

OPERATION AND MAINTENANCE MANUAL WITH PARTS LIST

Model:	3454 E
Serial No.:	26240 & UP
Year:	1973 & UP
Manual:	ME-450-89

- IMPORTANT -

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



TAYLOR-DUNN®
Commercial and Industrial Vehicles Since 1949

2114 West Ball Road, Anaheim, CA 92804 (714) 956-4040 FAX (714) 956-0504

Mailing Address: P.O. Box 4240, Anaheim, California 92803

MODEL: E 3454

SERIAL NO: BEGIN 26240

YEAR: BEGIN 1973

MANUAL NO: ME-450-89

PRICE: \$25.00

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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 checklist 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 their being tight.
- 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 operational test should be made. Refer to operating instructions Section B.

INSPECTION AND INTRODUCTION

INTRODUCTION

This vehicle is primarily designed as a rider type electric tractor, for use in warehouses and industrial plants on smooth floors. It is not designed for outside use, over rough ground or up steep ramps. Its compact design and short turning radius are ideally suited for narrow aisles. The Standard Model operates at 2 to 5 m.p.h. with a normal draw bar pull of 225 to 350 lbs. The fast speed option provides operating speeds of 5 to 9 m.p.h., with a normal draw bar pull of 200 lbs. The frame is constructed of heavy steel plate. All components are ruggedly designed and mounted to the main frame. Access panels are provided at strategic points for ease of maintenance and service.

MODEL NO.

The following Model number is covered by this manual:

3454E

SERIAL NO.

The serial number of your unit is stamped into the angel frame member, between battery compartment and control console 4" from the left side. The model number and serial number are on a nameplate riveted to the dash panel adjacent to forward reverse switch. When ordering parts or referring to your unit, please use these numbers. Replacement parts can be purchased directly from your local authorized dealer or direct from the factory in Anaheim, California.

OPERATING INSTRUCTIONS

The controls on your Pinto II 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. Read the following instructions and with power OFF, operate each control. By following this suggestion you will attain a "feel" for their operation prior to traveling under power for the first time.

STEERING

The steering wheel and steering system operates 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.

BRAKE-AUTOMATIC (DEADMAN)

The control handle is a combination brake and accelerator. It is designed for either hand operation while riding or walking along side of vehicle. Applying pressure by pulling rearward with your hand actuates the braking action. The greater the pressure applied with your hand the greater the braking action.

A heavy spring control is incorporated with the handle linkage and automatically returns the handle to a brake applied position whenever it is released. (Refer to remote push button controls for additional instructions.)

ACCELERATOR

The same handle is the accelerator control. Applying forward pressure to the handle turns power on to the drive motor. The amount of power delivered to the motor is controlled by the amount the handle is depressed. Full power when fully depressed, and minimum power when partially depressed.

FORWARD-REVERSE SWITCH

The forward-reverse switch is located on the right side of the console. It is operated by its handle. To place in forward position, pull handle to left as indicated. To place in reverse position push handle to right towards outside of tractor.

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.

KEY LOCK

Your vehicle is equipped with a keyed lock located on the corner of forward reverse switch. 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.

HORN BUTTON - HAND OPERATED

The horn button is located to the right of steering wheel. Depressing button sounds horn. Releasing button will immediately silence horn.

HORN SWITCH - KNEE OPERATED

The knee operated horn switch is conveniently located for right knee operation while standing in the normal driving position. Depressing switch with right knee sounds horn; releasing switch will immediately silence horn.

STANDARD OPTIONAL ACCESSORIES

REMOTE PUSH BUTTON CONTROL SYSTEM

This feature incorporates an electro-mechanical solenoid to operate the accelerator/brake linkage system. The linkage can be adjusted to operate tractor semi-automatically in one of the first three speeds. It is activated by depressing one of the push buttons located at the rear of the back rest or remotely mounted on the Pinto-Pik trailer being towed by the tractor. Depressing the button energizes the electro-mechanical solenoid and a system of relays. The brake is released, the accelerator engaged and a timer is activated. The tractor will start and run in the speed which has been previously selected for the duration of the timed period. At the end of this period, the accelerator is returned to neutral and the brake is applied stopping the tractor. It can be programmed to advance from approximately 3 ft. per cycle to 100 ft. per cycle.

When used with the Pinto-Pik trailer, an electrical receptacle is provided above the towing hitch. The trailer is equipped with a power cord which plugs into this receptacle. Power is supplied to the hydraulic pump and the push buttons mounted on the trailer.

EMERGENCY SAFETY STOP BUTTONS.

A large knob is located on both sides of the console. Pushing this knob inward interrupts the main power supply. If knob is pushed when tractor is operating automatically the brake is immediately applied. When operating manually it is necessary to either apply the brake or release the control handle for automatic braking action.

SAFETY SENSOR BUMPER

This option is available for use with the push button control system. It consists of a rubber bumper switch located on front and both sides of tractor frame approximately 4" from ground. When tractor is in motion and being controlled by the automatic electro-mechanical system, a light pressure applied to the safety bumper immediately shuts off power to the motor and applies the brake.

CAUTION: This safety sensor does not stop operation of the tractor when being operated manually. It is not designed to serve as a protective guard against damage to tractor or surrounding objects when operating in the manual mode. It's sole purpose is to provide safe operation by immediately shutting down the power and stopping the tractor when operating in the riderless automatic mode.

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 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.

MAINTENANCE SERVICE	EVERY WEEK	EVERY MONTH	EVERY 3 MONTHS	EVERY YEAR
Check and fill batteries. If necessary, fill with distilled water only.	X	X	X	X
Clean off all dirt and grease on and between power bars and J-Hook. Re-apply chassis lube.	X	X	X	X
Check rheostat adjustment	X	X	X	X
Check all contact points on open contactors		X	X	X
Check Electro-Mechanical Solenoid Adjustment.		X	X	X
Blow out dirt and dust from armature				
Adjust Motor Mount & Chain (Refer to Chart Section J2)		X	X	X
Lubricate all zerk fittings		X	X	X
Check Dash Pot Performance (Fill with oil if necessary)		X	X	X
Lubricate all moving parts without zerk fittings. Use all-purpose engine oil.		X	X	X
Wash off batteries with water. (Use soda if necessary)		X	X	X
Check all wire connections. Be sure they are all clean and tight.		X	X	X
Check service and adjust manual/automatic brake (Deadman type)		X	X	X
Check steering chain adjustment.		X	X	X
Check centering rubber roll (Rotate or replace as needed)		X	X	X
Check rear axle differential oil level. (Refer to lubrication diagram).		X	X	X
Check, clean, forward/reverse switch		X	X	X
Check brake lining for wear, adjust brake band (Replace when necessary)		X	X	X
Check motor brushes. Blow out carbon dust. (Replace if necessary)			X	X
Check and adjust front wheel bearings and fork spindle bearings.			X	X
Drain differential and refill with SAE ⁹⁰⁻¹⁴⁰ 20 oil (Refer to lubrication diagram).				X
Repack front wheel bearing and front fork spindle bearings. (Use wheel bearing grease)				X

MODEL E 81128
GENERAL 41115

- A. PRESSURE GUN GREASE**
- | | No. of Grease Points |
|--------------------------------------|----------------------|
| 1. Front Wheel Hub | 1 |
| 2. Front Wheel Spindle | 1 |
| 3. Dashpot Linkage | 3 |
| 4. Brake Lever | 2 |
| 5. Switch (Lubricate by Hand) | 1 |
| 7. Steering Shafts | 2 |
| 8. Handle & Bellcrank Assy. | 2 |
| B. LIGHT OIL | |
| 10. Clevis Pins - Mechanical Linkage | 6 |
| 11. Chain | 1 |

C. "POWER TRACTION" USE SAE 20 OIL

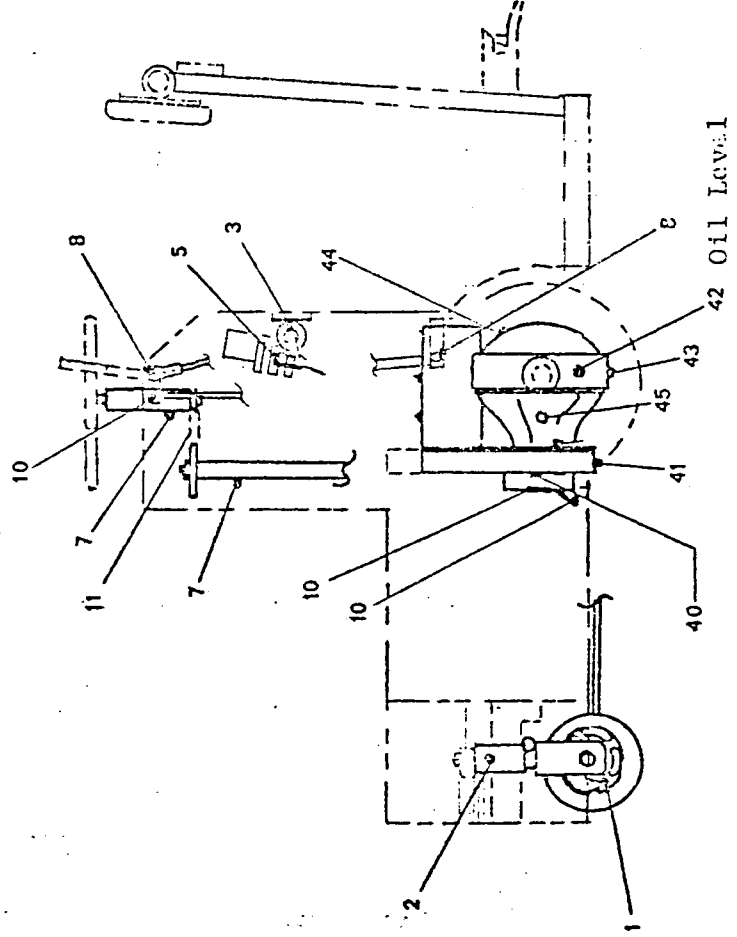
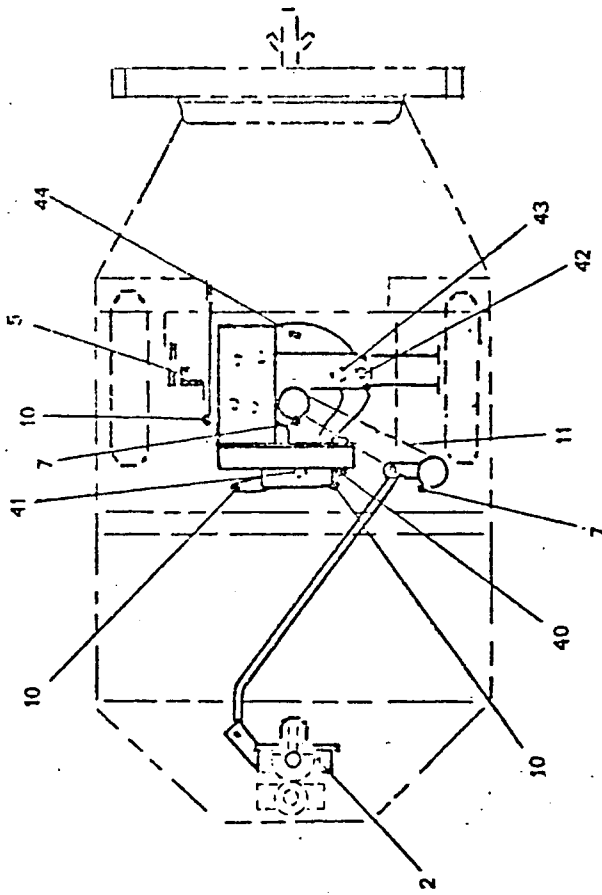
Proper Oil Level Check at Plug 42.

TO CHANGE OIL USE 2 QTS.

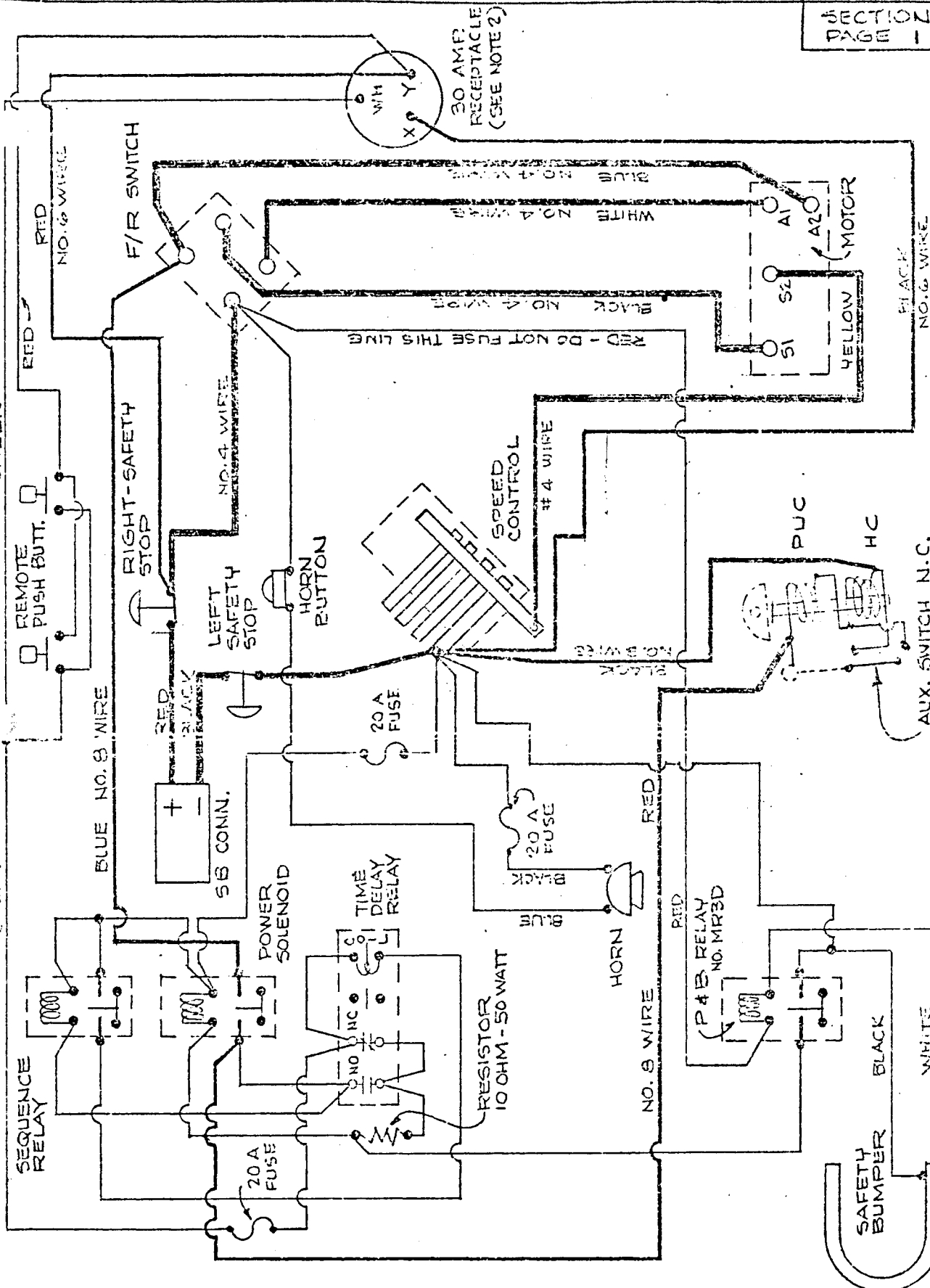
- Remove Drain Plugs 41 & 43
- Remove Level Plugs 40, 42 & Fill Plug 44
- Drain Oil & Replace 41 & 43
- Add Oil by 44 to Level of 42
- Add Oil by 40 to Level of 40
- Replace Plugs

NOTE: 45 Not Used This Configuration.

NOTE: Plug 40 added for ease in refilling gear case to proper level. Gear case oil level is maintained by recirculation from differential during operation.



LENGTH | QUANT. | REVISED DATE | REVISION



SECTION 2 G
PAGE 1

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WIRING DIAGRAM
REMOTE WALK-ALONG CONTROL, MOD. E
DOLL-BITE MOD. 3454 F

FIGURE 2 A
SECTION G

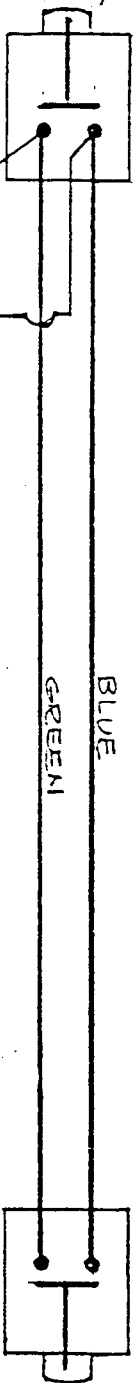
NOTE 1 - TIME DELAY RELAY
AT END OF TIMING CYCLE,
THE NORMALLY OPEN CONTACTS
(WHICH ARE CLOSED DURING THE
TIMING CYCLE) MUST BREAK
BEFORE THE NORMALLY CLOSED
CONTACTS (WHICH ARE OPEN DURING

NOTE 2 - PUSH BUTTON
ON TRAILER (REF. FIG. 2B)
CLOSES WH TO Y TERMINALS
OF 30 AMP RECEPTACLE
WHEN CLOSED.

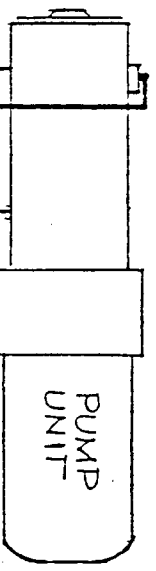
ELECTRO-MECH. SOLENOID

NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
101.	FRAC. + DEC. +				
SCALE	NONE				
DRAWN BY	EDS				

HEAVY DUTY PUSH BUTTONS



BLUE
GREEN



PUMP
SWITCH

ON

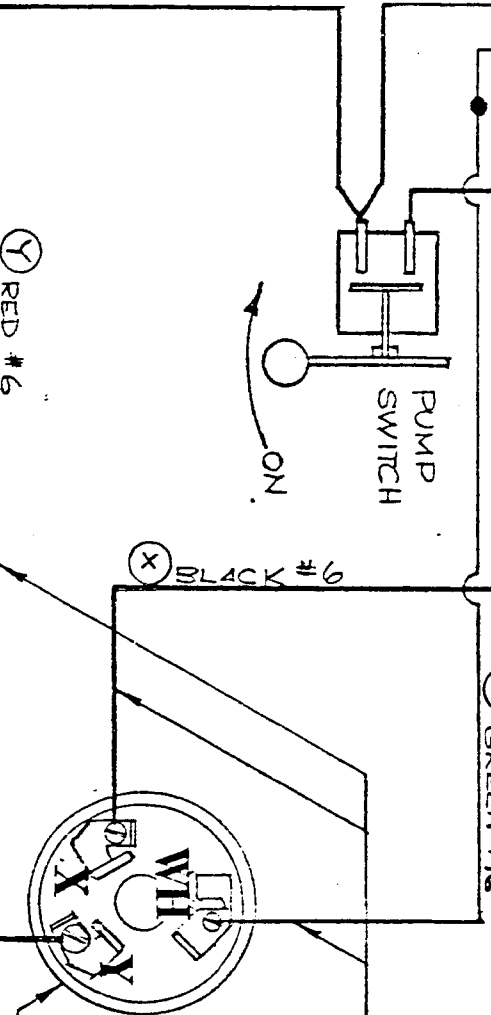
Y RED #6

X BLACK #6

W GREEN #16

76-002-00

MODIFIED 75-240-00



SECTION 6
Page 2

NO. DESCRIPTION

TOL. FRAC. ± DEC. ±

SCALE NONE

DRAWN BY RGA

LENGTH QUAN. REVISED DATE REVISION

FIGURE 2C

SECTION G

PINTO-PK TRAILER

WIRING DIAGRAM



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

PARTS ORDERING PROCEDURE

Parts may be purchased from your local authorized Taylor-Dunn Dealer or direct from the factory if desired. When ordering parts, be sure to specify the complete model no. and serial no. of the unit. Also specify the full Taylor-Dunn part number, description of part, and quantity of parts 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, also include the specifications found on the motor nameplate. Be sure to give complete shipping and billing address on all orders. Example:

- 1 - Part no. 86-501-98 Ball Joint (Left Hand Thread)
- 1 set of 4 - Part no. 70-124-00 Motor Brushes for Baldor Motor, 3½ H.P.,
36 Volt, Specification No. 28-1408-11704

— Above parts for Model 1248B Truck, Serial No. 15039.

Parts ordered under warranty must be placed with your authorized Taylor-Dunn Dealer or direct to Factory located in Anaheim, California. Be sure to include original invoice number, date of shipment of vehicle, and vehicle serial no.

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 MFG. CO.
2114 W. BALL ROAD,
ANAHEIM, CALIF. 92804.

PHONE: 714 - 956 - 4040

SUGGESTED SPARE PARTS LIST

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QUANTITY	
			1-10	10 or More
<u>REFER TO FIGURE NO. 3 FRONT AXLE, FORK & STEERING</u>				
3-4	80-011-00	1-1/4 I.D. Tapered Roller Bearing		2
3-5	87-074-00	Grease Fitting 1/4-28 Straight	1	1
3-7	45-307-00	Grease Seal		2
3-8	14-018-00	Front Fork (10 x 3-1/2 Whl.)		1
3-11	13-906-00	Tire, Wheel & Hub (10 x 3-1/2)	1	1
3-18	15-010-00	Front Axle		1
3-19	86-521-98	Rod End - Spherical Bearing, Male	1	1
3-19	86-521-99	Rod End - Spherical Bearing, Female	1	1
3-31	97-100-00	3/6 Woodruff Key		4
3-32	80-400-00	3/4" Open Ball Bearing	4	4
3-33	30-010-00	Sprocket, 32T #40 Chain 3/4" Bore		1
3-34	30-246-00	Chain, #40 Str. Column, 31-1/2 Long		1
3-35	30-400-00	Link, Master #40	1	1
3-36	30-002-00	Sprocket, 11T #40 Chain 3/4 Bore		1
3-48	18-082-50	Cam, Follower	1	1
3-49	18-082-51	Cam, Follower Bracket		1
<u>REFER TO FIGURE NO. 5 POWER TRACTION DRIVE AXLE</u>				
5-3	41-997-00	Drain and Level Plug (1/8" Pipe)	1	1
5-11	41-163-10	Axle Assembly with Axle, Retainer Ring, Retainer Plate, and Bearing (14-1/8" Long) Left Side		1
5-11	41-162-10	Axle Assembly with Axle, Retainer Ring, Retainer Plate and Bearing (11-5/8" Long) Right Side		1
5-13	45-042-00	Gasket (Housing to Differential Carrier)	1	1
5-42	80-702-00	"O" Ring - Drive Pinion Bearing Retainer		1
5-45	41-996-00	Plug - (Level) 1/2" with Recessed Top	1	1
5-50	45-021-00	Gasket Gear Case to Pinion Bearing Assembly	1	1
5-57	41-989-00	Plug (Filler Level and Drain) 1/4" N.P.T.	1	1
5-63	45-331-00	Oil Seal - Gear Case to Pinion	2	2
5-64	41-532-00	Brake Drum (Splined)		1
5-66	41-661-00	Full Brake Band for 6" Drum	2	2
5-73	85-060-00	Compression Spring 5/8" O.D. x 2½" Long		1
5-83	45-002-00	Gasket - Gear Case Cover	1	1
5-86	45-506-00	Oil Seal (G.E. Motor)	1	1
5-87	70-100-00	Motor Brushes - G.E. Motor, 24 & 36 Volt		4

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QUANTITY	
			1-10	10 or
5-98	13-920-00	Tire, Cast Iron Wheel 15 x 5 Solid Cushion Tire (Five $\frac{1}{2}$ " Holes on 4 $\frac{1}{2}$ " Bolt Circle) Roll-Rite	2	2
5-106	45-044-00	Gasket - Rear Axle Bearing	2	2
5-122	80-703-00	"O" Ring Motor Mount Seal		1
<u>REFER TO FIGURE NO. 7 MECHANICAL CONTROL LINKAGE</u>				
7-1	98-350-00	Hand Grip		2
7-3	50-643-00	Handle Assembly		1
7-4	96-762-00	Clevis - 3/8 Cast	6	6
7-5	96-772-00	Pin - Clevis 3/8" x 1"	4	4
7-10	53-005-10	Dashpot Assembly		1
7-13	85-290-00	Spring Ext. 1-3/8 O.D. x 7-3/4 Free Length	1	1
7-14	72-540-00	Electro-Mechanical Solenoid		1
7-14	72-540-51	Coil Assembly Only	2	2
7-15	87-071-00	Grease Fitting 3/16" Drive (Straight)	3	3
7-17	96-202-00	Eye Bolt 3/8 x 4		1
7-18	50-801-00	Brake Apply Spring Stop		1
7-19	50-630-00	Accelerator Link Assembly		1
7-20	50-632-00	Electro-Mechanical Solenoid Link		1
7-21	50-032-00	Brake Link - 13" Long		1
7-22	50-631-00	Brake/Accelerator Bellcrank		1
7-23	50-127-00	Rod - Deadman Brake to Accelerator Handle		1
7-24	50-028-00	Rod - All Thread 3/8-24		1
7-25	85-120-00	Compression Spring		1
<u>REFER TO FIGURE NO. 8 GROUP 8 FORWARD/REVERSE SWITCH</u>				
8-0	71-040-00	Forward & Reverse Switch Complete (4 Fingers)		1
8-1	71-040-60	Switch Finger - Silver Plated with $\frac{1}{4}$ " Hole	4	4
8-3	71-040-61	Finger Board with $\frac{1}{4}$ " Holes		2
8-5	71-040-71	Bolt-Finger Mounting (1/4" NF x 7/8" Spec.)		4
8-7	71-040-73	Cover Screw (10-32 x 1/2" Filister Head)		1
8-8	71-040-70	Rubber Insulator Strip		1
8-11	71-040-62	Switch Handle - Metal (Red Color)		1
8-13	71-040-72	Face Stop Bolt (10-32 x 3/8 Spec.)		2
8-16	71-040-55	Lock Assembly with 2 Keys		1
8-16	71-040-87	Tubular Lock Assy. with Two Keys		1
8-17	71-040-74	Key Only (Give No. of Lock or Vehicle Ser. No.)		2

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QUANTITY	
			1-10	10 or Mo
8-19	71-040-54	Spring - (Cam)		1
8-20	71-040-75	Snap Ring - 1/4"		1
8-21	71-040-68	Bushing		1
8-22	71-040-67	Cam Index		1
8-23	71-040-66	Plastic Spacer Set (Sold Only as Set of 4 Pcs.		1 Set
8-24	71-040-58	Rotor Contacts (Set of 2-1 Right & 1 Left)	1 Set	1 Set

REFER TO FIGURE NO. 9 SPEED CONTROL & MAIN
POWER SWITCHING

9-1	88-060-09	1/4-20 x 3/4 Hex Head Bolt	2	2
9-2	61-834-51	Insulating Board for J-Hook - 4 Hole Pattern	1	1
9-4	61-833-00	J-Hook Strap		1
9-5	61-832-00	J-Hook	1	1
9-6	61-835-14	Neutral Bar		1
9-9	78-214-00	Coil - #5 Nichrome (5 Turn)		1
9-10	78-212-53	Coil - #5 Nichrome (6 Turn)		2
9-13	61-836-00	Pressure Bar	1	1
9-14	61-831-00	Power Bar	4	4
9-17	85-034-00	Spring - Compression (7/16 O.D. x 2 Lg.)		1
9-0	61-837-29	4-Speed Rheostat with Coils		1

REFER TO FIGURE NO. 10A MAIN POWER SWITCHING
AND GENERAL ELECTRICAL

10-1	76-020-00	Charging Receptacle and Plug (175 Amp)		1
10-2	71-302-00	Time Delay Relay - G.E. (24V)		1
10-3	78-302-00	Resistor, 10 OHM, 50 Watt		1
10-4	71-303-00	Safety Bumper Switch Relay		1
10-5	73-001-00	Horn, 24V		1
10-6	72-510-00	Solenoid, 12V, 150 Amp	1	1
10-7	72-511-00	Solenoid, 24V, 100 Amp	1	1
10-8	71-030-13	Emergency Stop Switch		1
10-28	71-503-00	Push Buttons	2	2
10-29	76-012-00	Receptacle - 30 Amp		1
10-30	71-142-00	Safety Bumper Switch		1
10-31	71-504-00	Horn Switch (Tapeswitch)		1
10-32	76-028-52	Receptacle Cover		1

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QUANTITY	
			1-10	10 or More
<u>REFER TO FIGURE NO. 11 BODY & TRIM PARTS</u>				
11-2	90-000-00	Back Rest Cushion		1
11-5	92-104-01	Push Button Operator		2
11-10	95-902-50	Knob, Emergency Stop Switch	2	2
11-17	85-067-00	Compression Spring	2	2
11-18	71-628-00	Upper Retainer - Safety Bumper Switch		1
11-19	71-628-51	Lower Center Retainer - Safety Bumper Switch		1
11-20	71-628-50	Lower Side Retainer - Safety Bumper Switch		4
11-21	71-628-52	Bumper Switch Guard		2
11-22	80-709-00	"O" Ring	2	2
11-23	30-718-00	Push Button Guard	2	2
11-24	98-020-00	Sill Mat		2

MAINTENANCE PROCEDURES

REFER TO FIGURE 3

FRONT AXLE, FORK, STEERING, AND TIRES

Your front wheel assembly consists of a ruggedly designed fork mounted with 2 Timken Roller Bearings. The front wheel is mounted on a 3/4" axle and turns on 2 Timken Roller Bearings. Grease fittings are provided at bearing points for proper lubrication.

The front wheel is a rugged design with solid rubber tire molded directly to wheel for long trouble free life.

The steering linkage consists of a steering wheel and shaft mounted on ball bearings. Mechanical advantage for smooth easy steering is obtained through roller chain and sprockets between the steering shaft and jack shaft. An automotive type drag link is provided between the jack shaft and fork for reliable trouble free steering. Heavy spherical bearing rod ends provide smooth operation and also serve as the drag link adjustment. The roller chain will require an occasional adjustment for proper tension. Refer to Service and Adjustment instructions in this section of the manual.

Refer to Maintenance Guide and Lubrication Diagrams (Sections D & E) for normal care of your front wheel and steering assembly.

Optional Equipment - Self Centering Steering

This feature provides a moderate amount of self centering action by the use of a rubber roller under compression working against a notched cam attached to the fork spindle. It is provided with adjustments to align the fork and wheel in an exact straight ahead position and to also vary the amount of compression (self centering effort) of the rubber roller.

Refer to Service and Adjustment instructions in this section of the manual.

Only a portion of the roller is in operation against the cam. Therefore, it is recommended that periodically the compression be released, and the roller rotated 180° in relation to the cam. Readjust the proper amount of compression. This procedure will double the life of the rubber roller.

SERVICE AND ADJUSTMENT

REFER TO FIGURE 3

FRONT AXLE, FORK, STEERING AND TIRES

Adjustment of Wheel Bearings

1. 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.

Removal of 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. Wheel bearings may be flushed, cleaned and repacked without removing from hub, unless, severely damaged or embedded with foreign material.
4. 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 of Wheel and Axle

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 and hub assembly into fork by starting axle through one side of fork, inserting one 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 as outlined above.
7. Wheel hub has one 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 bearings can lead to bearing failure due to shock effect when vehicle encounters bumps or uneven terrain.

NOTE: On vehicles equipped with self centering steering cam it will be necessary to loosen rubber roller tension adjusting nut and cam lock nut to gain access to the fork spindle lock and adjusting nut.

Removal of Fork and Spindle

1. Remove battery
2. Remove locknut and bolt to release rod end at fork arm.
3. Remove centering cam roller and cam. (Self centering option only)
4. Remove lock nut on spindle end.
5. Slide fork and spindle out of housing.
6. Remove bearings and dust seals.
7. 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 centering cam and cam roller (Optional)
 6. Replace rod end, bolt and locknut. Tighten locknut to 25 ft. - lb.
 7. Replace battery.
- NOTE: There is one zerk fitting located on the fork spindle bearing housing which requires lubrication every one to three months. Refer to Lubrication Diagram and Maintenance Guide Section D & E.

Replacement of Rod Ends

1. Remove locknut and bolt to release rod end from steering arm.
2. Loosen sleeve clamp.
3. Either measure position of rod end or count number of threads exposed from sleeve. Remove rod end by unscrewing from sleeve. Note that one end will be left hand thread and the opposite rod end will be right hand thread. Install new rod end and position same as the one removed.
4. Replace bolt and locknut. Before tightening securely, try steering action by turning wheel from stop to stop. If necessary, adjust rod end in sleeve so that wheel will travel equally in both directions from straight ahead position.
5. Tighten sleeve clamps and tighten rod end stud locknuts to 25 ft. - lb.

Adjustment of Steering Chain

1. Loosen inner nut on adjustment stud located on upper portion of jack shaft tube.
2. Adjust outer nut to remove chain slack and apply a slight tension to chain. DO NOT apply excessive tension to chain as undue bearing and chain wear will result.
3. Retighten inner nut to lock adjustment stud in position.

Adjustment of Steering Shaft and Jack Shaft Bearings

1. Adjustment is required only when steering shaft assemblies have been dismantled and reassembled.
2. Adjust free end play of each shaft from 1/64" to 1/16" by turning locknut located at each shaft end until desired results are obtained.

Disassembly of Jack Shaft

1. Disconnect master link and remove steering chain.
2. Remove locknut and rod end from jackshaft lever arm.
3. Remove "U" bolt located at lower end of jack shaft.
4. Remove outer nut from adjustment stud and remove jack shaft assembly from chassis.
5. Remove locknut, sprocket, woodruff key and spacers. (Note position of spacers for proper re-assembly.)
6. Slide jack shaft out of housing and bearings. (Note position of spacers located on jack shaft lower end.)
7. Shaft bearings may be replaced at this time by removing them from housing with suitable puller or drift punch.

Re-Assembly of Jack Shaft

1. Drive new bearings into housing until seated against shoulder.
2. With spacers in position reassemble jack shaft, sprocket key and locknut in the reverse order of removal.
3. Replace assembly in chassis also following the reverse order of removal.
4. When replacing chain onto sprockets align steering wheel spinner knob in forward position and front fork and wheel in straight ahead position.
5. Replace chain master link and adjust chain tension as previously outlined.

Adjustment of Self Centering Steering Device

NOTE: The rubber roller is mounted on a bracket bolted to the main frame. The bolt holes are slotted to allow the bracket and roller to be adjusted laterally as well as inward or outward to vary the amount of cam to roller contact.

1. For best results position the bracket as far inward as possible. If necessary, turn the hex head bolt (rubber roll stud) so that one of the flats of the bolt head serves as a stop against the main frame.
2. Visually align the front wheel in a straight ahead position.
3. Position the rubber roller in exact alignment with the cam notch.
4. Tighten the two bracket mounting bolts securely.
5. Tighten the rubber roller stud nut compressing the rubber roll until it measures 3-3/4" in diameter.
6. Test Drive the tractor on a flat area using a straight line as a guide. The tractor should follow the straight line unaided. An error of 1" per 10 feet is considered acceptable.

NOTE: It is important to align the forward motion of the tractor with the guide line. Failure to align tractor with guide line will give false results when performing test.

Adjustment of Self Centering Steering Device (Cont'd.)

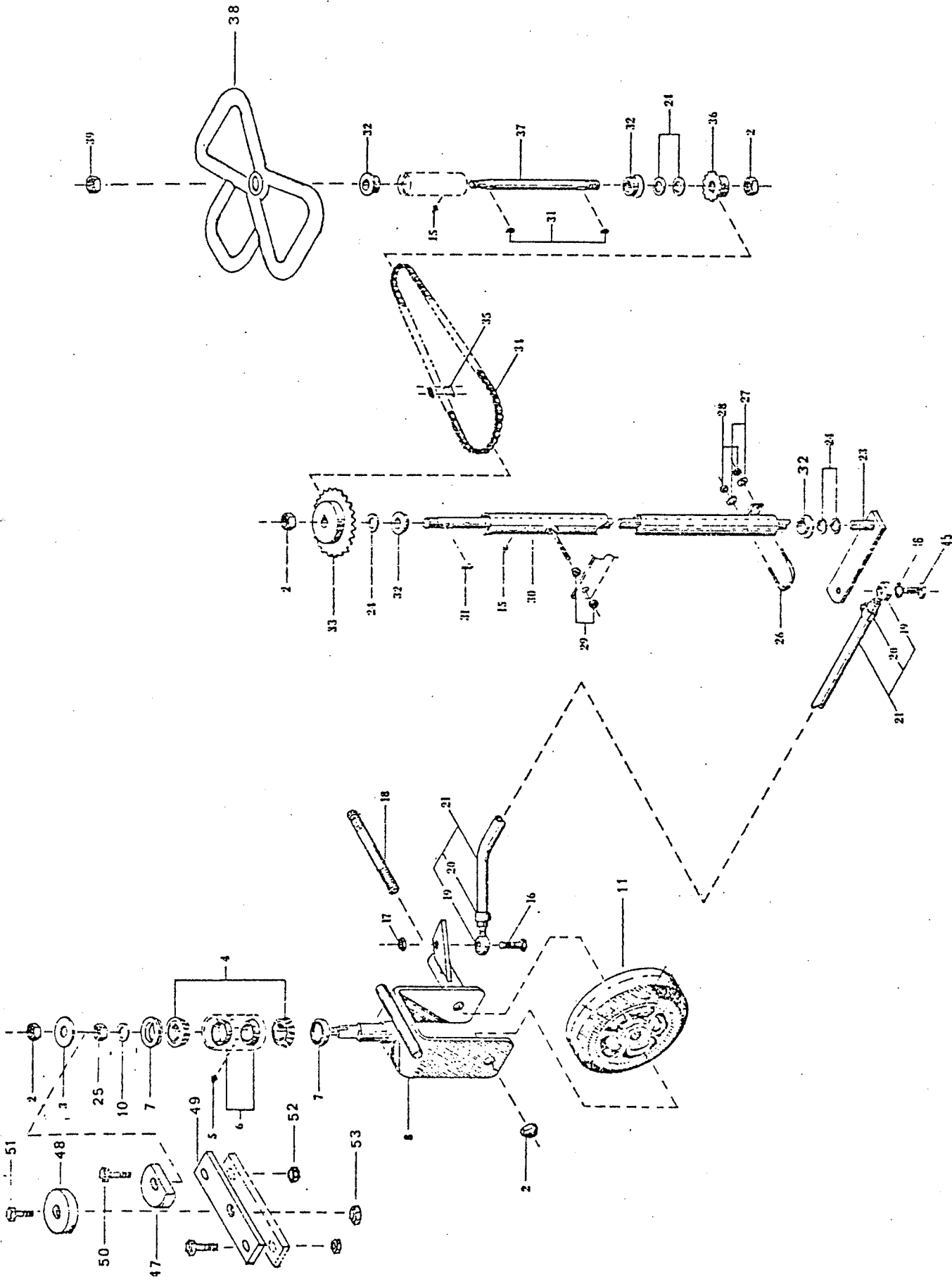
7. If tractor does not follow the guide line within acceptable limits perform Steps 8 through 13.
8. Loosen rubber roller stud nut completely to remove all compression from roller.
9. Loosen bracket mounting bolts slightly.

NOTE: Two scribe marks have been placed on the bracket and the frame after the final inspection and adjustments were made at the factory. They indicate the exact position of the bracket for proper tracking providing that all the parts of the self centering steering system are the original parts. They will also serve as reference marks if any corrections or adjustments are to be made.

10. Tap bracket laterally in the direction necessary to correct the error in steering. Moving bracket $1/16$ " will correct steering approximately 4" in 10 feet.

Example: If tractor is veering approximately 4" to the right of the guide line every 10 feet of travel it will be necessary to move the bracket $1/16$ " to the left (direction necessary to correct error) to correct this amount of error.

11. Retighten bracket mounting bolts securely.
12. Tighten rubber roller stud nut compressing the rubber roller to 3-3/4" in diameter.
13. Perform test drive repeating Steps 8 through 13 until satisfactory steering guidance is achieved.



LENGTH QUAN REVISED DATE REVISION

NO. DESCRIPTION

OL. FRAC. DEC. +

CALE. NAME

DRAWN BY DATE

FRONT FORK & STEERING

FIGURE 3



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

FIGURE NO. 3
FRONT AXLE, FORK & STEERING

<u>Fig. I.D. No.</u>	<u>T-D Part No.</u>	<u>Description</u>	<u>Qty. Req.</u>
3-2	88-229-81	3/4 N.C. Lock Nut	5
3-3	88-228-61	3/4 SAE Washer	1
3-4	80-011-00	1-1/4 I.D. Tapered Roller Bearing	2
3-5	87-074-00	Grease Fitting 1/4-28 Straight	1
3-6	80-102-00	Bearing Race for 1-1/4 Tapered Bearing	2
3-7	45-307-00	Grease Seal	2
3-8	14-018-10	Front Fork (10 x 3-1/2 Whl.)	1
3-10	16-409-00	Spacer, 1" I.D. x 1/4 Thick	1
3-11	13-906-00	Tire, Wheel & Hub (10 x 3-1/2)	1
3-16	88-180-15	5/8 N.C. x 1-3/4 Hex Head Bolt	3
3-17	88-189-82	5/8 N.C. Flexlock Nut Thin-Pattern	2
3-18	15-010-00	Front Axle	1
3-19	86-521-98	Rod End - Spherical Bearing, Male	1
3-19	86-521-99	Rod End - Spherical Bearing, Female	1
3-20	86-510-00	Clamp - Bail Joint	2
3-21	18-041-12	Steering Sleeve Assembly	1
3-22	18-041-00	Steering Adjustment Sleeve	1
3-23	20-146-00	Jack Shaft Assembly	1
3-24	16-405-00	Spacer - Straight Shaft	6
3-25	97-230-00	Nut, 1" Full Fiber Insert	1
3-26	96-102-00	"U" Bolt 5/16 N.C.	1
3-27	88-088-62	5/16 Lockwasher	2
3-28	88-089-80	5/16 N.C. Hex Nut	2
3-29	88-149-81	1/2 N.C. Locknut	3
3-30	32-047-00	Sleeve Only - Jack Shaft	1
3-31	97-100-00	3/6 Woodruff Key	4
3-32	80-400-00	3/4" Open Ball Bearing	4
3-33	30-010-00	Sprocket, 32T #40 Chain 3/4" Bore	1
3-34	30-246-00	Chain, #40 Str. Column, 31-1/2 Long	1
3-35	30-400-00	Link, Master #40	1
3-36	30-002-00	Sprocket, 11T #40 Chain 3/4 Bore	1

FIGURE NO. 3 (Cont.)

<u>Fig. I.D. No.</u>	<u>T-D Part No.</u>	<u>Description</u>	<u>Qty. Rec</u>
3-37	20-145-00	Shaft, Steering Column	1
3-38	19-009-00	Steering Wheel	1
3-39	88-199-92	5/8 N.F. (Hex Jam) Nut	1
3-45	96-317-00	5/8 x 1-1/2 N.C. Hex Head Cap Screw with Wire Hole	1
3-46	88-188-62	5/8 Lockwasher	1
3-47	18-081-00	Cam, Self-Centering Steering	1
3-48	18-082-50	Cam, Follower	1
3-49	18-082-51	Cam Follower Bracket	1
3-50	88-120-14	7/16 x 1-1/2 N.C. Hex Head Cap Screw	2
3-51	88-140-20	1/2 x 3 N.C. Hex Head Cap Screw	1
3-52	88-129-81	7/16 N.C. Locknut	2
3-53	88-149-80	1/2 N.C. Hex Head	1

MAINTENANCE PROCEDURES

REFER TO FIGURE 5

"POWER TRACTION" REAR AXLE, MOTOR AND BRAKES

Your "Power Traction" direct drive assembly is a highly efficient unit. Great care was taken in its 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 its 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 D) and lubrication diagrams (Section E) 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 extend normal chain life. Refer to Section J2 Page 7 for proper adjustment procedures. It is important to adhere to the adjustment schedule included on Page 8. Failure to do so will seriously effect normal chain life.

The electric motor will provide many hours of trouble free service. It is provided with sealed ball bearings which are pre-lubricated for their lifetime.

Periodically, the motor brushes should be inspected and cleaned. The carbon dust and dirt should be blown out of motor. When brushes are worn they should be replaced. Approximately 3000 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.

Check wiring terminals for cleanliness and tightness. A loose connection will cause burning of the respective terminal and can induce motor failure.

Refer to Maintenance Guide (Section D) and Service and Adjustment (Section J2) 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 J2 of this manual for proper procedures.

A few drops of oil on the clevis pin and pivot pins of the mechanical linkage is recommended on a monthly basis. 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.

If your vehicle is equipped with hydraulic brakes refer to Section J3 for their care and adjustment.

A periodic tightening of all bolts and nuts, especially the spring mounting "U" bolts should be made.

The normal life of the shock absorber unit is approximately 2 years.

SERVICE AND ADJUSTMENTS

REFER TO FIGURE 5

"POWER TRACTION" REAR AXLE, MOTOR AND BRAKES.

Adjustment Of Brake (Minor) To Compensate For Normal Lining Wear.

1. Remove Battery and con sole inspection cover. Observe position of Brake Lever Arm. It must be 1/16" or less from Gear Case Cover with Accelerator/ Brake hand control in the full speed on position.

If brake lever arm is not in the correct position, due to improperly adjusted brake rod, then it will be necessary to perform a complete major brake adjustment as itemized under next section "Adjustment of Brakes (Complete)".

2. Release accelerator/brake handle allowing it to return to the brake applied position.
3. Adjust brake band anchor bolt and nut, tightening it until tension on band moves accelerator/brake handle away from rear stop. The correct position is determined by observing position of Rheostat "J" hook. It should be 3/8" to 3/4" above the First Speed Power Bar (Upper most copper power bar).
4. Operate accelerator/brake handle several times applying heavy pressure to the brake band. Check that "J" hook returns to the correct position. If necessary readjust anchor bolt until satisfactory results are obtained.

IMPORTANT NOTE:

On vehicles equipped with the deadman brake coast adjusting screw it may be necessary to back screw away from spring stop to obtain proper brake band adjustment.

5. Block accelerator/brake handle in the full speed on position.
6. Adjust centering screws, centering band around drum to bring band as close to drum as possible without brake dragging. Lock centering screws. If band is not centered around drum deadman lever will not have sufficient travel to engage brakes properly.

Adjustment of Brake (Complete) For Automatic (Deadman) Brake Linkage,
Refer to Section J4.

IMPORTANT NOTE:

If brake/accelerator bellcrank does not contact its mounting plate when the accelerator handle is moved to the full on position, it will be necessary to perform a major mechanical linkage adjustment as described in Section J4.

1. Adjust clevis on brake link (Offset rod which connects brake lever to brake/ accelerator bellcrank assembly), shortening or lengthening the link as needed to bring brake lever 1/16" or less from gear case cover when the brake/ accelerator bellcrank is in contact with its mounting plate. Accelerator will be in the full speed on position.
2. Adjust brake band as outlined in steps 1 through 6 above.

3. Adjust desired amount of "coasting" when automatic deadman brake is applied by raising or lowering coast adjusting screw. Raising coast adjusting screw towards spring stop reduces braking action and increases amount vehicle will coast. Lowering coast adjusting screw away from spring stop increases braking action.
4. Refer to Section J4 "Deadman Spring Adjustment" for proper method to adjust amount of spring tension on accelerator/brake bellcrank assembly.

Removal Of Brake Assembly And Drum

1. Remove cotter pin and clevis pin, disconnecting cable from brake lever arm, (Note location of clevis). Remove lever arm return spring.
2. Remove 4 bolts holding brake mounting assembly and slide assembly off drum.
3. Band and drum may now be cleaned, inspected, and if necessary parts may be replaced as needed.
4. 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.
5. 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.
6. Inspect seal in gear case cover. If worn or damaged, replace with new one. It is recommended that new seal be pre-soaked in light oil for several hours before installation. Use small amount of oil resistant sealer on seal opening in cover when pressing seal into place.
7. Re-assemble drum and spacer on pinion shaft. Tighten to 100 lb. ft. torque.
8. Replace brake assembly in the reverse order to which it was removed.
9. Adjust brake band and cables as outlined on page 2.

Removal Of "Power Traction" Rear Axle & Drive Assembly From Chassis.

1. Disconnect one battery lead to prevent accidental engagement of power while servicing unit.
 2. Clearly mark motor leads to insure their proper location when re-assembling.
 3. Remove motor leads.
 4. Pull clevis pin and disconnect brake cable from brake arm.
 5. Remove lower bolt from shock absorber. (Only vehicles equipped with shock absorbers).
 6. Disconnect hydraulic brake line at hose end. (Only vehicles equipped with hydraulic brakes.)
- Note: Steps 7 and 8 refer to vehicles with spring suspension.
7. Remove "U" Bolt clamp and nuts attaching spring to frame.
 8. Remove spring eye anchor bolts.
 9. Remove 4 bolts attaching power traction assembly to frame (Only on unsprung type vehicles).
 10. Remove axle and drive assembly from chassis.
 11. Install axle and drive assembly in the reverse order of removal, taking care that support pads and rubber bushings are in good condition. (Replace if worn or damaged).
 12. Check brake adjustments as previously outlined on page 2.
 13. On models equipped with hydraulic brakes, it will be necessary to bleed the air from brake system. Follow procedure outlined in Hydraulic Brake Section J3 of this manual.

Disassembly Of "Power Traction" Rear Axle

1. Remove unit from chassis. (As previously outlined)
2. Remove wheels and drain oil from housing.
3. Lock drive shaft brake by pulling brake lever. Remove pinion nut and pull off brake drum.
4. Remove four bolts and spring and lift off brake assembly.
5. Remove remaining nuts and bolts, and remove drive case cover.
6. Remove 3 nuts and washers and remove motor and mount plate. (If motor requires further service, refer to appropriate Section J2 of this manual.)
7. Remove chain and pinion sprocket. Observe location of spacers on shaft. Refer to Figure 5 for their correct location.
8. Remove five bolts holding back plate and remove from carrier housing.
9. On hydraulic brake models, remove brake drums, disconnect hydraulic line, remove brake shoe return springs (orange color) and remove wheel cylinders.
10. Remove four bolts on each end holding axle retainer (and brake backing plate on hydraulic brake models) and pull both axles.
11. Remove nuts around differential carrier housing and remove carrier from axle housing. (Note position of clip for proper reassembly of brake spring.)
12. 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.
13. Remove drive gear from differential case.
14. Drive out differential pinion shaft retainer and separate the differential pinion shaft and remove gears and thrust washers.
15. Remove drive pinion retainer from carrier. Remove O-ring from retainer.
16. Remove pinion locating shim. Measure shim thickness with micrometer.
17. 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.
18. Press the pinion shaft out of front bearing cone and remove spacer.
19. Remove pinion bearing cone.
20. 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 of bore.

Re-Assembly of Power Traction Rear Axle

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 lb. ft. torque.
 2. If the differential bearings have been removed, use a suitable press to install them.
 3. Pinion and Retainer: 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.
 4. Lubricate both bearings with differential oil. Place spacers, sprocket and brake drum on spline with nut and washer and tighten to 100 lb. ft. torque.
- NOTE: The bearing should spin free but have no play. If tight or loose, adjust with .005" and .019" shims.

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, Fig. 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" thicknesses 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 +1 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: The 5 bolts will have to be removed later to install back plate assembly.)
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 bearing to move while making the adjustments. If the caps are too loose an error will result when trying to set backlash and bearing clearance. 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 5.
12. Remove pinion nut, spacers, brake drum, and sprocket. Remove 5 bolts from pinion bearing retainer.
13. Install gasket (use gasket sealer) and back plate assembly. Tighten 5 bolts to 50 lb. ft. torque.
14. Install spacers, sprockets and chain in the reverse order to which they were removed. Take care that 3/16" woodruff key is in proper position and all spacers are in original position. Tighten 3/4" motor shaft nut to 75 lb. ft. torque (if sprocket was removed from motor).
15. Install motor and motor mount plate with "O" ring. Do not tighten 3 nuts until final adjustment is made. Be sure motor terminals are located in the same position as when motor was removed.
16. If seal is worn or damaged in gear case cover, replace with new seal. It is recommended that new seal be pre-soaked in light oil for several hours before installation. When pressing new seal into cover use small amount of oil resistant sealer on seal opening in cover..
17. Install cover gasket and cover.
18. Install brake drum and pinion nut. Tighten to 100 lb. ft. torque.
19. Install brake assembly in the reverse order to which it was removed.
20. Replace wheels and fill chain and differential housing with approximately 2 qts. SAE 20 oil.
21. Replace unit in chassis following steps 11 to 13 outlined in Section titled Removal Of "Power Traction" Rear Axle.
22. Adjust motor mount plate (as outlined in Motor Adjustment Section following) to proper chain tension.

Adjustment of Drive Chain Tension - Power Traction

1. Disconnect one battery lead to prevent accidental engagement of power while servicing vehicle.
2. Tighten three motor mount nuts.
3. Loosen and unscrew each nut exactly one full turn.
Note: This procedure is very important for if the nuts are too loose or too tight an error will result in the final adjustment which will seriously reduce the life of the chain.
4. Loosen adjusting set screw lock nut. Using standard socket set screw wrench turn set screw clockwise until tight. (If a torque wrench is available tighten to 80 inch lbs. torque). Without a torque wrench bear in mind that a standard socket set screw wrench is approximately 4" long. An average person will only be able to develop the required torque necessary if he tightens it as far as possible with his hands and does not use any extended handle on the wrench.
5. After developing the required torque, unscrew the adjusting screw exactly 2-1/2 turns. It is also very important to be exact on this adjustment.
6. Tighten locknut. DO NOT allow adjusting screw to move while tightening locknut.
7. Be certain that motor has moved all the way back and adjusting screw is in contact with back plate. If necessary tap motor lightly to assure this condition.
8. Tighten three motor mount nuts securely.

Perform this adjustment procedure regularly as listed below to assure long and trouble free life from your "Power Traction" Drive.

Scheduled Adjustment	After	Comments
1st Adjustment	1 Month	New unit or after installing new chain
2nd Adjustment	3 Months	Normal running conditions
3rd Adjustment	6 Months	Normal running conditions
Thereafter	Every 6 Mo.	Normal running conditions

Remove Motor - Power Traction

1. Remove rear axle and drive assembly from chassis as described in Steps 1 through 10 in Subsection titled "Removal of Power Traction Rear Axle and Drive Assembly from Chassis."
2. Drain oil from gear case by removing drain plug.
3. Unhook brake spring.
4. Remove pinion nut, washer, and brake drum.
5. Remove all bolts and nuts around gear case cover.
6. Remove gear case cover.
7. Remove three nuts and washers, and remove motor and mounting plate.
8. If replacing motor, remove nut, washer, sprocket, and spacers. Also remove motor mounting plate. NOTE: Observe location of motor terminals in relation to motor mounting plate for proper positioning when re-assembling.

Install Motor In "Power Traction" Drive.

It is not necessary to remove motor mount plate when performing minor motor repairs. Therefore, follow step 1 only when replacing motor with new one.

1. Clean motor surface and install mounting plate with four flat head cap screws. Tighten to 30 lb. ft. torque. Stake head in place with centerpunch.

Note: It is important to locate the motor mount plate in relation to the motor terminal so that they motor terminals will be in an accessible location when drive is completely assembled.

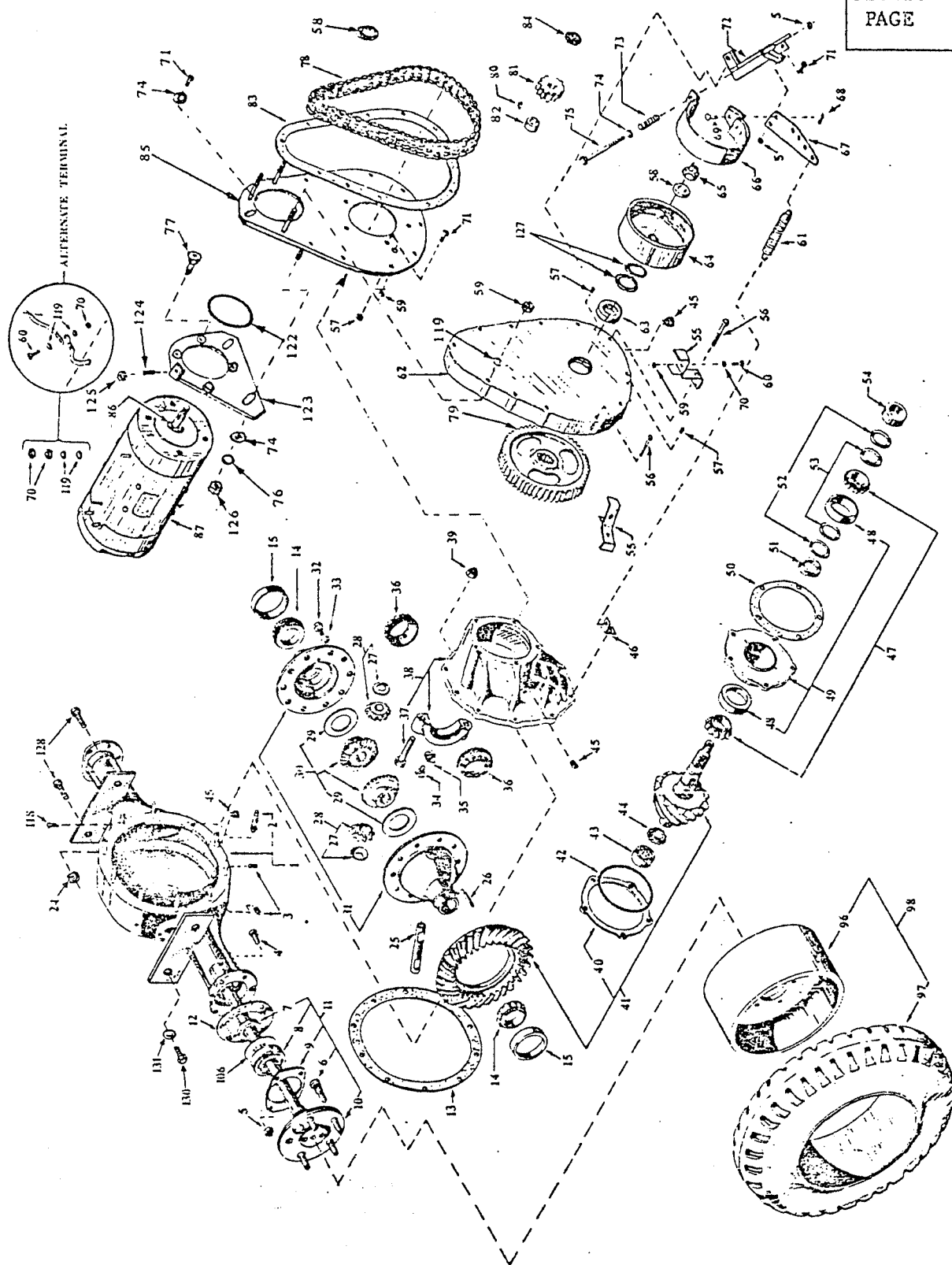
2. Place "O" ring into motor mount plate opening and attach motor and plate to back plate.
3. Re-assemble drive in the reverse order to that of removal.
4. Adjust motor mount to obtain proper chain tension.
5. Refill gear case with SAE ⁹⁰⁻¹⁴⁰ 20 oil.

Motor Repairs.

Unless the maintenance man is properly qualified, it is advisable that repair work be done at a qualified service station. When ordering replacement parts, give complete name plate data.

Disassembly of Motor

1. Remove cover, exposing brush assembly.
2. Lift brushes out of brush holder.
3. 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.
4. Press or pull old bearings off by using bearing press or bearing puller. Do not damage shaft while removing bearings.
5. 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.
6. On "Power Traction" Model, replace motor seal in shaft extension end bell housing.
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 re-assembly.
9. Re-assemble motor taking care that all parts are kept clean.
10. Install brushes and seat in with fine sand paper.
11. Be certain that brushes slide freely, and do not stick or bind in their holders.
12. Replace covers.



TAYLOR DUNN MFG. CO.
2114 1st Bell Rd.
Arlington, Va.

FIGURE 5 "POWER TRACTION" (UNSPRUNG)

NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
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TOL. FRAC.	+	DEC.	+
SCALE	AS SHOWN		
DRAWN BY			

FIGURE 5
POWER TRACTION DRIVE AXLE

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY
5-1	41-290-00	Housing Rear Axle With Bolts	
5-2	96-330-00	Bolt-Differential Carrier To Housing	1
5-3	41-997-00	Drain And Level Plug (1/8" Pipe)	
5-4	88-100-11	Hex Head Cap Screw 3/8" x 1" N.C.	
5-5	88-109-81	Lock Nut 3/8" N.C. (Hex)	1
5-6	96-331-00	Bolt - 1/2" N.F. (Spec.) Rear Hub	1
5-7	32-509-00	Retainer Ring Rear Axle Bearing	
5-8	80-505-00	Rear Axle Ball Bearing	
5-9	32-511-00	Retainer Plate Rear Axle	
5-10	41-163-00	Rear Axle 14-1/8" Overall Length) Left Side	
5-10	41-162-00	Rear Axle 11-5/8" Overall Length) Right Side	
5-11	41-163-10	Axle Assembly With Axle, Retainer Ring, Retainer Plate, And Bearing (14-1/8" Long) Left Side	
5-11	41-162-10	Axle Assembly With Axle, Retainer Ring, Retainer Plate And Bearing (11-5/8" Long) Right Side.	
5-12	32-512-00	Retainer Spacer (Used Only <u>Without</u> Hydraulic Brakes)	
5-13	45-042-00	Gasket (Housing To Differential Carrier)	
5-14	80-511-00	Tapered Roller Bearing - Carrier (Small 1.628 I.D.)	
5-14	80-512-00	Tapered Roller Bearing - Carrier (Large 1.784 I.D.)	
5-15	80-127-00	Tapered Bearing Race-Carrier (Small)	
5-15	80-128-00	Tapered Bearing Race-Carrier (Large)	
5-16	97-236-00	Nut 1/2" N.F. (Lug)	
5-24	88-149-81	Lock Nut 1/2" N.C. (Hex)	3
5-25	41-700-00	Differential Pinion Shaft	
5-26	41-701-00	Pin	
5-27	41-702-00	Thrust Washer - Differential Pinion Shaft	
5-28	41-703-00	Differential Shaft Pinion Kit (Two Differential Gears And Two Thrust Washers)	
5-29	41-704-00	Thrust Washer-Differential Side Gear	
5-30	41-705-00	Differential Side Gear Kit (Two Differential Side Gears And Two Thrust Washers)	
5-31	41-712-00	Differential Gear Case Assembly (Small Carrier Bearings 1.628" I.D.)	
5-31	41-713-00	Differential Gear Case Assembly (Large Carrier Bearings 1.784" I.D.)	
5-32	88-130-10	Hex Head Cap Screw 7/16" x 7/8" N.F.	
5-33	97-163-00	Washer 7/16" I.D. X 3/4" O.D. X 1/32"	

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY REQ
5-34	88-080-04	Hex Head Cap Screw 5/16" X 3/8" N.C.	2
5-35	41-706-00	Differential Bearing Adjustment Nut Lock	.
5-36	41-707-00	Nut-Differential Bearing Adjustment 3-1/8"-16 Thread (For Small Carrier Bearing 1.628" I.D.)	2
5-36	41-708-00	Nut-Differential Bearing Adjustment 3-5/16"-16 Thread (For Large Carrier Bearing 1.784" I.D.)	2
5-38	41-709-00	Differential Carrier Assembly (For Small Carrier Bearings 1.628" I.D.)	1
5-38	41-710-00	Differential Carrier Assembly (For Large Carrier Bearing 1.784" I.D.)	1
5-39	88-119-80	Nut - 3/8" N.F. (Hex)	14
5-40	41-711-00	Shim - Drive Pinion Bearing	1 To
5-41	31-235-00	Ring And Pinion Gear Set 2.69 Ratio	1
5-41	31-236-00	Ring And Pinion Gear Set 2.91 Ratio	1
5-41	31-237-00	Ring And Pinion Gear Set 3.10 Ratio	1
5-41	31-238-00	Ring And Pinion Gear Set 3.56 Ratio	1
5-41	31-239-00	Ring And Pinion Gear Set 5.43 Ratio	1
5-42	80-702-00	"O" Ring - Drive Pinion Bearing Retainer	1
5-43	80-555-00	Ball Bearing - Rear, Pinion Pilot	1
5-44	41-714-00	Driving Pinion Pilot Bearing Retainer	-
5-45	41-996-00	Plug - (Level) 1/2" With Recessed Top	1 Or
5-46	91-509-00	Spring Clip	0 Or
5-47	80-554-00	Tapered Roller Bearing - Pinion Shaft	2
5-48	80-125-00	Tapered Bearing Race - Pinion Shaft	2
5-49	41-715-10	Pinion Bearing Case Assembly & Bearing Races	1
5-50	45-021-00	Gasket Gear Case To Pinion Bearing Assembly	1
5-51	16-415-00	Spacer Pinion Shaft (.440" Thick)	1
5-52	16-410-00	Spacer Pinion Shaft (.018" Thick)	2 To
5-53	16-411-00	Spacer Pinion Shaft (.005" Thick)	2 To
5-54	16-414-00	Spacer Pinion Shaft (.440" Thick)	1
5-54	16-417-00	Spacer Pinion Shaft (.340" Thick)	1
5-55	41-371-00	Brake Alignment Bracket	2
5-56	88-080-20	Hex Head Cap Screw 5/16" X 3" N.C.	9
5-57	41-989-00	Plug (Filler Level And Drain) 1/2" N.P.T.	2
5-58	88-228-61	Washer 3/4" S.A.E.	2
5-59	88-089-81	Lock Nut 5/16" N.C. (Hex)	
5-60	88-080-11	Hex Head Cap Screw 5/16" X 1" N.C.	2
5-61	85-270-00	Extension Spring 1 1/4" O.D. X 4-3/8" Free Length	0 Or

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
5-62	43-201-00	Gear Case Cover	1
5-63	45-331-00	Oil Seal - Gear Case to Pinion	1
5-64	41-532-00	Brake Drum (Splined)	1
5-65	97-250-00	Nut - Pinion 3/4" - 20 Extra Fine Thread	1
5-66	47-661-00	Full Brake Band for 6" Drum	1
5-67	50-656-00	Brake Lever Arm	1
5-66	41-660-00	Brake Band ($\frac{1}{2}$ Band) for Drive Shaft Brake	1
5-68	88-517-11	Cotter Pin 3/32" x 1"	1
5-69	96-771-00	Clevis Pin 3/8" x 3/4" Face to Hole	1
5-70	88-089-80	Nut - 5/16" N.C. (Hex)	10
5-71	88-100-13	Hex Head Cap Screw 3/8" x 1 $\frac{1}{2}$ " N.C.	7
5-72	41-372-00	Brake Mounting Bracket - Full Band	1
5-72	41-373-00	Brake Anchor Bracket - $\frac{1}{2}$ Band Brake	1
5-72	41-377-00	Brake Mounting Bracket - $\frac{1}{2}$ Band Brake	1
5-73	85-060-00	Compression Spring 5/8" O.D. x 2 $\frac{1}{2}$ " Long	1
5-74	88-108-60	Washer 3/8" Flat Cut	4
5-75	88-100-24	Hex Head Cap Screw 3/8" x 4" N.C.	1
5-76	88-108-62	Lockwasher 3/8"	7
5-77	88-103-09	Flat Head Socket Cap Screw 3/8" x 3/4" N.C.	4
5-78	30-508-00	Chain - 48 Links (For 81 Tooth Sprocket)	1
5-79	30-093-00	Sprocket - 81 Tooth with Splined Hub	1
5-80	97-100-00	Woodruff Key - 3/16"	1
5-81	30-080-00	Sprocket - 15 Tooth x 3/4" Bore	1
5-82	17-110-10	Shaft Collar - 3/4" with Keyway	1
5-83	45-002-00	Gasket - Gear Case Cover	1
5-84	88-239-82	Jam Nut - 3/4" N.F. (Hex)	1
5-85	44-352-52	Gear Case Back Plate (Vertical Motor Mount)	1
5-86	45-506-00	Oil Seal (G.E. Motor)	1
5-87	70-054-00	Motor 2.25/3.5 H.P., 24/36 Volt 1800/2800 R.P.M.	1

FIG. I.D. NO.	T D PART NO.	DESCRIPTION	QTY. REQ.
5-87	70-100-00	Motor Brushes - G.E. Motor - 24 & 36 Volt	4
5-87	70-186-00	G.E. Brush Head Assy. Without Brushes	1
5-87	80-504-00	Ball Bearing for Front of G.E. Motor	1
5-87	80-200-00	Ball Bearing for Rear of G.E. Motor	1
5-87	85-401-00	Brush Extension Spring (G.E.) 24 & 36 Volt	4
5-96	12-050-00	Wheel for 16 x 4 x 12-1/8 Solid Cushion Tire (Five 1/2" Holes on 4 1/2" Bolt Circle)	2
5-97	10-250-00	Tire - Solid Cushion, Smooth, 16 x 4 x 12-1/8	2
5-98	13-952-10	Tire Cast Iron Wheel 16 x 4 x 12-1/8 Solid Cushion Tire (Five 1/2" Holes on 4 1/2" Bolt Circle)	2
5-98	13-920-00	Tire & Wheel Assembly (15 x 5) (Roll-Rite)	2
5-106	45-044-00	Gasket - Rear Axle Bearing	2
5-118	88-527-11	Cotter Pin 1/8" x 1" (Axle Vent)	1
5-119	88-088-61	Washer 5/16" SAE	11
5-122	80-703-00	"O" Ring Motor Mount Seal	1
5-123	70-454-00	Motor Mount Plate	1
5-124	88-067-11	Socket Set Screw 1/2" NC x 1"	1
5-125	88-069-80	Nut 1/4" NC (Hex)	1
5-126	88-109-80	Nut 3/8" NC (Hex)	3
5-127	16-400-00	Spacer 1 1/4" I.D. x .125" Thick	0 - 1 or 2
5-128	88-140-14	Hex Head Cap Screw 1/2" x 1 1/2" NC	3 or 4
5-130	88-180-11	Hex Head Cap Screw 5/8 x 1 1/2" NC (Model E)	1
5-131	88-188-62	Lock Washer 5/8" (Model E)	1

MAINTENANCE PROCEDURES

REFER TO FIGURE 7

MECHANICAL CONTROL LINKAGE

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

The accelerator/brake handle is connected to the bellcrank assembly which contains a heavy spring. This spring automatically returns the accelerator to the off position and applies the deadman brake. The brake/accelerator bellcrank assembly, being an integral unit, simultaneously operates the release of braking action while motor power is being applied and conversly disconnects motor power when brake action is applied.

On vehicles equipped with automatic remote operated control system there is added to the standard linkage an electro-mechanical solenoid, hydraulic dashpot and suitable connecting linkage. When the electro-mechanical solenoid is energized it pulls the accelerator/brake handle to the on position (pre-set to engage first, second or third speed) simultaneously releasing the brake. The vehicle will run at this position until the program timer deactivates the electro-mechanical solenoid. In turn, the accelerator returns to the off position and the brake is applied. The hydraulic dashpot is adjusted to retard or cushion the "slam" of the solenoid engaging the control handle.

The various mechanical linkage components are located within the main console area. They are all accessible by removing the battery and the inspection cover.

All wear points should be lubricated monthly using pressure gun grease at the points equipped with zerk fittings, and all purpose engine oil at other points. Refer to Maintenance Guide Section D and Lubrication Diagram Section E.

For service and adjustments refer to the following sections:

- | | |
|------------|---|
| Section J2 | For brake band service and adjustments. |
| Section J4 | For accelerator and automatic brake linkage service and adjustment. |
| Section J6 | For accelerator switch service and adjustments. |

SERVICE AND ADJUSTMENTS
REFER TO FIGURE 7
MECHANICAL CONTROL LINKAGE

CAUTION: DISCONNECT BATTERY BY UNPLUGGING FROM VEHICLE PRIOR TO MAKING ANY ADJUSTMENTS TO CONTROLS.

Adjustment of Deadman Spring

1. Prevent eye bolt from turning while adjusting nut by placing large screw-driver or bar through the eye opening.
2. Tightening the adjusting nut stretches the spring and increases the amount of "deadman" spring tension. Loosening the adjusting nut decreases the amount of tension.

Important Note

On vehicles equipped with electro-mechanical solenoid too much spring tension can overload the solenoid and cause it to fail. The best adjustment of spring tension is where there is sufficient tension to return accelerator completely to off and supply adequate stopping power to the braking system but no excess tension wasting solenoid power.

3. The maximum spring tension on vehicles equipped with electro-mechanical solenoid is 30 lbs. measured with a suitable scale at the solenoid plunger link with the plunger seated against the solenoid frame.

Adjustment of Electro-Mechanical Solenoid

CAUTION: The maximum allowable stroke of the solenoid plunger is 1-3/4" measured between the plunger and the solenoid frame.

Note: This measurement and any subsequent adjustment of the electro-mechanical solenoid linkage should be made after all other mechanical control linkages and brake adjustments are properly set. The electro mechanical solenoid can be adjusted to operate the vehicle in first, second or third speed. Lengthening the linkage moves the "J" hook towards the first speed power bar. Shortening the linkage moves the "J" hook towards the third speed power bar.

1. Observe position of "J" hook by holding the solenoid plunger down against its stops. The "J" hook should be 1/16" past the preceding speed power bar. Example: to set the electro-mechanical solenoid linkage to operate vehicle in the third speed position adjust linkage to position "J" hook 1/16" past the second speed power bar.
2. Remove clevis bolt and nut at dashpot arm.
3. Adjust clevis, lengthening or shortening link until desired setting is obtained.
4. Measure total stroke of electro-mechanical solenoid. It must not exceed 1-3/4".

DASHPOT ADJUSTMENT

The dashpot assembly is effective only during the downward pull of the electro-mechanical solenoid stroke.

1. Adjust metering screw located on the lower half of the body. Turning screw clockwise increases the retarding action of the dashpot. Turning the adjusting screw counterclockwise decreases the retarding action. Adjust dashpot action to where the hard mechanical "slam" is eliminated when solenoid is energized.

NOTE: The nature of the mechanical action generated by the electro-mechanical solenoid tends to be swift and noisy. This is considered normal, especially when solenoid is cold. The dashpot does not eliminate the noise. It is there to reduce the severe mechanical slamming of solenoid plunger which over a period of time may be destructive to the solenoid parts.

SPEED CONTROL RHEOSTAT "J" HOOK ADJUSTMENT.

1. Place accelerator/brake handle in the full on position.
Brake/accelerator bellcrank should be in contact with its mounting bracket.
2. Observe position of "J" hook. It should be in exact alignment with the fourth speed power bar. If it is not in alignment as described follow steps 3 through 5.
3. Loosen two bolts and nuts connecting the accelerator link to the "J" hook insulator board.
4. Raise or lower "J" hook and insulator until "J" hook is in proper alignment.
5. As an alternative adjustment, the mounting bracket to which the entire rheostat switch is attached is fitted with slotted holes. Loosen bolts and slide entire switch assembly into position to bring "J" hook and fourth power bar into alignment.

MAJOR ADJUSTMENT PROCEDURE FOR MECHANICAL LINKAGE

This procedure is necessary only after the removal and replacement of all or part of the mechanical linkage components.

NOTE: It may be necessary to disconnect portions of the linkage system during the adjustment procedures. If they are out of adjustment they will interfere with the correct setting of the part being adjusted.

1. Position Speed Control Rheostat "J" Hook as previously outlined.
2. Place accelerator/brake handle in the extreme off position (rearward) until the arm (to which the bellcrank to handle connecting rod is attached) stops against the top of the console.

3. Observe the position of the "J" hook. If necessary, adjust the bellcrank to handle connecting rod to bring the "J" hook 3/4" to 1" above the first speed power bar.
4. Check stroke and operation of the handle and bellcrank. Full speed on position is correct when bellcrank contacts its mounting bracket and the "J" hook is in exact alignment with fourth speed power bar. Complete off position is correct when handle connecting rod arm is against top of console and "J" hook is 3/4" to 1" above first speed power bar.
5. Adjust brake band as outlined in Section J2 and adjust brake link to bring brake lever arm 1/16" or less from gear case cover when bellcrank is in contact with its mounting bracket.
6. Adjust brake coast stop screw to desired amount of braking/coasting action.
7. Adjust Electro-Mechanical Solenoid linkage, setting it to operate tractor in the desired speed position as previously outlined.
8. Adjust deadman spring to correct tension as previously outlined.

CAUTION: Do not exceed 30 lbs. pull at the solenoid link in the full speed on position.

9. Adjust Dashpot as required.
10. Operate tractor making final minor adjustments until its performance is satisfactory.

Refer to Section J7 for proper setting of electrical control circuit components on vehicles equipped with semi-automatic remote control system.

Refer to Section J2 for proper brake adjustments.

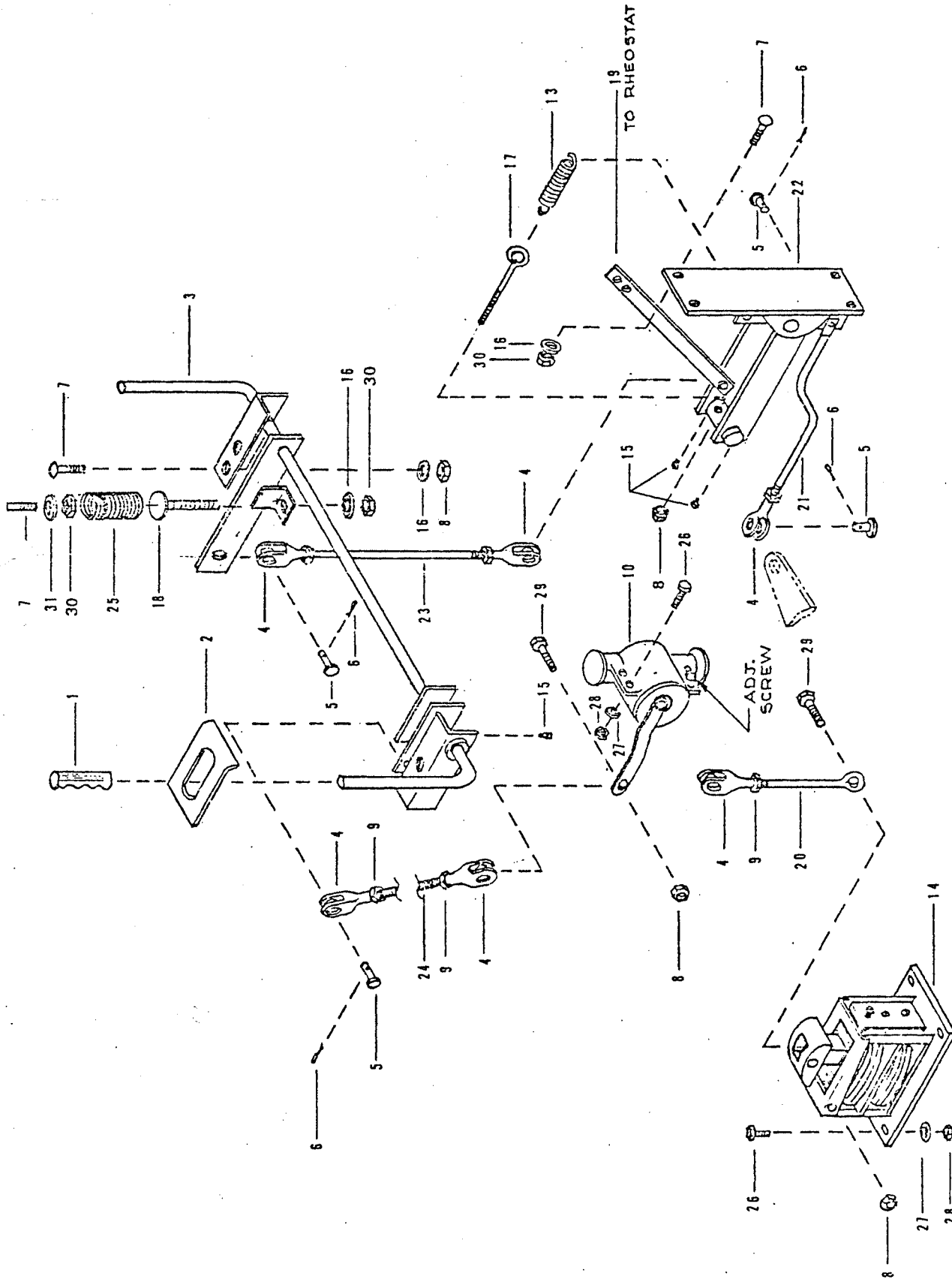


FIGURE 7
SECTION J4
MECHANICAL CONTROL LINKAGE
(ROLL-RITE)

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

NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
TOL. FRAC.	DEC.	+			
SCALE	NONE				
DRAWN BY	EDS				
DATE	10-22-73				

FIGURE NO. 7
MECHANICAL CONTROL LINKAGE

<u>Fig. I.D. No.</u>	<u>T-D Part No.</u>	<u>Description</u>	<u>Qty. Req.</u>
7-3	50-641-00	Linkage Control Assembly	1
7-4	96-762-00	Clevis - 3/8 Cast	6
7-5	96-772-00	Pin - Clevis 3/8" x 1"	4
7-6	88-519-09	Cotter Pin 3/32" x 3/4"	5
7-7	88-102-11	Carriage Bolt - 3/8 x 1 N.C.	8
7-8	88-109-81	3/8 N.C. Hex Locknut	6
7-9	88-119-80	3/8 N.F. Hex Nut	6
7-10	53-005-10	Dashpot Assembly	1
7-11	88-069-87	1/4 N.C. Nut (Fastite)	7
7-12	88-065-09	1/4 x 3/4 N.C. Truss Head Machine Screw	7
7-13	85-290-00	Spring Ext. 1-3/8 O.D. x 7-3/4 Free Length	1
7-14	72-540-00	Electro-Mechanical Solenoid	1
7-14	72-540-51	Coil Assembly Only	2
7-15	87-071-00	Grease Fitting 3/16" Drive (Straight)	3
7-16	88-108-62	3/8 Washer	4
7-17	96-202-00	Eye Bolt 3/8 x 4	1
7-18	50-801-00	Brake Apply Spring Stop	1
7-19	50-630-00	Accelerator Link Assembly	1
7-20	50-632-00	Electro-Mechanical Solenoid Link	1
7-21	50-032-00	Brake Link - 13" Long	1
7-22	50-631-00	Brake/Accelerator Bellcrank	1
7-23	50-127-00	Rod- Deadman Brake to Accelerator Handle	1
7-24	50-026-00	Rod - All Thread 3/8-24 X 3" Long	1
7-25	85-120-00	Compression Spring	1
7-26	88-060-11	1/4 N.C. x 1" Hex Head Screw	7
7-27	88-068-61	1/4 SAE Washer	7
7-28	88-069-80	1/4 N.C. Hex Head Nut	7
7-29	88-100-15	3/8 x 1-3/4 N.C. Hex Head Screw	2
7-30	88-109-80	3/8 N.C. Hex Head Nut	10
7-31	88-148-60	1/2" Washer	1

MAINTENANCE PROCEDURES
REFER TO FIGURE 8
FORWARD-REVERSE SWITCH

The forward-reverse switch on your vehicle serves the same purpose as does the transmission in your automobile. It should be treated with the same respect, for abusive treatment will not only shorten its life, but will seriously effect the life of the motor, drive gears and differential.

DO NOT SHIFT POSITION OF SWITCH FROM FORWARD TO REVERSE OR VICE-VERSA WHILE VEHICLE IS IN MOTION.

It will require very little maintenance if properly used. Every month check contact fingers and rotor contacts for cleanliness and to insure that they are making snug and even contact. If they show evidence of abnormal pitting or burning they should be replaced.

Refer to Service and Adjustment Section J5 of this manual for replacement procedures.

It is recommended that an occasional small quantity of lubricant be placed on the cam and cam follower of the switch. Refer to Figure 8.

An occasional application of powdered graphite or similar key lock lubricant will keep your key and lock in good working order.

SERVICE AND ADJUSTMENT
REFER TO FIGURE 8
FORWARD-REVERSE SWITCH

Caution: Whenever service work is to be conducted on the switch or any part of your vehicle wiring system, disconnect the positive lead at your battery or unplug power leads on vehicles so equipped.

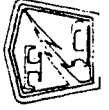
REMOVAL, DIS-ASSEMBLY AND RE-ASSEMBLY OF SWITCH

1. Remove handle screw in center of handle and then remove handle and spacer.
2. Remove 2 screws in center of face plate, this will release switch unit from frame. Then lift switch unit clear of frame noting that the end plate will be free to lift off of switch.
3. Remove cover.
4. If you wish to remove contact fingers or finger-boards at this time, then it will be necessary to follow steps 5-6-8 & 9. If you will only be servicing the rotor assembly it will not be necessary to remove wires.
5. Note position of wires and mark their respective locations to insure that they will be properly placed on re-assembly.
6. Remove 4 wires from switch terminals and slide out of switch housing.
7. Pull cam follower away from cam on rotor and lift rotor assembly from switch housing.
8. If you wish to replace finger-boards at this time, tap them out of their slots in the direction of the handle end of switch taking care to catch the wedges as they come free of the frame.
9. Install new finger board in the reverse manner outlined in step 8, noting that the long notch on end of board is located on handle end of switch. Tap wedges into place to lock finger boards to frame.
10. Inspect cam and spring. If necessary replace with new parts.
11. Remove nut on end of rotor shaft and dis-assemble spacers and rotor contacts. Note: it is very important to observe the position of each part as you remove it from rotor shaft to insure it's proper re-assembly. The rotor contacts look similar but are actually a pair consisting of a left and a right contact.
12. Re-assemble rotor parts on rotor shaft in their proper order and lock into place by tightening 1/4" nut at end of shaft. Use care in tightening nut as undue strain could shear the locking ring on opposite end of shaft.
13. Install rotor assembly into frame moving cam follower enough to allow cam to set in position.
Note: It will ease the rotor installation if you will place it in neutral position. i.e. The contacts will be free from finger contacts and the low side of cam will engage cam follower.

14. Install wires onto their respective terminals and tighten securely.
15. Replace cover.
16. Replace end plate and slide switch unit back into place against face plate.
17. Replace 2 screws. It may be necessary to exert sufficient pressure and joggle switch unit into alignment with screw holes as cam spring tends to hold the switch out of position. A simple method to align the face plate and switch frame together, is to slip a medium size nail or ice pick into one hole through both pieces. Align second hole, insert screw, and tighten. Remove nail or ice pick from first hole and install screw and tighten.
18. Replace spacer and handle and tighten into position with center screw.

REPLACEMENT OF CONTACT FINGERS ONLY

1. Remove cover. (Note: on some vehicles it will be necessary to remove switch from mounting plate to gain access to cover.)
2. If you will be removing more than one finger at a time, it is recommended that you note the position of the wires and mark their respective locations.
3. Remove terminal nut and wire.
4. Remove nut holding finger to finger-board and remove finger.
5. Install new finger and replace nuts and wires in the reverse order to which they were removed.



FORWARD-REVERSE SW.
PART NO. 71-040-00

FIGURE 8
SECTION J5

LENGTH QUAN. REVISED DATE REVISION

NO. DESCRIPTION

TOL. FRAC. + DEC. -

SCALE NONE

DRAWN BY RFE4

DATE 9-13-69

SECTION J5
PAGE 4

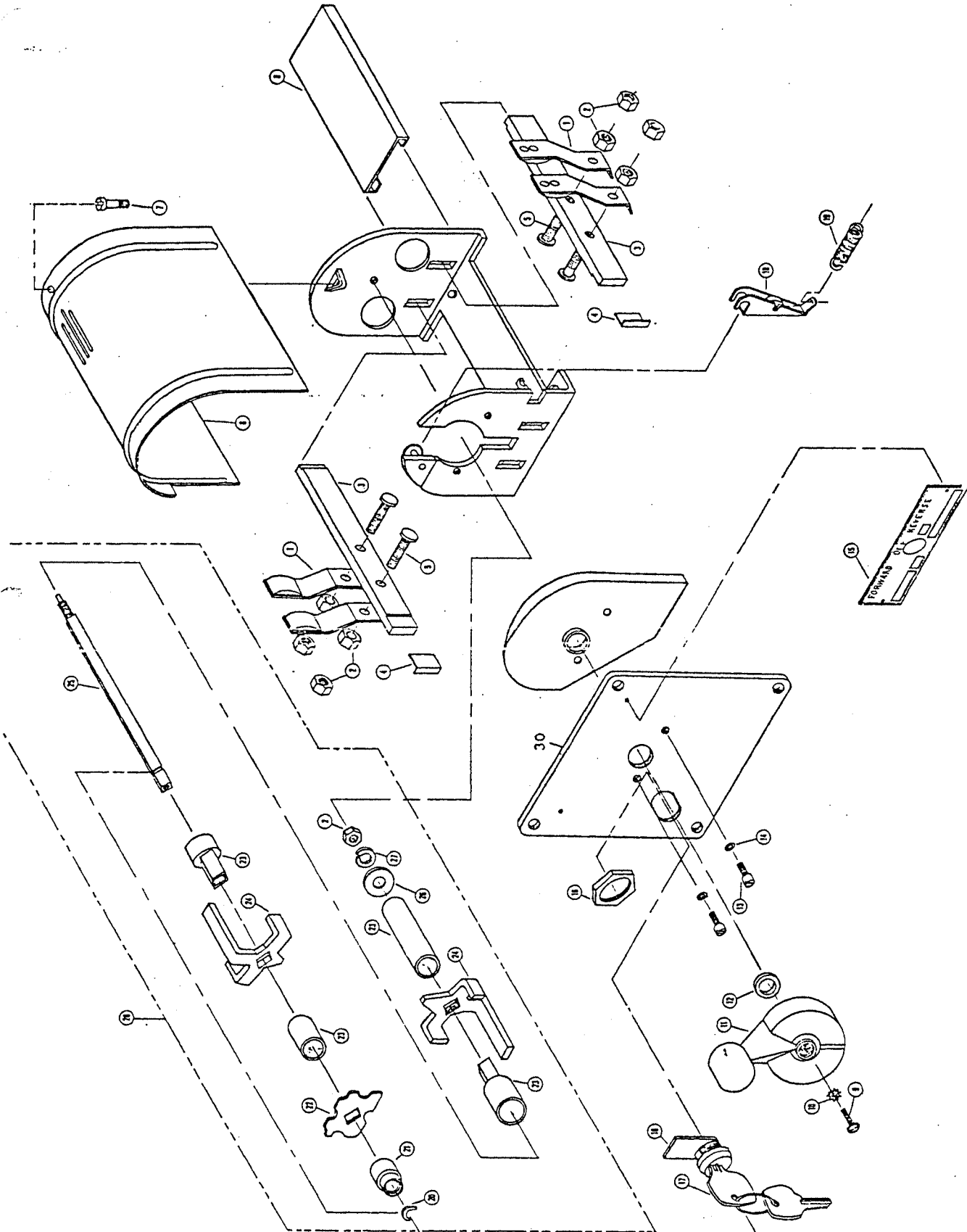


FIGURE NO. 8
GROUP 8 FORWARD AND REVERSE SWITCH

FIG. I. D. NO.	T-D PART NO.	DESCRIPTION	QT RE
8-0	71-040-00	Forward & Reverse Switch Complete (4 Fingers)	-
8-1	71-040-60	Switch Finger - Silver Plated With 1/4" Hole	4
8-2	88-079-80	Nut 1/4" NF (Hex)	9
8-3	71-040-61	Finger Board With 1/4" Holes	2
8-4	71-040-69	Finger Board Wedge	2
8-5	71-040-71	Bolt-Finger Mounting (1/4" NF X 7/8" Spec.)	4
8-6	71-040-65	Switch Cover	1
8-7	71-040-73	Cover Screw (10-32 X 1/2" Filister Head)	1
8-8	71-040-70	Rubber Insulator Strip	1
8-9	88-025-06	Screw 8-32 X 1/2" Truss Head	1
8-10	88-028-64	Washer 8-32 (External Star Lock)	1
8-11	71-040-62	Switch Handle - Metal (Red Color)	1
8-12	71-040-59	Spacer Washer	1
8-13	71-040-72	Face Stop Bolt (10-32 X 3/8 Spec.)	2
8-14	88-048-62	Lock Washer 10-32	2
8-15	94-305-00	Forward-Reverse Switchplate	1
8-16	71-040-55	Lock Assembly With 2 Keys	1
8-16	71-040-87	Tubular Lock Assy. With Two Keys	1
8-17	71-040-74	Key Only (Give No. Of Lock Or Vehicle Ser. No.)	2
8-18	71-040-53	Cam	1
8-19	71-040-54	Spring - (Cam)	1
8-20	71-040-75	Snap Ring - 1/4"	1
8-21	71-040-68	Bushing	1
8-22	71-040-67	Cam Index	1
8-23	71-040-66	Plastic Spacer Set (Sold Only As Set Of 4 Pcs.)	1
8-24	71-040-58	Rotor Contacts (Set Of 2-1 Right & 1 Left)	1
8-25	71-040-64	Rotor Shaft (Only)	1
8-26	88-068-61	Washer SAE	1
8-27	88-068-62	Lock Washer 1/4"	1
8-28	71-040-52	Rotor Assembly	1
8-30	71-040-82	Face Plate	1
	71-040-76	Kit-Conversion to Six Finger Switch	1
<u>Switch Extension Handle Parts</u>			
8-9	71-040-80	Extension Rod-8-32 x 6 1/2" Long	1
8-9	71-040-78	Extension Tube-11/16 OD x 5 1/2" Long	1
8-11	71-040-77	Switch Position Indicator	1
	71-040-79	Bracket - Extension Support	1
	88-029-80	Nut 8-32 (Hex)	1

MAINTENANCE PROCEDURES

REFER TO FIGURE 9

RHEOSTAT 4 SPEED CONTROL

The rheostat controls the speed of your vehicle through the use of coils of nichrome resistance wire. With this type of resistance control, you use approximately the same amount of power from batteries in low speed as you do in high speed. The four flat copper bars and a movable J-Hook are the major parts in the rheostat. With proper adjustment and lubrication the rheostat will give many months of trouble free use. It doesn't take much grease to do the job, but it should be done weekly. Monthly the space between bars should be cleaned with a piece of wood or plastic or steam cleaned if possible. When J-Hook is worn to 1/8" thickness, replace J-Hook and power bars.

Refer to Service and Adjustment Section J6 of this manual for proper adjustment and service procedures.

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 to the connection. Care should also be taken at each inspection to insure that proper contact is maintained between J-Hook and power bars.

J-Hook and accelerator linkage should work freely allowing return spring to always return J-Hook to neutral bar when accelerator is released.

Refer to Lubrication Diagram Section E for proper lubrication.

SERVICE AND ADJUSTMENT

REFER TO FIGURE 9

SPEED CONTROL PROGRAM SWITCH

Caution: Whenever service work is to be performed on the electrical system disconnect the battery by unplugging power leads.

Adjustment of J-Hook Pressure Bar

1. Adjust J-Hook pressure bar by disconnecting J-Hook from accelerator link and sliding J-Hook near the anchor bolt at neutral bar end. Anchor bolt is held in position by 2 nuts. Loosen one nut and adjust the other until J-Hook may be moved with a minimum of effort but not allowed to "jiggle" freely. At the opposite end of the pressure bar, adjust the spring pressure to maintain snug contact between J-Hook and power bars. Too much spring pressure will tend to make the J-Hook bind and stick. Too little pressure will promote poor contact, causing burning and pitting to occur. Re-connect operating arm to accelerator link and check operation of switch. J-Hook should slide smoothly with very little noise. If noticeable clicking noises occur as J-Hook passes over power bars, it is usually indicative of poor J-Hook alignment. If necessary, bend or twist connecting strap until J-Hook contacts power bars in a flat and smooth manner.

Caution: Every time adjustments are made to rheostat switch, always check the operation of the accelerator handle. The J-Hook MUST return completely to neutral bar when handle is released from any position. Lubricate as outlined in Section E.

Adjustment of J-Hook Travel

1. With power disconnected, move accelerator/brake handle to full ON position.
2. Observe position of rheostat switch J-Hook. Correct position is when J-Hook and high speed contact bar are in exact alignment. If J-Hook is not correctly aligned then refer to Section J4, Page 2, and follow adjustment of Automatic (Deadman) Brake Linkage.

Replacement of J-Hook

1. With power disconnected, remove two bolts attaching J-Hook to connecting strap.
2. Slide J-Hook to full ON position and open pressure bar by pulling against spring pressure.
3. Roll J-Hook out from between pressure bar and power bars.
4. Replace J-Hook following reverse procedure.

Replacement of Rheostat Switch

1. Note location of wires connected to switch and mark accordingly, to insure their return to original location on re-assembly.
2. Remove wires at respective terminals.
3. Remove bolts connecting J-Hook insulator to operating link.
4. Remove three bolts holding switch to bracket and remove switch.
5. Replace switch in the reverse manner to which it was removed.
6. Check and adjust rheostat switch as outlined above.

Replacement of Power Bars

1. With power disconnected, remove terminal bolt and holding bolts.
2. Slide bar out of rheostat switch.
3. Clean switch thoroughly and install new bar.

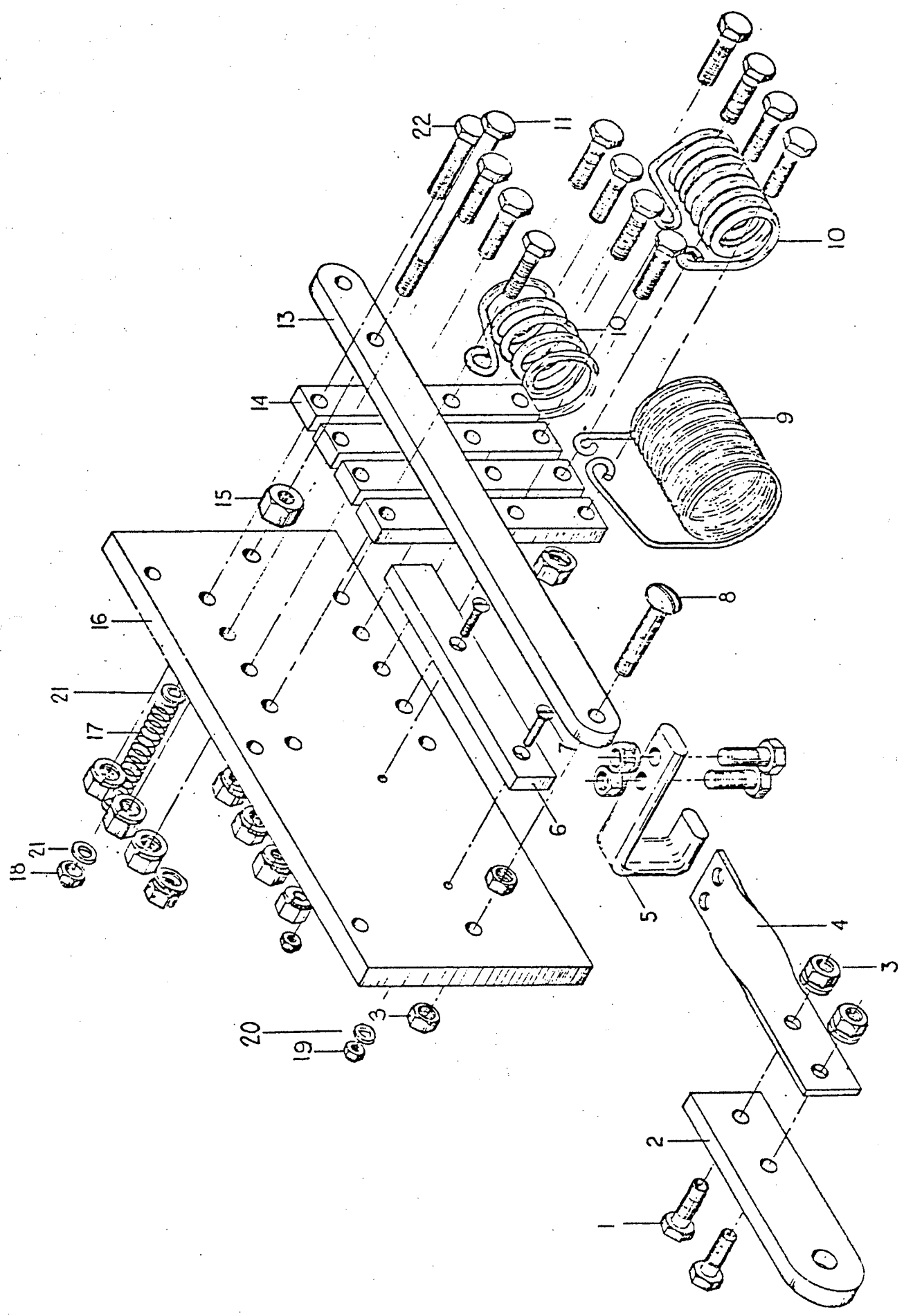
Note: Power bars tend to wear at the same rate, except when 1 bar may become excessively burned because of poor contact. When replacing with new power bars, it is important that all bars be of the same thickness. Binding and sticking will occur when bars are not of uniform thickness.

It is recommended that power bars be replaced as a set rather than individually to avoid the above condition.

Minor high points may be removed with a file to produce smooth switching action.

4. Follow adjustment procedures previously outlined.

TAYLOR DUNN MFG. CO.
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Anaheim, Calif.



NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
FIGURE 9	SPEED CONTROL SWITCH				
SECTION J 6	4-SPEED - MOD. 3454 E				
TOL. FRAC. ±	DEC. ±				
SCALE	NONE				
DRAWN BY	EDE				
DATE	5-15-73				

FIGURE NO. 9
SPEED CONTROL & MAIN
POWER SWITCHING

<u>Fig. I.D. No.</u>	<u>T-D Part No.</u>	<u>Description</u>	<u>Qty. Req.</u>
9-1	88-060-09	1/4-20 x 3/4 Hex Head Bolt	2
9-2	61-834-51	Insulating Board for J-Hook-4 Hole Pattern	1
9-3	88-069-87	1/4 - 20 Fastite Nut	16
9-4	61-833-00	J-Hook Strap	1
9-5	61-832-00	J-Hook	1
9-6	61-835-14	Neutral Bar	1
9-7	88-026-10	8-32 x 7/8 Flat Head Screw	2
9-8	88-065-14	1/4-20 x 1-1/2 Truss Head Screw	1
9-9	78-214-00	Coil - #5 Nichrome (5 Turn)	1
9-10	78-212-53	Coil - #5 Nichrome (6 Turn)	2
9-11	88-060-22	1/4-20 x 3-1/2 Hex Head Bolt	1
9-12	88-060-11	1/4-20 x 1 Hex Head Bolt	8
9-13	61-836-00	Pressure Bar	1
9-14	61-831-00	Power Bar	4
9-15	88-069-80	1/4-20 SAE Nut	1
9-16	61-837-00	Resistor Board	1
9-17	85-034-00	Spring - Compression (7/16 O.D. x 2 Lg.)	1
9-18	88-069-86	1/4-20 Flex Locknut	1
9-19	88-029-86	8-32 Flex Locknut	2
9-20	88-026-62	8-32 Lockwasher	2
9-21	88-068-60	1/4-20 Washer	2
9-22	88-060-14	1/4-20 x 1-1/2 Hex Head Cap Screw	1
9-0	61-837-29	4-Speed Rheostat with Coils	1

SERVICE AND ADJUSTMENTS
GENERAL ELECTRICAL SYSTEM

ADJUSTMENT OF EMERGENCY STOP SWITCHES.

1. Loosen stop collar set screw and adjust collar to contact frame when rotor contact buttons are in full contact with their respective power bars.
2. Tighten stop collar set screws.
3. Loosen Push Knob locknut and adjust nut in or out as necessary to stop rotor in the vertical position. (Complete off position of switch contacts).
4. Tighten knob against locknut. Check operation of rod and switch. If necessary repeat adjustment procedures until satisfactory results are achieved.

ADJUSTMENT OF PROGRAM TIMER

The timer function controls the duration of the "on" time when vehicle is operated with the semi-automatic remote push buttons.

The longer the timed on period, the greater the distance the vehicle will travel before it shuts off and stops.

1. Adjust timer control set screw (marked with letter "A") to change the duration of the timed on period. Turn adjusting set screw clockwise to increase the timed on period and counterclockwise to decrease the timed on period.

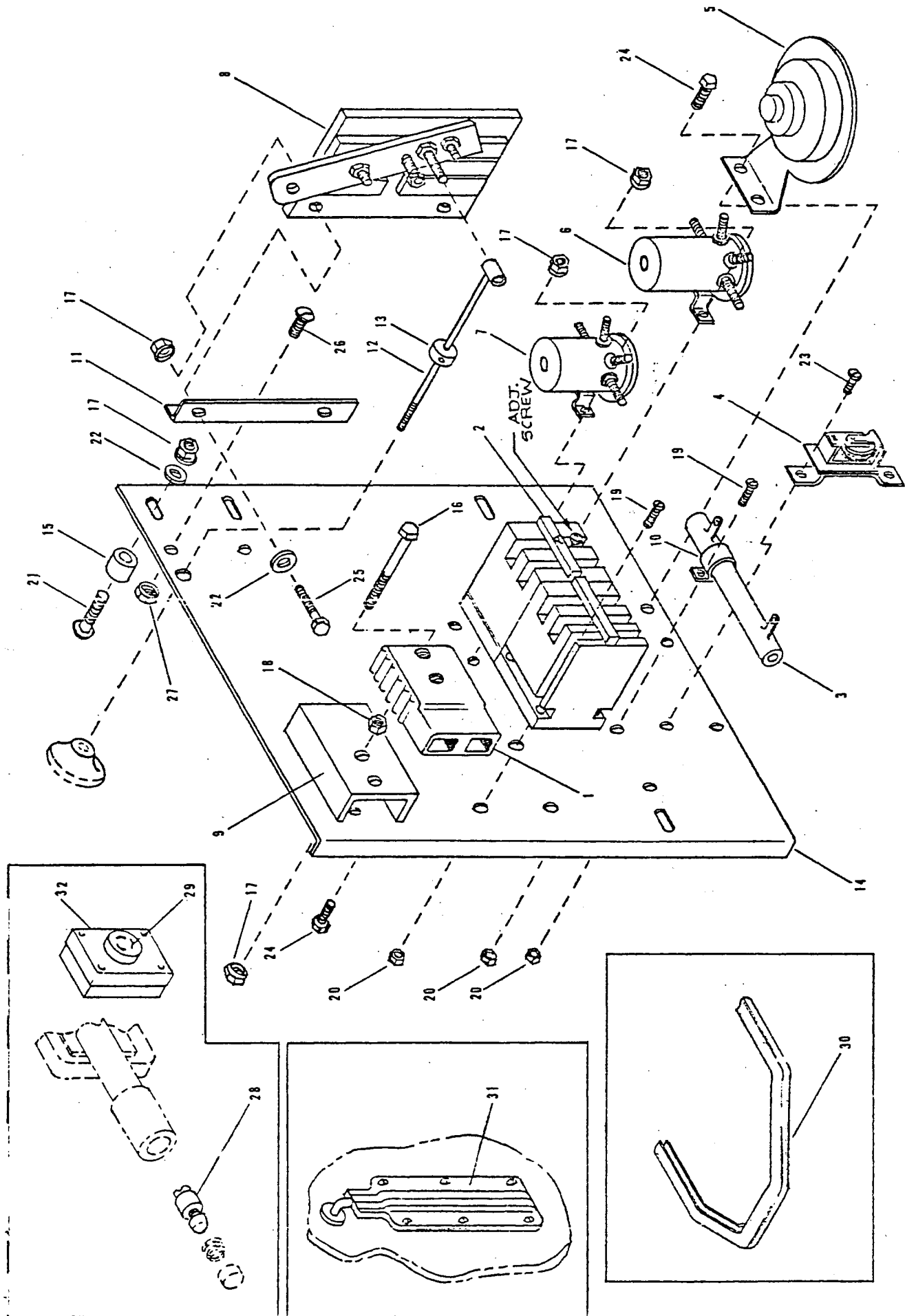
IMPORTANT NOTE: Several factors control the distance the vehicle will travel for one cycle of operation. They are:

- a) The timed period begins after the push button is released.
- b) The length of time you hold the push button in the depressed position is added to the duration of the "timer on" setting.
- c) The amount of "braking" or "coasting" action preset by the mechanical linkage determines the distance travelled after the power is turned off.
- d) The total trailing load will influence the vehicle speed and braking ability. Heavier loads travel slower and coast further.

It will be necessary to adjust the braking or coasting performance of the vehicle first. Then set the electrical program timer to deliver the desired distance of travel per cycle of operation.



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NO.		DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
FIGURE 10A		MAIN POWER SWITCHING #				
SECTION J7		GENERAL ELECTRICAL				
TOL. FRAC. + DEC. -		SCALE				
DRAWN BY E.D.B.						

FIGURE NO. 10A
MAIN POWER SWITCHING AND GENERAL
ELECTRICAL

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY.
10-1	76-020-00	Charging Receptacle and Plug (175 Amp)	1
10-2	71-302-00	Time Delay Relay - G.E. (24V)	1
10-3	78-302-00	Resistor, 10 OHM, 50 Watt	1
10-4	71-303-00	Safety Bumper Switch Relay	1
10-5	73-001-00	Horn, 24V	1
10-6	72-510-00	Solenoid, 12V, 150 Amp	1
10-7	72-511-00	Solenoid, 24V, 100 Amp	1
10-8	71-030-13	Emergency Stop Switch	1
10-9	76-019-00	Mounting Bracket for SB Connector	1
10-10	96-603-00	Clamp, Cable Tie, Self-Clinching	2
10-11	71-627-00	Bracket, Emergency Stop Switch	1
10-12	71-030-59	Control Rod, Emergency Stop Switch	1
10-13	17-100-00	Collar Shaft, Control Rod	1
10-14	71-616-00	Electrical Mounting Panel	1
10-15	16-507-00	Spacer, Electrical Panel	4
10-16	88-060-18	1/4 x 2-1/2 NC Hex Head Cap Screw	2
10-17	88-069-87	1/4 NC Fastite Nut	16
10-18	88-099-80	5/16 NF Hex Head Nut	2
10-19	88-025-08	8-32 x 5/8 Truss Head Machine Screw	8
10-20	88-029-86	8-32 Flexlock Nut	8
10-21	88-060-14	1/4 x 1-1/2 NC Hex Head Cap Screw	4
10-22	88-068-61	1/4 SAE Washer	6
10-23	88-025-06	8-32 x 1/2 Truss Head Machine Screw	2
10-24	88-060-06	1/4 x 1/2 NC Hex Head Cap Screw	4
10-25	88-060-09	1/4 x 3/4 NC Hex Head Cap Screw	2
10-26	88-065-06	1/4 x 1/2 NC Truss Head Machine Screw	2
10-27	88-069-81	1/4 NC Locknut	2
10-28	71-503-00	Push Buttons	2
10-29	76-012-00	Receptacle - 30 Amp	1
10-30	71-142-00	Safety Bumper Switch	1
10-31	71-504-00	Horn Switch (Tapeswitch)	1
10-32	76-028-52	Receptacle Cover	1

MAINTENANCE PROCEDURES
BATTERIES

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 openings. 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 7½ years, or 1800 cycles, in appropriate use and with proper care.

It can not 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 fully charged condition.

Over charging will reduce battery life. Undercharging will cause poor vehicle performance, and shorten the life of all electrical components, including the batteries. Refer to Service and Adjustment, Section J8, for proper methods to determine charge condition.

2. DISCHARGING - CAPACITY

Batteries are commonly rated in ampere hours at the six hour discharge rate to a 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 over discharging is to prepare a rigid schedule for charging batteries which will insure against their being discharged beyond the limits of their capacity.

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 over-filling. 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 types of service they are subject to. 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.

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 pound 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 a much higher temperature. For example, a fully charged battery will not freeze at temperatures near 60° below zero. Yet a battery in a very low state of charge may freeze at temperatures around 10° to 15° above zero.

A battery not in use maintains small amounts of chemical action which slowly tends to dissipate the charged condition. 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.

VEHICLE NO.

BATTERY MAINTENANCE RECORD

Battery No.	Cell No.	Date			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	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 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.
- 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 1.175 (30% charged) and 1.260 (100% charged), and gravity readings of all cells should be within a 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 above 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.

SERVICE AND ADJUSTMENTS
CHARGER AND BATTERIES

CHARGER

Refer to Operating and Service Handbook, included in this manual for correct use and service to your charger. The correct charging rates and operation of your charger is included in the handbook.

The A series of chargers requires a pre-selection of charging time needed every time it is used.

Refer to chart included in appropriate handbook.

The T series of charger is equipped with an automatic timer device which will control and shut off the charger automatically when the battery is fully charged.

Refer to operating instructions in the handbook.

Any major repairs to charger should be conducted by a qualified serviceman only.

BATTERIES

To determine whether or not a battery is properly charged, a measuring device known as a hydrometer should be used. A hydrometer consists of a glass tube or body with a rubber bulb at one end and a small spout at the other. Inside the tube is a graduated float.

The float will reach a point of equilibrium relative to the specific gravity of the fluid in which it floats.

The electrolyte within 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 fully discharged condition to 1260 for fully charged condition on the electric vehicle type of battery.

On the heavy duty industrial type of battery, the specific gravity reading will be approximately 1275 to 1285 for fully charged condition.

Note: Because of the difference in the electrolyte the specific gravity will range slightly higher on the industrial type of battery. No amount of overcharging will raise the specific gravity above 1260 on the electric vehicle type of battery. Actually overcharging will only injure the plates and shorten battery life.

When testing battery charge 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.

Refer to Charger Handbook for additional information on battery testing and charging methods.

OPERATING & SERVICING HANDBOOK

SERIES "SA" BATTERY CHARGERS

INSPECTION

Inspect the charger immediately upon receipt. If there is any indication of shipping damage, call the carrier for an inspection and file a damage claim.

CHARGING CHARACTERISTICS

The CHRISTIE Series "SA" Charger provides charging characteristics as recommended by industrial battery manufacturers. The initial charging rate is determined by the state of charge of the battery and the rated capacity of the charger. All chargers are designed to bring a specified capacity battery to 100% charge in 8 hours. Chargers are furnished with a 24-hour timer so they may be used to charge a higher capacity battery if longer charging time is available. Normally a discharged battery of the proper rating is 80% charged in about 5 hours. As the battery reaches this point, the charge rate drops quickly to a slow finishing rate to safely complete the charge. On a partially discharged battery, the charge rate will drop to the finishing rate much sooner. Do not discharge batteries too much (see battery manufacturers' recommendations) as it will cause the charger to start charging at a rate higher than normal and may blow a fuse.

INSTALLATION

The charger is designed for convection cooling, which means that it depends upon the free circulation of air. The charger should not be placed in any location where ventilation through the unit is restricted. Severe damage may result.

Locate the charger as near as possible to the main power source. Check the nameplate of the charger to be certain that it can be operated from the a-c power source you have available. Most chargers are manufactured to operate from two different a-c voltages. The charger has been set at the factory for the voltage marked on the tag attached to it. To change the a-c voltage setting, remove the front panel* and reconnect as shown on the wiring diagram furnished with this booklet.

CAUTION: Be sure to disconnect the charger from the a-c source before making adjustments.

Verify that the number of cells shown on the nameplate correspond with the number of cells in the battery you intend to charge. On 18-cell chargers that have an adjustment for different cell groups (15, 16 and 18 cells), be sure that the adjustment link is set for the correct number of cells. This adjustment is also on the terminal board behind the front panel and instructions for settings are shown on the wiring diagram.

Each charger is provided with d-c output cables, 10 ft. long. The cables are marked + for positive and - for negative. It is recommended that a polarized charging plug be installed for connection to the battery.

INITIAL OPERATION

With the timer in the "off" position, connect to the battery, observing correct polarity. If any sparking occurs at the d-c plug, check the polarity of the cables. Set the timer to the desired charging time, normally 8 hours. Observe that the pilot light turns on and the ammeter indicates that the charger is charging.

It is recommended that the battery be given an equalizing charge of 12 hours once weekly.

The charger can be used to charge a battery of higher capacity than its 8-hour rating if longer charging time is available. As a rule-of-thumb, the charger should not be used on a battery with an ampere hour rating of more than 9 times the d-c rated output of the charger (for a 100 amp charger - 9×100 , or 900 AH). Approximate charging time can be estimated from relationship of the AH capacity of the battery to be charged with the 8-hour AH rating of the charger as shown on the nameplate. Exact charging time should be determined by periodic hydrometer checks to be sure battery is getting charged.

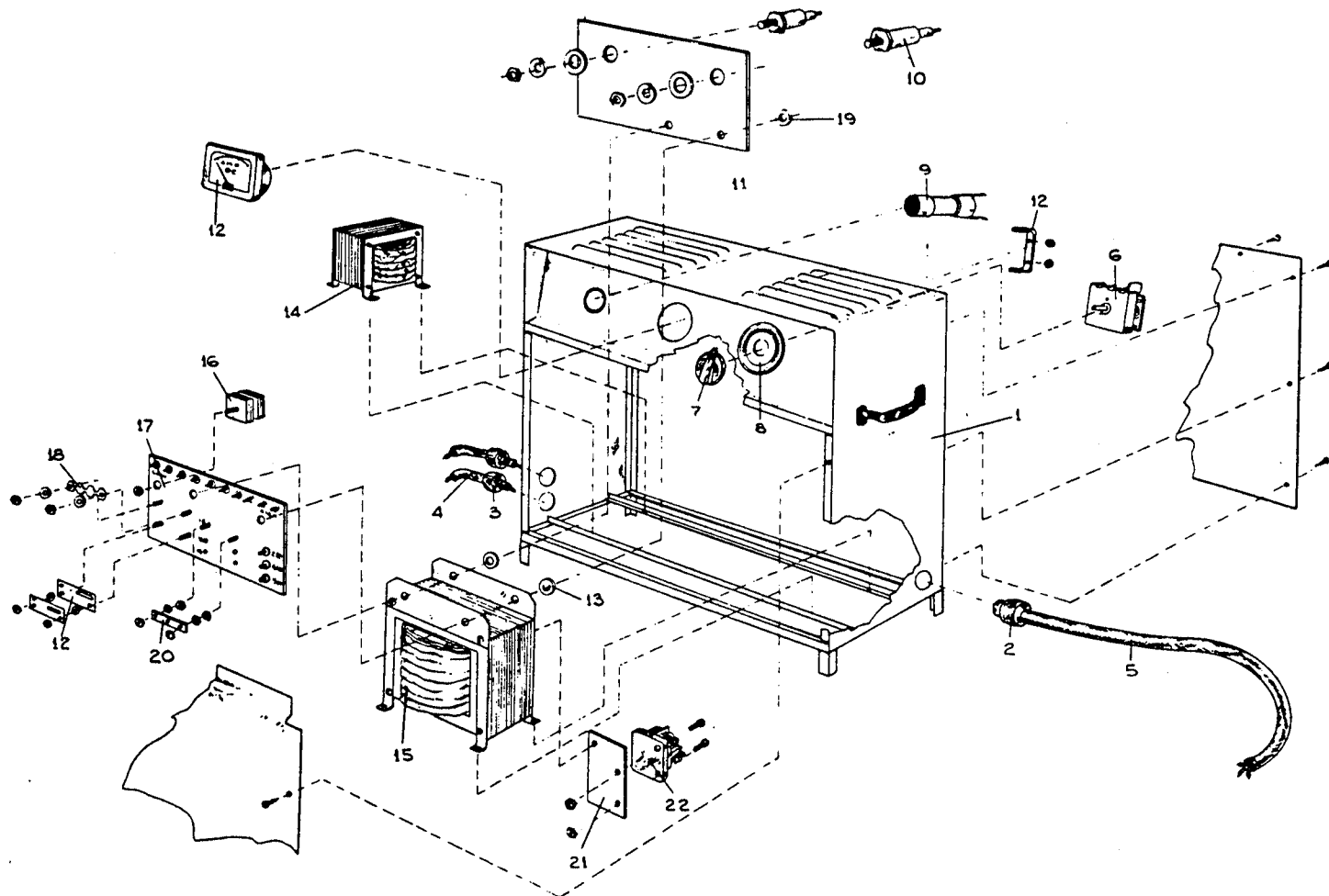
If the a-c input voltage varies considerably from the nominal voltage shown on the nameplate (i.e., actual voltage 210 v when nameplate shows 230 v), the charger will not give optimum performance without proper output adjustment. These adjustments are also made on the terminal board behind the front panel* and instructions are shown on the wiring diagram. **CAUTION:** Be sure to disconnect the charger from the a-c source before making adjustments.

The need for adjustment may be determined in one of the following ways:

1. With an accurate d-c voltmeter, measure the d-c open circuit voltage (output voltage with the charger turned on but without the battery connected) at the ends of the d-c cables. For correct charging, the proper setting should be 2.45 volts per cell for a 16-hour charge or 2.55 volts per cell for an 8-hour charge (i.e., 12 cell battery would be set for $12 \times 2.55 = 30.6$ v).
2. With the battery discharged to approximately 11.50 specific gravity, connect the charger and turn the timer on. Charging current as observed on the ammeter should not exceed the d-c output rating of the charger.
3. With the battery fully charged, connect the charger and turn the timer on. After charger has been on 1 hour, charging current as observed on the ammeter should be about 4 amp per hundred ampere hour battery rating (i.e., 500 AH battery - $5 \times 4 = 20$ amp).

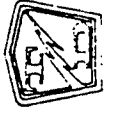
*NOTE: On smaller chargers access to the terminal board is through a panel in the rear of the unit.

EXPLODED DIAGRAM (typical unit)

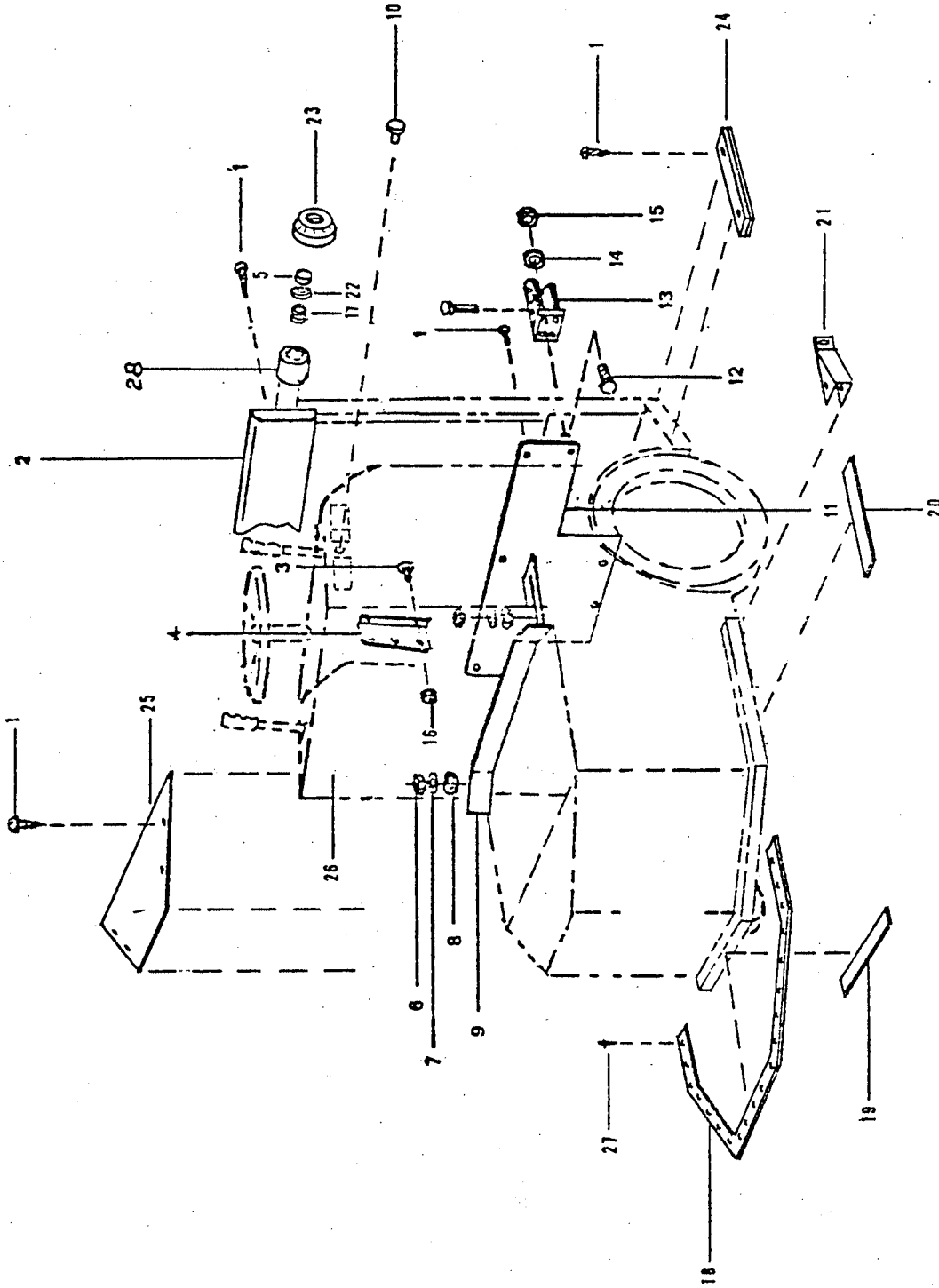


- | | |
|----------------|----------------------------|
| 1 Cabinet | 12 Ammeter and Shunt |
| 2 Bushing, AC | 13 Insulator Washer (3/4") |
| 3 Bushing, DC | 14 Choke |
| 4 Cord, DC | 15 Transformer |
| 5 Cord, AC | 16 Surge Suppressor |
| 6 Timer | 17 Terminal Panel |
| 7 Control Knob | 18 Fuse (link) |
| 8 Timer Dial | 19 Insulator Washer (3/8") |
| 9 Pilot Light | 20 DC Adjustment Bar |
| 10 Diode | 21 Contactor Bracket |
| 11 Heat Sink | 22 Contactor |

When ordering replacement parts, give model and serial number of charger.



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



LENGTH QUAN. REVISED DATE REVISION

BODY & TRIM PARTS

FIGURE 11
SECTION J9

NO. DESCRIPTION
TOL. FRAC. ± DEC. ±
SCALE 1/2" = 1"
DRAWN BY J. J. J.
DATE 1-27-75

FIGURE NO. 11
BODY & TRIM PARTS

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY.
11-1	88-837-09	#14 x 3/4 Pan Head Sheet Metal Screw	17
11-2	90-000-00	Back Rest Cushion	1
11-3	88-065-11	1/4 x 1 N.C. Truss Head Machine Screw	2
11-4	71-627-00	Bracket, Emergency Stop Switch	1
11-5	92-104-01	Push Button - Operator	2
11-6	88-109-80	3/8 N.C. Hex Nut	2
11-7	88-108-62	3/8 Lockwasher	2
11-8	88-108-60	3/8 Flat Washer	2
11-9	77-863-00	Battery Clamp	1
11-10	95-902-50	Knob, Emergency Stop Switch	2
11-11	71-617-00	Rear Panel, Motor	1
11-12	88-140-14	1/2 x 1-1/2 N.C. Hex Head Cap Screw	4
11-13	97-814-00	Mark II Coupling Hitch	1
11-14	88-148-62	1/2" Lockwasher	4
11-15	88-149-80	1/2 N.C. Hex Nut	4
11-16	88-069-87	1/4 N.C. Fastite	4
11-17	85-067-00	Compression Spring	2
11-18	71-628-00	Upper Retainer - Safety Bumper Switch	1
11-19	71-628-51	Lower Center Retainer - Safety Bumper Switch	1
11-20	71-628-50	Lower Side Retainer - Safety Bumper Switch	4
11-21	71-628-52	Bumper Switch Guard	2
11-22	80-709-00	"O" Ring	2
11-23	30-718-00	Push Button Guard	2
11-24	98-020-00	Sill Mat	2
11-25	91-808-01	Cover Panel, Front Cowl	1
11-26	71-618-01	Inspection Panel	1
11-27	88-737-08	3/16 Dia. x 5/8 Lg., Aluminum Rivet	28
11-28	71-624-00	Housing, Push Button Switch, Model 3454E	2