

Otis®

THREE AND FOUR WHEEL GASOLINE AND ELECTRIC DRIVEN VEHICLES

MODEL Super 71 & 71E

PARTS AND
MAINTENANCE MANUAL

&

OPERATOR'S MANUAL

OTIS TOWN AND TURF ELECTRIC DRIVEN VEHICLE

ILLUSTRATED PARTS LIST
COMPONENT ASSEMBLY
WIRING DIAGRAM

SCANNED FROM A COPY OF THE ORIGINAL

Jim Kaness
www.jimkaness.com
February 2008

Lee Trevino says,
**Otis Golf Cars give you
the best of everything**



Otis Town & Turf
Otis Elevator Company

P.O. Box 8600, Stockton, California 95204



Otis Town & Turf

OTIS ELEVATOR COMPANY

Warranty

OTIS TOWN & TURF warrants its products, so far as of its own manufacture, to be free from defects of material & workmanship. Under normal service & use, should any part be found to be defective in this regard within 90 days, the Company will replace said defective part F.O.B. the nearest authorized OTIS TOWN & TURF Dealer.

OTIS ELEVATOR COMPANY

1801 EAST CHARTER WAY P. O. BOX 8600
STOCKTON, CALIFORNIA 95204

INTRODUCTION

This manual is an illustrated parts list of the OTIS TOWN & TURF ELECTRIC DRIVEN VEHICLES. To find the part number for a specific part required, locate the group in the Table of Contents and then turn to the appropriate page. Find the part required in the illustration then refer to the accompanying list of parts. Nomenclature and number can be read following the key letter in each list. Part Numbers for all standard hardware have been omitted. These parts may be obtained locally from your hardware dealer. Replacement parts may be ordered from an authorized OTIS TOWN & TURF dealer.

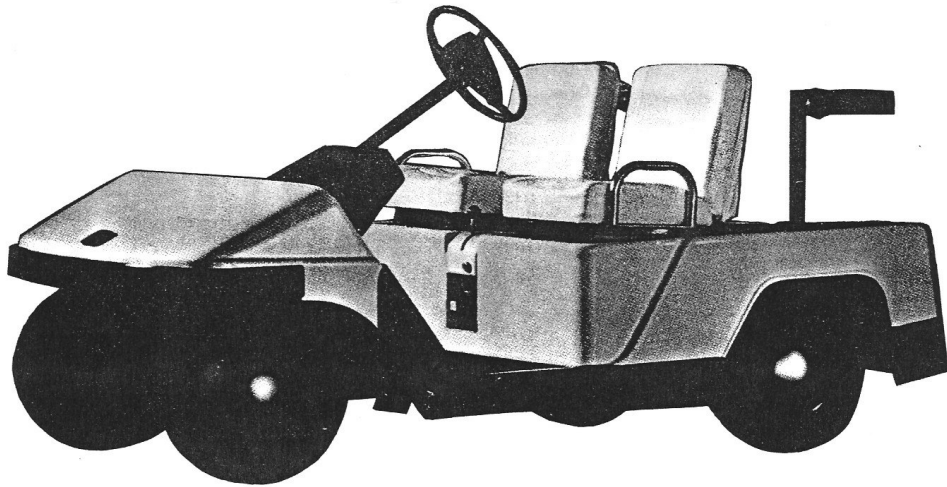


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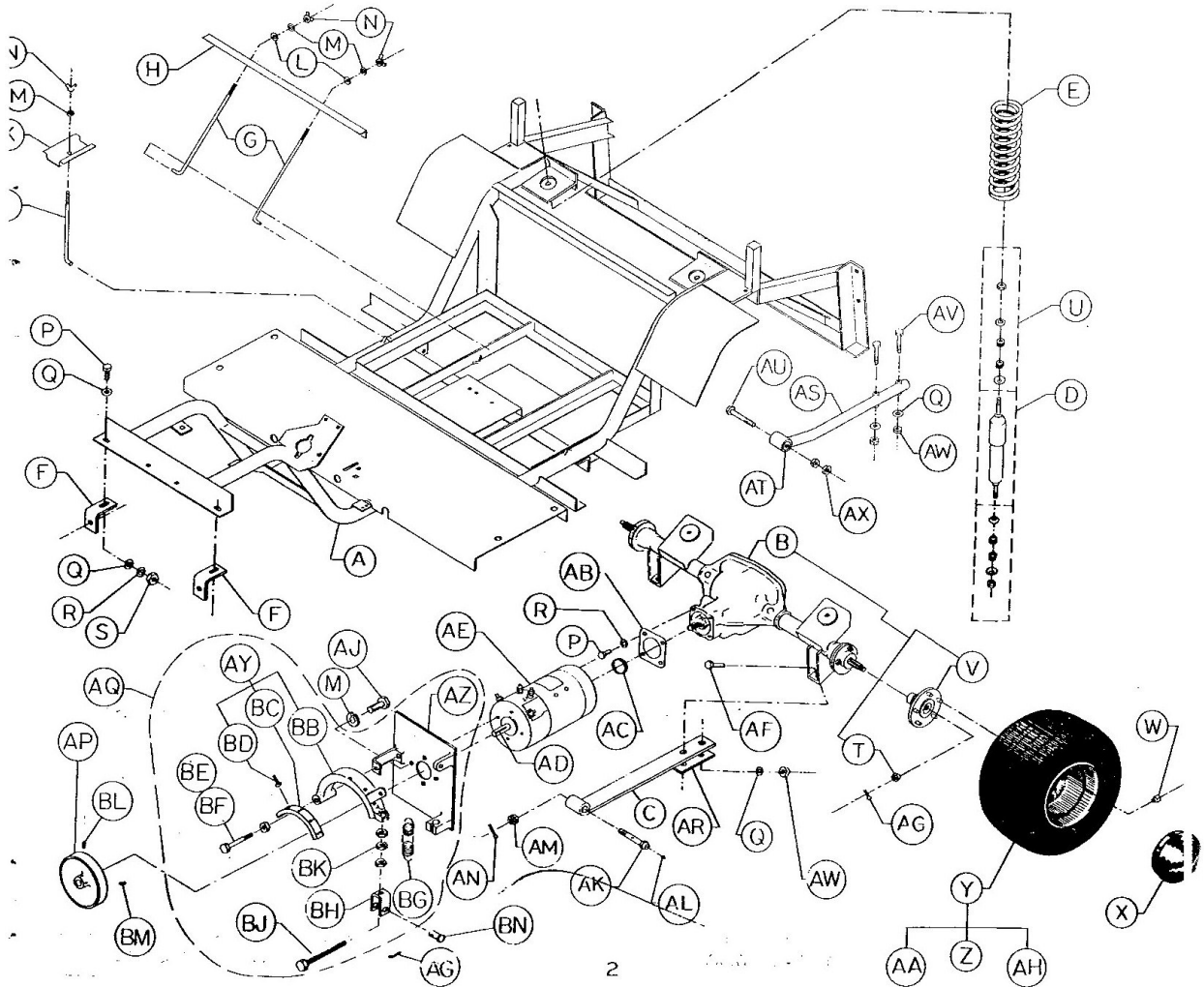
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REAR SUSPENSION - FRAME - MOTOR
BRAKE AND BATTERY HOLD DOWNS

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
A	E-54764	WELDMENT - MAIN FRAME	1
B	D-54817	REAR AXLE WELDMENT & ASS'Y	1
C	B-53937	LEAF - TRAILING ARM	1
D	A-40099	SHOCK ABSORBER	2
E	B-54589	SPRING	2
F	A-53575	BUMPER BRACKET	2
G	A-54820	"J" BOLT - REAR BATTERY HOLD DOWN	2
H	B-53847	BATTERY HOLD DOWN - REAR	1
J	A-53589	"J" BOLT - SIDE BATTERY HOLD DOWN	2
K	B-53591	BATTERY HOLD DOWN	2
L	---	FLATWASHER $\frac{1}{4}$ STD. STL. CAD. PL.	2
M	---	LOCKWASHER $\frac{1}{4}$ MED. STL. CAD. PL.	8
N	---	WING NUT $\frac{1}{4}$ -20 STL. CAD. PL.	4
P	---	HEX SCREW $\frac{3}{8}$ - 16 x 1 STL. CAD. PL.	6
Q	---	FLATWASHER $\frac{3}{8}$ STD. STL. CAD. PL.	8
R	---	LOCKWASHER $\frac{3}{8}$ MED. STL. CAD. PL.	6
S	---	HEX NUT $\frac{3}{8}$ - 16 STL. CAD. PL.	2
T	---	HEX SLOTTED NUT $\frac{5}{8}$ -18 STL. CAD. PL.	2
U	A-55055	P-160 HARDWARE PKG.	4
V	A-55651	REAR HUB ASS'Y	2
W	A-30337	WHEEL NUT	10
X	A-21018	HUB CAP	2
Y	A-53899	TIRE & WHEEL ASS'Y	2
Z	A-54058	WHEEL, 5 HOLE (PAINTED BLACK)	2
AA	A-45046	VALVE STEM (FOR TUBELESS TIRE)	2
AB	A-53844	CARRIER FLANGE GASKET	1
AC	A-53922	MOTOR SEAL	1
AD	---	KEY $\frac{3}{16}$ SQ x $1\frac{1}{2}$ " LONG	1
AE	A-53706	2 HP 36 VOLT MOTOR	1
AF	---	HEX SCREW $\frac{3}{8}$ - 16 x $1\frac{1}{2}$ " GRADE 5	2
AG	---	COTTER PIN .125 DIA x 1" STL. CAD. PL.	2
AH	A-53900	TIRE 18 x 8.50 x 8 TUBELESS	2
AJ	---	HEX SCREW $\frac{1}{4}$ - 20 x $\frac{3}{4}$ STL. CAD. PL.	4
AK	A-35089	BOLT - SPRING SHACKLE	1
AL	A-35873	GREASE FITTING	1
AM	---	HEX SLOTTED NUT $\frac{9}{16}$ - 18 STL. CAD. PL.	1
AN	---	COTTER PIN .125 NOM. DIA. x $1\frac{1}{4}$ STL. CAD. PL.	1
AP	C-54996	BRAKE DRUM	1
AQ	D-55019	BRAKE BAND & MOUNTING BRKT.	1
AR	A-53590	SPRING MOUNTING PLATE	1
AS	C-54180	TORQUE ARM ASS'Y (INCLUDES "AT")	1
AT	A-53825	BUSHING (INCLUDED WITH "AS")	2
AU	---	HEX SCREW $\frac{1}{2}$ -13 x $3\frac{1}{2}$ GRADE 5	1
AV	---	HEX SCREW $\frac{3}{8}$ -24x $2\frac{1}{2}$ GRADE 5	2
AW	---	HEX LOCKNUT $\frac{3}{8}$ -24 STL. CAD. PL.	4
AX	---	HEX NUT $\frac{1}{2}$ -13 STL. CAD. PL.	2
AY	B-55026	ASS'Y BRAKE BAND	1
AZ	C-55020	WELDMENT - BRAKE MOUNTING BRKT.	1

(CONT. NEXT PAGE)

KEY	PART NO.	PART	NO. REQ.
BB	C-55027	WELDMENT - BRAKE BAND	1
BC	B-55032	BRAKE LINING	1
BD	A-55033	7-8 RIVET	8
BE	---	HEX SCREW 3/8 - 16 x 3 STL. CAD. PL.	1
BF	---	HEX LOCKNUT 3/8-16 STL. CAD. PL.	1
BG	A-35531	SPRING	1
BH	A-55036	CLEVIS	1
BJ	---	HEX HD CAP SCREW - 3/8-16 x 3 STL. CAD. PL.	1
BK	---	HEX JAM NUT 3/8 - 16 STL. CAD. PL.	1
BL	---	SET SCREW	
BM	---	SET SCREW	
Bn	A-55170	CLEVIS PIN	1

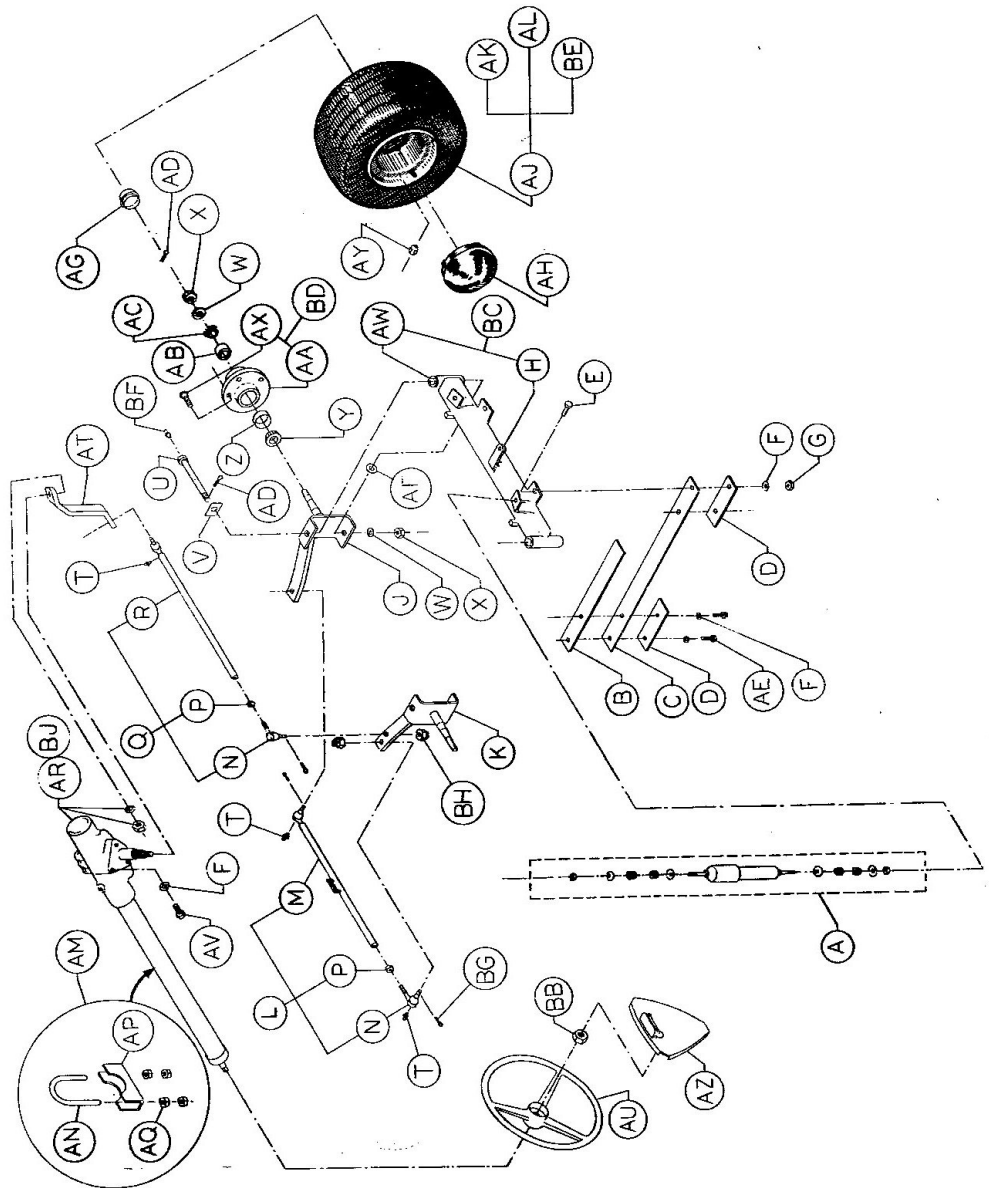


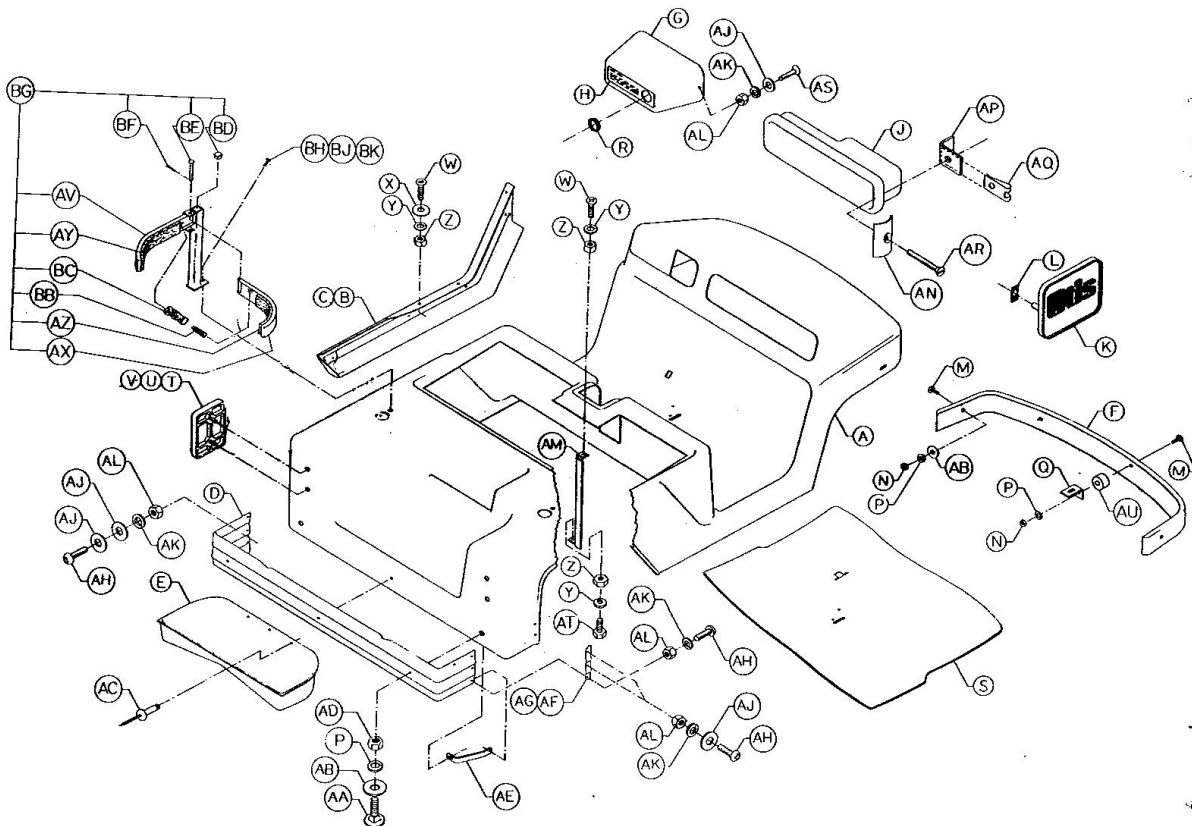
FRONT SUSPENSION AND STEERING COMPONENTS

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
A	A-40099	SHOCK ABSORBER	2
B	A-53601	SPRING - SHORT LEAF - FRONT AXLE	2
C	A-53599	SPRING - LONG LEAF - FRONT AXLE	2
D	A-53590	CLAMP - LEAF SPRINGS TO FRAME	4
E		HEX SCREW, 7/16 - 14 x 1 $\frac{1}{2}$, GRADE 5, CAD. OR ZINC PL.	4
F		LOCKWASHER, 7/16 MED. SPR., STL. CAD. PL.	11
G		HEX NUT, 7/16 - 14, STL. CAD. PL.	8
H	C-53794	WELDMENT - FRONT AXLE	1
J	C-54721	WELDMENT - SPINDLE & STEERING ARM - L/H	1
K	C-54722	WELDMENT - SPINDLE & STEERING ARM - R/H	1
L	B-53956	ASSEMBLY - TIE ROD - FRONT SPINDLES	1
M	B-53792	WELDMENT - TIE ROD - FRONT SPINDLES	1
N	A-40554	BALL JOINT	2
P	A-51916	HEX NUT 11/16 - 18 N.F. - L.H.	2
Q	B-53957	ASS'Y - TIE ROD - PITMAN ARM TO R/H SPINDLE	1
R	B-53791	WELDMENT - TIE ROD - PITMAN ARM TO R/H SPIN.	1
T	A-53090	GREASE FITTING, $\frac{1}{4}$ - 28, ALEMITE #1641-B	4
U	A-51417	KING BOLT	2
V	A-51418	CLIP - BOLT RETAINING	2
W		FLATWASHER, 3/4 SAE	4
X		SLOTTED HEX NUT, 3/4 - 16, STL.	4
Y	A-51321	CONE - ROLLER BEARING	2
Z	A-51322	CUP - ROLLER BEARING	2
AA	B-54716	HUB - FRONT WHEEL	2
AB	A-50041	CUP - ROLLER BEARING	2
AC	A-50042	CONE - ROLLER BEARING	2
AD		COTTER PIN, 3/16 x 1 $\frac{1}{2}$, STL.	4
AE		HEX SCREW, 7/16 - 14 x 1 3/4, GRADE 5, CAD. OR ZINC PL.	4
AF	A-51320	THRUST WASHER - KING PIN	2
AG	A-14647	DUST COVER	2
AH	A-21018	HUB CAP	2
AJ	A-53899	WHEEL & TIRE ASS'Y.	2
AK	A-53900	TIRE	2
AL	A-45046	VALVE STEM	2
AM	A-40607	"U"-BOLT ASS'Y - 1 $\frac{1}{2}$ " TUBE	1
AN	A-40458	"U" BOLT	1
AP	A-40929	CLAMP - "U" BOLT	1
AQ		HEX NUT, 5/16 - 18, STL. CAD. PL.	4
AR	C-53713	STEERING GEAR ASS'Y	1
AT	D-53655	PITMAN ARM - STEERING	1
AU	C-54089	STEERING WHEEL (14" DIA.)	1
AV		HEX SCREW, 7/16 - 14 x 1 $\frac{1}{4}$, STL. CAD. PL.	3
AW	A-51409	BEARING - FLANGED - KING PIN HOUSING	4
AX	A-50026	WHEEL STUD	10
AY	A-30337	WHEEL NUT	10
AZ	B-54090	SCORE CARD HOLDER	1
BA	A-40505	STEERING WHEEL NUT	1

(CONTINUED ON FOLLOWING PAGE)

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
BB	A-40505	STEERING WHEEL NUT	1
BC	C-55622	FRONT AXLE ASS'Y	1
BD	B-55641	ASS'Y - FRONT HUB	2
BE	A-54058	WHEEL - 5 HOLES - BLACK	2
BF	A-53089	GREASE FITTING, 90°, 1/4-28	2
		ALEMITE #3020-B	
BG		COTTER PIN, 3/32 x 1, STL. CAD. PL.	4
BH		SLOTTED HEX NUT, 1/2-ZONE	4
BJ	C-54947	ASS'Y - STEERING GEAR (S71-E ONLY)	1



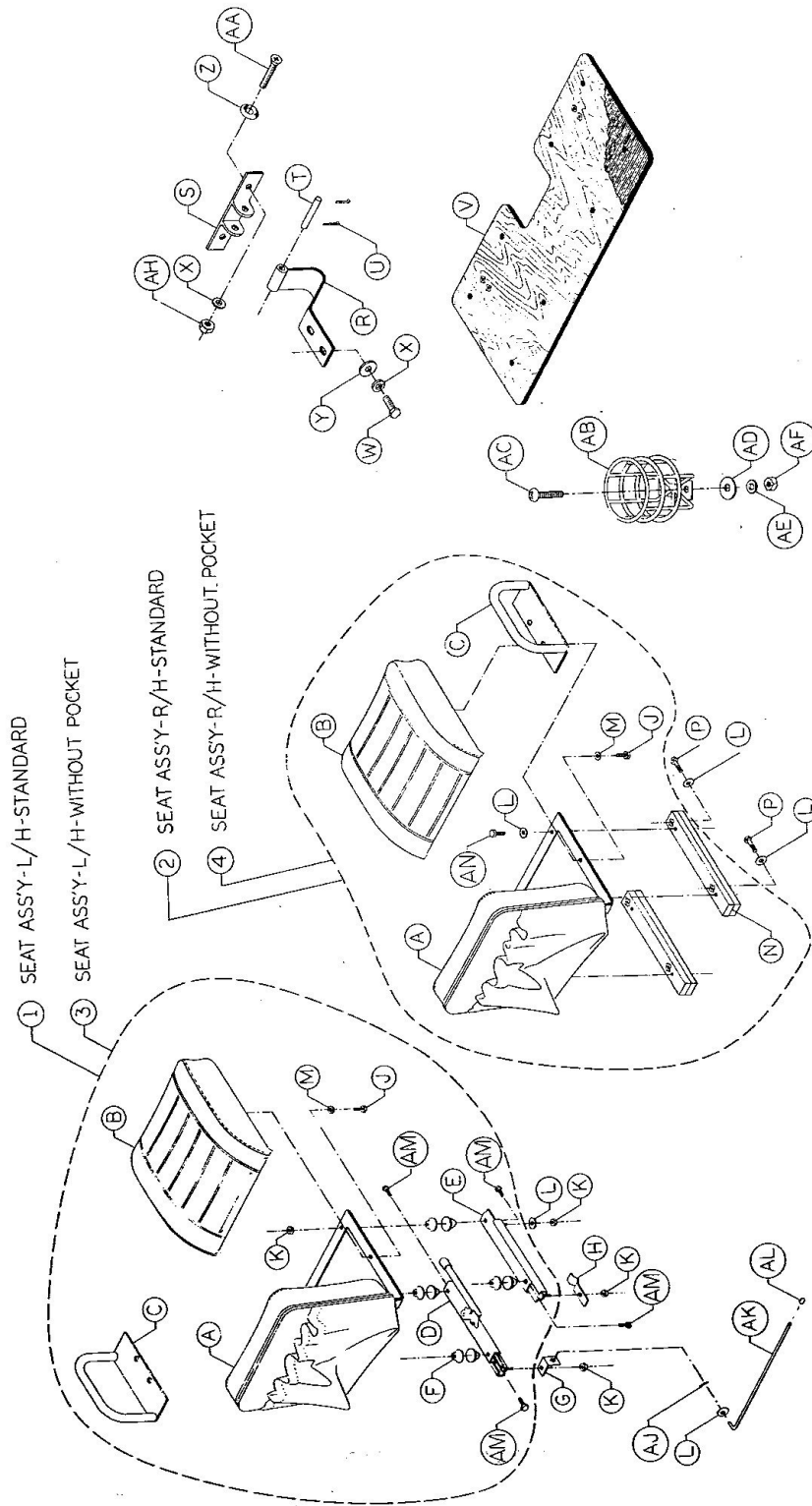


BODY & RELATED PARTS

KEY	PART NO.	PART	NO. REQ.
A	E-54459	BODY (VACUUM FORMED)	1
B	54421	SIDE RAIL-L/H (SHOWN) (VACUUM FORMED)	1
C	54422	SIDE RAIL-R/H (NOT SHOWN) (VACUUM FORMED)	1
D	D-54458	REAR BUMPER (VACUUM FORMED)	1
E	D-54469	BAG WELL (VACUUM FORMED)	1
F	C-54842	FRONT BUMPER	1
G	C-53542	CONSOLE-STEERING GEAR (INCLUDES DECAL)	1
H	C-53715	(VACUUM FORMED)	
H	C-53715	DECAL (INCLUDED WITH ITEM "G")	1
J	D-53544	GLOVE BOX (VACUUM FORMED)	1
K	B-53946	OTIS EMBLEM	1
L	A-54110	PUSH ON SPEED NUT	2
M		CARRIAGE BOLT, 5/16-24 x 1 1/4, RD.HD., STL.CAD.PL.	4
N		HEX NUT, 5/16-24, STL.CAD.PL.	4
P		LOCKWASHER, 5/16 MED.SPR., STL.CAD.PL	7
Q	A-53575	BUMPER BRACKET	2
R	A-53698	GROMMET-STEERING GEAR	1
S	D-53693	RUBBER MAT	1
T	C-53551	REAR BUMPER PAD	2

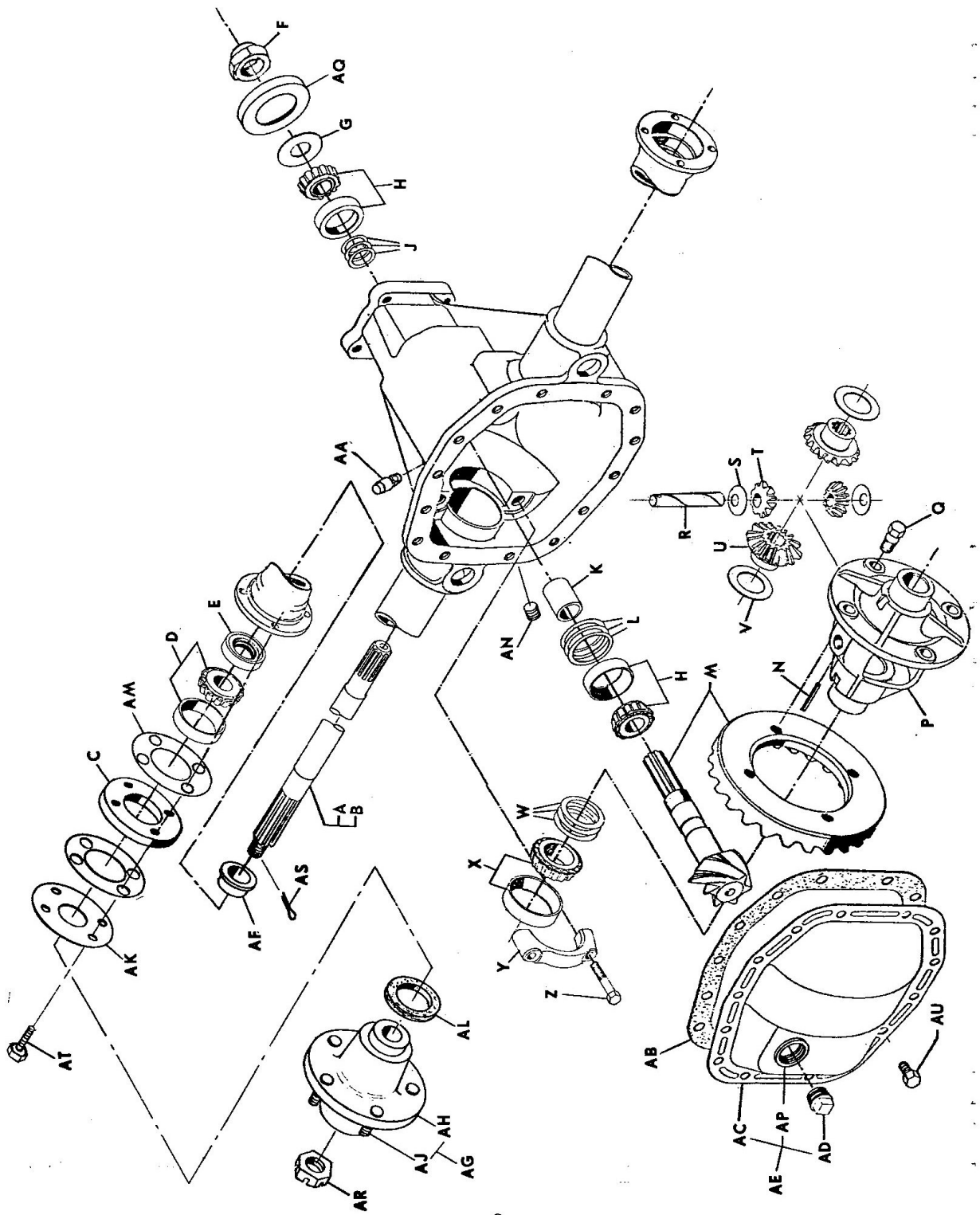
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KEY	PART NO.	PART	REQ. NO.
U		HEX NUT, 3/8-16, STL. CAD. PL	4
V		LOCKWASHER, 3/8 MED. SPR., STL. CAD. PL	4
W		MACH. SCREW, 1/4-20x1, PHIL. FLT. HD., STL. CAD. PL	15
X		FLATWASHER, 1/4 STD, STL. CAD. PL.	14
Y		LOCKWASHER, 1/4 MED. SPR., STL. CAD. PL.	16
Z		HEX NUT, 1/4-20, STL. CAD. PL.	16
AA		CARRIAGE BOLT, 5/16-18 x 1 1/4, STL. CAD. PL.	3
AB		FLATWASHER, 5/16 STD, STL. CAD. PL.	5
AC		POP RIVET	5
AD		HEX NUT, 5/16-18, STD. CAD. PL.	3
AE	B-54511	BRACKET-REAR BUMPER SUPPORT	2
AF	A-54500	CLIP-L/H-REAR BUMPER SUPPORT	1
AG	A-54501	CLIP-R/H-REAR BUMPER SUPPORT	1
AH		MACH. SCREW, #10-24 x 3/4, PHIL. RD. HD., STL. CAD. PL.	8
AJ		FLATWASHER, #10 STD., STL. CAD. PL.	10
AK		LOCKWASHER, #10 MED. SPR., STL. CAD. PL.	10
AL		HEX NUT, #10-24, STD. CAD. PL.	10
AM	B-54679	SUPPORT-CONSOLE	1
AN	A-54565	GLOVE BOX MOUNTING CAP	2
AP	A-54126	GLOVE BOX MOUNTING CLIP	2
AQ	A-51258	SPEED NUT	2
AR		MACH. SCREW, #10-24 x 1 1/2, SLOTTED FLAT HD., ST. CAD. PL.	2
AS		MACH. SCREW, #10-24x 3/4, PHIL. FLT. HD., STL. CAD. PL.	2
AT		HEX SCREW, 1/4-20x3/4, STL. CAD. PL.	1
AU	A-55129	SPACER-FRONT BUMPER	4
AV		WELDMENT -BAG RACK L/H	1
AW		WELDMENT - BAG RACK R/H (NOT SHOWN)	1
AX		WELDMENT - BAG CLAMP	2
AY	A-54056	BAG SUPPORT PROTECTOR	2
AZ	B-51622	BAG SUPPORT PROTECTOR	2
BB	A-51619	SPRING	2
BC	A-53963	COVER-SPRING	2
BD	A-53699	PLASTIC END CAP (CARS WITHOUT CANOPY)	2
BE	A-53803	PIN	2
BF		COTTER PIN, .094 DIAx3/4	2
BG	D-54055	ASS'Y - BAG HOLDER L/H	1
BH		HEX HD SCREW, 3/8-16 x 1, STL. CAD. PL	2
BJ		LOCKWASHER, 3/8 MED, STL. CAD. PL.	2
BK		HEX NUT, 3/8-16, STL. CAD. PL.	2
BL	D-54054	ASS'Y - BAG HOLDER R/H (NOT SHOWN)	1
BM	B-53547	COVER - FOOT PAD - RACK (NOT SHOWN)	2



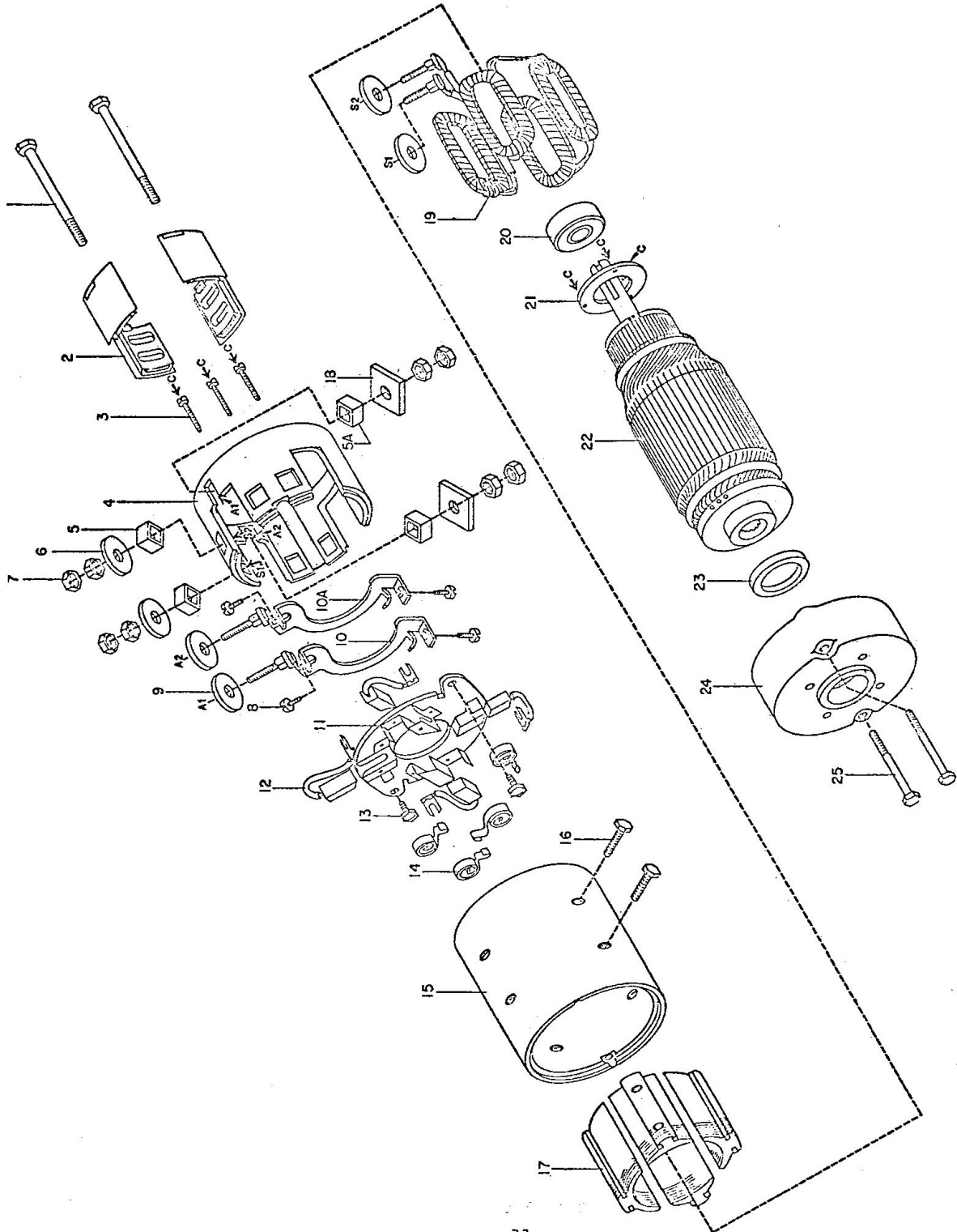
SEAT ASSEMBLY

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
1	D-54302	SEAT ASSY-L/H-STANDARD (SPECIFY WHITE OR BLACK)	1
2	D-54301	SEAT ASSY-R/H-STANDARD (SPECIFY WHITE OR BLACK)	1
3	54755	SEAT ASSY-L/H-WITHOUT POCKET (SPECIFY WHITE OR BLACK)	A/R
4	54759	SEAT ASSY-R/H-WITHOUT POCKET (SPECIFY WHITE OR BLACK)	A/R
1-A	54760	SEAT BACK & FRAME ASSY-STANDARD (SPECIFY WHITE OR BLACK)	1
2-A	54760	SEAT BACK & FRAME ASSY-STANDARD (SPECIFY WHITE OR BLACK)	1
3-A	54754	SEAT BACK & FRAME ASSY-WITHOUT POCKET (SPECIFY WHITE OR BLACK)	A/R
4-A	54754	SEAT BACK & FRAME ASSY-WITHOUT POCKET (SPECIFY WHITE OR BLACK)	A/R
B	54758	SEAT BOTTOM ASSEMBLY	2
C	54761	SAFETY HAND RAIL	2
D	C-53218	SEAT ADJUSTER ASSEMBLY	1
E	C-50292	SEAT TRACK ASSEMBLY	1
F	54756	SPACER	8
G	A-53917	BRACKET-SEAT SUPPORT ROD	1
H	A-53916	CLIP - SEAT SUPPORT ROD	1
J		HEX SCREW, 5/16-18 x 1, STL. CAD. PL.	2
K		HEX NUT, 5/16-18, STL. CAD. PL.	8
L		FLATWASHER, 5/16 STD., STL. CAD. PL.	12
M		LOCKWASHER, 5/16 MED. SPR., STL. CAD. PL.	2
N	A-54698	SEAT SPACER ASSEMBLY	4
P		HEX SCREW, 5/16-18 x 2, STL. CAD. PL.	4
R	B-53834	HINGE LEAF (WELDMENT)	2
S	A-53832	HINGE BRACKET (WELDMENT)	2
T	A-52679	PIVOT PIN	2
U		COTTER PIN, .109 NOM. DIA X 1, STL. CAD. PL.	4
V	B-53958	DECK BOARD & MAT ASSEMBLY	1
W		HEX SCREW, 1/4-20 x 3/4, STL. CAD. PL.	4
X		LOCKWASHER, 1/4 MED. SPR., STL. CAD. PL.	8
Y		FLATWASHER, 1/4 STD., STL. CAD. PL.	4
Z		FINISHING WASHER, 1/4 BRASS, BRIGHT NICKLE PLATE)	4
AA		MACH. SCREW, 1/4-20 x 1 1/4 PHIL. FLAT HD., STL. CAD. PL.	4
AB	A-53718	DRINK HOLDER	2
AC		MACH. SCREW, #10-24 x 1, PHIL.RD.HD. STL. CAD. PL.	4
AD		FLATWASHER, #10 STD., STL. CAD. PL.	4
AE		LOCKWASHER, #10 MED. SPR., STL. CAD. PL.	4
AF		HEX NUT, #10-24, STL. CAD. PL.	4
AG		TEE NUT, 5/16-18, STL. CAD. PL. (INCLUDED WITH ITEM "N")	8
AP		HEX NUT, 1/4-20, STL. CAD. PL.	4
AJ		COTTER PIN, .094 NOM. DIA. x 3/4, STL. CAD. PL.	1
AK	A-53915	SEAT SUPPORT ROD	1
AL	A-53219	ROD CAP	1
AM		HEX SCREW, 5/16 - 18 x 1 1/4 STL. CAD. PL.	4
AN		HEX SCREW, 5/16 - 18 x 1 3/4 STL. CAD. PL.	4



REAR AXLE & DIFFERENTIAL ASS'Y D-54816
 USED WITH SERIAL NO. 1968 & HIGHER

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
A	55660	AXLE SHAFT - R/H	1
B	55661	AXLE SHAFT - L/H	1
C	55662	WHEEL BEARING RETAINER	2
D	55663	WHEEL BEARING CUP & CONE ASS'Y	2
E	54000	TUBE OIL SEAL	2
F	54001	PINION NUT	1
G	54003	PINION OIL SLINGER	1
H	55664	PINION BEARING CUP & CONE ASS'Y	2
J	54006	PINION FRONT SHIM	A/R
K	54007	PINION BEARING SPACER	1
L	55665	REAR PINION SHIM	A/R
M	54011	DRIVE GEAR & PINION ASS'Y	1
N	55666	GROOVE PIN	1
P	55667	DIFFERENTIAL CASE ASS'Y	1
Q	54014	DRIVE GEAR SCREW	4
R	55668	PINION MATE SHAFT	1
S	55669	PINION MATE THRUST WASHER	2
T	55670	DIFFERENTIAL PINION MATE	2
U	55671	DIFFERENTIAL SIDE GEAR	2
V	55672	SIDE GEAR THRUST WASHER	2
W	55673	DIFFERENTIAL SHIM	A/R
X	55674	DIFFERENTIAL BEARING CUP & CONE ASS'Y	2
Y	55675	BEARING CAP	2
Z	55676	BEARING CAP BOLT	4
AA	54026	VENT	1
AB	55111	CARRIER COVER GASKET	1
AC	55677	CARRIER COVER	1
AD	55678	COVER PLUG	1
AE	55679	CARRIER COVER ASS'Y	1
AF	55680	WHEEL BEARING ADAPTER	2
AG	55681	WHEEL HUB ASS'Y	2
AH	55682	WHEEL HUB FINISHED	2
AJ	55683	WHEEL BOLT	10
AK	55684	DUST SHIELD	2
AL	55685	FELT SEAL	2
AM	55686	WHEEL BEARING GASKET	4
AN	55687	PIPE PLUG	1
AP	55688	PLUG SEAT	1
AQ	55692	BAFFLE	1
AR		HEX SLOTTED NUT 5/8-18 STL. CAD. PL.	2
AS		COTTER PIN .125 NOM. DIA. x 1 1/4" S.S.	2
AT		INDENTED HEX WASHER H.D. SCREW 5/16-18 x 7/8" STL. CAD. PL.	8
AU		TENSILOCK HEX H.D. SCR. 5/16-18 x 5/8" GRADE 5	12

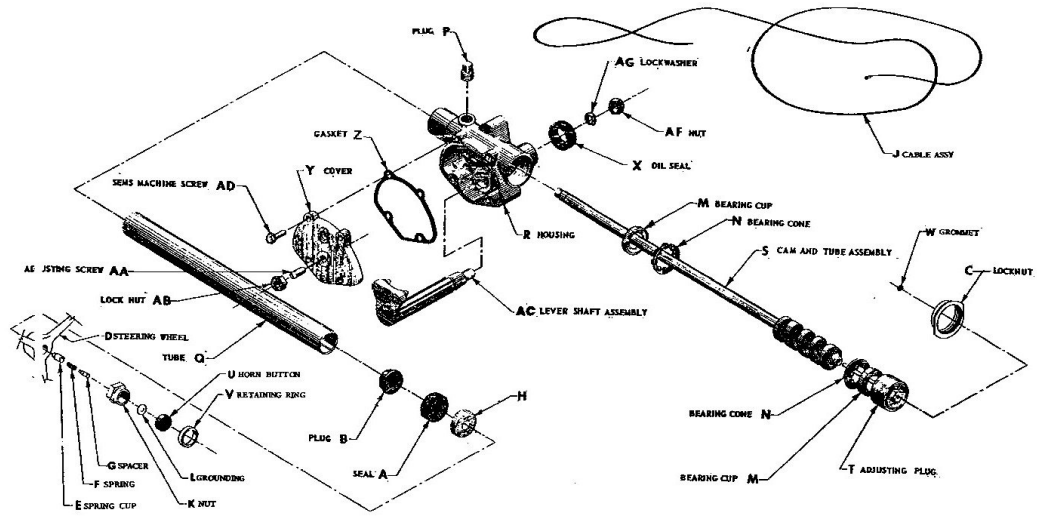


MOTOR ASSEMBLY #53706

KEY	PART NO	PART	NO.REQ
8 (4), 10,10A,11, 14, (4)	#56223	BRUSH RIGGING AND PARTS	1
12	#56224	BRUSH AND PARTS	4
14	#56225	BRUSH SPRING	4*
20	#56226	BALL BEARING, COMMUTATOR END	1
1	#56227	SCREW, MOTOR CLAMP, CE	2
2	#56228	BRUSH COVER	4
3	#56229	SCREW, RETAINER	3
4	#56230	ENDSHIELD, COMMUTATOR END	1
5	#56231	BUSHING INS. FOR FIELD STUDS	2
5A	#56232	BUSHING INS. FOR A1 & A2 STUDS	2
6	#56233	WASHER, INSULATION, FOR TERMINAL STUDS	2
7	#56234	NUT, TERMINAL SCREW	8
8	#56235	SCREW, BRUSH	4*
9	#56236	WASHER, INSULATION, FOR TERMINAL STUDS	4
10	#56237	CROSS OVER & STUD "A1"	1*
10A	#56238	CROSS OVER & STUD "A2"	1*
13	#56239	SCREW, BRUSH RIGGING MOUNTING	2
15,16, (8),17,19	#56240	STATOR (COMPLETE)	1
16	#56241	SCREW, POLE PIECE	8
18	#56242	WASHER, INSULATION, FOR TERMINAL STUDS	2
19	#56243	FIELD COILS (SET)	1
21	#56244	BEARING RETAINER RING	1
22	#56245	ARMATURE	1
23	#56246	SHAFT SEAL	1
24	#56247	ENDSHIELD PULLEY END	1
25	#56248	SCREW, MOTOR CLAMP, PE	2

ACCELERATOR AND BRAKE LINKAGES

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
A	C-55374	BRAKE ROD ASS'Y	1
B	A-55164	FLANGE BUSHING - NYLON	4
C	C-55364	LOCK - PARKING BRAKE	1
D	B-55690	ASS'Y - BRAKE PEDAL	1
E	B-55100	BRAKE PEDAL	1
F	A-54466	PARKING BRAKE LOCK	1
G		HEX. HD. CAP SCREW, $\frac{1}{4}$ -28 x $\frac{3}{4}$, STL. CAD. PL.	2
H		PHIL. RD. HD. MACH. SCREW, $\frac{1}{4}$ -20 x $\frac{3}{4}$, STL. CAD. PL.	1
J		LOCKWASHER, $\frac{1}{4}$ MED., STL. CAD. PL.	5
K	C-55347	WELDMENT - BRAKE RELEASE	1
L		HEX HD. CAP SCREW, $\frac{3}{8}$ -16 x $\frac{3}{4}$, STL. CAD. PL.	4
M		LOCKWASHER, $\frac{3}{8}$ MED., STL. CAD. PL.	4
N	A-53624	LINKAGE - BRAKE RELEASE	1
P		HEX NUT, $\frac{1}{4}$ -28, STL. CAD. PL.	3
Q	B-55691	ASS'Y - ACCELERATOR PEDAL (INC. 2 of ITEM R)	1
R	A-40869	BUSHING	2
S	A-54766	ACCELERATOR ROD	1
T	B-53649	MOUNT - ACCELERATOR PEDAL	1
U		HEX HD. CAP SCREW, $\frac{1}{4}$ -20 x 1, STL. CAD. PL.	2
V		HEX. HD. CAP SCREW, $\frac{5}{16}$ -18 x 1 STL. CAD. PL.	2
W		LOCKWASHER, $\frac{5}{16}$ MED, STL. CAD. PL.	2
X		HEX NUT, $\frac{5}{16}$ -18, STL. CAD. PL.	2
Y	B-54981	ASS'Y - BRAKE CABLE	1
Z	A-10992	ROD END PIN	1
AA	A-10700	ADJUSTABLE END YOKE	1
AB	A-12194	ADJUSTABLE END YOKE	3
AC	A-12192	ROD END PIN	3
AD		COTTER PIN, .062 DIA x $\frac{3}{4}$, S.S.	3
AE		COTTER PIN, .078 DIA x 1, S.S.	5
AF	A-35475	CABLE CLAMP	1
AG		HEX HD. CAP SCREW, $\frac{3}{8}$ -16 x 1, STL. CAD. PL.	2
AH		HEX NUT, $\frac{3}{8}$ -16, STL. CAD. PL.	2
AJ	A-53905	ACCELERATOR PIVOT ROD	1
AK	A-55147	CLEVIS PIN	1
AL		COTTER PIN, .094 DIA x $\frac{3}{4}$, S.S.	1
AM		FLATWASHER, $\frac{3}{8}$ STD, STL. CAD. PL.	1
AN	A-40089	DRIVE TYPE PLUG BUMPER	1
AP	A-50892	CLIP - SPRING	1
AQ	A-35561	SPRING	2
AR	A-35478	CLEVIS PIN	1
AS		HEX NUT, $\frac{5}{16}$ -24, STL. CAD. PL.	1

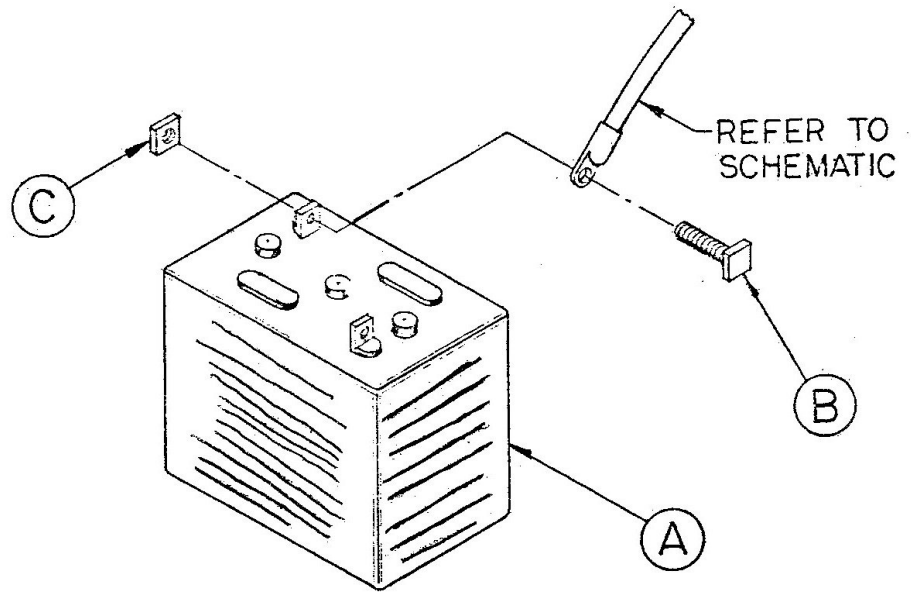


STEERING GEAR ASSEMBLY

C-53713 & C-54947*

KEY	PART NO.	PART	NO. REQ.
A	A-53756	SEAL - STEERING GEAR	1
B	A-53952	PLASTIC INSERT - JACKET TUBE	1
C	A-53955	LOCKNUT	1
D	C-54089	STEERING WHEEL	1
E*	A-40880	SPRING CUP	1
F*	A-40502	SPRING - HORN BUTTON	1
G*	A-40500	SPACER	1
H	A-40521	STEERING COLUMN CAP	1
J	A-51031	CABLE ASS'Y	1
K	A-40505	STEERING WHEEL NUT	1
L*	A-50911	GROUNDING DISC.	1
M	A-40902	BALL CUP	2
N	A-40903	RETAINER & BALL ASS'Y	2
P	A-40904	PLUG	1
Q	A-53954	JACKET TUBE	1
R	A-40906	HOUSING	1
S	A-53953	CAM & TUBE ASS'Y	1
T	A-40908	ADJUSTING PLUG	1
U*	A-40503	HORN BUTTON	1
V*	A-50952	RETAINING RING	1
W	A-40918	GROMMET	1
X	A-40912	OIL SEAL	1
Y	A-40913	SIDE COVER	1
Z	A-40914	GASKET - SIDE COVER	1
AA	A-40915	ADJUSTING SCREW	1
AB	A-40916	LOCKNUT	1
AC	A-40911	LEVERSHAFT ASS'Y	1
AD		SEMS MACH. SCREW, 5/16-18 x 3/4, HEX HD., STL.CAD.PL.	4
AF		HEX NUT, 5/8-18, STL.CAD.PL.	1
AG		LOCKWASHER, 5/8 MED.SPR., STL.CAD.PL.	1

* USE ON S71-E ONLY (C-54947)



STANDARD EQUIPMENT ON S-71 ONLY

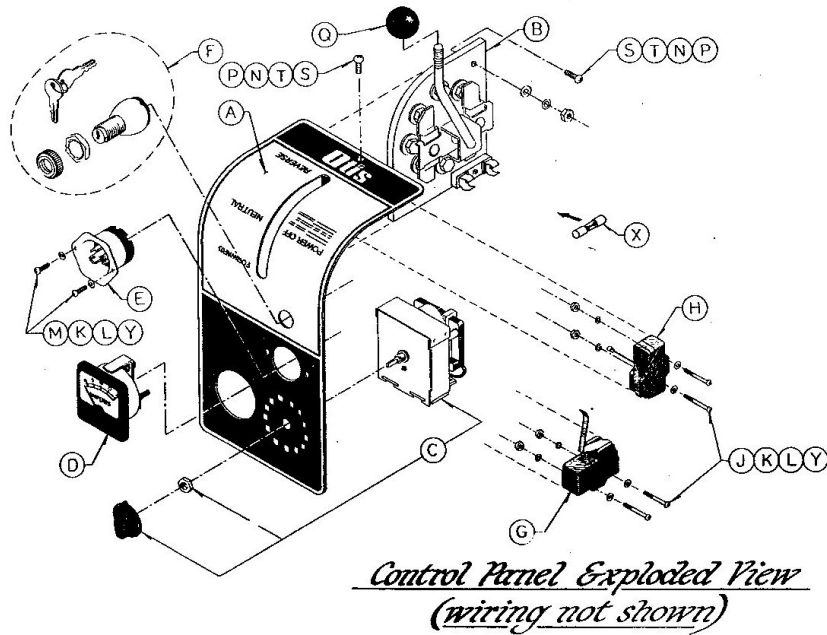
KEY	PART NO.	PART	REQ. NO
A	55446	BATTERY - 6 VOLT 217 AMP	6
B		SQ HD. MACH SCR. - 5/16 - 18 x 1 - STL CAD PL	12
C		SQ NUT - 5/16 - 18 - STL CAD PL	12

ACCELERATOR SWITCH ASS'Y
S-71

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
A	A-14159	12 V. SOLENOID SWITCH	5
B	B-54732	COVER - L/H - HOUSING	1
C	B-54731	COVER - R/H - HOUSING	1
D	A-54700	MICRO SWITCH	4
E	C-54735	MOUNTING BRACKET - MICRO SWITCH	1
F	C-54738	HOUSING WELDMENT	1
G	A-54743	PIVOT ASS'Y - ACCELERATOR SWITCH	1
H	A-54746	BUSHING	1
J	A-54750	LEVER ARM ASS'Y - ACCELERATOR SWITCH	1
K	A-54747	LEVER ARM WELDMENT	1
L		COTTER PIN, .078 NOM. DIA. x 3/4, STL. CAD. PL.	1
M		FLATWASHER, 3/8 STD., STL. CAD. PL.	1
N	A-54733	COPPER BUSS BAR	1
P	A-54734	COPPER BUSS BAR	1
Q	A-35293	GROMMET	1
R		MACH. SCREW, 1/4-20 x 1/2, PHIL. RD. HD., STL. CAD. PL.	20
S		LOCKWASHER, 1/4 MED. SPR., STL. CAD. PL.	20
T		HEX NUT, 1/4-20, STL. CAD. PL.	18
U		SELF TAPPING SCREW, TYPE A, #10 x 1/2, PHIL. R.D. H.D., STL. CAD. PL.	8
V		LOCKWASHER, 5/16 MED. SPR., STL. CAD. PL.	10
W		HEX NUT, 5/16-24, STL. CAD. PL.	10
X		LOCKWASHER, #10 MED. SPR., STL. CAD. PL.	10
Y		HEX NUT, #10-32 STL. CAD. PL.	10

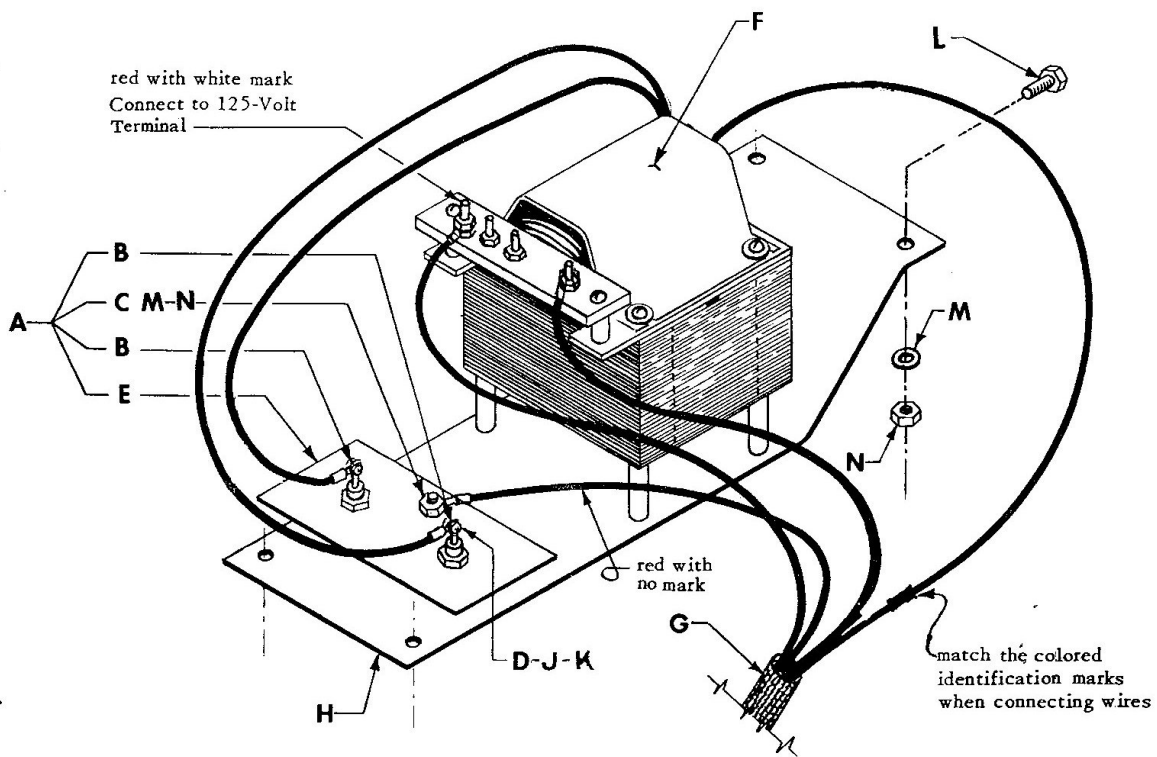
ASSEMBLY - RESISTANCE COILS

1	C-54582	ASSEMBLY RESISTANCE COILS	1
2	A-54562	MOUNTING STRIP - RESISTANCE COILS	1
3	B-54585	1ST STAGE RESISTANCE COILS	1
4	B-54583	WELDMENT - 2ND STAGE RESISTANCE COILS	1
5		MACH. SCREW, 1/4-20, 3/4, PHIL. R.D. H.D., STL. CAD. PL.	3
6		HEX SCREW, 1/4-20 x 1 1/4, STL. CAD. PL.	4
7		FLATWASHER, 1/4 STD., STL. CAD. PL.	11
8		HEX NUT, 1/4-20, STL. CAD. PL.	11
9		EXT. STAR LOCKWASHER, 1/4, STL. CAD. PL.	4
10		LOCKWASHER, 1/4 MED. SPR., STL. CAD. PL.	3



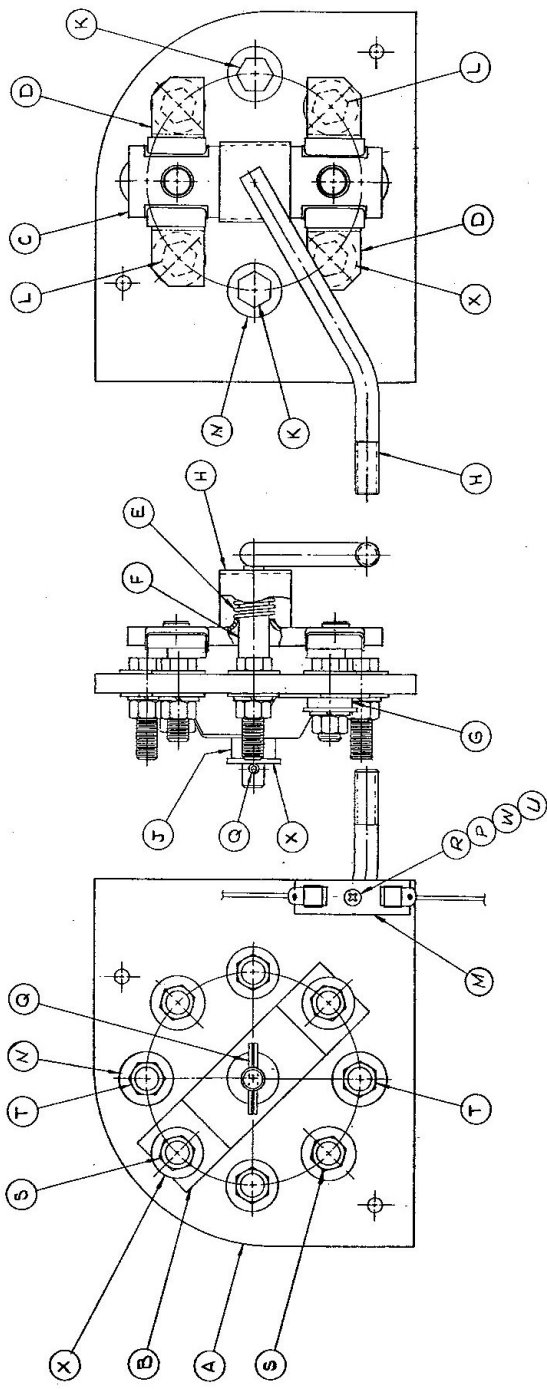
CONTROL PANEL ASSEMBLY D-54048

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
A	B-53968	CONTROL PANEL & DECAL ASSEMBLY	1
B	C-53800	REVERSING SWITCH	1
C	B-53194	24 HR. TIMER	1
D	A-11055	AMMETER	1
E	A-12128	3 WIRE FLUSH RECEPTICLE	1
F	A-54692	LOCK SWITCH	1
G	A-54036	MICRO SWITCH - LOWER	1
H	A-54035	MICRO SWITCH - UPPER	1
J		MACH. SCREW, #6-32 x 1, PHIL. RD.HD., STL. CAD. PL.	4
K		LOCKWASHER, #6 MED. SPR., STL. CAD. PL.	6
L		HEX NUT, #6-32, STL. CAD. PL.	6
M		MACH. SCREW, #6-32 x 1/2, STL. CAD. PL.	2
N		LOCKWASHER, #10 MED. SPR., STL. CAD. PL.	3
P		HEX NUT, #10-24, STL. CAD. PL.	3
Q	A-11104	KNOB	1
R	D-53716	DECAL (ONLY) CONTROL PANEL WITH CHARGER	1
S		MACH. SCREW, #10-24 x 3/4, STL. CAD. PL.	3
T		FLATWASHER, #10 STD., STL. CAD. PL.	3
X	A-16048	50 AMP FUSE	1
Y		FLATWASHER, #6 STD., STL. CAD. PL.	6



TRANSFORMER AND RECTIFIER

KEY	PART NO.	PART	NO. REQ.
A	A-20620	RECTIFIER ASS'Y	1
B	A-20616	SILICON POWER DIODE	2
C	A-20624	RUBBER MOUNT - RECTIFIER	1
D		MACH. SCREW, #8-32x3/8, PHIL. RD. HD., STL. CAD. PL.	2
E	A-20634	MOUNTING PLATE - RECTIFIER	1
F	B-13336	TRANSFORMER	1
G		WIRING HARNESS	1
H	C-53829	MOUNTING PLATE - TRANSFORMER	1
J		LOCKWASHER, #8 MED. SPR., STL. CAD. PL.	2
K		HEX NUT, #8-32, STL. CAD. PL.	2
L		HEX SCREW, 1/4-20x1	4
M		LOCKWASHER, 1/4 MED. SPR., STL. CAD. PL.	6
N		HEX NUT, 1/4-20, STL. CAD. PL.	6

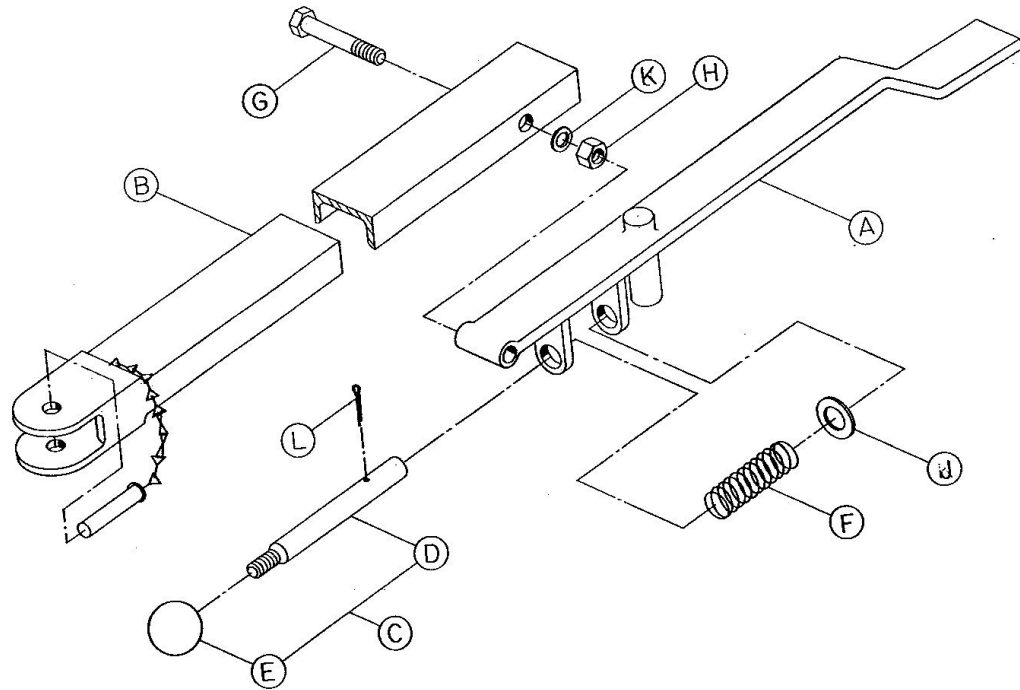


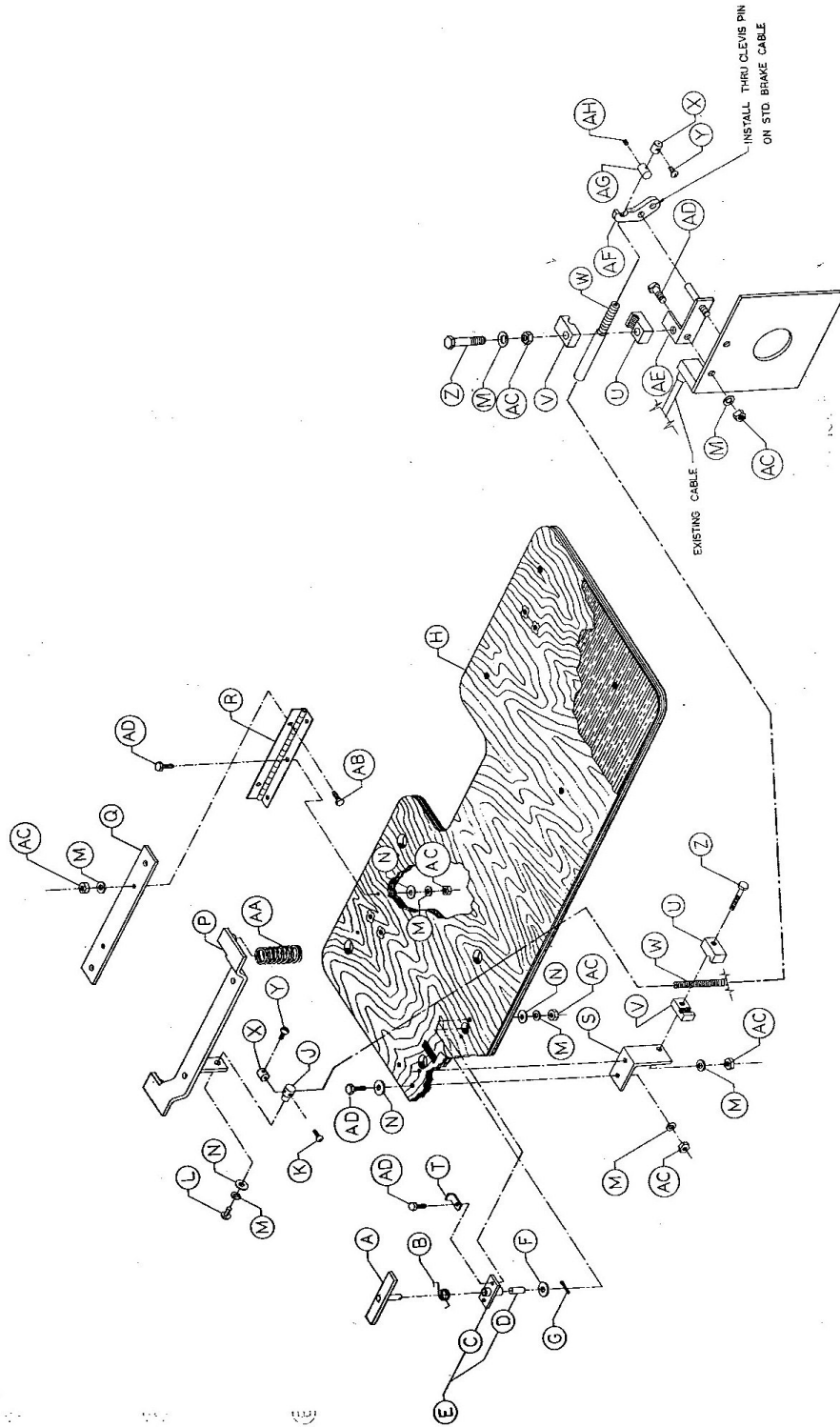
ASSEMBLY REVERSING SWITCH - C-53800

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
A	B-53799	MOUNTING BOARD	1
B	A-53321	SUPPORT BRACKET ROTARY SHAFT	1
C	A-53307	CLAMP - SPRING	1
D	B-53311	ASS'Y ROTARY CONTACT BAR	2
E	A-53313	SPRING - ROTARY BAR	1
F	A-53312	SPACER - ROTARY SHAFT	1
G	A-53188	INSULATING BUSHING	2
H	B-53784	WELDMENT REVERSING SWITCH HANDLE	1
J	A-53319	SPACER - ROTARY SHAFT	1
K	A-53317	CONTACT - BRASS	4
L	A-53318	CONTACT - REST	4
M	A-54037	ASS'Y - 50 AMP FUSE HOLDER	1
N		PLAIN FLATWASHER - 5/16 STD. - BRASS	8
F		PLAIN FLATWASHER - #6 STD. - STL. CAD. PL.	1
Q		SPRING PIN 1/8 DIA. NOM. 1" LG. STL. CAD. PL.	1
R		MACH. SCR. - #6-32 x 5/8 PHIL. R.D. H.D. STL. CAD. PL.	1
S		HEX NUT 5/16-18 NC STL. CAD. PL.	4
T		HEX NUT 5/16-18 NC BRASS	4
U		HEX NUT #6-32 STL. CAD. PL.	1
V		LOCKWASHER 5/16 MED. STL. CAD. PL.	8
W		LOCKWASHER #6 MED. STL. CAD. PL.	1
X		PLAIN FLATWASHER 5/16 STL. CAD. PL.	9

ASS'Y - TOW BAR C-55593

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>REQ. NO.</u>
A	B-55695	WELDMENT - EXTENSION BAR	1
B	B-55694	WELDMENT - TOW BAR	1
C	A-55696	ASS'Y - LOCK PIN	1
D	A-55703	LOCK PIN	1
E	A-11104	KNOB	1
F	A-41158	SPRING	1
G		HEX HD. CAP SCREW, 3/8-16 x 2 1/2, STL.CAD.PL.	1
H		HEX LOCKNUT, 3/8-16, STL. CAD. PL.	1
J		FLATWASHER, 1 5/16 O.D-5/8 I.D. - 1/16 THK. STL. CAD. PL.	1
K		FLATWASHER, 3/8 STD., STL. CAD. PL.	1
L		COTTER PIN, 1/8 DIA x 1, S.S.	1





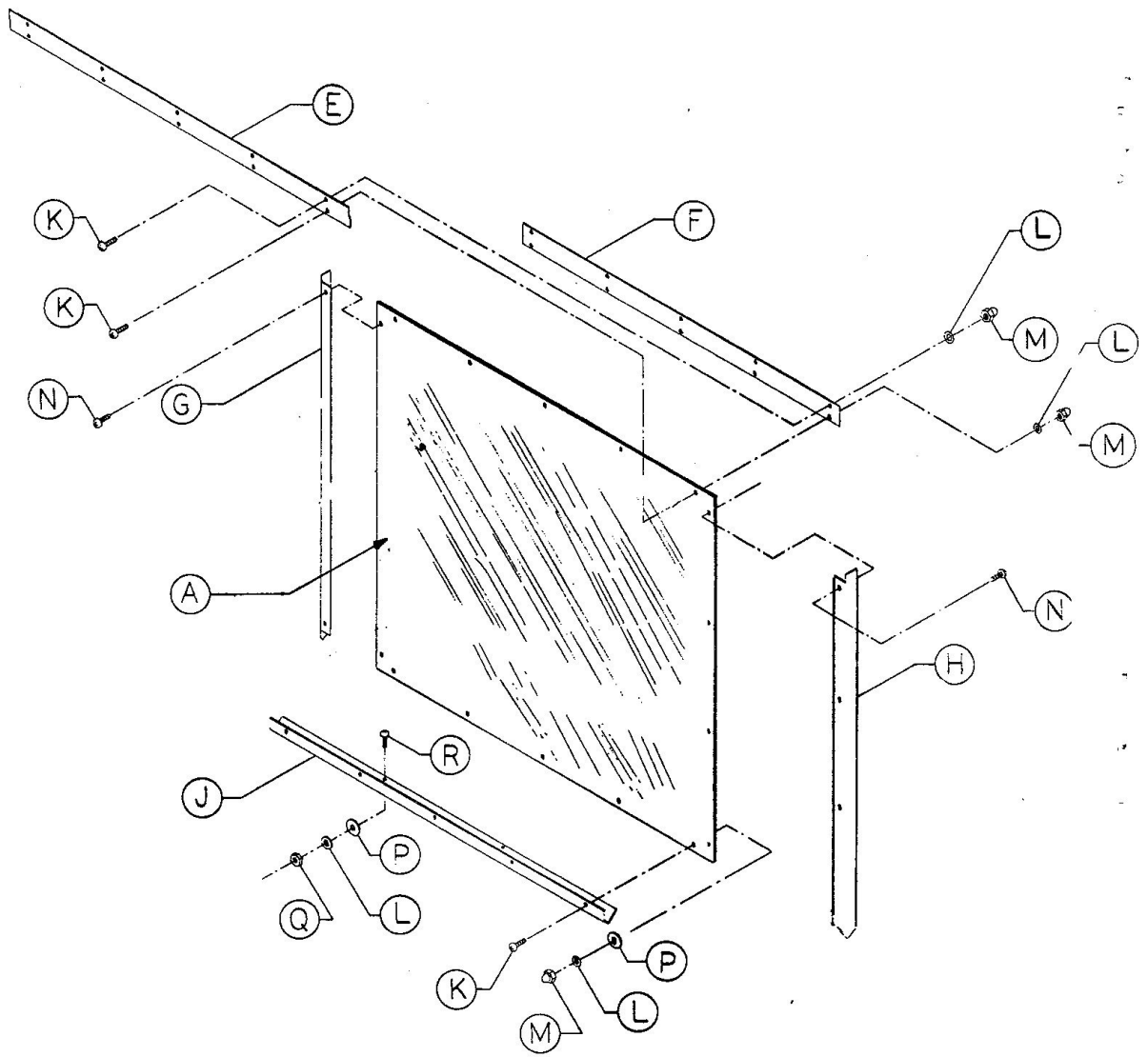
DEAD MAN'S SEAT

55650

<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>REQ. NO.</u>
A	A-54651	WELDMENT - SEAT LATCH	1
B	A-54655	SEAT LATCH SPRING	1
C	A-54648	WELDMENT - SEAT LATCH BUSHING	1
D	A-50479	BUSHING	1
E	A-54787	BRACKET ASS'Y - SEAT LATCH	1
F		FLATWASHER, 3/8 STD., STL. CAD. PL.	1
G		COTTER PIN, .109 DIA x 1, S.S.	1
H	B-54640	DECK BOARD	1
J	A-54647	CABLE WIRE PIVOT MOUNT	1
K		PHIL. RD. HD. SCREW, #10-24 x 3/8, STL. CAD. PL.	1
L		PHIL RD. HD. SCREW, 1/4-20 x 5/8, STL. CAD.PL.	1
M		LOCKWASHER, 1/4 MED., STL. CAD. PL.	14
N		FLATWASHER, 1/4 STD., STL. CAD. PL.	7
P	B-54633	WELDMENT - SEAT ADJUSTER SUPPORT - REAR	1
Q	B-54638	SEAT ADJUSTER SUPPORT - FRONT	1
R	A-54639	HINGE	1
S	B-54643	CABLE SUPPORT TO SEAT BOARD	1
T	A-54654	SEAT LATCH BRACKET STOP	1
U	A-54645	CABLE CLAMP	2
V	A-54646	CABLE CLAMP	2
W	A-54644	BRAKE CABLE ASS'Y	1
X	A-35299	CABLE LOCK	2
Y		SLOT. RD.HD. SCREW, #8-32x1/4, STL. CAD. PL.	2
Z		HEX HD. SCREW, 1/4-20 x 1 1/2, STL. CAD. PL.	2
AA	A-54786	SPRING	2
AB		HEX HD. SCREW, 1/4-20 x 3/4, STL. CAD. PL.	2
AC		HEX NUT, 1/4-20, STL. CAD. PL.	13
AD		HEX HD. SCREW, 1/4-20 x 1	8
AE	B-55713	WELDMENT - BRAKE CABLE MOUNT	1
AF	A-55714	CABLE PIVOT	1
AG	A-55715	CABLE LOCK	1
AH		ALLEN HD SET, SCREW, #8-32 x 1/4, STL.	1

VACUUM FORMED CANOPY - 53773

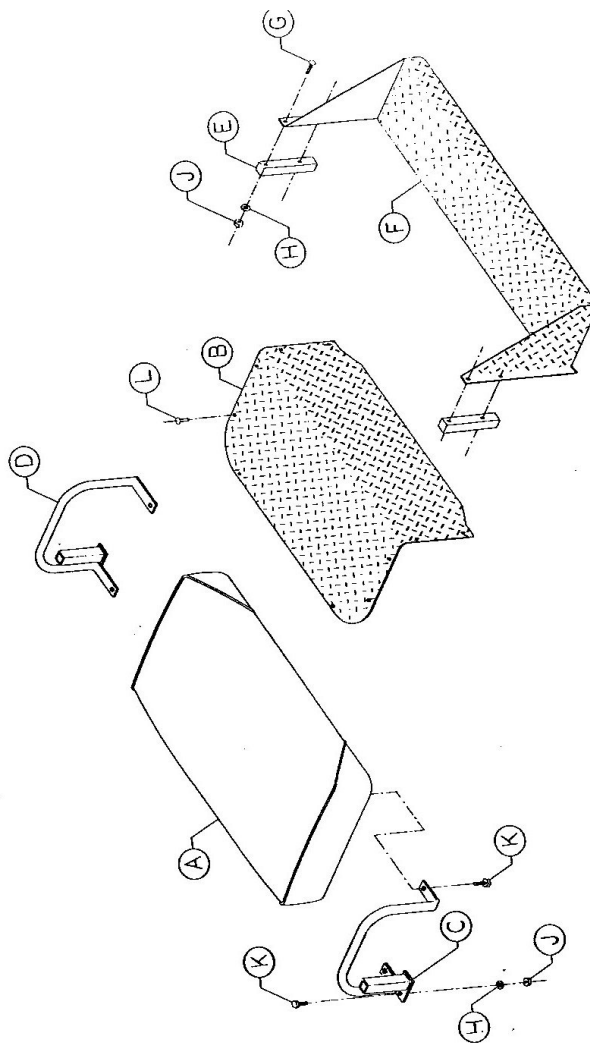
<u>KEY</u>	<u>PART NO.</u>	<u>PART</u>	<u>NO. REQ.</u>
A	D-54948	CANOPY	1
B	C-53977	WELDMENT - CANOPY SUPPORT	2
C	A-54138	LINK - CANOPY SUPPORT/BUMPER - R/H	1
D	A-54139	LINK - CANOPY SUPPORT/BUMPER- L/H	1
E		CARRIAGE BOLT-R.D. H.D.-5/16-24 x 1½ - STL. CAD. PL.	2
F		FLATWASHER, 5/16 STD., STL. CAD. PL.	4
G		LOCKWASHER, 5/16 MED. SPR. STL. CAD. PL.	4
H		HEX SCREW, 5/16-18 x1, STL. CAD. PL.	2
J		SELF TAPPING SCREW, ¼-20 x ¾, SLOTTED FLAT H.D. STL. CAD. PL. (TYPE F)	10
K		FINISHING WASHER, ¼, BRASS, BRIGHT NICKLE PLATE	10
L	B-54564	CANOPY STIFFENER - FRONT	1
M		MACH. SCREW, 1/8-40 x 3/8, PHIL R.D. H.D. STL. CAD. PL.	12
N		ACORN HEX NUT, 1/8-40, STL. CAD. PL.	12
P		FLATWASHER, 1/8 STD., STL. CAD. PL.	24
Q	B-55097	CANOPY STIFFENER - REAR	1
R		HEX NUT - 5/16-24 - STL. CAD. PL.	2



OPTIONAL WINDSHIELD GROUP

OPTIONAL WINDSHIELD
S-71 & S-71-E

KEY	PART NO	PART	NO. REQ
A	A-54132	WINDSHIELD - PLEXIGLAS	1
E	A-54795	BRACKET UPPER WINDSHIELD MOUNTING	1
F	B-54137	BINDING STRIP WINDSHIELD MOUNTING	1
G	C-54136	BRACKET R/H WINDSHIELD MOUNTING	1
H	C-54135	BRACKET L/H WINDSHIELD MOUNTING	1
J	C-54133	BRACKET LOWER WINDSHIELD MOUNTING	1
K		MACH. SCREW, 10 24 x 3/8, PHIL. RD. HD., STL. CAD. PL.	15
L		LOCKWASHER, #10 MED. SFR., STL. CAD. PL.	17
M		CAP NUT, #10-24, STL. CAD. PL.	15
N		SELF TAPPING SCREW STL. CAD. PL.	8
P		FLATWASHER, #10 STD., STL. CAD. PL.	7
Q		HEX NUT	2
R		MACH. SCREW	2



REAR SEAT & STEP ASSEMBLY S-71E D-55130

KEY	PART NO.	PART	NO. REQ.
A	B-53186	SEAT	1
B	C-54680	BAG POCKET COVER PLATE	1
C	B-54942	SIDE RAIL L/H (WELDMENT)	1
D	B-54943	SIDE RAIL R/H (WELDMENT)	1
E	A-54944	SPACER (WELDMENT)	2
F	B-54415	REAR STEP (WELDMENT)	1
G		MACH. SCREW, 3/8-16 x 2. RD.HD., STL.CAD.PL.	4
H		FLATWASHER, 3/8 STD., STL.CAD.PL.	6
J		HEX NUT, 3/8-16, STL.CAD.PL.	6
K		MACH. SCREW, 3/8-16 x 3/4. HEX HD., STL.CAD.PL.	6
L		POP RIVET	6

SECTION II OPERATION - MAINTENANCE AND REPAIR

Your OTIS TOWN & TURF ELECTRIC CAR is built with service in mind and we are sure you will appreciate its rugged and simple construction and efficient operation. Among several special features is our proven 36 volt Electrical System.

For your added convenience and your assurance of many useful hours of operation, we wish to draw your attention to a few simple instructions for operating and maintaining your OTIS TOWN & TURF ELECTRIC CAR".

1 OPERATING INSTRUCTIONS

- a). Turn Key Locking Switch to ON position.
- b). Set the Control Lever according to the desired direction of travel as indicated by the Control Panel Decal.
- c). Gradually depress the Accelerator Pedal to obtain full speed. CAUTION: DO NOT DEPRESS THE ACCELERATOR PEDAL RAPIDLY OR STALL CAR ON STEEP GRADES AS THIS MIGHT CAUSE EXCESSIVE DRAIN ON THE BATTERIES OR SHORTEN COMMUTATOR AND BRUSH LIFE. USE BRAKING ACTION TO AVOID OVERSPEED OF VEHICLE GOING DOWNGRADE WHICH WILL DEFINITELY DAMAGE MOTOR. UNDER NO CIRCUMSTANCES SHIFT THE CONTROL LEVER WHILE THE ACCELERATOR PEDAL IS DEPRESSED.
- d). For maximum safety & protection always set the brake and remove Key from Switch before leaving vehicle unattended.

2. LUBRICATION

- a). FRONT WHEEL BEARINGS: Use wheel bearing lubricant. Lubricate yearly.
- b). REAR WHEEL BEARING: The rear wheel bearings are packed at the factory and should require no further attention, however, if repacking is necessary, use wheel bearing lubricant.
- c). DIFFERENTIAL: Capacity $1\frac{1}{2}$ pints; use SAE 90 Gear Lube.
- d). MOTOR: No lubrication is necessary for the life of the bearings.
- e). SPEERING GEAR: Use gear lube SAE 90.
- f). PIVOT POINTS: Lubricate weekly using lubricating oil.

3. BATTERY CARE

- a).
 1. Check water daily, add if necessary.
 2. Keep battery terminals tight and clean.
- b). **HYDROMETER READINGS**

Full charge specific gravity is 1.250 to 1.285. The full charge readings will decrease a little with age and use, but this is normal and requires no new solution or electrolyte. Use hydrometer syringe to take hydrometer or specific gravity readings.
- c). **ADDING WATER**

Add distilled water as required. DO NOT fill higher than the TRIANGLE OR SQUARE under filler cap. CAUTION: Do not overfill batteries; the electrolyte is a conductor and will short to the frame of the car and cause excessive damage and weaken the batteries.

- d). **CLEANLINESS** The outside of batteries should be kept CLEAN AND DRY. If batteries become corroded, wash with bicarbonate of soda and water, then rinse with clear water. Corrosion on STEEL carriers should first be washed with bicarbonate of soda, then scraped or wire brushed and repainted with acid-resisting paint.
- e). **VENTILATION** When charging, raise seat deck assembly for full ventilation KEEPING VENT PLUGS IN PLACE. Battery temperature should not exceed 110° F.
- f). **PRECAUTIONS** Keep open flames and sparks away from batteries. Do not allow specific gravity to drop below 1.100. Do not allow batteries to remain in a discharged condition; charge immediately after using. Do not add acid to cells without special instruction.

4. BATTERY CHARGING

- a). Your OTIS TOWN & TURF Electric Car is fully equipped with a built-in charging system. The charging unit is wired at the factory for 120 volt, 60 cycle single phase alternating current. Special voltage taps 105 V., 110 V., 115 V., 120 V., and 125 V., have been provided on the transformer winding to compensate for high or low line voltage. Do not select a voltage tap which will give a charging rate greater than 20 amperes when batteries are in a discharged condition. For adequately charging the batteries, line voltage at the car should be 115 or 120 volts. Should your power supply input fluctuate during the charging cycle, the battery charging rate will be affected proportionately.
- b). Plug polarized end of charger cord into receptacle on the control panel.
- c). Plug charger cord into a standard 120 volt A.C. Convenience outlet. Set the semi-automatic timer for number of hours required. A maximum of 14 hours is sufficient for one charging. When car is to be left unattended for lengthy periods of time such as off season months, etc., disconnect charger cord and check batteries periodically with Hydrometer and recharge as required.

5. BATTERY STORAGE

- a). If the Electric Car is to be stored for any length of time, batteries should be given a booster charge every 60 days. CAUTION: Do not allow batteries to remain in a discharged condition especially in BELOW freezing temperatures. If batteries are to be stored separately, store adequately by placing wood or rubber as a platform for protection.

6. ORDERING SPARE PARTS AND TECHNICAL INFORMATION

When ordering repair parts for your OTIS TOWN & TURF ELECTRIC CAR, always describe parts clearly and give Serial Number of car. See name plate on car for Serial Number.

For information concerning our dealer covering your particular area and for technical information, please write to OTIS TOWN & TURF COMPANY, P.O. Box 8600, Stockton, California 95204.

7. TUBLESS TIRES

Front and rear wheels are equipped with 18x8.50-8 tires with a 4 ply rating. Inflation should be maintained at 20 to 24 psi.

8. BRAKE DESCRIPTION AND ADJUSTMENT

Your S-71 and S-71-E is equipped with a mechanical brake which is mounted onto the electric drive motor. As a convenience the parking brake linkage is interconnected to the accelerator linkage and is automatically released whenever the accelerator pedal is depressed. As a further convenience the brake pedal can be made to operate as either a foot or a parking brake. When depressed normally it will function as a foot brake and release as the foot is raised. When the pedal is tilted forward as it is depressed the ratchet underneath the pedal will engage a pawl and remain depressed when the foot is lifted. The parking brake may be released by tilting the pedal back to it's normal position or released automatically by depressing the accelerator. The brake linkage should be kept in adjustment to both hold the car when depressed and not to cause drag when the brake is released. Adjustment is made with the adjustable rod end which connects the brake cable to the lever of the Brake Rod Assembly underneath the vehicle.

9. CONTROL SWITCHES

The rotary type reverse switch and accelerator should be checked monthly to be sure contacts and rotors are clean and secure.

MAINTENANCE AND REPAIR

There are four parts of the electric car for which you may need information in servicing. They are the motor, control switch, batteries, and charger. In an attempt to help you properly service your car, we are listing some of the more prevalent difficulties experienced in the field.

1. THE MOTOR: While the motor incorporated in your car is designed to withstand temporary overloading, precautions should be taken to see that it is not overloaded for extended periods of time. This means that the car should not be made to climb long or unnecessary hills. Stalling the car on steep hills will damage the brushes and commutator, thus shortening the life of the motor. An inspection of the commutator and brushes should be made periodically. If brushes are worn or commutator pitted, the motor should be taken to the nearest authorized motor dealer for servicing. DO NOT attempt to make adjustments yourself. If the motor has been abused by continuous overloading or serviced by other than authorized personnel, the warranty is thereby void. To protect yourself, do these three things. (1) Don't overload; (2) Inspect frequently; (3) Use authorized service facilities.

2. CONTROL SWITCH: The control switch in your electric car has been designed to be as trouble-free as possible. Under no circumstances change directional switch with accelerator depressed. This protects the contacts on the control switch and prevents their burning and pitting. The control switch also should be inspected periodically and cleaned, if necessary. Some of the common difficulties are listed:

- a. Broken or loose wiring
- b. Burned or broken contacts
- c. Defective solenoid
- d. Broken resistance coils
- e. Broken terminal boards

While items a, b, d, and e can be discovered by inspection, a defective solenoid may be more difficult. There are two ways solenoids are defective - those that do not close the circuit (open coil) and those that stick in a closed position. With the on-off switch in the "on" position and the accelerator depressed and the car will not go, the solenoid is stuck in the Open Position. With the on-off switch in the "off" position and the accelerator depressed and the car goes, the solenoid is stuck in the closed position. The directional switch must be thrown to the "off" position and not engaged again until the defective solenoid has been replaced.

3. BATTERIES: Batteries are often neglected but should be very carefully looked after and if properly taken care of, should give long and satisfactory service. Add distilled water as often as necessary to keep plates covered, or to mark indicated on battery. Be careful not to overfill, as the electrolyte is a conductor and will short to frame of the car and cause damage. Also, you will lose electrolyte and weaken the battery. Keep battery terminals tight and clean. Do not let the batteries become discharged below 1.100 Specific Gravity. 1.250 to 1.285 indicates a fully charged battery. Use Hydrometer syringe to take Specific Gravity readings. Do not drop electrolyte on batteries when taking readings. Keep batteries CLEAN AND DRY. To clean batteries, wash with a medium solution of water and bicarbonate of soda. Rinse off with clear water, keep corrosion from frame and battery box of car. When charging, keep vent covers in place. Temperature should not exceed 110° F. When replacing batteries, be sure they are wired in series correctly, and wires are tight and clean. Remove defective battery or batteries from circuit.

PRECAUTIONS: Keep open flames and sparks away from batteries. Do not allow batteries to remain discharged; charge immediately. Do not add acid to battery cells without special instructions.

4. CHARGER: There are four basic parts to the charger, and any one of them might become defective. These parts are the Semi-Automatic Timer and Cord, Transformer, Ammeter and Rectifier. Some common troubles and possible causes are listed below.

No charge	No line voltage Defective Semi-Automatic Timer Broken leads Defective transformer Defective Rectifier Open ammeter
High charge on D.C.meter	Shorted turns in transformer winding

As in all trouble shooting, especially without testing equipment, follow a process of elimination.

EXAMPLE: If a car is not getting an adequate charge, and if your other cars are charging properly, you can be sure that your A.C. voltage is adequate. Next check rectifiers. Take the rectifier from a car that is charging correctly and place that rectifier in the defective car. Be sure connections are correct and tight, and try it. The same is true with the transformer and ammeter; exchange and try. One of the above processes should locate the trouble.

