

OPERATION AND MAINTENANCE MANUAL WITH PARTS LIST

MODEL:	SS 5-34
SERIAL NO. :	83585 - 86709
YEAR:	1986 - 10/87
MANUAL NO. :	MS-534-04

- IMPORTANT -

**READ AND FOLLOW INSTRUCTIONS GIVEN
IN SAFETY & OPERATIONS AND THOSE
SECTIONS RELATED TO YOUR SERVICE
AND REPAIR RESPONSIBILITIES**



TAYLOR-DUNN

Commercial and Industrial Vehicles Since 1949

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IMPORTANT INFORMATION

This vehicle conforms to applicable portions of ANSI B56.8 (American National Standard Personnel and Burden Carriers). This manual is designed for use by Vehicle Operators and Service Personnel alike. Throughout the manual, there are various WARNINGS, CAUTIONS, and NOTICES which must be carefully read to help reduce the possibility of personal injury. Maintenance personnel must understand that if a service procedure or method is used that is not recommended by Taylor-Dunn, it then becomes the personal responsibility of the person performing the work to first satisfy himself that neither his safety, the safety of others, or the safety of the vehicle will be endangered.

Definitions of the three terms are as follows:

WARNING - There is a potential for injury to yourself or others.

CAUTION - There is a potential for damage to the vehicle.

Note - Specific information clarifying or giving the reason for a particular maintenance procedure.

Before operating your Taylor-Dunn vehicle, it is your responsibility to read, understand and follow the safety and operating instructions contained in this manual to help ensure your safety and comfort. If this car is to be used for rental purposes, it is your responsibility to explain to the operator about the various controls and vehicle operating characteristics. Equally important is the operators need to know the basic rules required for safe operation of the vehicle in day to day usage. Sections 5 and 6 of ANSI B56.8 have been inserted in Section 3 of this manual for your specific operating guidelines.

1. Vehicle is to be operated only by qualified persons and only in designated areas.
2. Vehicle will not be started until all occupants are seated.
3. Occupants must remain seated while vehicle is in motion.
4. Arms, legs and feet must be kept inside while vehicle is in motion.
5. Slow down when making a turn.
6. Drive slowly straight up and down inclines.
7. Set parking brake before leaving vehicle.
8. Forward/Reverse lever must be in the correct position for direction of travel desired.

Warning: Failure to comply with above instructions could result in injury to the vehicle occupants, bystanders and to property.

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INSPECTION AND INTRODUCTION
ARRIVAL INSPECTION CHECK LIST

Visual inspection should be made to determine that the truck has remained in good condition during transit. If any damage is found, the details should be noted on the delivery receipt IMMEDIATELY. After delivery the truck should be most carefully checked for HIDDEN DAMAGE. Any concealed damage not noted on the delivery receipt should be reported, in writing, to the delivering carrier within 48 hours.

The following check list has been prepared to aid you during arrival and inspection of your vehicle.

- a. Open all packages and examine any accessories which may be shipped detached from vehicle.
- b. Examine wiring for visible evidence of damage. Check all connections to insure that none have loosened during transit.
- c. Check all battery connections and electrolyte level in each cell.
- d. Inspect battery charger in accordance with manufacturers installation instructions.
- e. Check tires for damage and proper inflation. Check wheel lugs to insure tightness.
- f. If vehicle is equipped with hydraulic brakes, check hydraulic lines for evidence of damage.
- g. Check brake fluid level in master cylinder.
- h. Examine entire vehicle for damage such as dents or cracks.
- i. Check operation of controls to see that they are working freely.

Upon completion of the Visual Inspection, an operations test should be made. Refer to Operating Instructions Section 3.

INSPECTION SAFETY AND INTRODUCTION

SAFETY

The safe and satisfactory use of any vehicle is responsibility shared by many persons.

As the manufacturer, we feel that it is our responsibility to emphasize vehicle characteristics and make safety recommendations regarding those characteristics.

Persons who operate this vehicle need to be aware of, and to observe, the safe driving rules established in their locality, and need also to be aware of the vehicle operating characteristics and safety recommendations of the manufacturer, to assist them in exercising the judgement necessary to prevent injury to themselves or to others.

SAFETY continued

IMPORTANT: Persons who service and maintain the vehicle need to be aware of how their activities relate to safe vehicle operation, and of potential hazards involved in the service and maintenance processes, to assist them in applying sensible judgement to those processes.

STEERING: This vehicle has a very small minimum turning radius, which is very desirable for maneuverability.

CAUTION: This characteristic, so desirable at slow speeds, requires that great care be exercised at high speeds to avoid turning so sharply that one or more wheels lose contact with the ground, or that the vehicle is caused to overturn. Be especially careful while traveling on an incline. Avoid sharp turns, even at slow speeds

CONTROLS: Bring the vehicle to a complete standstill before operating the forward/reverse switch to change direction of travel. Operation of this control while the vehicle is in motion can result in complete loss of power and brakes.

Do not use the accelerator to hold the vehicle at a standstill on an incline. This can cause complete power loss. Use only the brakes to hold the vehicle at rest while on a hill.

BRAKES: The brake system relies on contact of rear tires with the ground for effectiveness. As tire to ground contact is reduced, braking effect is reduced. While driving, the operator must consider terrain, speed, and steering maneuvers to prevent tires from losing contact with the ground, with consequent reduction of braking action.

MAINTENANCE: Many operating characteristics relate to maintenance in ways which are not readily obvious. Those characteristics most closely related to vehicle operating safety are indicated in Sections 4 and 5.

Also to be considered is the safety of personnel who perform service and maintenance duties. Two characteristics need special emphasis.

1. This electric vehicle does not "idle" noisily, is never "out of gear" and set into motion whenever the battery to motor circuit is closed, intentionally or otherwise. Whenever practical, disconnect one or both battery leads to avoid unintentional starting of the motor during servicing and maintenance.
2. Batteries emit gases which can be explosive, especially while they are being charged. Personnel who are involved with servicing vehicles, or maintain vehicles, need to be made familiar with this hazard. A detailed explanation is contained in Section 8.

CAUTION:

1. When performing maintenance on any part of the vehicle electrical system disconnect main battery leads, place forward/reverse switch in neutral. Remove key from keylock in dash panel.
2. Never replace a circuit fuse with one having a higher rating than the original equipment fuse. Fuses have been selected to provide full circuit protection for all operating conditions. A FUSE WILL ONLY BLOW DUE TO A SHORT-CIRCUIT. Therefore, always locate and correct the cause of short-circuit before replacing a blown fuse. Using a fuse of higher rating is UNSAFE PRACTICE and could cause serious damage to equipment.
3. Intentional or unintentional mis-use of controls could result in an accident.

INSPECTION, SAFETY AND INTRODUCTION
INTRODUCTION

This vehicle is designed to be driven on smooth surfaces in and around industrial plants, nurseries, institutions, motels, mobile home parks and resorts. It is not designed to be driven on the public highways. It is not designed to be driven or towed at speeds in excess of 10 MPH on level surfaces or downhill. Speeds in excess of this may result in difficulty in steering, or may damage the motor wind through over-speeding.

MODEL NUMBER:

This manual covers Model SS-025-34 (SS 5-34) starting with Serial No. 83585.

SERIAL NUMBER

The serial number of your unit is stamped into the upper surface of the tubular frame member, just below the deck board. The model number and serial number are on a nameplate riveted to the kick panel. In ordering parts referring to your unit, please use these numbers. Replacement parts can be purchased directly from distributors located across the United States.

TAYLOR-DUNN LIMITED 90 DAY WARRANTY

TAYLOR-DUNN MANUFACTURING COMPANY (TDMC), warrants each new Taylor-Dunn vehicle for ninety (90) days according to the following terms:

This warranty provides coverage for the original retail purchaser only and becomes effective on the date of the original retail purchase.

Any part of the Taylor-Dunn vehicle manufactured or supplied by TDMC and found in the reasonable judgment of TDMC to be defective in material or workmanship will be repaired and/or replaced at the business location of an authorized Taylor-Dunn distributor only without charge for parts and labor. The Taylor-Dunn vehicle (including any defective part) must be delivered to an authorized Taylor-Dunn distributor within the warranty period.

All costs of a service call regarding warranty-related repairs and/or replacements on the Taylor-Dunn vehicle at the owner's location, the labor performed by the distributor at the owner's location, all costs of delivering the Taylor-Dunn vehicle to the distributor for warranty work and the costs of returning the Taylor-Dunn vehicle back to the owner after repair or replacement will be paid for by the owner. Proof of purchase will be required by the authorized Taylor-Dunn distributor to substantiate any warranty claim. All warranty work must be performed by an authorized Taylor-Dunn distributor.

TDMC does not provide a warranty related to SCR's, tires, batteries, chargers, or other parts not of their manufacture as such parts are usually warranted separately by their respective manufacturers.

This warranty does not include service items subject to normal wear such as brake linings, seals, belts, light bulbs and fuses.

This warranty does not provide coverage for any Taylor-Dunn vehicle that has been subject to misuse, neglect, negligence, accident, or operated in any way contrary to the operating or maintenance instructions as specified in the TDMC operator's manual. The warranty does not apply to any Taylor-Dunn vehicle that has been altered or modified so as to adversely affect the vehicle's operation, performance or durability or that has been altered or modified so as to change its intended use. In addition, the warranty does not extend to repairs made necessary by normal wear, or by the use of parts or accessories which in the reasonable judgment of TDMC are either incompatible with the Taylor-Dunn vehicle or adversely affect its operation, performance or durability.

Repairs or replacements qualifying under this warranty will be performed by an authorized Taylor-Dunn distributor following delivery of the vehicle to the distributor's place of business. TDMC's responsibility in respect to claims is limited to making the required repairs or replacements. No claim of breach of warranty shall be cause for cancellation of the contract of sale of any Taylor-Dunn vehicle.

TDMC assumes no liability or responsibility for loss of use of the Taylor-Dunn vehicle, loss of time, inconvenience, or other damage, consequential or otherwise, including, but not limited to, all costs for delivering the Taylor-Dunn vehicle to the distributor and all costs of returning the vehicle back to the owner, mechanic's travel time, telephone or telegram charges, trailering or towing charges, rental of a like vehicle during the time warranty repairs are being performed, travel, lodging, loss or damage to personal property, or loss of revenue.

TDMC reserves the right to change or improve the design of any vehicle without assuming any obligation to modify any TDMC vehicle previously manufactured.

All implied warranties are limited in duration to the ninety (90) day warranty period. Accordingly, any such implied warranties

including merchantability, fitness for a particular purpose, or otherwise, are disclaimed in their entirety after the expiration of the ninety (90) day warranty period. TDMC's obligation under this warranty is absolutely and exclusively limited to the repair or replacement of defective parts, and TDMC does not assume, or does not authorize anyone to assume for them, any other obligation.

This warranty applies to all TDMC vehicles sold in the United States.

WARRANTY SERVICE

To make a claim under warranty, contact an authorized Taylor-Dunn distributor immediately upon realizing a problem exists. We recommend having the warranty work performed by the distributor who originally sold you the vehicle; however, warranty work can be obtained from any authorized Taylor-Dunn distributor. Remember, your Taylor-Dunn vehicle must be delivered to an authorized distributor within the warranty period, and all warranty work must be performed only by an authorized Taylor-Dunn distributor. Your proof of purchase will be required by the dealer to verify any warranty claim.

Examples of Items Not Covered by Warranty

Provisions of the warranty will not apply to:

Normal service requirements occurring during the warranty period, such as adjustment and cleaning or wear of a drive belt, drive chain, brake or rheostat.

Normal service work over and above the repair and replacement of defective parts. Vehicles subject to misuse, neglect, negligence, or accident.

Vehicles that have been altered or modified so as to adversely affect their operation, performance or durability or to change their intended use.

Repairs made necessary by the use of parts or accessories which are either incompatible with the vehicle or adversely affect its operation, performance or durability.

Vehicles not operated or maintained in accordance with the instructions in the Taylor-Dunn Operator's Manual.

Periodic checking, lubricating the vehicle or service check-up.

All costs of delivering the vehicle to the distributor and all costs of returning the vehicle back to the owner, mechanic's travel time, trailering or towing charges, or rental of a like vehicle during the time warranty repairs are being performed.

This warranty applies only to the original retail purchaser. Second-owner or subsequently owned vehicles are not covered under the warranty.

Owner's Obligation and Responsibility

Normal maintenance service and replacement of service items are the responsibility of the owner and as such are not considered defects in material or workmanship with the terms of this warranty. Individual operating habits and usage may contribute extensively to the need for maintenance service.

Consult with your authorized Taylor-Dunn distributor for advice on proper maintenance and care of your vehicle. Proper maintenance and care will be very helpful in keeping your overall operating costs at a minimum.

To assure warranty coverage, it is the owner's responsibility to maintain all components in proper adjustment and to service the vehicle as specified in the Taylor-Dunn Vehicle Operator's Manual. It is the owner's responsibility to provide proper lubrication for all components and provide correct recommended battery maintenance, to maintain the battery liquid level and charge as specified, as well as maintain the correct pressure in the tires of the vehicle.

MODEL SS
OPERATING INSTRUCTIONS

The controls on your Taylor-Dunn vehicle have been designed and located for convenience of operation and efficient performance. Before driving your vehicle for the first time, familiarize yourself with each of the controls after carefully reading the instructions contained in this manual.

STEERING - TILLER TYPE: The steering tiller is designed for two hand control. It is directly connected to the front wheel fork spindle. Move the tiller counterclockwise when making a left turn or clockwise when making a right turn.

STEERING - WHEEL TYPE: The steering wheel and steering system is similar to automotive types. Turn the steering wheel to the right (or clockwise) for a right turn and left (or counterclockwise) for a left turn.

KEY LOCK: Your vehicle is equipped with a keyed lock located on the left side of the dash panel. It is designed to lock the switch in the Neutral position only. The key will remove from the lock in the locked position (Neutral) only.

BRAKE - SERVICE AND PARKING - FOOT OPERATED: The brake pedal is designed and located for right foot operation. It is the pedal located to the left of the accelerator pedal. It functions the same as the brake pedal in your automobile. Depressing the pedal applies the braking action. The greater the effort applied to the pedal with your foot, the greater the braking action to your vehicle. Removing your foot from the pedal allows immediate release of the braking action to your vehicle. The brake pedal pad swivels to engage a lock for parking vehicle. Applying pressure to the rear of the pedal with your heel will engage the lock and hold brake in the on position after foot is removed from the pedal. To release brake from the locked position apply foot pressure to the forward part of the pedal. Lock will disengage and pedal will be free to travel.

FORWARD-REVERSE SWITCH: The forward/reverse control is a rocker type switch and is mounted on the dash panel to the right of the steering column. Center position is OFF and should always be in this position whenever power is turned off. To go forward, depress switch in forward (labelled) position. For reverse, depress switch in reverse (labelled) position.

CAUTION: The forward/reverse switch serves the same purpose as the transmission in your automobile. Treat it with the same respect and care. DO NOT SHIFT from forward to reverse or vice-versa while the vehicle is in motion. Shifting while in motion, especially near top speed, causes great strain to your entire vehicle and will eventually cause severe damage.

POWER-ON LIGHT: Is located next to forward reverse switch. The blue panel light will turn on and off when accelerator pedal is activated.

ACCELERATOR PEDAL: The accelerator pedal is located to the right of the brake pedal. It is designed for right foot operation similar to your automobile. Depressing the pedal turns the power on to the motor and controls the speed.

HORN BUTTON: The horn button is located in steering tiller or adjacent to steering gear box. Depressing button sounds horn.

LIGHT SWITCH: The light switch that controls headlamps and taillamps is located on the steering tiller or adjacent to steering gear box. It is labelled for ON - OFF positions.

BATTERY CHARGER: Refer to Section 8 for proper instructions to operate your battery charger.

OPERATING RESPONSIBILITIES
AMERICAN NATIONAL STANDARD PERSONNEL AND BURDEN CARRIERS
ANSI B 56.8-1981
SECTION 5
OPERATING RULES AND PRACTICES

501 OPERATOR QUALIFICATIONS

Only trained and authorized operators shall be permitted to operate a Personnel and Burden Carrier. Operators of Personnel and Burden Carriers shall be qualified as to visual, auditory, physical, and mental ability to safely operate the equipment according to Section 5 and all other applicable parts of this standard.

502 PERSONNEL AND BURDEN CARRIER OPERATORS' TRAINING

(a) The carrier owner, lessee, or employee of the carrier operator shall conduct an operators' training program for the carrier operators.

(b) Successful completion of the operators' training program shall be required by the owner, lessee, or employer of the carrier operator before operation of the Personnel and Burden Carrier by any operator.

(c) An effective operator's training program should center around user company's policies, operating conditions, and their Personnel and Burden Carrier by any operator.

(d) Information on operator training is available from several sources, including carrier manufacturers.

(e) The carrier owner, lessee, or employer of the carrier operator should include in the operators' training program the following:

(1) Careful selection of the operators, considering physical qualifications, job attitude and aptitude.

(2) Emphasis on safety of stock, equipment operator, and other employees.

(3) General safety rules contained in this standard and the additional specific rules determined by the carrier owner, lessee, or employer of the carrier operator in accordance with this standard, and why they were formulated.

(4) Introduction of equipment, control locations and functions, and explanation of how they work when used properly and when used improperly; and ground and floor conditions, grade, and other conditions of the environment in which the Personnel and Burden Carrier is to be operated.

(5) Operational performance tests and evaluations during, and at completion of the program.

(6) Rules of the employer and any applicable labor contract governing and dealing with discipline of employees for violation of employer's rules, and including safety rules.

503 OPERATOR RESPONSIBILITY

Operators of Personnel and Burden Carriers shall abide by the following safety rules and practices in 504, 505, 506, and 507.

504 GENERAL

(a) Safeguard the pedestrians at all times. Do not drive carrier in a manner that would endanger anyone.

(b) Riding on the carrier by persons other than the operator is authorized only when personnel seat(s) are provided. Do not put any part of the body outside the outer perimeter of the carrier.

(c) When a Personnel or Burden Carrier is left unattended, stop carrier, place directional controls in neutral, apply the parking brake, stop the engine or turn off power, turn off the control or ignition circuit, remove the key if provided, and block the wheels if machine is on an incline.

OPERATING RESPONSIBILITIES (continued)
ANSI B56.8-1981

504 GENERAL

(d) A Personnel and Burden Carrier is considered unattended when the operator is 25 ft. (7.6 m) or more from the carrier which remains in his view, or whenever the operator leaves the carrier and it is not within his view. When the operator of a Personnel and Burden Carrier is dismounted and within 25 ft. (7.6 m) of the carrier still in his view, he still must have controls neutralized, and brakes set to prevent movement.

(e) Maintain a safe distance from the edge of ramps and platforms.

(f) Use only approved Personnel and Burden Carriers in hazardous locations.

(g) Report all accidents involving personnel, building structures, and equipment.

(h) Operators shall not add to, or modify, the Personnel or Burden Carrier.

(i) Fire aisles, access to stairways, and fire equipment shall be kept clear.

(j) Operators and personnel shall be warned of the hazards of long hair and loose clothing.

505 TRAVELING

(a) Observe all traffic regulations, including authorized plant speed limit. Under normal traffic conditions keep to the right. Maintain a safe distance, based on speed of travel, from the carrier or vehicle ahead; and keep the Personnel and Burden Carrier under control at all times.

(b) Yield the right of way to pedestrians, ambulances, fire trucks, or other carriers or vehicles in emergency situations.

(c) Do not pass another carrier or vehicle traveling in the same direction at intersections, blind spots, or at other dangerous locations.

(d) Keep a clear view of the path of travel, observe other traffic and personnel, and maintain a safe clearance.

(e) Slow down and sound the audible warning device at cross aisles and other locations where visibility is obstructed.

(f) Ascend or descend grades slowly.

(g) Use extra caution when operating on grades. Never turn on any grade, ramp, or incline; always travel straight up and down.

(h) Under all travel conditions the carrier shall be operated at a speed that will permit it to be brought to a stop in a safe manner.

(i) Make starts, stops, turns, or direction reversals in a smooth manner so as not to shift the load, overturn the carrier, or both.

(j) Do not indulge in stunt driving or horseplay.

(k) Slow down when approaching, or on, wet or slippery surfaces.

(l) Do not run carrier onto any elevator unless specifically authorized to do so. Approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, neutralize the controls, shut off power, and set brakes. It is advisable that all other personnel leave the elevator before a carrier is allowed to enter or leave.

(m) Avoid running over loose objects on the roadway surface.

(n) Prior to negotiating turns, reduce speed to a safe level, turning hand steering wheel or tiller in a smooth, sweeping motion.

506 LOADING

(a) Handle only stable or safely arranged loads. When handling off-center loads which cannot be centered, operate with extra caution.

(b) Handle only loads within the capacity of the Personnel and Burden Carrier as specified on the nameplate.

OPERATING RESPONSIBILITIES (continued)
ANSI B56.8-1981

506 LOADING

(c) Handle loads exceeding the dimensions used to establish carrier capacity with extra caution. Stability and maneuverability may be adversely affected.

507 OPERATOR CARE OF MACHINE

(a) At the beginning of each shift during which the Personnel and Burden Carrier will be used, the operator shall check the carrier condition and inspect the tires, warning devices, lights, battery, controller, brakes, and steering mechanism. If the carrier is found to be in need of repair, or in any way unsafe, or contributes to an unsafe condition, the matter shall be reported immediately to the designated authority, and the carrier shall not be operated until it has been restored to safe operating condition.

(b) If, during operation the carrier becomes unsafe in any way, the matter shall be reported immediately to the designated authority, and carrier shall not be operated until it has been restored to safe operating condition.

(c) Do not make repairs or adjustments unless specifically authorized to do so.

(d) The engine shall be stopped and the operator shall leave the carrier while refueling.

(e) Spillage of oil or fuel shall be carefully and completely absorbed or evaporated and fuel tank cap replaced before starting engine.

(f) Do not operate a carrier with a leak in the fuel system or battery.

(g) Do not use open flames for checking electrolyte level in storage batteries or liquid level in fuel tanks.

SECTION 6
MAINTENANCE PRACTICES

601 INTRODUCTION

Personnel and Burden Carriers may become hazardous if maintenance is neglected. Therefore, maintenance facilities, trained personnel, and procedures shall be provided.

602 MAINTENANCE PROCEDURES

(a) Maintenance and inspection of all personnel and Burden Carriers shall be performed in conformance with the manufacturer's recommendations and the following practices.

(b) A scheduled preventive maintenance, lubrication, and inspection system shall be followed.

(c) Only qualified and authorized personnel shall be permitted to maintain, repair, adjust, and inspect Personnel and Burden Carriers.

(d) Before leaving the Personnel and Burden Carrier, stop carrier, place directional controls in neutral, apply the parking brake, stop the engine or turn off power, turn off the control or ignition circuit, and block the wheels if carrier is on an incline.

(e) Before undertaking maintenance or repair on carrier, raise drive wheels free of floor or disconnect battery, and use chocks or other positive carrier positioning devices.

(f) Block chassis before working under it.

(g) Before disconnecting any part of the engine fuel system of a gasoline or diesel powered carrier with gravity feed fuel systems, be sure shutoff valve is closed, and run engine until fuel system is depleted and engine stops running.

MAINTENANCE PRACTICES (continued)
ANSI B56.8-1981

602 MAINTENANCE PROCEDURES (continued)

(h) Before disconnecting any part of the engine fuel system of LP gas powered carriers, close the LP gas cylinder valve and run the engine until fuel in the system is depleted and the engine stops running.

(i) Operation to check performance of the Personnel and Burden Carrier shall be conducted in an authorized area where safe clearance exists.

(j) Before starting to operate the carrier:

- (1) Have operator in the operating position.
- (2) Depress clutch (or brake pedal on automatic transmission and electric carriers).
- (3) Place directional controls in neutral.
- (4) Start engine or switch electric carrier to "on" position.
- (5) Check functioning of directional speed controls, steering, warning devices steering, warning devices, and brakes.

(k) Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check level or leakage of fuel, electrolyte, or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.

(l) Properly ventilate work area.

(m) Handle LP gas cylinders with care. Physical damage, such as dents, scrapes, or gauges, may dangerously weaken the tank and make it unsafe for use.

(n) Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, guards, and safety devices shall be inspected regularly and maintained in a safe operating condition.

(o) Special Personnel and Burden Carriers or devices designed and approved for hazardous area operation shall be inspected to ensure that maintenance preserves the original approved safe operating features.

(p) Fuel systems shall be checked for leaks and condition of parts. Action shall be taken to prevent the use of the carrier until the leak has been corrected.

(q) The Personnel and Burden Carrier manufacturer's capacity, operation and maintenance instruction plates, tags, or decals shall be maintained in legible condition.

(r) Batteries, motors, controllers, limit switches, protective devices, electrical conductors, and connections shall be inspected and maintained in conformance with good practice.

(s) Carriers shall be kept in a clean condition to minimize fire hazards and facilitate detection of loose or defective parts.

(t) Modifications and additions which affect capacity and safe machine operation shall not be performed by the customer or user without manufacturer's prior written authorization; where authorized modifications have been made, the user shall ensure that capacity, operation, warning and maintenance instruction plates, tags, or decals are changed accordingly.

(u) Care shall be taken to assure that all replacement parts are interchangeable with the original parts and of a quality at least equal to that provided in the original equipment.

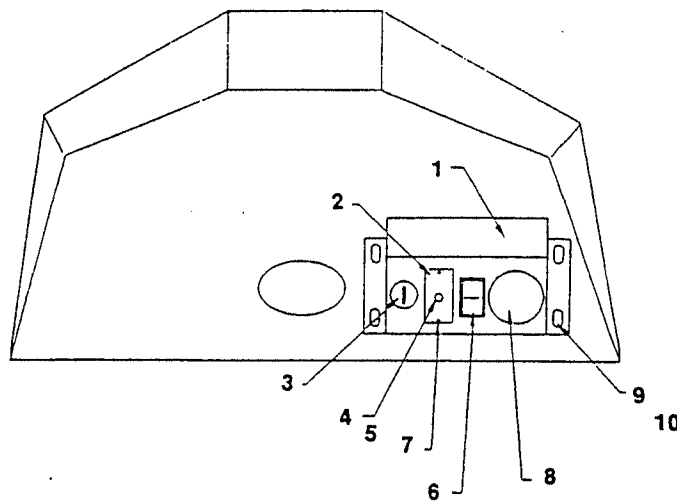
VEHICLE OWNER AND OPERATOR'S GUIDELINES

To put your vehicle into operation, unlock forward/reverse switch by turning keyed lock counter clockwise. Select direction you wish to travel by moving handle of forward/reverse switch into position. Release parking brake, slowly depress accelerator pedal until vehicle is moving at the desired speed. Steer vehicle as required utilizing the foot brake and accelerator to control your speed as desired.

CAUTION: DO NOT "hold" vehicle at a stand still on a hill or incline using accelerator only. Continued "stalled" condition as described will damage motor and electrical controls. Use either your foot brake or hand brake to hold the vehicle on a hill safely.

CAUTION: When you leave your vehicle, it is best to always place forward/reverse switch in neutral position. Set parking brake to prevent vehicle from rolling free, and lock and remove key.

Drive safely and enjoy your Taylor-Dunn vehicle.



CONTROL PANEL, MODEL SS 5-34

FIG. I. D.	T-D PART NO.	DESCRIPTION	QTY.
1	Ø1-534-56	DASH PANEL	1
2	94-312-ØØ	LABEL, FORWARD/REVERSE SWITCH	1
3	71-12Ø-ØØ	SWITCH, IGNITION	1
4	72-Ø18-Ø9	ASSEMBLY, POWER ON LIGHT 24V	1
5	72-Ø18-11	CAP, PLASTIC LENS, BLUE	1
6	71-Ø39-ØØ	SWITCH, FORWARD/REVERSE SELECTOR	1
7	88-727-Ø6	RIVET. 5/32 X 1/2 INCH	2
8	95-919-ØØ	PLUG, PLASTIC (2-1/8 INCH HOLE)	1
9	88-Ø65-Ø6	SCREW, TRUSS HEAD, 1/4 X 1/2	4
10	88-Ø69-87	KEPS NUT, 1/4 INCH	4

* ACCESSORY HOLE FOR HOUR METER OR CHARGE INDICATOR OPTIONS

MAINTENANCE GUIDE CHECKLIST

This checklist is provided for your convenience as a guide for servicing your vehicle. If followed you will enjoy a good running and trouble free unit. It has been set up for normal use. More frequent service is recommended for extreme or heavy usage. If desired your Taylor-Dunn dealer will gladly perform these services for you as he has expert service men in the field for this purpose. Do not hesitate to call your Service Manager if any questions arise.

CAUTION: When performing maintenance on any part of the electrical system, disconnect battery leads, place forward/reverse switch in neutral, turn key to off position and remove from switch. Set parking brake.

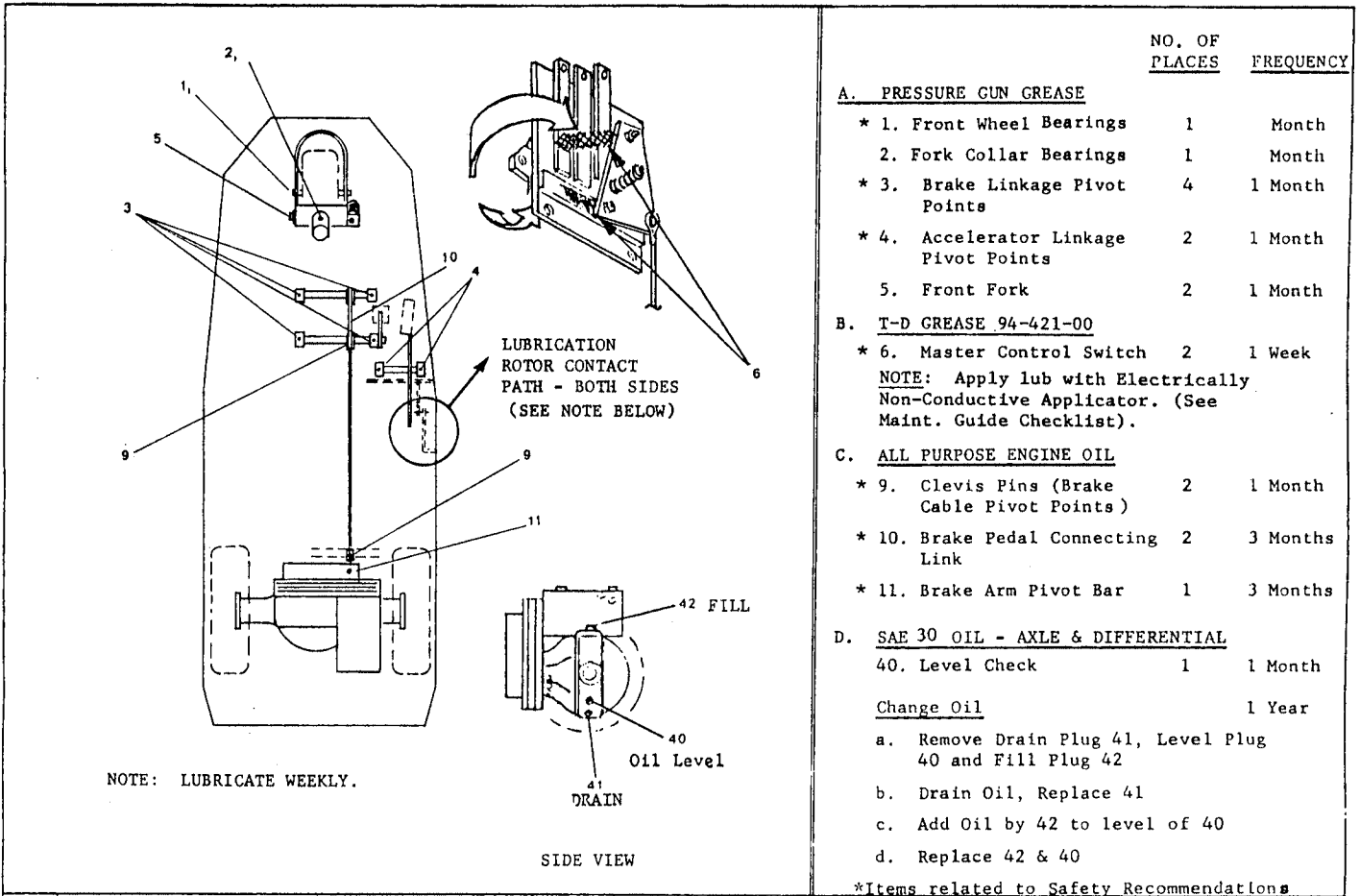
MAINTENANCE SERVICE	REFER SECTION	EVERY MONTH	EVERY 3 MONTHS	EVERY YEAR
Check and fill batteries. If necessary fill with distilled water only.	7	X	X	X
* Apply lube to speed control sliding contact area with electrically nonconductive applicator. Use T-D grease 94-421-00 or a quality hi-temp grease with a 500 minimum drop point.	14	X	X	X
NOTE: *Switch may require cleaning and lubrication more often than once a month depending on vehicle operation environment. See Section 16 for additional information.				
* Check rheostat adjustment	14	X	X	X
Check tire pressure	10	X	X	X
Adjust motor mount & Chain (Refer to chart Section 11)	11	X	X	X
Lubricate all zerk fittings	11	X	X	X
Lubricate all moving parts without zerk fittings. Use all purpose engine oil.	5	X	X	X
Wash off batteries with water. (Use soda if necessary).	7	X	X	X
* Check all wire connections. Be sure they are all clean and tight.		X	X	X
* Check brake lining for wear. Adjust or replace as necessary.	12	X		
Check rear axle differential oil level (Refer to lubrication diagram).	5	X	X	X
Check and adjust hand and foot operated brake system.	12	X	X	X
Check and adjust front wheel and fork spindle bearings	10		X	


MAINTENANCE GUIDE CHECKLIST continued

Lubricate front wheel bearings (2 zerk fittings).	10	X	X
Clean surface between power bars of the speed control switch.	14	X	X
Check motor brushes. Blow out carbon dust. (Replace if necessary).	13	X	X
Drain differential and refill with SAE 30 oil (refer to lubrication diagram).	5		X
Repack front wheel bearings. (Use wheel bearing grease).	10		X
Lubricate steering gear box with grease.	5		X
Check and adjust front wheel bearings.	10	X	X

CAUTION: Never bend the brake band anchor bolt. Any bending of the bolt may result in Unexpected failure of the bolt and complete loss of drive line braking action.

* Items related to safety recommendations.



NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION 12-81
TOL. FRAC. ±	DEC. ±	FIGURE 1		LUBRICATION DIAGRAM	
SCALE	NONE	SECTION 5		MODEL 2534SS	
DRAWN BY	EDB	 TAYLOR DUNN MFG. CO. 2114 West Ball Rd. Anaheim, Calif.			
DATE	7-17-81				

TROUBLE SHOOTING PROCEDURES

<u>SYMPTOM</u>	<u>PROBABLE CAUSE</u>	<u>CORRECTIVE ACTION</u>
1. Steering:		
a. pull in one direction	1. Check for bent fork	Replace or straighten
b. hard steering	1. Bad or frozen bearing in fork spindle collar 2. Low tire pressure	Replace Inflate to recommended pressure
c. Sloppy or loose steering	1. Loose spindle bearing 2. Loose wheel bearing	Adjust Adjust
2. Brakes:		
a. Soft brakes	1. Check for worn lining 2. Alignment of brake shoes 3. Oil on brake lining 4. Dirt on brake lining 5. Bind in linkage 6. Weak spring 7. Air in hydraulic brake lines 8. Bad seals in brake cylinders	Adjust or replace when 1/16 or less of lining left Realign Find oil source and correct, wash brake band Clean Loosen or realign Replace Bleed brakes Replace
b. No brakes	1. Broken shoe 2. Broken connection in linkage 3. Broken Axle 4. Break in hydraulic line 5. Seal failure in brake cylinder	Replace Replace Replace Repair Replace
3. Drive Axle:		
a. No power	1. Discharged batteries 2. Check rheostat for contact 3. Check motor brushes for contact 4. Check for loose wire 5. Check continuity through motor	Recharge or replace Adjust or replace bars Clean or replace Tighten or replace Repair or replace
b. Lack of power or slow operation	1. Dragging brake 2. Tight front wheel bearing 3. Rheostat not making contact on high speed bar 4. Loose connection in wiring 5. Partially burned out motor or thrown lead 6. Weak batteries 7. Bind or drag on differential	Re-adjust Re-adjust Re-adjust or replace bars Tighten Replace or reorder Repair

TROUBLE SHOOTING PROCEDURES (continued)

<u>SYMPTOM</u>	<u>PROBABLE CAUSE</u>	<u>CORRECTIVE ACTION</u>
c. Thump or grinding noise in drive axle	1. Motor bearing 2. Loose motor on base 3. Worn Sprockets 4. Defective bearing in differential 5. Defective gears in differential 6. Slack drive chain	Replace Tighten & adjust Replace Sprocket and chain Replace Replace Adjust, See Section 11
4. Rheostat:		
a. Jerky starting	1. Resistor coil burned open 2. Resistor shorted together 3. Poorly adjusted rheostat 4. Dirt between power bars causing shorts	Replace Spread apart Re-adjust Clean as necessary
b. Takes off in forward or reverse without accelerator depressed	1. Dirt shorting out neutral bar 2. Check rheostat adjustment 3. Short in wiring circuit	Clean, re-adjust, or replace bars Correct Correct

BATTERY MAINTENANCE PROCEDURES

WARNING: Lead acid batteries continuously emit highly explosive gases. Flame or sparks must be kept away from the batteries at all times.

This emission is greatly increased during the charging process. Any area in which charging batteries are confined must be well ventilated, and flame or sparks must be kept out of the charging area and away from ventilator opening. DO NOT disturb battery connections while batteries are being charged.

The lead acid battery (or batteries) will furnish all power required by your vehicle. Two types are generally employed. The electric vehicle type battery pack, commonly used, can be expected to have a life of approximately 2 years, or 350 to 400 cycles. One cycle is the discharging and charging of the battery within proper limits. The heavy duty industrial type of battery has a life of approximately 7-1/2 years, or 1800 cycles, with appropriate use and care.

It cannot be over emphasized how important good maintenance procedures and careful care of your batteries will affect their useful life. It is therefore recommended that a comprehensive maintenance program be established and adhered to throughout the life of your vehicle. A 5 point program is outlined below to assist you in understanding and establishing good battery care.

1. CORRECT CHARGING: Poor charging practices are responsible for more short battery life than any one other item. The charging equipment must be properly maintained and adjusted to give a charge which the battery will accept with maximum efficiency. Two things are involved in correct charging. These are the charging rate in amperes and the termination of the charge at the correct time. No amount of overcharging will increase the battery capacity or raise the specific gravity above its full charged condition.

Overcharging will reduce battery life. Undercharging will cause poor vehicle performance, and shorten the life of all electrical components, including the batteries. Refer to Service Adjustment in this section for proper methods to determine charge condition.

2. DISCHARGING - CAPACITY: Batteries are commonly rated in ampere hours at the six hour discharge rate to final voltage of 1.75 per cell. They will deliver additional capacity in an emergency, but should not be required to do so regularly. The best way to avoid discharging is to prepare a rigid schedule for charging batteries which will ensure against their being discharged beyond the limits of their capability.

3. WATERING: Water must be replaced from time to time. The frequency and quantity depends upon the watering space above the plates and the amount of gassing which the battery does on charge. Only approved or distilled water should be added to the battery. Water should be added after hydrometer or voltmeter readings have been taken. The liquid level within the battery raises as the gassing occurs. Thus filling after charging minimizes overfilling. However, the water level should cover the plates prior to charging.

4. CLEANING: Batteries pick up various kinds of dirt and dust, depending on their surroundings and the type of service to which they are subjected. This is usually dry dirt, which can readily be blown off with low pressure air or brushed off. However, if cells are overfilled and electrolyte collects on the covers, the top of the battery becomes wet and stays wet, since the acid in the electrolyte does not evaporate. This moist surface in combination with certain kinds of dirt becomes electrically conductive and permits stray currents to flow externally over the top of the battery. These currents cause corrosion of cell posts, nuts, connectors and steel trays, which eventually become troublesome and expensive to repair.

BATTERY MAINTENANCE PROCEDURES (continued)

When wet dirt accumulates on top of the battery, remove it by washing the battery with a strong solution of baking soda and hot water (1 lb. of soda to 1/2 gallon of water). A convenient brush to use is one having flexible bristles like an old paint brush. Continue the application of the soda solution until all fizzing stops, which indicates that the acid has been neutralized. Then rinse thoroughly with clear water.

Wet covers can be an indication of overfilling, leaky seals at posts and covers or of excessive gassing during charge. When observed the cause should be determined and the abusive conditions corrected.

5. RECORDS: A battery record system is recommended for all vehicles. It is considered essential for large operations, and where minimum battery operating cost is desired. A properly supervised record system can be made to detect and call attention to such operating irregularities as:

- a. Overcharging
- b. Undercharging
- c. Overdischarging
- d. Excessive Water Consumption
- e. Cleanliness
- f. Worn Out Batteries
- g. Excessive Current Consumption on Trucks

It is not advisable to allow a battery to stand for a long period of time in a low state of charge. Doing so subjects the battery to excessive plate erosion and in cold climate conditions the electrolyte will freeze at temperatures near 60 degrees below zero. Yet a battery in a very low state of charge may freeze at temperatures around 10 to 15 degrees above zero.

A battery not in use maintains small amounts of chemical action which slowly tends to dissipate the charged conditions. It is wise to re-charge a battery not in use every 1 to 2 months. If possible store the battery in a cool place, as the self discharge rate is increased with warmer temperatures.

BATTERY MAINTENANCE RECORD

VEHICLE NO.

Battery No.	Cell No.	Date			Date			Date		
		Water OK or Low	Gravity Before Charge	Gravity After Charge	Water OK or Low	Gravity Before Charge	Gravity After Charge	Water OK or Low	Gravity Before Charge	Gravity After Charge
1	1									
	2									
	3									
2	1									
	2									
	3									
3	1									
	2									
	3									
4	1									
	2									
	3									
5	1									
	2									
	3									
6	1									
	2									
	3									

- CAUTION:** Batteries emit explosive gases. During normal operation the concentration of these gases is rarely sufficient to be considered dangerous unless flame or sparks occur in the battery compartment close to the vent holes in the battery caps. It is important that this not be allowed to occur at anytime. During the charging process, emissions are greatly increased. Any area in which charging batteries are confined must be well ventilated, and flame, sparks or lighted cigarettes must be kept out of the charging area and away from ventilator openings associated with the charging area. Battery connections must not be disturbed while batteries are being charged.
- Do not fill an uncharged battery. Bring water level up to just cover the plates, and complete filling after battery is fully charged. Use distilled water. Fill only to level indicated on battery.
- Batteries which require unusually frequent watering may indicate overcharging. Review charging practices and/or adjustment of transformer taps in charger.
- Gravity should be kept between 1175 (30% charged) and 1260 (100% charged), and gravity readings of all cells should be within 10 point range. When they are not, an equalizing charge should be applied. Refer to information under "Charging Time Chart" in Charger Handbook.
- Periodically check for loose terminal posts or loose connections to terminal posts, but not while batteries are being charged.
- Keep tops of batteries clean, and free of moisture, grease, and acid films. Any of these can cause current leakage.
- Keep weekly (or oftener) record as shown in sample chart, for a new vehicle or when charging results seem unsatisfactory, until satisfactory charging continues for a four week period, then keep record on a monthly basis.

BATTERIES

T-D PART NO. NO.	DESCRIPTION	QTY. REQ.
75-231-00	BATTERY JUMPER # 6 WIRE (10-1/4 " LONG)	3
75-240-00	BATTERY BOX CHARGING CORD AND PLUG	1
75-241-00	BATTERY BOX CHARGING RECEPTACLE	1
77-031-00	6 VOLT - 190 A.H. BATTERY	4
77-042-00	6 VOLT - 217 A.H. BATTERY	4
77-200-00	HYDROMETER	1
77-201-00	BATTERY FILLER	1

IMPORTANT FACTS ON BATTERIES

To determine whether or not a battery is properly charged, a measuring device known as a hydrometer is used. A hydrometer measures the specific gravity of a liquid and a battery hydrometer is graduated to measure the specific gravity of battery electrolyte. The electrolyte in your battery becomes heavier as it is charged, therefore, a higher specific gravity reading indicates a higher charge condition of your battery. The specific gravity reading will range from 1100 for a completely discharged battery, to 1260 for a fully charged battery. No amount of overcharging will raise the specific gravity above 1260 on the electric vehicle type of battery. Both overcharging and undercharging can cause a premature failure of a battery. Overcharging destroys the positive plates. Consistent undercharging causes a buckling of the plates.

Do not discard a good battery as being defective because its specific gravity does not show an increase immediately upon applying a charge. Many good batteries require a charging period as long as three hours before they show any increase in the specific gravity. Do not charge a battery if the electrolyte temperature could rise above 120 degrees F. This could damage both battery and charger. As a rule of thumb, the electrolyte temperature during normal charging will rise about 25 degrees above the temperature in the charging area.

Failure to keep the battery electrolyte to the proper level will result in crumbling (abnormal sulfation) of the plates and cause failure of the battery. Distilled water must be added to the battery regularly to make up for the loss due to evaporation. Prior to charging, the electrolyte level should cover the battery plates. Fill the battery to the proper level only after it has been fully charged.

WARNING - HAZARD OF EXPLOSIVE GAS MIXTURE

Batteries being charged or discharged will give off hydrogen gas. If this gas is concentrated it can cause an explosion. Concentrations of gas may remain for several hours if ventilation is not provided. DO NOT have any fire in the vicinity and do not tamper with circuits that might cause sparking while charging or discharging batteries.

INSPECTION OF BATTERIES AND ASSOCIATED CIRCUITS

An inspection of batteries and associated circuits is required to assure that the batteries are being properly charged. For this inspection we recommend the use of a hydrometer and a continuity tester.

1. Verify that all connections within the unit to be charged are clean and tight.
2. Check each battery for loose terminal posts.
3. Test for continuity between all battery terminals and the charging receptacle.
4. Verify that the top of each battery is free of moisture, grease and acid film, which may cause terminal corrosion and current leakage.
5. After the battery has been recharged, test each individual cell in each battery with hydrometer to verify that all specific gravity readings are within 10 points of each other.
6. Using the hydrometer, pull out acid from a cell and then vigorously expel the acid back into the cell to cause a violent stirring action. Immediately draw out another sample of acid and visually inspect it to see if it contains a brownish sediment (indicates positive plates are deteriorated).
7. When testing battery condition with hydrometer, always return electrolyte solution to the same cell from which it was removed. DO NOT MIX electrolyte from one cell to another.

CHARGER MAINTENANCE, SERVICE AND ADJUSTMENT

TAYLOR-DUNN / LESTER-MATIC
BATTERY CHARGER

Line voltage compensation achieved by flux oscillator circuit applied to battery chargers by Lester in 1962 for high reliability "Minute Man" missile standby applications. Compensates automatically for AC supply voltage variations 105-128 volts. Supply voltage variation $\pm 10\%$ from 117 volts $\approx \pm 1\%$ maximum battery voltage variation, decreasing to $\pm 1/2\%$ at finish rate with constant electrolyte temperature. No taps or rate controls to set.

Automatic taper of charge rate for superior battery life through good equalization of cells and low water use rate.

Silicon diodes with inherent surge protection operated at a conservative percentage of their rating.

Convection cooled design for maximum reliability and minimum maintenance.

LESTRONIC II BATTERY CHARGERS

The all new automatic Lestronic chargers eliminate over and undercharging for new, old or defective batteries, whether hot or cold. Precise charging is achieved by patented Electronic Timer, utilizing state of the art integrated circuits.

Charger turns on automatically by simply connecting D.C. cord to batteries. The ammeter indicates charge rate. The charge rate tapers gradually to a finish rate of 5 to 10 amps. The Electronic Timer monitors the rate of voltage change during the charge period. When this rate levels off, the charger automatically shuts off.

OPERATION OF "LESTER MATIC" BATTERY CHARGERS

INTRODUCTION

The Lester-Matic battery charger is a highly reliable, line compensating unit. When used according to instructions, the Lester-Matic will tend to lengthen battery life with less frequent additions of water.

INITIAL INSTALLATION:

Circuit breaker or fuse protection in the AC line to which the charger is to be plugged should allow at least 15 amps per charger. When it is necessary to use an AC extension cord to the charger, use a three conductor No. 12 AWG cord with ground, and keep as short as possible. Instructions printed on the cover of the charger are for daily reference.

NORMAL OPERATION:

The state of discharge of the batteries will be slightly different every time they are put on charge, but the Lester-Matic varies automatically the initial charge rates, and taper of charge rate over the charge period. Thus momentary initial charge rate will vary from 18-30 amps, dropping quickly to a lower value, and then tapering gradually over the charge period to a finish rate of 1-4 amps (in the green shaded area of the ammeter dial) for the last 1-3 hours. When batteries are slightly discharged, the ammeter needle will be in the green shaded area for 7-8 hours, but the specific gravity will not rise to full charge until the cells have been equalized. The normal charging with the ammeter needle in the green shaded area is important to achieve equalization of all battery cells, every time the batteries are charged. Since the taper of the charging rate (in amps, as indicated by the ammeter needle) is controlled by the rising voltage of the batteries being charged, proper performance of the charger and resulting good battery life is dependent upon the following factors.

1. An Adequate AC line to handle the power required (see "Initial Installation")
2. All cells of the batteries must be good, rising to approximately 2.5 DC volts per cell while still on charge or near the end of a 12-hour charging period. When in doubt, check each cell with a single voltmeter while still on charge. If a low reading is obtained; check the low cells with a temperature corrected hydrometer. NOTE: Hydrometer float must be thoroughly clean to obtain accurate specific readings.
3. All electrical connections of the vehicle must be clean and tight.
4. Batteries should be charged just enough to bring them to full charge because overcharging is harmful. The state of charge can be tested accurately in each cell with a hydrometer or cell tester (voltmeter), but to simplify maintaining a fleet of cars, which normally require charging at least once a day, the following "CHARGING TIME CHARTS" can be used for daily charging. Set timer knob to desired charging time shown in chart. Charger shuts off automatically at end of set period.

CHARGING TIME CHART

GOLF CAR USE	CHARGING TIME
9 Holes or Less	7 Hours
18 Holes or More	12 Hours
COMMERCIAL USE	
Less than 1 Hour	7 Hours
More than 1 Hour	12 Hours

OPERATION OF "LESTER-MATIC" BATTERY CHARGERS (continued)

If a golf car is used only occasionally, it is recommended that a refresher charge be given prior to using the car.

Commercial cars, not used in golf course operation, should be charged after use each day, or as charge becomes low as indicated by hydrometer or voltmeter test.

The necessity of adding water more frequently than two or three weeks, and/or hot battery cases at the end of the charging cycle, indicates the finish rate is too high, due to one or both of the following:

1. One or more bad cells in the batteries.
2. Batteries are starting to age to a point where hours of charge should be reduced gradually to obtain prolonged battery life.

STORAGE:

Charger may be left connected to the batteries and should be turned on for the 12-hour period once a month. In extremely cold conditions it may be necessary to charge more frequently., Check with your battery manufacturer. After each charge cycle the charger should be checked to ensure that it has turned off. Severe overcharging and possible damage to the batteries could result if the charger remains on for prolonged periods of time.

CAUTION:

THIS CHARGER IS FOR USE ONLY ON BATTERY SYSTEMS OF THE TYPE AND CAPACITY SPECIFIED ON THE CHARGER NAMEPLATE. USE OTHERWISE WILL DAMAGE CHARGER AND/OR BATTERIES.

Due to the electrical characteristics of this charger, it is possible to improperly hook up batteries and not blow the fuses when charging. When installing batteries, be sure polarity is correct. With a DC voltmeter, check terminal voltage and polarity at the car receptacle.

CAUTION:

When working near capacitor terminals be sure charger is turned off. With charger "on" transformer capacitor voltage is approximately 640 volts. Use care. Before performing service, disconnect AC and DC leads. Discharge capacitor before servicing.

STEP BY STEP OPERATING PROCEDURES

1. Provide adequate ventilation for both batteries and charger. The convection-cooled Lester-Matic requires an unobstructed flow of cooling air for proper operation.
2. Connect DC plug (portable unit) to vehicle receptacle.
3. Turn timer to "ON" for well discharged batteries or to "7" for lightly discharged batteries. Charger shuts off automatically at end of set period.
4. To determine approximate full charge at start of days use, turn timer knob to "1". Drop of ammeter needle to 1-4 amps in 15 minutes or less indicates full charge.
5. ALWAYS TURN TIMER TO "OFF" BEFORE DISCONNECTING CHARGER FROM BATTERIES.

PROPER CARE OF MOTIVE POWER BATTERIES

NEW BATTERIES

1. Brand new batteries should be given a 12 hour charge before their first use, because it is difficult to know how long vehicle batteries have been in storage without a charge since new.
2. Limit use of brand new batteries between charges for first 5 cycles. New batteries and older batteries which have been in storage are not capable of their rated output until they have been discharged and charged a number of times.
3. During the first month of new batteries, particularly when night-time temperatures are below 60 F, give them an extra 12 hour charge once a week. The ampere-hours of energy that batteries can deliver and their charge acceptance varies directly with battery temperature.
4. All batteries that still taper down into the 1-4 amps area of the ammeter toward end of charge should be given the full 12 hours of charge. All cells in a set of batteries do not react identically to the same discharge and charge current. In a normal 12 hours charge the last 3 to 5 hours at low finish charge rate equalize the cells for better battery life.
5. When batteries age to the point where charge rate no longer tapers into the 1-4 amps area of the ammeter, reduce the hours of charge progressively to 10 hours, 8 hours, and finally down to 6 hours near the end of useful life. As batteries age, their on-charge voltage at end of charge period drops progressively, thereby causing a high finish charge rate in amperes and resultant higher water use rates.

VERIFY BATTERIES ARE CHARGED

1. Turn on the timer first thing in the morning and check to see if charger ammeter needle jumps smartly to 15 amps or more and then tapers into the 1-4 amps area within 15 minutes. This will provide a very simple means of verifying that the batteries were truly charged the night before. It also shows aging batteries whose finish charge rate will not taper into the ammeter 1-4 amps area.
2. Add water carefully to proper level in cells as required after they have been fully charged. Do not fill them so high that they bubble over while charging. New batteries require very little additional water, whereas very old batteries may need additional water two or three times a week. Water (electrolyte) level in battery cells settles when batteries are discharged and rises during charge. The probability of overfilling can be reduced by adding water when batteries are fully charged.

PREVENTIVE MAINTENANCE

1. When night air temperatures fall below 65 degrees F, batteries charged in unheated areas should be placed on charge as soon after use as possible. Under such condition a 4 hour equalize charge once a week in the early afternoon will improve state of charge and battery life.
2. Keep tops of batteries and battery hold-downs clean and dry. Tops of batteries and battery hold-downs must be kept clean at all times to prevent voltage leakage and flow of current between the batteries and the vehicle frame.

PROPER CARE OF MOTIVE POWER BATTERIES (continued)

WARNING

LEAD ACID BATTERIES CONTINUOUSLY EMIT HIGHLY EXPLOSIVE GASES. DURING NORMAL VEHICLE OPERATION THE CONCENTRATION OF THESE GASES IS A POTENTIAL HAZARD TO BE CONSIDERED DANGEROUS WHEN FLAME OR SPARKS OCCUR IN THE BATTERY COMPARTMENT CLOSE TO THE VENT HOLES IN THE BATTERY CAPS. IT IS IMPORTANT THAT THIS NOT BE ALLOWED TO OCCUR AT ANY TIME. LIGHTED CIGARETTES MUST NOT BE BROUGHT CLOSE TO THE BATTERY COMPARTMENT.

DURING THE CHARGING PROCESS, EMISSIONS ARE GREATLY INCREASED.

ANY AREA IN WHICH CHARGING BATTERIES ARE CONFINED MUST BE WELL VENTILATED, AND FLAME, SPARKS, OR LIGHTED CIGARETTES MUST BE KEPT OUT OF THE CHARGING AREA AND AWAY FROM VENTILATOR OPENINGS ASSOCIATED WITH THE CHARGING AREA. BATTERY CONNECTIONS MUST NOT BE DISTURBED WHILE BATTERIES ARE BEING CHARGED.

NOTE: Please refer to your Taylor-Dunn vehicle maintenance manual for a more detailed description on battery maintenance.

MALFUNCTIONS SYMPTOMS AND THEIR REMEDIES

1. The Lester-Matic charger is designed with as few parts as possible. Since each component can be tested individually, trouble shooting is a simple task. The following is a list of symptoms with their associated test procedures and remedies.

NO TRANSFER HUM AND AMMETER DOES NOT REGISTER

In the event no hum is detected from the transformer, check the AC cord to be sure it is securely plugged into a live AC outlet. When three-prong to two-prong adapters are used, they tend to work loose giving a poor connection. If the cord connection is secure and still no hum is noticed, a continuity test of the AC circuit is necessary. Turn the timer to "ON" and, with a suitable continuity tester, check circuit across the AC plug prongs (Figure 1). CIRCUIT SHOULD BE COMPLETE. If not complete, individually check the AC cord, timer primary transformer coil, and all connections.

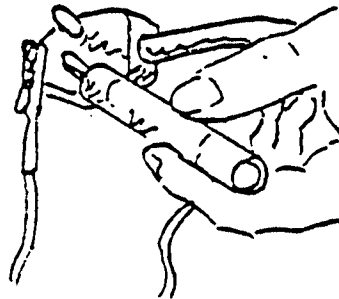


FIGURE 1

TRANSFORMER HUMS BUT NO AMMETER INDICATION

Inspect the DC plug connection to the vehicle receptacle and also check to ensure that the batteries are connected properly to the receptacle. If there is still no ammeter indication, a continuity test of the charger DC circuit must be performed. Turn the time to "OFF" and disconnect the AC and *DC plugs. Perform the following tests, using a low voltage tester, to check the continuity of the DC circuit.

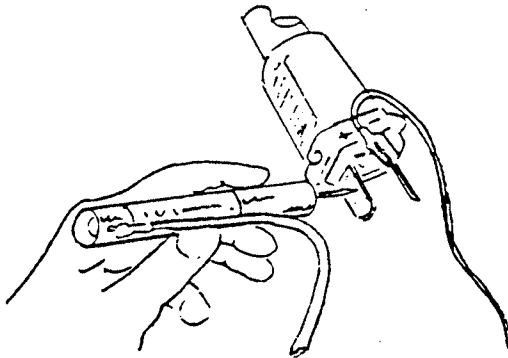
MALFUNCTION SYMPTOMS AND THEIR REMEDIES (continued)

TRANSFORMER HUMS BUT NO AMMETER INDICATION (continued)

- * For built-ins, disconnect AC plug and DC leads to battery to isolate charger.
- (a) Connect tester clip to negative (-) blade and probe to positive (+) blade (Figure 2). CIRCUIT SHOULD BE COMPLETE. If not complete, first check the DC fuse link.

If one or both fuses have blown, the link will be broken and usually the clear plastic fuse cover will be discolored. Refer to "Fuse Link Blowing" for test procedures. If fuses are good, individually check the fuse connections, DC cord, and diode connections (each may be checked with the continuity test light).

NOTE: On built-in charger the red lead is (+) and black lead is (-) on DC output.



Typical plug.
Check same
polarity on
other plugs.

FIGURE 2
D.C. PLUG CHECK FOR PORTABLE CHARGERS ONLY

- (b) If the circuit in Figure 2 is complete, reverse test light leads as shown in Figure 3. CIRCUIT SHOULD NOT BE COMPLETE. If circuit is complete, check DC cord for a "short" between the two wires. More probably, one or both diodes have "shorted". Refer to "Fuse Link Blowing" part (b) for continuity test of diodes.

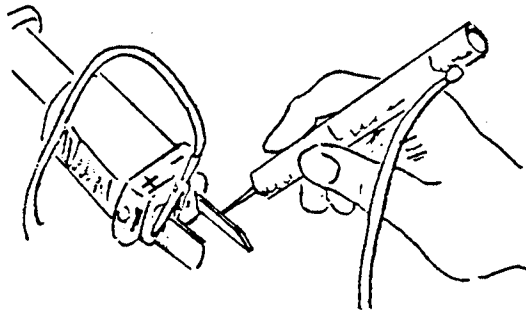


FIGURE 3
D.C. PLUG CHECK FOR PORTABLE CHARGERS ONLY

CAUTION: Discharge capacitor before proceeding with (c).

MALFUNCTION SYMPTOMS AND THEIR REMEDIES (continued)

- (c) If (a) Figure 2 and (b) Figure 3 check good, assume the capacitor is shorted. Remove one wire from a capacitor terminal and place continuity tester clip to one terminal and probe to other. If circuit is complete, capacitor is "shorted" and must be replaced.

CHARGER DC FUSE LINK(S) BLOWS

This condition is caused by:

- (a) Reverse polarity between charger and batteries, such as incorrect installation of batteries, wiring of DC receptacle or charger plug.
- (b) A short circuit failure of one or both diodes. First disconnect one diode. Using a low voltage continuity tester check each diode as shown in Figure 4. Then reverse the tester leads and check each diode again. If the diode conducts current in both directions the diode is shorted and must be replaced. Replace either the entire heat-sink assembly or the defective diode. When replacing a single diode be sure the new diode is pressed squarely into the hole and does not extend beyond the rear surface of the heat-sink plate.

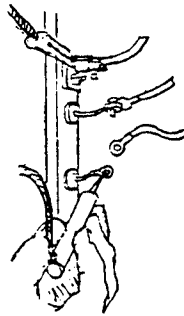


FIGURE 4

- (c) If (a) and (b) fail to reveal the malfunction, check wiring of both charger and vehicle against their respective wiring diagrams.

CHARGER OUTPUT IS LOW

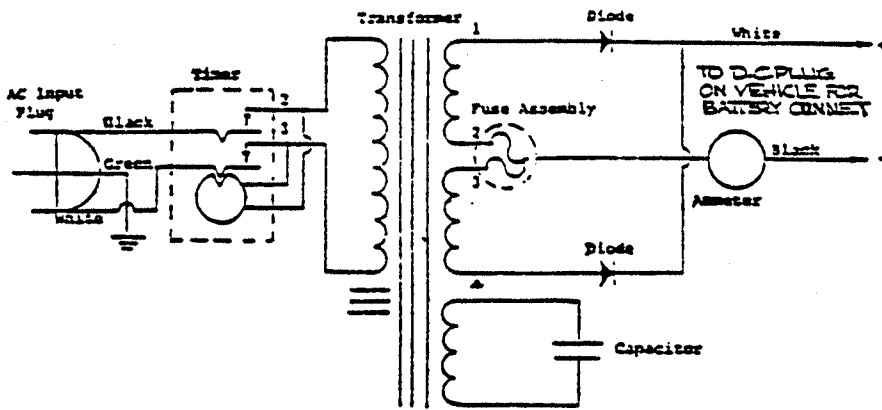
The most probable cause is one diode shorting and blowing one fuse. Refer to "Fuse Link Blowing" part (b) to check the diodes. If a diode is shorted both the heat sink and fuse assemblies must be replaced.

CHARGER DOES NOT TURN OFF

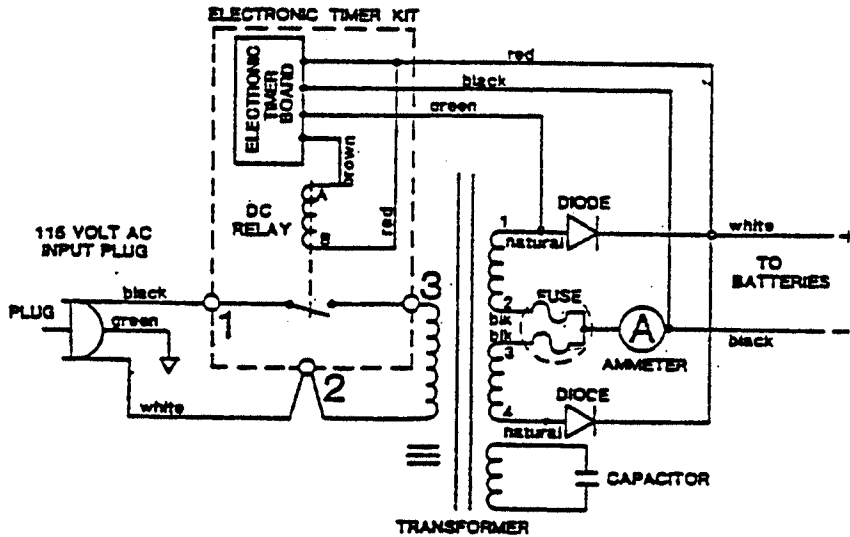
In models equipped with timers, this is due to an inoperative timer. In this case replace timer assembly.

AC LINE FUSE OR CIRCUIT BREAKER BLOWS

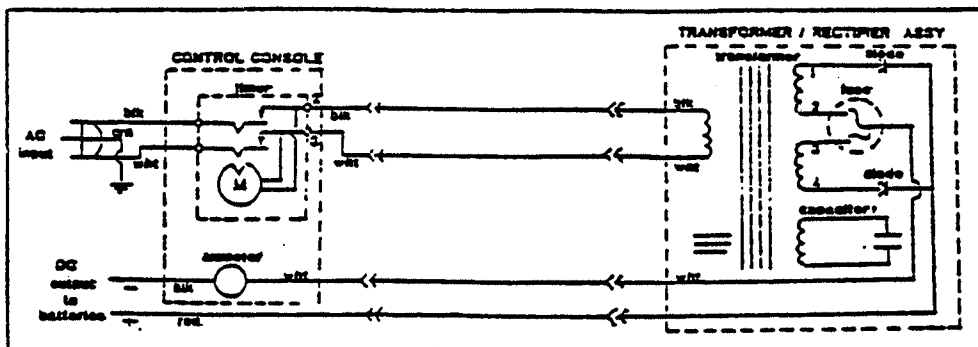
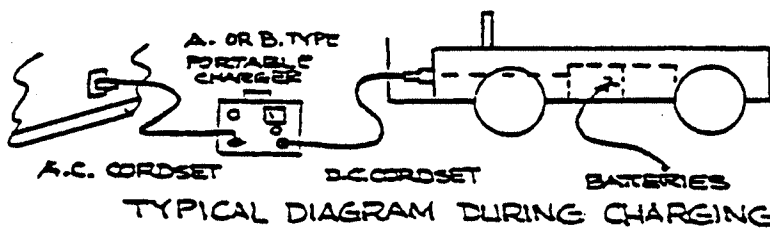
If this occurs when charger is turned on without being plugged into the vehicle, the AC cord, timer motor coil, or the transformer may be shorted. To check the AC cord, ensure that the timer is "OFF" and connect the continuity tester across the AC plug prongs. If circuit is complete the AC cord is shorted and must be replaced. To check the timer motor coil, disconnect the white timer motor wire and connect continuity tester to the motor coil leads. If the lamp glows, the coil is shorted. To test the transformer, disconnect secondary leads #1 and #4. If the AC fuse or breaker still blows, the transformer is shorted internally and must be replaced.



A. TYPICAL PORTABLE CHARGER



B. TYPICAL PORTABLE ELECTRONIC TIMER CHARGER (LESTRONICII)

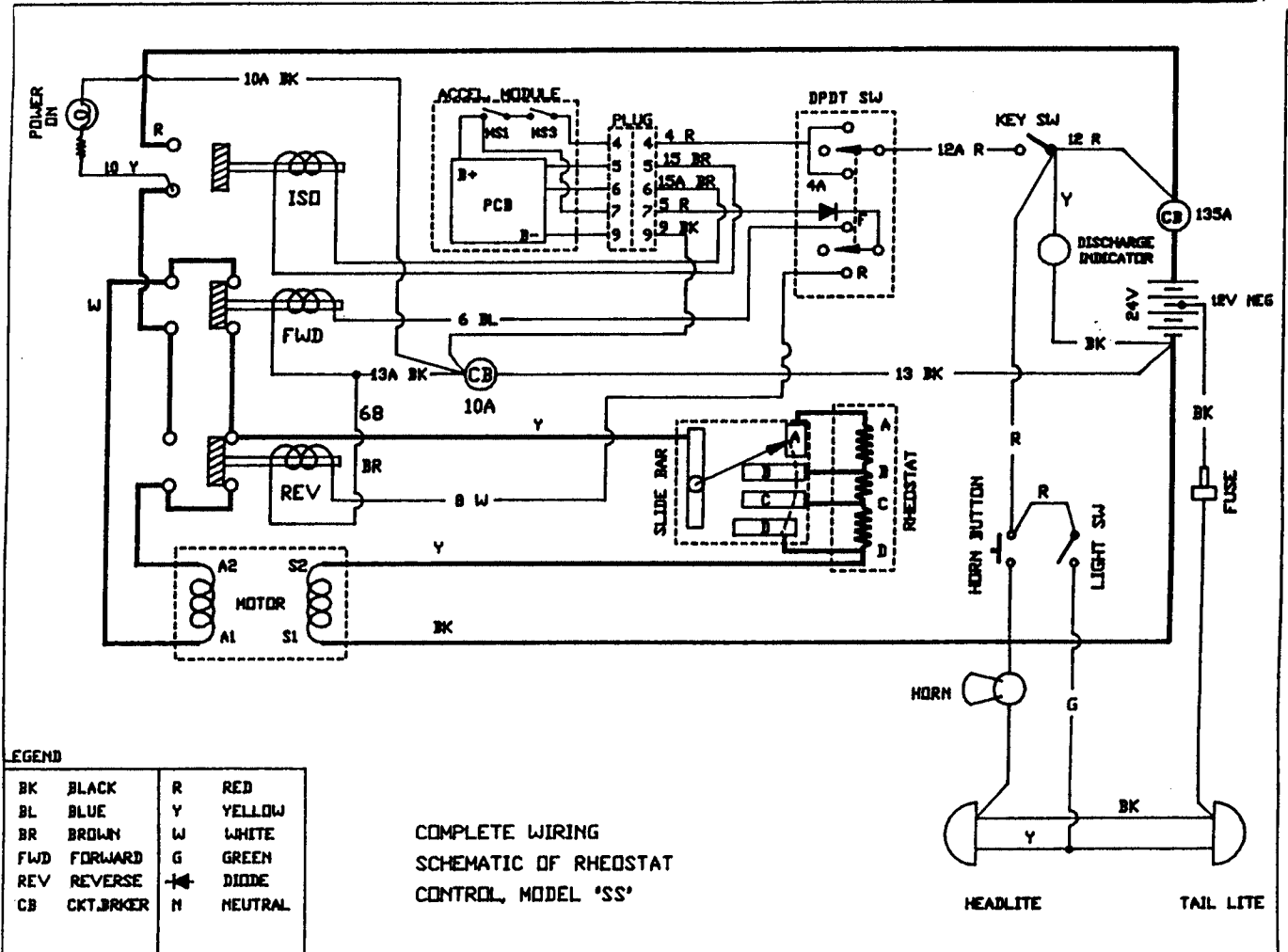


SCHEMATIC, LESTER CHARGER
TYPICAL FOR ALL BUILT-IN CHARGERS

RECOMMENDED REPLACEMENT PARTS
FOR SS CHARGERS

TAYLOR-DUNN PART NO.	PORTABLE 79-300-00	BUILT-IN 79-300-05	PORTABLE 79-301-00	BUILT-IN 79-301-05
LESTER MODEL NUMBER	24LC25T12 115/60 8824	24LC25-3T12 115/60 7675	PORTABLE LESTRONIC II 9510 24LC25 115/60	LESTRONIC II 24LC25 115/60 7210
TRANSFORMER/RECTIFIER ASSEMBLY, COMPLETE				
TRANSFORMER	79-644-10	79-644-10	79-644-11	
CAPACITOR	79-902-00	79-902-00	79-902-00	79-902-00
AMMETER	79-851-10	79-851-10		
TIMER	79-805-00	79-805-11	79-805-64	79-805-64
KNOB, TIMER	79-806-00	79-806-00		
HEAT SINK ASSEMBLY w/diodes	79-749-10	79-749-11	N/A	N/A
DIODE REPLACEMENT	79-745-10	79-745-10	79-745-10	79-745-10
FUSE ASSEMBLY	79-831-00	79-831-00	79-831-00	79-831-00
CORDSET, A.C.	79-575-10	79-575-10		
CORDSET, D.C.	79-566-10			
BUSHING FOR CORDSET A.C.	79-530-00	79-530-00		
BUSHING FOR CORDSET D.C.	79-530-00	79-530-00		

MODEL SS
WIRING SCHEMATIC RHEOSTAT
NOTE: SEE SECTION 15 FOR PWR-TRON



MAINTENANCE PROCEDURES
FRONT AXLE, FORK, STEERING AND TIRES
REFER TO FIGURE 3

Your front wheel assembly consists of a ruggedly designed fork mounted on 2 Timken Roller Bearings. The front wheel is mounted on a 3/4" axle and turns on 2 Timken Roller Bearings. Two heavy coil springs and an automotive type shock absorber produce a comfortable ride. With proper care, these parts should give long service.

If by chance the front wheel should be submerged for any length of time in mud or water, it is recommended that you remove, wash and clean the axle assembly. Clean all parts, especially bearings, in a suitable cleaning solvent, reassemble and repack with wheel bearing grease. Follow the procedures outlined in the service and adjustment section 10 of this manual.

The normal life of the shock absorber unit is 2 years, based on average use of the vehicle.

The steering worm gear box and steering linkage is similar to those used on auto. It requires very little attention. Refer to Section 10 for disassemble and reassemble procedures Steering Worm Assembly.

If service and adjustments are required, refer to appropriate section of this manual.

TIRE CARE:

Tire pressure is governed by how you want your vehicle to ride and the terrain to which it is most commonly used upon.

Slightly lower pressure will assist traction on soft terrain without undue wear.

The chart listed below will assist you to determine the correct tire pressure for your needs.

TIRE INFLATION CHART					
TIRE SIZE	TYPE	TIRE LOAD RATING		MAXIMUM INFLATION P.S.I.	MAXIMUM LOAD POUNDS
		LOAD RANGE	EQUIVALENT PLY RATING		
4.80-8/400-8	HIGHWAY TREAD	A	2	35	665
4.80-8/400-8	HIGHWAY TREAD	B	4	70	1000
4.80-8/400-8	STEELGUARD	C	6	100	1230
5.70-8/500-8	HIGHWAY TREAD	B	4	55	1170
5.70-8/500-8	HIGHWAY TREAD	C	6	85	1505
5.70-8/500-8	STEELGUARD	D	8	100	1655
16 x 6.50 x 8	TERRA TIRE	B	4	45	810
18 x 8.50 x 8	TERRA TIRE	B	4	40	1080
18 x 9.50 x 8	TERRA TIRE	B	4	36	1315
18 x 9.50 x 8	TERRA TIRE	C	6	42	1660

THE INFLATION AND LOAD RATINGS MOLDED ON HIGHWAY TREAD TIRES, PER FEDERAL STANDARD FMVSS-119, ARE FOR MASIMUM HIGHWAY SPEEDS AND **DO NOT** APPLY TO THIS LOW SPEED VEHICLE.
-TAYLOR-DUNN MANUFACTURING CO.-

CAUTION: Do not over-inflate tires as this will promote increased wear. Under inflation especially on hard surfaces also promotes undue wear and should be avoided.

SERVICE AND ADJUSTMENT
FRONT AXLE, FORK, STEERING AND TIRES
REFER TO FIGURE NO. 3

Adjustment of Wheel Bearings

1. Adjust wheel bearings by holding 1 axle nut and tightening the other until drag is felt on wheel. Then back off nut approximately 1/4 turn. Wheel should turn free but not have excess play in bearings.

Removal of Tire wheel and axle assembly:

1. Remove 1 axle nut by holding nut on one end of axle and unscrewing nut on opposite end.
2. Slide axle from fork and wheel, being careful to catch spacers and wheel as they come free.
3. Tire may be changed or repaired without removing wheel from hub. To change wheel remove 5 lug nuts thereby releasing wheel from hub assembly.
4. Wheel bearings may be flushed, cleaned and repacked without removing from hub, unless, severely damaged or embedded with foreign material.
5. To remove wheel bearings and seals:
 - A. Pull seals from hub.
 - B. Remove taper roller bearings.
 - C. If necessary, press bearing races from hub with suitable press or with flat punch by hitting back and forth one side to other.

Re-Assembly and Adjustments:

1. Press bearing races into hub with suitable press, taking care that they are seated against stops within the hub.
2. Generously lubricate wheel bearings with wheel bearing grease and insert into bearing races.
3. Press or tap seals into place, (proper position is when face of seal is flush with end of hub). NOTE: It is recommended that new seals be installed whenever bearings are removed from wheel hub, or whenever seals are worn or damaged. Worn or damaged seals allow dirt and foreign matter to enter wheel bearings, shortening bearing life.
4. Install wheel & hub assembly into fork by starting axle through one side of fork, inserting 1 spacer then sliding axle through wheel bearings. Insert other spacer and slide axle through remainder of fork assembly.
5. Install locknut.
6. Adjust wheel bearings by holding 1 axle nut and tightening the other until a drag is felt on wheel. Then back off nut approximately 1/4 turn. Wheel should turn free but not have excess play in bearings.
7. Wheel hub has 1 zerk fitting for grease lubrication.

Adjustment of Fork Spindle Bearings

1. Adjust by tightening nut until drag is felt on spindle bearings. Loosen about 1/4 turn or until spindle rotates free but does not have any play in bearings. Note: Any excessive play in spindle bearing can lead to failure due to shock effect when vehicle encounters bumps or uneven terrain.

Removal of Fork From Vehicle

1. Loosen tiller clamp and remove tiller from fork spindle. It may be necessary to work tiller loose from spindle by rocking back and forth while pulling upward until tiller is free of shaft.

NOTE: On models equipped with steering gear box, disassemble gear box as outlined on page 3 of this section.

SERVICE AND ADJUSTMENT continued
FRONT AXLE, FORK, STEERING AND TIRES
REFER TO FIGURE NO. 3

Removal of Wheel & Axle Assembly continued

2. Remove woodruff key and remove bearing lock nut. On earlier models it will be necessary to remove dust cap to gain access to spindle bearing locknut.
3. Raise vehicle on suitable hoist and remove fork assembly from bearing housing. Observe the location of all spacers etc., and if necessary note their location for proper replacement when reassembling the fork in vehicle.
4. Remove bearings and dust seals.
5. A puller is required to remove bearing races from housing.

Re-Assembly of Fork and Spindle

1. Bearing races may be pressed into position by using a 1/2" x 6" bolt. Place a disc or bar of suitable size over bolt then one bearing race, pass this assembly through housing. Place other bearing race, a suitable disc or bar and then the nut. Tightening the nut and bolt will draw the two bearing races into position without damage.
2. Generously pack bearings with wheel bearing grease. Assemble one dust seal and bearing in lower part of housing. Refer to Figure 3 for proper location. Slide fork spindle through housing and insert upper bearing spacers and washer.
3. Install spindle nut.
4. Adjust fork spindle bearings as previously outlined.
5. Replace dust cap on fork spindle housing. (Early models).
6. Replace bearing seal if it has been removed from bearing housing. (Late Models - Tiller Only).
7. Install woodruff key.
8. Install tiller and tighten tiller clamp securely. On models equipped with steering gear box, re-assemble box as outlined on page 4 of this Section.

Dis-Assembly of Steering Gear Box

NOTE: It is not necessary to remove steering wheel from shaft unless service work is to be performed on the bearings or shaft assembly. If steering wheel is not to be removed then start with Step 2 below.

1. Remove wheel lock nut and with suitable puller remove steering wheel.
2. Remove 6 bolts holding box together.
3. Set horn button and light switch bracket aside.
4. Place sufficient rags or waste around box before removing cover to help catch the grease which has been packed inside.
5. Remove cover and gasket and set aside.
6. Scoop out as much grease as possible and then remove center of box and lower gasket.
7. Remove countershaft gear and pinion.
8. Remove fork spindle gear.
9. It will only be necessary to remove bottom gear box plate to replace bronze bushing or lower gasket. To do so remove 3 bolts and lift plate from spindle housing flange.

SERVICE AND ADJUSTMENT continued
FRONT AXLE, FORK, STEERING AND TIRES
REFER TO FIGURE 3

Replacement of Steering Shaft Bearings

1. Remove steering shaft from steering column by removing steering wheel and top of steering gear box as previously outlined in steps 1 thru 5.
2. Slide steering shaft from assembly. Take care to note spacer location and when reassembling to return spacers to their original location.
3. Pull bearing from it's seat in the end of the steering column.
4. Clean all parts thoroughly.
5. Tap or press in new bearings seating the flange against the housing.
6. Re-assemble all parts in the reverse order to which they were removed, taking care to align steering wheel with fork.
7. Adjust shaft end play by adding or removing shims.

Re-Assembly of Steering Gear Box.

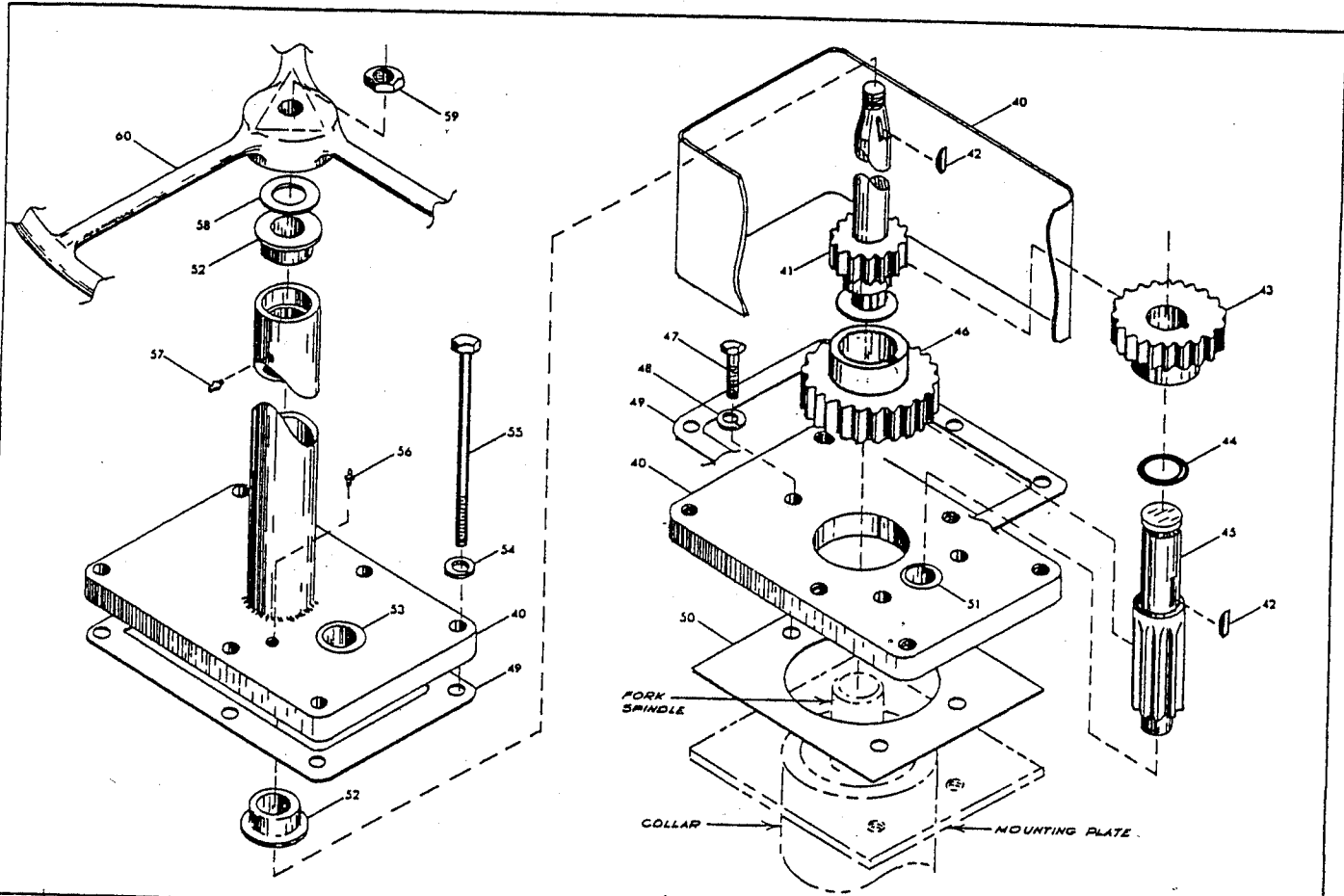
1. Bolt bottom gear box plate to spindle housing flange.
2. Install woodruff key in fork spindle shaft.
3. Install fork spindle gear (hub down).
4. Install countershaft gear and pinion.
5. Install lower gasket, center section of box and upper gasket.
6. Place cover assembly in position. Align front wheel in forward position with steering wheel. It may be necessary to remesh steering shaft gear with counter shaft gear to allow steering wheel to align with fork when in forward position.
7. Replace 6 bolts, horn and light switch bracket and tighten evenly.
8. Fill steering gear box with lubricant through zerk fitting. Note that steering gear box and fork spindle bearing housing are coupled together forming one continuous assembly. Lubricating one section will lubricate the adjoining section.

FRONT STEERING & FORK
REFER TO FIGURE NO. 3


FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
3-1	97-230-00	Nut, 1" - Full Fiber Insert	1
3-2	45-307-00	Grease Seal	2
3-3	16-409-00	Spacer, .250 Thick - 1" I.D. x 1-1/2 O.D.	1
3-4	80-011-00	Bearing - Tapered Roller 1-1/4	2
3-5	80-102-00	Bearing Race for 1-1/4 Tapered Bearing	2
3-6	87-074-00	Grease Fitting, 1/4-28 Straight	1
3-8	19-101-11	Steering Loop Tiller	1
3-9	14-079-10	Front Fork (Less Springs)	1
3-10	97-100-00	Woodruff Key, 3/16	1
3-11	87-071-00	Grease Fitting 3/16 Drive	2
3-12	88-100-10	Hex Head Cap Screw, 3/8 N.C. x 1-1/4	2
3-13	85-141-00	Spring Clip	2
3-14	85-140-00	Spring-Compression, 2-7/16 x 6-1/4" Long (.362 Dia. Wire)	1
3-15	45-308-00	Oil seal for Wheel with 3/4" Bearing	2
3-16	12-120-00	Wheel Hub - 3/4" Tapered Roller Bearings (Five Studs on 4-1/2" Circle) Not used with Wheel 13-001-00	1
3-17	80-015-00	Bearing, Tapered Roller 3/4"	2
3-18	80-105-00	Bearing Race for 3/4" Tapered Bearing	2
3-19	87-050-00	Grease Fitting 90 Degrees, 1/4-28	1
3-20	96-240-00	Bolt - Wheel Lug, Dico wheel Hub, 1/2 N.F.	5
3-21	97-236-00	Lug Nut 1/2 (Tapered)	5
3-22	15-010-00	Front Axle 3/4 Dia. x 9-1/4" Long	1
3-23	16-207-00	Wheel Spacer 3/4 I.D. x 1/2 Thick	4
3-24	88-229-81	Lock Nut, 3/4" N.C.	2
3-25	88-108-62	Lock Washer, 3/8	2
3-26	88-149-80	Nut, 1/2" N.C.	1
3-27	13-576-10 (1982 UP)	Tire, Wheel and 4" Hub with 400 x 8, 4 Ply Tubeless Super Rib Tire & 3/4" Tapered Roller Bearings.	1
3-27	13-595-00	Tire, Tube, Wheel & 4" hub with 16 x 6.50 x 8, 4 Ply Tire	1
3-28	13-001-00	Wheel and 4" Hug for 4.80 x 8 Tubeless Tire with 3/4" Tapered Roller Bearings. (Also used for 16 x 6.50 x 8 Tire)	1
3-29	10-075-00	Tire, 4.80 x 8, 4 Ply, Super Rib, Tubeless	3
3-29	10-078-00	Tire, 4.80 x 8, 6 Ply, Steelguard, Tube Type	3
3-29	10-089-00	Tire, 16 x 6.50 x 8, 4 Ply, Terra Tire, Traction Tubeless	3
3-30	11-030-00	Tube, 4.80 x 8, Straight Valve Stem	3
3-30	11-040-00	Tube, 5.70 x 8, Straight Valve Stem (For 6.50 x 8 Tire)	3
3-30	13-989-00	Valve Stem (For Tubeless Tires)	3
3-31	13-734-00	Tire and Demountable Wheel, 4.80 x 8, 4 Ply Tubeless Super Rib Tire with Five 1/2" Holes on 4-1/2" Bolt Circle on Wheel.	2
3-31	13-739-00	Tire, Tube and Demountable Wheel, 4.80 x 8, 6 Ply, Steelguard tire with Five 1/2" Holes on 4-1/2" Bolt Circle on Wheel	3
3-31	13-748-00	Tire and Demountable Wheel, 16 x 6.50 x 8, 4 Ply Terra Tire, Traction with Five 1/2" Holes on 4-1/2" Bolt Circle on Wheel	2

FRONT STEERING & FORK continued
REFER TO FIGURE NO. 3

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
3-31	13-861-00	Tire and Demountable Split Wheel Zero Pressure 16 x 4.00 H.S. with Five 1/2" Holes on 4-1/2" Bolt Circle, Black	1
3-31	13-862-00	Tire and Demountable Split Wheel Zero Pressure 16 x 4.00 H.S. With five 1/2" Holes on 4-1/2" Bolt Circle, Gray, Non-Marking	1
3-32	12-045-00	Wheel for 16 x 6.50 x 8 Tire, Demountable, Drop Center, Off Center Mount, Five 1/2" Holes on 4-1/2" Bolt Circle	2
3-32	12-012-00	Wheel for 4.80 x 8 Tubeless, Tire, Five 1/2" Holes on 4-1/2" Bolt Circle (Used for Steelguard Tire)	1
3-32	12-041-00	Wheel for 4.80 x 8 Tire and 16 x 400 Zero Pressure Tire, Demountable, H. D., Split Disk, Five 1/2" Holes on 4-1/2" Bolt Circle	1
3-33	12-050-00	Wheel for 16 x 4 12-1/8 Solid Cushion Tire, Five 1/2" Holes on 4-1/2" Bolt Circle.	1
3-33	12-054-00	Wheel for 16-1/4 x 4 x 11-1/4 Solid Cushion Five. Five 1/2" Holes on 4-1/2" Bolt Circle	1
3-34	10-261-00	Tire, Solid Extra Cushion, All Service, 16/1/4 x 4 x 11-1/4	3
3-34	10-250-00	Tire, Solid Cushion, Smooth, 16 x 4 x 12-1/8	3
3-35	13-952-10	Tire and Demountable Cast Iron Wheel with 16 x 4 x 12-1/8 Solid Cushion Tire	1
3-35	13-954-10	Tire and Demountable Cast Iron Wheel with 16-1/4 x 4 x 11-1/4 Solid Extra Cushion, All Service Tire	1



NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
					12-9-81

NO. DESCRIPTION	<p>FIGURE 4A SECTION</p> <p>GEARED STEERING ASSEMBLY FOR MODEL 'SS' WITH STEERING WHL.</p>	 <p>TAYLOR DUNN MFG. CO. 2114 West Ball Rd. Anaheim, Calif.</p>
TOL. FRAC. ± DEC. ±		
SCALE NONE		
DRAWN BY PFA		
DATE 2-2-71		

GEARED STEERING ASSEMBLY
FOR MODEL SS WITH STEERING WHEEL
REFER TO FIGURE 4A

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
4A-40	18-309-00	Steering Gear Box Only, with bolts, bushings and grease fittings	1
4A-41	20-031-00	Steering Shaft with Gear	1
4A-42	97-100-00	Woodruff Key - 3/16"	2
4A-43	31-253-00	Spur Gear, 36 Tooth 16 D.P. - 14-1/2° P.A. 3/4" Bore with Keyway	1
4A-44	80-706-00	O Ring 3/4" O.D.	1
4A-45	31-255-00	Stem Pinion - 7 Tooth	1
4A-46	31-254-00	Spur Gear, 36 Tooth 12 D.P. 14-1/2° P.A. 7/8" Bore with Keyway	1
4A-47	88-080-11	Hex Head Cap Screw 5/16" x 1" N.C.	3
4A-48	88-088-62	Lock Washer, 5/16	3
4A-49	45-004-00	Gasket (4 x 6 O.D.)	2
4A-50	45-003-00	Gasket (4 x 4-1/2 O.D.)	1
4A-51	32-207-00	Bushing, Bronze 3/8" I.D. x 5/8" O.D. x 1/2" Lg.	1
4A-52	80-405-00	Ball Bearing - 3/4" I. D.	2
4A-53	32-203-00	Bushing, Bronze 3/4" I.D. x 7/8" O.D. x 1/2" Lg.	1
4A-54	88-068-62	Lockwasher 1/4"	6
4A-55	88-060-24	Hex Head Cap Screw 1/4" x 4" N.C.	3
4A-55	88-060-25	Hex Head Cap Screw 1/4" x 4-1/2" N.C. (with horn)	3
4A-56	87-074-00	Grease Fitting 1/4" - 28 N.F.	1
4A-57	87-071-00	Grease Fitting 3/16 Drive	1
4A-58	16-405-00	Spacer - 3/4" I. D. x 1-1/4" O. D.	1 or 2
4A-59	88-199-82	Nut 5/8 N.F. (Jam)	1
4A-60	19-007-20	Steering Wheel	1

MAINTENANCE PROCEDURES
BELT DRIVE REAR AXLE, MOTOR AND BRAKES
REFER TO FIGURE NO'S. 5 THROUGH 5R

Your drive assembly is a highly efficient unit. Great care was taken in it's design to promote long life with a minimum of maintenance. It employs an automotive type differential unit which operates within an enclosed housing. The gears, bearings, etc., are lubricated from within by oil which when maintained at it's proper level insures complete coverage of all moving parts. This oil level should be checked on a regular basis as outlined in the Maintenance Guide (Section 4) and Lubrication Diagrams (Section 5) of this manual. If the oil level is allowed to drop below normal limits, serious damage to the differential and drive unit will result.

An adjustable motor mount has been provided to keep belts or chain properly tensioned Refer to Section 11, Page 1 for proper adjustment procedures. It is important to maintain belt or chain tension and alignment as outlined on Page 1. Failure to do so will seriously affect belt life.

The electric motor will provide hours of trouble free services. It is provided with sealed ball bearing which are prelubricated for their lifetime.

Periodically, the motor brushes should be inspected and cleaned. The carbon dust and dirt should be blown out of motor. Approximately 30000 hours operating life may be expected from a new set of brushes. To determine when to replace worn brushes, proceed as follows:

1. For motors equipped with brushes having end pigtails and side hooks, replace brush when hook is within 1/16" from bottom of hook slot.
2. For motors equipped with brushes having side pigtails only, replace brush when pigtail is within 1/16" from bottom of pigtail slot.

NOTE: When one brush is replaced in a motor, it is considered good maintenance practice to replace all brushes. Inspect commutator for roughness or undue wear as arcing and shortened brush life will result from this condition.

Refer to Section 15 for detailed service procedure. Check motor wiring terminals for cleanliness and tightness. A loose connection will cause burning of the respective terminal and can induce motor failure. DO NOT PERFORM THIS MAINTENANCE WHILE BATTERIES ARE BEING CHARGED. Refer to Maintenance Guide (Section 4) and Service adjustment (Section 15) for further recommendations on motor care.

The mechanical brake assembly located on the differential pinion shaft will require a periodic inspection for lining wear and consequently periodic adjustment. Refer to Service and Adjustment Section 12 of this manual for proper procedures. Great care must be taken that no oil is allowed to contact the brake band or drum as it will seriously impair the braking ability. If the braking surfaces become oily or contaminated for any reason it will be necessary to remove the brake band and clean all parts thoroughly. Refer to the appropriate section of this manual for the correct procedure to follow.

A periodic tightening of all bolts and nuts, and especially those which fasten the drive to the chassis, should be made: BUT NOT WHILE THE BATTERIES ARE BEING CHARGED. For service procedures required to remove drive axle assembly from the vehicle, refer to following pages in Section 11.

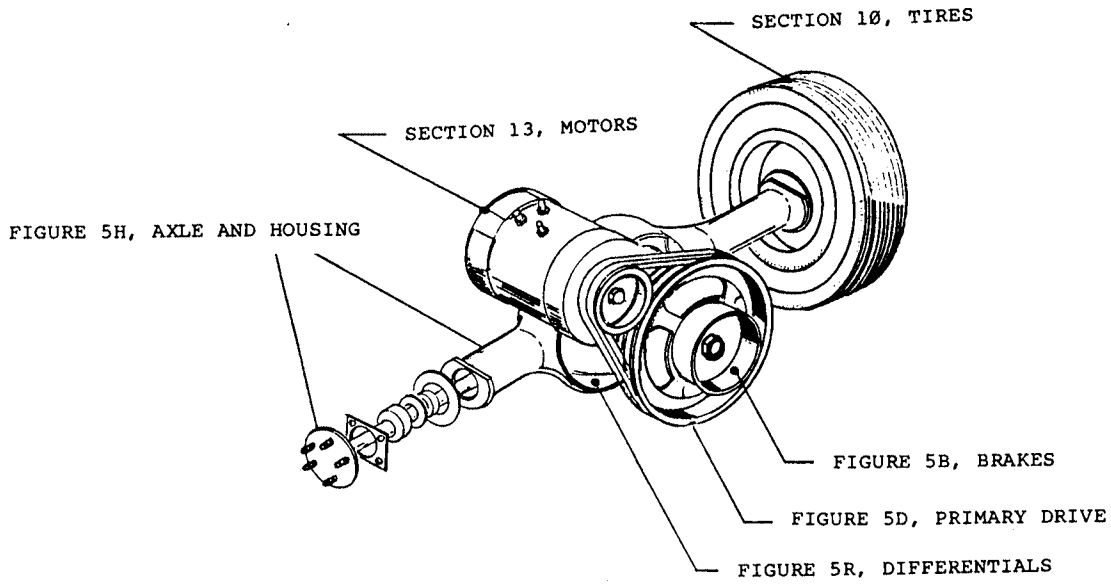



ILLUSTRATION MAY NOT BE IDENTICAL TO APPEARANCE
OF DRIVE AXLE ASSEMBLY USED IN VEHICLE.

NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION	12-24-86
TOL. FRAC. ±	DEC. ±	FIGURE NO. 5		 TAYLOR DUNN MFG. CO. 2114 West Ball Rd. Anaheim, Calif.		
SCALE	NONE	SECTION 11				
DRAWN BY	B.B.	DRIVE AXLE ASSEMBLY - BELT DRIVE				
DATE	1-29-76					

SERVICE AND ADJUSTMENT
PRIMARY DRIVE

REFER TO FIGURE NO'S. 5, 5H & 7

REMOVAL OF DRIVE AXLE ASSEMBLY FROM CHASSIS

1. **CAUTION: Disconnect main plus & minus battery leads to prevent accidental engagement of power while servicing unit.**
2. Clearly mark motor leads to insure their proper location when reassembling.
3. Remove motor leads from motor terminals, and from wiring clip at front end of drive frame.
4. Pull clevis pin, disconnect brake cable and brake return spring from brake lever arm.
5. Remove lower bolt from shock absorber (See Section 11).
6. Using a hoist, or other suitable equipment, support the rear end of the chassis, and remove the two bolts, that mount the drive assembly to the chassis.
7. Elevate the body until the drive assembly can be removed. Note that the coil suspension spring will be loose after the body has been elevated a short distance.
8. Install drive assembly in reverse order. Examine the rubber bushings and replace, if they are worn, before securing the drive assembly to the chassis.
9. Check brake adjustment as outlined on next page, before placing vehicle back into service.

SERVICE AND ADJUSTMENTS
BRAKES

REFER TO FIGURE NO'S. 5B & 5D

ADJUSTMENT OF-BRAKE BAND TO COMPENSATE FOR NORMAL LINING WEAR

NOTE: If, after performing the following adjustments, braking system does not perform as indicated, the most probable cause is stretching or maladjustment of the brake cable. See "Replacement or Adjustment of Brake Cable", listed below.

1. Adjust brake band anchor bolt, tightening it until brake band engages brake drum with sufficient force to stop vehicle when brake pedal has traveled half-way to the floor board.

NOTE: With the adjustment indicated above, the parking brake is automatically adjusted so that when the lower slot of the pedal engages the locking angle welded to the frame, proper parking brake force is applied.

As the lining wears, pedal travel will increase to the point where the upper slot must engage the locking angle in order to provide proper parking brake force. Brake band adjustment MUST be made before lining wear reaches the point where engagement in the upper slot fails to provide adequate parking brake force.

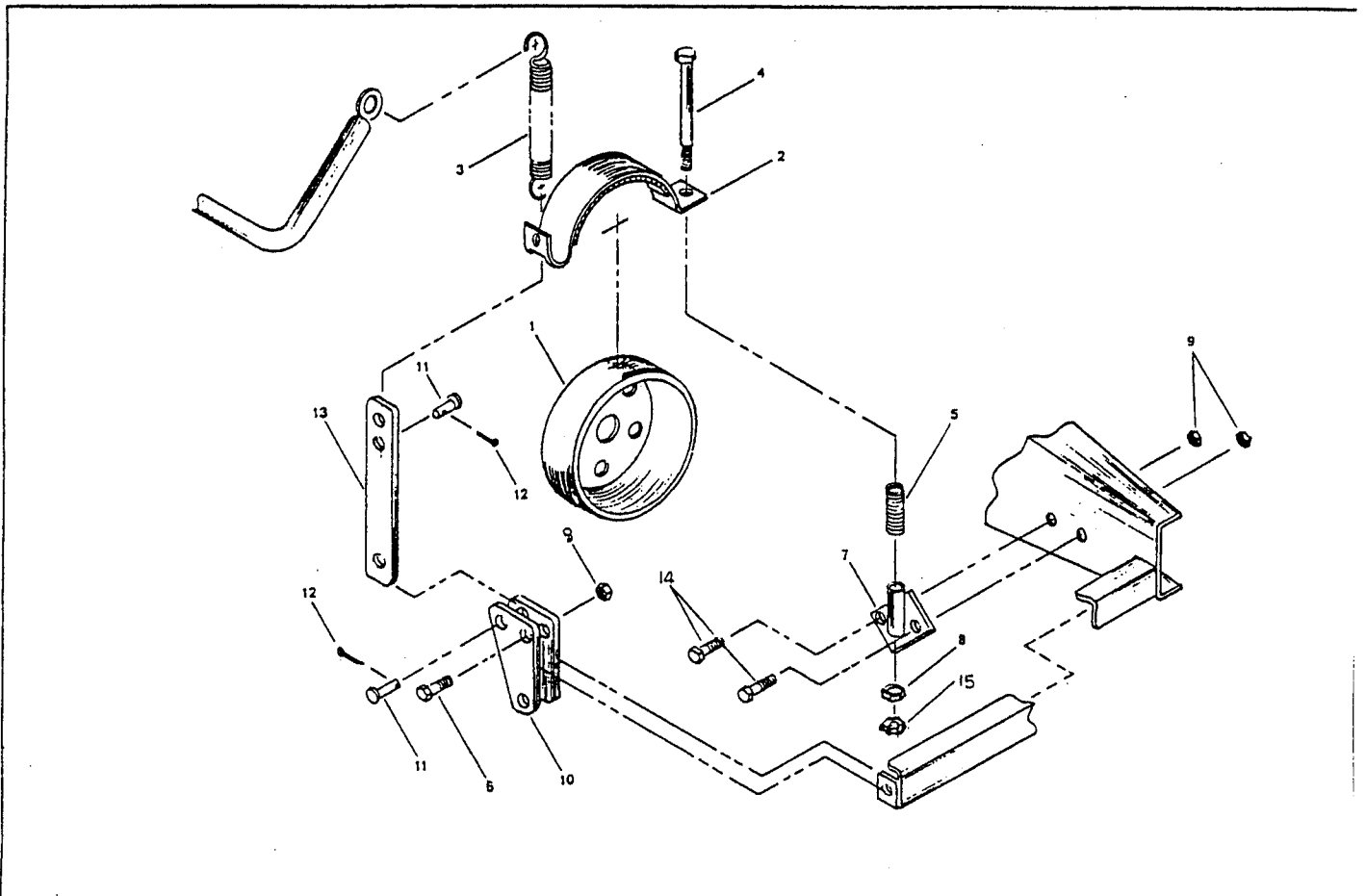
REMOVAL OF BRAKE ASSEMBLY AND DRUM


1. Disengage spring from brake lever bar.
2. Remove cotter pin and clevis pin from brake band.
3. Remove brake band anchor bolt, and remove brake band.
4. Band and drum may now be cleaned, inspected, and if necessary parts may be replace as needed.
5. Brake band lining is bonded to the band for long dependable service. When it wears to approximately 1/16" thickness the band should be replaced.
6. If the brake drum is scored, it should be removed and turned. It is recommended that a brake drum that has been severely scored or damaged should be replaced with a new drum.
7. Reassemble drum and spacer on pinion shaft. Tighten to 100 lb. ft. torque.
8. Replace brake assembly in the reverse order from which it was removed.
9. Adjust brake band.

REPLACEMENT OR ADJUSTMENT OF BRAKE CABLE

1. To replace, disengage brake lever arm return spring from brake lever arm, disconnect brake cable from linkage at each end of cable.
2. Assemble adjustable end of cable to brake pedal bell crank with clevis pin and cotter pin.
3. Check brake band adjustment. Band must be loose on drum. Adjust length of cable so that with brake lever arm (located below brake drum) pivoted rearward as far as possible, the slack is just barely removed from the cable when cable is assembled to brake lever arm.
4. Secure cable fitting to brake lever arm with clevis pin and cotter pin and install brake lever arm return spring to brake lever arm.
5. Adjust brake band as outlined.

* **CAUTION:** Never bend the brake band anchor bolt. Any bending of the bolt may result in unexpected failure of the bolt and complete loss of Drive Line Braking Action.



NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION	12-24-86
TOL. FRAC. ±	DEC. ±					
SCALE	NONE					
DRAWN BY	B.B.					
DATE	12-22-80					
FIGURE 5B SECTION 11		MECHANICAL BRAKE				
		 TAYLOR DUNN MFG. CO. 2114 West Ball Rd. Anaheim, Calif.				

MECHANICAL BRAKE

REFER TO FIGURE 5B

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
5B-1	41-532-00	Brake Drum, Machined Broached	1
5B-2	41-660-61	Kit, Brake Band with Anchor Bolt & Nuts	1
5B-3	85-270-00	Spring, Extension 1-1/4 OD x 4-3/8 Free Length	1
5B-4	96-245-00	Hex Head Cap Screw 3/8 NC x 4-15/16, Grade 5 Thread	1
5B-5	85-060-00	Spring Compression 5/8 OD x 2-1/2	1
5B-6	88-100-11	Hex Head Cap Screw 3/8 NC x 1-3/4	1
5B-7	41-380-00	Brake Mounting Bracket	1
5B-8	88-109-81	Lock Nut 3/8 NC	2
5B-9	88-089-81	Lock Nut 5/16 NC	2
5B-10	50-662-00	Brake Lever, Belt Drive	1
5B-11	96-771-00	Pin, Clevis 3/8 x 3/4" From Face to Hole	2
5B-12	88-517-11	Cotter Pin, Steel 3/32 x 1" Long	2
5B-13	50-661-00	Brake Lever Bar	1
5B-14	88-080-11	Hex Head Cap Screw, 5/16 NC x 1	2
5B-15	88-109-80	Hex Nut 3/8 NC	1

SERVICE AND ADJUSTMENTS
DRIVE BELTS, PULLEYS & MOTOR MOUNTS

REFER TO FIGURE 5D

REPLACEMENT OF BELTS

New belts will "seat in" rapidly after a few operating hours. Therefore, inspection and readjustment of belt tension will prevent undue slippage and abnormal wear. It may be necessary that this readjustment will be repeated two or three times in the first two weeks of operation until new belts become thoroughly "seated in".

1. **CAUTION:**
Disconnect both main positive and negative battery leads to prevent accidental engagement of power while servicing unit.
2. Remove brake band anchor bolt and spring.
3. Loosen motor mount clamp nuts slightly.
4. Loosen motor adjusting bolt lock nut and turn adjusting bolt in until belts can be easily lifted from pulley grooves without prying or forcing. Remove belts.

SERVICE AND ADJUSTMENTS continued
DRIVE BELTS, PULLEYS & MOTOR MOUNTS

REFER TO FIGURE 5D

REPLACEMENT OF BELTS continued

5. Install a full set of new belts of equal length. Replacement of only a part of the set will prevent obtaining proper tension of all belts. This will cause unequal division of load among the the abnormal wear as a result.
6. Adjust tension and alignment as described below.
7. Reassemble brake band and adjust as described in this Section, Page 1.

BELT TENSION ADJUSTMENT AND ALIGNMENT

1. **CAUTION: Disconnect both main positive and negative battery leads to prevent accidental engagement of power while servicing unit.**
2. Loosen motor mount clamp nuts slightly.
3. Loosen motor adjusting bolt lock nut and turn adjusting bolt in or out as needed to tension belts properly.

NOTE: Belt tension is correct when belts will deflect between 1/4" and 3/8" at the mid point between pulleys. Press each belt firmly at the mid point with your thumb or finger and measure the deflection at the same point.

4. Rotate drive pulley sufficiently so belts will travel at least one full turn and check belt tension again. This will allow belts to seat properly in grooves.
5. Tighten lock nut on tension adjustment bolt, holding bolt in position with one wrench while tightening lock nut with second wrench.
6. Check pulley alignment with straight edge. If misaligned move motor forward or rearward on its mounting bracket to bring pulleys into alignment. If necessary tap motor mount bracket into position with soft hammer.
7. Retighten motor mount clamp nuts securely.

REMOVE AND INSTALL MOTOR

1. Disconnect battery leads to prevent accidental engagement of power while servicing unit.
2. Clearly mark motor leads to assure proper location when reassembling. Remove motor leads from motor.
3. Loosen motor mount clamp.
4. Loosen motor adjusting bolt lock nut and turn adjusting bolt in until belts can easily be lifed from pulley grooves without prying or forcing. Remove belts from motor pulley.
5. Remove motor mount clamp nuts and clamp. Remove motor and mounting bracket from axle housing.
6. If installing new motor, remove motor shaft nut, pulley, and key from old motor. Also remove motor mounting brackets and screws. For information on maintenance of motor, refer to subsections titled "Motor Maintenance" and "Motor Disassembly and Reassembly".
7. If installing new motor, assemble pulley, key, and shaft nut. Tighten shaft nut to 75 ft. lb. torque.

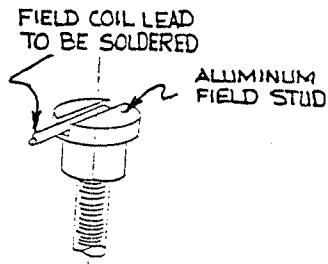
SERVICE AND ADJUSTMENTS continued
DRIVE BELTS, PULLEYS & MOTOR MOUNTS

REFER TO FIGURE 5D

REMOVE AND INSTALL MOTOR continued

8. Reassemble to drive assembly in reverse order. Adjust and align belts as described in subsection titled "Belt Tension Adjustment and Alignment".
9. Connect Motor Leads as Follows: (IMPORTANT!!)
 - a) Check that each motor terminal stud nut is tightened securely but not over-tightened as this could bend or twist the terminal post and cause an electrical short within the motor.
 - b) Install motor leads on correct motor terminals post.
 - c) Install a second nut on each terminal post and finger tighten.
 - d) To avoid bending, twisting or breaking-off a terminal post use a thin pattern 9/16" wrench to hold the bottom nut from moving while tightening the top nut. Carefully tighten the top nut so as to make a good connection between the terminal post and motor lead.
 - e) Soldering field coil leads to aluminum field stud should be done in the following manner: Remove from vehicle, disassemble motor, thoroughly clean areas to be joined of all solder, and residue using heat to soften solder, then wire brush, (a stainless steel wire brush is recommended, since it will not oxidize or leave unwanted residue), which could result in a weak solder connection.

Field stud must be in vertical position with joint to be soldered pointing upward, the field coil lead then laying horizontally in stud slot as shown. Apply heat to shoulder of Field Stud approximately 1/2 inch below joint to be soldered, apply solder to both sides of the coil lead, after all solder is applied, remove heat, add flux vigorously and generously to joint until solder flows throughout joint. It is recommended that the MG460 soldering kit, Part No.70-210-63 be used for this repair sequence.



DISASSEMBLE AND REASSEMBLE OF BELT DRIVE ASSEMBLY

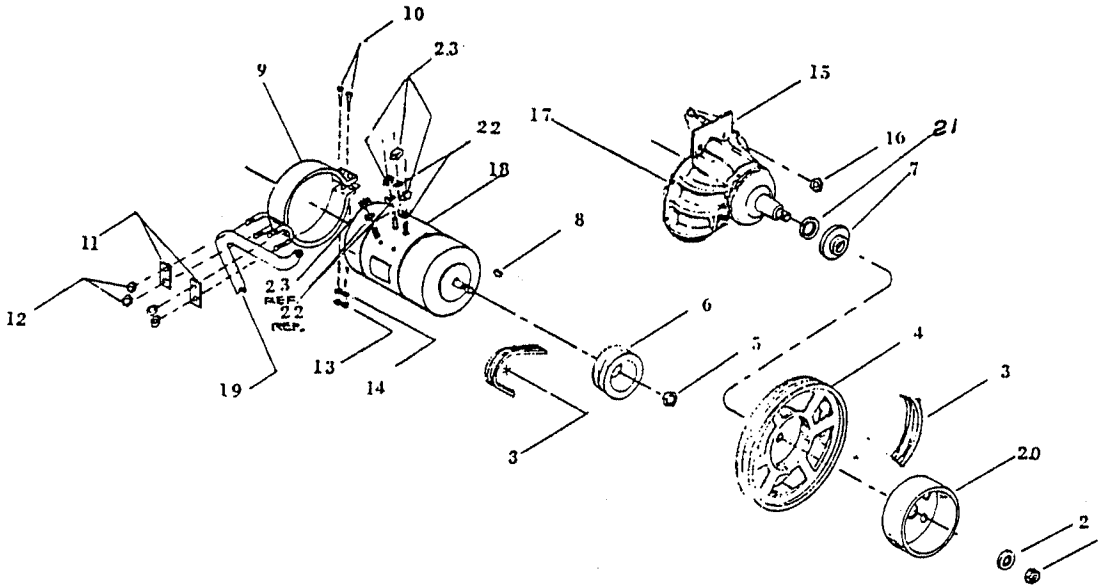
1. Perform steps 1 through 5 in subsection titled "Remove and Install Motor" (Section 13), and steps 1 through 3 in subsection "Removal of Brake and Drum" (Section 11).
2. Remove belts, and remove pinion shaft nut, washer, brake drum, and pulley, from pinion shaft.
3. Before reassembly, inspect seal in pinion bearing retainer, and replace if damaged or worn. It is recommended that the new seal be pre-soaked in light oil for several hours before installation, and that a small amount of oil resistant sealer be applied to the opening in the pinion bearing retainer.
4. Reassemble in reverse order. Adjust bolt tension and alignment, and adjust brakes.


NOTE: For service and Adjustment of Motor see subsection 13.

BELT DRIVE

REFER TO FIGURE 5D

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
5D-1	97-250-00	Nut-Pinion 3/4-20 Extra Fine Thread	1
5D-2	88-228-61	Washer SAE 3/4	1
5D-3	30-601-00	Belt, AX-33 (With 8" Pulley)	2
5D-3	30-613-00	Belt, AX-38 A-Section (With 11" Pulley)	2
5D-4	30-116-00	Pulley, 8" O.D.	0 or 1
5D-4	30-117-00	Pulley, 11" O.D.	0 or 1
5D-5	88-239-82	Nut, Hex Jam 3/4 N.F. (not used on 7/8 Bore Pulley)	0 or 1
5D-6	30-114-00	Pulley, Motor, 2 Belt, 2-1/4 O.D., 3/4 Bore	0 or 1
5D-6	30-115-00	Pulley, Motor, 2 Belt, 2-3/4 O.D., 3/4 Bore	0 or 1
5D-7	45-339-00	Oil Seal, Pinion Shaft, 3" O. D.	0 or 1
5D-7	45-340-00	Oil Seal, Pinion Shaft, 4-1/8" O.D.	0 or 1
5D-8	97-100-00	Woodruff Key - 3/16	1
5D-9	70-434-61	Kit, Swivel Motor Mount with Hardware	1
5D-10	88-101-18	Hex Head Cap Screw, 3/8 N.C. x 2-1/2 Long	2
5D-11	70-422-00	Motor Mount Strap; 1-7/8 Long	2
5D-12	88-109-87	Nut, Fastite, 3/8 N.C.	4
5D-13	88-109-80	Nut, Hex, 3/8 N.C.	2
5D-14	88-108-62	Lock Washer, 3/8	2
5D-15	41-381-00	Motor Adjustment Bracket	1
5D-16	88-119-80	Nut, Hex 3/8 N.F.	2
5D-17	Sub Assembly	Refer to Section 11	
5D-18	Sub Assembly	Refer to Section 13	
5D-19	Sub Assembly	Refer to Section 11	
5D-20	Sub Assembly	Refer to Section 12	
5D-21	16-418-00	Spacer, 1-5/16 I.D. x 1-5/8 O.D. x .140 Thick	0 or 1
5D-22	88-088-62	Lock Washer, 5/16	4
5D-23	88-089-82	Nut, Hex 5/16-18 NC Brass	4



NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
TOL. FRAC. ±	DEC. ±			FIGURE NO. 5D	
SCALE	NONE			BELT DRIVE	
DRAWN BY	B.B.			SECTION 11	
DATE	7-20-81			TAYLOR DUNN MFG. CO. 2114 West Ball Rd. Anaheim, Calif.	
	JB				

MAINTENANCE, SERVICE AND ADJUSTMENT
REAR AXLE AND HOUSING

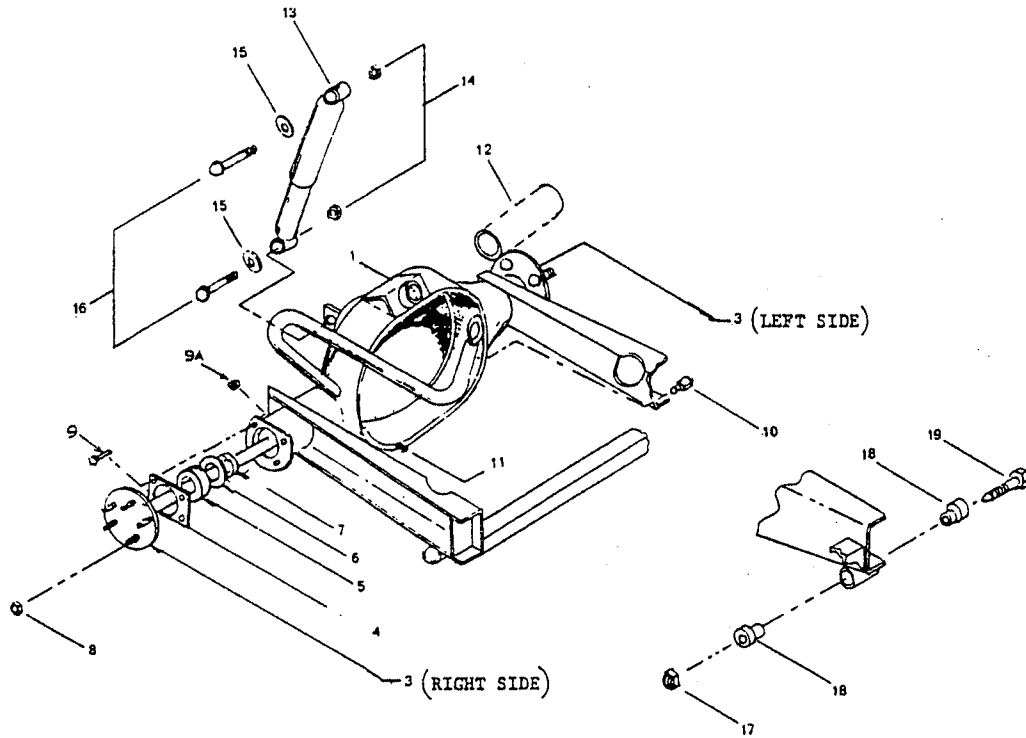
REFER TO FIGURE 5H


The rear axles combined with the differential is enclosed in housing unit. Extra effort has been spent in giving your vehicle a rugged, reliable and simple drive system, a part of which is the integration of the automotive type axle. Given proper care and maintenance, it will offer you trouble free service during the whole life time of your vehicle.

A simple maintenance procedure is detailed below.

INSPECTION, REMOVAL AND INSTALLATION OF REAR WHEEL AXLE AND BEARINGS

1. **CAUTION: Disconnect both main positive and negative battery leads to accidental engagement of power while servicing vehicle.**
2. Remove wheel and tire assembly.
3. Remove four bolts attached to axle retainer plate and pull axle out of housing.
4. Remove bearing gasket and inspect ball bearings. If bearing shows signs of roughness and play, pull bearing ring and bearing from axle shaft. Inspect axle for metal fatigue, leave axle retainer plate on the axle shaft.
5. Press new bearing to shoulder on axle shaft. Press new bearing retainer ring into position on axle shaft.
6. Install new gasket over bearing retainer ring.
7. Install axle into axle housing and differential assembly.
8. Install axle retainer plate to axle housing with four studs. Tighten lock nuts.
9. Install wheel and tire assembly.
10. Reconnect battery leads.



NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION 5-2-82 JPB
TOL. FRAC. ±	DEC. ±				
SCALE	NONE				
DRAWN BY	B.B.				
DATE	4-1-80				
FIGURE 5H SECTION 11		REAR AXLE AND HOUSING		 TAYLOR DUNN MFG. CO. 2114 West Ball Rd. Anaheim, Calif.	

REAR AXLE AND HOUSING
REFER TO FIGURE 5H

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
5H-1	41-296-00	Housing, Rear Axle with Bolts	1
5H-3	41-166-11	Axle Assembly, Left Side 10-7/8 Long with Large Bearing and Retainer Plates.	1
5H-3	41-165-11	Axle Assembly, Right side 13-1/4 Long with Large Bearing and Retainer Plates.	1
5H-4	32-514-00	Retainer Plate, Rear Axle	1
5H-5	80-503-00	Ball Bearing, Rear Axle	2
5H-6	45-045-00	Gasket, Rear Axle Bearing to Housing used with 1-9/16 I.D. Wheel Bearing (2 I.D.)	0 or 2
5H-7	45-301-00	Oil Seal	2
5H-8	97-736-00	Lug nut, 1/2" Tapered	10
5H-9	88-120-11	Hex Head Cap Screw 7/16 N.C. x 1 Long	8
5H-9A	88-129-81	Lock Nut, 7/16 NC	8
5H-10	41-997-00	Fill Level or Drain Plug (1/8 Pipe)	3
5H-11	96-330-00	Bolt, Differential Carrier to Housing	10
5H-12	85-140-00	Spring, 2-7/16 O.D. x 6-1/4 (.352 Diameter Wire)	1
5H-13	86-602-00	Shock Absorber	1
5H-14	88-189-81	Lock Nut 5/8 Hex	2
5H-15	88-188-61	Washer 5/8, SAE	2
5H-16	88-180-18	Hex Head Cap Screw 5/8 N.C. x 2-1/2 Long	2
5H-17	88-149-81	1/2 N.C. Lock Nut	2
5H-18	98-601-00	Grommet, Rubber 1/2" I.D.	4
5H-19	96-240-00	Bolt with Pointed End - 1/2 x 4" Long	2

SERVICE AND ADJUSTMENT
DIFFERENTIAL ASSEMBLY
REFER TO FIGURE 5R & 5H

DISASSEMBLY OF DIFFERENTIAL MEMBER

1. **CAUTION:** Disconnect both main plus and minus battery leads to prevent accidental engagement of power while servicing unit.
2. Remove rear axle and drive assembly from chassis, and remove primary drive and brake components, as described in appropriate subsections.
3. Remove four bolts on each end holding axle retainer and pull both axles.
4. Remove nuts around differential carrier housing and remove carrier from axle housing. (Note position of clip for proper reassembly of brake spring).
5. Mark one differential bearing cap and bearing support to insure proper assembly. Remove adjusting nut locks, bearing caps, and adjusting nuts. Lift differential out of carrier.
6. Remove drive gear from differential case.
7. Drive out differential pinion shaft retainer and separate the differential pinion shaft and remove gears and thrust washer.
8. Remove drive pinion retainer from carrier. Remove O-Ring from retainer.
9. Remove pinion locating shim. Measure shim thickness with micrometer.
10. If the drive pinion pilot bearing is to be replaced, drive the pilot end and bearing retainer out at the same time. When installing, drive the bearing in until it bottoms. Install a new retainer with the concave side up.
11. Press the pinion shaft out of front bearing cone and remove spacer.
12. Remove pinion bearing cone.
13. Do not remove pinion bearing cups from retainer unless they are worn or damaged. The flange and pilot are machined by locating on these cups after they are installed in the bores. If new cups are to be installed, make sure they are seated in the retainer by trying to insert a .0015" feeler gauge between cup and bottom bore.

REASSEMBLY OF DIFFERENTIAL MEMBER-ALL VEHICLES

1. Differential Case: Place a side gear and thrust washer in the differential case bore. LUBRICATE ALL PARTS LIBERALLY WITH AXLE LUBRICANT DURING ASSEMBLY. With a soft faced hammer, drive pinion shaft into case only far enough to retain a pinion thrust washer and pinion gear. Place the second pinion and thrust washer in position. Drive the pinion shaft into place. Be careful to line up pinion shaft retainer holes. Place second side gear and thrust washer in position and install differential case cover. Install retainer. A pinion or axle shaft spline can be inserted in side gear spline to check for free rotation of differential gears. Insert two 7/16 x 2" bolts through differential flange and thread them three or four turns into the drive gear as a guide in aligning the drive gear bolt holes. Press or tap the drive gear into position. Install and tighten the drive gear bolts evenly and alternately across the gear to 60-65 ft. lb. torque.

SERVICE AND ADJUSTMENT continued
DIFFERENTIAL ASSEMBLY
REFER TO FIGURE 5R & 5H

REASSEMBLY OF DIFFERENTIAL MEMBER-ALL VEHICLES continued

2. If the differential bearings have been removed, use a suitable press to install them.
3. Install pinion rear bearing cone on the pinion shaft. Install spacer with shims on the shaft. Place the bearing retainer on the pinion shaft, and install the front bearing cone. Lubricate both bearings with differential oil.
4. Place brake drum and pulley on pinion shaft spline. Assemble washer and shaft nut and tighten to 100 ft. lb. torque.

NOTE: The bearing should spin freely without end play. If it is too tight or or too loose, adjust by removing or adding spacers. Refer to Figure 5R I.D. No's 26 and 27.

5. Shim Selection: Manufacturing tolerances in the pinion bore dimensions and in the best operating position of the gears make an adjustment shim necessary. This shim is placed between the pinion retainer and the carrier, Figure 5. An increase in the thickness of the shim moves the pinion away from the drive gear. Manufacturing objectives are to make axles requiring a .0015" shim and if a new assembly is being built, a .0015" shim should be used for a tentative build-up. Shims are available in .010" to .021" thickness in steps of .001". Pinions and drive gears are marked, when matched, with the same number. Following the number on the pinion is a minus (-) or (+) followed by a number. If the pinion is marked "-1" it indicates that a shim .001" thinner than a standard shim for this carrier is required. A minus number means the pinion should be moved closer to the drive gear and a thinner shim is required. A plus number means the pinion should be moved farther from the drive gear and a thicker shim is required. A pinion marked zero (0) is a standard pinion. To select a shim, measure the original shim with a micrometer. Note the dimensional mark on the original pinion. Compare the mark on the original pinion with the mark on the new pinion to determine how the original shim should be modified. For example, if the original shim is .015" and the original pinion is marked "-1" the new pinion requires a + shim. Therefore, the new pinion requires a .002" thicker shim, and a .017" shim should be used. If the new pinion is marked the same as the old pinion, no shim change is required.
6. After the proper selection of shims, insert "O" ring seal and pinion retainer assembly into differential carrier. Tighten 5 retainer bolts to 50-lb. ft. torque.

NOTE: Two of the retainer bolts will have to be removed later for installation of belt tension adjuster.

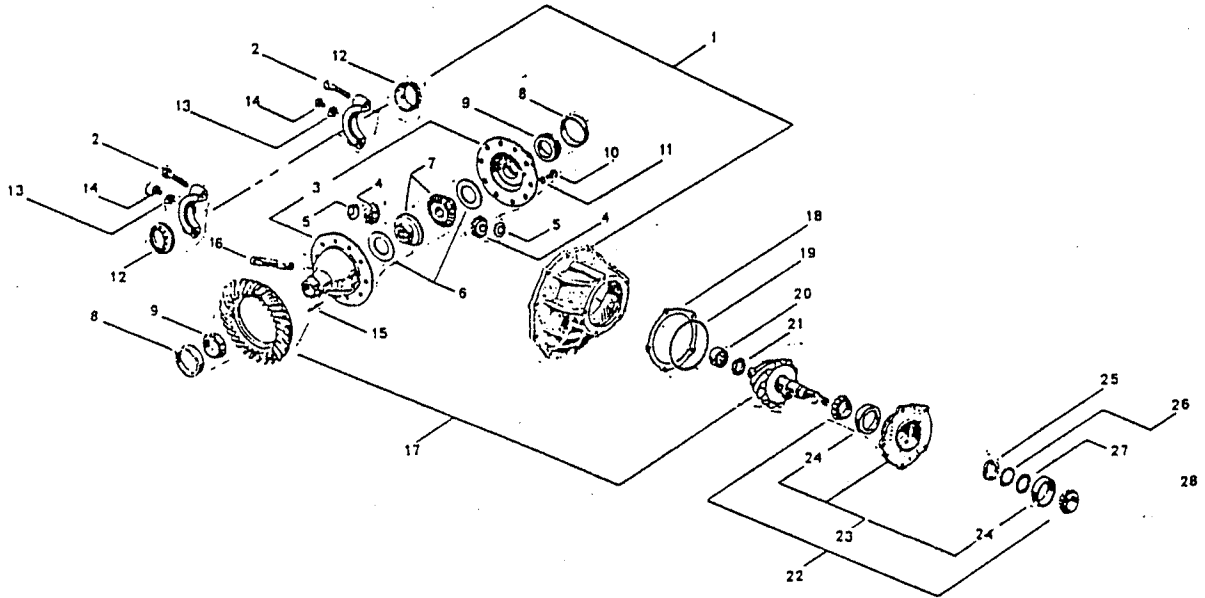
7. Install differential case, bearing cups, adjusting nuts, and bearing caps being sure that each cap is located in the same position from which it was removed (Use marks as guide).
8. Adjust bearing nuts so that differential case will be free to revolve. It is very important that there will be no bearing play or looseness, as this will inevitably lead to gear noise and wear. Gear backlash must be set at the same time to a tolerance of .005" to .009". NOTE: It will be necessary to release some of the cap bolt tension in order to allow the bearings to move while making the adjustments. If the caps are too loose an error will result when trying to set backlash and bearing clearance.


SERVICE AND ADJUSTMENT continued
DIFFERENTIAL ASSEMBLY
REFER TO FIGURE 5R & 5H

REASSEMBLY OF DIFFERENTIAL ASSEMBLY continued

Therefore, double check your setting after the cap bolts have been tightened. If necessary make corrections in your settings until the specified tolerances are maintained after the cap bolts have been tightened.

9. Install nut locks.
10. Install differential carrier assembly in axle housing using new gasket and gasket sealer.
11. Install axles, brake assemblies (on models with hydraulic brakes), bearing retainers, and gaskets. NOTE: Axles are equipped with special sealed bearings. Should there be evidence of seal leakage, it is recommended that the bearing be replaced. It is also recommended that gasket located between bearing and bearing seat in axle housing be replaced at the same time. Refer to Figure 5H.
12. Remove pinion shaft nut, washer, brake drum, and pulley. Remove two bolts from pinion bearing retainer which retain motor adjusting bracket. Install motor adjusting bracket and primary drive components as described in subsection titled "Disassemble and Reassemble Primary Drive".
13. Fill housing with oil to level described in Section 5, Figure 1.



NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
TOL. FRAC. ±	DEC. ±	FIGURE 5R SECTION II DIFFERENTIAL			
SCALE	NONE				
DRAWN BY	B. B.				
DATE	11-2-78				
 TAYLOR DUNN MFG. CO 2114 West Ball Rd. Anaheim, Calif.					

DIFFERENTIAL

REFER TO FIGURE 5R

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
5R-1	41-709-00	Differential Carrier Assembly with Small 1.628 I.D. Carrier Bearing, F2 Axle	1
5R-1	41-710-00	Differential Carrier Assembly with Large 1.784 I.D. Carrier Bearing, F2 Axle	1
5R-2	88-140-16	Hex Head Cap Screw 1/2 N.C. x 2	4
5R-3	41-712-00	Differential Gear Case Assembly, for Small 1.628 I.D. Carrier Bearing	1
5R-3	41-713-00	Differential Gear Case Assembly, for Large 1.784 I.D. Carrier Bearing	1
5R-4	41-703-00	Differential Shaft Pinion Kit of Two Gears and Two Thrust Washers, F2 Axle	1 Kit
5R-5	41-702-00	Differential Pinion Shaft Thrust Washer, F2	2
5R-6	41-704-00	Differential Side Gear Thrust Washer, F2	2
5R-7	41-705-00	Differential Side Gear Kit of Two Differential Gears and Two Thrust Washers	1 Kit
5R-8	80-127-00	Tapered Bearing Race, Small, F2 Axle LM 501310	2
5R-8	80-128-00	Tapered Bering Race, Large, F2 Axle LM 603011	2
5R-9	80-511-00	Tapered Roller Bearing, Carrier (Small 1.628 I.D.)	2
5R-9	80-512-00	Tapered Roller Bearing, Carrier (Large 1.784 I.D.)	2
5R-10	96-243-00	Hex Head Cap Screw 7/16 N.F. x 7/8, Grade 5	10
5R-11	97-163-00	Washer, 7/16 I.D. x 3/4 O.D. x 1/32 Thick	10
5R-12	41-707-00	Differential Bearing Adjustment Nut 3-1/8 - 16 with small 1.628 I.D. Carrier Bearing, F2 Axle	2
5R-12	41-708-00	Differential Bearing Adjustment Nut 3-5/16 -16 with Large 1.784 I.D. Carrier Bearing, F2 Axle	2
5R-13	41-706-00	Differential Bearing Adjustment Nut Lock, F2 Axle	2
5R-14	88-080-04	Hex Head Cap Screw 5/16 N.C. x 3/8	2
5R-15	41-701-00	Pin	1
5R-16	41-700-00	Differential Pinion Shaft	1
5R-17	31-235-00	Ring & Pinion Gear Set, 2.75 Gear Ratio	1
5R-17	31-236-00	Ring & Pinion Gear Set, 3.10 Gear Ratio	1
5R-17	31-237-00	Ring & Pinion Gear Set, 3.25 Gear Ratio	1
5R-17	31-238-00	Ring & Pinion Gear Set, 3.50 Gear Ratio	1
5R-17	31-239-00	Ring & Pinion Gear Set, 5.43 Gear Ratio	1
5R-17	31-234-00	Ring & Pinion Gear Set, 3.00 Gear Ratio	1
5R-18	41-711-00	Shim Drive Pinion Bearing .005" Thick F2	1
5R-19	80-702-00	O-Ring Differential Drive, National 623025, 4-3/4 I.D. x 5 O.D.	1-3 1
5R-20	80-555-00	Roller Bearing, Pinion, rear, F2 Axle	1
5R-21	41-714-00	Driving Pinion Pilot Bearing Retainer	1
5R-22	80-544-00	Tapered Roller Bearing, Pinion Shaft	1
5R-23	44-340-91	Pinion bearing Housing with Bearing Races	2
5R-24	80-125-00	Tapered Bearing Race	1
5R-25	16-415-00	Spacer Pinion Bearing .440 Thick	2
5R-26	16-410-00	Spacer Pinion shaft, .020 Thick, 1-5/16 I.D. x 1-5/8 O.D.	1 1-3
5R-26	16-419-00	Spacer Pinion Shaft, .002 Thick, 1-5/16 I.D. x 1-5/8 O.D.	1-3
5R-27	16-411-00	Spacer Pinion Shaft, .005 Thick, 1-5/16 I.D. x 1-5/8 O.D.	1-3

MAINTENANCE PROCEDURES

MECHANICAL CONTROL LINKAGE

REFER TO FIGURE 7

The mechanical control linkage operates the various controls and mechanisms located throughout your vehicle.

The accelerator system consists of the operating pedal and pivot shaft assembly, the connecting rods and adjusters and the return spring. All wear points should be lubricated monthly for normal service. Refer to Maintenance Guide Section 4 and Lubrication Diagram Section 5 for proper application of lubricants.

The footbrake system consists of the foot pedal, pivot shaft, connecting link, brake operating cable, and return spring.

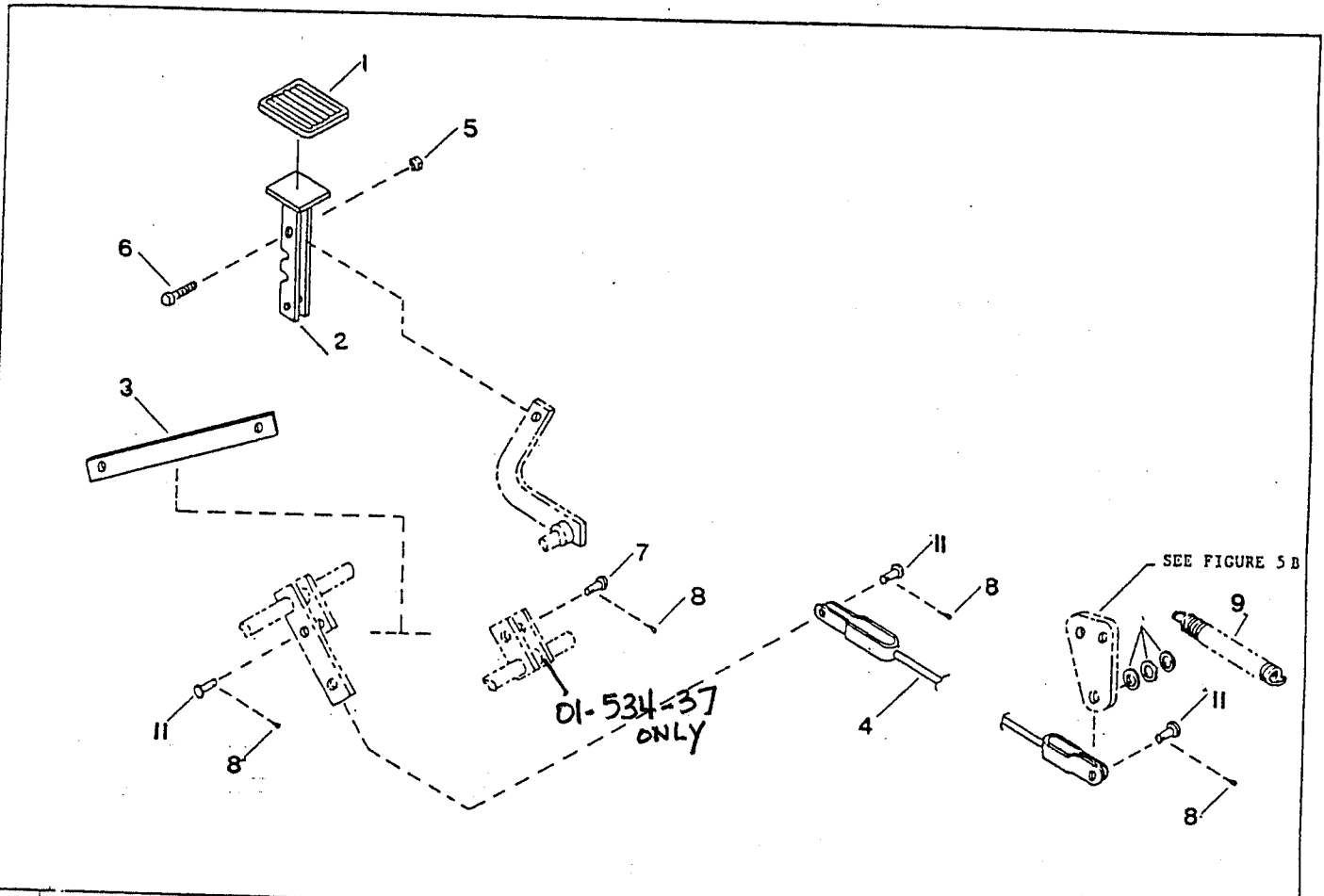
all wear points should be lubricated monthly. Refer to Maintenance Guide Section 4 and Lubrication Diagram Section 5 for proper application of lubricants.


For service and adjustments refer to the following sections;

Section 12 - For brake service and adjustments.

Section 14 - For accelerator service and adjustments.

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
7-1	98-200-00	Brake Pedal Pad	1
7-2	51-508-00	Pedal, Brake, & Lock	1
7-3	50-432-00	Link, Brake Pedal Connecting	1
7-4	96-813-00	Brake Cable Assembly 28-1/4 to 31-1/4 Length	1
7-5	88-149-81	1/2 N.C. Hex Lock Nut	1
7-6	88-140-14	1/2 N.C. x 1-1/2, Hex Head Cap Screw	1
7-7	96-771-00	Clevis Pin, 3/8 x 3/4 Face to Hole	1
7-8	88-517-11	Cotter Pin, 3/32 x 1	4
7-9	85-295-00	Spring Extension 9/16 O.D. x 4-7/8	1
7-10	88-108-60	3/8 Washer	3
7-11	96-772-00	Clevis Pin, 3/8 x 1 Face to Hole	3



NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
					12-24-86
TOL. FRAC. ± DEC. ± SCALE NONE DRAWN BY EDB DATE 2-13-76		FIGURE 7 SECTION 12		CONTROL LINKAGE MODEL 2534 SS	
				 TAYLOR DUNN MFG. CO. 2114 West Ball Rd. Anaheim, Calif.	

See MS-534-01
for weld
#s J4 Page 2

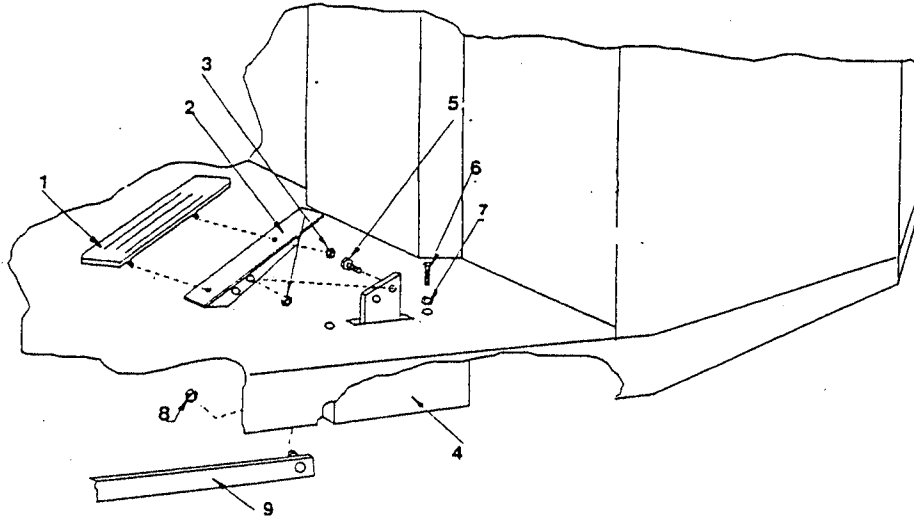


FIGURE 7A
PARTS LIST
ACCELERATOR LINKAGE, RHEOSTAT

FIG I.D.	PART NO.	DESCRIPTION	QTY.
7A-1	98-254-00	ACCELERATOR PEDAL PAD	1
7A-2	98-254-15	MOUNT, PEDAL WELDMENT	1
7A-3	88-069-87	1/4 IN KEPS NUT	4
7A-4	62-033-42	ACCELERATOR, RHEOSTAT	1
7A-5	88-060-08	1/4 X 5/8 HEX HEAD SCREW	2
7A-6	88-065-08	1/4 X 5/8 TRUSS HEAD SCREW	2
7A-7	88-068-67	1/4 INTERNAL TOOTH LOCK WASHER	2
7A-8	88-089-81	5/16 LOCK NUT	1
7A-9	01-534-50	LINKAGE, PRIMARY	1

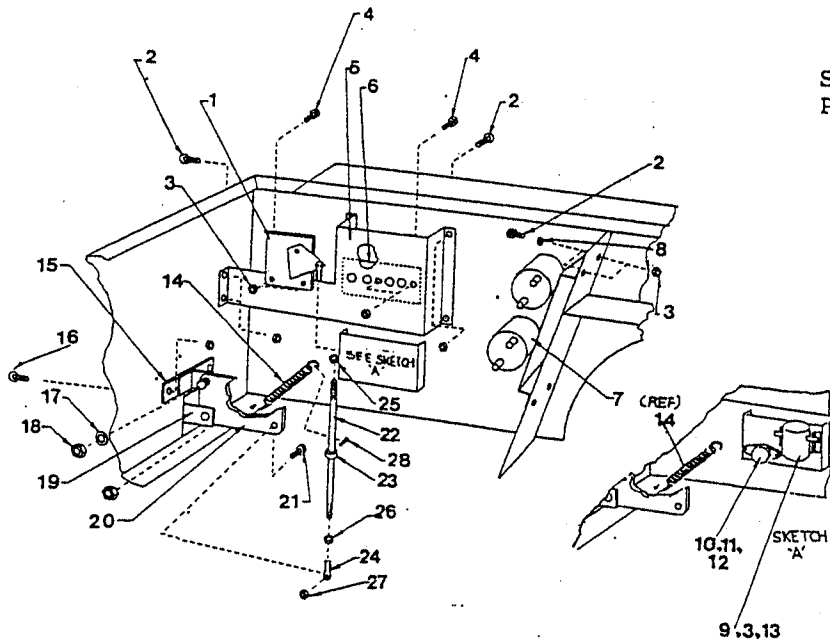


FIGURE 7B
RHEOSTAT INSTALLATION AND LINKAGE

FIG I.D.	PART NO.	DESCRIPTION	QTY.
7B-1	61-844-17	SWITCH MASTER CONTROL 4 SPEED	1
7B-2	88-065-08	1/4 X 5/8 TRUSS HEAD SCREW	8
7B-3	88-069-87	1/4 KEPS NUT	19
7B-4	88-060-11	1/4 X 1 HEX HEAD SCREW	4
7B-5	01-534-48	BRACKET, SWITCH AND COIL	1
7B-6	78-225-13	COIL BOARD ASSEMBLY	1
7B-7	72-560-04	ASSEMBLY, SOLENOID FORWARD/REVERSE	1
7B-8	88-068-61	WASHER, 1/4 SAE	1
7B-9	72-511-00	SOLENOID, 24 VOLT	4
7B-10	79-844-00	CIRCUIT BREAKER, KLIXON CDLA-135	1
7B-11	88-045-11	10-32 X 1 TRUSS HEAD MACHINE SCREW	1
7B-12	88-049-86	10-32 LOCK NUT	2
7B-13	88-060-09	1/4 X 3/4 HEX HEAD SCREW	2
7B-14	85-295-00	SPRING EXTENSION, ACCELERATOR	1
7B-15	01-534-55	PIVOT WELDMENT	1
7B-16	88-065-09	1/4 X 3/4 NC PHILLIPS TRUSS HEAD	2
7B-17	88-108-61	3/8 WASHER SAE	2
7B-18	88-109-81	3/8 LOCK NUT	2
7B-19	01-534-50	PRIMARY LINKAGE, WELDMENT	2
7B-20	01-534-52	ASSEMBLY, BELLCRANK	1
7B-21	88-060-13	1/4 X 1-1/4 HEX HEAD SCREW	1
7B-22	50-002-12	ROD, ACCELERATOR LINKAGE 10-3/4 LONG	1
7B-23	17-100-00	COLLAR, 1/4 INCH SHAFT	1
7B-24	86-503-98	ROD END, 1/4 28 THREAD X 1/4 ID LEFT	1
7B-25	88-079-80	1/4 NF HEX HEAD NUT	1
7B-26	97-211-00	1/4 NF LOCK NUT	2
7B-27	88-069-81	1/4 LOCKNUT	2
7B-28	88-047-06	10-32 X 1/2 SOCKET HEAD CAP SCREW	1

MOTOR MAINTENANCE, SERVICE AND ADJUSTMENT
ELECTRIC MOTORS
REFER TO FIGURE 8, 8A, 8B, & 8C

Detailed service procedures covering maintenance of bearing brushes and commutator are covered in this section. DO NOT PERFORM THIS PROCEDURE WHILE BATTERIES ARE BEING CHARGED.

Maintenance of electric motors should be referred to personnel with experience and equipment. Should it be necessary for you to order replacement parts for your motor. IT IS NECESSARY TO INCLUDE COMPLETE NAMEPLATE DATA WITH ORDER.

MOTOR MAINTENANCE - BRUSH INSPECTION AND REPLACEMENT

1. Remove cover, exposing brush assemblies. Lift brush from holder for inspection.
2. If brushes are worn, remove, install new brushes. Use fine sandpaper to "Seat in" new brushes to commutator. To determine when to replace worn brushes, proceed as follows:
 - a. For motors equipped with brushes having end pigtails and side hooks, replace brush when hook is within 1/16" from bottom of hook slot.
 - b. For motors equipped with brushes having side pigtails only, replace brush WHEN PIGTAIL IS WITHIN 1/16" from bottom of pigtail slot.

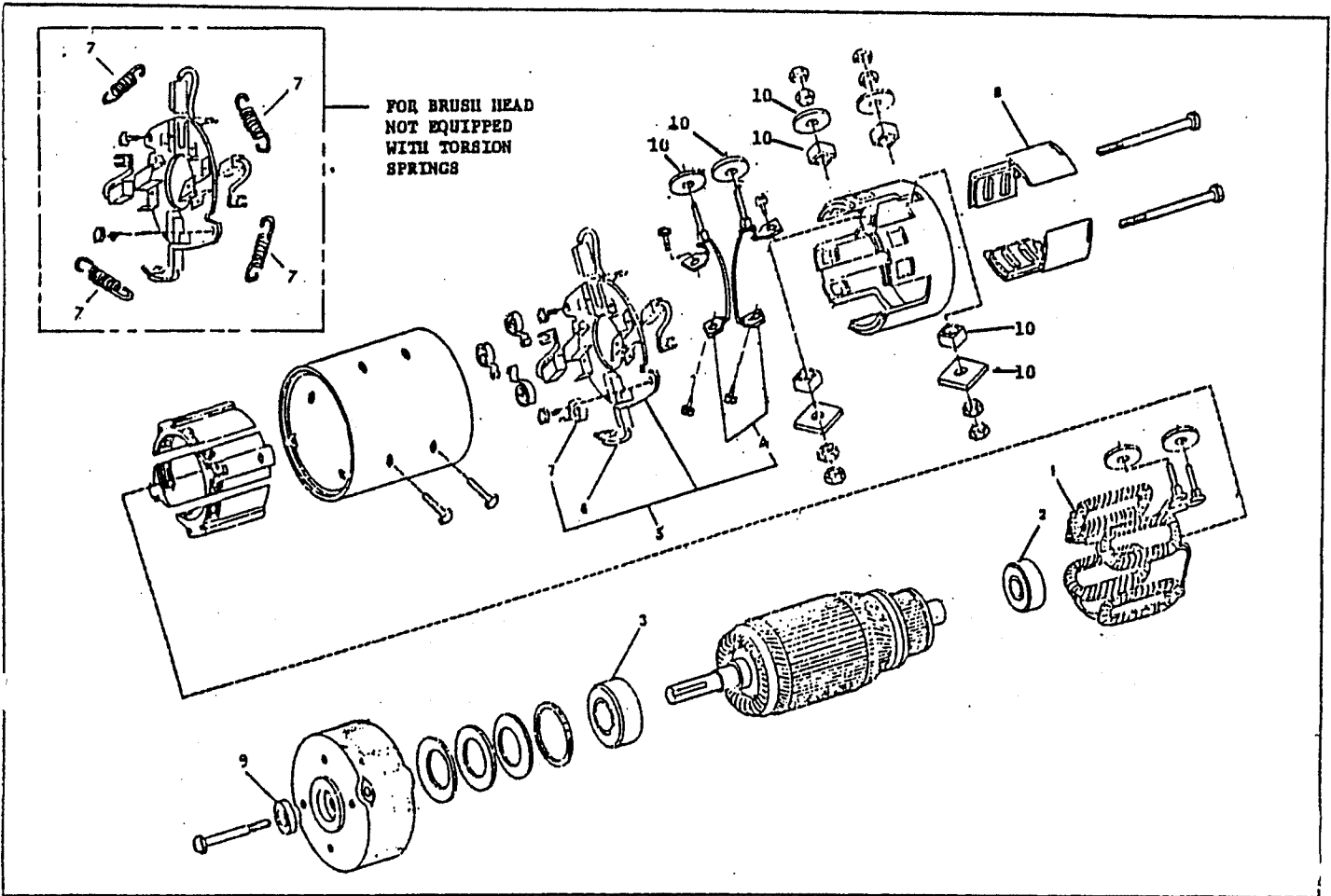
NOTE: When one brush is replaced in a motor, it is considered good maintenance practice to replace all brushes.

4. Replace Cover.

MOTOR DISASSEMBLY AND REASSEMBLY

1. Remove motor from vehicle as described in Section 11.
2. Determine if witness marks on end bell and stator housing are present. If not, mark end bell and housing to assure proper relation of brushes and commutator when reassembling.
3. Remove cover, exposing brush assemblies. Lift brushes from brush holder.
4. Remove bolts holding end bells and remove end bell and rotor. (Pull from shaft extension end). Take care not to damage any coils or armature wires when handling motor parts.
5. Press or pull old bearings off by using bearing press or bearing puller. Do not damage shaft while removing bearings.
6. Install new bearings onto shaft by gentle pressure or tapping with proper tool on inner race only. Bearing will be damaged if pressed or driven by outer race or seals.
7. If the commutator is worn or "burned" it should be turned, the mica undercut and the commutator polished.
8. Oil bearing housing lightly to aid in reassembly.
9. Reassemble motor taking care that all parts are kept clean.
10. Install brushes and "seat in" with fine sandpaper.
11. Check operation of each brush to assure that brush slides freely in holder.
12. Replace cover.
13. Reassemble to vehicle as described in preceding subsection.

NOTE: If motor terminal studs were removed for inspection, refer to Section 11, Page 2 item 9 for correct procedure to avoid damaging studs.

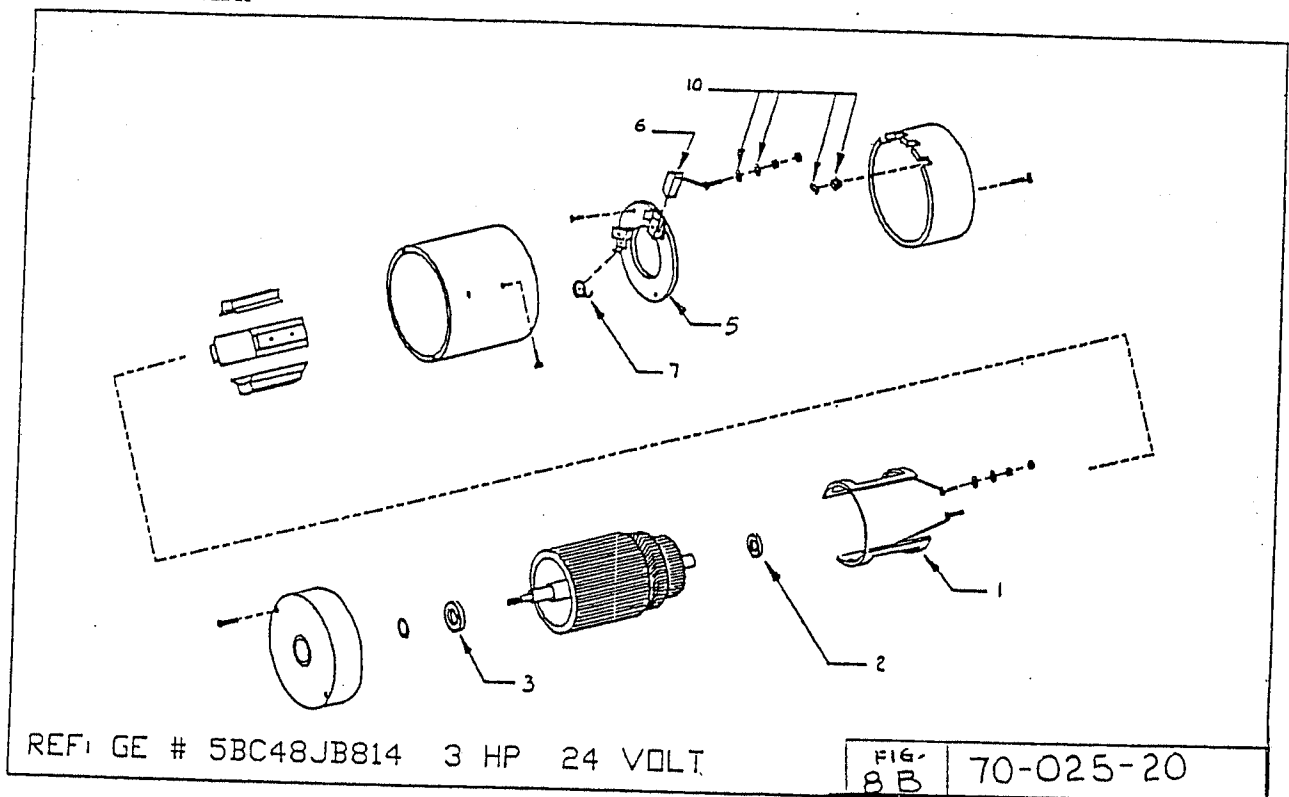
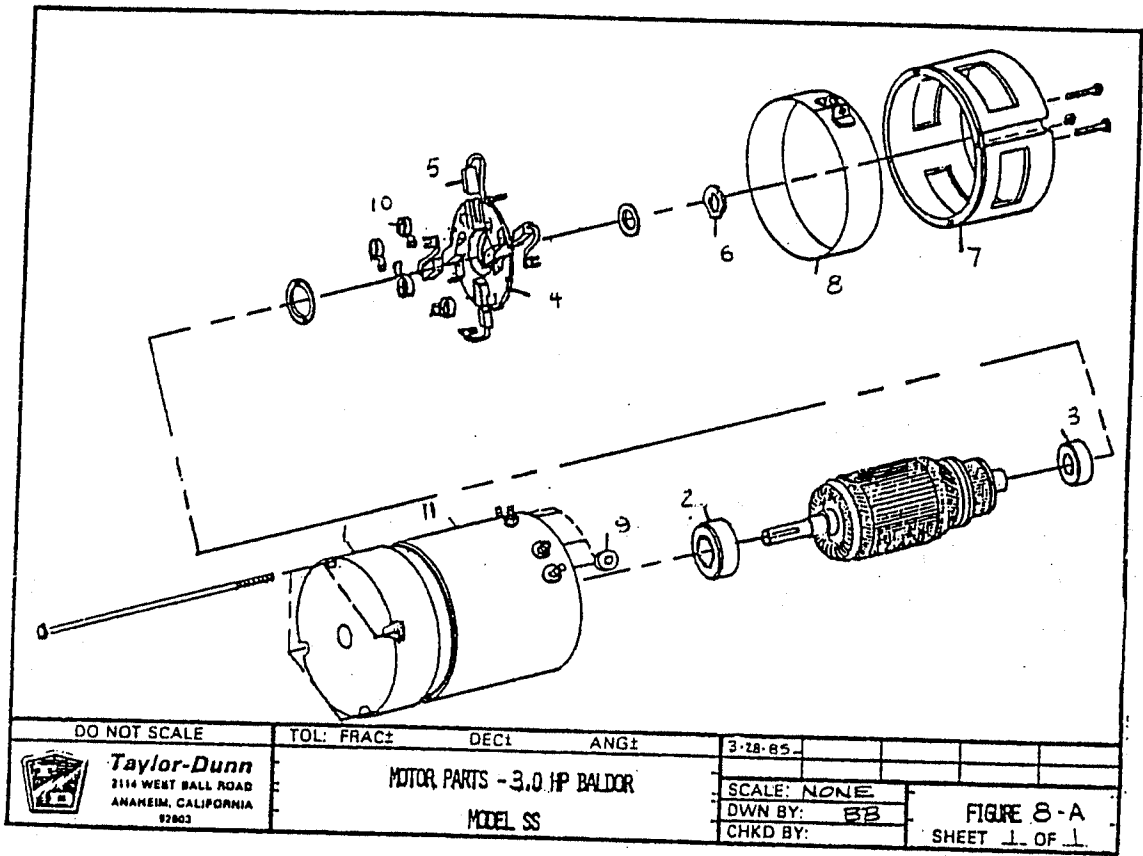


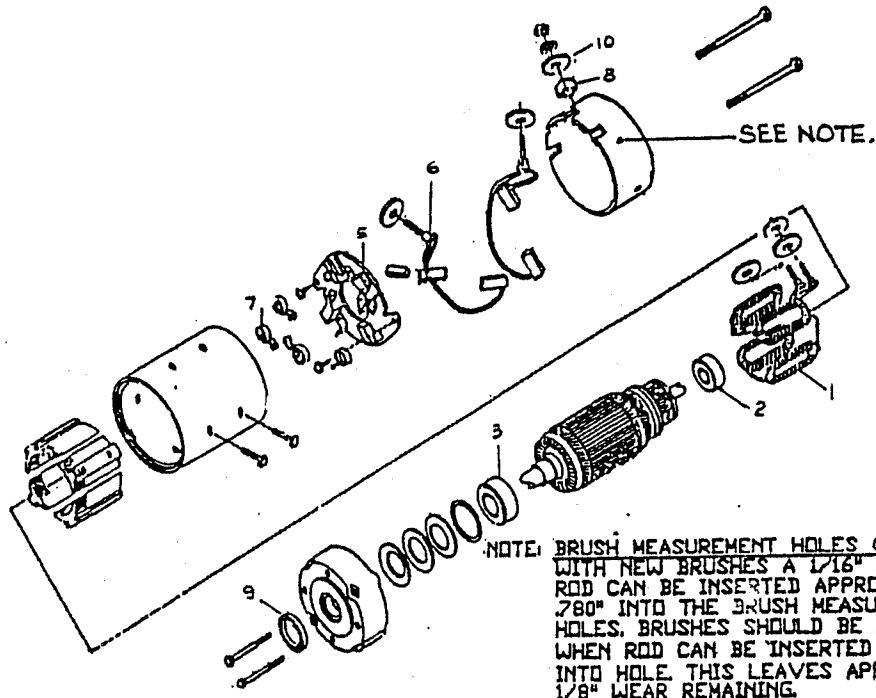
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FIGURE 8
SECTION 13

MOTOR PARTS - G.E. MOTORS


TAYLOR DUNN MFG. CO.
2114 West Ball Rd.
Anaheim, Calif.





NOTE: BRUSH MEASUREMENT HOLES (2)
WITH NEW BRUSHES A 1/16" DIA
ROD CAN BE INSERTED APPROXIMATELY
.780" INTO THE BRUSH MEASUREMENT
HOLES. BRUSHES SHOULD BE REPLACED
WHEN ROD CAN BE INSERTED 1.560"
INTO HOLE. THIS LEAVES APPROXIMATELY
1/8" WEAR REMAINING.

70-049-00
G.E. 5BC48JB754

DO NOT SCALE	TOL: FRAC±	DEC±	ANG±	3-28-85				
 Taylor-Dunn 2114 WEST BALL ROAD ANAHEIM, CALIFORNIA 92803	MOTOR, D.C. G.E. 4.5 H.P.			SCALE: NONE	FIG. 8-C			
				DWN BY: JPB			SHEET ___ OF ___	
				CHKD BY:				

ELECTRIC MOTORS
REFER TO FIGURE 8

For D.C. motor replacement parts, IT IS NECESSARY TO INCLUDE COMPLETE MOTOR NAME PLATE DATA WITH ORDER.

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.	
Replacement parts for G.E. Motor 5BC48JB531, 5BC48JB550 AND 5BC48JB582.				
1	70-201-00	Field Coil Set (not used on G.E. Motor 5BC48JB5782)	1	
1	70-202-00	Field Coil Set (for G.E. Motor 5BC48JB582)	1	
2	80-200-00	Ball Bearing - Commutator End	1	
3	80-504-00	Ball Bearing - Pulley End	1	
4	70-195-10	Set of armature terminal & brush pair connectors, <u>not used</u> on motor 5BC48JB550 with suffix letter "C" or "D". Two required per motor. (Included in 70-188-00)	2	
*	4	70-196-00	Armature terminal & brush pair connector <u>used only</u> with motor 5BC48JB550 with suffix letter "C" or "D". Two required per motor. (included in 70-184-00).	2
5	70-184-00	Brush holder, without brushes, including brush springs, armature terminal & brush pair connectors. <u>Used only</u> on motor 5BC48JB550 with suffix letter "C" or "D".	1	
5	70-188-00	Brush holder, without brushes, including brush springs, armature terminal & brush pair connectors. <u>Not used</u> on motor 5BC48JB550 with suffix letter "C" "D".	1	
6	70-101-00	Motor Brush	4	
7	85-412-00	Brush Spring, Torsion	4	
8	30-801-00	Brush Inspection Cover	4	
9	45-506-00	Oil Seal	4	
10	70-210-62	Motor Terminals Insulator Kit	1	

* NOTE: This part replaces strap type 3 HP armature terminal and is 2 way interchangeable on 2 HP motors only.

Replacement parts for G.E. Motors 5BC48JB251 & 5BC48JB265.

2	80-200-00	Ball Bearing, Commutator End	1
3	80-504-00	Ball Bearing, Pulley End	1
5	70-185-00	Brush Holder Assembly	1
6	70-100-00	Motor Brush	4
7	85-401-00	Brush Spring, Extension	4
9	45-506-00	Oil Seal	4

Replacement for G.E. Motor 5BC48JB726

1	70-204-00	Field Coil Set	1
2	80-209-00	Ball Bearing, Commutator End	1
3	80-504-00	Ball Bearing, Pulley End	1
4	70-104-00	Armature Terminal & Brush Pair Connector	2
5	70-172-00	Brush Holder Assy. <u>Without</u> Brush Springs But <u>With</u> Brush Springs	1
7	85-412-00	Spring, Brush	4
9	45-506-00	Oil Seal	1

ELECTRIC MOTORS (continued)
REFER TO FIGURE 8

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
------------------	-----------------	-------------	--------------

Brush Measurement Procedure for 726 Motor.

With new brushes, a 1/16" drill rod can be inserted approximately .76" into brush measurement holes. Brushes should be replaced when rod can be inserted 1.56" into hole. This leaves approximately 1/8" allowable wear remaining.

Replacement Parts for G.E. Motor 5BC48JB67B & 5BC48JB114.

2	80-205-00	Ball Bearing, Commutator End	1
3	80-204-00	Ball Bearing, Pulley End	1
6	70-100-00	Motor Brush Assy	4
7	80-401-00	Brush Spring, Extension	4

Replacement Parts for T.D. Motor 388P3816 & Baldor 45-39W03, 45-39W16, 45-39W19.

2	80-200-00	Ball Bearing, Commutator End	1
3	80-504-00	Ball Bearing, Pulley End	1
5	70-187-00	Brush Head Assy. Complete with Brushes	1
6	70-101-00	Motor Brush	4
8	30-803-00	Brush Inspection Cover	4
9	45-506-00	Oil Seal	1

Replacement Parts for G. E. Motor 5BCG56EA17

2	80-201-00	Ball Bearing, Commutator End	1
3	80-504-00	Ball Bearing, Pulley End	1
5	70-189-00	Brush Holder Assembly	1
6	70-101-00	Motor Brush Assembly	4
7	85-412-00	Brush Torsion Spring	4

Replacement Parts for G.E. Motor 5BC49JB122

2	80-200-00	Ball Bearing, Commutator End	1
3	80-504-00	Ball Bearing, Pulley End	1
4	70-185-00	Brush Holder	1
6	70-100-00	Motor Brush	4
7	85-401-00	Brush Extension Spring	4
9	45-506-00	Oil Seal	1

Replacement Parts for G.E. Motor 5BC49JB305

1	70-203-00	Field Coil Set	1
2	80-200-00	Ball Bearing, Commutator End	1
3	80-504-00	Ball Bearing, Pulley End	1
4	70-195-10	Armature Terminal to Brush	2
5	70-188-00	Brush Holder Assembly	1
6	70-101-00	Motor Brush	4
7	85-412-00	Brush Extension Spring	4
8	30-802-00	Brush Inspection Cover	4
9	45-506-00	Oil Seal	1
10	70-210-62	Motor Terminals Insulator Kit	1

ELECTRIC MOTORS (continued)
REFER TO FIGURES 8

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
4	70-185-00	Brush Holder	
6	70-100-00	Motor Brush	1
7	85-401-00	Brush Extension Spring	4
9	45-506-00	Oil Seal	4
			1
Replacement Parts for G.E. Motor 5BC49JB305			
1	70-203-00	Field Coil Set	
2	80-200-00	Ball Bearing, Commutator End	1
3	80-504-00	Ball Bearing, Pulley End	1
4	70-195-10	Armature Terminal to Brush .	1
5	70-188-00	Brush Holder Assembly	2
6	70-101-00	Motor Brush	1
7	85-412-00	Brush Extension Spring	4
8	30-802-00	Brush Inspection Cover	4
9	45-506-00	Oil Seal	4
10	70-210-62	Motor Terminals Insulator Kit	1
			1
Replacement Parts for Taylor-Dunn Motor 388P381A			
2	80-204-00	Ball Bearing, Commutator End	
3	80-205-00	Ball Bearing, Shaft End	1
5	*70-187-00	Brush Head Assembly. Complete with Brushes * Not supplied as original equipment on A series motor but must be used as replacement part.	1
6	*70-102-00	Motor Brush with Wire Hook * Replacement part for original A series motor NOT converted to new brush head assy. 70-187-00.	4
6	70-101-00	Motor Brush for A series motor to new brush head 70-187-00.	4
7	*85-413-00	Brush Torsion Spring * Replacement part for original A series motor not converted to new brush head assy. 70-187-00.	4
8	30-802-00	Brush Inspection Cover	
9	45-506-00	Oil Seal	1
			1
Replacement Parts of G.E. Motor 5BT1326A96			
2	80-504-00	Ball Bearing, Commutator End	
3	80-206-00	Ball Bearing, Shaft End	1
5	70-171-10	Brush Holder Assembly	1
6	70-112-00	Dual Motor Brush, One Terminal	1
7	85-398-00	Brush Spring	4
9	45-507-00	Oil Seal	8
			1
Replacement Parts for G.E. Motor 5BT1326B96			
2	80-504-00	Ball Bearing Commutator End	
3	80-206-00	Ball Bearing, Shaft End	1
5	70-171-00	Brush Holder Assembly	1
6	70-112-00	Dual Motor Brush, One terminal	1
7	85-398-00	Brush Spring	4
9	45-507-00	Oil Seal	8
			1

ELECTRIC MOTORS (continued)
REFER TO FIGURES 8

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
Replacement Parts for G.E. Motor 5BC48JB254			
2	80-504-00	Ball Bearing, Pulley End	1
3	80-200-00	Ball Bearing, Brush End	1
5	70-186-00	Brush Head Assy., without Brushes	1
6	70-111-00	Motor Brush, 1/2 x 1-1/4	4
7	85-401-00	Brush Spring	4
9	45-506-00	Oil Seal	1

ELECTRIC MOTOR
REFER TO FIGURE 8-A

MODEL SS ONLY

FOR D.C. MOTOR REPLACEMENT PARTS

IT IS NECESSRY TO INCLUDE COMPLETE MOTOR NAME PLACE DATA WITH THE ORDER

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
Replacement parts for Baldor Motor 3 H.P. 35P161Z113 T-D Part # 70-025-00			
A-1	70-617-11	End Plate, Pulley	1
A-2	80-504-00	Ball Bearing, Pulley End	1
A-3	80-202-00	Ball Bearing, Commutator	1
A-4	70-181-50	Brush Holder, Mounting Assembly	1
A-5	71-121-10	Brush, Motor	4
A-6	97-126-00	Washer, Wavey	1
A-7	70-617-10	End Plate, Front	1
A-8	30-804-00	Cover, Brush Inspection	1
A-9	70-210-60	Insulator, Terminals	4
A-10	85-408-00	Spring, Brush Torsion, Orange	4
A-11	70-206-00	Field Coil, Stator & Case With Terminals	1

Replacement Parts for G.E. Motor 5BC48JB814 (3 H.P. Motor)
Taylor-Dunn Part Number 70-025-20 Refer to Figure 8-B

B-1	70-204-10	Field Coil Set	1
B-2	80-504-30	Ball Bearing Commutator End	1
B-3	80-207-00	Ball Bearing Pulley End	1
B-5	70-174-00	Brush Holder Assembly W/O Brushes	1
B-6	70-114-00	Brush	4-2
B-7	85-413-20	Spring, Brush Extension	4-2
B-10	70-210-66	Kit, Motor Terminals, Insulator	1

ELECTRIC MOTORS (continued)
REFER TO FIGURES 8-C

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
Replacement Parts for G.E. Motor 5BC48JB754 (4.5 H.P. Motor) Taylor-Dunn Part Number 70-049-00. Refer to Figure 8-C			
C-1	70-205-00	Field Coil Set	1
C-2	80-200-00	Ball Bearing Commutator End	1
C-3	80-504-00	Ball Bearing Pulley End	1
C-5	70-172-00	Assembly W/O Brushes	1
C-6	70-104-00	Brush	1
C-7	85-412-00	Spring, Brush Extension	4
C-8	70-250-00	Gasket, Terminal	4
C-9	45-506-00	Seal, Oil	4
C-10	70-210-62	Insulator Kit, Motor Terms	1

MAINTENANCE PROCEDURES
MASTER CONTROL SWITCH
REFER TO FIGURE 9
RHEOSTAT MODEL

GENERAL

CAUTION: Before working on the Master Control Switch or any part of the vehicle electrical system, disconnect both main positive & negative battery leads, place the forward/reverse switch in NEUTRAL, turn key off and remove from switch. Set Parking Brake.

The Master Control Switch supplied with your vehicle controls speed of travel. It is located below the deck board and is readily accessible for routine maintenance. The switching components are rugged, designed for long life and trouble free operation. Maintenance requirements are simple and easy to perform. Adherence to a regular schedule will assure maximum life of, and minimum trouble with the system.

It is recommended that all terminal connections be checked and tightened at least once a month. If a terminal bolt or wire becomes loose, sufficient heat will be generated to cause permanent damage at the connection. Disconnect battery leads while servicing to prevent unintentional vehicle movement.

Refer to Section 4 and 5 for recommended scheduling of routine maintenance and for lubrication instructions.

Refer to Service and Adjustment instructions of this section of the manual for replacement and adjustment procedures.

FORWARD/REVERSE SWITCH

The forward/reverse switch (a rocker type) is mounted on operator's console. IT SHOULD NOT BE OPERATED WHILE THE VEHICLE IS IN MOTION. This seriously reduces the life of the switch through arcing, and will place excessive strain on the motor, and on their components in the power train.

SPEED CONTROL SWITCH

The Speed Control Switch is operated by the accelerator pedal and linkage. Voltage applied to the motor is varied by the use of resistance wire, mounted rearward of the switch, and by varying the number of batteries applies to the motor circuit. A light coating of grease MUST be maintained on the power bars where there is contact with the contact buttons, and periodic cleaning is essential to prevent short circuits and assure proper operation.

MODEL SS
MAINTENANCE PROCEDURES continued
MASTER CONTROL SWITCH
REFER TO FIGURE 9

RHEOSTAT CONTROL SWITCH continued

Clean off all dirt & grease on and between the power bars and contact buttons with a suitable rag, plastic probe or with an electrically nonconductive object. Steam cleaning will accomplish the same result. The important thing to remember is NOT TO USE any object, for switch cleaning or lubing purposes, that contains metal or is metal coated.

CAUTION: Whenever service work is to be performed on the electrical system, disconnect the two main positive & negative battery jumpers to prevent accidental engagement of power while servicing switch.

ADJUSTMENT OF SPEED CONTROL LINKAGE (Refer to Diagram A)

1. Place Forward/Reverse switch in OFF position. Lock and remove key.
2. Depress accelerator pedal until it contacts floor board, and note position of speed rotor contact button and speed rotor. Button should be in full contact with high speed power bar, with a minimum of 1/32 inch clearance between rotor and nut on lower screw of high speed power bar.
3. If contact button is not in proper position, disengage accelerator return spring from accelerator rod, and loosen nuts on rod which bear against ball joint rod ends. NOTE: Threads at lower end of rod are left-hand threads.
4. Turn rod to change effective length. Lengthening the rod will move the button toward the third speed bar, while shortening it will move it toward the second speed bar.
5. When proper adjustment has been made, tighten locking nuts on rod against ball joint ends, and re-engage accelerator return spring.
6. With accelerator pedal released, contact button must be in full contact with first speed bar. This will automatically occur when high speed position is properly adjusted, unless the accelerator pedal extension bar has been bent out of position. Should this have occurred, it will be necessary to bend the pedal extension bar into position and repeat the adjustment outlined above.

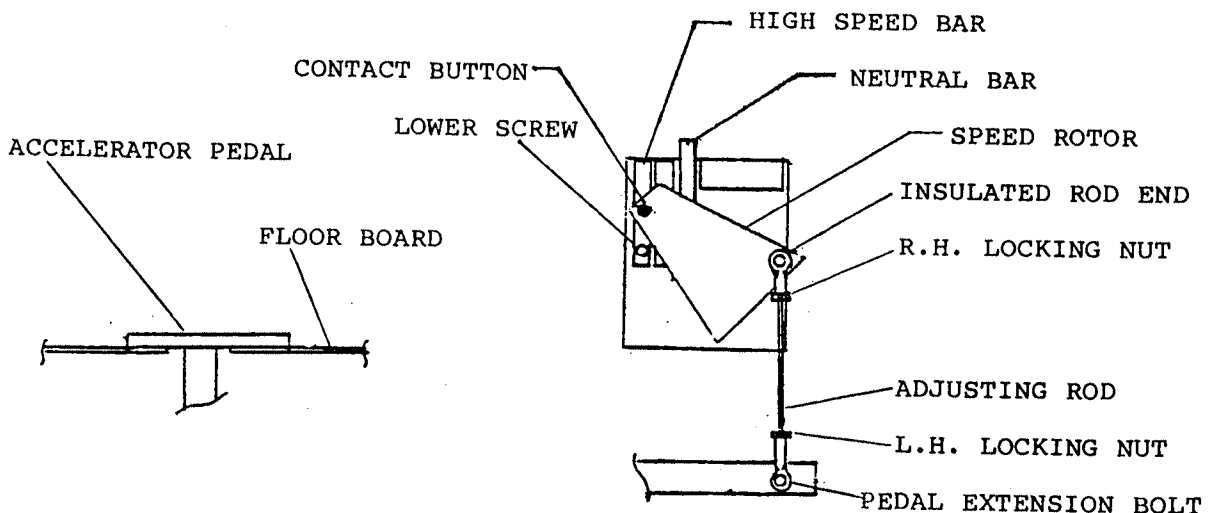


DIAGRAM A

SERVICE AND ADJUSTMENT continued

RHEOSTAT CONTROL SWITCH
REFER TO FIGURE 9

REMOVE AND REPLACE RHEOSTAT (61-844-17)

1. Disconnect the two outer jumpers which connect the front and rear batteries.
2. Disengage accelerator return spring.
3. Remove pedal extension bolt and nut (See Diagram A).
4. Remove two switch mounting screws at bottom of mounting board.
5. Note locations of wires connected to switch and mark accordingly to assure their return to correct locations and disconnect from switch.
6. For Service of Adjustments refer to other Subsections of this Section of manual.
7. Replace Switch in reverse order of removal. Before connecting battery leads, adjust speed control linkage as outlined in preceding Subsection, and lubricate rotor contact path.

REPLACE SPEED ROTOR CONTACT BUTTONS (71-030-58)

1. Disconnect the two outer jumpers which connect the front and rear batteries.
2. Disengage accelerator return spring.
3. Loosen nuts which lock accelerator rod to ball joint rod ends, and disengage rod from rod end fastened to speed rotor.
4. Remove nut which retains rotor spring, and remove spring and rotor.
5. Install new contact buttons, check operation against power bars for smoothness, and dress any rough points on buttons or power bars.
6. Reassemble rotor to switch in reverse order of removal. Before connecting battery leads, adjust rotor spring pressure and Speed Control Linkage as described in appropriate Subsections of this Section of Manual, and lubricate rotor contact path.

***NOTE:** WHEN REPLACING CONTACT BUTTON IT IS PREFERABLE TO REPLACE ALL THREE AS A SET. THIS WILL INSURE EVENNESS OF WEAR DURING OPERATION.

MODEL SS
SERVICE AND ADJUSTMENT continued

ADJUSTMENT OF ROTOR SPRING (85-034-00)

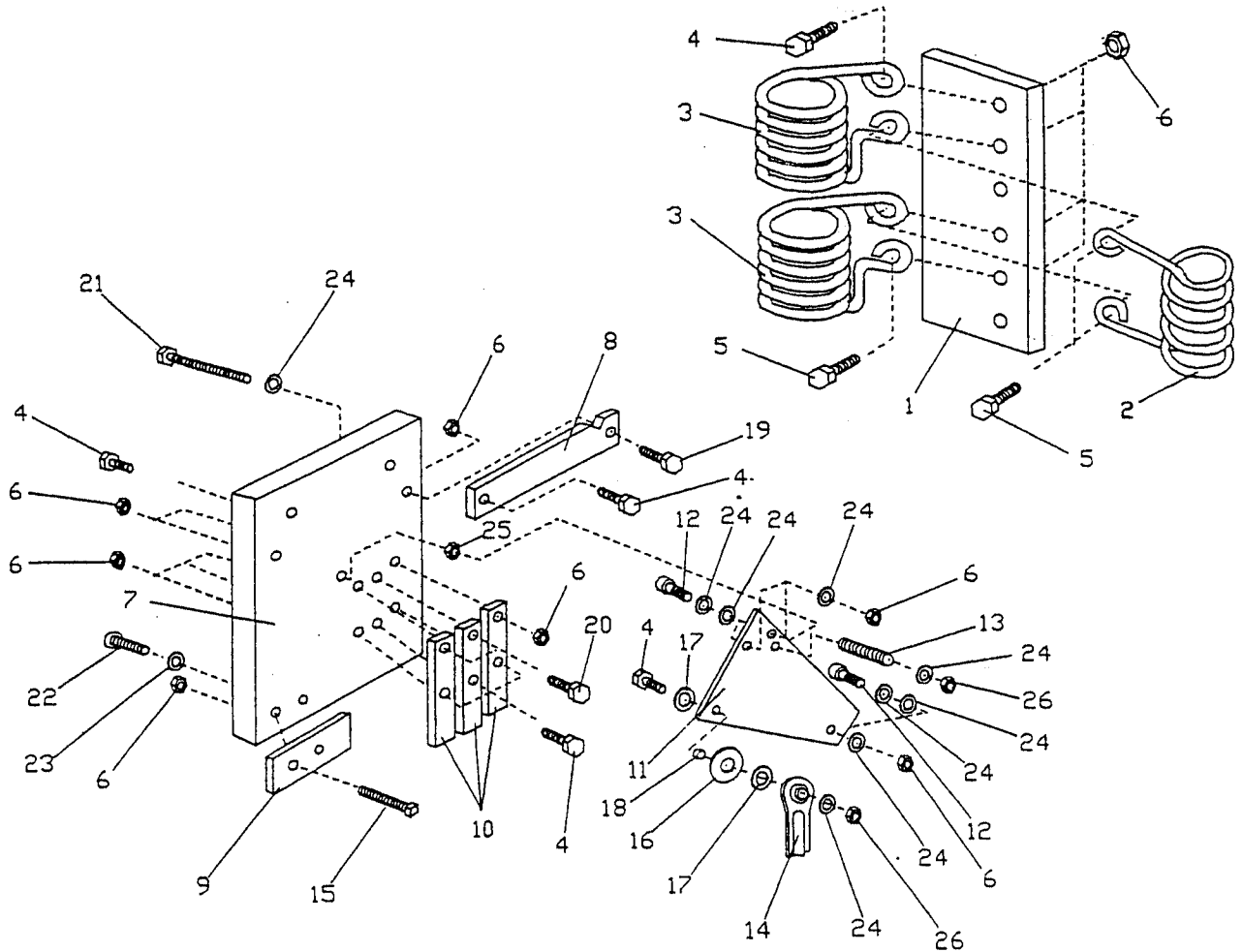
Firm, but not binding, pressure must be maintained between the contact buttons and power bars. The rate of wear of these components, in normal use is very slight, and frequent adjustment are not necessary. The proper pressure setting is - Compress 2" spring to 1-1/2 to 1-3/8.

REPLACE POWER BARS (61-844-51)

NOTE: Power bars tend to wear at the same rate, except when one bar may become excessively burned because of poor contact. When replacing with new power bars, it is important that all bars be of the same thickness. Binding and sticking will occur when bars are not of uniform thickness. For this reason, it is recommended that power bars be replaced as a full set.

1. Follow steps 1 through 6 in Subsection titled "Remove and Replace Master Control Switch".
2. Remove holding screws or nuts from power bars and slide power bars from switch.
3. Clean switch thoroughly and install new power bars.
4. Check operation for smoothness, and dress any rough points on contact buttons or power bars.
5. Lubricate the paths of the contact buttons with a light coating of grease, and reassemble to console and vehicle in reverse order of removal. Before connecting battery leads, adjust Speed Control Linkage as described in Subsection of this Section of Manual.

SS 5-34
MASTER RHEOSTAT CONTROL SWITCH, 61-844-17
& COIL BOARD ASSEMBLY, 78-225-13
Figure 9



MODEL SS
RHEOSTAT, 61-844-17 AND COIL BOARD ASSEMBLY, 78-225-13
REFER TO FIGURE 9

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
9-1	78-225-00	COIL MOUNTING BOARD	1
9-2	78-214-00	RESISTOR, #5	1
9-3	78-212-52	RESISTOR COIL, #6 WIRE SS 5-34	1
9-4	88-060-13	1/4 X 1-1/4 HEX HEAD BOLT	2
9-5	88-067-14	1/4 X 1-1/2 HEX TAP BOLT	7
9-6	88-067-87	1/4 NC KEPS NUT	3
9-7	61-844-03	RHEOSTAT MOUNTING BOARD	16
9-8	61-831-52	POWER BAR, STEEL	1
9-9	61-844-40	BUSS BAR, 1ST SPEED	1
9-10	61-844-51	POWER BAR, 1/4 X 1/2 X 2-1/2	1
			3
9-11	61-844-54	ROTOR, 3 SPEED SWITCH	
9-12	71-030-58	SWITCH CONTACT BUTTON	1
9-13	85-034-00	SPRING, COMPRESSION	3
9-14	86-503-99	ROD END, 1/4-28 THD, RIGHT	1
9-15	96-340-02	BOLT .25 X 1.5 SQUARE HEAD	1
9-16	97-169-00	WASHER, NYLATRON	1
9-17	97-170-00	WASHER, INSULATED, 3/4 OD	1
9-18	32-212-50	BUSHING, PLASTIC, 1/4 ID X 1/4	2
9-19	88-060-12	1/4 X 1-1/8 NC HEX BOLT	1
9-20	88-060-09	1/4 X 3/4 NC HEX BOLT	1
			2
9-21	88-067-20	1/4 X 3 NC HEX TAP BOLT	
9-22	88-025-08	8-32 X 5/8 TRUSS HEAD MACHINE SCREW	1
9-23	88-028-62	#8 LOCK WASHER	1
9-24	88-068-61	1/4 SAE WASHER	1
9-25	88-069-80	1/4 NC HEX NUT	12
9-26	88-069-81	1/4 NC LOCKNUT	1
			2

MODEL SS
ACCELERATOR, RHEOSTAT CONTROL
62-033-42

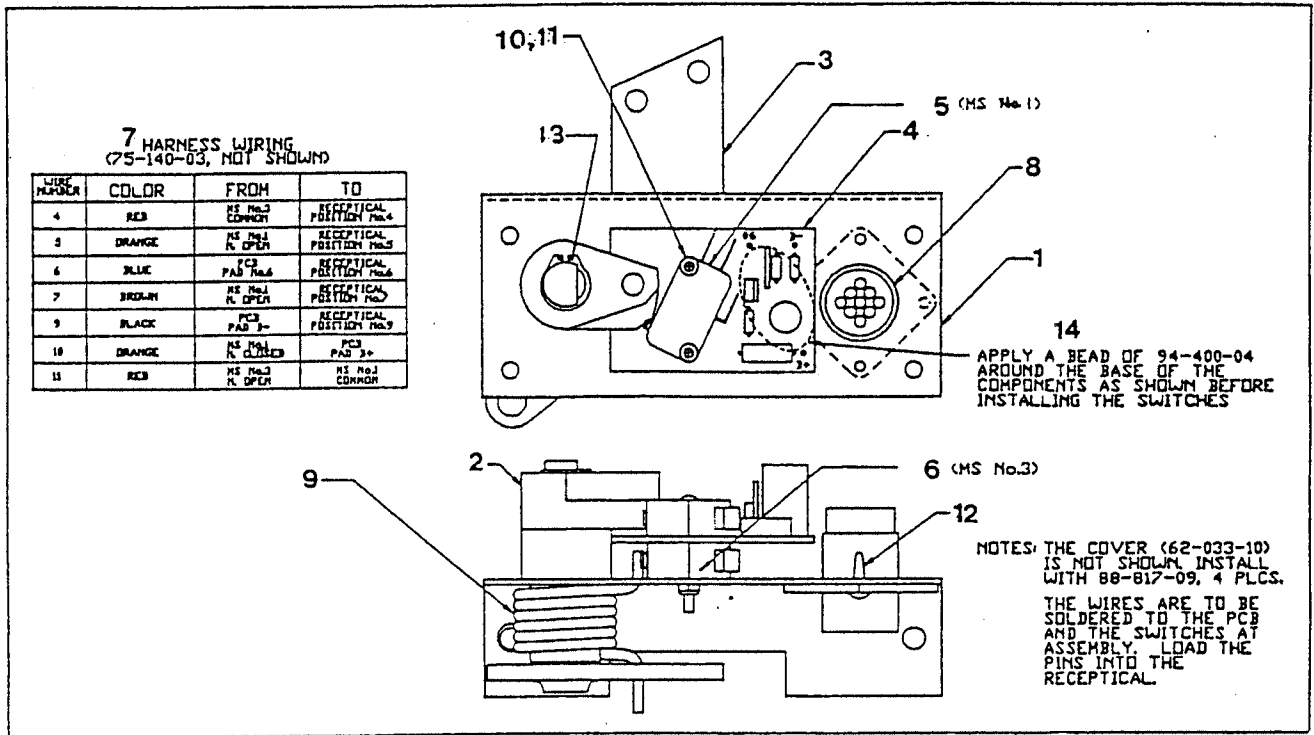
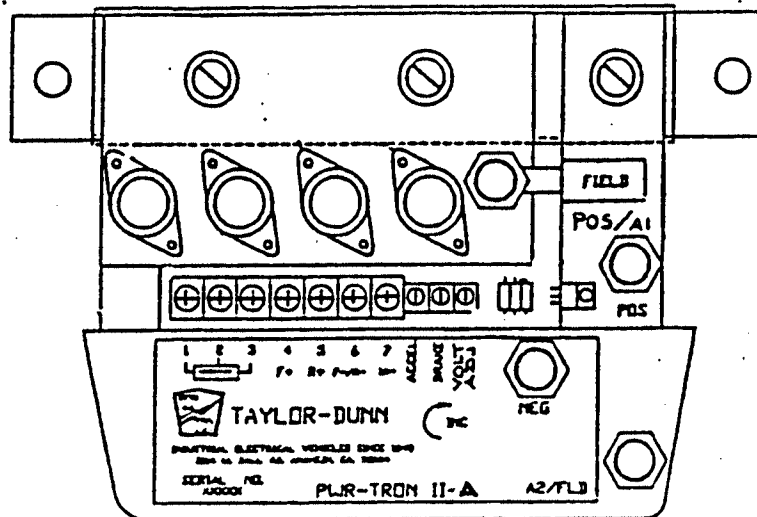


FIG I.D.	PART NO.	DESCRIPTION	QTY.
1	62-033-01	ASSEMBLY, BACKING PLT, ACCEL	1
2	62-033-06	CAM, W/O MAGNET	1
	* 62-033-10	COVER, SOLID STATE ACCELERATOR	1
3	62-033-52	WELDMENT, ROTOR, SHORT, SHORT ARM	1
4	62-033-81	PCB, INTERLOCK, RHEOSTAT, W/COMP	1
5	71-127-00	SW, SNAP ACTION, MINIATURE (MS NO. 1)	1
6	71-127-05	SWT, SNAP ACTION, SHORT LEVER (MS NO. 3)	1
7	75-140-03	HARNESS, RHEOSTAT ACCEL	1
8	75-440-20	RECEPTACLE, SQUARE FLANGE, 9	1
	75-440-22	SEAL, RECEPTACLE, 9 POS AMP	1
9	85-352-38	SPRING, TORSION, SOLID STATE	1
10	88-005-11	4-40 X 1-1/4 TRUSS HEAD SCREW	2
11	88-009-81	4-40 LOCK NUT	2
12	88-606-00	CLIP, CANOE, .125 X .16 GRIP	2
	* 88-817-09	#8 X 3/4 PAN HEAD METAL SCREW	4
13	88-840-08	RING SNAP 1/2 EXT.	1
14	94-400-04	RTVS, FOR PCB, 2.8 OZ TUBE	.05

* REMOVED FOR CLARITY, SCREWS USED FOR MOUNTING COVER

MODEL SS
PWR-TRON II INTRODUCTION

The PWR-TRON II is developed and available only from Taylor-Dunn and is warranted for one full year. Modifications to the control unit, drive or power system will void the warranty.



PT180 (STANDARD)

24 VOLTS
RECOMMENDED FOR
USE UP TO 6 HP
MOTORS.
(INTERMITTENT)

INTRODUCTION

PWR-TRON II transistorized control is a solid state voltage regulator designed specifically for use on electric vehicles. Its essential function is to regulate the power fed from battery to motor so as to provide full control of the vehicle speed under all operating conditions.

The PWR-TRON II unit is connected in between the motor and the battery. Power fed to the motor is regulated by switching the motor on and off at high speed. By adjusting the ON time with respect to the OFF time the average voltage applied to the motor can be varied. This switching is done using power transistors.

MODEL SS
PWR-TRON II ELECTRIC VEHICLE CONTROL

FEATURES

Current Limit - Cold current limit is 180 A, for type A.

Thermal Roll-Back - Continuous overloading will reduce the current limit progressively above 150 degrees F (65 degrees C).

Acceleration Limit - Built in acceleration ramp to prevent jack-rabbit starts (can be factory set for various applications, or may be adjustable).

Automatic Plug Braking - Built in plugging control to give smooth reversals and prevent operator injury or equipment damage with inadvertent direction changes.

Bypass Enables and Time Delay - Built in circuitry give on-demand bypass (1A) facility and plugging hold-off.

Special Feature - Faulty transistor detection helps prevent vehicle runaway or dangerous starts.

Add-on Protection - Suppression diodes for the Forward/Reverse and By-pass Contactor Coils are incorporated in the PWR-TRON II unit. If the vehicle has other contactors for power steering, pumps, etc., these coils must also be suppressed by fitting a diode across them.

The PWR-TRON II unit may have a number of adjustments enabling a control to be custom set for a particular installation. The adjustments do not override any of the safety functions, hence the control unit will not be damaged by incorrect setting of the following functions:

Acceleration - The rate of acceleration can be preset by means of the ACCEL trimpot on the logic. This cannot be overridden by rapid depression of the accelerator.

Brake - The brake control adjusts the deceleration rate in the plug braking mode. As protection to the motor and other electrical devices, the braking effect is kept low. The vehicle should be stopped using the service brake.

Volts Adjust/Low Speed - This trimmer is used to adjust for different supply voltages and when incorrectly set, will cause a delay between the operation of the accelerator and the movement of the vehicle and may cause instability during plug braking mode.

GENERAL

The PWR-TRON unit is readily accessible under the deckboard. The PWR-TRON unit performs two functions; power control for speed and acceleration rate control for smooth operation. The PWR-TRON unit is a transistorized supply that regulates the voltage from the battery. An accelerator module provides a signal to the PWR-TRON proportional to the desired power output of the control. This gives the operator full control of the vehicle power and speed.

MODEL SS
PWR-TRON II

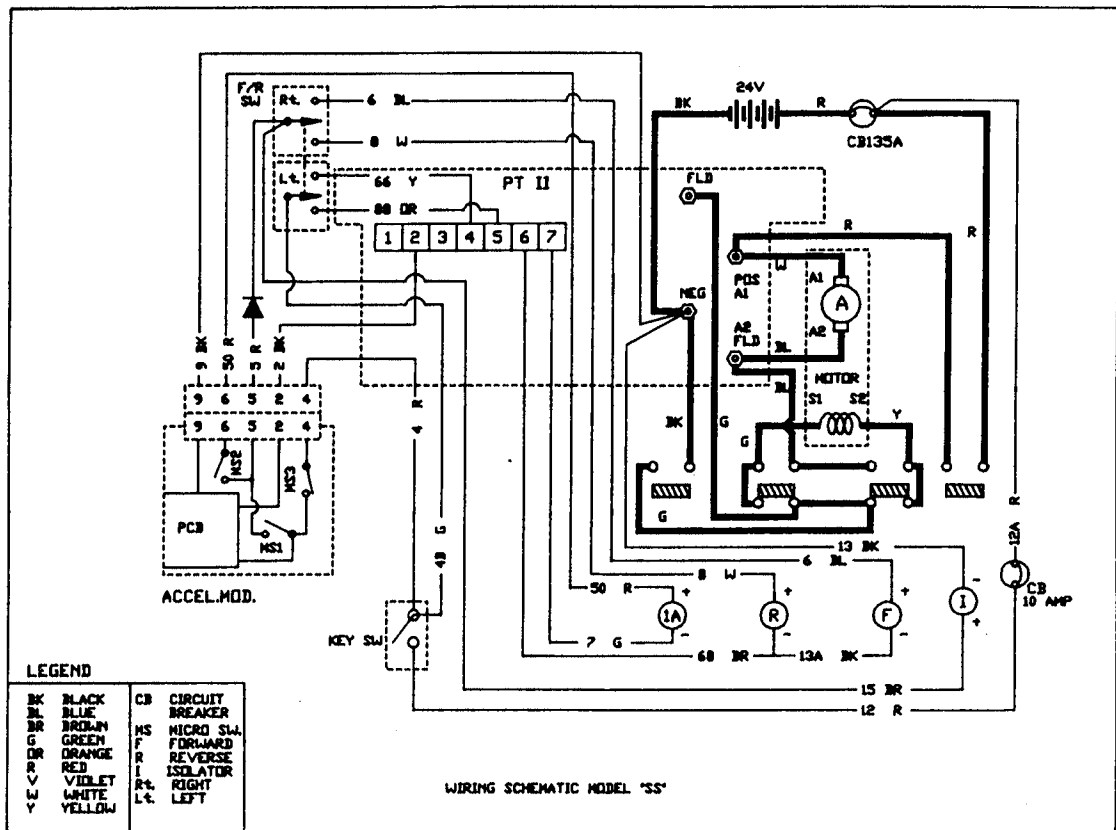


Figure 1

CIRCUITRY AND OPERATION

There are two circuits included in the operation of the PWR-TRON II, the control circuit and the power circuit.

The control circuit (light gauge wire) includes: key switch, seat switch, MS-1; activated by the accelerator module, the PWR-TRON solid state controller, forward-reverse switch and solenoid panel.

The power circuit (heavy gauge wire) includes the batteries, forward reverse switch and motor.

CONTROL CIRCUIT (See Figure 1, Shown in light lines) CONTROL HARNESS 75-146-24

Forward Operation. 1) Turn key to "ON" position and move forward-reverse switch to forward position. 2) As the accelerator is depressed, a cam, MS1 closes providing a current path to the forward solenoid coil and closing forward contact on the forward-reverse switch. 3) The magnetic sensor on the PCB board will increase the PWR-TRON signal voltage moving vehicle forward reverse operation. As the accelerator is depressed, a cam on the PCB board will increase the voltage, moving the vehicle forward.

Reverse Operation. 1) Turn key to "ON" position and move forward-reverse switch to reverse position. 2) As the accelerator is depressed, a cam, MS1 closes providing a current path to the reverse solenoid coil and closing reverse contact on the forward-reverse switch. 3) The magnetic sensor on the PCB board will increase the PWR-TRON signal voltage moving vehicle forward reverse operation. As the accelerator is depressed, a cam on the PCB board will increase the voltage, moving the vehicle in reverse.

MODEL SS PWR-TRON II

POWER CIRCUIT (See Figure 1, Shown in Heavy lines) POWER HARNES 75-147-24
Forward operation. When the control circuit is energized and the isolator and forward solenoid contacts are closed current flow is then channeled through the PWR-TRON II and then to the power wiring. Motor speed is controlled by voltage output from the PWR-TRON II.

Reverse operation. The same circuit is used as forward operation except the reverse solenoids contact (not forward) is closed to reverse current flow through the motor.

When the accelerator is fully depressed, a microswitch (MS-2) is closed which activates the bypass solenoid (1A). This provides full battery potential to the motor.

OPERATING YOUR PWR-TRON II

To put your vehicle into operation, turn ignition key to "ON". Select direction you wish to travel by moving forward/reverse switch to desired position. Release parking brake, slowly depress accelerator pedal until vehicle is moving at desired speed.

You will notice your vehicle has a smooth transition from start to high speed operation. This is a built-in characteristic of the PWR-TRON II speed control, avoiding "jack-rabbit" starts.

"Plug braking" is an additional feature of the PWR-TRON. It is a safety feature that makes it unnecessary to come to a complete stop before reversing the vehicle. When reversed, the vehicle will automatically slow to a stop and reverse itself to full acceleration. This maneuver does no damage to the PWR-TRON II. However, stopping the vehicle should be done with the service brake. Also, it is recommended when starting the vehicle to be sure to always turn ignition key on first then select direction of travel with the forward-reverse switch, before depressing the accelerator pedal.

PWR-TRON II PREVENTIVE MAINTENANCE

WARNING: BEFORE WORKING ON THE PWR-TRON UNITS OR ANY PART OF THE VEHICLE SYSTEM, DISCONNECT BOTH THE MAIN POSITIVE AND NEGATIVE BATTERY LEADS. PLACE THE FORWARD-REVERSE LEVER IN NEUTRAL, TURN OFF AND REMOVE KEY. ALWAYS SET PARKING BRAKE.

* No regular maintenance is required.

Be sure ignition key is on before depressing accelerator pedal. DO NOT depress pedal then turn on key. This is unsafe operation.

CAUTION:

Do not steam clean or spray with water.

Make sure all wire connections are secure.

There are three modules as part of this system, solenoid panel, accelerator module and PWR-TRON II module. These are all easily removable for replacement and service.

Only qualified service personnel should perform any replacement, adjustments or servicing of the PWR-TRON II module, solenoid panel or the accelerator module. This will avoid the possibility of voiding your warranty on the PWR-TRON

When returning vehicle to pre-service configuration make certain batteries are properly connected to avoid damage.

MODEL SS
PWR-TRON II PREVENTIVE MAINTENANCE

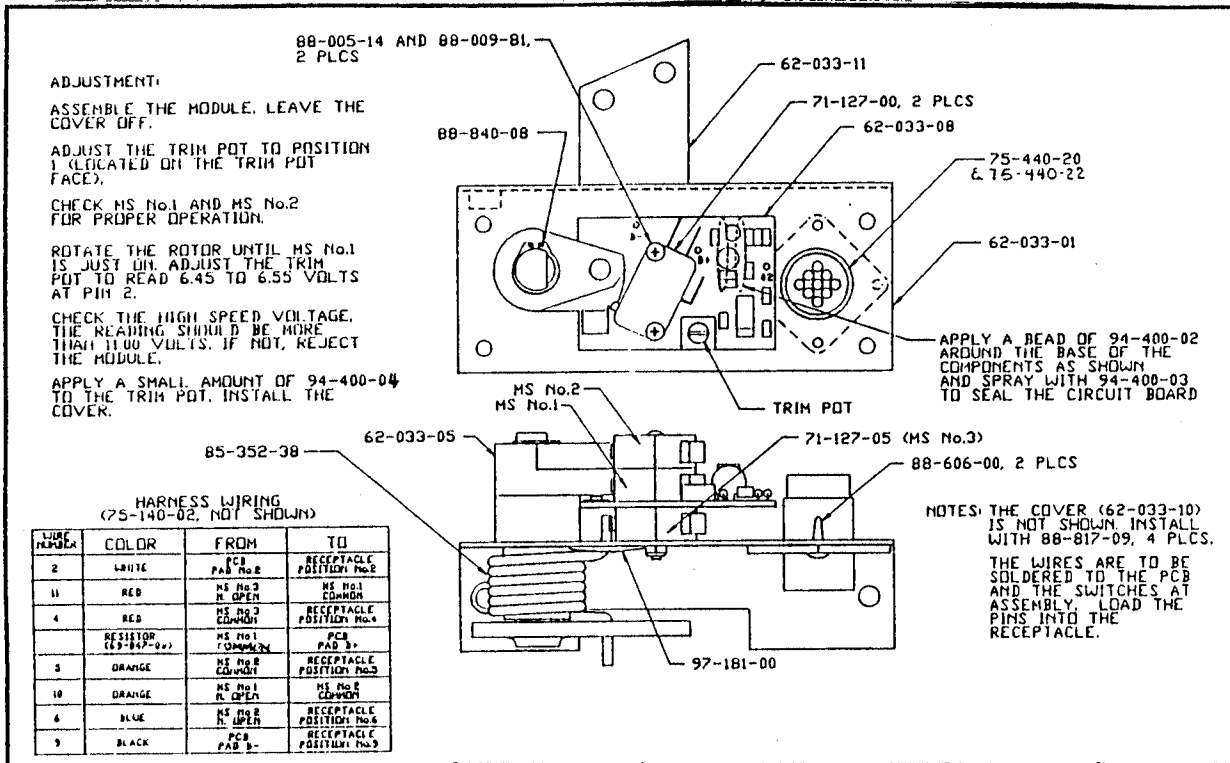
1. REPAIR OR REPLACEMENT OF INDIVIDUAL COMPONENTS

If replacement of semi-conductors, i.e. transistors or diodes becomes necessary, the following points must be rigidly adhered. The serviceman is advised that in the event of uncertainty over repair procedures, it is better to change the complete control unit, rather than risk further damage with an improper repair.

- (a) Transistors - These are available as a factory approved spare consisting of a matched set of transistors. Only factory approved spares must be used. **Replacement of individual transistors invalidates warranty.**
- (b) Insulation - The wire insulation material (fiberglass reinforced teflon) must be kept absolutely clean. The electrical isolation between heatsink and baseplate must be checked with an Ohm meter after assembly. Check that the resistance is greater than 1 Megohm (1,000,000 Ohms).
- (c) Wiring - The positions of all wires and lugs should be noted and marked prior to removal so that there is no confusion on re-assembly.
- (d) Component Polarity - Transistors can be damaged by quite modest currents incorrectly applied and are destroyed by reverse currents. If replacing transistors, ensure that polarity is correct.
- (e) Connections - Check all connections for tightness on completion.
- (f) Final Checks - Prior to the first switch on, **check battery polarity.** Use test light to ensure safety.

* **NOTE:** Any controllers that will be used in ambient temperature above 104 degrees F or 40 degrees C should be brought to the attention of the truck manufacturer.

MODEL SS
ACCELERATOR MODULE



ACCELERATOR MODULE
FIGURE 2

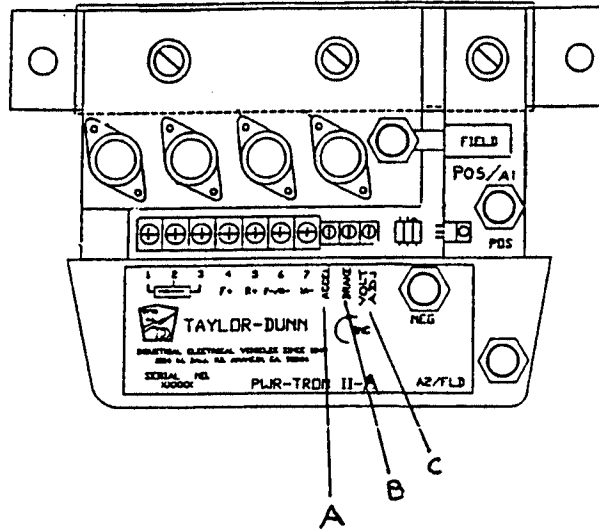
GENERAL FEATURES

This item is a solid state module, factory adjusted. The accelerator mounts directly to the accelerator pedal eliminating the need for any intermediate linkage. Should it become necessary to adjust the solid state accelerator, remove the accelerator from the vehicle.

Double Check Battery Polarity Severe damage will result if the battery polarity is reversed.

It is always good practice to use the test light (part number 62-027-00) in series with the motor, prior to initial turn on. This will indicate any abnormalities in the control.

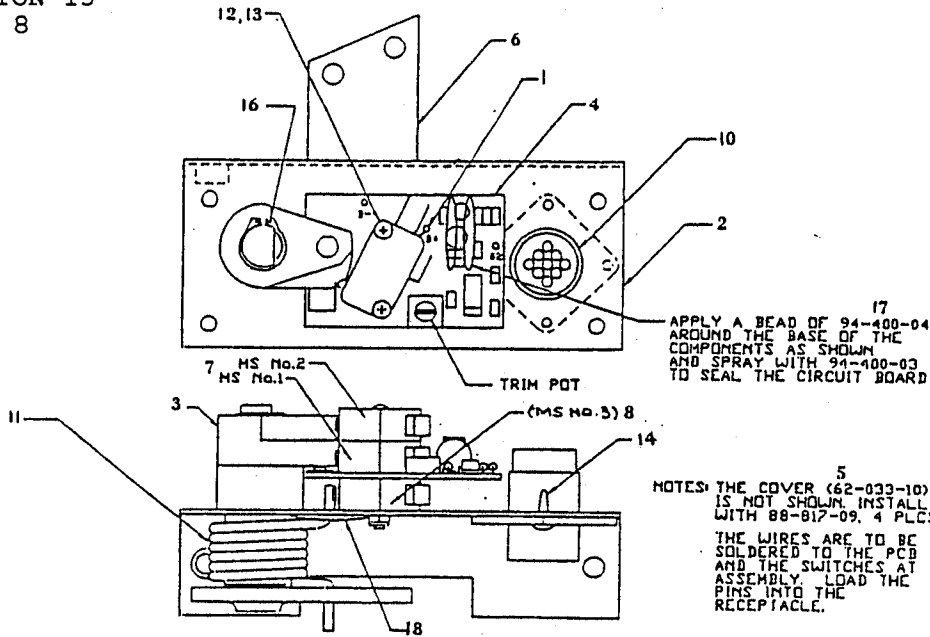
MODEL SS



PWR-TRON II TRIMPOT ADJUSTMENTS

- A. ACCELERATOR - Turn full direction of arrow
- B. BRAKE - Turn full opposite direction of arrow to start. Turn up 1/4 in direction of arrow.
- C. VOLTS ADJUST - Adjust trimpot so motor whines but does not turn when accelerator switch is first closed.

AFTER ALL POTS HAVE BEEN FINAL ADJUSTED, COAT POTS WITH WHITE SILICONE SEALANT.

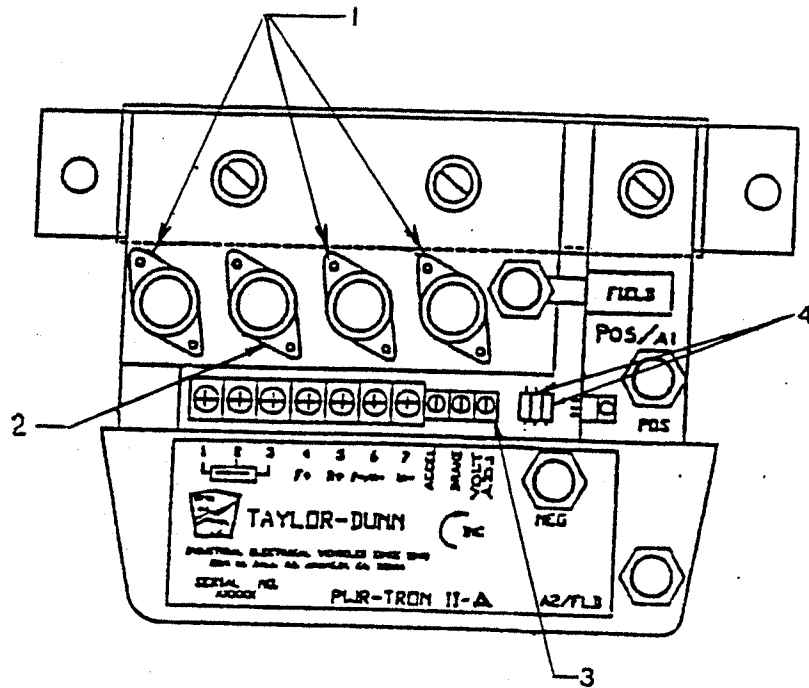


HARNESS WIRING - 9 (75-140-02, NOT SHOWN)

WIRE NUMBER	COLOR	FROM	TO
2	WHITE	PCB PAD NO. 2	RECEPTACLE POSITION NO. 2
11	RED	MS NO. 3 N. OPEN	MS NO. 1 COMMON
4	RED	MS NO. 3 COMMON	RECEPTACLE POSITION NO. 4
5	RESISTOR (69-047-01) ORANGE	MS NO. 1 COMMON	PCB PAD B+
10	ORANGE	MS NO. 2 COMMON	RECEPTACLE POSITION NO. 5
6	BLUE	MS NO. 1 N. OPEN	MS NO. 2 COMMON
9	BLACK	MS NO. 2 N. OPEN	RECEPTACLE POSITION NO. 6
		PCB PAD B-	RECEPTACLE POSITION NO. 9

ACCELERATOR (SOLID STATE) MODULE (COVER NOT SHOWN) 62-033-00

FIG ID	T-D PART	DESCRIPTION	QTY.
1.	69-047-01	RESISTOR 47 OHMS, 1 WATT	1
2.	62-033-01	ASSEMBLY, BACKING PLATE	1
3.	62-033-05	ASSEMBLY, CAM W/MAGNET	1
4.	62-033-08	PCB WITH COMPONENTS	1
5.	62-033-10	COVER, SOLID STATE ACCELERATOR (NOT SHOWN)	1
6.	62-033-11	WELDMENT, ROTOR, SOLID STATE ACCELERATOR	1
7.	71-127-00	SW, SNAP ACTION MINIATURE	2
8.	71-127-05	SWT. SNAP ACTION, SHORT LEVER	1
9.	75-140-02	HARNESS, SOLID STATE AC	1
10.	75-440-20	RECEPTACLE, SQUARE FLANGE, 9	1
11.	85-352-38	SPRING, TORSION, SOLID STATE	1
12.	88-005-14	4-40 X 1-1/2 MACHINE SCREW	2
13.	88-009-81	4-40 LOCK NUT	2
14.	88-606-00	CLIP, CANOE, .125 X .16 GRIP	2
15.	88-817-09	#8 X 3/4 PAN HEAD SCREW (FOR COVER MOUNTING)	4
16.	88-840-08	RING SNAP 1/2 EXT	1
17.	94-400-02	SEALANT, SILICONE, BLACK	1
18.	97-181-00	WASHER, 22 GA SST .141 X .875	1

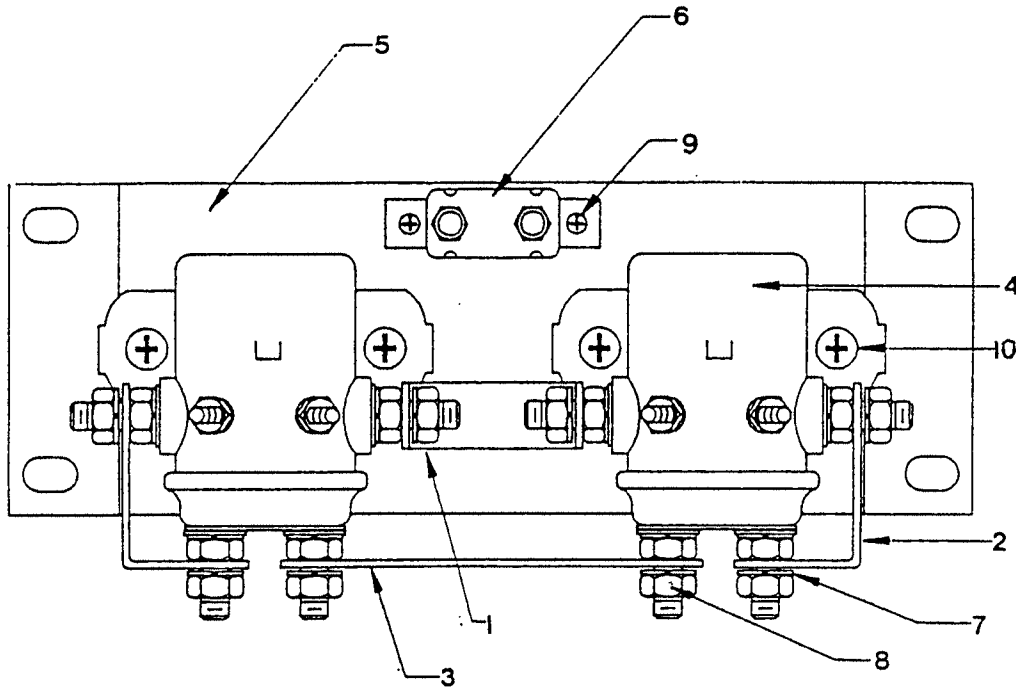


PARTS LIST

PWR-TRON II MODEL 180 PART NO. 62-018-00

FIG. ID	T-D PART	DESCRIPTION	QTY.
1	62-018-32	POWER TRANSISTORS (3)	1 (SET)
2	62-018-31	DRIVER TRANSISTOR	1
3	69-020-30	TRIMPOT, 20K OHM (3/8 SQUARE)	3
4	69-056-92	RESISTOR, 5.6 OHM, 1/2 WATT (2)	1 (SET)

MODEL SS



24 VOLT SOLENOID PANEL ASSEMBLY PART NO. 72-560-04

PARTS LIST

FIG.ID	T-D PART	DESCRIPTION	QTY.
1	61-838-33	BUSS BAR, COPPER, U-SHAPE	1
2	61-838-34	BUSS BAR, COPPER, L-SHAPE	2
3	61-838-35	BUSS BAR, COPPER, 5/8 X 3-15/16	1
4	72-511-25	SOLENOID, 24V SPDT	2
5	72-560-54	PANEL, FWD/REV MTG., SS	1
6	79-78-840-00	CIRCUIT BRKR, 10AMP, AUTO	1
7	88-088-63	5/16 LOCK WASHER, INT TOOTH	8
8	88-089-91	6/16 NC HEX JAM NUT	8
9	88-818-06	#8 X 1/2 PAN HD SCR TYPE B THD	2
10	88-838-06	#14 X 1/2 PAN HD SC TYPE A THD	4

* NOTE: 79-511-00 SOLENOID, 24V SPST
USED FOR 1A BYPASS AND ISOLATOR ARE MOUNTED SEPARATELY
FROM PANEL SEE PAGE 3, THIS SECTION.

MODEL SS PWR-TRON II
TROUBLE SHOOTING

Before proceeding with any trouble shooting, read the manual; understand the basic principles of operation and be familiar with component testing and replacement procedures. The PWR-TRON II controller, when operating correctly, will emit a clear whistle, the frequency of which is related to the frequency of the ON/OFF chopper action. The pulsing of the equipment is too fast to measure with conventional equipment and the following fault procedure is based on the use of simple tools.

TOOLS AND EQUIPMENT REQUIRED

- (a) Test light, part number 62-027-00
- (b) Clip leads.
- (c) Multimeter

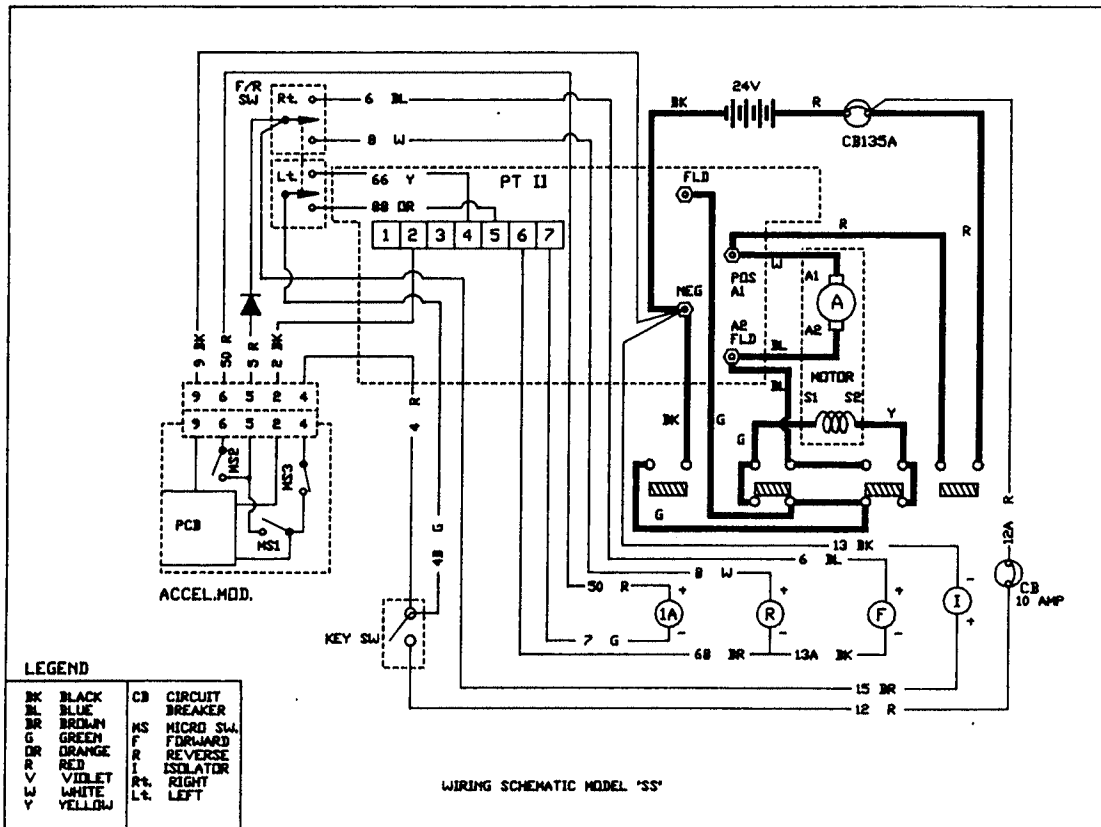
PHYSICAL INSPECTION

Check controller for physical damage, loose or broken wiring, evidence of component overheating, etc. Pay particular attention to adjustment of accelerator switch and potentiometer operation.

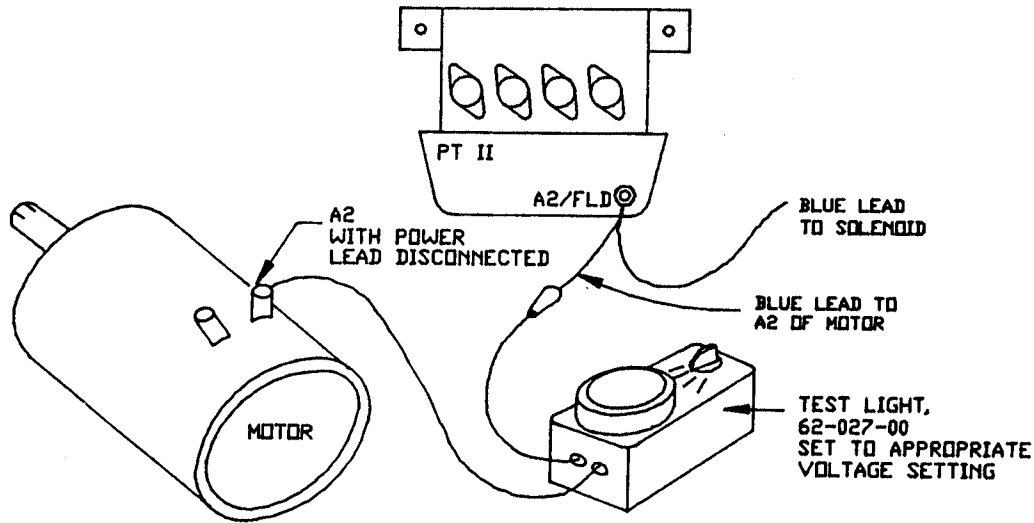
Prior to touching any electrical components **DISCONNECT BATTERY AND CONNECT TEST LIGHT IN SERIES WITH MOTOR ARMATURE.** (See Continuity & Power Check next page).

Reconnect battery as needed for carrying out any specific tests.

PWR-TRON II SCHEMATIC



MODEL SS
PWR-TRON II



CONTINUITY AND POWER CHECK

NOTE: VEHICLE DRIVE WHEELS MUST BE JACKED UP OFF THE FLOOR FOR THE FOLLOWING TEST.

CAUTION: THIS IS A FACTORY CHECKOUT PROCEDURE AND SHOULD ONLY BE MADE BY A QUALIFIED MECHANIC.

After the PWR-TRON II system has been installed, a preliminary power check is required, prior to fine tuning of the PWR-TRON. The vehicle should be ready for basic operation at this time.

Lift blue lead at A2 on motor (refer to Figure 1) and place test light in series with A2/FLD pole on PWR-TRON II. Place forward/reverse switch in forward. Initiate accelerator slowly, light should come up to maximum brilliance at full acceleration. Repeat same step for reverse. If problems are encountered, see "Trouble Shooting" in this section. Also check acceleration rate by quickly depressing accelerator full. Light should come to full brilliance in 3 seconds. **(CAUTION, do not perform plugging with light attached).**

When both steps are completed satisfactorily, place vehicle on floor, prepared for operation and fine tuning of the PWR-TRON II unit. Proceed to the page on "Trimpot Adjustment".

MODEL SS
PWR-TRON II
TROUBLE SHOOTING

<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
1. Vehicle will not reach full speed	Check that the accelerator is set up correctly and the voltage swing at logic pin 2 is correct (6.3 volts to 11 volts) Check acceleration setting on PWR-TRON II.
2. Vibration or roughness when braking	Incorrectly adjusted BRAKE TRIMPOT. See Trimpot Adjust in this section.
3. Weak and uneven braking forward and reverse.	Incorrectly adjusted BRAKE TRIMPOT. See Trimpot Adjust in this section.
4. Very strong braking	Incorrectly adjusted BRAKE TRIMPOT. See Trimpot Adjust in this section. Armature and Field connections interchanged. Armature and Field cables not independently routed back to controller.
5. Strong braking on freshly charged battery	BRAKE TRIMPOT set too high.
6. Delay between operation of accelerator and motion of vehicle	CREEP TRIMPOT not set properly.
7. Vehicle accelerates when key switch is on. No accelerator movement is necessary	CREEP TRIMPOT not set properly. Accelerator stop rest (mono directional) /center off rest position (Bi-directional) or linkages not correctly set up. Microswitch in accelerator not adjusted correctly.

MODEL SS
PWR-TRON II
TROUBLE SHOOTING

LOW OR NO MOTOR TORQUE

NO TEST VOLTAGES, FIRST PLACE TEST LIGHT IN SERIES WITH THE MOTOR.

SYMPTOM

POSSIBLE CAUSE

1. Solenoids do not operate. No voltage at solenoid coils.

Check power and control fuses. Replace if defective.

Check for power at both sides of key switch.

Check for power at both sides of direction switch.

Check for power at both sides of brake switch.

Check for flat or reversed battery.

If there is voltage at requested solenoid coil.

Check that there is no short between FLD and NEG, e.g. shorted transistor, welded bypass contacts.

Check that battery voltage is reaching terminals 4 (Forward), 5 (Reverse) as relevant.

2. Solenoid close. No power and no transistor whistle when speed is wound up.

Check circuit breaker. Battery voltage should appear at both ends of fuse.

Check battery volts.

Check accelerator circuit and operation of speed pot - To do this, place test light in series with the armature and wind the speed up and down with accelerator pedal. The voltage at logic terminal 2 should move from 6.3 volts to 11 volts. If it stays at 6.3 volts the fault is in the accelerator wiring. If voltage stays high, accelerator may be bad or it has lost negative lead to battery.

Check motor circuit. If the voltage at FLD terminal is lower than B+ then examine the motor circuit for worn brushes, sticking brushes, loose cable connections, etc. Also low voltage may indicate loss across contactor (solenoid) tips. Check resistance.

3. Solenoids close, little or no power. High frequency whistle.

Check motor circuit for short circuits.

Check for loose connections.

Check for interchanged armature and field connections.

4. Solenoids close. Vehicle accelerates to full speed but lacks power.

Check battery voltage under load. Check voltage on transistor heatsink, FLD. If low to full speed but lacks power (approx. 2 volts) when accelerating, check motor circuit. If high, check for loose connections.

MODEL SS
PWR-TRON II
TROUBLE SHOOTING

SYMPTOM

POSSIBLE CAUSE

FULL MOTOR TORQUE AVAILABLE - GENERAL FAULTS

TO TEST VOLTAGES, FIRST PLACE TEST LIGHT IN SERIES WITH ARMATURE.

- | | |
|---|---|
| 1. Solenoid closes and full speed. | Check accelerator circuit and voltage at pin 2. Should swing from 6.3 to 11 Volts with depression of accelerator. |
| 2. Unequal braking in either direction, or unequal power in each direction. | Misadjusted motor brushes. Rotate brush gear to give equal braking in each direction.

Dirty or burned direction solenoid contacts. |

MODEL SS PWR-TRON II
TROUBLE SHOOTING

STANDARD LOGIC VOLTAGES MEASURED WITH RESPECT TO B-

TO TEST VOLTAGES, FIRST PLACE LIGHT BULB IN SERIES WITH ARMATURE.

LOGIC TERMINAL

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>CONDITION</u>	<u>VOLTAGE*</u>
1.	Speed Pot Reference	Key switch open Key switch and solenoid closed	0V ~ 11V
2.	Speed Pot Signal	Key switch open Key and solenoid closed, slow speed Key and solenoid closed, fast speed	0V ~ 6.3 V ~ 11V
3.	Speed Pot Reference	Key switch open Key switch and solenoid closed	0V 6V
4.	Forward Solenoid Coil Positive	Key switch closed, forward selected Key switch closed, reverse selected	B+ ~ 0V
5.	Reverse Solenoid Coil Positive	Key switch closed, reverse selected Key switch closed, forward selected	B+ ~ 0V
6.	Forward/Reverse Solenoid Coil Negative	Key switch closed, direction not selected Key switch closed, direction selected. For <.5 sec., brief rise to After .5 sec., falls back to Key switch closed, direction selected. Faulty transistor	~ 0V ~ 7V ~ 0 B+
7.	Bypass Solenoid Coil Negative	Key switch & direction solenoid closed. Bypass requested Key switch & direction requested solenoid closed. ** Bypass requested for 3 secs. after 3 secs.	~ 0V B+ ~ 0V
NEG.	Battery Negative	All	0
POS/A1	Battery Positive	After key switch & solenoid closed	B+
A2/FLD	Armature & Forward/Reverse Solenoid Normally Closed	Key switch & solenoid closed - Vehicle at rest Key switch & solenoid closed - Vehicle at full speed	B+ ~ 2V
FLD	Field, i.e. Forward/Reverse Solenoid Normally Open	Key switch open Key switch closed and solenoid open	0V B+

*B+ = Battery Positive - Voltages are measured with respect to Battery Negative.

* * = This delay is set by Acceleration Trimptot.

PWR-TRON II

MODEL SS SUGGESTED SPARE PARTS LIST

T-D PART NO.	DESCRIPTION	NO. OF CARTS		
		1-20	21-50	50-UP
62-018-00	PT 180 SPEED CONTROLLER	1	1	2
62-018-31	DRIVER TRANSISTOR	1	2	4
62-018-32	POWER TRANSISTOR SET	1	2	4
72-560-04	24 VOLT SOLENOID PANEL ASSY	1	1	2
72-511-00	SOLENOID, SPST 24V 100 A	1	1	2
72-511-25	SOLENOID, SPDT 24V 100 A	2	2	4
75-235-25	JUMPER, 6 GA 5 INCH LONG	1	1	2
75-235-29	JUMPER, 6 GA 9 INCH LONG	1	1	2
61-838-32	BUS-BAR 3/8 X 3-5/8	1	1	2
61-838-30	BUS BAR 5/8 X 2-1/2	1	1	2
62-033-00	ACCELERATOR, (SOLID STATE)	1	1	2
62-033-10	COVER, ACCELERATOR	0	0	1
75-146-24	CONTROL HARNESS	0	0	1
75-147-24	POWER HARNESS	0	0	1

MAINTENANCE PROCEDURES
ELECTRIC SYSTEM COMPONENTS

Your electrical system has been installed with care, utilizing quality materials for safe trouble free service. Proper fuses have been located where necessary to prevent unsafe overloads and protect the wiring and components from short circuits.

Little care will be required, except for an occasional visual inspection for loose connections or damaged wiring.

Normal replacement parts such as light bulbs, fuses, flasher etc. have been arranged for simple changing by plug in devices or conveniently located terminals.

CAUTION: A blown fuse is usually indicative of a short circuit or faulty device. Care should be exercised to remove the faulty condition before replacing fuse. DO NOT place larger capacity fuses or "jumpers" to overcome the condition as serious damage can occur.

CAUTION: Whenever service work is to be performed on any part of the vehicle's electrical system, disconnect the two main positive & negative battery leads to prevent accidental engagement of power.

Refer to the following sections for more detailed information on the main power and electrical components:

Section 7 - Batteries

Section 8 - Chargers

Section 9 - Wiring Diagram

Section 13 - Motor

Section 14 - Speed Control and Main Power Switching

Section 15 - PWR-TRON Speed Control

ELECTRICAL PARTS

T-D PART NO.	DESCRIPTION	QTY. REQ.
71-100-00	Light Switch	1
71-111-00	Brake Light Switch	1
71-135-00	Micro Switch	1
71-505-00	Bracket - Horn Button, Light Switch and Headlight With Geared Steering	1
71-502-00	Horn Button	1
72-005-00	Chrome Headlight Fixture With 4" Sealed Beam Bulb	1
72-022-00	Stop and Taillight Fixture, 4" Rubber Mount (12 Volt)	2
72-072-00	4" Sealed Beam Headlight Bulb (12 Volt)	1
73-004-00	Horn (12 Volt)	1
74-000-00	Hour Meter	1
74-005-00	Charge Indicator (12 Volt)	1
75-010-00	Wiring Harness For Power, Lights and Horn	1
75-206-00	Wire #6 (Per Foot)	
75-208-00	Wire #8 (Per Foot)	
75-218-00	Wire #16 (Per Foot)	
75-231-00	Battery Jumper #5 Wire (10-1/4" Long)	
75-406-53	Terminal Lug #6 Wire 1/4" Hole	
75-406-54	Terminal Lug #6 Wire 5/16" Hole	
75-408-54	Terminal Lug #8 Wire 5/16" Hole	
75-408-53	Terminal Lug #8 Wire 1/4" Hole	
75-418-51	Terminal Lug #16 Wire #6 Hole	
75-418-52	Terminal Lug #16 Wire 3/16" Hole	
75-418-53	Terminal Lug #16 Wire 1/4" Hole	
78-010-00	Secondary Fuse and Holder (Inline Type)	

SUGGESTED SPARE PARTS LIST

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. OF 1-20 UNITS
<u>REFER TO FIGURE NO. 3 FRONT AXLE, FORK & TILLER</u>			
3-10	97-100-00	Woodruff Key, 3/16	1
3-11	87-071-00	Grease Fitting, 3/16 Drive	3
3-15	45-308-00	Grease Seal	1
3-16	12-120-00	Wheel Hub - 3/4" Tapered Roller Bearings (Five Studs on 4-1/2" Bolt Circle)	0 or 1
3-17	80-015-00	Bearing, Tapered Roller 3/4"	2
3-19	87-050-00	Grease Fitting 90°, 1/4-28	1
3-21	97-236-00	Lug Nut 1/2" N.F.	5
3-27	13-576-00	Tire, Wheel & 4" Hub with 400 x 8, 4 Ply Tubeless Super Rib Tire & 3/4" Tapered Roller Bearings.	1
3-30	13-989-00	Valve Stem (For Tubeless Tires)	3
<u>FOR GEARED STEERING ONLY - REFER TO FIGURE 4A</u>			
4A-42	97-100-00	Woodruff Key - 3/16"	2
4A-44	80-706-00	O-Ring 3/4" O.D.	1
4A-45	31-255-00	Stem Pinion - 7 Tooth	1
4A-49	45-004-00	Gasket (4 x 6 O.D.)	2
4A-50	45-003-00	Gasket (4 x 4-1/2 O.D.)	1
4A-51	32-202-00	Brushing, Bronze - 1/2" I.D. x 5/8" O.D.	1
4A-52	80-400-00	Ball Bearing - 3/4" I.D.	2
4A-53	32-203-00	Bushing, Bronze - 3/4" I.D. x 7/8" O.D. x 1/2" Long	1
<u>REFER TO FIGURE NO. 5B MECHANICAL BRAKE</u>			
5B-2	41-660-00	Brake Band for Drive Shaft Brake	1
5B-4	88-100-25	3/8 N.C. x 4-1/2 Hex Head Cap Screw	1
<u>REFER TO FIGURE NO. 5D BELT DRIVE</u>			
5D-3	30,601-00	Belt "AX-33" for 8" Pulley	0 or 2
5D-3	30-613-00	Belt "AX-38" for 11" Pulley	0 or 2
5D-7	45-339-00	Pinion Oil Seal, 3" O.D.	0 or 1
5D-7	45-340-00	Pinion Oil Seal, 4-1/8" O.D.	0 or 1
5D-8	97-100-00	3/16 Woodruff Key	1
<u>REFER TO FIGURE NO. 5H REAR AXLE & DIFFERENTIAL HOUSING</u>			
5H-10	41-997-00	Level Drain or Fill Plug	2
<u>REFER TO FIGURE NO. 5M D.C. MOTORS</u>			
----	-----	Spare motor for Every 5 Vehicles	-
----	-----	Motor Brushes, One Set (Two or Four/Set)	-
----	-----	Brush Carrier Complete with Brushes if applicable	-

SUGGESTED SPARE PARTS LIST continued

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. OF 1-20 UNITS
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REFER TO FIGURE NO. 7 - MECHANICAL CONTROL LINKAGE

7-5	96-813-00	Brake Cable Assembly 28-1/4 to 31-1/4 Length	1
7-7	86-503-98	Rod End, Spherical Bearing - Left Hand Thread	1
7-9	97-211-00	Nut, 1/4 N.F. - Left Hand Thread	2
7-15	95-771-00	Clevis Pin, 3/8 x 3/4 Face to Hole	1
7-16	88-517-11	Cotter Pin, 3/32 x 1	4
7-17	85-295-00	Spring Extension 9/16 O.D. x 4-7/8	2
7-21	96-772-00	Clevis Pin 3/8 x 1 Face to Hole	3

REFER TO FIGURE NO. 9 - RHEOSTAT SPEED CONTROL

9-1	32-212-50	Plastic Bushing 1/4 X 1/4	2
9-2	61-832-52	Power Bar, Steel	1
9-4	61-844-40	Bus Bar 1st Speed	2
9-5	61-844-51	Power Bar - 2 Hole	2
9-6	61-844-54	Rotor, Speed Control	1
9-7	71-030-58	Contact Button	3
9-8	85-034-00	Spring 7/16 O.D. x 2 Long	1
9-9	86-503-99	Rod End. Spherical Bearing Right Hand Thread	1
9-21	97-169-00	Washer, Nylatron, 3/8 I.D.	1
9-22	97-170-00	Washer, Insulated 3/4" O.D.	2
9-23	78-225-13	Coil Board & Resistor Coil Assembly	1

REFER TO FIGURE 10 - ACCELERATOR

10-1
10-2
10-3
10-4

PARTS ORDERING PROCEDURE

Parts may be purchased from your local authorized Taylor-Dunn Dealer. When ordering parts, be sure to specify the complete model no. and serial no. of the unit. Also specify the full Taylor-Dunn part no., description of part, and quantity required. You will find a complete listing of part numbers and descriptions in the following pages of this manual. When ordering parts for the drive motor, it is necessary to include complete name plate data with the order. Be sure to give complete shipping and billing address on all orders. Example:

- 1 - Part #86-501-98 ball joint (left hand thread)
- 1 - Part #70-104-00 (set of 4) motor brushes for
G.E. Motor, 4.5 H.P., 24 Volt, Specification
Number 5BC48JB754

Parts ordered under warranty must be placed with your authorized Taylor-Dunn Dealer. Be sure to include original invoice number, date of shipment of vehicle, and vehicle serial number.

Note: On contracts with National Federal Government Agencies, Defense General Supply Agency and United States Post Office Department, orders for all warranty parts must be placed directly with the Taylor-Dunn Factory in Anaheim, California.

TAYLOR-DUNN MANUFACTURING CO.
2114 West Ball Road
Anaheim, California 92804

Telephone: 714-956-4040
Telex: 65-5393

MAINTENANCE PROCEDURES

BODY AND TRIM

Your vehicle has been finished with several coats of durable baked on enamel.

It will require the same care as you would give your automobile. The chrome trim is also resistant to corrosion and will require an occasional cleaning.

It is recommended that your vehicle be washed with a mild soap and warm water. For long life a good automotive type of wax will extend the life of the finish and maintain lasting beauty.

For identification of Body and Trim Parts available for repair and replacement, refer to the following pages in this section.

BODY & TRIM PARTS

REFER TO FIGURE 11

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
11-1	71-650-00	3" Red Reflector	1
11-2	72-022-51	Rubber Ring	0 or 2
11-3	90-144-00	Seat, Brackrest	1
11-4	90-166-00	Seat, Cushion	1
11-5	90-109-50	Seat Backrest Frame, Bolt-On	1
11-6	90-109-51	Seat Back Frame, Base Bolt-On	1
11-7	90-109-61	Kit, Covertible Seat Backrest - Including Hardware	1
11-8	90-409-00	Deckboard	1
11-9	92-001-00	Chrome Wheel, Covers (6") for 4.00 x 8 Wheel	2
11-10	92-201-00	4-1/2 x 8-1/2 Mirror	1
11-11	92-202-00	Mirror Bracket	1
11-12	94-201-00	Taylor-Dunn Emblem	2
11-13	94-301-00	Taylor-Dunn Decal	2
11-14	96-203-00	Thumbscrew for Locking Backrest	1
11-15	94-025-51	Aluminum Rear Deck Trim	1

PARTS NOT ILLUSTRATED

94-313-00	Decal, Battery Warning	1
91-812-00	Hinge, Deck Board	2
50-235-00	1/4 Battery Rod - 21-3/4" Long	0 or 2
77-864-00	Strap, Battery Hold Down 14-1/8" Long	1
94-309-50	Decal Brake Warning	1
94-378-00	Data Plate Battery Box (Vehicles without Lift Out Battery Box Only)	1
77-976-51	Lift Out Battery Box Frame	1
77-976-61	Lift Out Battery Box Kit Including Wiring, Receptacle Hardware, Less Batteries	As Req'd.
95-953-XX	Paint, 1 Gallon Can (Specify Color)	As Req'd.
95-954-XX	Paint, Spray Can (Standard Colors) 16 oz.	As Req'd.
95-952-XX	Paint, 1 Quart Can (Specify Color)	As Req'd.
94-373-00	Data Plate, Vehicle	1
94-313-50	Decal, Battery Disconnect	1
50-243-10	1/4 Battery Rod with bend, 1/4" Dia. x 12" Long UNC Threaded one end 1-1/4" Long	0 or 2
91-371-10	Data Plate, Export Vehicle	1
50-250-00	Clamp, Battery, Nylon Disc, Bat-Lok	1

BODY & TRIM PARTS

FASTENERS

USED WITH I.D.NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
11-7	88-108-60	3/8 Washer	2
11-7	77-101-16	3/8 N.C. X 2 Hex Head Screw	2
11-7	88-109-80	3/8 N.C. Hex Nut	2
11-6	88-065-13	1/4 x 1-1/4 Truss Head Screw	4
11-6,17	88-068-60	1/4 Cut Washer	4
11-6,17,11	88-069-87	1/4 Fastite Nut	10
11-6,8,4	88-837-13	#14 x 1-1/4 Phillips Head Screw	4
11-17	88-737-08	3/16 Diameter x 5/8 Aluminum Pop Rivet	5
11-14	88-727-06	5/32 Diameter x 1/2 Aluminum Pop Rivet	4
11-12	88-557-91	1/8 Push on Nut	6
All Data & Serial Plates	88-807-01	#4 x 3/16 Drive Screw, Round Head	10
11-8	88-065-09	1/4 x 3/4 N.C. Truss Head Machine Screw	8
11-17,11	88-065-08	1/4 x 5/8 N.C. Truss Head Machine Screw	4
11-3,5	88-837-09	#14 x 3/4 Phillips Head Sheet Metal Screw	6

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* EXAMPLE: Section 13, Page 5, Item 5.
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ANAHEIM, CA 92804

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