and subsequently, discharge capacities will decline. If this condition goes unchecked irreversible damage will occur. Therefore, lead-acid E.V. batteries must periodically undergo an "equalization" charge. This is a low rate charge for a duration much longer than a normal recharge. This procedure assures maximum active material utilization and maximum discharge capacities. In general, the range of energy replaced during an equalization charge is 120% - 140% of what was removed during the last discharge. As always, be sure to check the manufacturer's recommendations for the rate, duration and frequency of equalization charges.
Battery Description

1. One-Piece Polypropylene Cover
   - Heat-sealed to container forming a continuous container/cover making the battery more resistant to vibration and road shock.
   - Easy to keep clean reducing the possibility of self discharge and corrosion.

2. Universal Terminals
   - Suitable for either automotive or eyelet cable connections.

3. Polypropylene Container
   - Thin-walled construction allows space for more power producing active materials.
   - Light in weight, yet stronger than hard rubber.

4. Flame Barrier Vent Caps
   - Diffuses gases providing for safer, cleaner operation.
   - Minimizes evaporation.

5. Welded Thru-Partition Inter-cell Construction
   - Increased power delivery results from the shorter current path.

   - Resistance welding offers greater connector reliability.

6. Exclusive Radial Grid Design
   - High antimony grids extend cycle life.
   - Radial design channels power more efficiently with lower internal resistance.
   - More resistant to overcharge/overheat conditions.

7. Plastic Glass Mat Separators
   - Offers lower internal resistance, lower organic contaminants, smaller pore size and excellent oxidation resistance.

8. Special EV Plate Material
   - High density positive paste for longer operation.
   - Industrial expander negative for quick recharging.

9. Unique EV4-19
   - New center lug design of EV4-19 increases power output.

10. Water fill system with automatic leveling optional

Specifications

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<tr>
<th>Battery Type</th>
<th>BCI Group</th>
<th>Volts</th>
<th>Plates/Battery</th>
<th>Length</th>
<th>Width</th>
<th>Height</th>
<th>Weight</th>
<th>AH @ 2 Hr.</th>
<th>AH @ 3 Hr.</th>
<th>75 Amp. (Min.)</th>
<th>Watt-Hr. @ 3 Hr. Rate</th>
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Terminology

**Ampere-Hour**
A unit of measure for battery capacity, obtained by multiplying the current flow in amperes by the time in hours to a final voltage (1.75 volts per cell).

**Watt**
The unit of electrical power obtained by multiplying the amperes flowing by the voltage which forces it to flow. Watts = (Amperes) X (Volts).

**Watt-Hour**
The unit of electrical energy obtained by multiplying the ampere-hour output by the average voltage during the discharge. Watt-Hours = (Volts) X (Amperes) X (Hours).
L. ACCESSORY BATTERY MOUNT

Because the drive system of the electric car is a 96-volt system, an additional battery is needed to power the accessory components which run on a 12-volt system. The lights, windshield wipers, pop-up headlights, flashers, radio, fans, etc., are all accessory components.

The 12-volt accessory battery is located directly above the front torsion tubes. The accessory battery bracket is bolted to the front torsion tube using the two existing mounting points already on the upper torsion tube. In this location, the 12-volt battery is easily accessible through the front access cover for maintenance.