

OPERATION AND MAINTENANCE MANUAL WITH PARTS LIST

MODEL : ET 1-50 48 Volts

SERIAL NUMBER : 108345 & UP

YEAR : March 1994 & UP

MANUAL NUMBER: MZ-150-03

- IMPORTANT -

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



TAYLOR-DUNN

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EEC 86.663 OF DEC. 1986
PARA. 9.7.3.5.5
FAULT SAFETY CIRCUIT
CHECK PROCEDURE

EEC certified vehicles are equipped with a safety system which will terminate any uncontrolled power-on condition due to a fault in the electronic circuit.

This fault safety circuit should be checked during scheduled periodic maintenance inspections by authorized service personnel.

PROCEDURE

Jack up the rear axle of the vehicle until the rear wheels spin free (see "General Safety " and "Support Points" section).

Disconnect the main traction battery cables.

WARNING!

The key switch must be turned off and battery cables disconnected. Be sure that the rear wheels are clear of any foreign objects.

Place a 6 gage jumper wire between the B- terminal and the M-terminal of the control PMC.

Reconnect the traction battery cables.

Turn on the key switch and place the vehicle in the forward drive position.

Depress the accelerator pedal down approximately half of the distance to the floor.

WARNING!

Do not exceed 80% of the accelerator travel.

If the rear wheels turn, the PMC fault safety circuit is defective and the PMC must be replaced.

If the rear wheels do not turn then the fault circuit is functioning correctly.

Turn off the key switch.

Disconnect the main traction battery cables.

Remove the jumper wire from the B- and M- terminals.

Reconnect the main traction battery cables and lower the vehicle.

Table of Contents

INTRODUCTION

Taking Delivery of Your Vehicle	INTRO - 3
Inspecting the Vehicle	INTRO - 3
Checking the Controls	INTRO - 3
What To Do if You Find a Problem	INTRO - 3
About This Manual	INTRO - 4
Notational Conventions	INTRO - 4

SAFETY / GENERAL INFORMATION

General Safety	SAFETY - 2
General Information	SAFETY - 3
Lift And Support Points	SAFETY - 3
Towing	SAFETY - 4
Batteries	SAFETY - 5
Battery Charging	SAFETY - 5
Battery Maintenance	SAFETY - 6
Checking Battery Electrolyte Level	SAFETY - 6
Tires	SAFETY - 7
Changing a Flat Tire	SAFETY - 7
Tire Rotation	SAFETY - 8

VEHICLE CONTROLS

Keys	CONTROLS - 2
Labels	CONTROLS - 2
Seats	CONTROLS - 2
Disconnect Seat Switch	CONTROLS - 2
Seat Access	CONTROLS - 2
Seat Belts	CONTROLS - 3
Belt Release	CONTROLS - 3
Wearing Seat Belts	CONTROLS - 4
Seat Belt Inspection	CONTROLS - 4
Seat Belt Cleaning	CONTROLS - 4

VEHICLE CONTROLS (Continued)

Keyswitch	CONTROLS - 5
Power-On Light	CONTROLS - 5
Light Switch	CONTROLS - 5
Windshield Wiper Switch	CONTROLS - 5
Battery Status Indicator	CONTROLS - 6
Speedometer	CONTROLS - 6
Odometer	CONTROLS - 7
Trip Meter	CONTROLS - 7
Steering	CONTROLS - 7
Speedometer	CONTROLS - 7
Steering	CONTROLS - 7
Horn Button	CONTROLS - 7
Turn Signal Lever	CONTROLS - 7
Hazard Warning Light Lever	CONTROLS - 8
Heater (Optional)	CONTROLS - 8
On/Off/Fan Switch	CONTROLS - 8
Heater Thermostat Knob	CONTROLS - 8
Heater Battery Status Indicator	CONTROLS - 8
Parking Brake Lever	CONTROLS - 9
Accelerator Pedal	CONTROLS - 9
Foot Brake Pedal	CONTROLS - 9
Shift Lever	CONTROLS - 10
Main Power Disconnect	CONTROLS - 10
Rearview Mirrors	CONTROLS - 10

MAINTENANCE

Brakes	MAINTENANCE - 2
Batteries	MAINTENANCE - 2
Appearance Care	MAINTENANCE - 2
Interior Trim	MAINTENANCE - 2
Windows	MAINTENANCE - 2
Scheduled Maintenance	MAINTENANCE - 3
Lubrication Chart	MAINTENANCE - 5
Troubleshooting Guide	MAINTENANCE - 6
Recommended Spare Parts List	MAINTENANCE - 8
Vehicle Specifications	MAINTENANCE - 9

BRAKES

Brake System	BRAKES - 2
Brake Fluid	BRAKES - 3
Checking Brake Fluid Level	BRAKES - 4
Adjusting the Brake Pedal Free Play	BRAKES - 5
Replacing the Front Brake Pads	BRAKES - 6
Replacing the Rear Brake Shoes	BRAKES - 7
Replacing the Front Brake Hoses	BRAKES - 10
Replacing the Front Brake Lines	BRAKES - 11
Replacing the Rear Brake Hose	BRAKES - 12
Replacing the Rear Brake Lines	BRAKES - 13
Replacing the Brake Light Switch	BRAKES - 13
Replacing the Master Cylinder	BRAKES - 14

SUSPENSION

Replacing the Front Axle Suspension Springs	SUSPENSION - 2
Replacing the Front Shock Absorbers (Optional)	SUSPENSION - 3
Replacing the Rear Axle Springs	SUSPENSION - 4
Replacing the Rear Shock Absorbers	SUSPENSION - 5

STEERING

Steering Linkages	STEERING - 2
Replacing the Balljoints/Steering Sleeves	STEERING - 2
Aligning the Front End	STEERING - 3
Replacing the Steering Gearbox	STEERING - 4
Removing the Steering Gearbox	STEERING - 4
Installing the Steering Gearbox	STEERING - 4

FRONT AXLE

Replacing the Front Axle Assembly	FRONT AXLE - 2
---	----------------

POWER TRACTION

Adjusting the Drive Chain	POWER TRACTION - 2
Removing the Motor	POWER TRACTION - 3
Installing the Motor	POWER TRACTION - 3
Disassembling/Reassembling the Power Traction Assembly-	POWER TRACTION - 4

REAR AXLE / DIFFERENTIAL

Replacing The Rear Axle	DIFFERENTIAL - 2
Replacing The Rear End Assembly	DIFFERENTIAL - 4
Repairing The Differential	DIFFERENTIAL - 5
Selecting Drive Pinion Shims	DIFFERENTIAL - 8

ELECTRICAL SYSTEM

Wiring Schematic	ELECTRICAL - 2-3
Battery Layout	ELECTRICAL - 4
Replacing the Battery Indicator Panel	ELECTRICAL - 5
Replacing the Keyswitch / Speedometer Panel	ELECTRICAL - 5
Replacing the Seatswitch	ELECTRICAL - 6
Replacing the Main Disconnect Switch	ELECTRICAL - 7
Disconnect Switch Wiring Layout	ELECTRICAL - 7
Replacing Shift Lever Switches	ELECTRICAL - 8
Replacing the Charger Assembly	ELECTRICAL - 9
Replacing the Speed Control Panel	ELECTRICAL - 10
Replacing the Accelerator Module	ELECTRICAL - 11
Replacing the Turn Signal Pilot Bulb	ELECTRICAL - 12
Replacing the Turn Signal Assembly	ELECTRICAL - 13
ELECTRICAL TROUBLESHOOTING	ELECTRICAL - 15
Testing the Main Power Output	ELECTRICAL - 15
Testing the Main Power Input	ELECTRICAL - 16
Testing Input to the Speed Control Module	ELECTRICAL - 17
Speed Control Module Wiring Diagram	ELECTRICAL - 18
Testing the Contactors	ELECTRICAL - 19
Testing the Forward / Reverse Switches	ELECTRICAL - 20
Testing the Accelerator Module	ELECTRICAL - 21
Electrical Troubleshooting Table	ELECTRICAL - 22
Repairing the Charger	ELECTRICAL - 24
Testing the Charger Timer	ELECTRICAL - 25
Testing the Diodes	ELECTRICAL - 26
Testing the Capacitor	ELECTRICAL - 26
Repairing the Motor	ELECTRICAL - 27

ACCESSORIES

Lights	ACCESSORIES - 2
Adjusting the Headlights	ACCESSORIES - 2
Replacing the Headlights	ACCESSORIES - 3
Replacing the Front Park Lights	ACCESSORIES - 4
Replacing the Stop Lights/Rear Park Lights	ACCESSORIES - 5
Windshield Wiper	ACCESSORIES - 6
Replacing Wiper Blades	ACCESSORIES - 6
Replacing Wiper Motor	ACCESSORIES - 7
Installing Wiper Arms	ACCESSORIES - 8
Replacing the Horn	ACCESSORIES - 9
Side Mirrors	ACCESSORIES - 10
Replacing Side Mirrors	ACCESSORIES - 10

ILLUSTRATED PARTS LIST

Front Brake Lines (Optional)	PARTS LIST - 2
Rear Brake Lines And Master Cylinder	PARTS LIST - 4
Front Brake Assembly (Optional)	PARTS LIST - 6
Rear Brake Assembly	PARTS LIST - 8
Park Brake Assembly	PARTS LIST - 10
Steering Gearbox And Linkages	PARTS LIST - 12
Front Axle and Suspension	PARTS LIST - 14
Power Traction	PARTS LIST - 16
Differential	PARTS LIST - 18
Rear Axle And Wheel	PARTS LIST - 20
Rear Axle Suspension	PARTS LIST - 22
Instrument Panel	PARTS LIST - 24
Speed Control	PARTS LIST - 26
Motor	PARTS LIST - 28
Charger And Charger Mount	PARTS LIST - 30
Heater, Heater Charger And Mount	PARTS LIST - 32
ET 1-50 48 Volts	PARTS LIST - 34

ILLUSTRATIONS

Lift and Support Points	SAFETY - 3
Towing Methods	SAFETY - 4
Battery Maintenance	SAFETY - 6
Checking Battery Electrolyte Level	SAFETY - 6
Changing a Flat Tire	SAFETY - 7
Recommended Tire Rotation Pattern	SAFETY - 8
Releasing the Seat Belt	CONTROLS - 3
Wearing Seat Belts	CONTROLS - 4
Instrument Panel	CONTROLS - 5
Battery Status Indicator	CONTROLS - 6
Speedometer	CONTROLS - 6
Steering Wheel and Turn Signal	CONTROLS - 7
Heater Battery Status Indicator	CONTROLS - 8
Floor Controls	CONTROLS - 9
Center Console	CONTROLS - 10
Lubrication Chart	MAINTENANCE - 5
Brake System	BRAKES - 2
Checking Brake Fluid Level	BRAKES - 4
Adjusting Brake Pedal Free Play	BRAKES - 5
Replacing the Front Brake Pads	BRAKES - 6
Replacing the Rear Brake Shoes	BRAKES - 7-8
Replacing the Front Brake Hoses	BRAKES - 10
Replacing the Front Brake Lines	BRAKES - 11
Replacing the Rear Brake Hose	BRAKES - 12
Replacing the Rear Brake Lines/Brake Light Switch	BRAKES - 13
Replacing the Master Cylinder	BRAKES - 14
Replacing the Front Axle Suspension Springs	SUSPENSION - 2
Replacing the Front Shock Absorbers (Optional)	SUSPENSION - 3
Replacing the Rear Axle Suspension Springs	SUSPENSION - 4
Replacing the Ball Joints / Steering Sleeves	STEERING - 2
Aligning the Front End	STEERING - 3
Replacing the Steering Gearbox	STEERING - 4-5
Replacing the Front Axle Assembly	FRONT AXLE - 2
Adjusting the Drive Chain/Replacing the Motor	POWER TRACTION - 3
Power Traction Assembly	POWER TRACTION - 4
Replacing the Rear Axle	DIFFERENTIAL - 2-3

ILLUSTRATIONS (continued)

Repairing the Differential	DIFFERENTIAL - 4
Electruck Wiring Diagram	ELECTRICAL - 2-3
Battery Layout	ELECTRICAL - 4
Replacing the Instrument Panel	ELECTRICAL - 5
Replacing the Seat Switch	ELECTRICAL - 6
Replacing the Main Disconnect Switch	ELECTRICAL - 7
Main Disconnect Switch Wiring Layout	ELECTRICAL - 7
Replacing Shift Lever Switches	ELECTRICAL - 8
Replacing the Charger Assembly	ELECTRICAL - 9
Replacing the Speed Control Panel	ELECTRICAL - 10
Replacing the Accelerator Module	ELECTRICAL - 11
Replacing the Turn Signal Pilot Bulb	ELECTRICAL - 12
Replacing the Turn Signal Assembly	ELECTRICAL - 13-14
Motor Wiring	ELECTRICAL - 15
Gang Plug	ELECTRICAL - 16
Speed Control Module Plug	ELECTRICAL - 17
Speed Control Module Wiring Diagram	ELECTRICAL - 18
Contactor Assembly	ELECTRICAL - 19
Forward / Reverse Switches	ELECTRICAL - 20
Accelerator Module Test Harness	ELECTRICAL - 21
Diode Block with Diodes	ELECTRICAL - 24
Timer	ELECTRICAL - 25
Diodes	ELECTRICAL - 26
Motor Components	ELECTRICAL - 27
Armature, Commutator Side	ELECTRICAL - 28
Replacing the Headlights	ACCESSORIES - 2
Adjusting the Headlights	ACCESSORIES - 2
Replacing the Front Park Lights	ACCESSORIES - 3
Replacing the Stop Lights / Rear Park Lights	ACCESSORIES - 4
Replacing the Wiper Arm / Blade / Motor	ACCESSORIES - 5
Replacing the Horn	ACCESSORIES - 6
Replacing Side Mirrors	ACCESSORIES - 7
Front Brake Lines (Optional)	PARTS LIST - 2
Rear Brake Lines And Master Cylinder	PARTS LIST - 4
Front Brake Assembly (Optional)	PARTS LIST - 6
Rear Brake Assembly	PARTS LIST - 8
Park Brake Assembly	PARTS LIST - 10

ILLUSTRATIONS (continued)

Steering Gearbox And Linkages	PARTS LIST - 12
Front Axle and Suspension	PARTS LIST - 14
Power Traction	PARTS LIST - 16
Differential	PARTS LIST - 18
Rear Axle And Wheel	PARTS LIST - 20
Rear Axle Suspension	PARTS LIST - 22
Instrument Panel	PARTS LIST - 24
Speed Control	PARTS LIST - 26
Motor	PARTS LIST - 28
Charger And Charger Mount	PARTS LIST - 30
Heater, Heater Charger And Mount	PARTS LIST - 32

TABLES

Scheduled Maintenance	MAINTENANCE - 3
Lubrication Table	MAINTENANCE - 5
Troubleshooting Guide	MAINTENANCE - 6
Recommended Spare Parts	MAINTENANCE - 8
Vehicle Specifications	MAINTENANCE - 9
Electrical Troubleshooting	ELECTRICAL - 22
Front Brake Lines (Optional)	PARTS LIST - 3
Rear Brake Lines And MasPARTS LIST	PARTS LIST - 5
Front Brake Assembly (Optional)	PARTS LIST - 7
Rear Brake Assembly	PARTS LIST - 9
Park Brake Assembly	PARTS LIST - 11
Steering Gearbox And Linkages	PARTS LIST - 13
Front Axle and Suspension	PARTS LIST - 15
Power Traction	PARTS LIST - 17
Differential	PARTS LIST - 19
Rear Axle And Wheel	PARTS LIST - 21
Rear Axle Suspension	PARTS LIST - 23
Instrument Panel	PARTS LIST - 25
Speed Control	PARTS LIST - 27
Motor	PARTS LIST - 29
Charger And Charger Mount	PARTS LIST - 31
Heater, Heater Charger And Mount	PARTS LIST - 33
Standard Parts	PARTS LIST - 35

INTRODUCTION

**WARNING!**

**FAILURE TO FOLLOW THESE INSTRUCTIONS CAN
RESULT IN SEVERE PERSONAL INJURY OR DEATH.**

- Δ THIS VEHICLE SHOULD BE OPERATED ONLY BY AUTHORIZED TRAINED PERSONNEL**
- Δ THIS VEHICLE IS RESTRICTED TO TWO OCCUPANTS.**
- Δ DO NOT START THE VEHICLE UNTIL BOTH OCCUPANTS ARE SEATED AND SEAT BELTS ARE FASTENED.**
- Δ ALL OCCUPANTS MUST KEEP THEIR ENTIRE BODIES AND ALL EXTREMITIES INSIDE THE VEHICLE AT ALL TIMES.**
- Δ DO NOT EXCEED 18 MPH (29 KPH) UNDER ANY CIRCUMSTANCES; DRIVE SLOWLY IN TURNS AND UP AND DOWN SLOPES.**
- Δ BRING THE VEHICLE TO A COMPLETE STOP BEFORE REVERSING DIRECTION.**
- Δ BEFORE LEAVING THIS VEHICLE, ALWAYS SET FORWARD-REVERSE SELECTOR IN THE CENTER "OFF" POSITION, SET PARKING BRAKE SECURELY, TURN KEYSWITCH TO OFF AND REMOVE THE KEY .**
- Δ READ THE REST OF THIS MANUAL FOR FURTHER INFORMATION.**

**WARNING: APPLY PARKING BRAKE
PARKING BRAKE NOT AUTOMATICALLY APPLIED**

**WARNING!**

**THIS VEHICLE HAS NOT BEEN CERTIFIED BY THE UNITED STATES
NATIONAL HIGHWAY TRAFFIC SAFETY ASSOCIATION IN
ACCORDANCE WITH THE U.S. NATIONAL TRAFFIC MOTOR VEHICLE
SAFETY ACT FOR USE ON STREETS AND HIGHWAYS.**

INTRODUCTION

TAKING DELIVERY OF YOUR VEHICLE

This vehicle should be inspected immediately after delivery. Use the following guidelines to make sure there are no obvious problems.

Inspecting the Vehicle

- ◆ Examine the contents of all packages that came with this vehicle. Make sure everything listed on the packing slip is there. Nothing should look broken or damaged.
- ◆ Examine any visible wiring for obvious signs of damage. Check that all connections are secure.
- ◆ Check that the battery connections are tight and all cells are filled.
- ◆ Inspect the tires for signs of damage. Check the tire pressure . Make sure that all wheel lugs are secure.
- ◆ Check the body, seats, windshield, trim and other external parts for obvious damage.

Checking the Controls

Try each of the following controls before turning on the keyswitch:

- ◆ Accelerator pedal
- ◆ Brake pedal
- ◆ Forward/Reverse Selector Lever
- ◆ Parking brake
- ◆ Steering wheel
- ◆ Horn
- ◆ Headlights

Each control should move smoothly and easily, without sticking or requiring undue effort.

What To Do If You Find A Problem

If you find evidence of transportation damage with this vehicle, you must immediately file a claim with the carrier. The claim must be filed within 48 hours of receiving the vehicle. Forward a copy of the damage claim to your Taylor-Dunn dealer.

Caution!

Do not repair, modify or adjust any part of this vehicle unless you are authorized to do so.

ABOUT THIS MANUAL

This manual contains important information about the safe operation and maintenance of your truck. We urge you to read it carefully, be familiar with the controls it describes, and follow its recommendations, to help make your driving trouble-free and enjoyable.

NOTATIONAL CONVENTIONS

Statements or labels preceded by the following words are of special significance:

DANGER!

Indicates severe personal injury, severe damage to the vehicle and/or severe property damage will result if instructions are not followed.

WARNING!

Indicates strong possibility that severe personal injury, severe damage to the vehicle and/or severe property damage will result if instructions are not followed.

Caution!

Alerts you to hazards or unsafe practices which may cause personal injury, property damage, or damage to the vehicle.

Note: *A note provides helpful information about a subject.*

Tip: *A tip is a suggestion that you might find helpful for a specific procedure.*

SAFETY / GENERAL INFORMATION

GENERAL SAFETY

WARNING!

Disconnect the main battery leads and remove the key before working on any part of the vehicle, EXCEPT when conducting tests on the electrical components.

When conducting tests on the electrical components, always raise and securely support the rear wheels to prevent runaways.

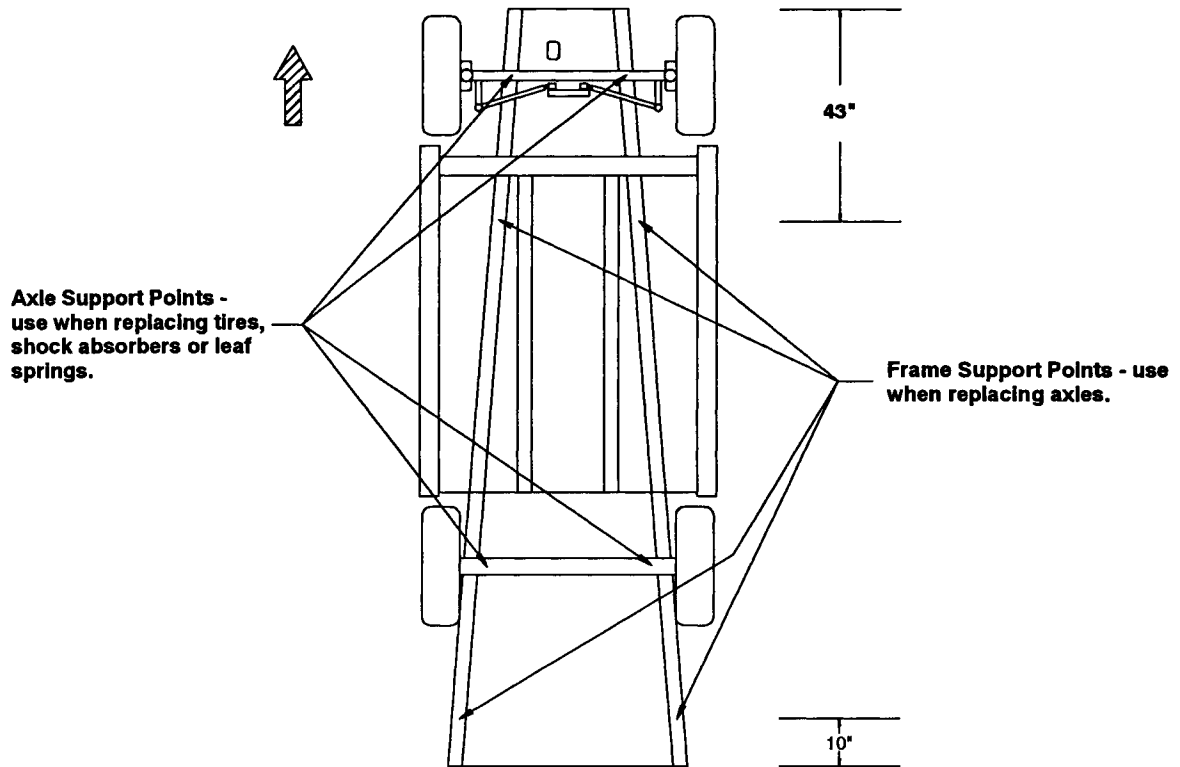
Always use jack stands of adequate capacity when supporting the vehicle.

Caution!

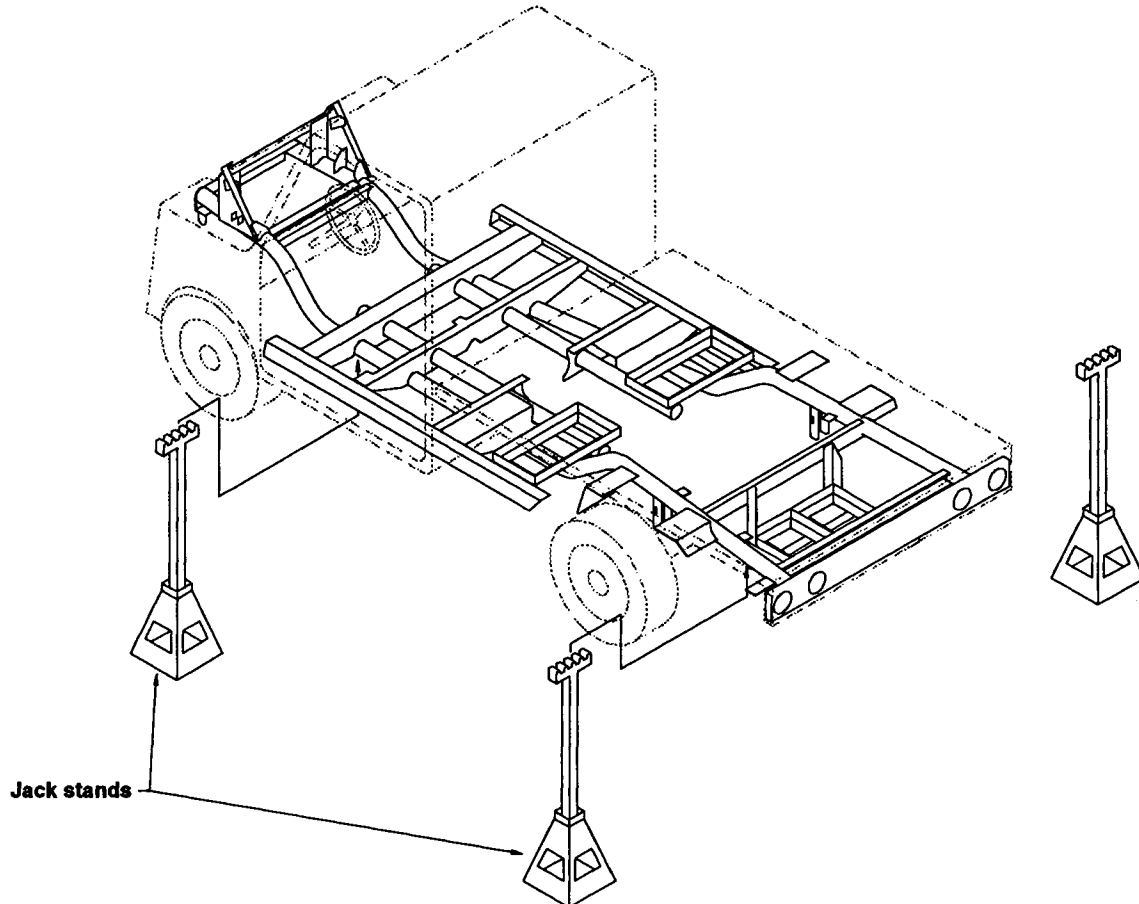
As a safety precaution, after raising the vehicle, place a piece of wood or the tire that was removed, under the frame. This will prevent a hand or a foot from being injured if the vehicle falls off the jack stands.

Note: *If a hoist is not available to raise the vehicle, jack one side of the vehicle and support it, then jack the other side and support it also.*

General Information



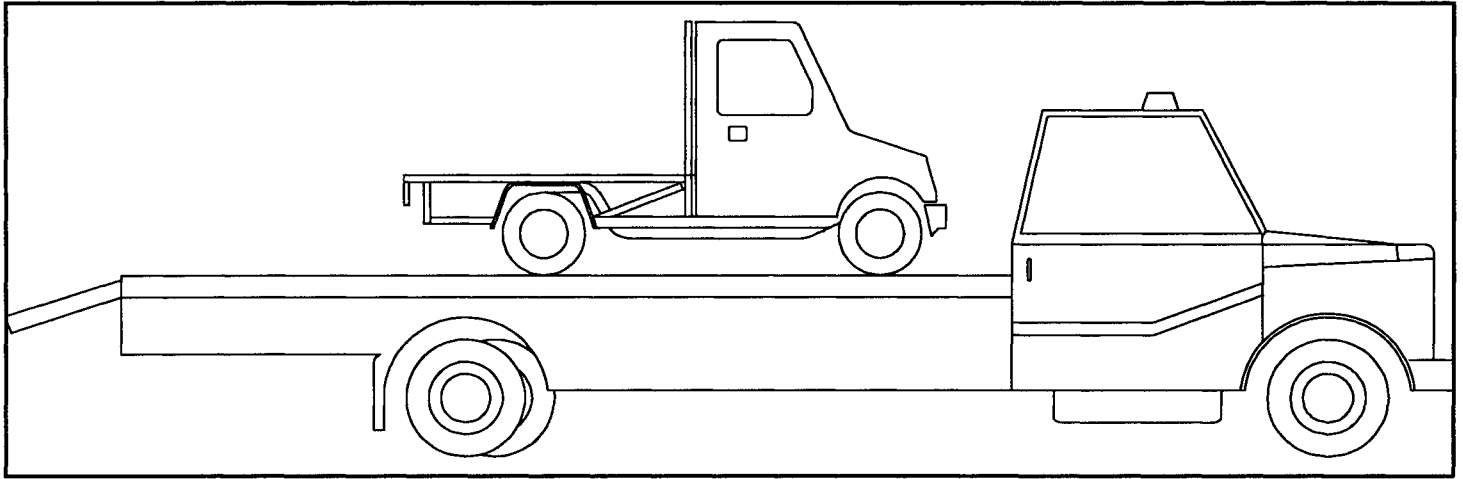
Lift and Support Points



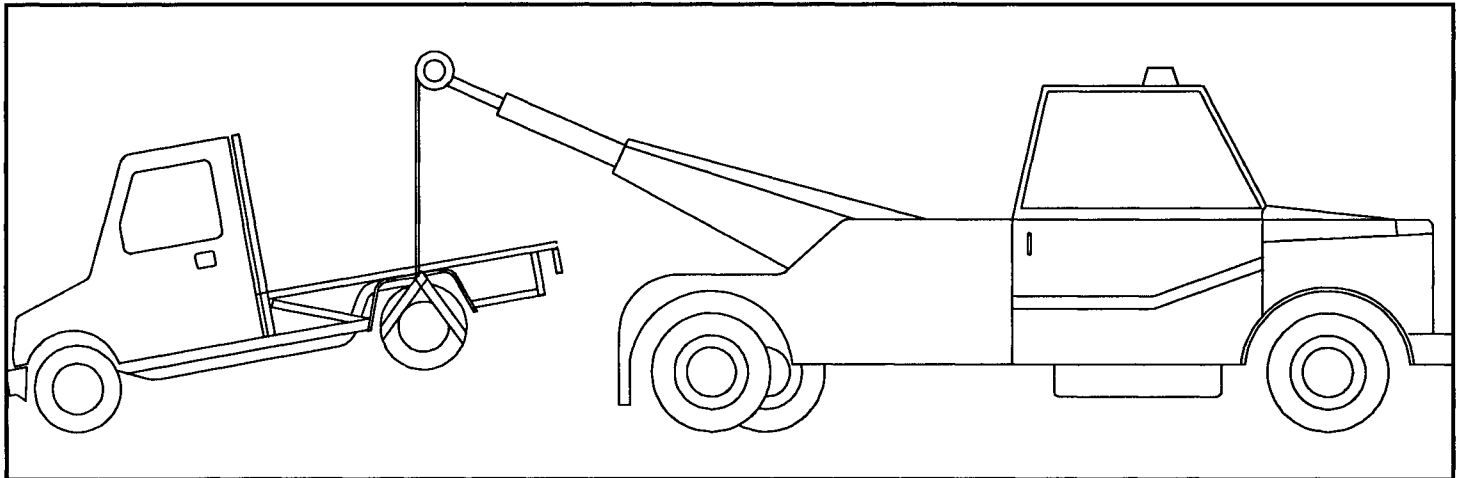
Towing

If towing is necessary, contact a professional towing service.

Check local towing regulations.



The best way of transporting the vehicle is on a flat bed truck, where the entire vehicle rides on the flat bed.



If the vehicle must be towed with a wheel lift type, tow with the **rear wheels off the ground**.

WARNING!

Towing with the rear wheels on the ground will cause severe damage to the differential and motor.

NEVER use tow chains or ropes to tow a vehicle. You might not be able to safely control the vehicle.

- ◆ Place the forward/reverse shift lever in the neutral position.
- ◆ Attach tow straps to each of the rear wheels.
- ◆ Firmly secure the steering wheel with the front wheels pointing straight forward.

WARNING!

Do not exceed 25 MPH or carry any passengers while towing this vehicle.

Batteries

WARNING!

Batteries give off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging or using the battery in an enclosed space.

The battery contains sulfuric acid as electrolyte. Contact with skin or eyes may cause severe burns and/or blindness. Wear protective clothing and a face shield.

If electrolyte (battery acid) gets on your skin, flush with water immediately.

If electrolyte gets in your eyes, flush with water immediately for 15 minutes and call a physician right away.

Electrolyte is poisonous. If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician.

KEEP OUT OF REACH OF CHILDREN!

Battery Charging

CAUTION

The batteries in this truck must be fully-charged prior to its initial use.

See "Vehicle Specifications," Maintenance Section, for charger specifications.

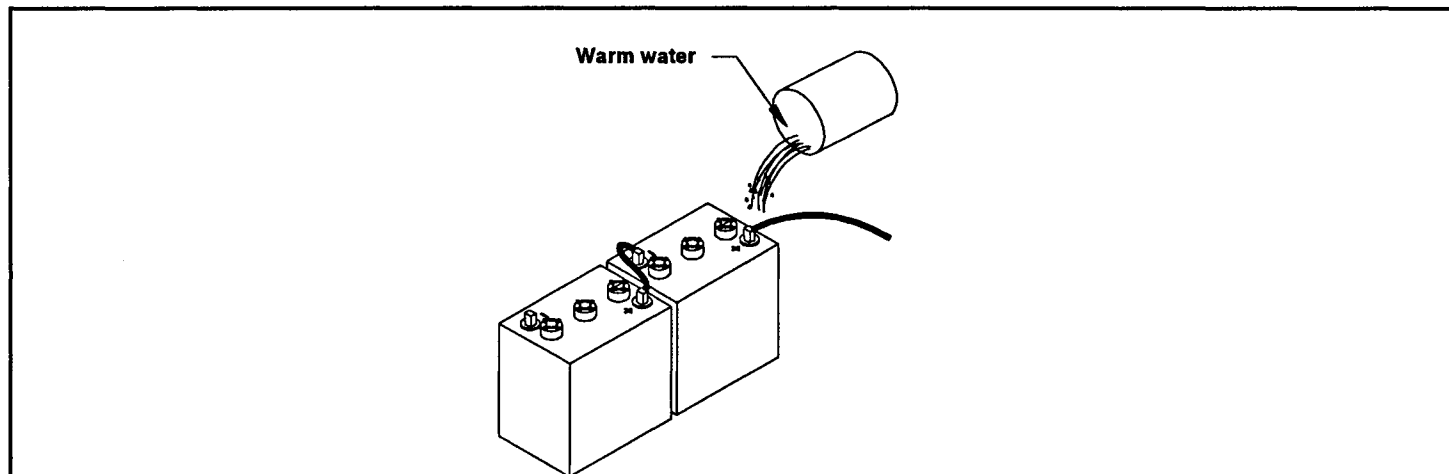
Before charging, make sure the voltage indicated on the charger identification plate complies with the line voltage in your locality. If not, contact Taylor-Dunn or your local Taylor-Dunn dealer.

To charge the truck, open the charger cord box and plug the cord to a matching electrical outlet.

The batteries are fully charged when the ammeter on the charger reads zero.

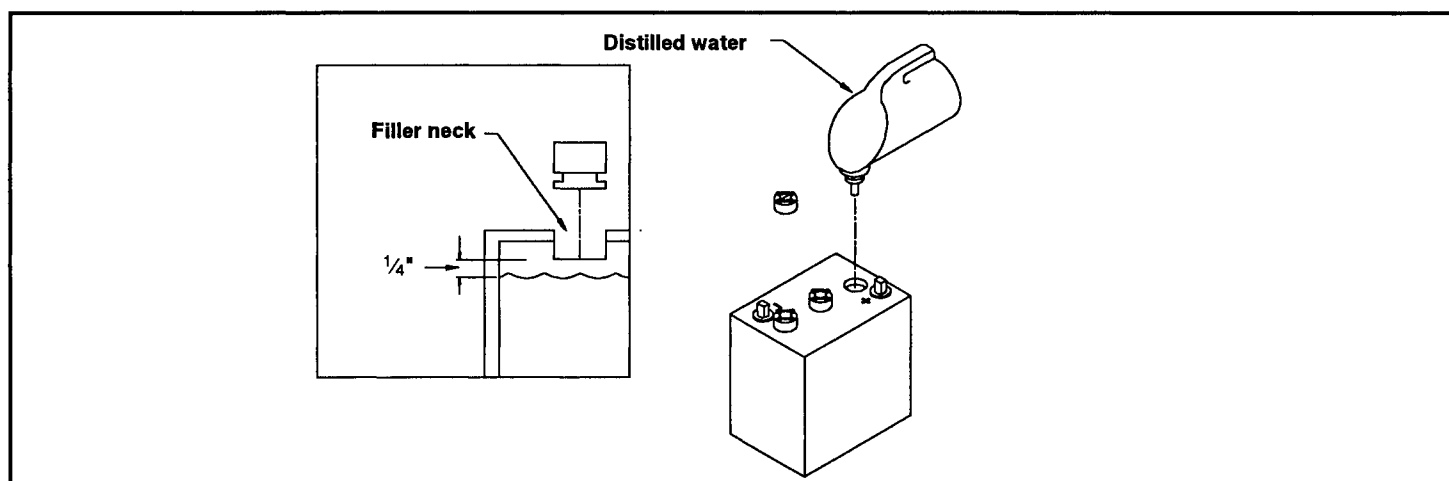
Battery Maintenance

Routine maintenance will help prolong the life of your batteries.



Acids usually form around the terminals under normal use, corroding the terminals, brackets and mounting bolts and nuts. Wash the terminals with warm water to dilute the acids, preferably once a week. Dry the terminals with a clean cloth after washing.

Any corrosion around the positive and negative battery terminals should also be washed off with warm water.



Checking Battery Electrolyte Level

To check electrolyte level for each battery:

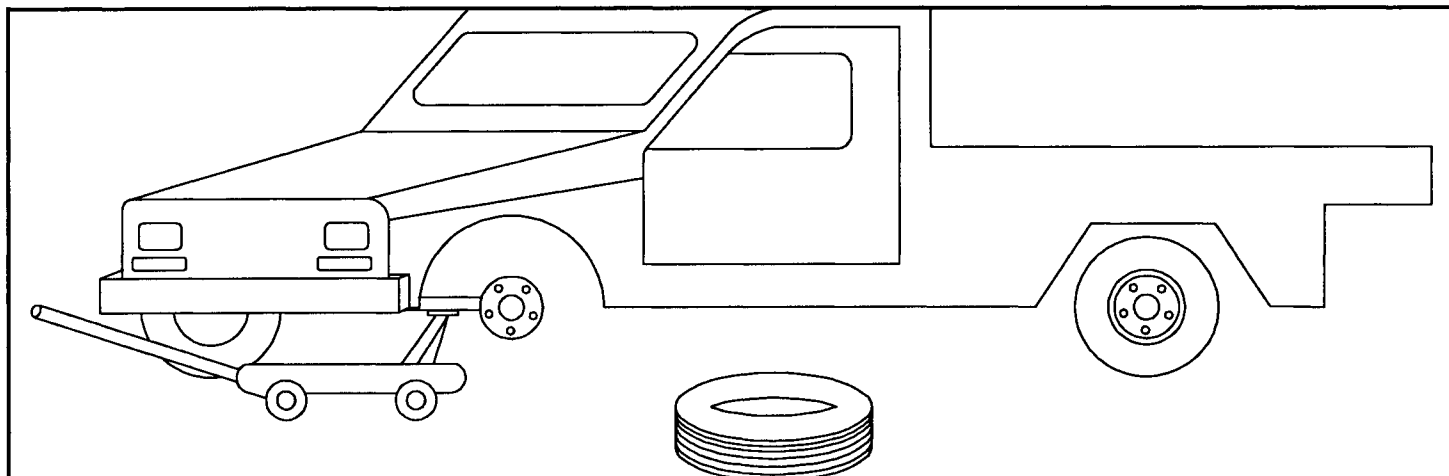
- 1** Remove each cell cover.
- 2** Visually inspect electrolyte level. It should be $\frac{1}{4}$ " below the battery filler neck.
- 3** If too low, fill to the proper level with distilled water from a NON-METALLIC container (plastic or glass).

Note: Remember to perform Steps 1 - 3 for all cells.

Caution

Do not overfill the batteries. If the top of the batteries appears wet before you fill or wash it, it is probably due to leaky or loose cell covers. Tighten or replace covers.

Tires



Changing a Flat Tire

WARNING!

Do not attempt to change a tire unless the truck is on firm, level surface and well out of the flow of traffic.

- 1** Park the truck on a firm, level surface. Apply the parking brake and turn on the hazard warning lights.
- 2** Turn off the keyswitch and push the emergency disconnect switch down.
- 3** Place blocks in front and back of the wheel diagonally opposite the tire you are changing.
- 4** Use a lug wrench to loosen the wheel lug nuts counter-clockwise one-half turn.

WARNING

Follow the tire changing procedures carefully to minimize the possibility of injury. DO NOT GET UNDER the truck and DO NOT run the motor when the truck is supported only by the jack.

- 5** Place a jack under the axle on the side nearest the wheel you are removing.

WARNING!

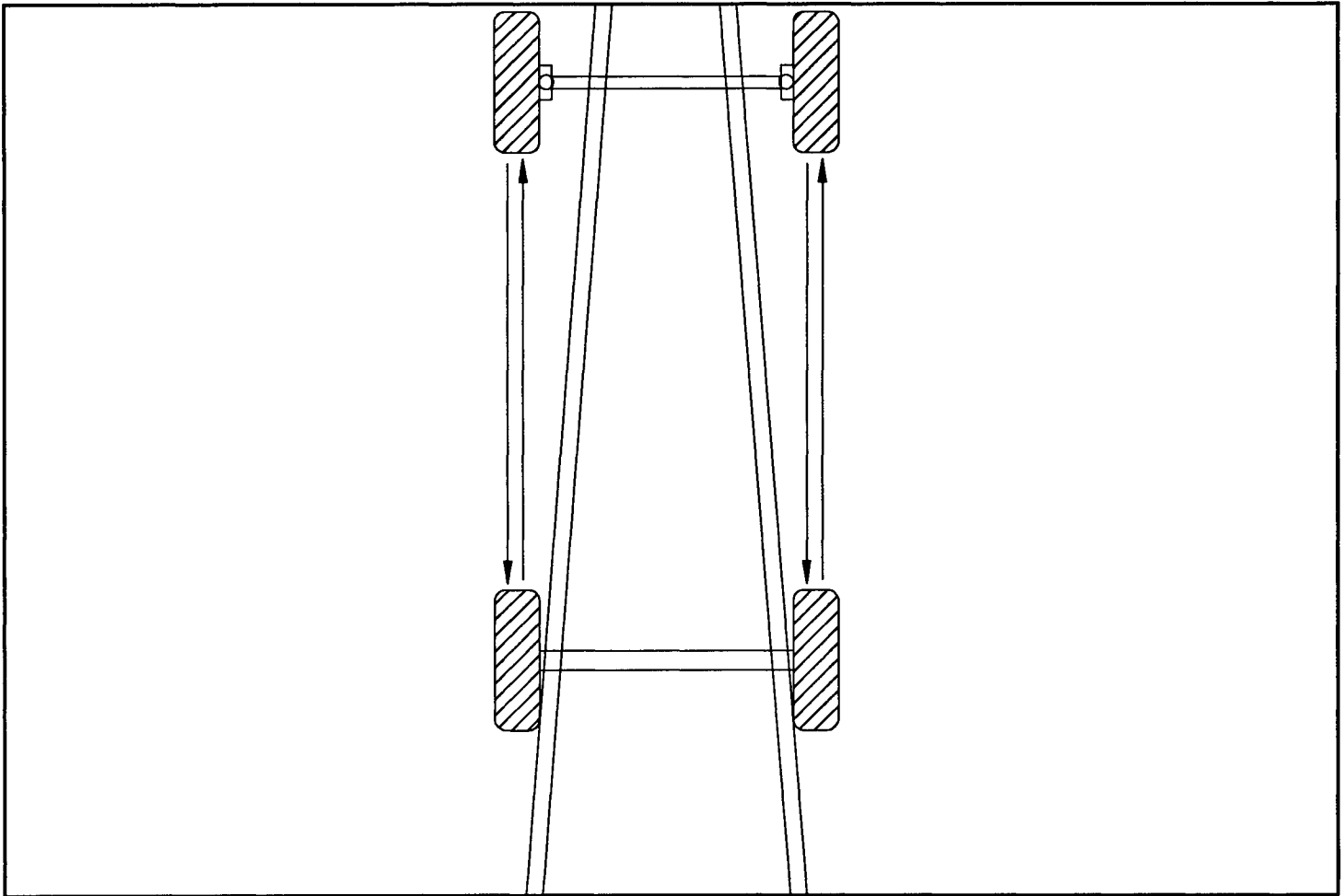
Always jack the vehicle from under the axle. Misplacement of the jack can cause severe damage to the vehicle.

- 6** Raise the vehicle until the tire to be replaced clears the ground.
- 7** Support the vehicle with jack stands.

WARNING

Always use jack stands of adequate capacity. Never work on a raised vehicle supported only by the jack.

- 8** Remove all lug nuts.
- 9** Carefully pull the tire out from the hub.
- 10** Mount the new tire and tighten the lug nuts alternately in a criss- cross pattern.
- 11** Remove the jack stands, and lower the jack slowly.
- 12** Clear away the jack, jack stands, lug wrench, and the wheel blocks.



Tire Rotation

Tires may wear unevenly when used for a long time at the same position on the vehicle. To avoid this, rotate the tires every 3,000 miles (5,000 km).

Caution

Do not mix radial and bias ply tires on the same truck.

Tire Traction

Driving on worn-out or under-inflated tires is very hazardous, and will reduce braking effectiveness, steering accuracy and traction.

WARNING!

WORN TIRES or slippery road surfaces can reduce driving, cornering and braking traction. Slow down when the road gets slippery, replace worn tires and **KEEP TIRES PROPERLY INFLATED**.

Check tire pressure when the tires are cold, i.e., after the truck has been parked for more than three (3) hours or driven less than 1 mile / 1.6 km.

VEHICLE CONTROLS

VEHICLE FEATURES AND SAFETY

CAUTION

The batteries in this truck must be fully charged prior to its initial use. See "Battery Charging," DRIVING Section.

Keys

Two sets of keys come with your truck. Keep one set in a safe place, away from the truck, as a spare.

One round-headed key fits the ON-OFF keyswitch (see "Keyswitch," this section). Another key opens the hood.

The ignition key number is on the back of the keyswitch dash panel, in case you need to have a duplicate made.

Door Locks (Door Option Only)

The doors can be locked and unlocked only from the outside with the square-headed key.

Hood Cover

The hood key opens the hood cover. For the cab option, this key also opens the charger cord box.

LABELS

Safety warning and operating instruction labels are posted at convenient, highly-visible locations in the vehicle for your guidelines.

You **MUST** be sure to **READ** these labels and **FOLLOW** the instructions in them. They are all for your safety, comfort and convenience while using this vehicle.

SEATS

Driver Seat Switch

The purpose of the driver seat switch is to help ensure that the vehicle can be driven only when the driver is seated.

Seat Access

The seats can each be lifted up and removed when necessary for repair access.

WARNING!

When transporting luggage or other cargo, do not pile it higher than the front seats. Such cargo might become dangerous projectiles in case of an accident.

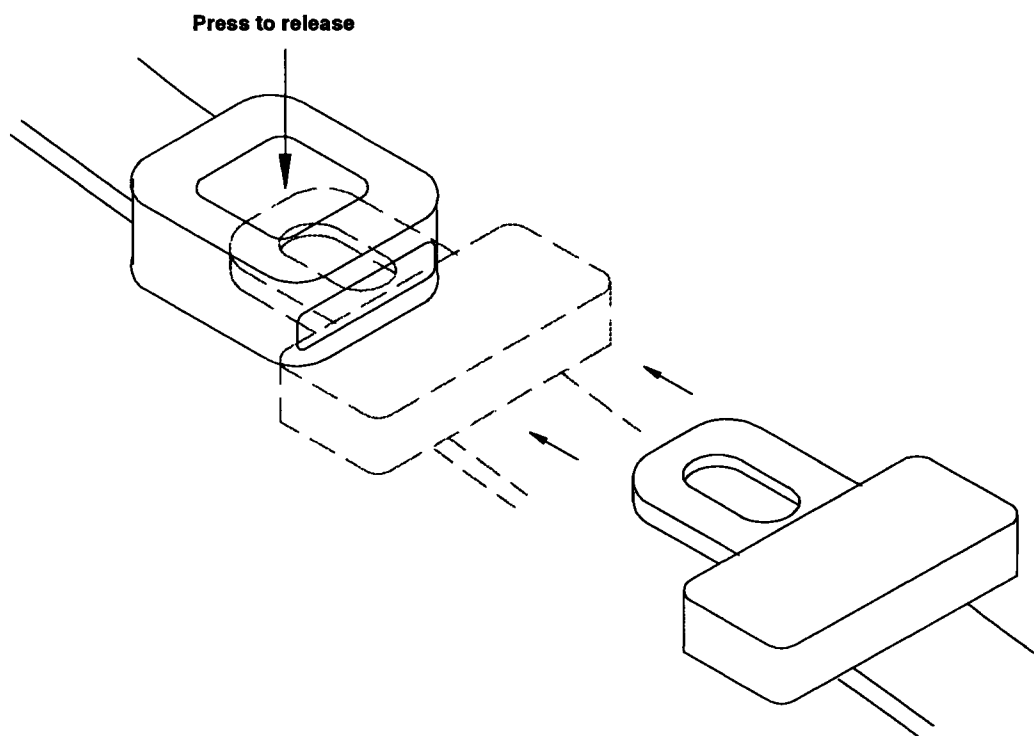


FIGURE 1 - Belt release

SEAT BELTS

Seat belts are provided to minimize the chance of injury to yourself and your passengers in case of a sudden stop or accident.

Seat belts are most effective when the driver and passenger are sitting up straight and well back in each seat.

WARNING!

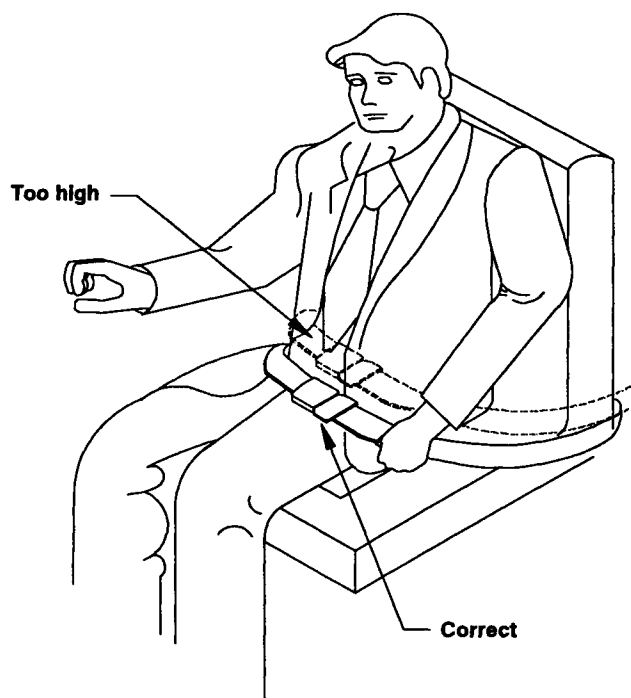
Make sure you and your passenger ALWAYS put on the seat belts before driving away.

CAUTION!

Be careful the seat belts are not damaged by catching or entangling in the door or seat mechanism.

Belt Release

The seat belts should remain permanently latched while the vehicle is moving. To release it, press the release button as shown.

**FIGURE 2 - Wearing seat belts**

Wearing Seat Belts

Sit as straight up as possible and well back in the seat.

Position the belt across your lap, not your abdomen, as low on your hips as possible. Be sure the belt is not twisted.

WARNING!

Avoid placing the lap belt across your abdomen. In the event of a collision, the pressure of the belt on the abdomen may increase the extent of injury.

Never use one belt for more than one person, whether child or adult.

Comfort clips sold on the open market are not recommended since they could impair the function and safety of the belts.

Never allow a child to be held in a person's arms while they are in a moving vehicle. It does not provide the child with a means of protection in case of an accident, even if the person holding the child is wearing a seat belt.

Inspection

All parts of the seat belts, including the seat belt fabric, should be regularly inspected for fraying, loosening, wear and other damage. Keep the belts in good condition at all times. Make sure the buckles, retractors, tongue plates, guides and anchors all work properly.

Don't let anything get inside the buckle or the retractor; it can cause latch or retractor failure.

Cleaning

The belts should always be kept clean and dry. To clean the belts, pull them all the way out and wash with warm water. Let them air dry fully extended, in the shade, with the cab windows open.

Do not scrub or use detergents to clean the seat belts.

VEHICLE CONTROLS

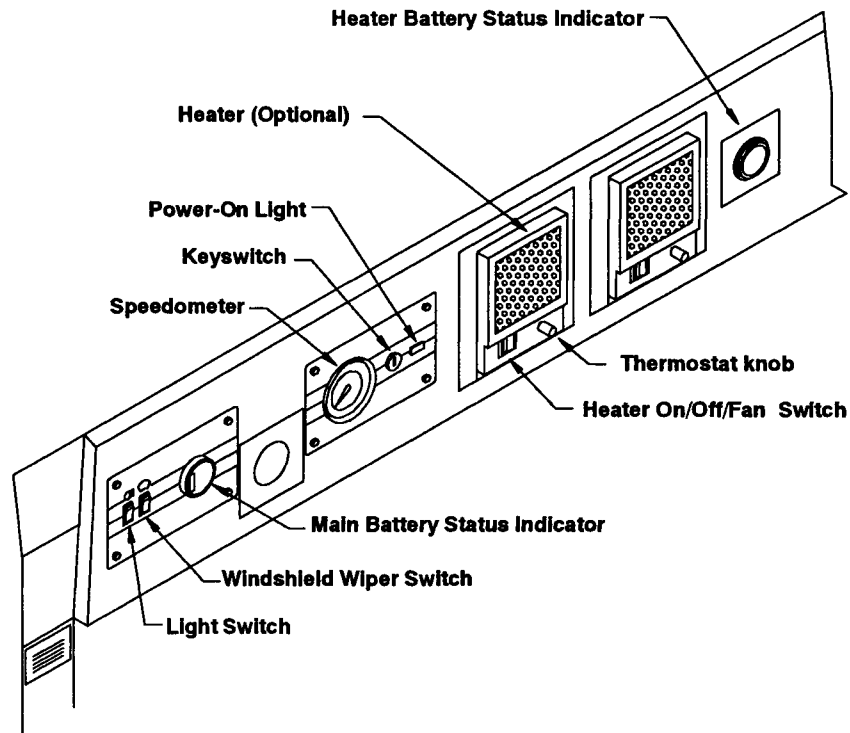


FIGURE 3 - INSTRUMENT PANEL

Keyswitch

Rotate the key clockwise to turn the vehicle on, counterclockwise to turn the vehicle off.

The key can only be removed when the keyswitch is in the OFF position.

Power-On Light

The power-on light will light up when the keyswitch is turned on.

WARNING!

Never leave the vehicle with the key on.

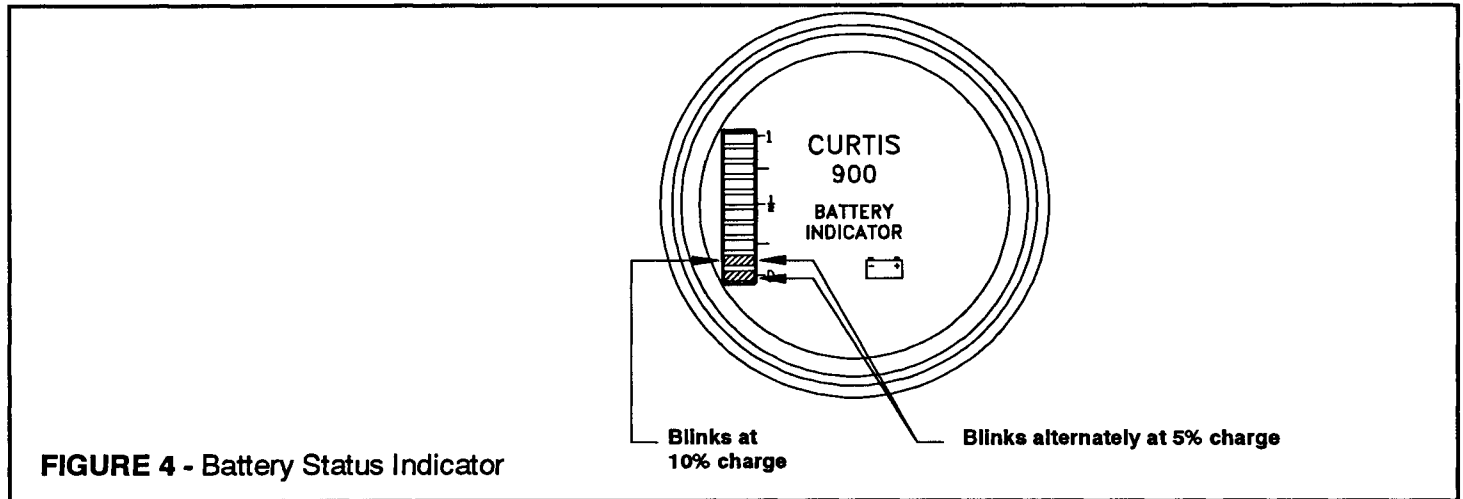
Light Switch

Press the upper portion of the light switch to turn the headlights and taillights on. Press the lower portion to turn the lights off.

Windshield Wiper Switch

To turn the the electric windshield wiper on, press the upper portion of the windshield wiper control switch. To turn the wiper off, press the lower portion.

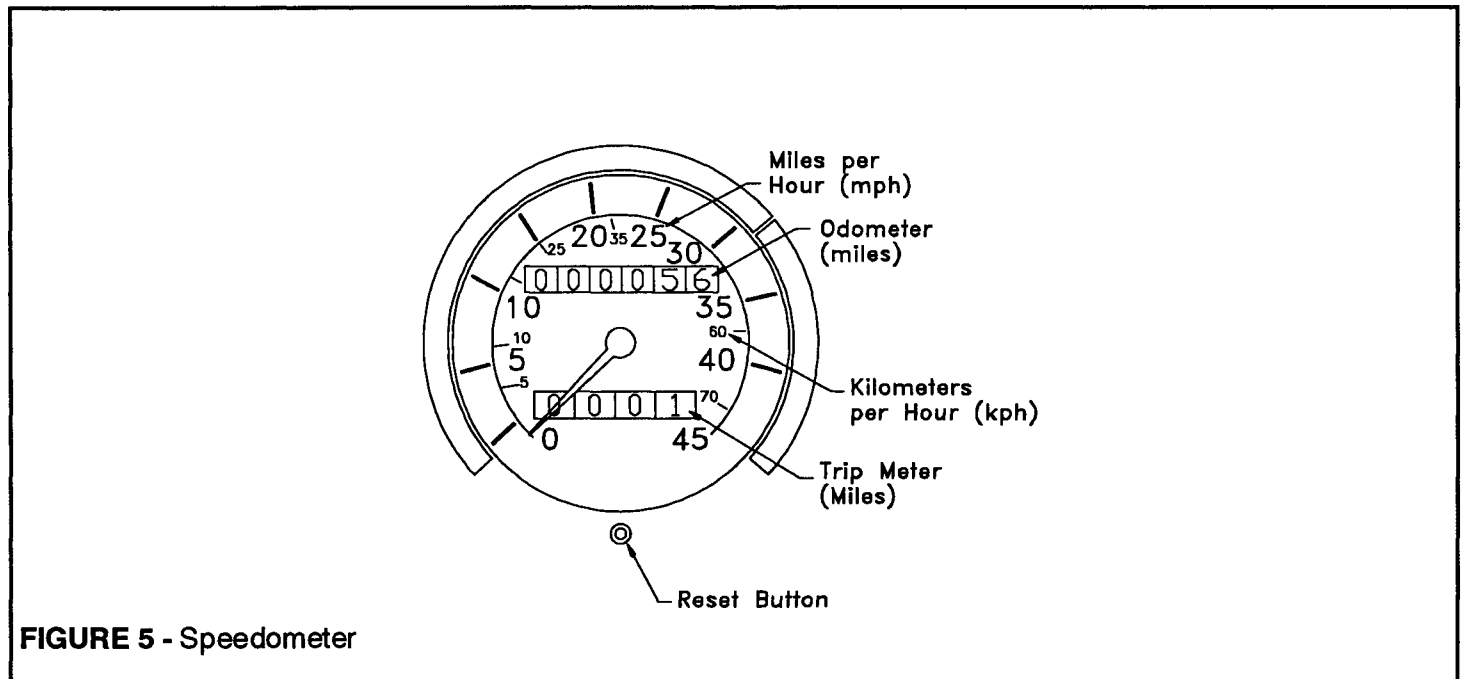
Note: The wiper should be turned off with the blade on the passenger side for better visibility.



Battery Status Indicator

The battery status Indicator has 10 light-emitting diodes (LED's) to indicate the batteries' state of charge. Only one LED will be lit at a time.

When the batteries are fully-or almost fully-charged, the top LED will be lit. The position of the light will go lower as the vehicle is used and the charge in the battery gets used up. The LED indicator will blink when the charge is at about 10% , and the two bottom LED's will blink alternately when the charge goes down to about 5%. This is the empty point.



Speedometer

The speed is indicated in miles per hour (outside scale) and kilometers per hour (inside scale).

WARNING!

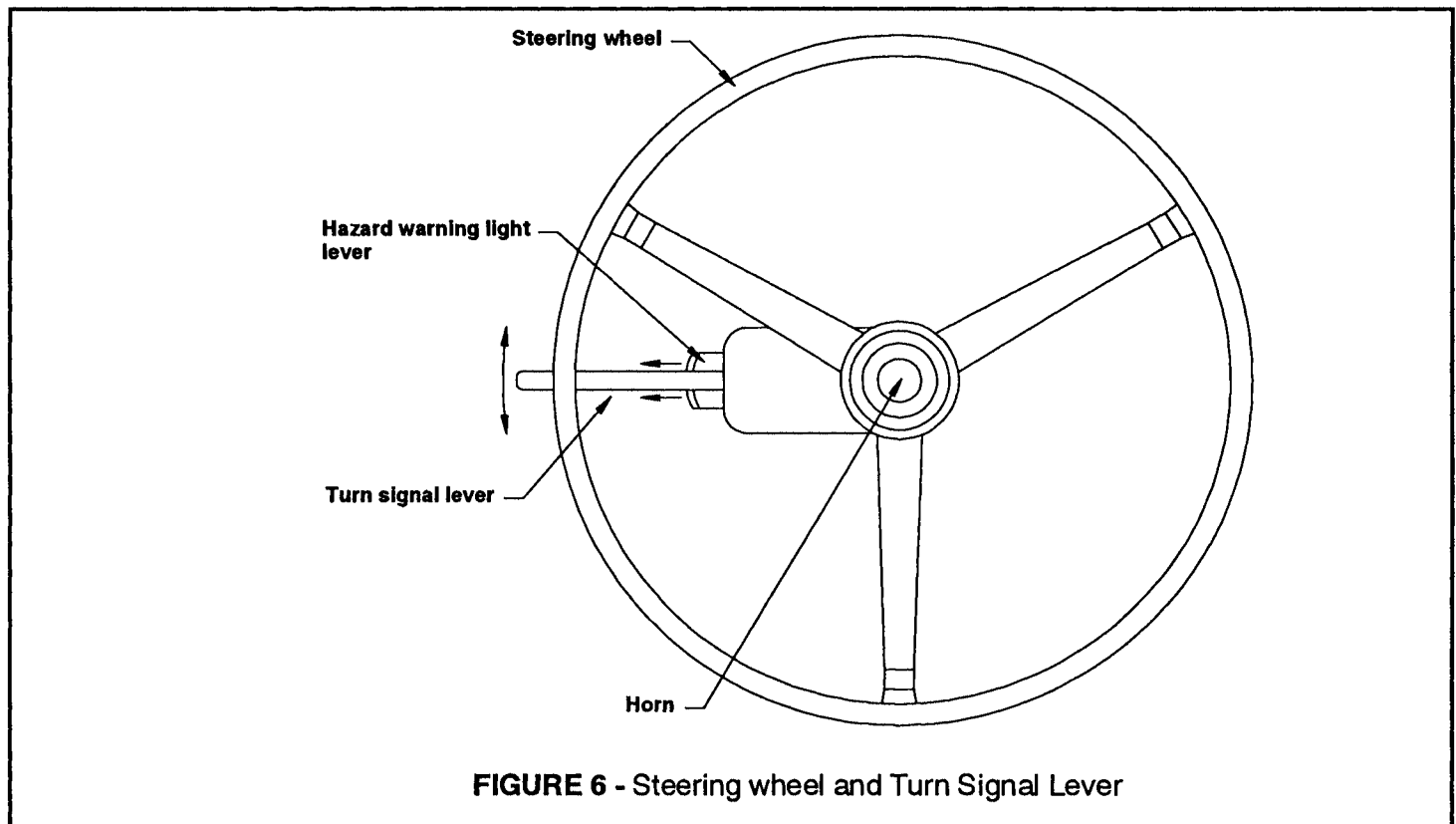
Do not exceed 18 miles per hour, especially when going downhill.

Odometer

The numbers on the odometer indicates total miles traveled. This serves as your guide for determining when periodic maintenance is due.

Trip Meter

The numbers on the trip meter indicates miles traveled since the trip meter was last set. It can be returned to 0 by pushing in the reset button. Use it for checking battery charge consumption or distance traveled per trip.



Steering

To turn right, turn the steering wheel clockwise. To turn left, turn the steering wheel counterclockwise .

Horn Button

Press the button to sound the horn, and release it to silence the horn.

Turn Signal Lever

Push the turn signal lever up (clockwise) to signal a right turn, and down (counter-clockwise) to signal a left turn. The indicator and appropriate signal lights will blink. After making the turn, push the lever back to its original position so the lights will stop blinking.

If either turn signal indicator lights up but does not blink, blinks faster than usual or does not light up, check for a burned out bulb or flasher.

Hazard Warning Light Lever

Pull the hazard warning light lever outward to activate all warning lights.

To turn the warning lights off, push the turn signal lever either up or down, then push the turn signal lever back to its original position.

Heater (Optional)

On/Off/Fan Switch

This switch has 3 positions. The middle is "OFF". Press it on the left side to turn just the fan on. Press it on the right side to turn on the **heater** and the fan.

CAUTION!

Always turn this switch to the middle "OFF" position when the vehicle is left unattended.

Heater Thermostat Knob

This knob controls the temperature at which the heater's heating element will be shut off. Turn it clockwise to increase shut-off temperature, counter-clockwise to decrease it.

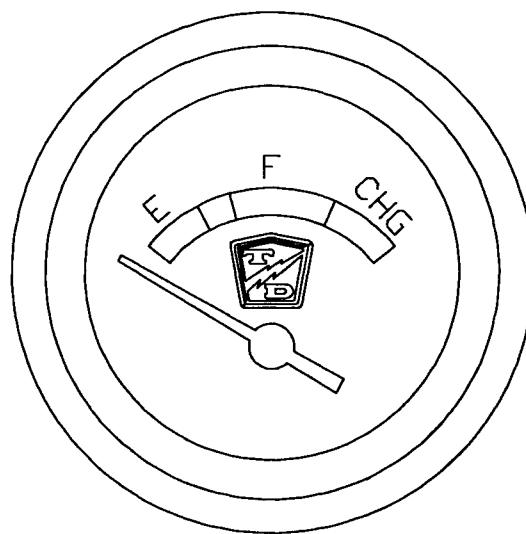


FIGURE 7 - Heater Battery Status Indicator

Heater Battery Status Indicator

This gauge indicates the state of charge of the heater batteries.

When the batteries are fully-charged, the indicator needle will point to "F". As the heater battery charge gets used up, the needle will progressively point to the left.

When the needle gets to the red zone on the left ("E"), the heater batteries are empty, or very nearly empty. Recharge them immediately.

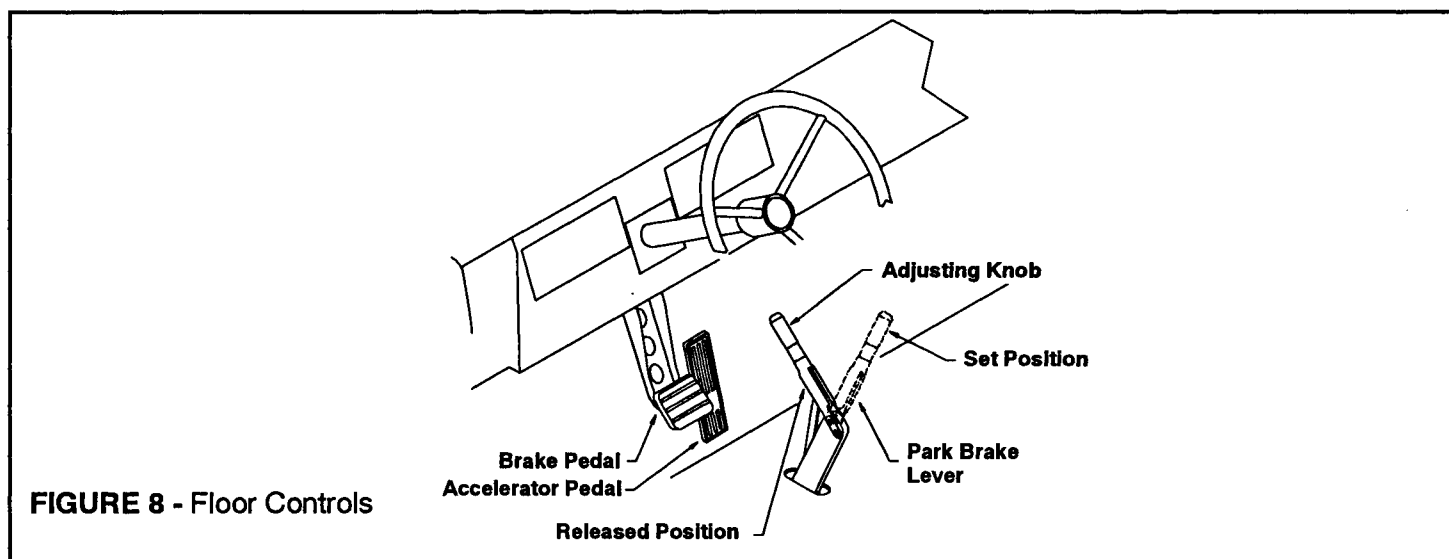


FIGURE 8 - Floor Controls

Parking Brake Lever

To set the parking brake, pull up and back all the way on the lever until it locks in place, as shown above. To release the parking brake, push the lever forward and down.

Note: If the park brake does not set because it is too tight, or if it is too loose, adjust it by turning the adjusting knob at the end of the lever.

WARNING!

Be sure to set the parking brake when the truck is left unattended.

CAUTION!

Be sure to RELEASE the parking brake before driving the vehicle.

To hold the vehicle on an incline, use the parking brake. Do not use the shift lever and accelerator - the motor will be severely damaged.

Accelerator pedal

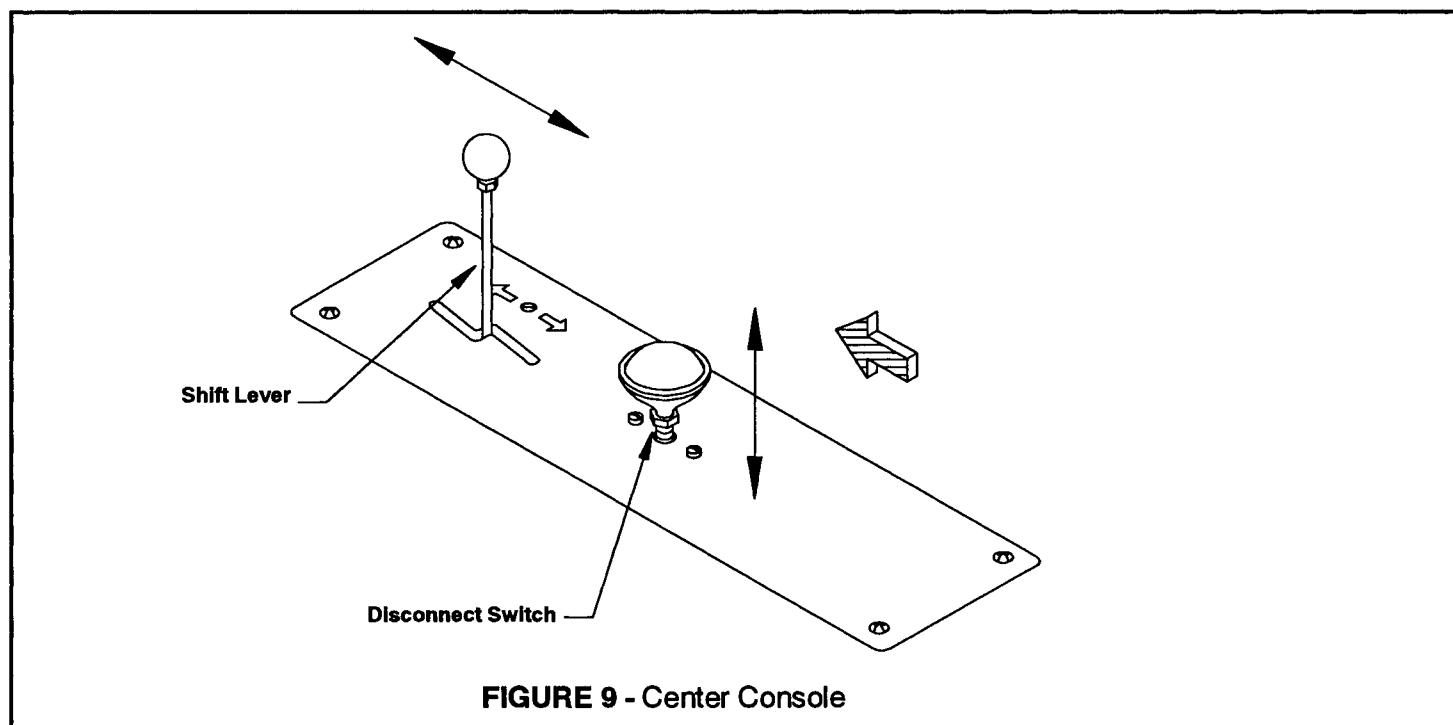
The accelerator pedal controls the speed of the vehicle and is designed for right foot operation. Step on the pedal and push down to accelerate. Lift your foot off the pedal to decelerate.

CAUTION!

Use the brakes to keep the truck stopped (hold) on a hill or an incline. **DO NOT** use the accelerator - the motor will be severely damaged.

Foot brake pedal

The foot brake pedal is also designed for operation with the right foot. Applying pressure to the brake pedal slows the vehicle according to the amount of pressure applied. Removing your foot from the pedal releases the braking action.



Shift Lever

The shift lever determines the direction of travel (forward or reverse) of the vehicle. Push the lever forward to go forward. Pull it back to go in reverse. Note that the shift lever has a center "OFF" or neutral position.

CAUTION

Do not shift while the vehicle is in motion.

WARNING!

Place the shift lever in the center "OFF" position and set the parking brake when the vehicle is left unattended.

Main Power Disconnect

This knob has to be pulled up to enable the truck to run. To immediately cut off power to the motor, push it down. To restore power to the motor, pull the knob back up until it locks in place.

NOTE: When the truck is left unattended, push the disconnect switch down for added safety.

Rearview Mirrors

Keep the inside and outside mirrors adjusted for best visibility.

NOTE: Be sure to adjust mirrors before you start driving.

MAINTENANCE

MAINTENANCE

This truck must be properly maintained to ensure that it is in peak operating condition.

The following instructions and maintenance procedures are based on the assumption that your vehicle will be used exclusively for the purpose for which it was designed:

- ◆ To carry passenger and cargo within the specified load limits of the vehicle.
- ◆ To be driven on reasonable road surfaces within legal limits, at speeds not exceeding 18 miles per hour (29 Kmph).
- ◆ To be driven daily over a distance of several miles.

NOTE: *Failures which occur due to lack of maintenance will not be covered under warranty.*

The required maintenance schedule specifies all maintenance required to keep your vehicle in peak operating condition. Work should be done by an authorized Taylor-Dunn dealer, but may be done by any qualified service facility.

Note: *All warranty work must be done by an authorized Taylor-Dunn dealer.*

Brakes

Brakes should be maintained according to the "PERIODIC MAINTENANCE INSPECTION CHECKLIST," this section. For more detail on brake servicing, repair and maintenance, see the "BRAKES" Section.

Batteries

Batteries should be maintained according to the "PERIODIC MAINTENANCE INSPECTION CHECKLIST," this section. For more detail on battery charging, cleaning and maintenance, see the "SAFETY / GENERAL INFORMATION SECTION" at the beginning of this manual.

Appearance Care

Interior Trim

Remove dust and loose dirt with a vacuum cleaner. Wipe the vinyl with a clean, damp cloth or sponge. Stains can be removed with a commercially available vinyl cleaner.

Caution:

Do not use thinner, gasoline, kerosene, naphtha or other solvents on the interior or exterior. They are toxic, flammable and hazardous and could damage the material you're cleaning.

Windows

A 10 to 1 mix of water and white vinegar, or a commercially available glass cleaner, may be used to clean windows.

Scheduled Maintenance

PERIODIC MAINTENANCE INSPECTION CHECKLIST				
Maintenance Item	Monthly (1,000 ml / 1,600 km)	Quarterly (3,000 ml / 4,800 km)	Semi-yearly (6,000 ml / 10,000 km)	Yearly (12,000 ml / 20,000 km)
** Rear brake drums, wheel cylinders and brake linings		I		
** Brake fluid level. Refill with DOT 3 brake fluid if necessary.	I			
Parking brake	I			
** Front brake pads		I		
** Brake lines and fittings		I		
** Steering operation, tie rod ends, steering gear box and boots		I		
Front wheel bearings and ball joint fittings. Lubricate if necessary. (use wheel bearing grease)		I		
Front end alignment and rod ends			I	
Suspension mounting bolts	I			
Check and fill batteries (use distilled water only).	I			
** Wash batteries with water (DON'T use baking soda)	I			
** Wash heat sink with water	I			
** Check tire pressure. Inspect for cuts and uneven or excessive wear.	I			
Rotate tires.		I		
Check windshield wiper.		I		

Troubleshooting Guide

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Steering pulls in one direction	Loose wheel bearing	Adjust wheel bearing
	Low tire pressure	Inflate tires to correct pressure
	Loose rod end bolts	Tighten bolts
	Worn rod ends	Replace rod ends
	Loose front axle mounting	Tighten mounting bolts
Hard to steer	Loose wheel bearing	Adjust wheel bearing
	Low tire pressure	Inflate tires to correct pressure
	Worn ball joints	Replace ball joints
	Worn king pin bushings	Replace king pin bushings
	Tight neutral axis bolt	Adjust neutral axis bolt
	Unlubricated neutral axis bolt	Lubricate neutral axis bolt
	Unlubricated steering gear	Lubricate steering gear
	Misadjusted steering gear	Adjust steering gear
	Unlubricated king pin bushings	Lubricate king pin bushings
Brakes feel soft	Air in brake lines	Fill master cylinder and bleed brake lines
	Bad seals in master cylinder	Rebuild or replace master cylinder
	Oil on brake pad lining	Find oil source and correct; replace brake pads
	Dirt on brake pad lining	Clean brake pad lining
	Bind in linkage	Loosen or realign brake linkage
	Weak pedal return spring	Replace pedal return spring
No brakes	Bad seals in wheel cylinder	Replace wheel cylinder
	Bad seals in master cylinder	Rebuild or replace master cylinder
	Air in brake lines	Bleed brake system
	Low or no brake fluid	Fill and bleed brake system. Inspect for leaks.
	Broken connection in linkage	Replace linkage
	Damaged/broken brake line or hose	Replace brake line or hose

Troubleshooting Guide (continued)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Lack of power or slow operation	Dragging brake	Re-adjust brakes
	Tight front wheel bearing	Re-adjust wheel bearing
	Defective rear axle bearing	Replace bearings
	Bind or drag on differential	Repair differential
	Corroded battery connections	Clean or replace
	Defective or worn motor brushes	Clean or replace
	Low battery voltage	Fill and charge battery or replace battery
	Loose wire connections	Check wires and connections
	Defective Controller	Replace controller
	Defective accelerator module	Replace accelerator module
	Loose accelerator pedal mount	Tighten pedal mount screws
Motor does not run	Motor or solenoids	Check motor and solenoids
	Dead battery	Replace or recharge battery
	Loose wire connections	Check wires and connections
	Defective accelerator module	Replace accelerator module
	No continuity through motor	Repair or replace motor
Controller does not operate	Loose wire connections	Check wires and connections
	No accelerator output	Replace accelerator
	Defective seat switch	Replace seat switch
	Defective keyswitch	Replace keyswitch
	Low battery voltage	Charge battery
Thump or grinding noise in drive axle	Motor bearing	Replace motor bearing
	Loose motor on base	Tighten and adjust motor
	Defective gears in differential	Replace gears
	Defective bearing in differential	Replace bearing

Recommended Spare Parts List

RECOMMENDED SPARE PARTS LIST			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	62-033-56	Accelerator Module	1
2	71-141-20	Turn Indicator Control	1
3	71-121-10	Key Switch, Keyed Unalike	1
4	74-020-00	Speedometer	1
5	72-028-25	Power-on Light	1
6	71-038-10	Light / Windshield Wiper Switch	1
7	71-505-55	Horn Button	1
8	73-004-20	Horn	1
9	72-076-00	Headlight	1
10	72-050-00	Front Turn Indicator Lights	1
11	72-022-00	Taillight	1
12	72-035-00	Back-up Light	1
13	96-826-14	Brake Cable Assembly	1
14	90-160-50	Bucket Seat (Driver)	1
15	74-052-10	Windshield Wiper Blade	1
16	13-770-00	Spare Tire and Wheel Assembly	1
16	76-002-01	Plug, Charger	1
18	71-110-00	Brake Light Switch	1
19	71-900-05	Flasher, 12V, 3-terminal	1

Vehicle Specifications

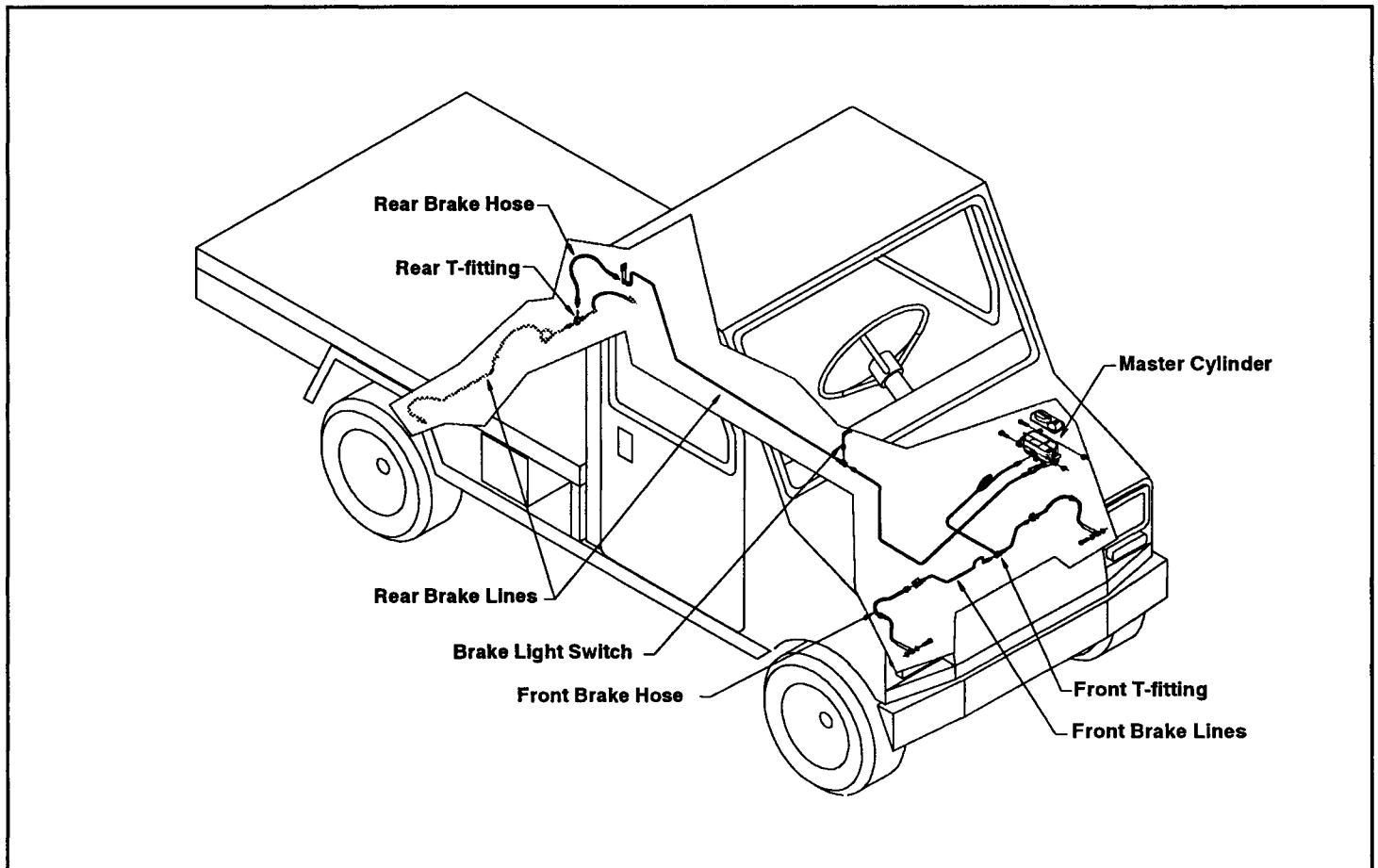
ITEM	SPECIFICATION *
Dimensions (Length x Width x Height)	417 X 157.5 X 193 cm 164 X 62 X 76 in
Bed dimensions (Length x Width)	223.5 X 157.5 cm 88 X 62 in
Wheelbase	259 cm (102 in)
Weight	1,045 Kg (2,300 lbs) with Charger and Batteries
Load Capacity	682 kg (1,500) lbs including driver, passengers and accessories
Turning Radius	534 cm (210 in)
Speed	18 mph (29 kmph) empty
Body	Fiberglass cab
Motor	15 hp DC series wound
Steering	Steering wheel, automotive steering gear unit
Drive Axle	Direct drive automotive differential
Frame	All-steel tubular independent frame
Bumper	Heavy-duty steel

Vehicle Specifications (continued)

ITEM	SPECIFICATION *
Suspension	Heavy-duty leaf springs front and rear; rear automotive shock absorbers standard, front shock absorbers optional.
Speed Controller	Digital proportional FET solid state, with modular magnetic pickup accelerator
Charger	48 volt/25 amp output, 115 volt/15 amp input, built-in
Battery	Eight (8), 6 volt 220 AH (105 min. rating)
Wiring	Motor power wire # 0 insulated cable; Interlock driver's seat switch; emergency power-off button
Brakes	Front: 11" hydraulic disc brakes (Optional) Rear : 11" hydraulic drum brakes (Standard)
Tires and Wheels	195/75 R14 Highway radial tread pneumatic; all wheels demountable from hubs
Lights, Horns, Indicators	Dual rectangular headlights, dual taillights, dual stoplights, electric horn, battery charge indicator, speedometer, directional signals, power-on light
Seats	Black vinyl upholstery, driver and passenger seat belts
* These are standard specifications, unless otherwise specified. Individual vehicle specifications may vary depending on the options installed at the time of manufacture.	

BRAKE SYSTEM

Brake System



WARNING!

Please refer to Section 1, "SAFETY / GENERAL INFORMATION" before performing any repairs / maintenance on this vehicle.

Use ONLY DOT 3 brake fluid in this truck. Other fluids will damage brake seals and result in brake failure.

It is dangerous to drive the truck with a problem in the brake system. Check the brake system if you suspect brake trouble.

Do not ride the brakes - do not put your foot on the brake pedal unless you intend to brake. This causes overheating, which leads to excessive brake wear and damage to or loss of brakes. It will also turn on your brake lights, and might confuse drivers behind you.

Driving through deep water may affect the brakes. Check by pressing the brake pedal gently. If the vehicle does not slow down at the normal rate, continue gently applying the brakes while maintaining a safe speed, until they dry out and normal braking returns.

The brake system consists of rear hydraulic drum brakes, mechanical park brakes, and optional front hydraulic disc brakes. The master cylinder has dual chambers, the front one controlling the rear brakes and the rear chamber controlling the optional front brakes. The brake light switch is pressure actuated.

Brake Wear

Both front and rear brakes should be inspected for wear at the intervals shown in the "Required Maintenance" table, Maintenance Section.

When brake parts require replacement, use only genuine Taylor-Dunn replacement parts.

Brake Fluid

WARNING!

Brake fluid is poisonous. Contact with skin or eyes may cause severe burns and/or blindness. Wear protective clothing and a face shield.

If brake fluid gets on your skin, flush with water immediately.

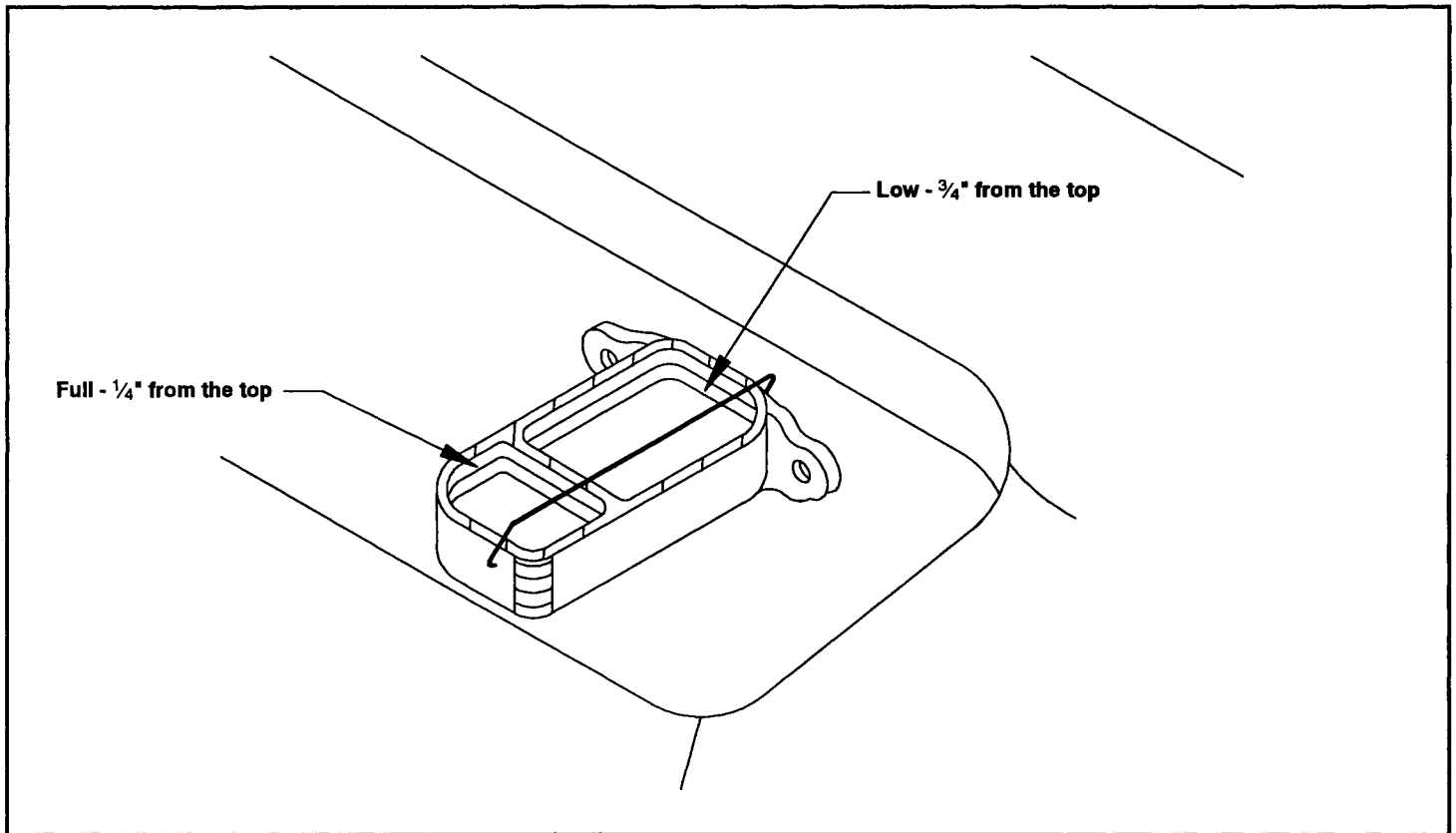
If brake fluid gets in your eyes, flush with water immediately for 15 minutes and call a physician right away.

If somebody swallows brake fluid, let them drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician.

KEEP OUT OF REACH OF CHILDREN!

CAUTION!

Brake fluid is corrosive and can damage paint finish. Avoid spilling brake fluid on any surface.

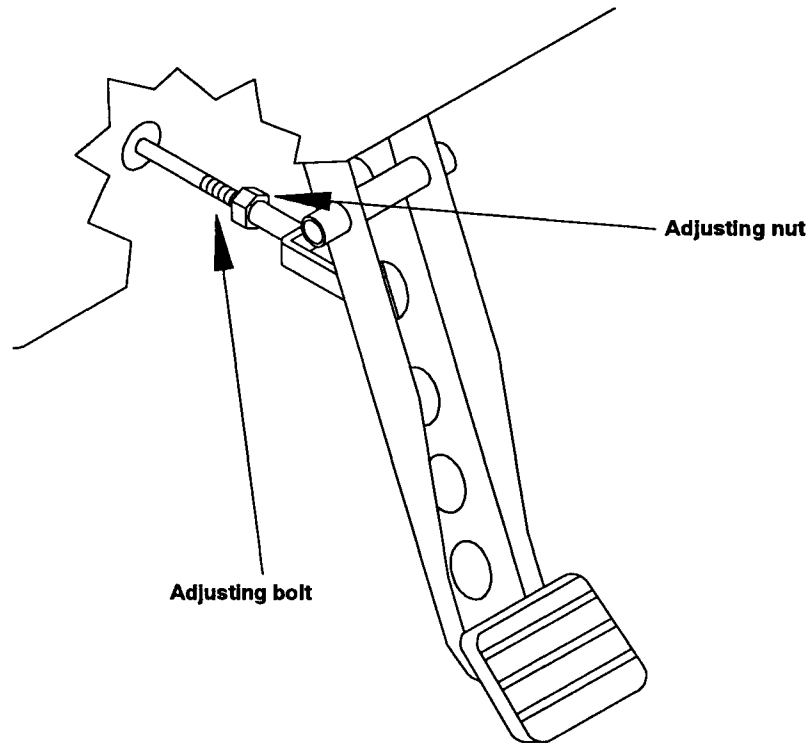


Checking Brake Fluid Level

- 1** Open the hood.
- 2** Clean up the cover and exterior of the master cylinder and the surrounding area.
- 3** Place a screwdriver under the wire clamp on the master cylinder cover, and push the clamp over the side of the cover. Remove the cover.
- 4** The master cylinder has two chambers. Check the fluid level in each chamber; it should be between 1/4" and 3/4" from the top .

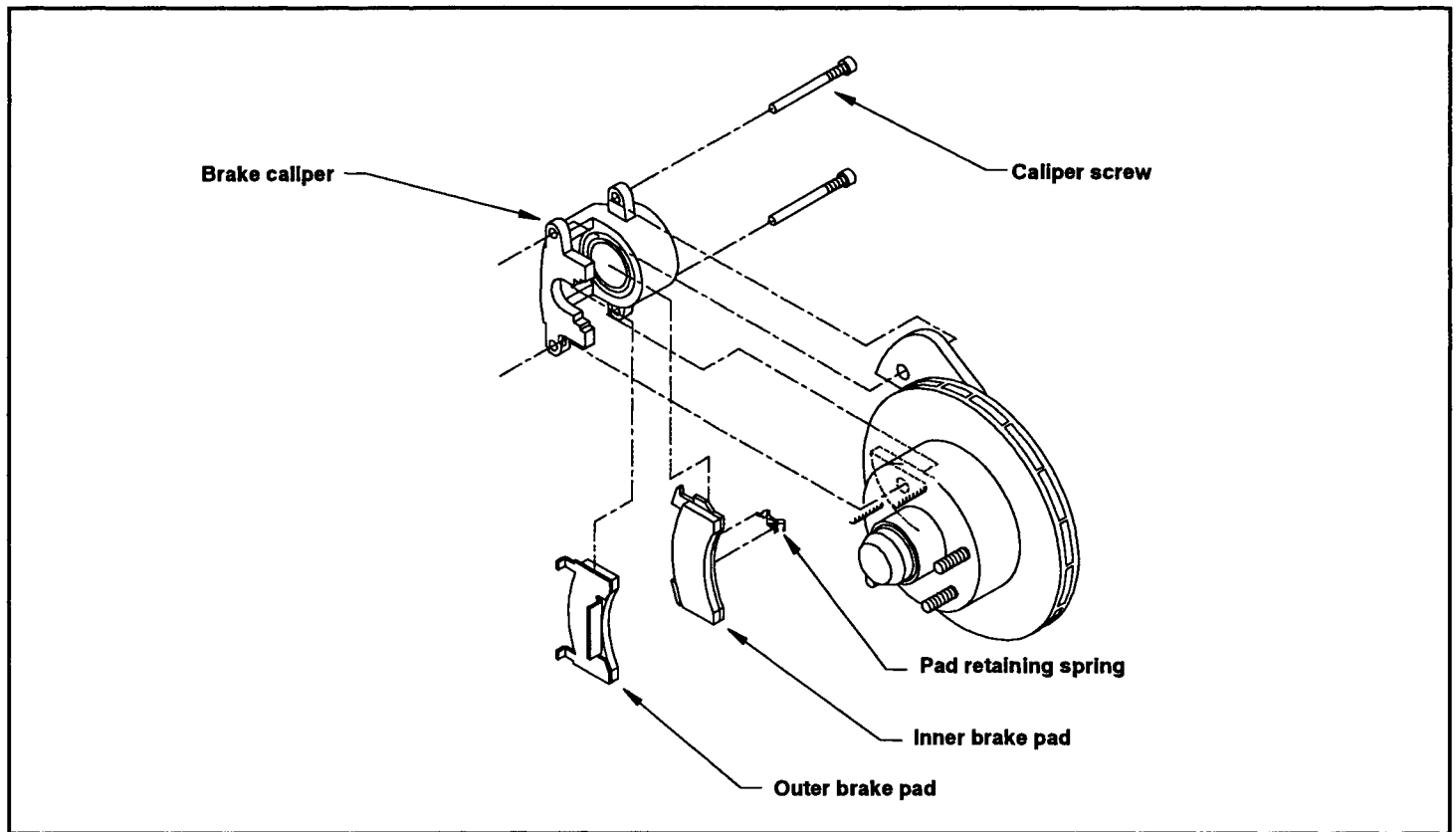
NOTE: *Low brake fluid level may be an indication of brake pad wear or of brake fluid leakage. Check for these items if the brake fluid level is low before refilling it.*

- 5** If the fluid needs refilling, add DOT 3 brake fluid from a sealed container. Fill up to 1/4" from the top of reservoir.
- 6** Place the cover back on the master cylinder. Pull the wire clamp back on the groove in the center of the master cylinder cover.



Adjusting the Brake Pedal Free Play

- 1** Loosen the adjusting nut.
- 2** Turn the push rod counter clockwise to reduce free play, clockwise to increase free play.
- 3** Tighten the adjusting nut.



Replacing the Front Brake Pads

- 1** Siphon part of the brake fluid from the rear master cylinder chamber to avoid fluid overflow. Discard the fluid properly.
- 2** Remove one front wheel (see "Replacing Tires").
- 3** Remove two caliper screws with a $\frac{3}{8}$ " Allen screwdriver.
- 4** Slide the caliper off the brake assembly.
- 5** Remove inner and outer brake pads. Place the caliper back on the rotor for support.

Caution:

Do not let the caliper hang by the brake hose, as the hose might get stretched or twisted.

- 6** Remove the retaining spring from the inner pad. Dispose of old pads properly. Clean all parts.

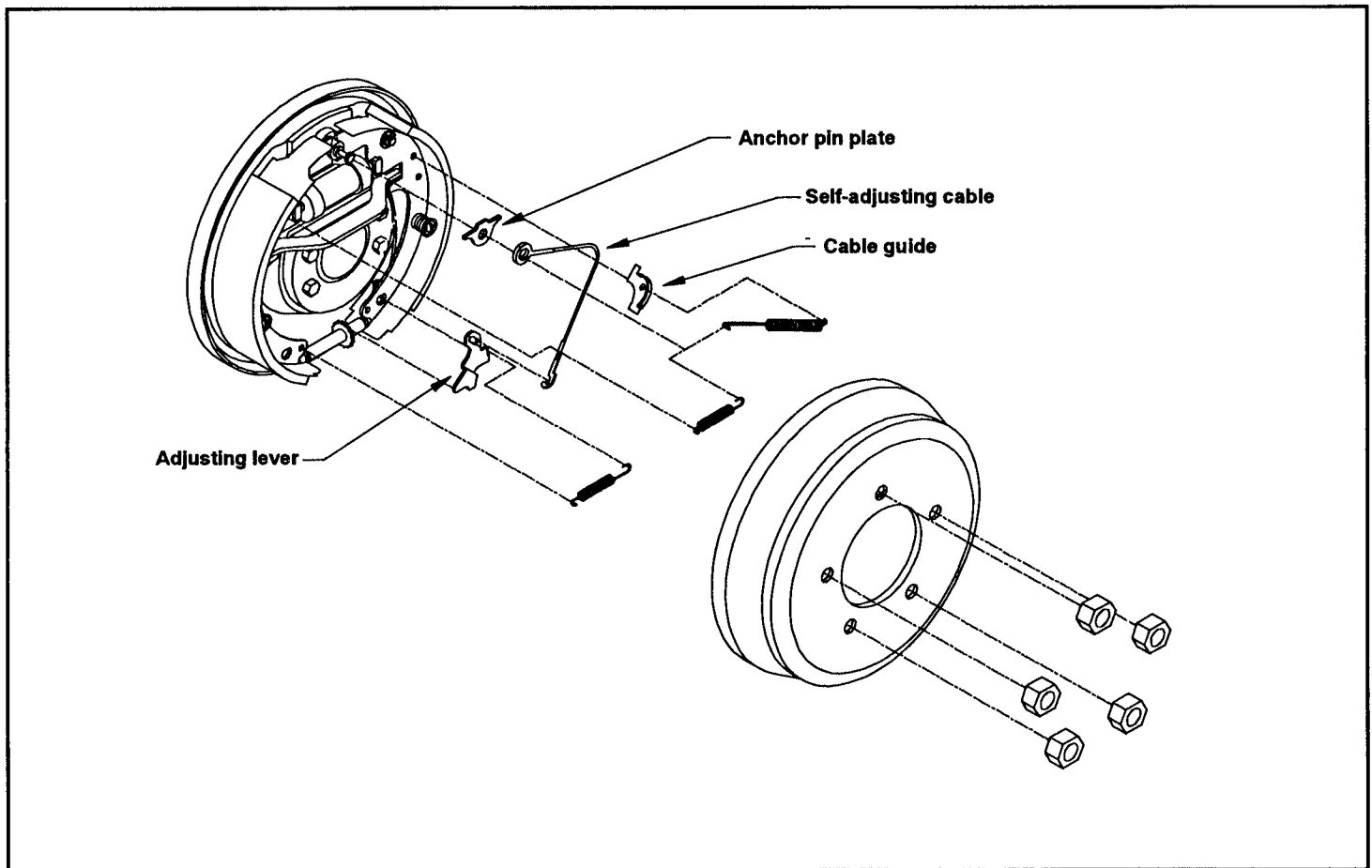
WARNING!

Inhaled asbestos fibers have been found to cause cancer and respiratory diseases.

Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or any alternate method approved by OSHA to minimize the hazards caused by airborne asbestos fibers.

- 7** Clean your hands thoroughly.
- 8** Install the retaining spring onto the new inner pad.

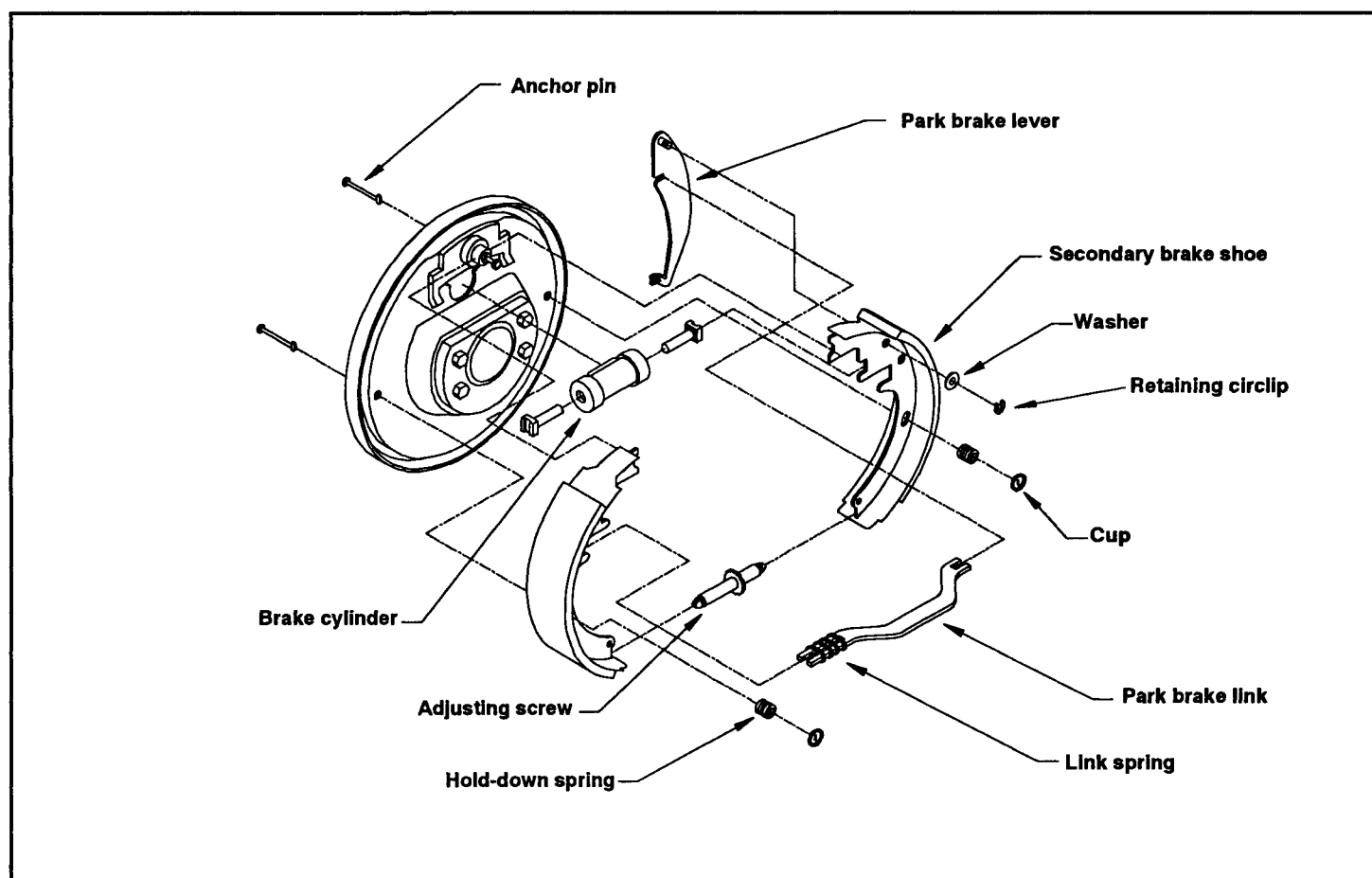
- 9** Use a C-clamp to compress the piston cup to its fully-recessed position. This will provide clearance for the new pads.
- 10** Install the inner and outer brake pads.
- 11** Slide the caliper back into position in the brake assembly.
- 12** Install and tighten two caliper screws removed earlier.
- 13** Repeat the entire procedure for the other front wheel.
- 14** Check brake fluid level in the master cylinder.



Replacing the Rear Brake Shoes

Jack up and support the vehicle on the rear axle housing (see "General Safety" at the beginning of this section).

- 1** Remove one rear wheel.
- 2** Remove the brake drum.
- 3** Remove the three brake springs.
- 4** Remove the adjusting lever, self-adjusting cable, cable guide and anchor pin plate.



- 5** Remove brake shoe hold-down springs by pushing down and rotating the cups $\frac{1}{4}$ turn. Remove hold-down pins from the back of the plate.
- 6** Remove the brake shoes, adjusting screw, park brake link and link spring.
- 7** Disengage park brake cable from the park brake lever.
- 8** Remove the circlip to disengage park brake lever from the secondary shoe.

Installation

- 9** See "Replacing Brake Pads," previous section, for cleaning all brake parts.
- 10** Clean your hands thoroughly.
- 11** Check the new linings for any defects. For bonded linings, check for and remove any bonding cement along the edges.
- 12** Use brake lubricant to lubricate the following items:
 - a. Park brake cable
 - b. Fulcrum end of park brake lever
 - c. Adjusting screw
 - d. Shoe contact points on the backing plate
- 13** Attach the park brake lever to the secondary shoe with the spring washer and retaining clip.
- 14** Install the shoes on the backing plate with the hold-down springs, cups and pins.
- 15** Install the park brake link, spring and washer and connect the brake cable to the rear brake lever.

- 16** Install the anchor pin plate and attach the cable anchor to the pin with the crimped side of the cable collar toward the backing plate.
- 17** Connect the primary shoe retracting spring to the anchor pin.
- 18** Install the cable guide in the secondary shoe.
- 19** Route the cable around the guide, making sure it is in the groove and not between the guide and shoe.
- 20** Connect the secondary shoe retracting spring to the anchor pin.

Note: *Make sure that the anchor pin plate, cable anchor, and the hooks on the primary and secondary shoe retracting springs are all stacked flat on the anchor pin.*

- 21** Assemble the adjuster, making sure it is the correct one for the assembly you are working on.

WARNING!

Installing the adjuster onto the wrong assembly will cause loss of brakes when the automatic adjuster operates.

Note: *The adjusting screw and lever are stamped either "R" or "L" for right or left. The right pivot nut has 2 machined identification lines, the left nut one.*

- 22** Screw the adjusting screw all the way into the pivot nut, then back it off ½ turn.
- 23** Install the socket on the end of the screw.
- 24** Install adjuster between shoes with screw toward secondary shoe.
- 25** Attach the cable to the adjusting lever, and engage the hook on the lever in the hole in the secondary shoe.
- 26** Connect the adjuster spring.

Checking the adjuster action

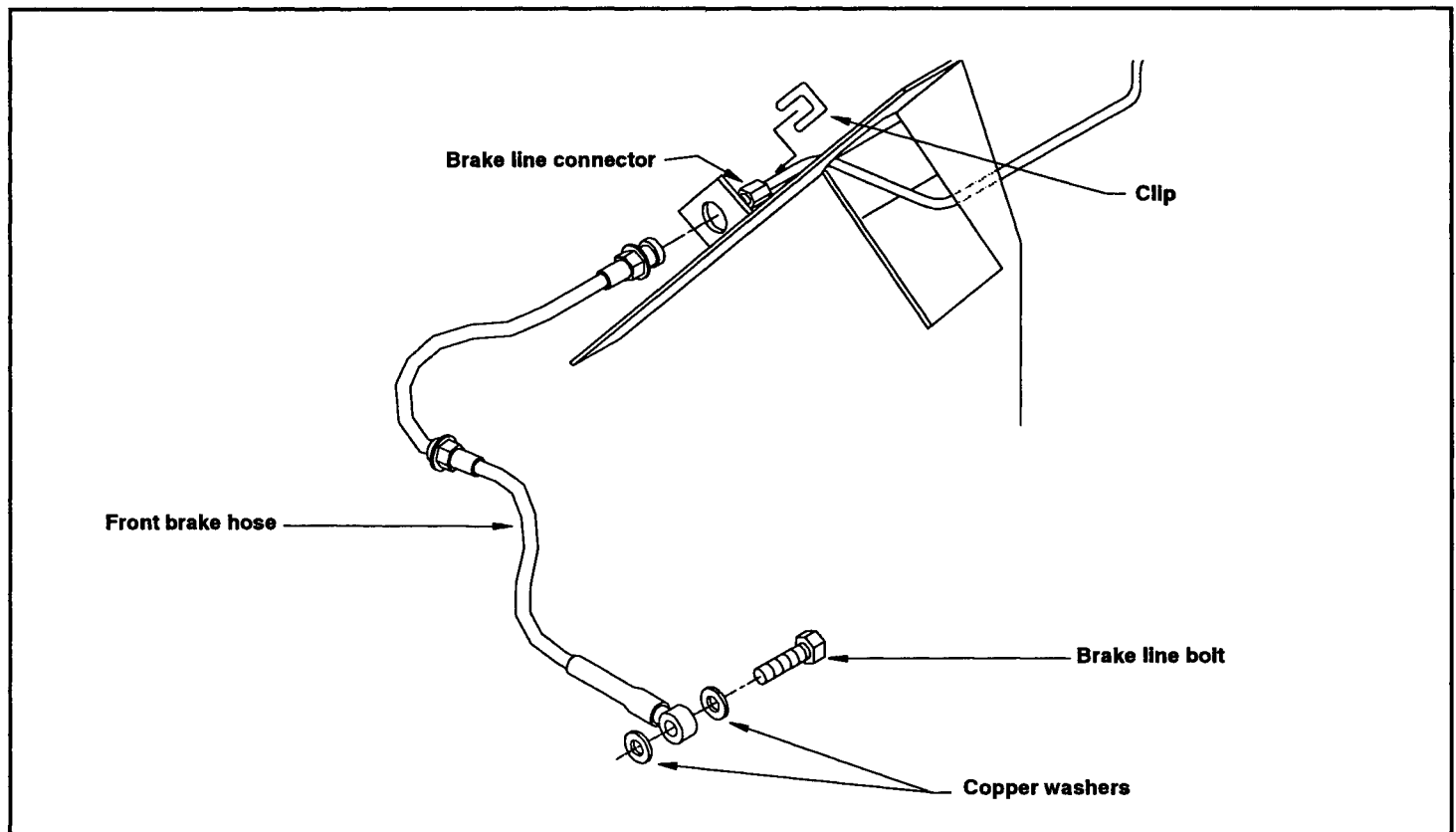
- 27** Pull the cable (between the guide and the adjuster lever) toward the secondary shoe far enough to lift the adjuster out of engagement with the notches in the adjuster screw.
- 28** Release the cable. The adjuster lever should engage the next notch in the screw, and the adjuster spring should pull the lever down to its original position, turning the screw one notch.

Checking the Rear Brake Drum

Check the rear brake drum for pitting, damage, or out-of-round condition. If necessary, have the drum turned.

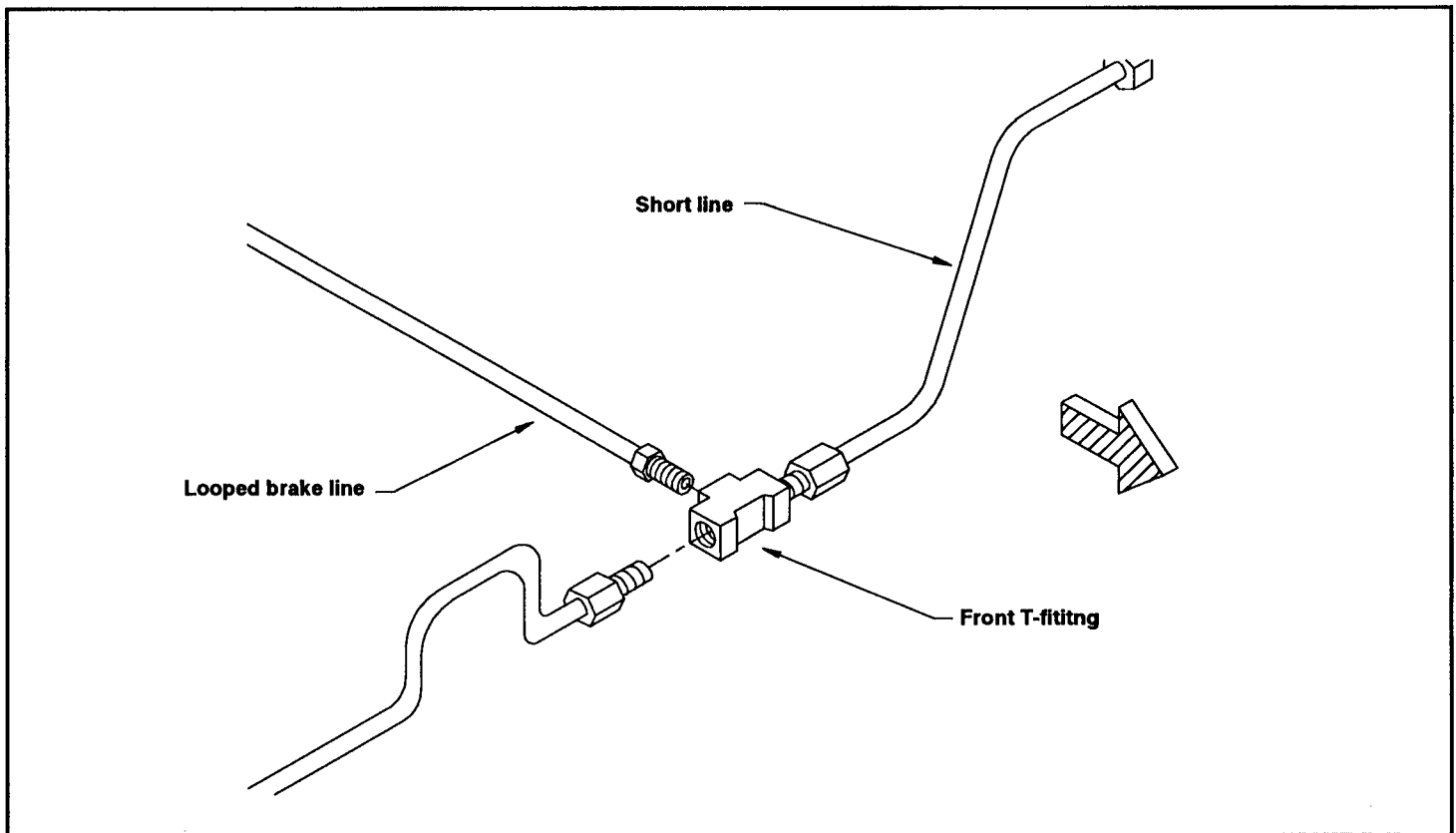
WARNING!

When the brake drum inner diameter reaches the maximum allowable (11.09"), replace the brake drum to avoid loss of braking action!



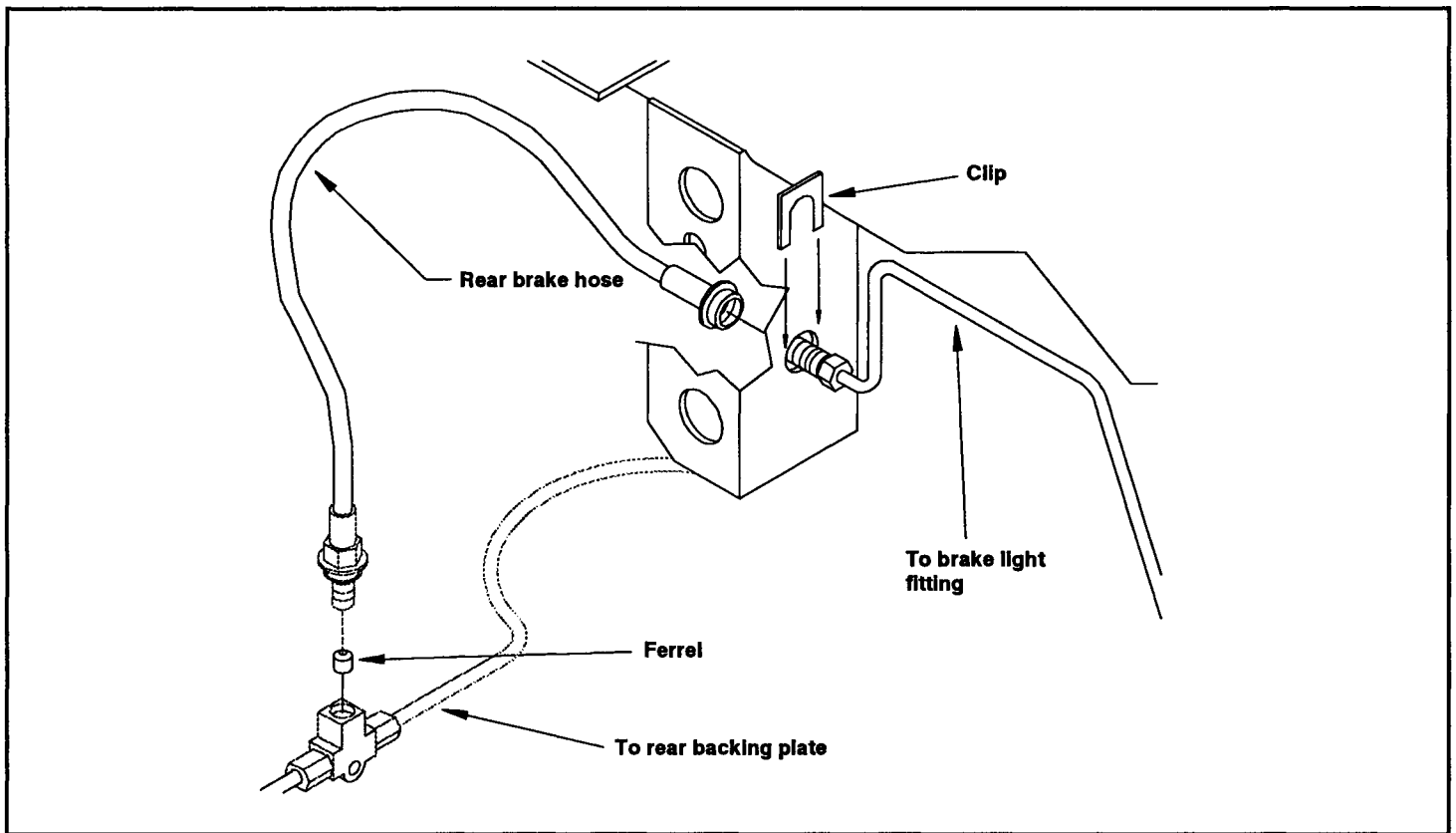
Replacing the Front Brake Hoses

- 1** Make provisions to catch brake fluid that may spill from the hoses.
- 2** Remove brake line bolt from the caliper.
- 3** Unscrew front connector from brake line to hose.
- 4** Remove clip. Dispose of old brake hose properly.
- 5** Place new copper washer, insert new hose end and another copper washer on brake line bolt and screw into brake caliper.
- 6** Mount the other end to the frame with the clip.
- 7** Screw brake line connector into hose thread.
- 8** Bleed front brake on the side of the new hose.
- 9** Check for leaks.
- 10** If necessary, repeat the procedure for the other front hose.
- 11** Fill the master cylinder with fresh DOT 3 brake fluid to $\frac{1}{4}$ " from the top.



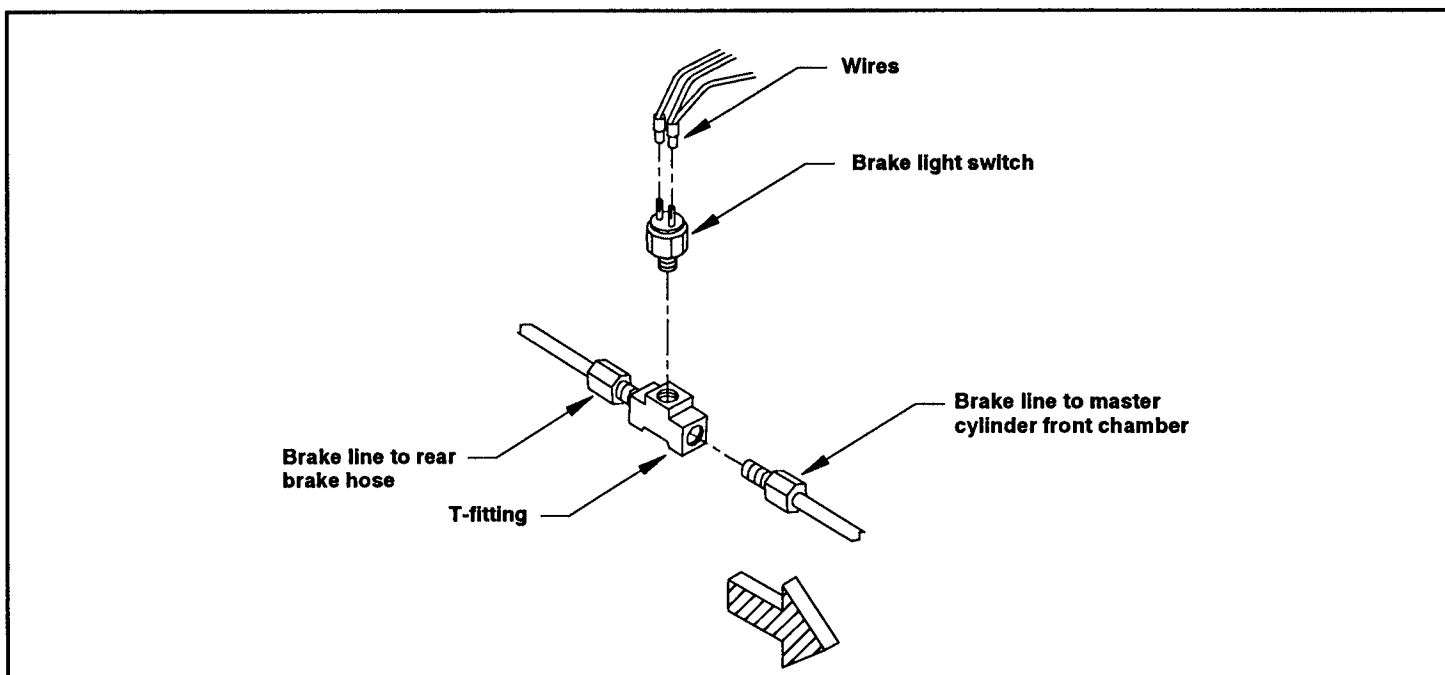
Replacing the Front Brake Lines

- 1** Make provisions to catch brake fluid that may spill from the fittings.
- 2** Unscrew REAR connector from master cylinder.
- 3** Unscrew connectors joining front brake lines and front brake hoses. Discard old front brake lines and T-fitting properly.
- 4** Screw the looped line into the middle thread of the T-fitting. The short line goes on the driver's side hole and the remaining long line for the remaining hole on the T-fitting.
- 5** Screw the connector at the other end of the looped line onto the master cylinder, the short line onto the driver's side brake hose and the remaining one into the right side brake hose.
- 6** Bleed front brakes.
- 7** Check for leaks.
- 8** Fill the master cylinder with fresh DOT 3 brake fluid to $\frac{1}{4}$ " from the top.



Replacing the Rear Brake Hose

- 1** Make provisions to catch brake fluid that may spill from the hose.
- 2** Unscrew the brake line connector from the front end of the rear brake hose.
- 3** Remove the clip.
- 4** Unscrew the rear brake hose from T-fitting, taking care not to drop the ferrel from inside the fitting. Discard the old brake hose properly.
- 5** Center the ferrel in the T-fitting and screw the hose end in.
- 6** Mount the hose on the frame with the clip, and screw the brake line connector into it.
- 7** Bleed the right and then the left rear brakes.
- 8** Check for leaks.
- 9** Fill the master cylinder with fresh DOT 3 brake fluid to $\frac{1}{4}$ " from the top.

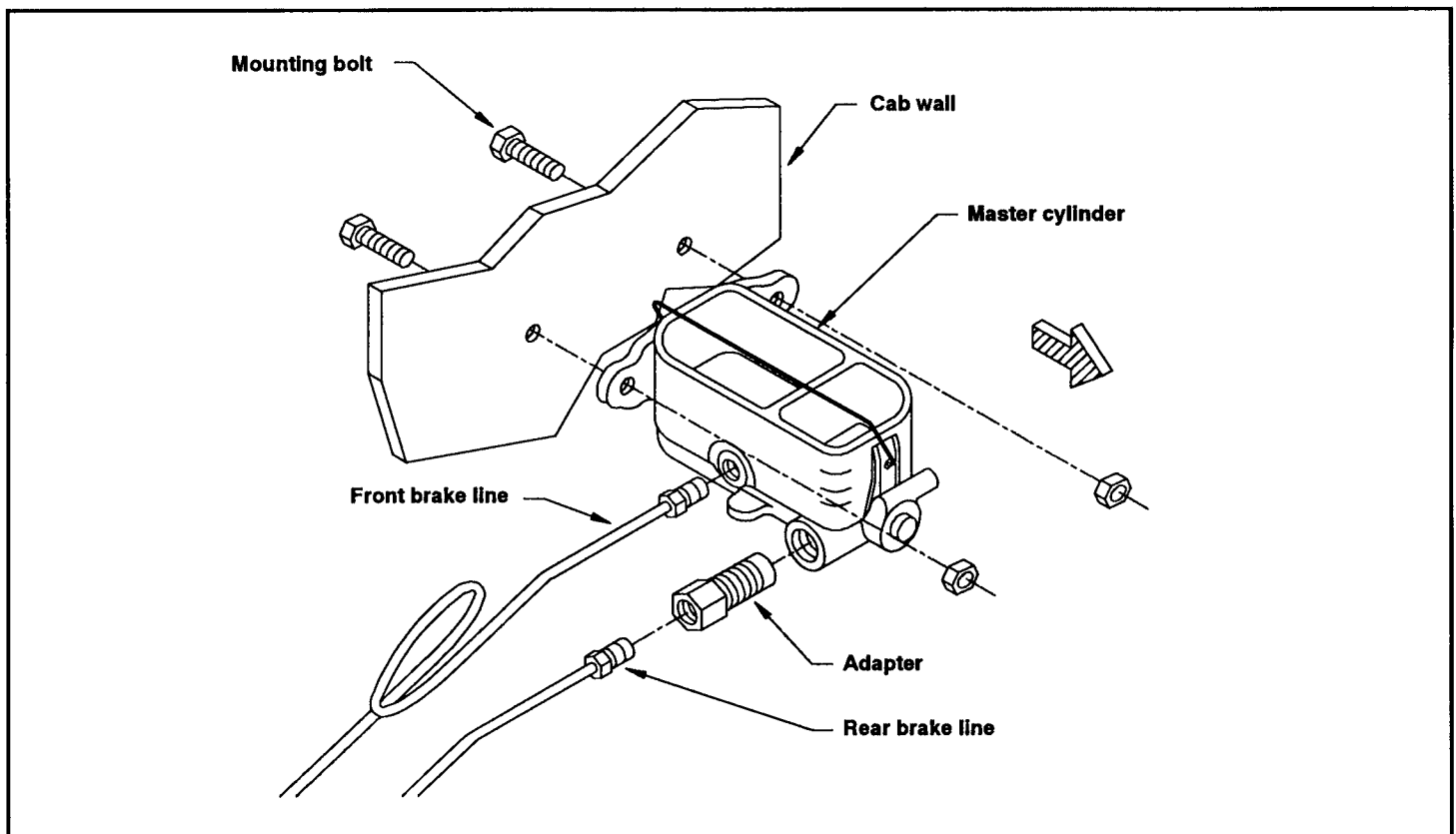


Replacing the Rear Brake Lines

- 1** Make provisions to catch brake fluid that may spill from the fittings.
- 2** Unscrew the FRONT connector from the adapter on master cylinder. If the adapter also needs replacing, unscrew the adapter from the master cylinder.
- 3** Lift up driver's seat and unscrew forward connector from the brake light T- fitting.
- 4** Pull the old brake line out. Insert the new one in.
- 5** Screw the respective connectors into the master cylinder and T-fitting.
- 6** Unscrew rear connector from the T-fitting.
- 7** Unscrew the rear brake line from the rear brake hose.
- 8** Unscrew brake line connectors to rear wheels. Remove the two rear wheel brake lines.
- 9** Install new rear wheel brake lines and T-fitting as shown.
- 10** Bleed the right rear brakes, then the left. Check for leaks.
- 11** Fill the master cylinder with fresh DOT 3 brake fluid to $\frac{1}{4}$ " from the top.
- 12** Dispose of the old brake lines properly.

Replacing the Brake Light Switch

- 1** Remove the driver's seat.
- 2** Disconnect two wires and unscrew brake light switch from the T-fitting. Discard the old switch properly.
- 3** Place thread sealant on the new brake light switch. Screw it onto the T-fitting and connect the two wires disconnected earlier.
- 4** Test by stepping on the brake pedal a few times.
- 5** Bleed the rear brakes.



Replacing the Master Cylinder

- 1** Pump out and dry the master cylinder.
- 2** Remove the front brake line connector, and the adapter for the rear connector. If the adapter also needs replacing, unscrew the connector from the adapter.
- 3** Have somebody hold the master cylinder to prevent it from falling. From inside the cab, remove the two bolts holding the master cylinder to the cab wall.
- 4** Discard the old master cylinder properly.
- 5** Install the new one in reverse order.
- 6** Fill with fresh DOT 3 brake fluid to $\frac{1}{4}$ " from the top.
- 7** Bleed all brakes.
- 8** Refill with fresh DOT 3 brake fluid to $\frac{1}{4}$ " from the top.
- 9** Adjust the brake pedal free play (see "Adjusting the Brake Pedal Free Play," this section).

STEERING

Steering

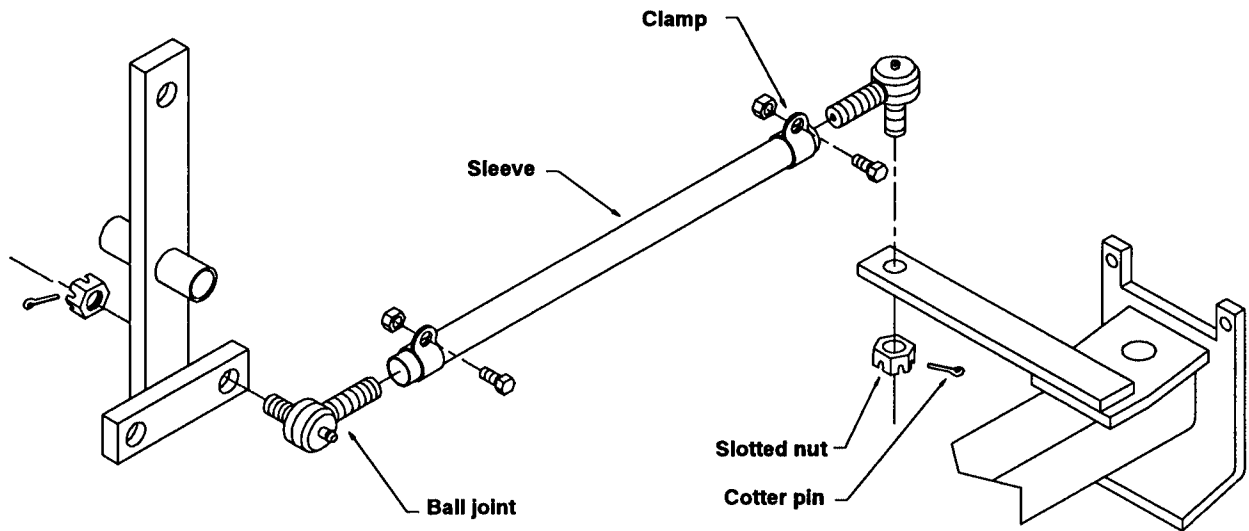


Figure 1 - Ball Joints / Steering Sleeves

WARNING!

Please refer to Section 1, "SAFETY / GENERAL INFORMATION" before performing any repairs / maintenance on this vehicle.

Steering Linkages

Replacing the Ball Joints / Steering Sleeves

- 1** Remove cotter pins. Unscrew and remove the slotted nuts from both ball joints.

Note: Use a pickle fork to remove the ball joint from the steering arm.

- 2** Note position of clamps. Loosen linkage clamps.

Note: Half the ball joints have right-hand and half have left-hand threads. For the next step, visually check whether turning the ball joint clockwise will back it out of the sleeve.

- 3** Unscrew and remove the ball joints from the sleeve.
- 4** Screw the (new) ball joints all the way into the (new) sleeve.
- 5** Insert one ball joint into one of the linkage mounting holes.
- 6** Align the other ball joint with the other linkage mounting hole.
- 7** Rotate the *sleeve*, not the ball joints, if necessary to adjust the linkage length.
- 8** Engage the slotted nuts onto the ball joints and tighten securely.
- 9** Insert a cotter pin into one ball joint hole and bend one end outwards around the ball joint. Repeat for the other end.
- 10** Tighten all clamp screws securely.
- 11** Align the front end for toe-in (see Aligning the Front End," this section).

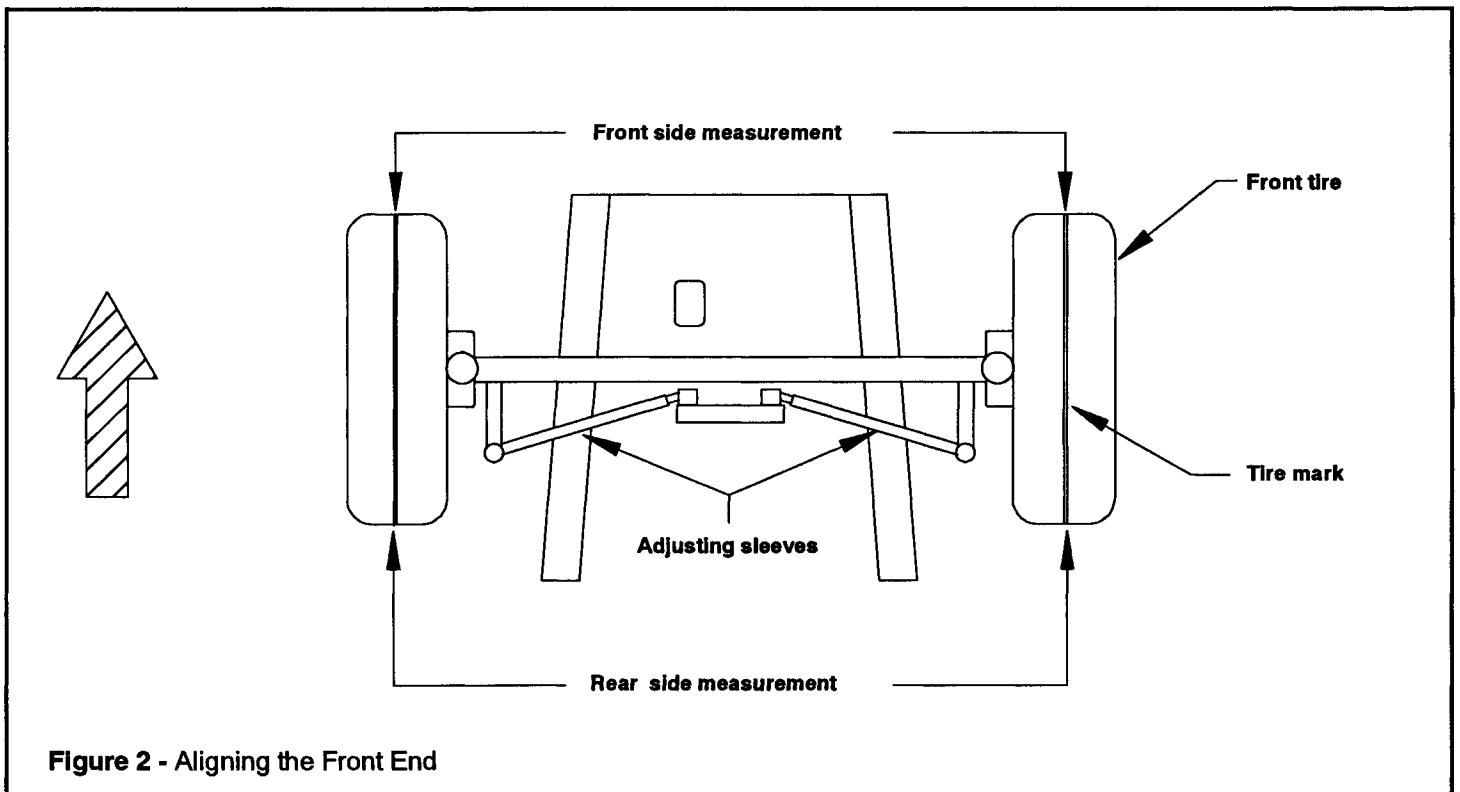


Figure 2 - Aligning the Front End

Aligning the Front End

To align the front end for toe-in, perform the following:

Note: *The caster and camber are set at the factory and are not adjustable.*

- 1** Raise the front end of the vehicle until the front wheels clear the ground, and support it (see "Lift and Support Points," Safety / General Information Section).
- 2** Mark all around the center of each front tire.
Tip: *Hold a white chalk or other marker against the tire tread at its center and rotate the tire.*
- 3** Lower the front end.
- 4** Position front wheels straight ahead.
- 5** Measure the distance between the marks on the rear side of the front tires.
- 6** Measure the distance between marks on the front side of the front tires.
The rear measurement should be between 0 and $\frac{1}{8}$ " greater than the front measurement.
If not, continue with the remaining steps.
- 7** Loosen the clamp nuts on the tie-rods until the tie rod sleeves can be turned (See Figure 2).
- 8** Turn both the tie-rod sleeves **evenly** until the distance between the rear marks on the tires is between $+\frac{1}{8}$ " and 0 greater than the front.
- 9** Tighten each tie-rod clamp nut.

Note: *Be careful not to change the position of the tie rods while tightening clamp nuts.*

Note: *The tie rods should be near equal in length.*

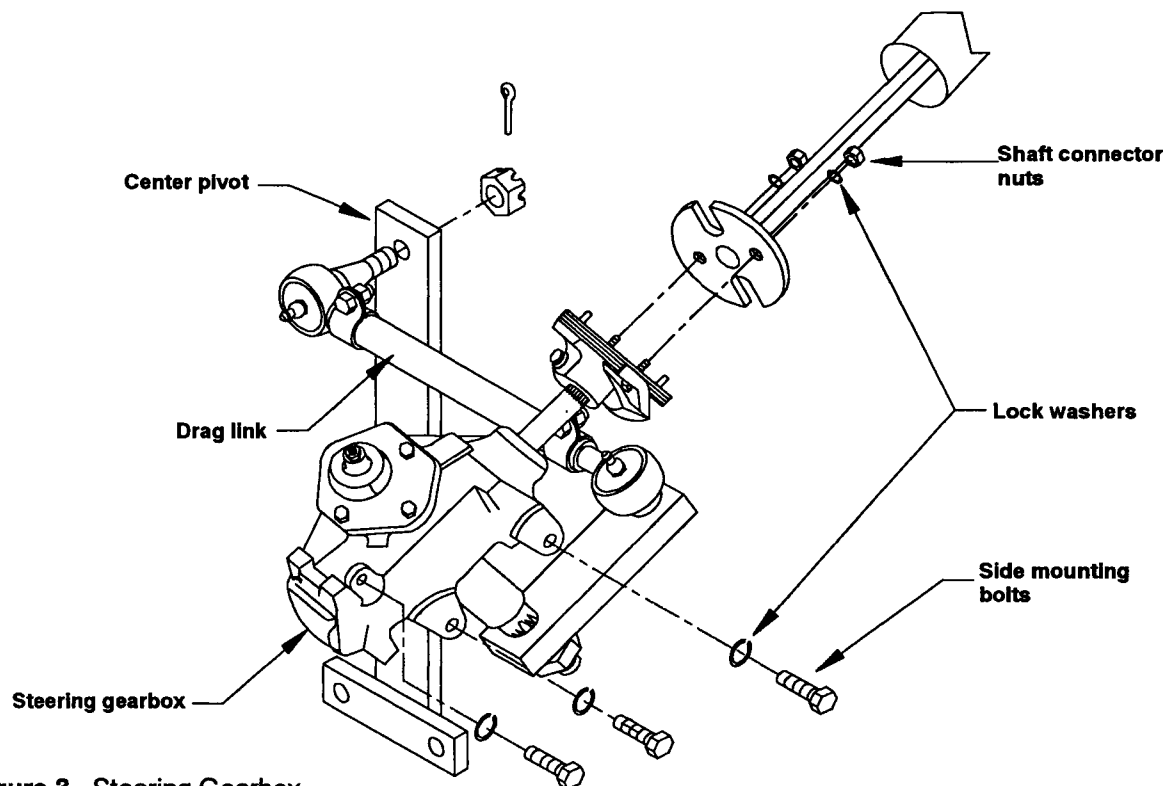


Figure 3 - Steering Gearbox

Replacing the Steering Gearbox

Removing the Steering Gearbox

- 1** Jack up the truck and remove the left front wheel (see "Changing a Flat Tire," Accessories section).
- 2** Disengage the drag link by removing the balljoint (see "Replacing Ball Joints," this section) at the top of the center pivot.
- 3** Remove the steering wheel shaft connector nuts, one $\frac{1}{2}$ " and one $\frac{9}{16}$ ", and lock washers.
- 4** Reach from under the wheel well to remove 3 gearbox mounting bolts and lock washers.
- 5** Slowly and carefully pull out the gearbox, steering arm and linkage through the hood opening.
- 6** Remove the nut and lock washer from the steering arm.
- 7** Use a wedge fork to force the arm from the spline. Set the old gearbox aside.
- 8** Remove the cotter pin and unscrew the slotted nut to disengage the balljoint from the steering arm.

Installing the New Steering Gearbox

- 9** Install the gearbox on the frame with the three mounting bolts.
- 10** Attach the gearbox to the steering shaft with the connector nuts and lock washers removed earlier.
- 11** Turn the steering wheel all the way to the right.
- 12** Turn it back all the way to the left, counting the number of turns.
- 13** Turn it back half the counted number of turns (approximately $3\frac{1}{2}$ turns).

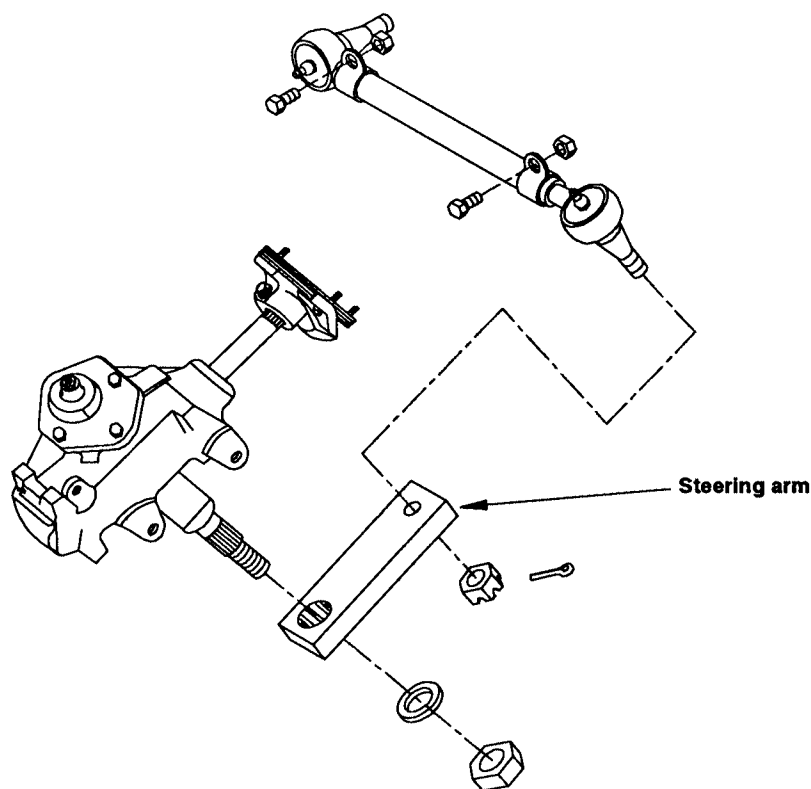


Figure 4

- 14** Engage the spline on the new gearbox into the steering arm hole, keeping the arm parallel to the gearbox body.

Note: *Spline can only go into the arm one way.*

- 15** Engage lock washer and nut on the spline. Tighten the nut securely.
- 16** Install the the drag link to the center pivot (see ("Replacing Ball Joints," this section).
- 17** Place the clamps as close to the edge of the sleeve as possible. Make sure clamp nuts are facing forward and up for easy servicing.
- 18** Tighten clamp nuts.
- 19** Test the steering.

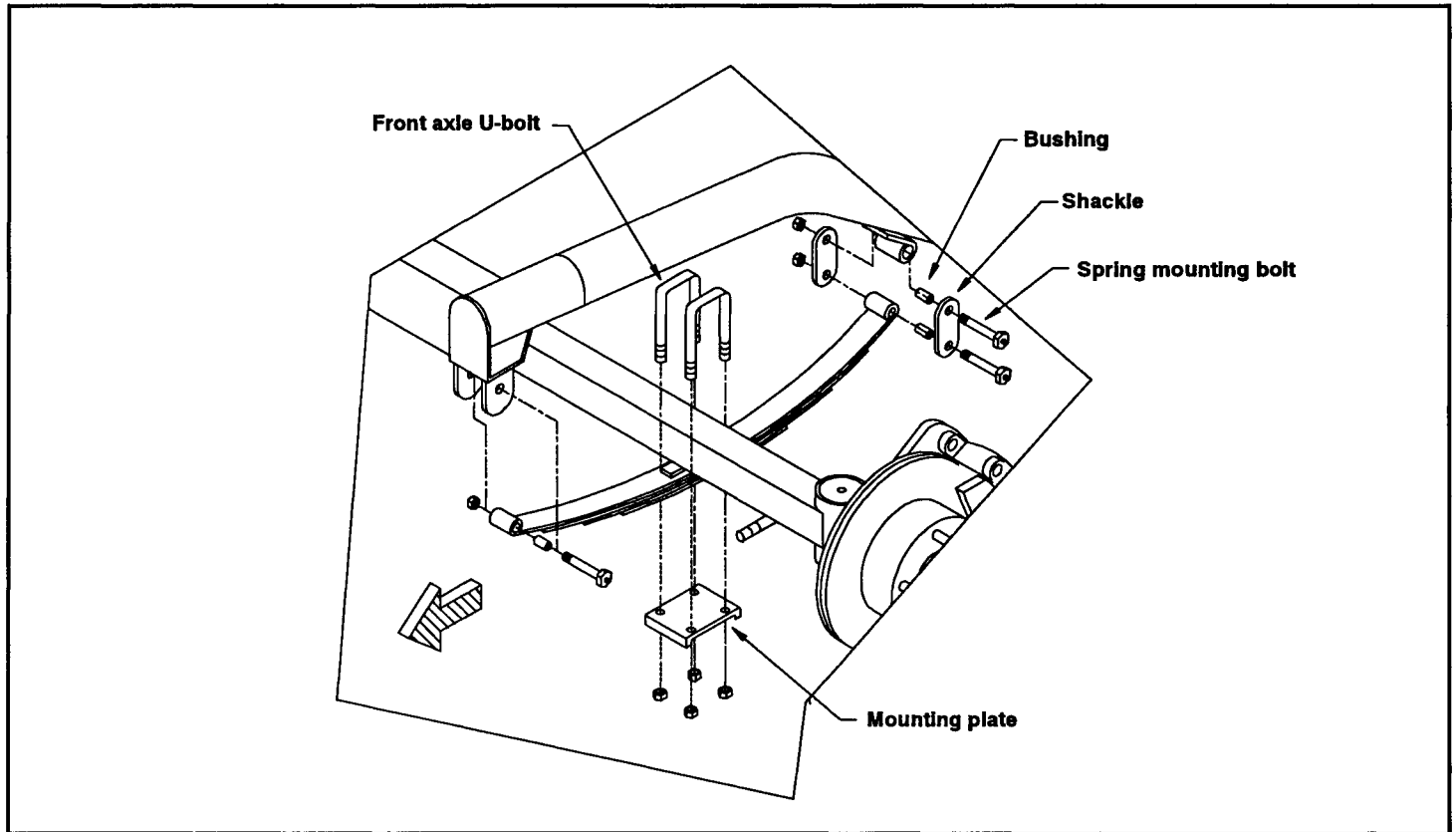
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SUSPENSION

Suspension

WARNING!

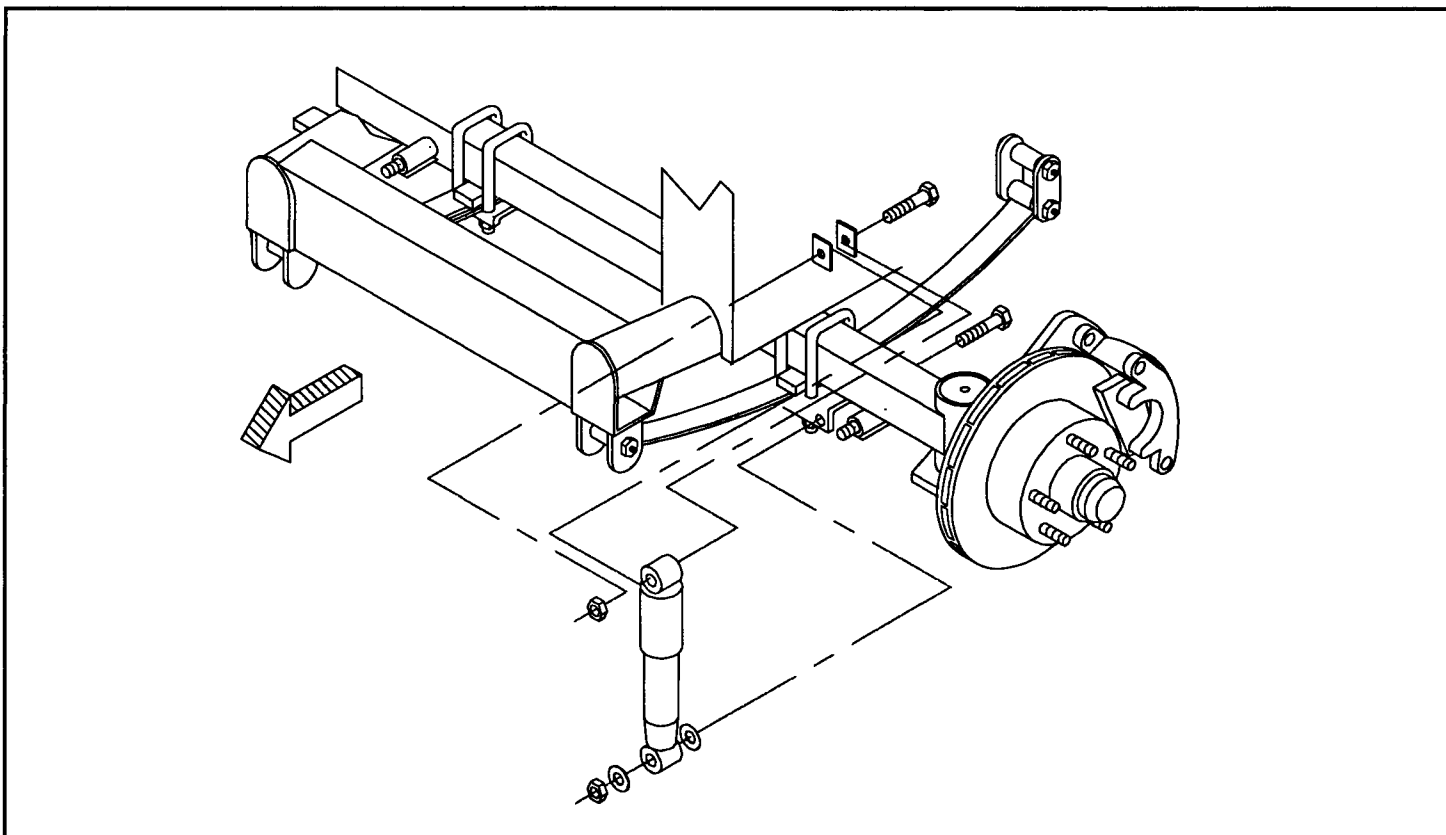
Please refer to Section 1, "SAFETY / GENERAL INFORMATION" before performing any repairs / maintenance on this vehicle.



Replacing the Front Axle Suspension Springs

- 1** Jack up and support the truck on the front frame support points.
- 2** Remove shock absorbers (see "Replacing the Front Shock absorbers," this section).
- 3** Tie up the axle to prevent it from falling.
- 4** Remove front axle u-bolts and spring mounting plates.
- 5** Remove front and rear mounting bolts, nuts, shackles and bushings. Dispose of the old springs properly.
- 6** Place new bushings inside new suspension springs. Install as shown.
- 7** Tighten nuts securely, then back them out 1/2 turn.
- 8** Lubricate all front axle grease fittings with multi-purpose grease using a grease pump.

Note: *It is recommended that both springs be replaced as a set.*

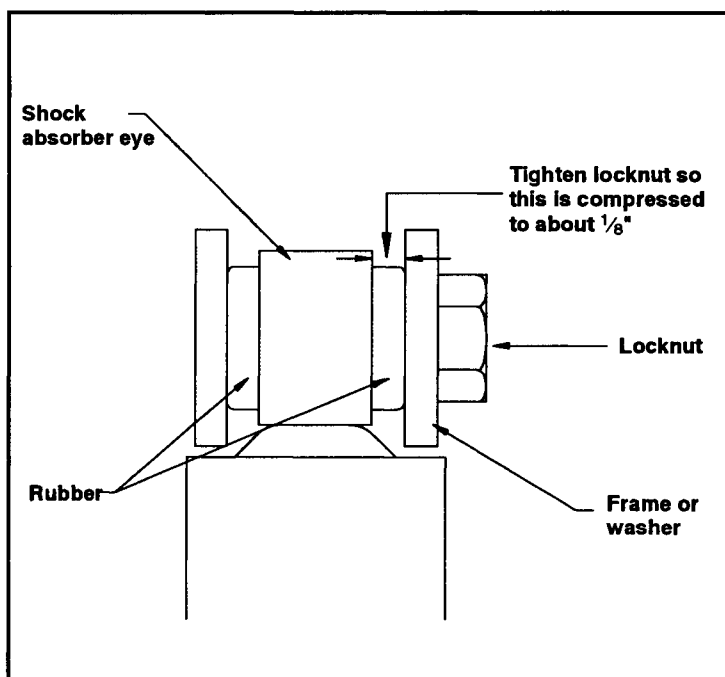


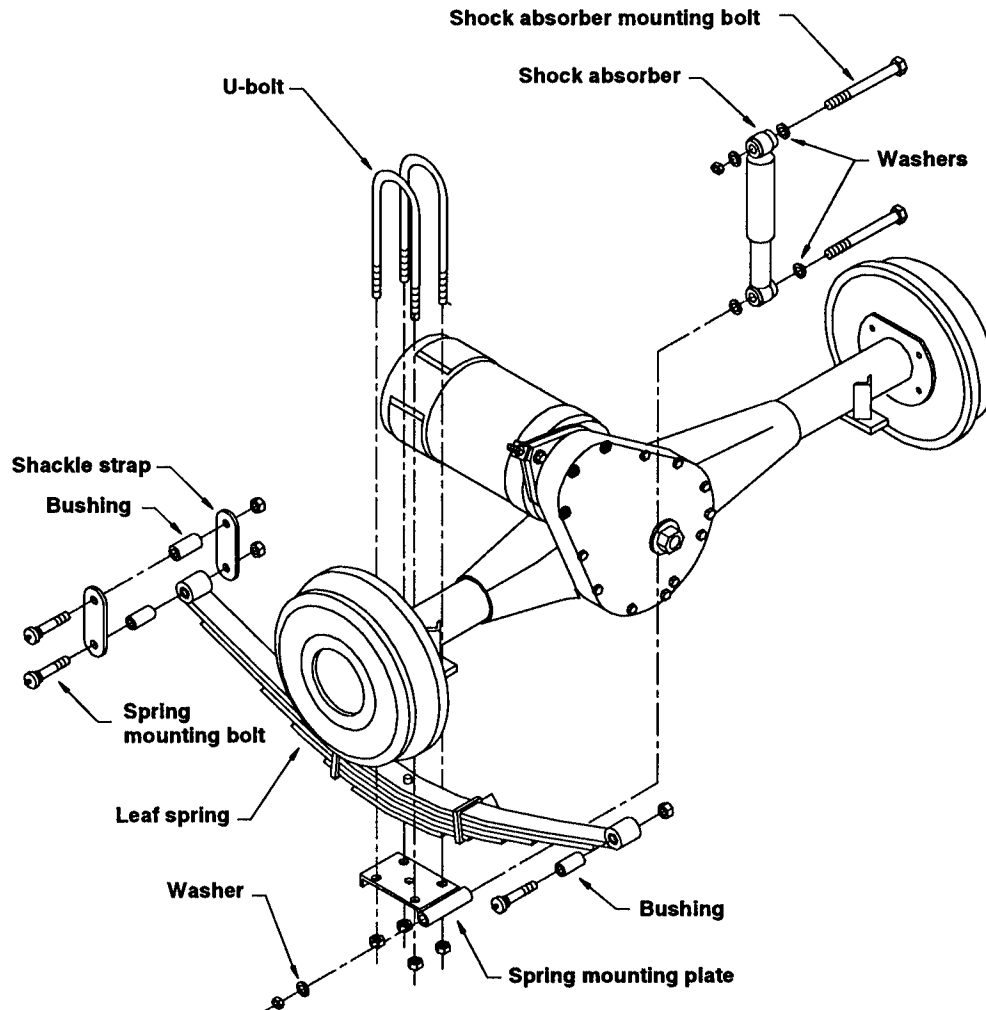
Replacing the Front Shock Absorbers (Optional)

- 1** Remove lower nut and washer.
- 2** Remove upper nut, and remove upper mounting bolt.
- 3** Rotate the upper part to free the shock absorber and pull it out of the lower stud.
- 4** Replace the remaining washers with new ones on the bottom side.
- 5** Install the bottom eye in the following order:

Bolt, spring mounting plate, washer, shocks, washer, locknut.

- 6.** Tighten the nut until washers touch shocks' rubber w/out squeezing them.
- 7** Align the top eye hole with the top mounting holes. Insert the mounting bolt, and insert new locknut.
- 8** Tighten nuts securely, but allow the shock absorbers free play.
- 8** Tighten the locknut until the rubber bushings are compressed to about $\frac{1}{8}$ " on either side, as shown.





Replacing the Rear Axle Springs

- 1** Jack up and support the truck on the rear of the frame (See "Lift and Support Points" at the beginning of this section.
- 2** Tie up the axle to prevent it from falling.
- 3** Remove three spring mounting bolts from the rear axle springs.
- 4** Remove 4 U-bolts. Dispose of the old springs properly.
- 5** Install in reverse order, using new spring bushings.
- 6** Tighten each nut securely, then back out $\frac{1}{2}$ turn.

Note: *It is recommended that both springs be replaced as a set.*

When installing, shackle straps are supposed to be on the rear, and grease fittings facing inside.

- 7** Repeat the entire procedure for the other side.
- 8** Lubricate all fittings with multi-purpose grease.

Replacing the Rear Shock Absorbers

- 1** Remove upper and lower nuts, bolts, washers and spacers. Dispose of old shock absorbers properly.
- 2** Install the new ones in the following order:

Top Mount - Bolt, washer, shocks, washer, short bushing, frame, nut.

Bottom Mount - Bolt, washer, shocks, washer, long bushing, differential, nut.
- 3** Tighten the locknut until the rubber bushings are compressed to about $\frac{1}{8}$ " on either side (see "Replacing the Front Shock Absorbers," this section).

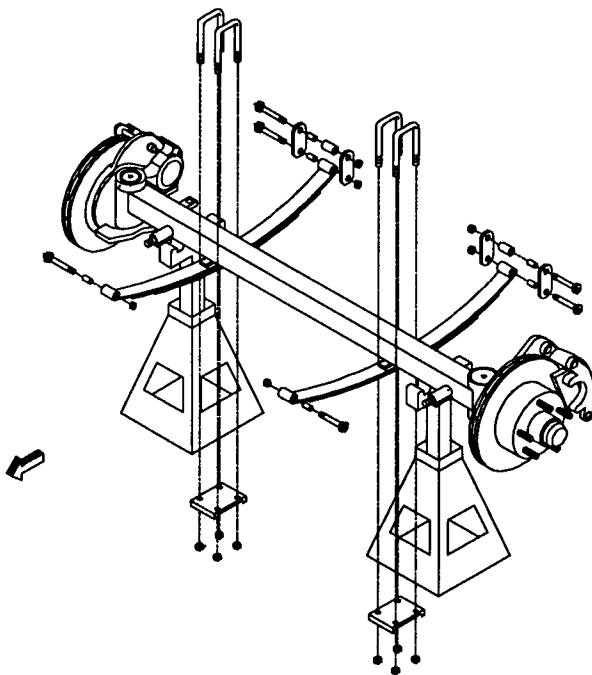
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FRONT AXLE

Front Axle

WARNING!

Please refer to Section 1, "SAFETY / GENERAL INFORMATION" before performing any repairs / maintenance on this vehicle.



Replacing the Front Axle Assembly

- 1** Lift the truck up and support the vehicle on the forward frame support points (See "Lift and Support Points," Safety / General Information Section).
- 2** Support the front axle.
- 3** Remove both front wheels.
- 4** Remove front brake line bolts (optional, see "Replacing the Front Brake Hoses," Brake section).
- 5** Remove steering linkages from the axle (see "Replacing the Ball Joints," Steering section).
- 6** If present, remove front shock absorbers (see "Replacing the Front Shock Absorbers," Suspension section).
- 7** Remove suspension springs (see "Replacing the Front Axle Suspension Springs," Suspension section).
- 8** Remove the axle.
- 9** Install the new one in reverse order.
- 10** Bleed both front brakes.

POWER TRACTION

POWER TRACTION ASSEMBLY

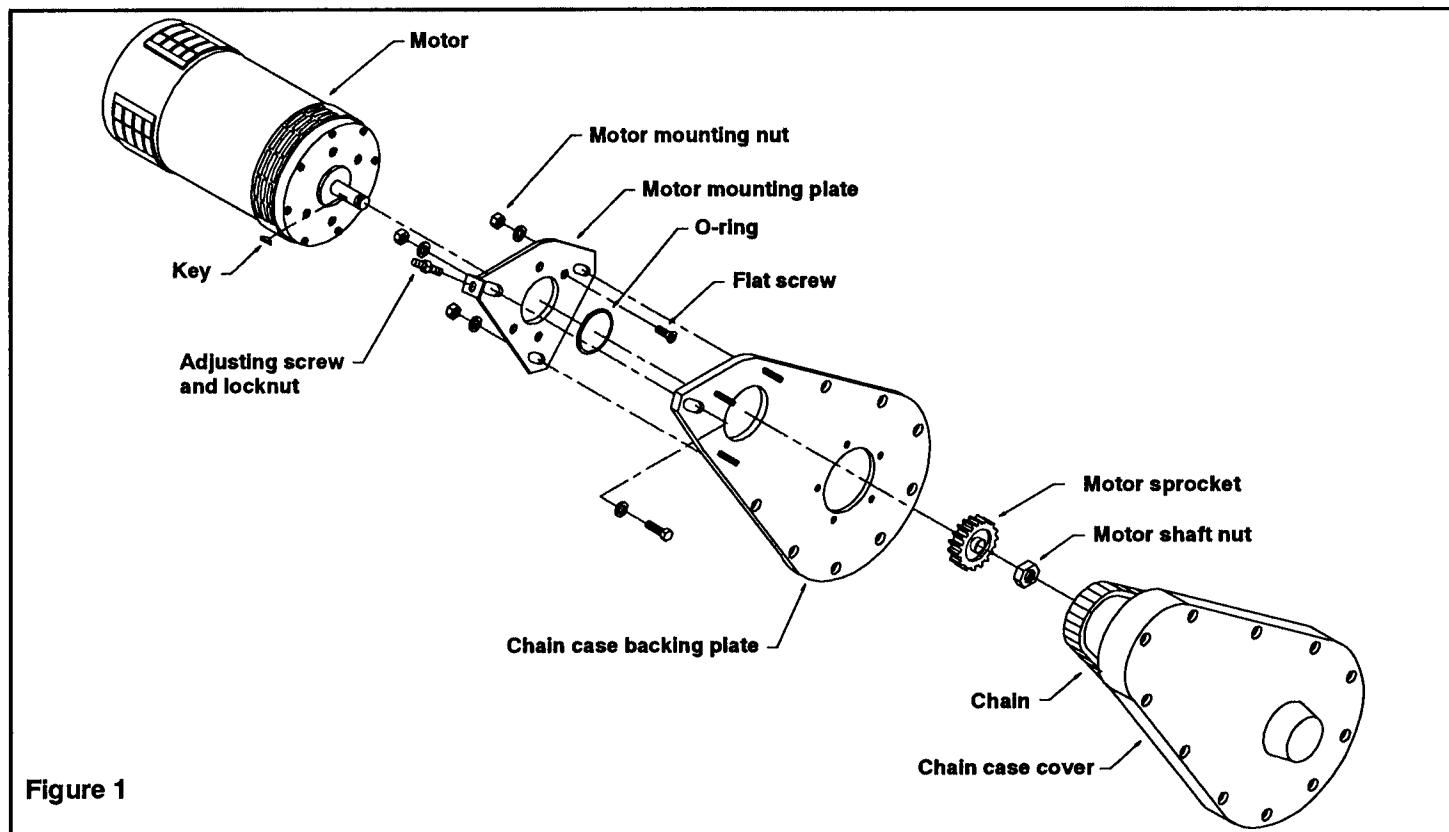


Figure 1

Adjusting the Drive Chain

DRIVE CHAIN MAINTENANCE SCHEDULE		
Adjustment	When	Comments
1st	at 100 hours	new unit or after installing new chain
2nd	next 150 hours	normal running conditions
3rd	next 250 hours	normal running conditions
4th and thereafter	every 400 hours	normal running conditions

To adjust the drive chain tension, perform the following (see Figure 1):

- 1** Tighten the three motor mounting nuts and then back off exactly one full turn.
- 2** Loosen the adjusting screw lock nut.
- 3** Turn the adjusting screw clockwise to a torque of 20 in-lbs.
Back adjusting screw off exactly 2½ turns.
- 4** Ensure that the motor is all the way back against the adjusting screw.
- 5** Tighten adjusting screw lock nut while preventing adjusting screw from turning.
- 6** Tighten the three motor mounting nuts.

Removing the Motor

To remove the motor without removing chain case cover, perform the following:

WARNING!

Disconnect the main battery leads and remove the key before working on any part of the vehicle's electrical system.

- 1** If not already done, disconnect all motor power leads.
 - 2** Loosen the three motor mounting nuts and the adjusting screw lock nut.
 - 3** Back off the adjusting screw sufficiently to allow the motor mounting plate to fully bottom.
 - 4** Remove the three motor mounting nuts and washers.
 - 5** Remove the chain from the motor sprocket.
 - 6** Tilt the motor to remove it.
-

Installing the Motor

To install the motor when the chain case has not been removed, do the following:

- 1** If applicable, clean the motor and mounting plate mating surfaces. Install motor on mounting plate using appropriate flat head screws. Tighten to 30 ft lbs.
- 2** Install spacers, key, sprocket, washer, and shaft nut to motor shaft. Tighten shaft nut to 75 ft lbs.
- 3** Place O-ring in the motor mounting plate opening.
- 4** Using a piece of wire, reach through the opening in the chain case backing plate and lift chain above the opening. Secure chain in this position by attaching a mechanic's safety wire to the chain and a suitable object.

Note: *Make sure the chain is properly seated on the large sprocket.*

- 5** Slip the motor sprocket into the chain case and under the chain.
- 6** Remove the mechanic's safety wire supporting the chain.
- 7** Move the vehicle slightly and observe the movement of the motor armature. If the armature does not move, the chain is not seated.
- 8** Position the motor onto the studs and install washers and nuts. *Finger tighten* the nuts.
- 9** Move the vehicle slightly and observe the movement of the armature which indicates the chain is still engaging the sprocket.

Caution!

If the chain is not properly positioned on the sprocket, severe damage can occur to Power Traction components.

- 10** Adjust drive chain as described earlier in this Section.

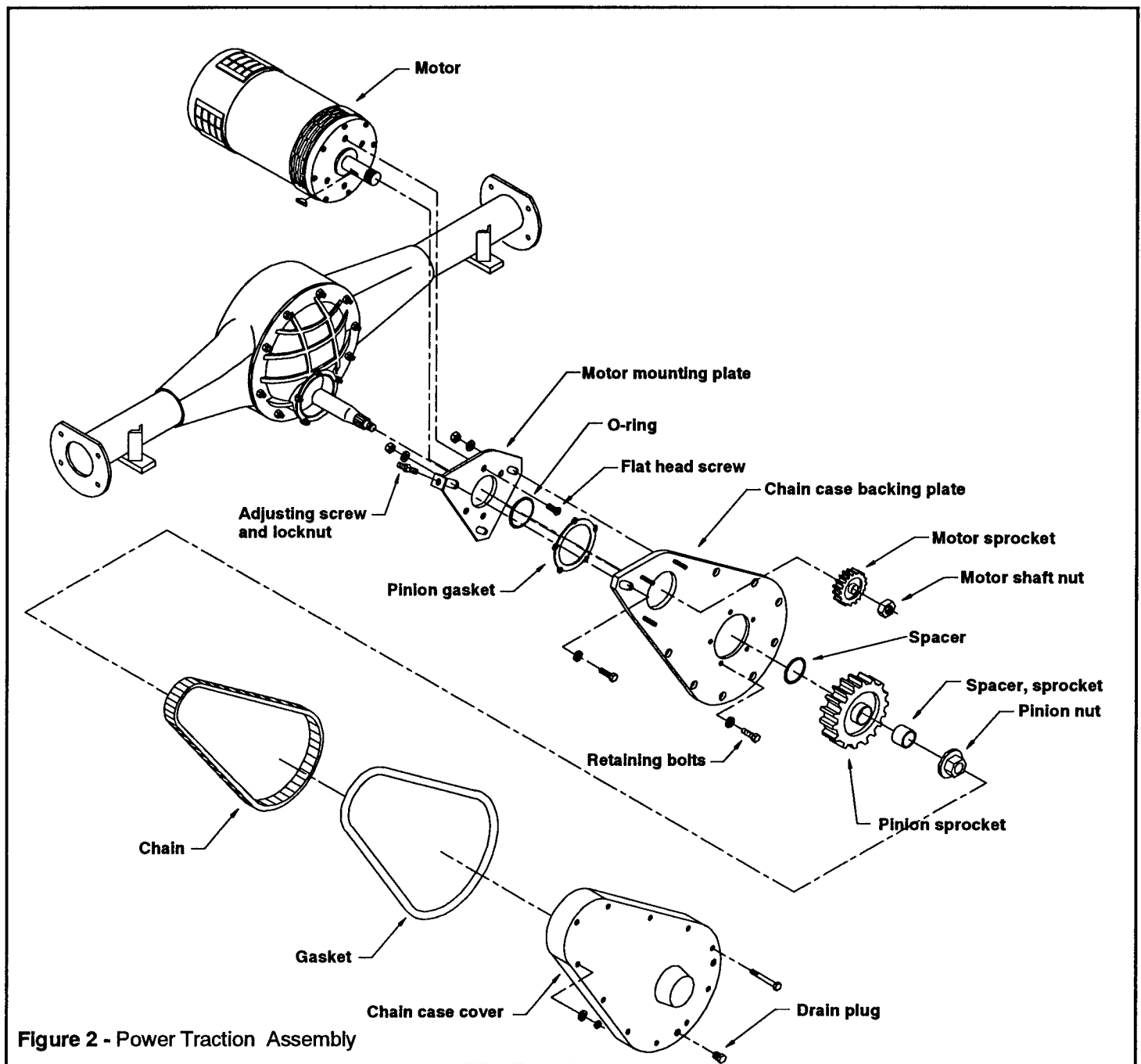


Figure 2 - Power Traction Assembly

Disassembling and Reassembling the Power Traction Assembly

To completely disassemble and reassemble the Power Traction Assembly, do the following:

- 1** Remove drain plugs and drain oil from chain case.
- 2** Remove bolts and nuts from the front of the chain case cover. Remove chain case cover.
- 3** Remove the three nuts and washers which fasten the motor to the backing plate.

- 4** Disengage the chain from the motor sprocket. Remove the motor.

Note: *It is not necessary to remove the motor to service the chain or sprockets.*

- 5** Remove the pinion nut.
- 6** Remove chain, pinion sprocket and spacers from pinion shaft. Note spacer location for reassembly.
- 7** Remove chain case backing plate and gasket by removing five retaining bolts.
- 8** Reassemble in reverse order with new gaskets and pinion nut. Tighten five chain case backing plate retaining bolts to 50 ft-lbs. Tighten pinion nut to 120 ft-lbs.
- 9** Adjust drive chain as described in "Adjusting the Drive Chain," this section.
- 10** Fill chain case with appropriate oil.
- 11** Connect the motor power leads.

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**REAR AXLE/
DIFFERENTIAL**

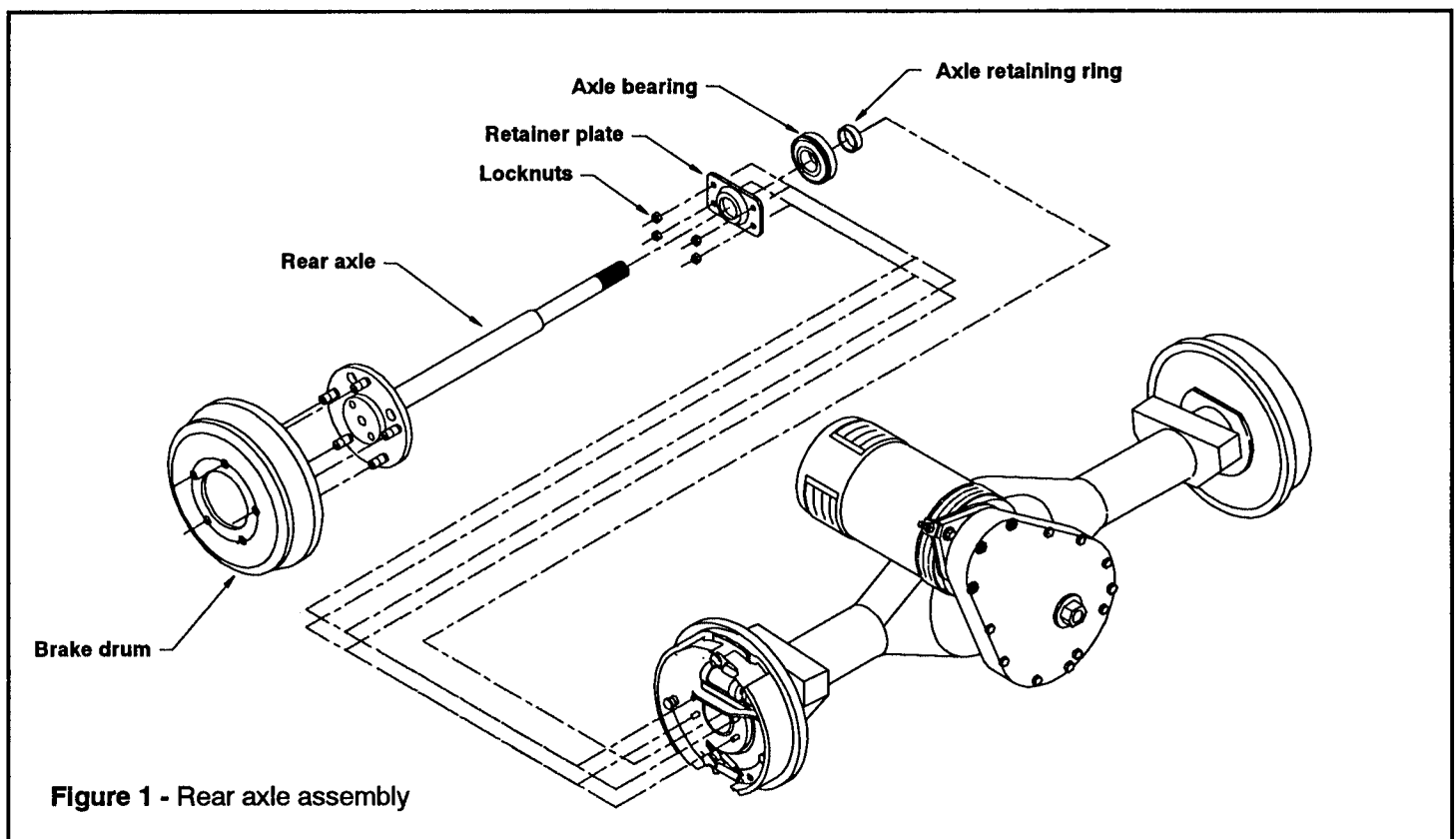
Rear Axle / Differential

WARNING!

Please refer to Section 1, "SAFETY / GENERAL INFORMATION" before performing any repairs / maintenance on this vehicle.

Adding Oil to the Differential

- 1** Remove differential filler plug with a socket wrench.
- 2** Pump oil into differential until it starts to overflow.
- 3** Disengage oil pump and wipe off any overspill.
- 4** Replace the filler plug.



Replacing the Rear Axle

Note: The rear end need not be removed to replace the rear axles. The rear end is shown by itself in these illustrations solely for purposes of clarity.

- 1** Remove the rear wheel (see "Changing a Flat Tire," Safety and General Information Section),
- 2** Remove the rear brake drum from the differential assembly.

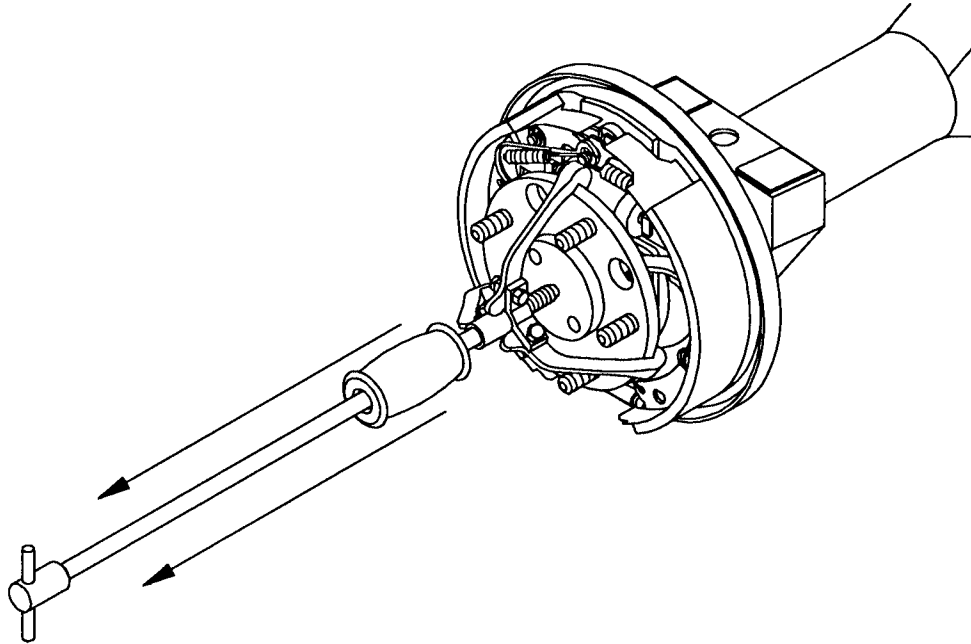


Figure 2 - Slide hammer puller

- 3** Disengage the four axle mounting nuts through the access holes.

Note: *Rotate the axle hub to align the access holes with each nut in turn.*

- 4** Engage a slide-hammer puller to the axle hub.
- 5** Pull the axle out of the housing by impact-loading with the hammer puller, as shown.

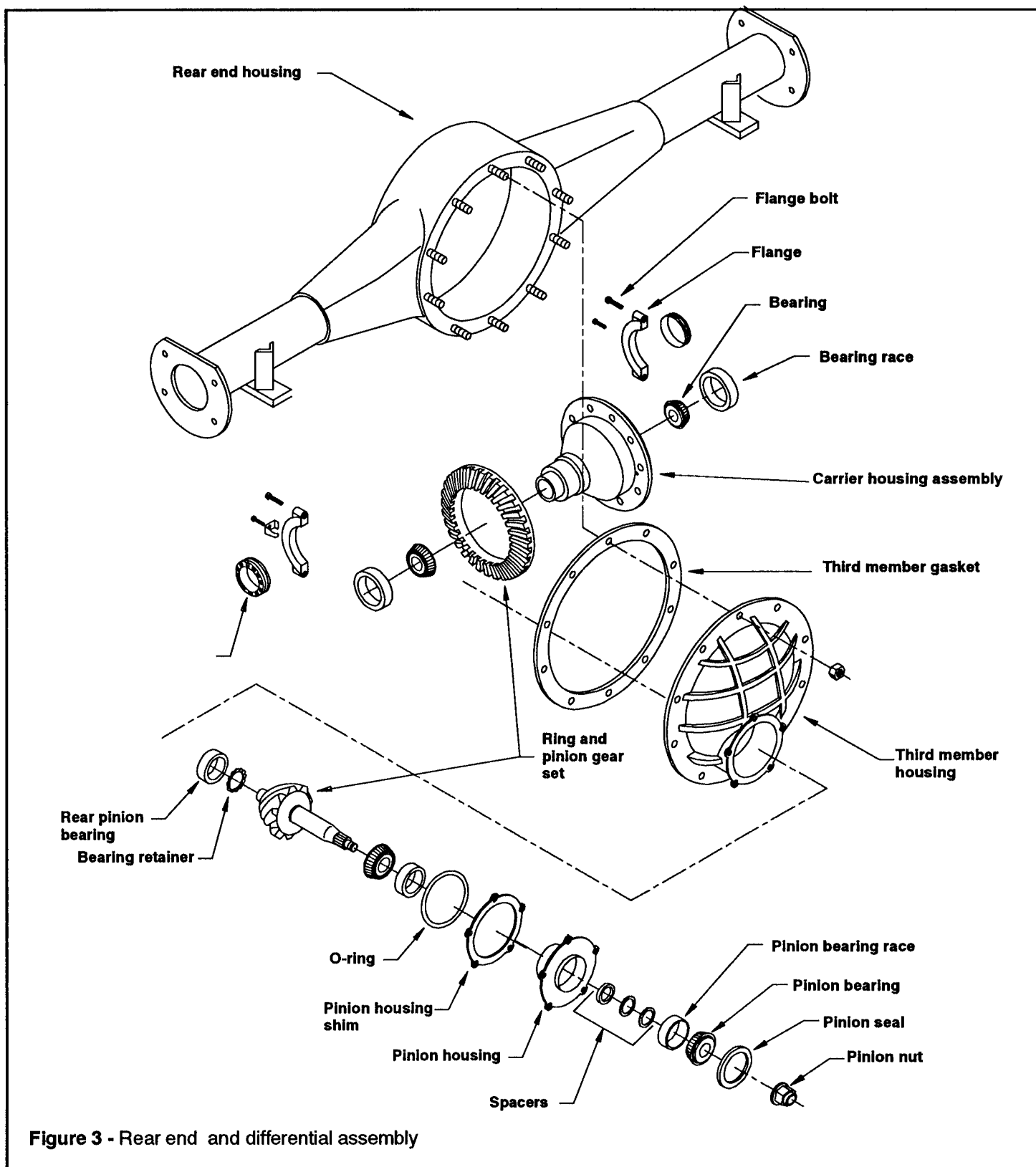
Note: *Have someone hold the axle backing plate during this procedure, to prevent it from falling and damaging the brake lines. After the axle assembly comes off, replace two axle nuts on the studs to hold the backing plate in place.*

- 6** Replace the axle, bearing and retaining ring with new ones. Replace the axle plate if necessary.

WARNING!

Always use a new retaining ring.

- 7** Assemble the axle plate into the axle.
- 8** Press fit the bearing and new retaining ring onto the axle.
- 9** Have somebody hold the rear brake backing plate to prevent them from falling, then remove the axle nuts that hold them in place.
- 10** Insert the axle into the differential housing. Seat it properly by rotating it by hand, then push it all the way in.
- 11** Tap the axle with a heavy hammer until the bearing is seated.
- 12** Install and tighten the four axle nuts.



Replacing the Rear End Assembly

- 1** Lift the truck at the rear frame support points until the rear wheels clear the ground (see "Support Points," Safety / General Information section).
- 2** Support the rear axle. Remove the rear wheels. Remove brake drums.

4 - DIFFERENTIAL

- 3** Disengage and remove the park brake cable from the park brake lever (see "Replacing the Rear Brake Shoes," Brake System section) .
- 4** Remove brake lines from rear wheel backing plates (see "Replacing the Rear Brake Lines," Brake System section).
- 5** Unclamp right rear brake line from differential housing. Tie the brake lines out of the way.

Note: *Do not kink the brake lines.*

- 6** Remove rear leaf springs (see "Removing Rear Leaf Springs," Suspension section).
- 7** For models so equipped, remove the rear shock absorbers (See "Removing Rear Shock Absorbers," Suspension section).
- 8** Disengage the power transfer case assembly and motor from the differential (See "Removing the Power Transfer Case Assembly," Power Train Section). Set the old rear end assembly aside.
- 9** Install the new rear end assembly in reverse order.

Repairing the Differential

Note: *It is not necessary to remove the entire rear end housing from the vehicle to perform this procedure. Neither is it necessary to pull the axles and backing plates out of the rear end housing. The rear end housing is shown bare only for purposes of clarity.*

- 1** Jack up and support the vehicle from the rear of the frame (see "Lift and Support Points," Safety/General Information Section).
- 2** Remove the motor and power traction assembly (see "Removing the Power Traction Assembly ," Power Traction Section).
- 3** Remove the rear wheels and brake drums (see "Replacing the Rear Brake Shoes," Brake System section).
- 5** Remove eight rear axle mounting nuts, four on each side (see "Replacing the Rear Axle," this section).

Tip: *Place oil pans under both ends of the differential, to catch the oil that might leak out at the next step.*

- 5** Pull out each axle about 4", to disengage them from the differential drive gears.

Caution

Do not pull the axles out all the way, as the backing plate might fall and damage the park brake lines.

- 6** Place another oil pan under the third member, to catch the oil that will leak out at the next step.
- 7** Remove the third member mounting nuts.
- 9** Pull out the third member from the housing.
- 9** Remove both carrier bearing flanges and remove carrier assembly from housing.

Note: *Do not disassemble the carrier housing assembly. There are no individually replaceable parts inside. If necessary, replace the entire carrier housing assembly.*

- 10** Remove the pinion housing assembly from the third member.
- 11** Remove the O-ring from the pinion housing assembly.

- 12** Remove pinion housing shim.
- 13** Remove pinion gear.
- 14** If the rear pinion bearing must be replaced due to wear or damage, remove the pinion bearing and retainer at the same time.
- 15** Press the pinion gear shaft from the bearings.
- 16** Remove bearings, races and spacers from the pinion housing assembly.
- 17** Inspect and replace as necessary all bearings, races, seals, gears, and O-rings.
- 18** Lubricate all parts liberally using axle lubricant.
- 19** Temporarily thread two $\frac{7}{16} \times 2$ " bolts (not supplied) through the flange until they meet the ring gear, then rotate the the bolts another three or four turns.

Note: *This serves as a guide when aligning the ring gear bolt holes.*

- 20** Press (or tap with a soft hammer) the ring gear into position.
- 21** Remove one $\frac{7}{16} \times 2$ " bolt and replace it with a ring gear bolt. Repeat the procedure with the other $\frac{7}{16} \times 2$ " bolt.
- 22** Alternately tighten each drive gear bolt across the gear by hand, then torque each bolt to 62 ft-lbs.

Note: *If you must replace the drive bearings and races, be sure to install the concave side of the new bearing race face-up.*

Tip: *Use a suitable press to install the bearings and races.*

- 23** Install front pinion bearings and race onto the pinion gear.
- 24** Install spacers and shim onto the pinion gear shaft.

Note: *If the shim must be replaced, refer to Selecting Shims (immediately following these procedures) before proceeding. If pinion bearings and races were replaced, the shim must also be replaced.*

- 25** Place the pinion shaft retainer onto the pinion gear and install the pinion bearing.
- 26** Lubricate both bearings using differential oil.
- 27** Install new pinion seal.
- 28** Place yoke onto the spline of the pinion gear.
- 29** Install the old pinion nut and tighten to 100 ft-lbs. of torque.

Note: *The pinion gear must spin freely without any play. If it is too tight or too loose, adjust the fit with a new shim.*

Selecting Drive Pinion Shims

Shims are available in 0.005" to 0.021" thickness in steps of 0.001" to correctly position the drive gear.

A standard shim is 0.015" thick. Inserting a thicker shim between the pinion retainer and the carrier moves the pinion away from the drive gear.

Note: *Matched pinions and drive gears use the same number.*

A "+" or a "-" indicates whether to add or subtract the indicated amount from a standard shim.

The following numbering system is used on pinions to indicate the amount you must add to or subtract from the standard shim:

PINION NUMBERING SYSTEM	
If number is	Adjust standard shim as follows:
0	standard shim (no adjustment)
+1	add 0.001"
+2	add 0.002"
+3	add 0.003"
+4	add 0.004"
+5	add 0.005"
-1	subtract 0.001"
-2	subtract 0.002"
-3	subtract 0.003"
-4	subtract 0.004"
-5	subtract 0.005"

ELECTRICAL SYSTEM

WIRING DIAGRAM (Page 1 of 2)

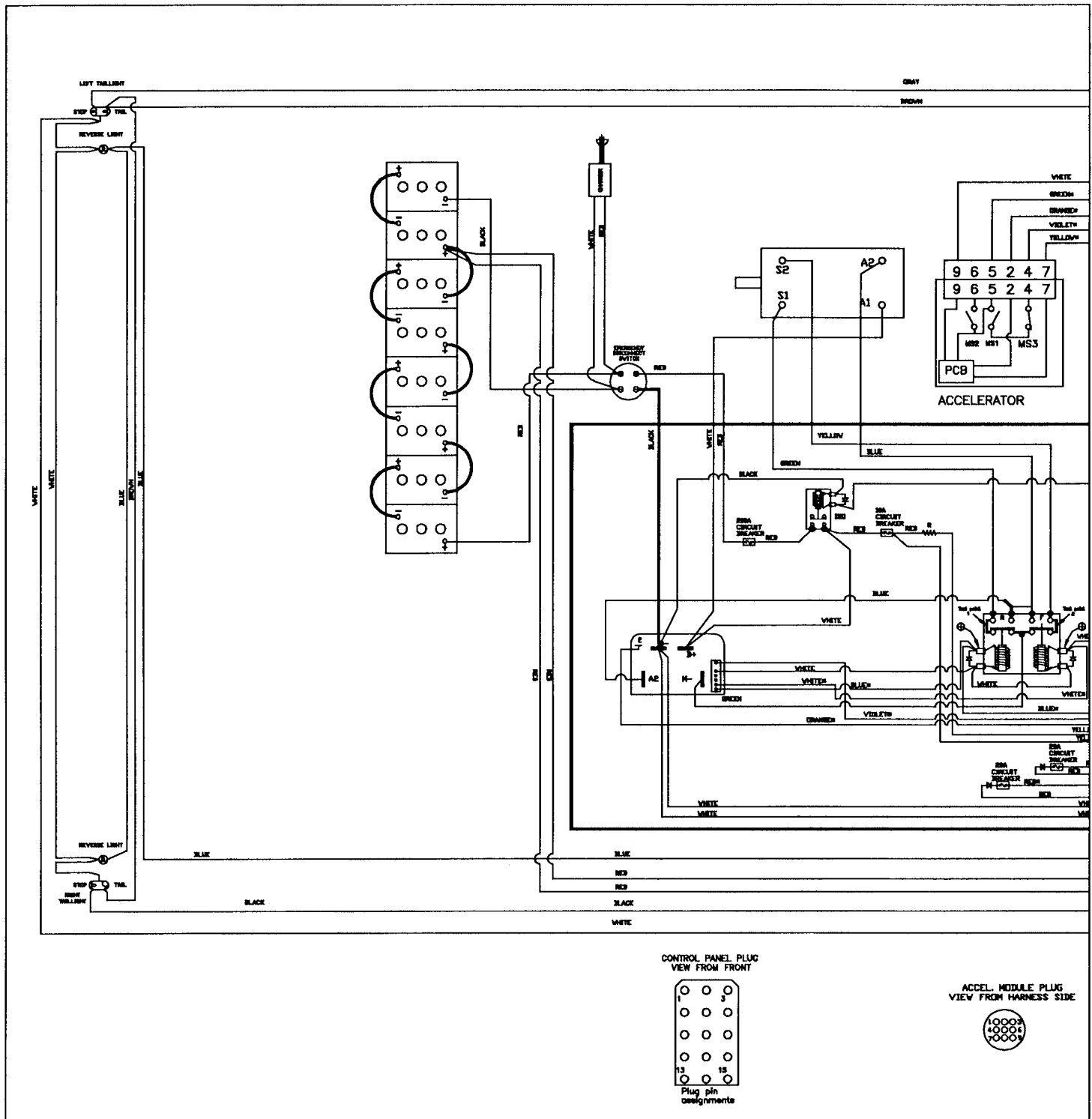


Figure 1 - Wiring Schematic (Page 1 of 2)

WIRING DIAGRAM (Page 2 of 2)

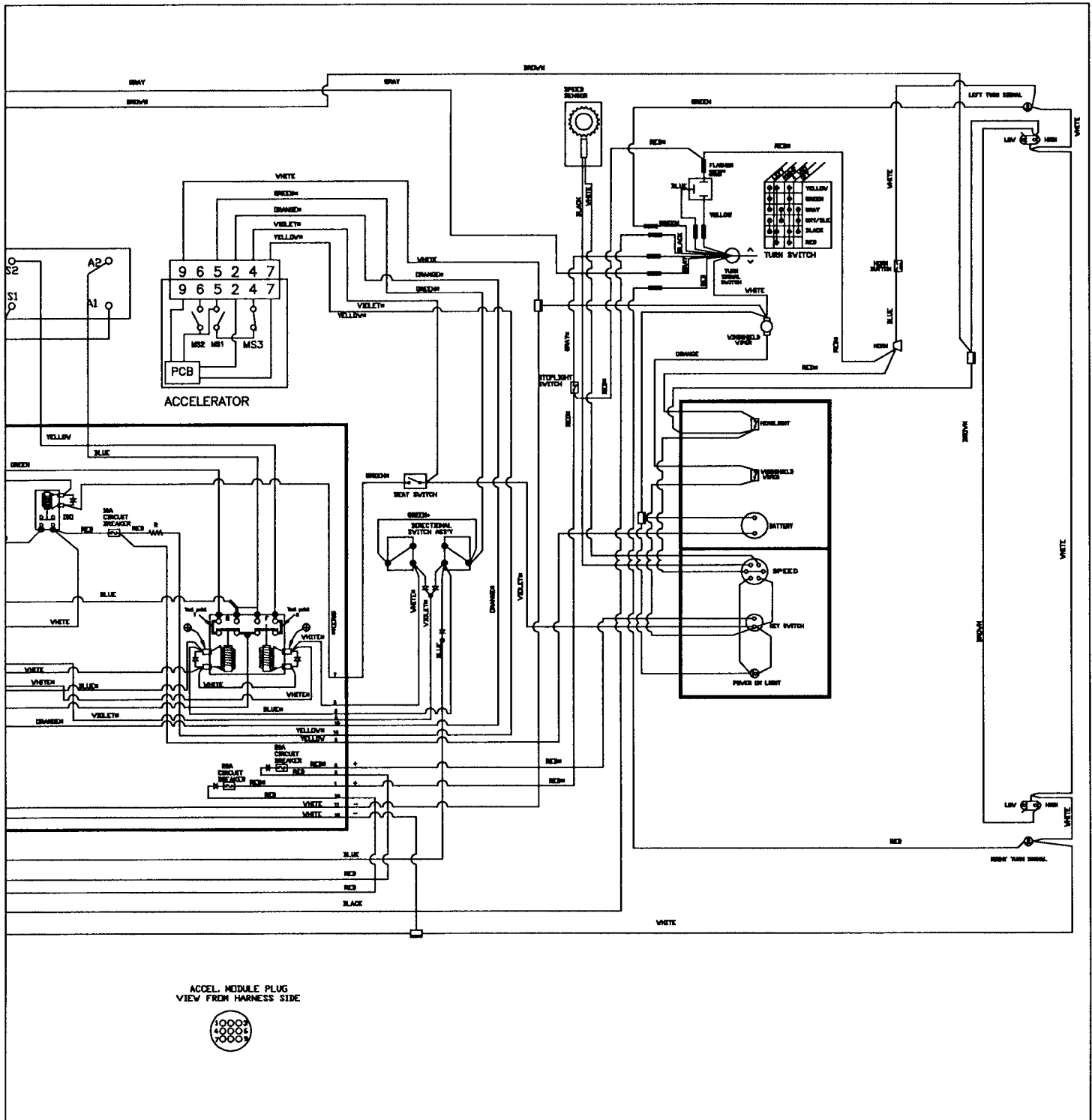
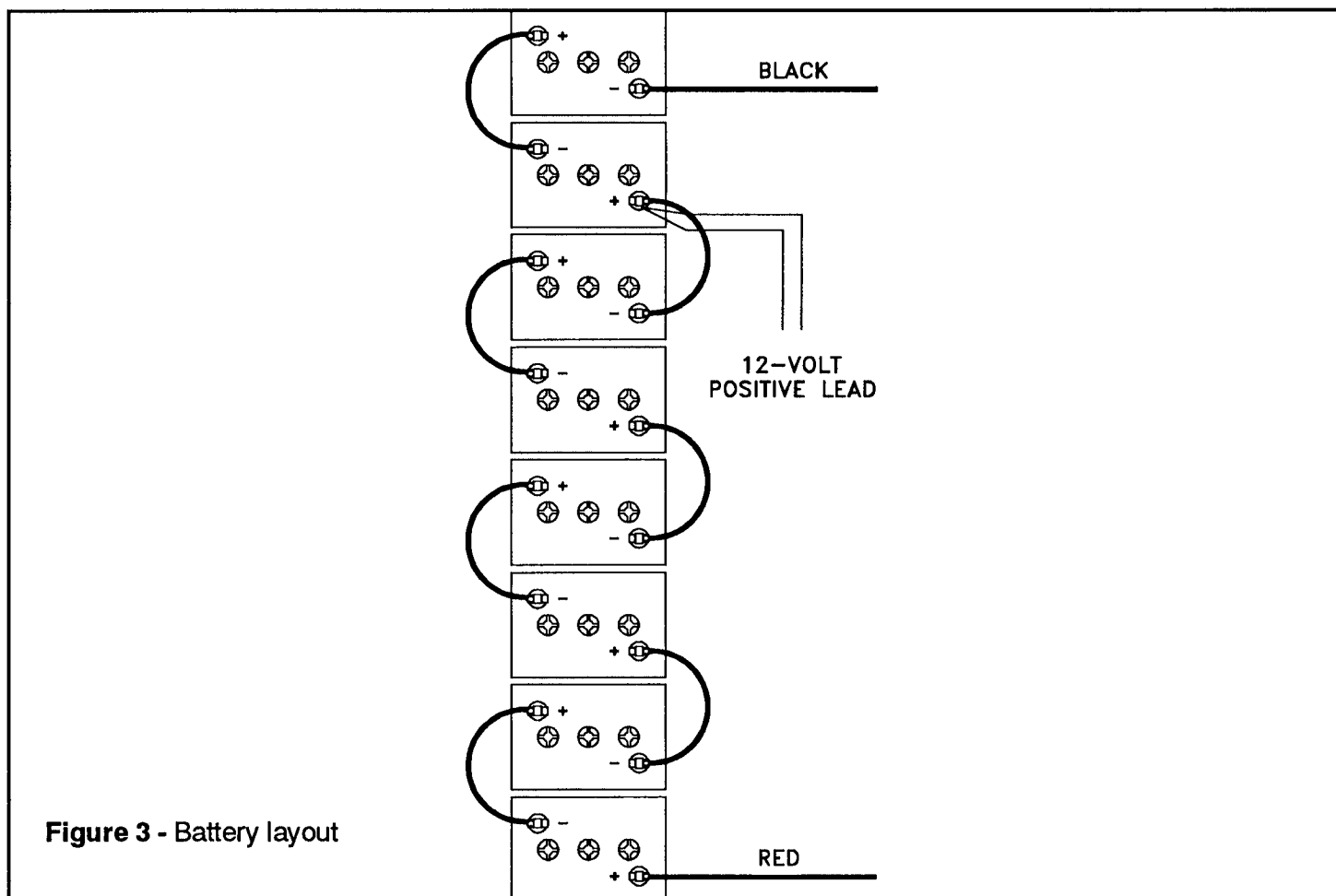


Figure 2 - Wiring Schematic (Page 2 of 2)

BATTERY LAYOUT

**WARNING!**

Disconnect the main battery leads and remove the key before working on any part of the vehicle, EXCEPT when conducting tests on the electrical components.

When conducting tests on the electrical components, always raise and securely support the rear wheels to prevent runaways.

Please refer to Section 1, "SAFETY / GENERAL INFORMATION" before performing any repairs/maintenance on this vehicle.

INSTRUMENT PANEL

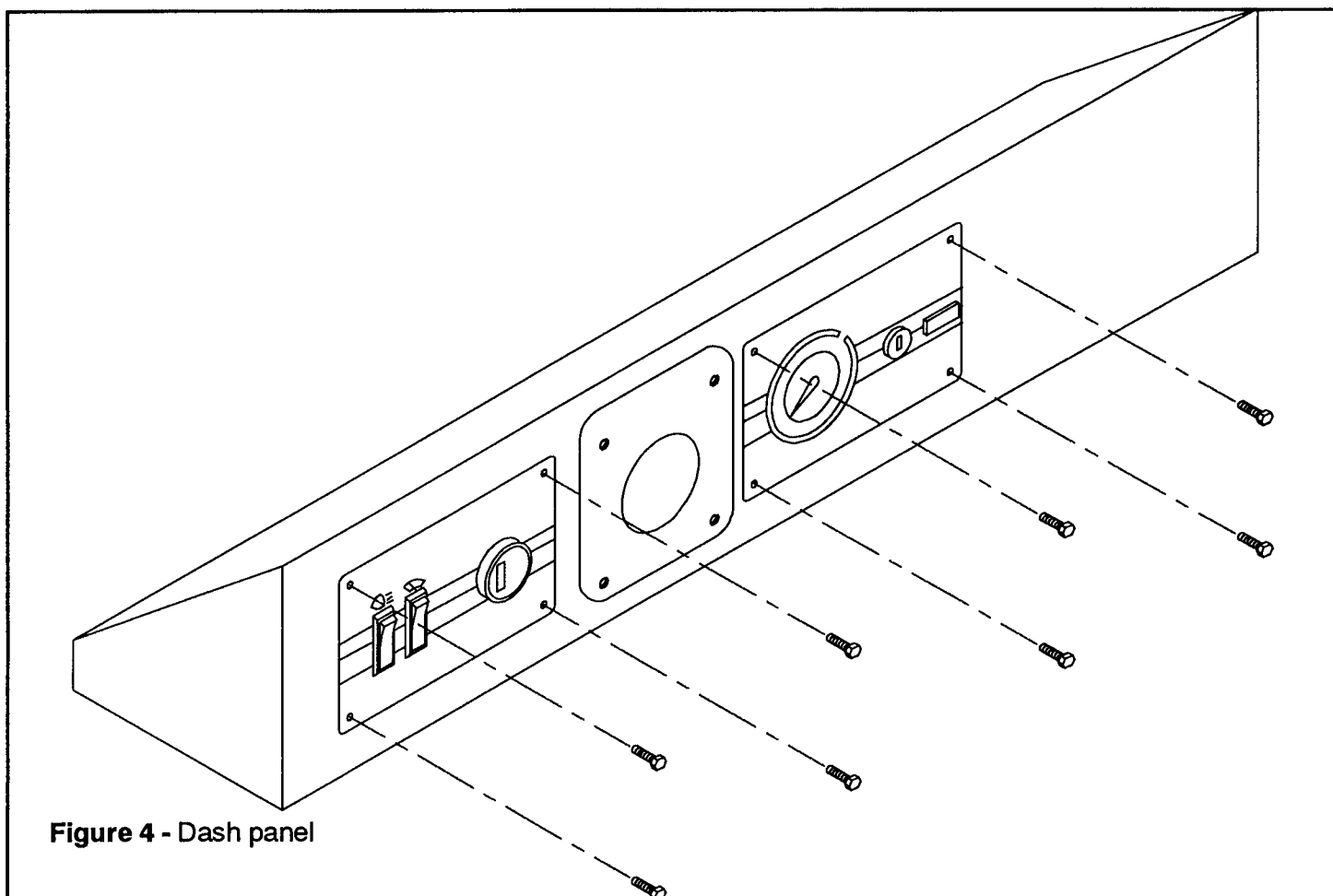


Figure 4 - Dash panel

Replacing the Battery Indicator / Light and Wiper Switch Panel

- 1** Remove four mounting screws from the front panel.
- 2** Disengage the wire harness coupling from the panel.
- 3** Install the new one in reverse order.

Replacing the Keyswitch / Speedometer Panel

- 1** Remove four mounting screws from the front panel.
- 2** Disengage the wire harness coupling from the panel.
- 3** Install the new one in reverse order.

SEAT SWITCH

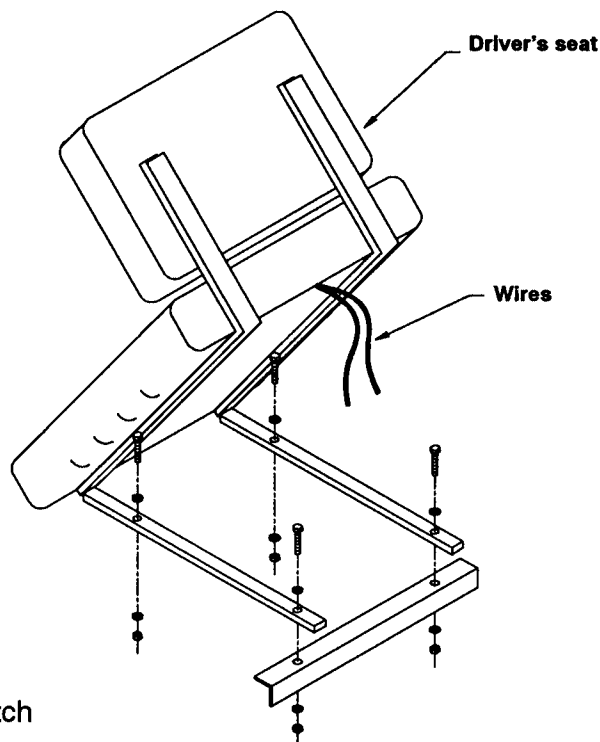


Figure 5 - Seat and seat switch

Replacing the Seat Switch

To replace the seat switch, the driver' seat must be replaced.

- 1** Lift up the driver's seat. Remove the four mounting bolts and angle mounting bracket.

Note: *The seat belts will come off.*

- 2** Cut the two wires from the seat switch.
- 3** Install the seat belts and new seat with the four mounting bolts and angle mounting bracket removed earlier.
- 4** Connect and crimp the new seat switch wires to the wires cut earlier.

MAIN POWER DISCONNECT SWITCH

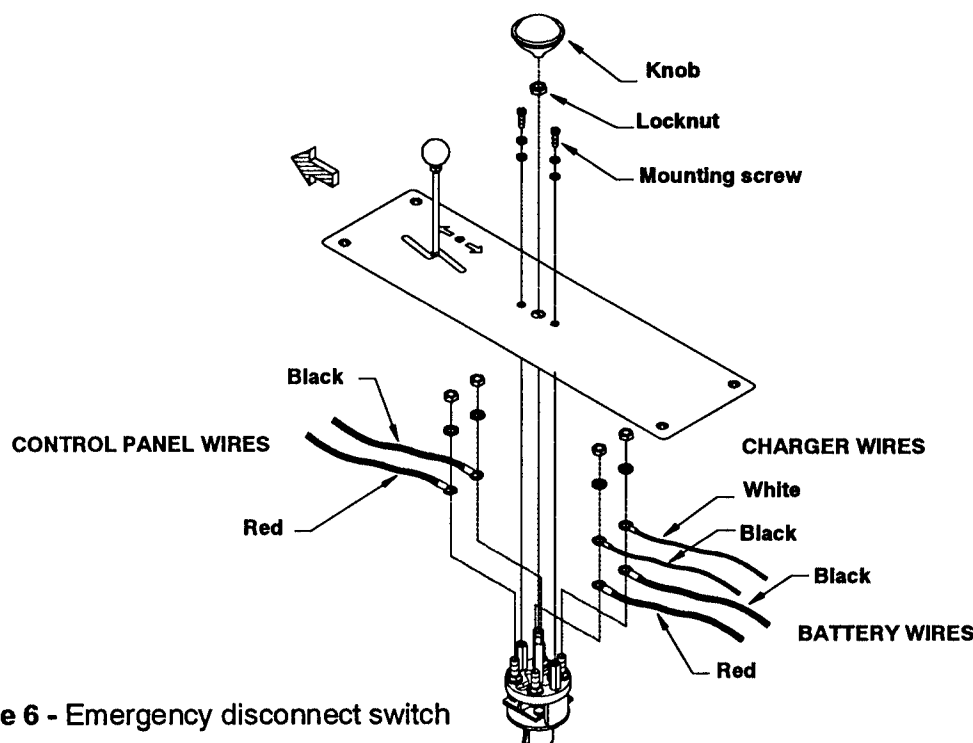


Figure 6 - Emergency disconnect switch

Replacing the Main Power Disconnect Switch

- 1** Unscrew knob and locknut from disconnect switch lever.
- 2** Support the switch from under, and remove 2 mounting screws from either side of the lever - the switch will be free.

Note: *Note wire positions - battery and charger wires are on the rear studs, the control panel wires on the front studs.*

- 3** Remove battery and charger wires and install them on the new switch.
- 4** Remove control panel wires and install on new switch.
- 5** Tighten nuts securely. Pull rubber caps over terminals.
- 6** Install in reverse order.

Note: *The white charger lead goes with the red battery lead.*

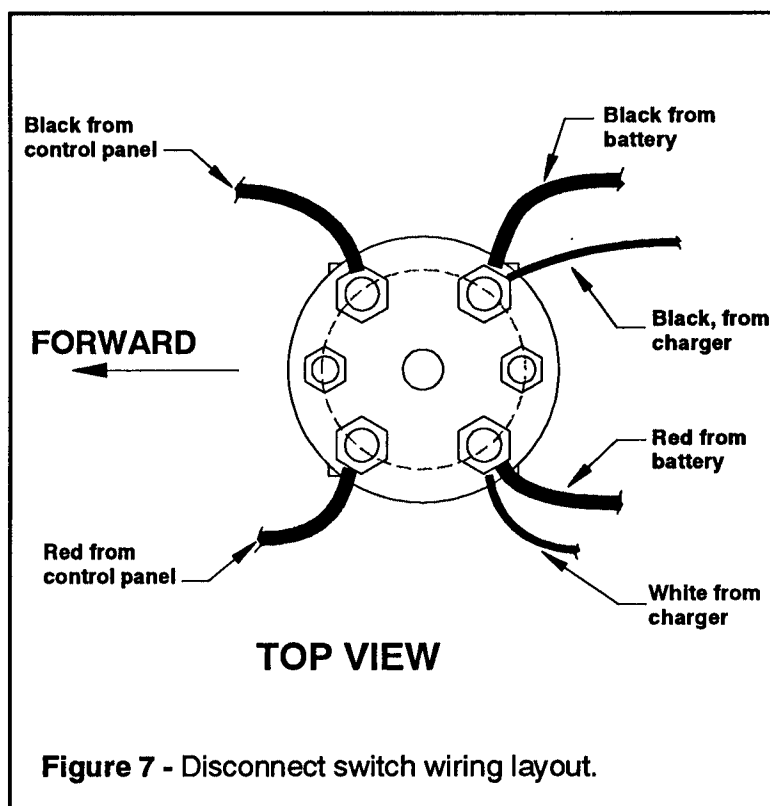


Figure 7 - Disconnect switch wiring layout.

SHIFT LEVER SWITCHES

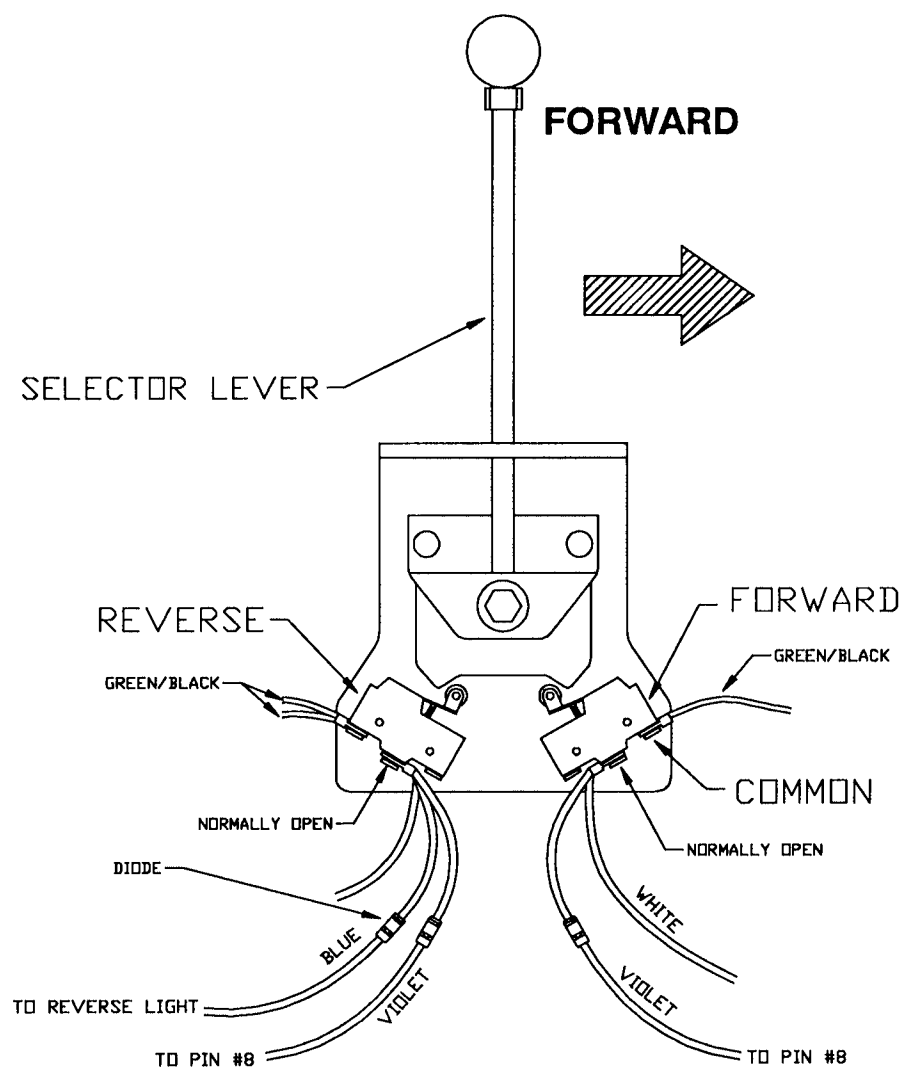


Figure 8 - Shift lever switches

Replacing Shift Lever Switches

- 1** Pull up passenger seat.
- 2** Remove switch mounting screws.
- 3** Remove wires from terminals, and install wires on new switch/es, as shown.
- 4** Install in reverse order.

CHARGER

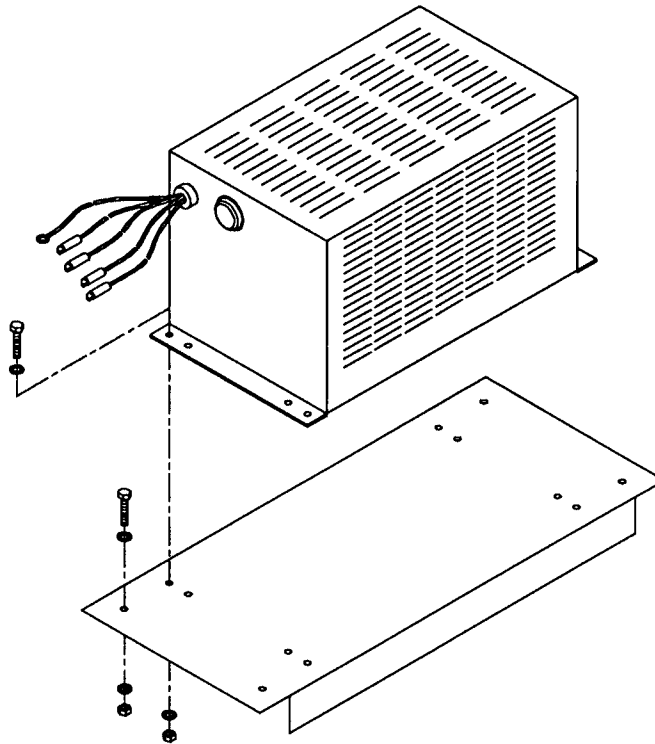


Figure 9 - Charger

Replacing the Charger Assembly

- 1** Disconnect the charger by disengaging the five (5) charger wire knife terminals.

Note: *The knife terminals are wrapped in heatshrink tubing.
The charger and vehicle harness wires are color-coded.*

Caution:

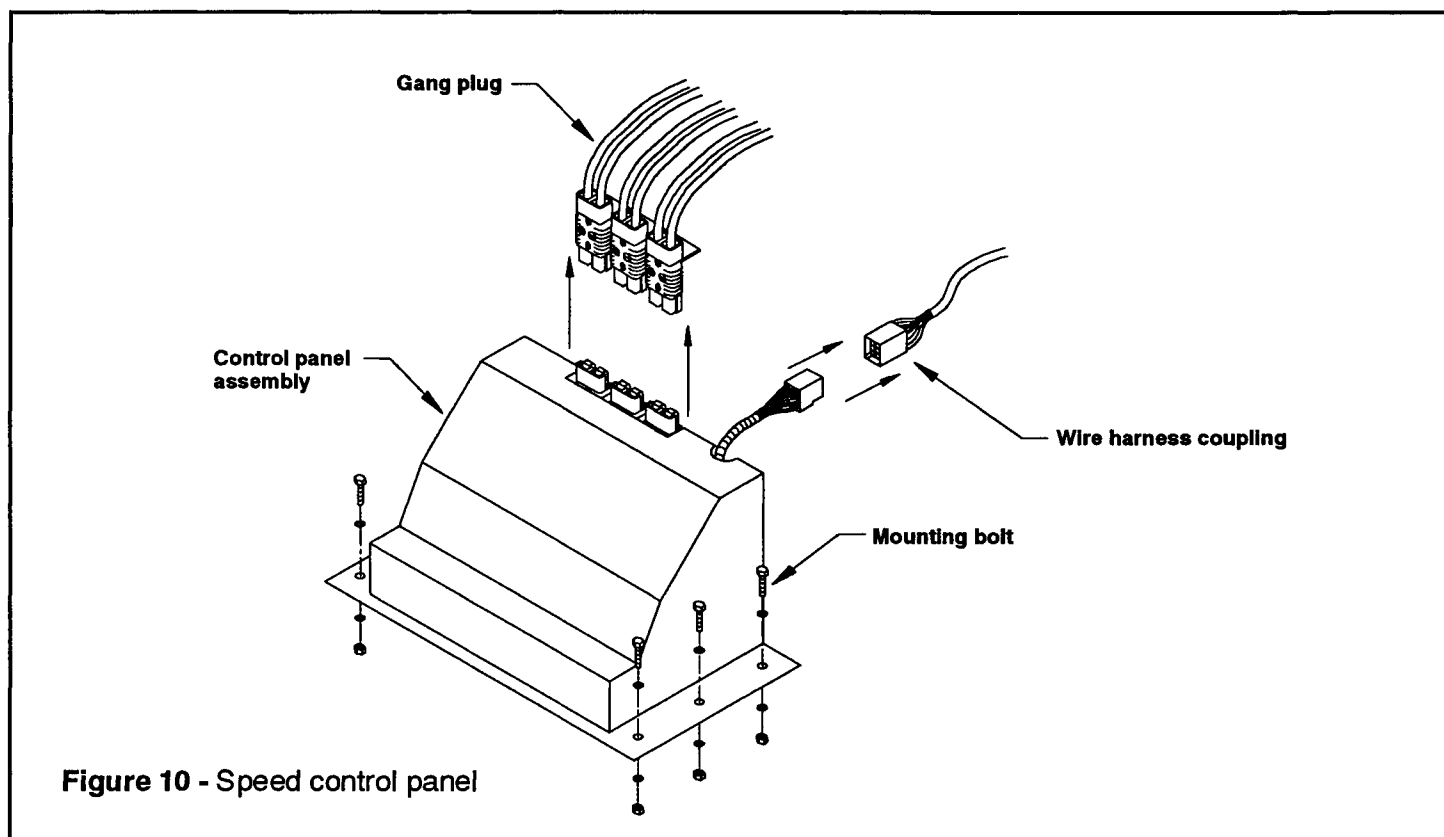
Support the charger from below before proceeding to the next step.

- 2** Remove four bolts that attach the mounting plate to the frame. Lower the charger and mounting plate.
- 3** Remove four bolts, nuts, and washers that attach the charger to the mounting plate. Set the old charger aside.
- 4** Install the new one in reverse order.
- 5** Encase the charger wires' knife terminals in approx. 3" strips of heatshrink tubing.
- 6** Connect the charger wires to the respective, color-coded vehicle harness wires.

Note: *There are two (2) white wires. The shorter, heavier white and the red wire connect to the respective emergency disconnect switch wires.*

- 7** Cover the terminal with the tubing, and blow hot air on the tubing to shrink them.

Speed Control



Replacing the Speed Control Panel

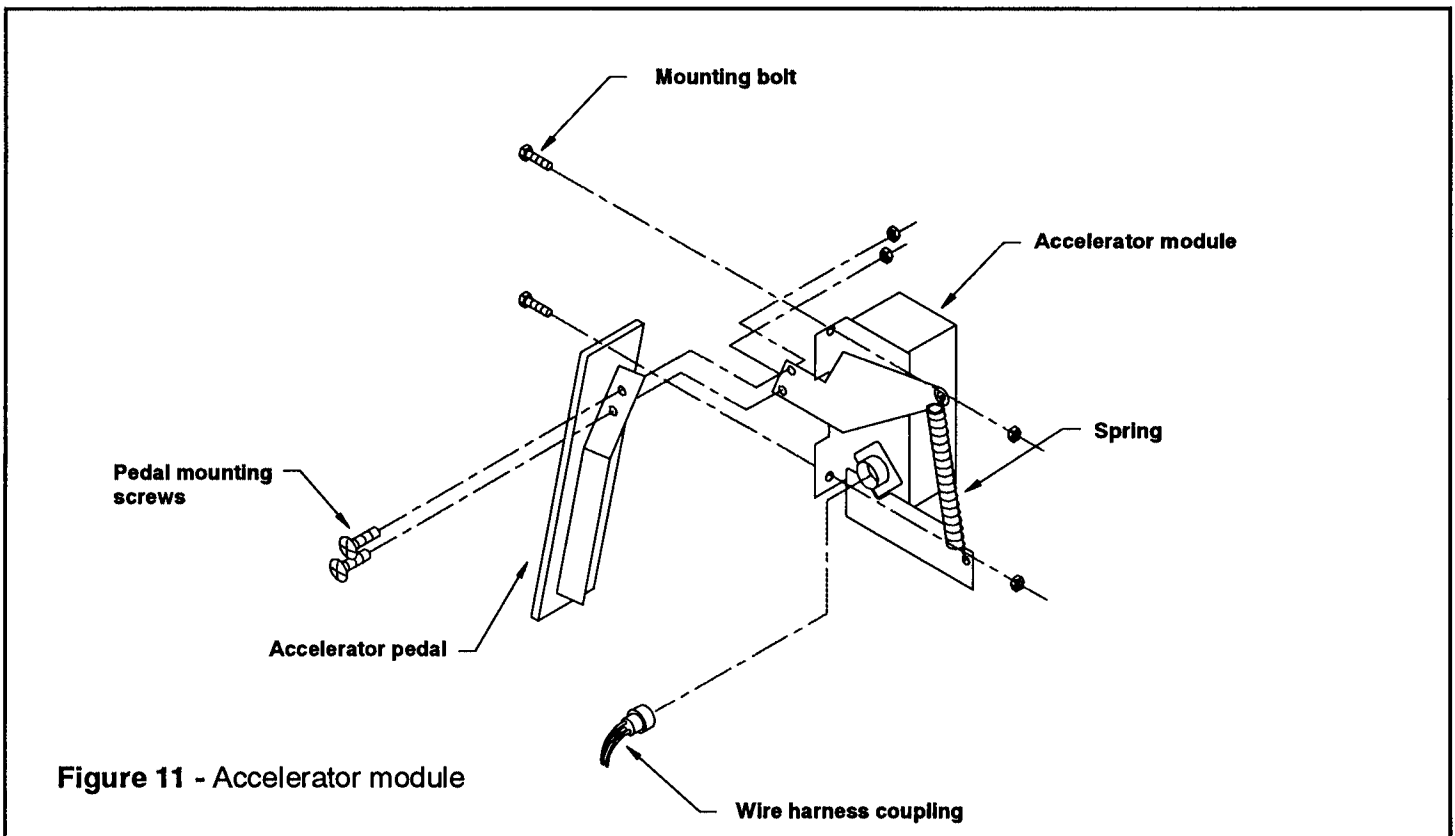
- 1** Pull up the passenger seat.
- 2** Pull off the gang plug connecting the control panel wires to the motor and disconnect switch.
- 3** Disengage the wire harness coupling.

Caution

Support the panel from the bottom before proceeding to the next step.

- 4** Remove 6 nuts from under the mounting plate. Lower the old panel safely.
- 5** Install the new one in reverse order.

Accelerator Module



Replacing the Accelerator Module

- 1** From inside the cab, remove two phillips screws that hold the accelerator pedal to the module.
- 2** From under the hood, disengage the wire harness coupling from the module.
- 3** Remove two nuts from bolts that mount the module to the cab. Dispose of the old module properly.
- 4** Install the new module in reverse order.

TURN SIGNAL ASSEMBLY

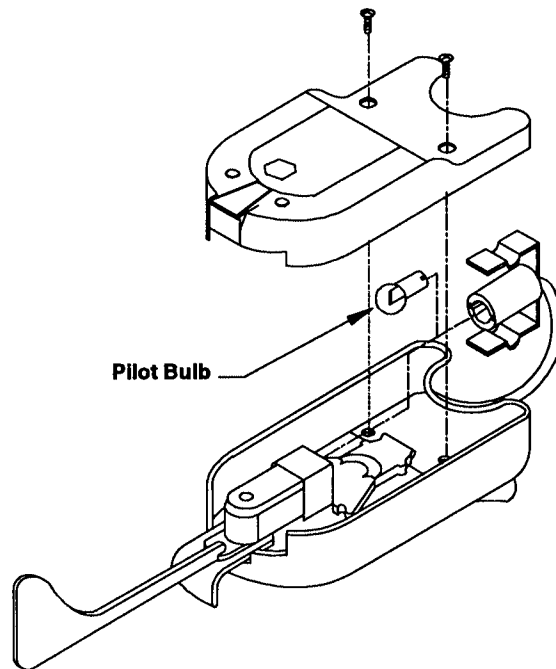


Figure 12 - Turn Signal

Replacing the Turn Signal Pilot Bulb

- 1** Remove the two screws on the top cover of the turn signal assembly.
- 2** Remove top cover.
- 3** Pull the spring clip away from the handle.
- 4** Unscrew the old bulb.
- 5** Screw the new bulb in.
- 6** Reassemble in reverse order.

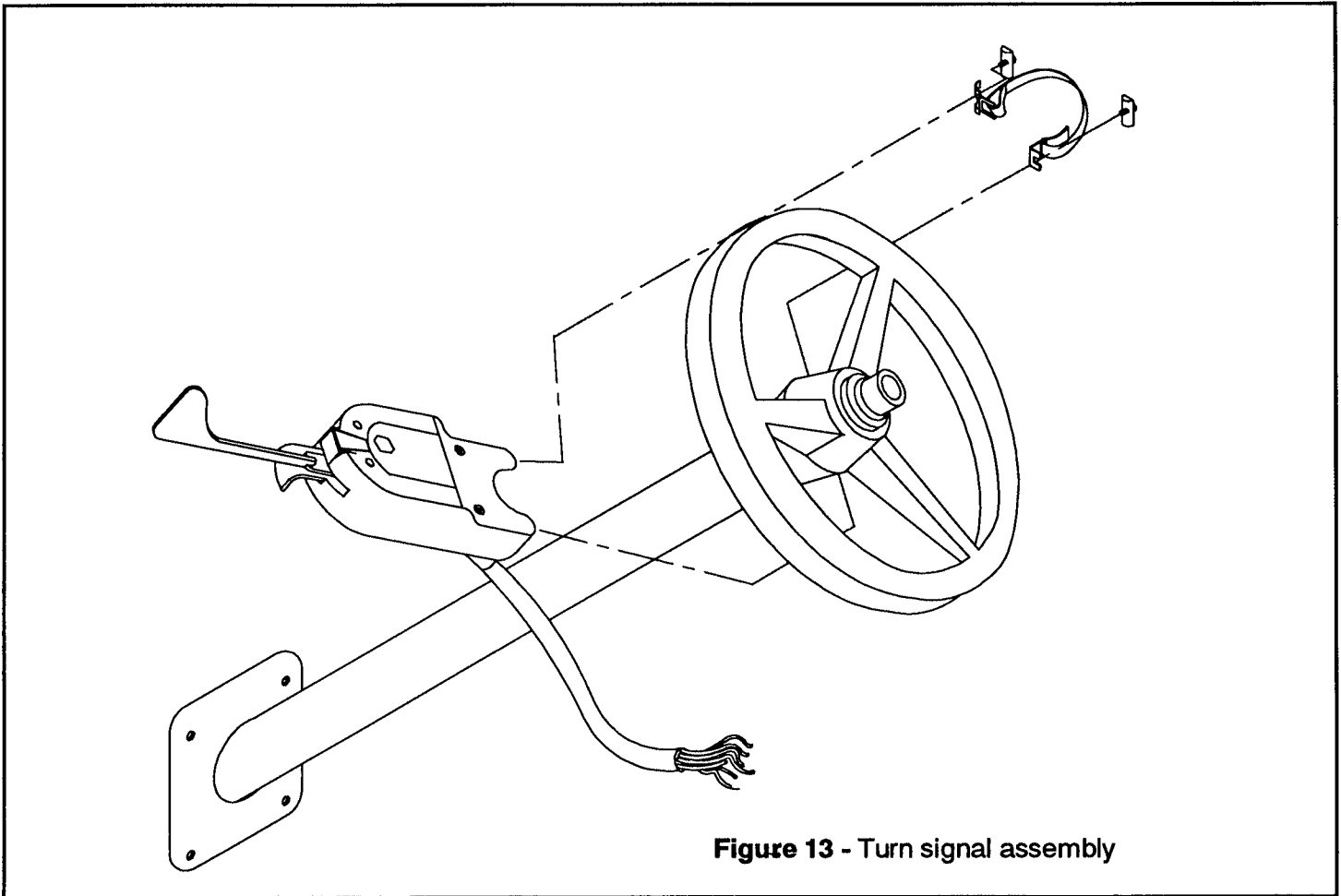


Figure 13 - Turn signal assembly

Replacing the Turn Signal Assembly

- 1** Remove strap mounting screws from turn signal assembly.
- 2** Disengage the ground wire (white) and remove the strap.
- 3** Clean the area on the steering column where the assembly was removed.
- 4** Separate the ground wire from the rest of the signal wires. Dispose of the old assembly properly.

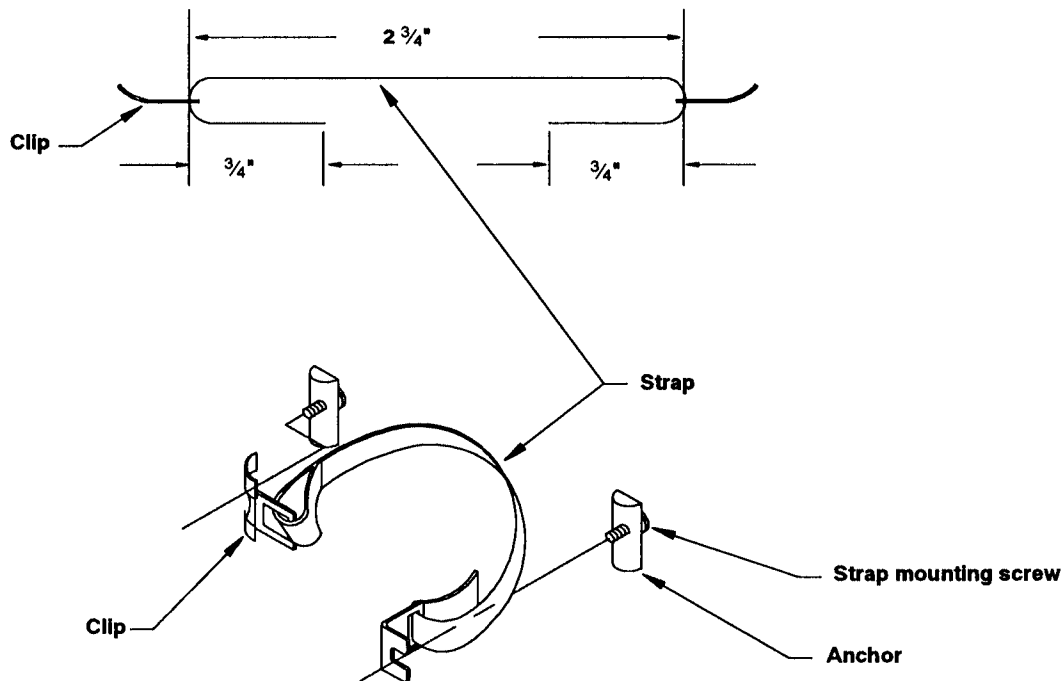


Figure 14 - Mounting the turn signal assembly

- 5** Take the new turn signal assembly. Engage the ground wire to one screw, and insert new screws into anchors.
- 6** Insert assembled anchors and screws into slots in clip. Do not tighten.
- 7** Bend approximately $\frac{3}{4}$ " of one strap end through and around one clip.
- 8** Measure $2\frac{3}{4}$ " from the bend of the strap, and make another bend.
- 9** Measure another $\frac{3}{4}$ " from the second bend, and cut the rest of the strap off.
- 10** Engage one clip between anchor and assembly.
- 11** Hold assembly in place against steering column where the old assembly was removed from. Bend the strap around the column.
- 12** Engage the other clip between anchor and assembly - This will hold the assembly fast to the steering column.
- 13** Cut the new wires, leaving enough length to reach under the dash panel, for aesthetic purposes.
- 14** Cut one old wire, strip off the end and fasten it to the new wire of the same color.
- 15** Repeat the procedure for all the wires.

ELECTRICAL TROUBLESHOOTING

WARNING!

Please refer to Section 1, "SAFETY / GENERAL INFORMATION," but **DO NOT** disconnect the rear battery jumper, before performing the following steps on this vehicle.

The following repairs should only be performed by a qualified electrical mechanic.

Folowing are the steps to be taken in the event of an electrical failure.

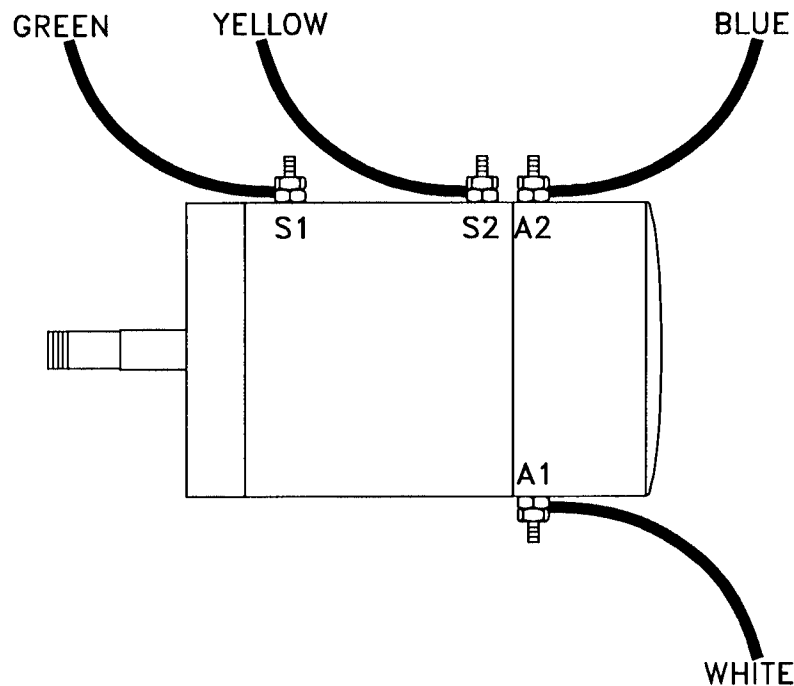


Figure 15 - Motor wiring

Testing the Main Power Output

For all of the following steps, use a volt-ohmmeter (V.O.M.) to check voltage.

Note: Actual readings may vary $\pm 10\%$ from voltages indicated.

If truck runs in only one direction, i.e., forward but not reverse or vice versa, go to Forward / Reverse Switches.

- 1** Close the seat switch.
- 2** Connect negative (-) volt-ohmmeter (V.O.M.) lead with the battery negative (-) terminal (black cable).
- 3** Turn the key switch on.
- 4** Depress the accelerator pedal.
- 5** Connect the positive (+) V.O.M. lead to the motor A1 terminal (see Figure 15). The V.O.M. should read positive (+) battery voltage.

If reading is lower than battery voltage, go to "Testing Main Power Input."

- 6** Connect the positive (+) V.O.M. lead to the motor A2 terminal. The V.O.M. should read positive (+) battery voltage.

If the A1 reading is good and A2 reading is lower than battery voltage, the motor armature or brushes are bad. Repair or replace armature and/or brushes (see "Repairing the Motor," this section).

- 7** Connect positive (+) V.O.M. lead to the motor A1 terminal.
- 8** Put Forward/Reverse Selector Lever (henceforth referred to as selector lever) in forward.

If the forward contactor does not click, go to "Testing Main Power Input."

- 9** If the forward contactor clicks, depress the accelerator pedal.
- 10** Test the voltages at the motor S1 and S2 terminals. Both should read between 0 and 48 volts, depending on accelerator pedal position.

If S1 reading is lower than battery voltage, go to "Testing Main Power Input."

If the S1 reading is good and S2 reading is lower than battery voltage, the motor field is open. Repair or replace the motor.

- 11** Repeat this procedure with the selector lever in reverse.

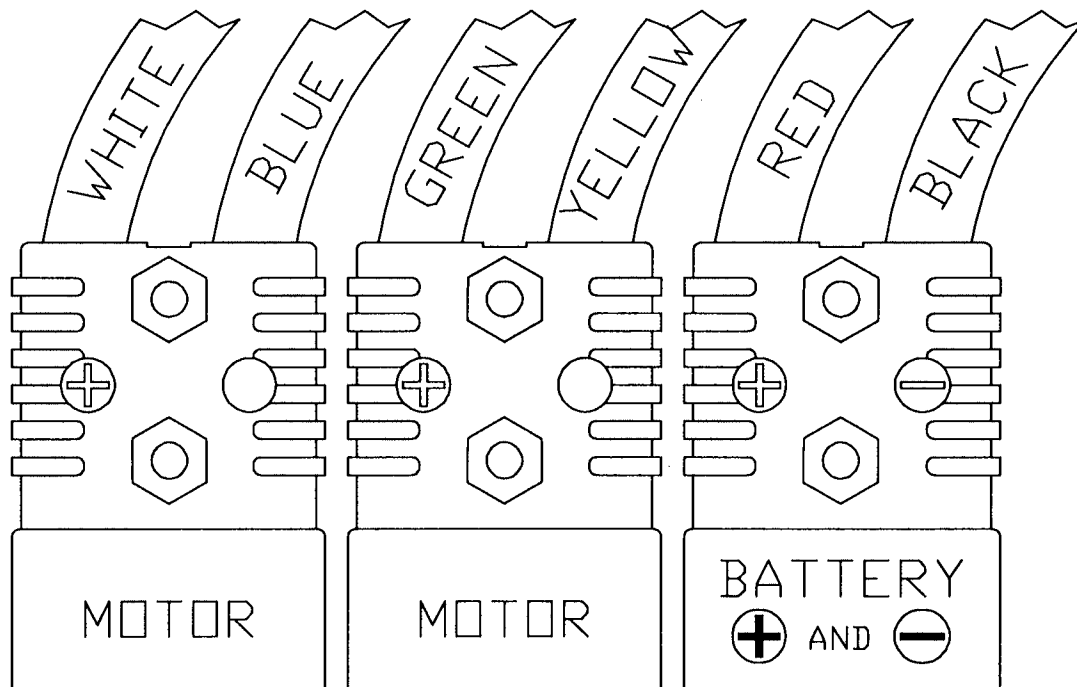


Figure 16 - Gang plug

Testing Main Power Input

- 1** Check voltage at the battery connector positive (+) and negative (-) terminals of the gang plug (red and black cables, Fig. 16). If not equal to battery voltage, check main power disconnect and battery connections for opens.
- 2** Close the seat switch. Turn the key switch ON and depress the accelerator.

- 3** Re-check voltage at the battery connector positive (+) and negative (-) terminals of the gang plug (red and black cables, Figure 16). If not equal to battery voltage, check main power disconnect and battery connections for poor contacts.

Note: For all of the following steps, when checking voltage, the negative (-) lead of the V.O.M. should be in contact with the battery negative (-) terminal (black cable) unless specified.

- 4** With seat switch closed, turn the key switch ON.

If the ISOLATOR contactor clicks, skip to step 7.

- 5** Check voltage at Pin 7 of the control module plug (see Figure 17).

If at positive (+) 12V, go to CONTROL MODULE.

If pin 7 is not at (+) 12V, check the key switch and seat switch for opens. STOP

- 6** Put selector lever in FORWARD.

If forward contactor clicks, go to CONTROL MODULE.

If forward contactor does not click, check voltage at Pin 6 of the control module plug.

If at positive (+) 12V, go to CONTROL MODULE. Otherwise go to Forward / Reverse Switches.

- 7** Check voltage at Pin 8 of the control module plug.

If not positive (+) 12V go to CONTROL MODULE.

If not positive (+) 12V go to FORWARD/REVERSE SWITCHES.

- 8** DEPRESS the accelerator.

- 9** Check voltage at Pin 10. It should be between 6.0 - 11.5 volts, depending on pedal position. If not, go to ACCELERATOR.

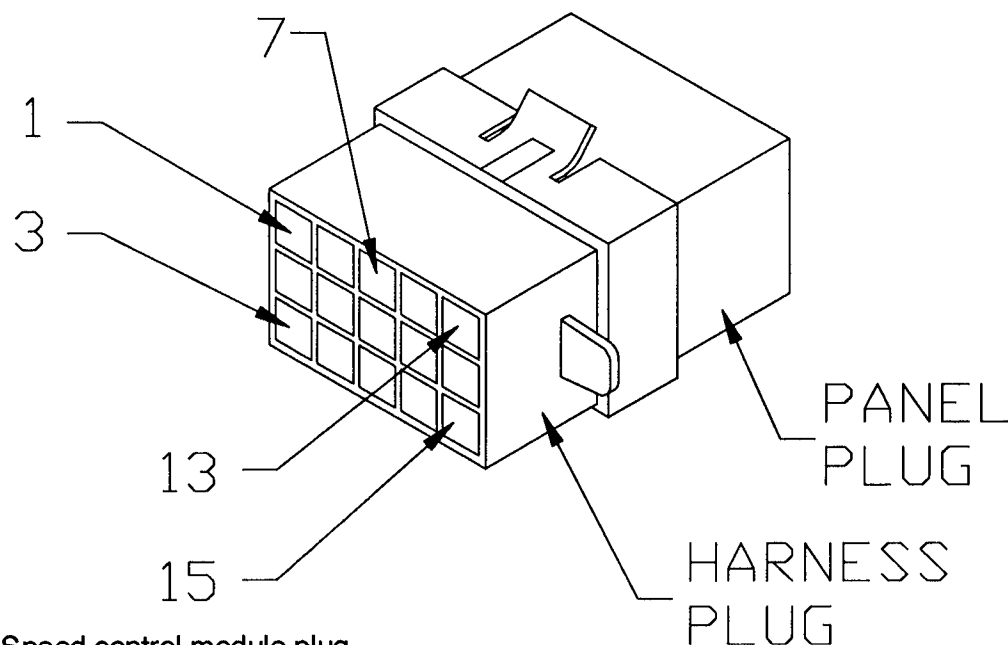


Figure 17 - Speed control module plug

TESTING INPUT TO THE SPEED CONTROL MODULE

- 1** Disconnect main battery positive (+) and negative (-) wires.



Failure to disconnect main battery wires can cause electric shock for the following procedures.

- 2** Remove speed control panel from the truck (see "Replacing the Speed Control Panel," this section).
- 3** Discharge the speed controller capacitors by shorting the B+ and B- terminals on the controller.

DO NOT make physical contact with the terminals when shorting them - you will get a severe electrical shock!

- 4** Inspect all wiring for loose or bad connections.

Refer to Figure 19 for correct diode polarities. Incorrect polarity will damage diodes.

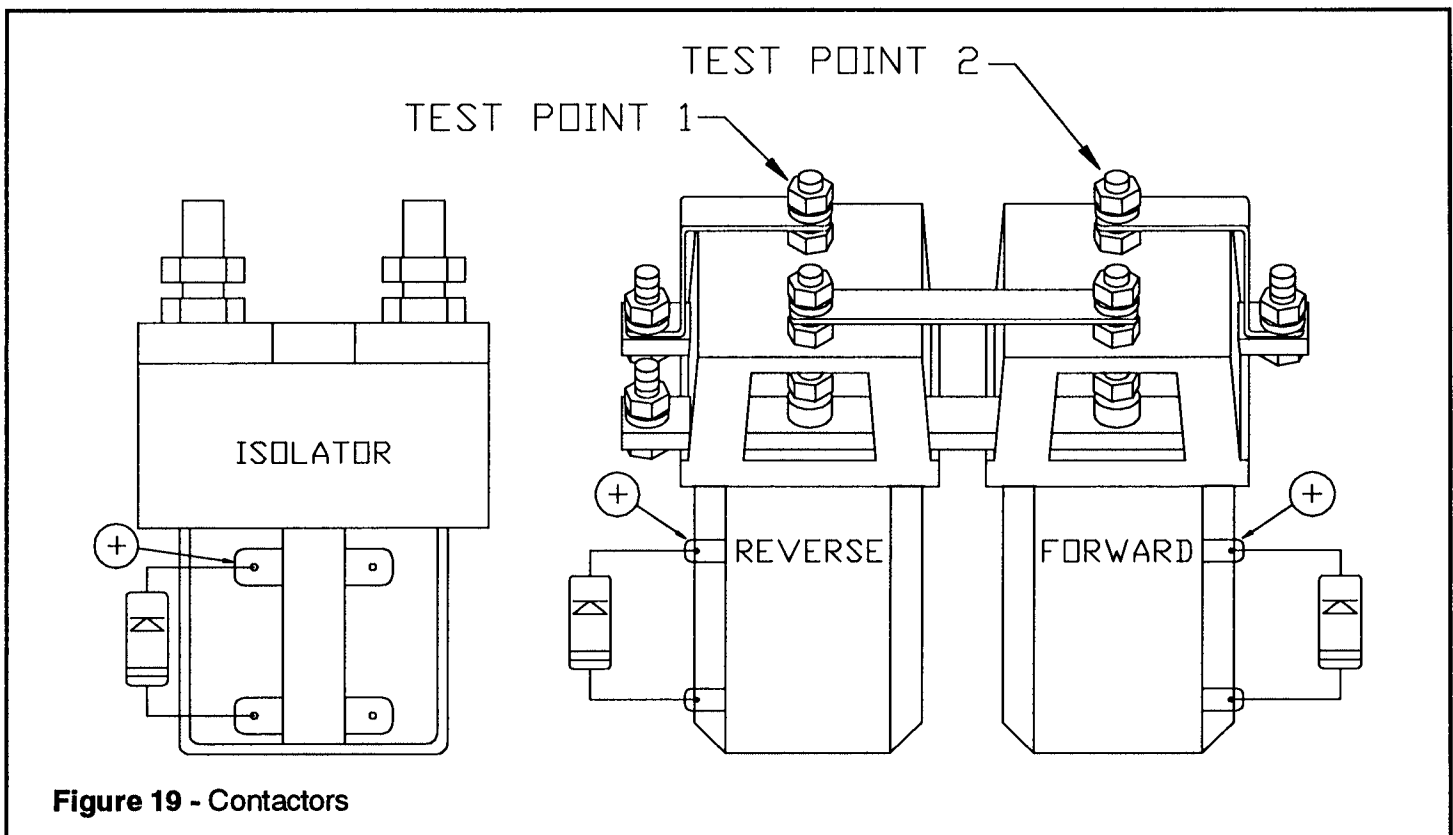


Figure 19 - Contactors

Testing Contactors

- 1** Place the voltmeter dial on R X 10.
- 2** Observing correct polarity, connect the 12V source across the ISOLATOR coil.

If resistance across contacts is not 0 ohms, ISOLATOR is bad. STOP.

If resistance across test points 1 and 2 (Figure 19) is not 0 ohms then the forward/reverse contactor is bad. STOP

- 3** Observing correct polarity, connect 12v source across both reverse and forward solenoid coils.
- Using R x10, if resistance across test points 1 and 2 (Figure 19) is not 0 ohms then F&R contactor is bad. STOP

NOTE: *Diodes on contactors are for voltage surge protection. Failure of these diodes will not prevent operation of control. Test all 3 diodes for continued protection.*

- 4** Using R x 10, test all 4 circuit breakers for 0 ohms.
- 5** Using R x 5K, test resistor for 2000 ohms.
- 6** Test diodes on 20A circuit breakers.

If all component and input voltages are correct, then the PMC controller is bad and must be replaced.

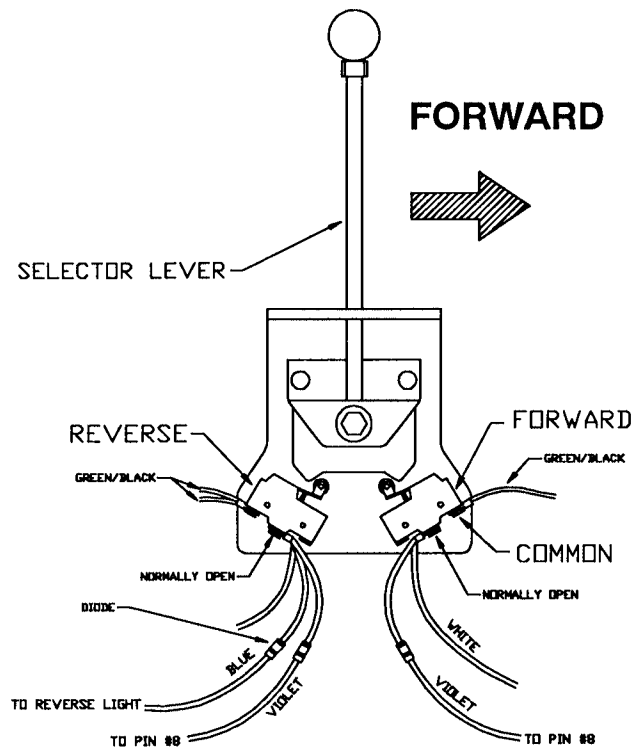


Figure 20 - Forward / reverse switches

Forward / Reverse Switches :

- 1** Keep the seat switch closed and turn the key switch on.
- 2** Depress the accelerator.
- 3** Check voltage at common on forward / reverse switches (Figure 20).

If not positive (+) 12V go to ACCELERATOR.

- 4** Place selector lever in FORWARD.

If voltage at the forward switch normally open (Figure 20) is not positive (+) 12V then switch is bad. STOP.

If voltage at Pin 8 on the control module plug (Figure 17) is not positive (+) 12V then F&R diode/s (Figure 20) are bad. STOP

- 5** Place selector lever in REVERSE.

If voltage at the reverse switch normally-open (Figure 20) is not (+) 12V then switch is bad. STOP

If voltage at Pin 8 on the control module plug (Figure 17) is not positive (+) 12V then F&R diode/s (Figure 20) are bad. STOP

NOTE: Connection for the reverse light is made through a diode to the reverse switch.

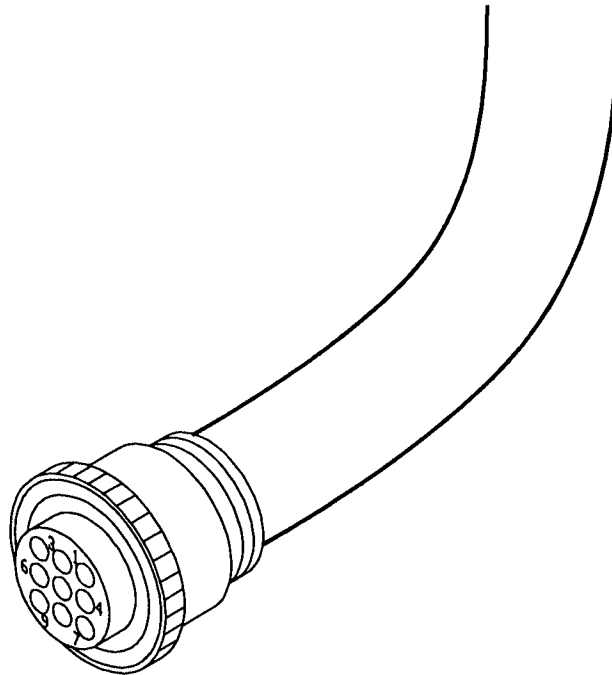


Figure 21 - Accelerator module test harness, female end

Testing the Accelerator Module

NOTE: For this procedure, use accelerator module test harness (TD Part # 75-089-00, female end shown in figure 21), referred to as test harness.

- 1** Unplug the accelerator pigtail from the accelerator.
- 2** Connect the test harness male connector to the accelerator pigtail, and the companion female connector to the accelerator, leaving the other end (female connector) free.
- 3** Close the seat switch and turn the key switch ON.
- 4** Test the voltages on the test harness female connector pins.

If Pin 4 on the connector is not positive (+) 12 - 15V, check the key switch. STOP

If Pin 7 is not approximately 36V, go to CONTROL MODULE.

- 5** Connect the V.O.M. positive (+) lead to the battery positive (+).

If Pin 9 is not negative (-) battery voltage, check wiring. STOP

- 6** Reconnect the V.O.M. negative (-) lead to the battery negative (+).

- 7** Depress the accelerator.

If Pin 5 is not positive (+) 12 - 15V, the accelerator module is bad. STOP

- 8** As pedal is depressed voltage at Pin 2 should start at 6V at slow speed and increase to approximately 11 - 11.5V at full speed. If not, the accelerator module is bad. STOP

Note: The truck **SHOULD NOT RUN** while the test harness is installed. If the truck runs under this condition, the wiring may be shorted or there is a controller failure.

TABLE 1

Note: For all of the following tables, seat switch must be closed, and the keyswitch must be on.

All readings may vary $\pm 10\%$ from this table.

Selector Lever Position	Accelerator Pedal Position	Pin Number	Correct Voltage	Corrective Action
Neutral ("OFF")	Up	1	12 to 15 Volts	See Note #1
Neutral ("OFF")	Up	2	Battery Voltage (B.V.)	
Neutral ("OFF")	Up	4	12 to 15 Volts	See Note #1
Neutral ("OFF")	Up	5	0 Volts	Go to Forward / Reverse Switches
Neutral ("OFF")	Up	6	0 Volts	Go to F/R Switches
Neutral ("OFF")	Up	7	12 to 15 Volts	Check key / seat switches
Neutral ("OFF")	Up	8	0 Volts	Check Wiring
Neutral ("OFF")	Up	9	12 to 15 Volts	See Note #2
Neutral ("OFF")	Up	10	0 Volts	Go to Accelerator
Neutral ("OFF")	Up	11	- (B.V.)	See Note #3
Neutral ("OFF")	Up	12	- (B.V.)	See Note #3
Neutral ("OFF")	Up	15	12 to 15 Volts	See Note #2
Neutral ("OFF")	Depressed fully	1	12 to 15 Volts	See Note #1
Neutral ("OFF")	Depressed fully	2	(B.V.)	Check Circuit Breakers
Neutral ("OFF")	Depressed fully	4	12 to 15 Volts	See Note #1
Neutral ("OFF")	Depressed fully	5	0 Volts	Go to F/R Switches
Neutral ("OFF")	Depressed fully	6	0 Volts	Go to F / R Switches
Neutral ("OFF")	Depressed fully	7	12 to 15 Volts	Check key / seat switches
Neutral ("OFF")	Depressed fully	8	0 Volts	Check Wiring
Neutral ("OFF")	Depressed fully	9	12 to 15 Volts	See Note #2
Neutral ("OFF")	Depressed fully	10	11 Volts	Go to Accelerator
Neutral ("OFF")	Depressed fully	11	- (B.V.)	See Note #3
Neutral ("OFF")	Depressed fully	12	- (B.V.)	See Note #3
Neutral ("OFF")	Depressed fully	15	12 Volts	See Note #2
Forward	Depressed fully	1	12 Volts	See Note #1
Forward	Depressed fully	2	B. V.	See Note #1
Forward	Depressed fully	4	12 Volts	See Note #1

TABLE 1 (continued)

Selector Lever Position	Accelerator Pedal Position	Pin Number	Correct Voltage	Corrective Action
Forward	Depressed fully	5	0 Volts	Go to F / R Switches
Forward	Depressed fully	6	12 Volts	Go to F / R Switches
Forward	Depressed fully	7	12 Volts	Check key / seat switches
Forward	Depressed fully	8	12 Volts	Go to F / R Switches
Forward	Depressed fully	9	12 Volts	See Note #2
Forward	Depressed fully	10	11.5 Volts	Go to Accelerator
Forward	Depressed fully	11	- (B.V.)	See Note #3
Forward	Depressed fully	12	- (B.V.)	See Note #3
Forward	Depressed fully	15	12 Volts	See Note #2
Reverse	Depressed fully	1	12 Volts	See Note #1
Reverse	Depressed fully	2	(B.V.)	Check circuit breakers
Reverse	Depressed fully	4	12 Volts	See Note #1
Reverse	Depressed fully	5	12 Volts	Go to F / R Switches
Reverse	Depressed fully	6	0 Volts	Go to F / R Switches
Reverse	Depressed fully	7	12 Volts	Check key / seat switches
Reverse	Depressed fully	8	12 Volts	Go to F / R Switches
Reverse	Depressed fully	9	12 Volts	See Note #2
Reverse	Depressed fully	10	11.5 Volts	Go to Accelerator
Reverse	Depressed fully	11	- (B.V.)	See Note #3
Reverse	Depressed fully	12	- (B.V.)	See Note #3
Reverse	Depressed fully	15	12 Volts	See Note #2
#1 - Check Pins 9 and 15 each for 12 - 15 volts. If good, circuit breaker on panel might be bad.				
#2 - Check wires to battery (12 volt tap).				
#3 - Check Main Power Input.				

REPAIRING THE CHARGER

WARNING!

Even if the charger is unplugged / disconnected from all AC and DC sources, high voltage may still be present in the charger components! **DO NOT** touch charger components, including the capacitor, until the capacitors are discharged, or you will get a severe electrical shock!!

When discharging the capacitor, make sure your hands and tools are dry, wear an electrically insulated glove and use a tool with an electrically insulated handle!

- 1** Disconnect the batteries (see "General Safety," Safety / General Information section at the beginning of this manual).
- 2** Disconnect the charger from the AC (plug) and DC (batteries) sources.
- 3** Remove the charger from the vehicle (see "Replacing the Charger," this section).
- 4** Remove the charger cover.
- 5** Discharge the capacitor by shorting across the capacitor terminals.
- 6** Inspect all internal wiring. Repair or replace if necessary.
- 7** Inspect the fuse. Replace if necessary.

WARNING!

High voltage will be present in the charger after the next step.

- 8** Reconnect batteries to charger.

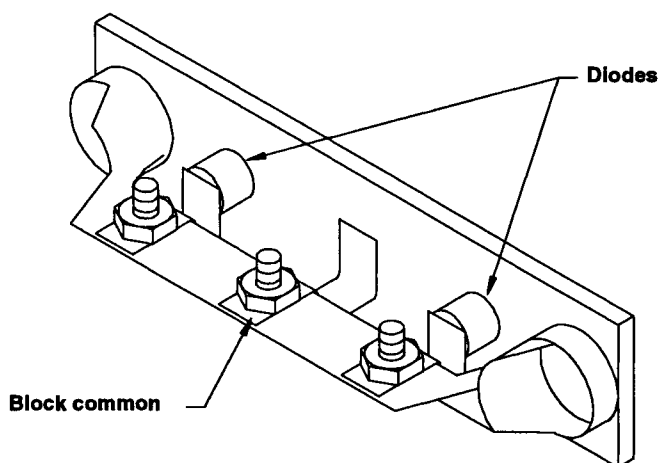


Figure 22 - Diode block

- 9** Measure DC voltage from the diode block common (see Figure 22) to the fuse assembly. If not equal to battery voltage, the wires to the batteries are bad.
- 10** Reconnect the AC source.

WARNING!

The charger must be GROUNDED, else high voltage may be present in the charger cover.

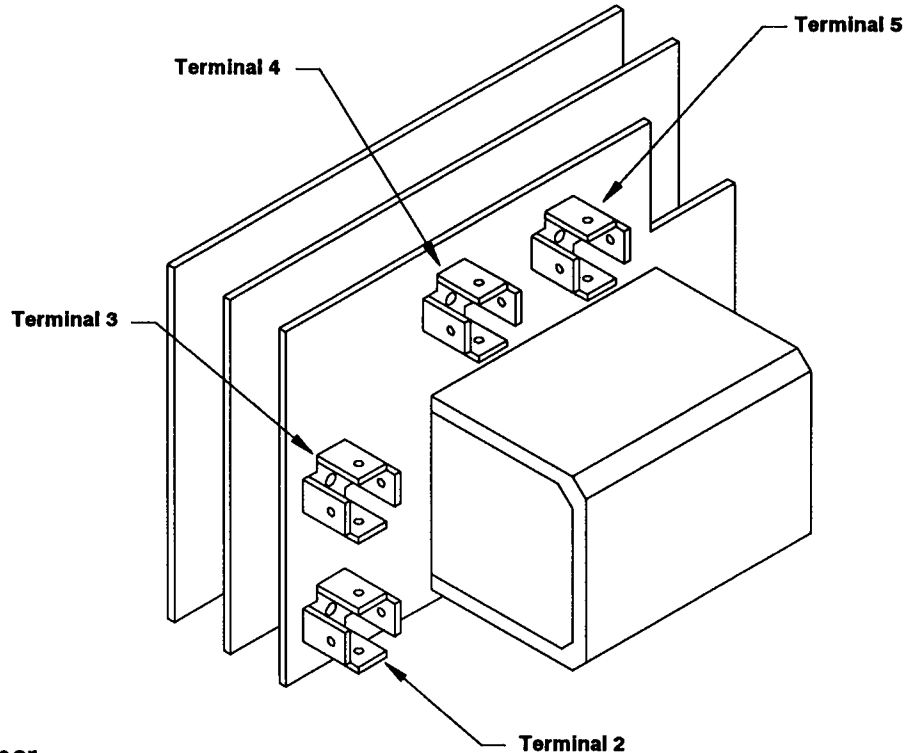


Figure 23 - Timer

Testing the Timer

- 1** Measure AC input voltage on timer terminals 4 and 5 (see Figure 23).
- 2** If not at rated charger AC voltage, AC input is bad.

WARNING!

If AC input is bad, repairs should be made by a qualified electrician.

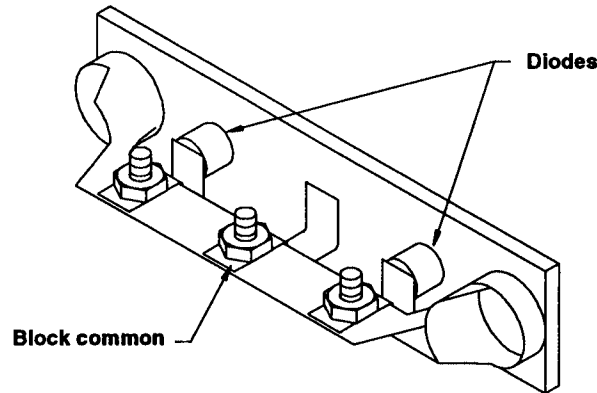
The possible problems are:

- Wiring to AC cord
- AC cord or plug
- House wiring or circuit breaker

- 3** Measure AC output voltage at timer AC output terminals 2 and 3 ((see Figure 23).
- 4** If not the same as input voltage, timer is bad.
- 5** Measure AC voltage at the diodes.

If not at rated house voltage AC, the transformer is bad.

- 6** Disconnect the charger from AC and DC sources
- 7** Discharge the charger capacitors.

**Figure 24 - Diodes**

Testing the Diodes

Set V.O.M. at R X 100 ohms.

- 1** Disconnect the lead from one diode (see Figure 24).
- 2** Connect test leads across the disconnected diode (i.e., to the diode lead and the block common).
- 3** The meter should either deflect to the right side of the scale or not at all.
- 4** Reverse polarity on the diode test leads. You should get the opposite readings from the previous step. If the readings are the same for both steps, the diode is bad and needs to be replaced.
- 5** Reconnect the diode lead.
- 6** Repeat the previous steps for the other diode.

Note: *It is recommended to replace the diodes as a set.*

Testing the Charger Capacitor

WARNING!

High voltage may still be present in the components if the capacitor has not been discharged!

- 1** If not yet done, discharge the charger capacitor.
- 2** Set the V.O.M. at the highest ohm scale, preferably at R X 10000.
- 3** Connect test leads across the capacitor.

The needle should deflect to low ohms reading and slowly return to infinity (left side of scale).

If needle stays on low ohms reading or does not deflect at all, the capacitor is bad and needs to be replaced.

- 4** Reverse polarities.
- 5** Repeat step 3.
- 7** If the charger is equipped with an ammeter, use R X 10 on the V.O.M. to check continuity across the meter.

If resistance is not 0 ohms, the meter is bad.

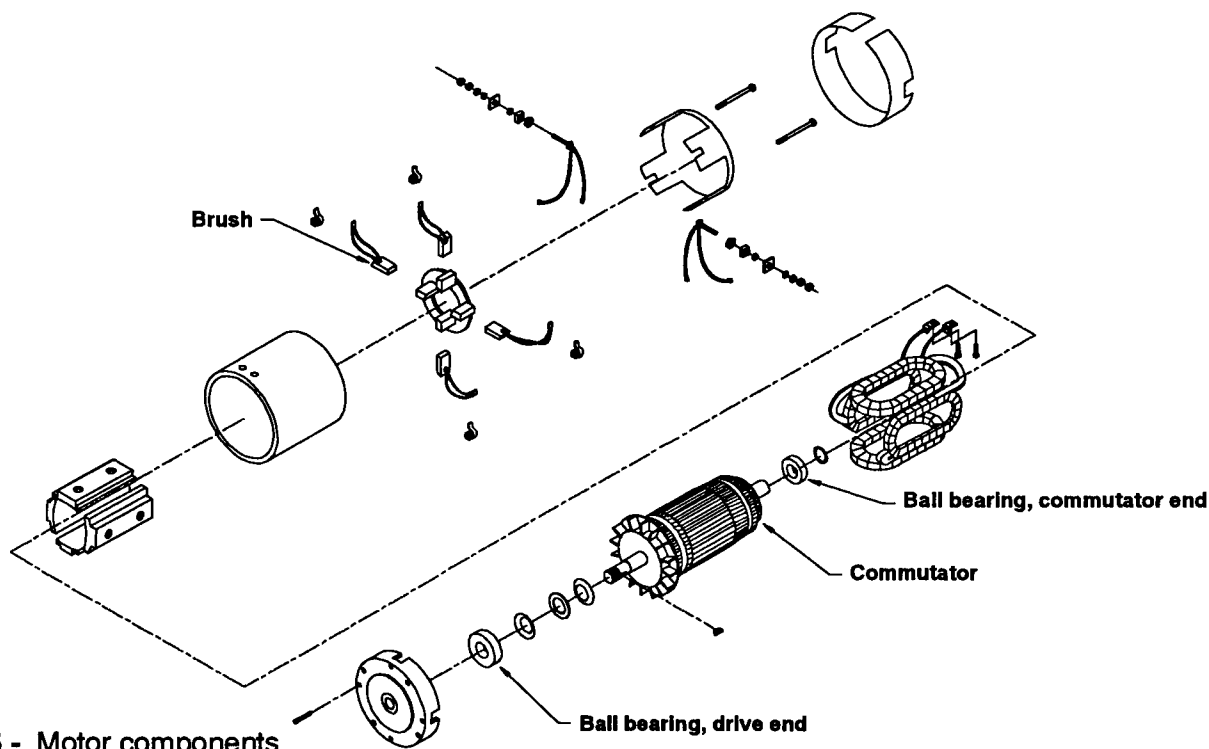


Figure 25 - Motor components

REPAIRING THE MOTOR

- 1** Remove the motor from the vehicle (See "Replacing the Motor," Power Train Section).
- 2** Remove the motor cover and separate the motor components.
- 3** Test the bearings by hand. If they do not operate smoothly, replace them with new ones.
- 4** Measure the length of the brushes. If they are less than 0.75", replace them with new ones.

Note: When installing new brushes, each brush should be sanded into the curvature of the commutator for most reliable performance. A minimum of 85% surface contact with 100% brush arc is recommended.

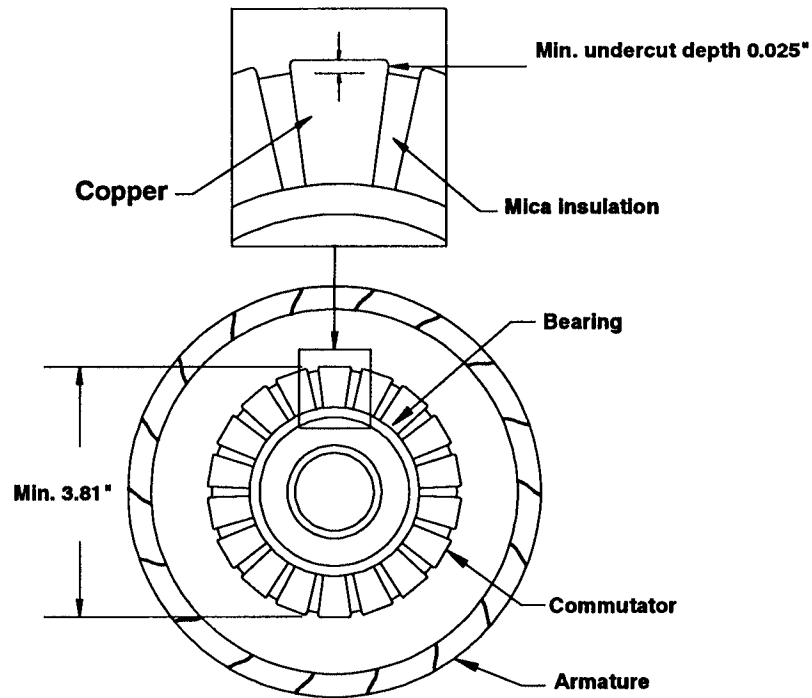


Figure 26 - Armature

- 5** Inspect the commutator for wear or damage. If it is uneven, cut with a lathe machine.

Note: *Total commutator runout should not exceed 0.002", with maximum allowable bar-to-bar variation of 0.0002".*

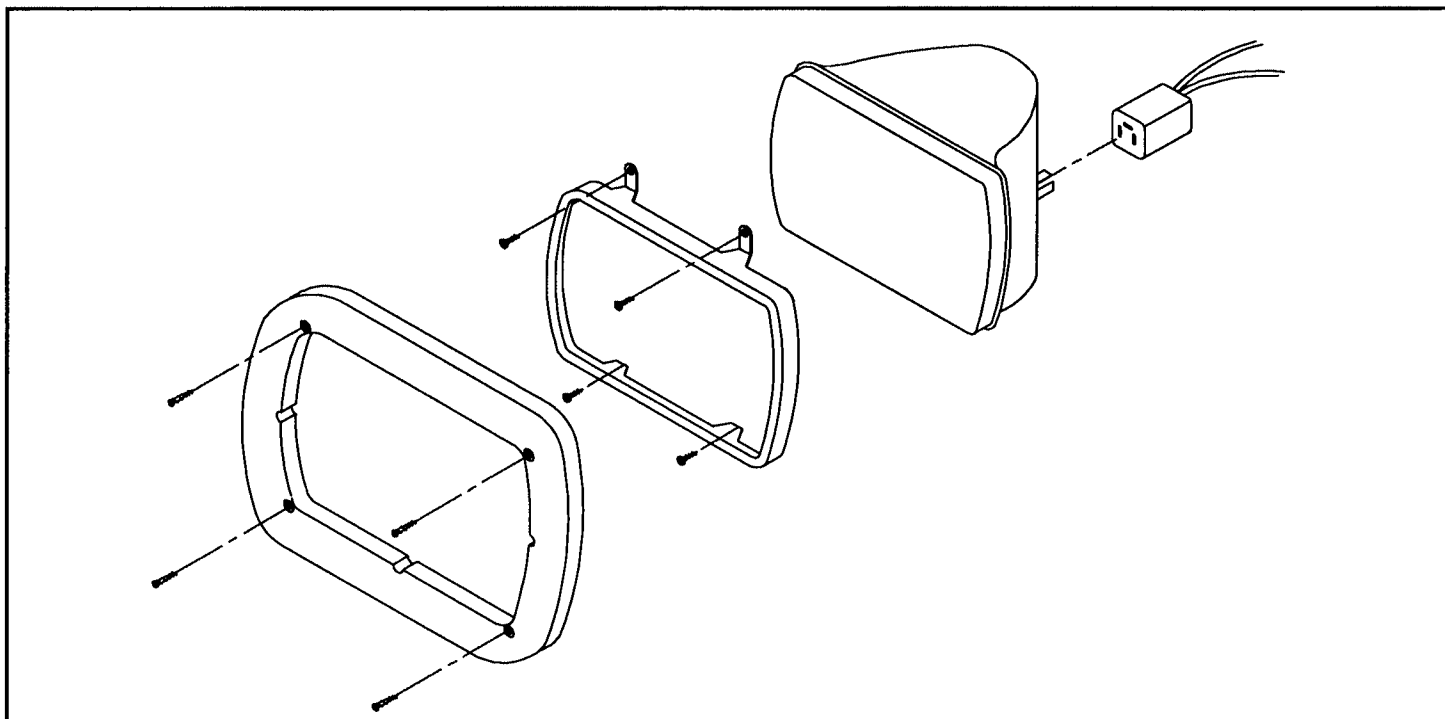
- 6** Measure the commutator diameter. If it is less than 3.81", replace the armature.

- 7** Inspect the mica bar-to-bar insulation. If commutator wear results in flush or protruding mica, the mica should be undercut to a depth of 0.025".

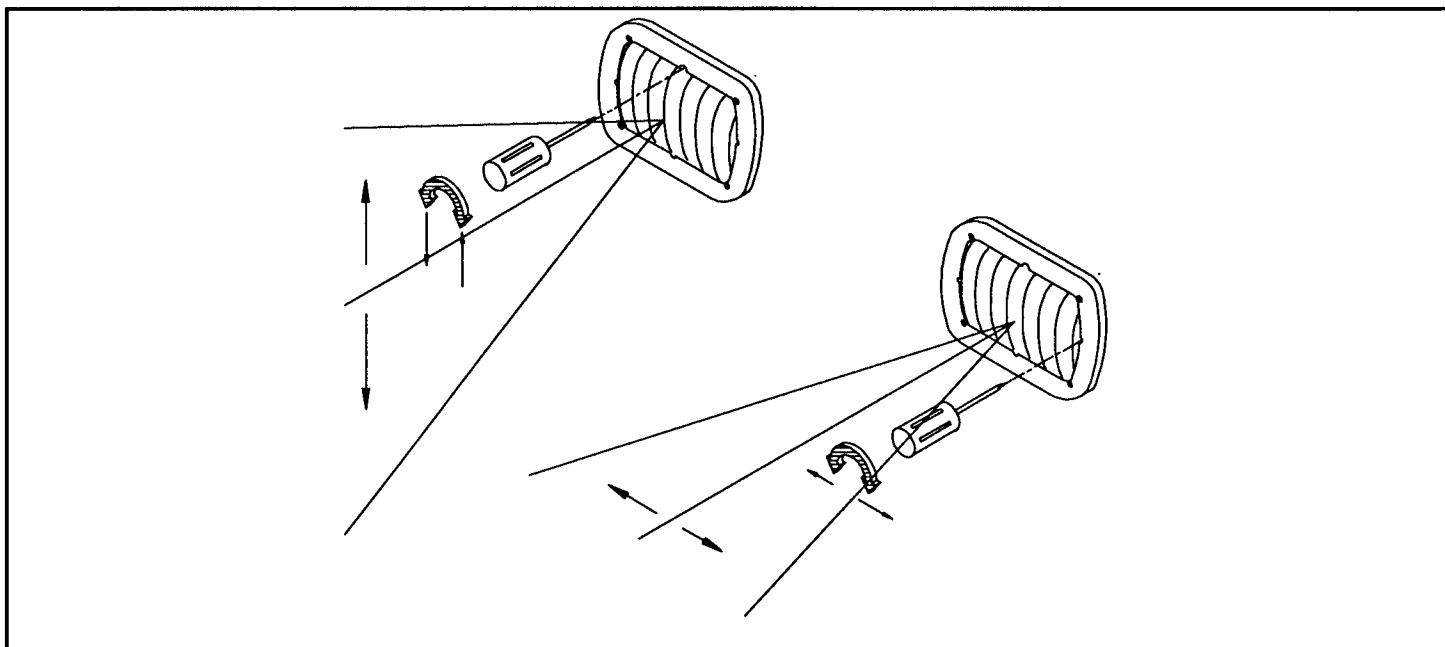
Note: *The undercut slot should be kept clean and free of dirt - clean it before reassembly.*

ACCESSORIES

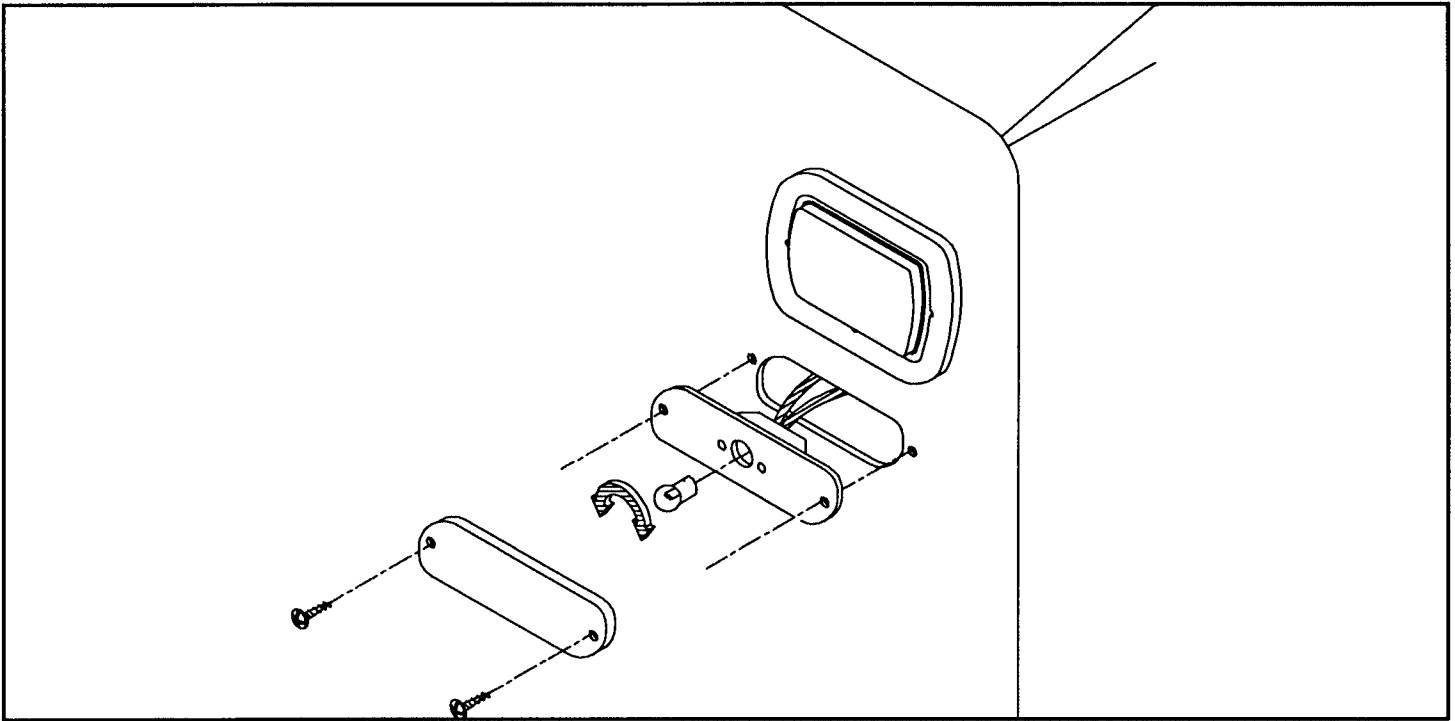
Lights



REPLACING THE HEADLIGHTS

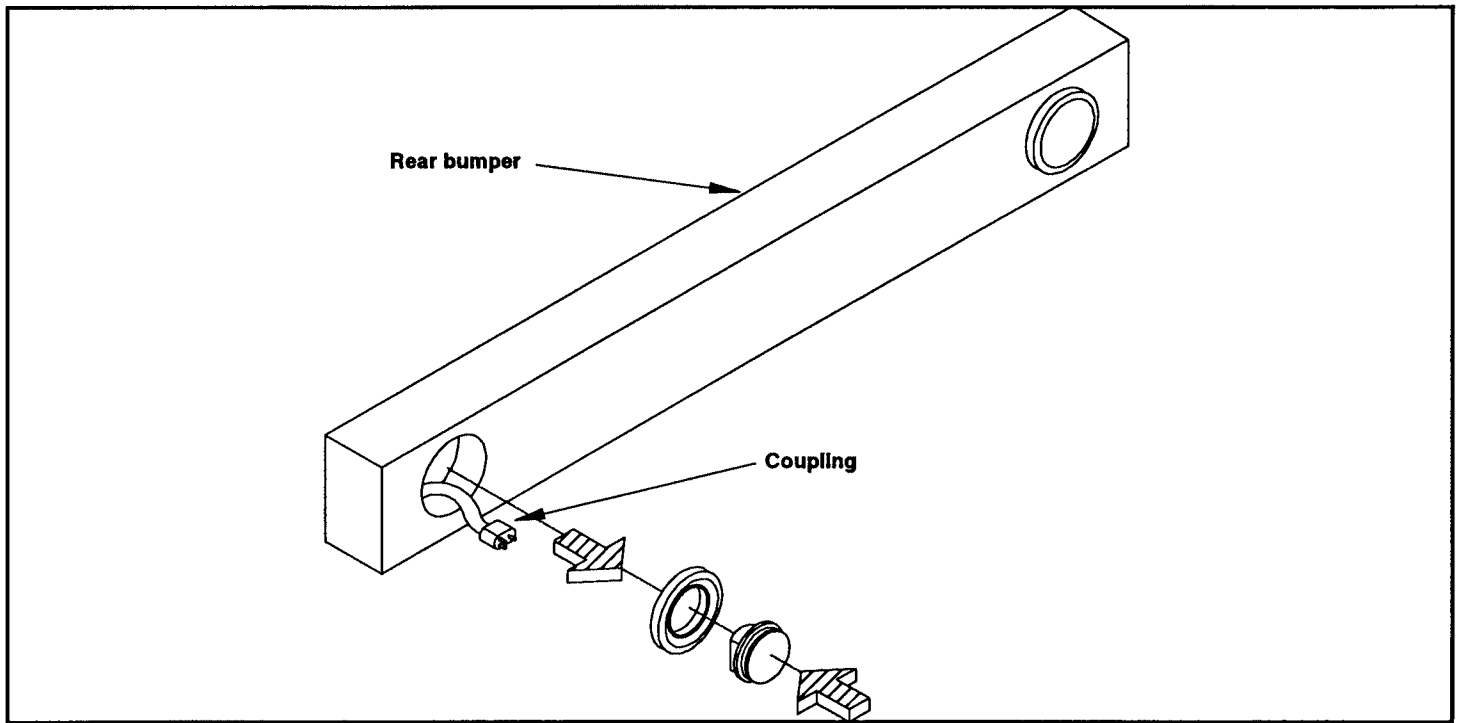


Adjusting the Headlights)



Replacing the Front Park Lights

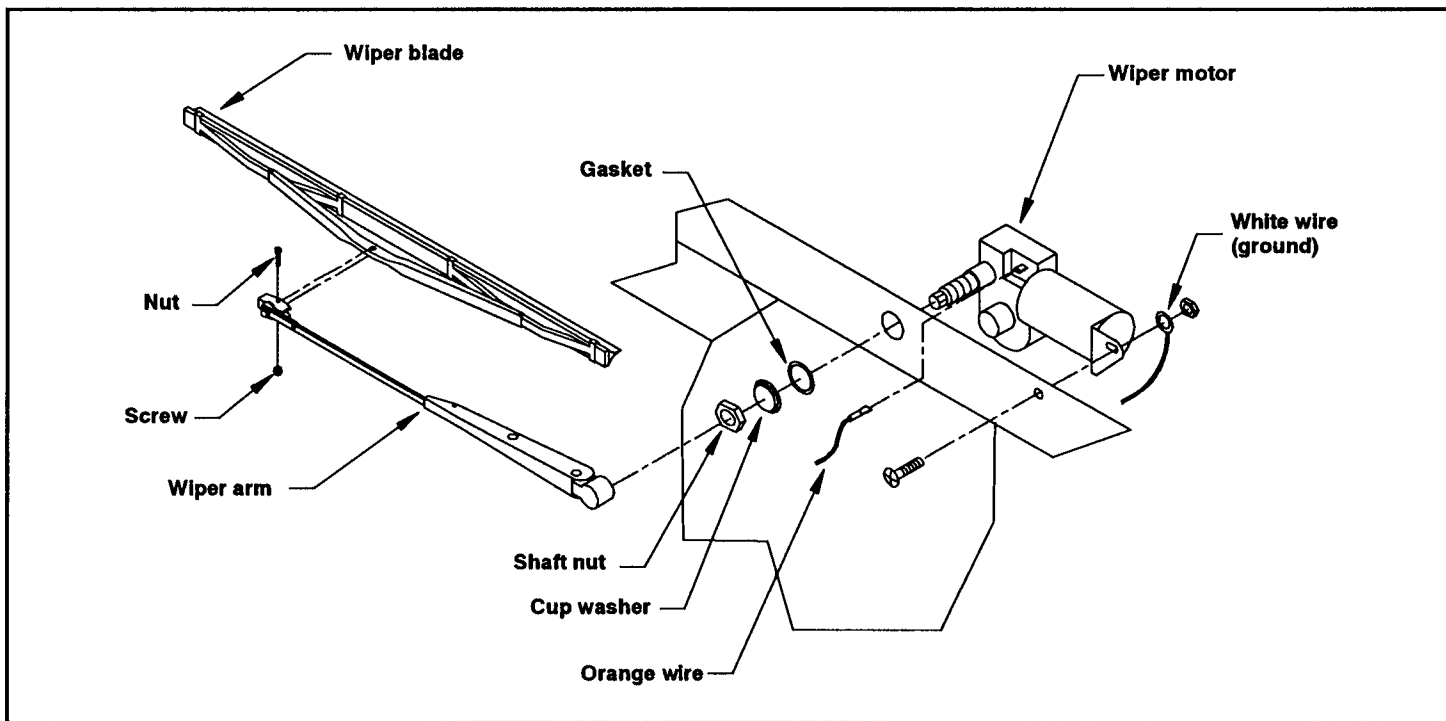
- 1** Remove the two front park light lens mounting screws.
- 2** Remove the park light lens, exposing the bulb.
- 3** Unscrew the bulb.
- 4** Screw the new bulb in.
- 5** Mount the lens with the two screws removed earlier.



Replacing the Stop Lights / Rear Park Lights

- 1** Reach under the bumper, behind the bulb to be replaced, and disengage the electrical coupling from the old bulb.
- 2** Push the bulb towards the rear out of the rubber grommet.
- 3** Push the new bulb from the rear into the rubber grommet.
- 4** Engage the electrical coupling on the new bulb.

Windshield Wiper



Replacing Worn-out Wiper Blades

For maximum visibility, replace worn or cracked wiper blades when you notice they do not wipe the windshield cleanly or smoothly.

- 1** Remove the screw and nut from the blade mounting bracket and remove the wiper blade.
- 2** Insert the new blade in the blade bracket, and attach with the mounting screw and nut.

Replacing the Wiper Motor

Removing the Wiper Arm

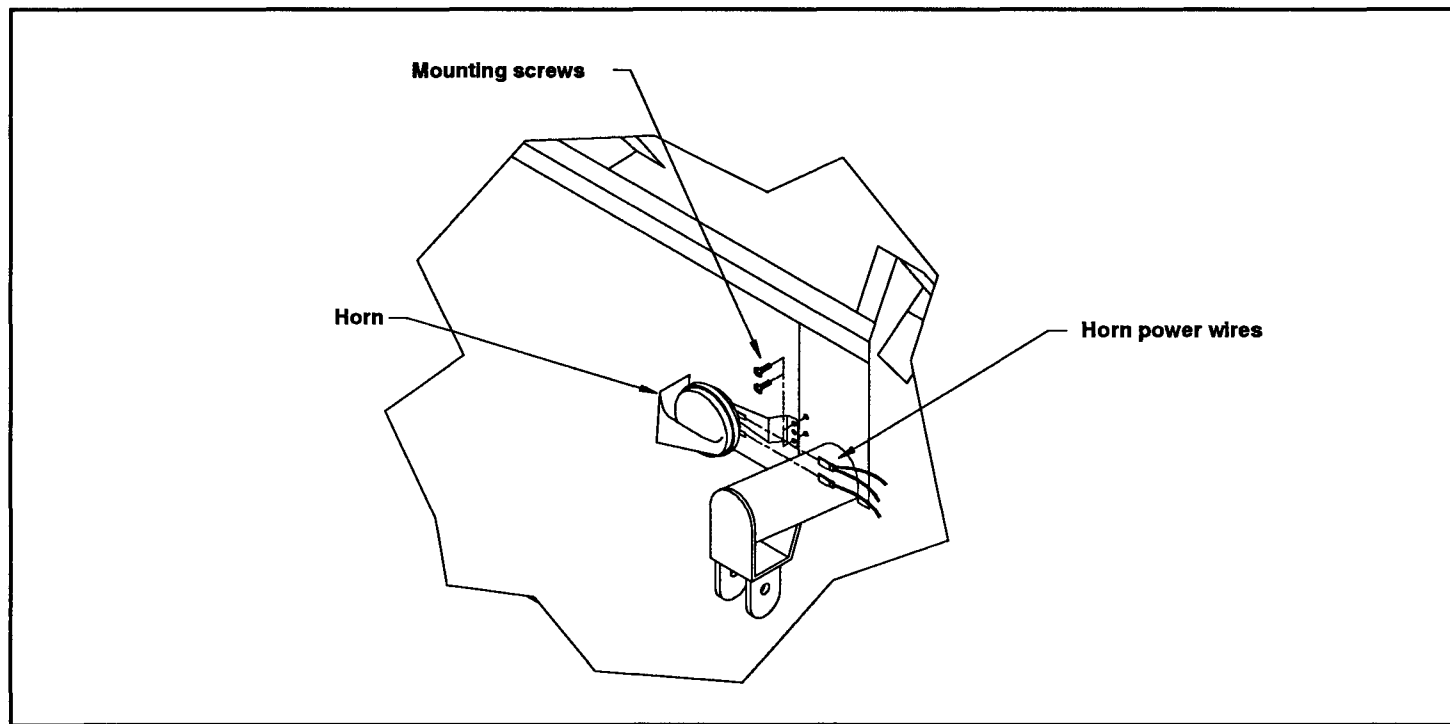
- 1** Use a small flat screw driver to pry up the spring clamp that mounts the wiper arm to the motor shaft, then pull the arm off.
- 2** Remove the nut from the motor mounting screw.
- 3** Remove the ground (white) wire.
- 4** Remove the motor shaft nut.
- 5** Remove the orange wire from the motor terminal and dispose of the old motor properly.
- 6** Scrape the paint off where the ground (white) wire comes in contact with the new motor. Make sure there is metal-to-metal contact between the wire terminal and motor when the nut is tightened.
- 7** Align the motor shaft and mounting hole and install on the frame.
- 8** Tighten the nut to the mounting screw.

- 9** Install the gasket, cup washer and nut on the motor shaft. Tighten the nut securely.

Installing the Wiper Arm

- 1** Turn the wiper on. The motor shaft will turn one way, then stop and turn the other way.
- 2** Turn the motor off when the shaft is all the way to the passenger side.
- 3** Push the wiper arm base down on the motor shaft until the spring clamp clicks into position.
- 4** Test the wiper to make sure it is operating properly - the blade should not hit the windshield frame.

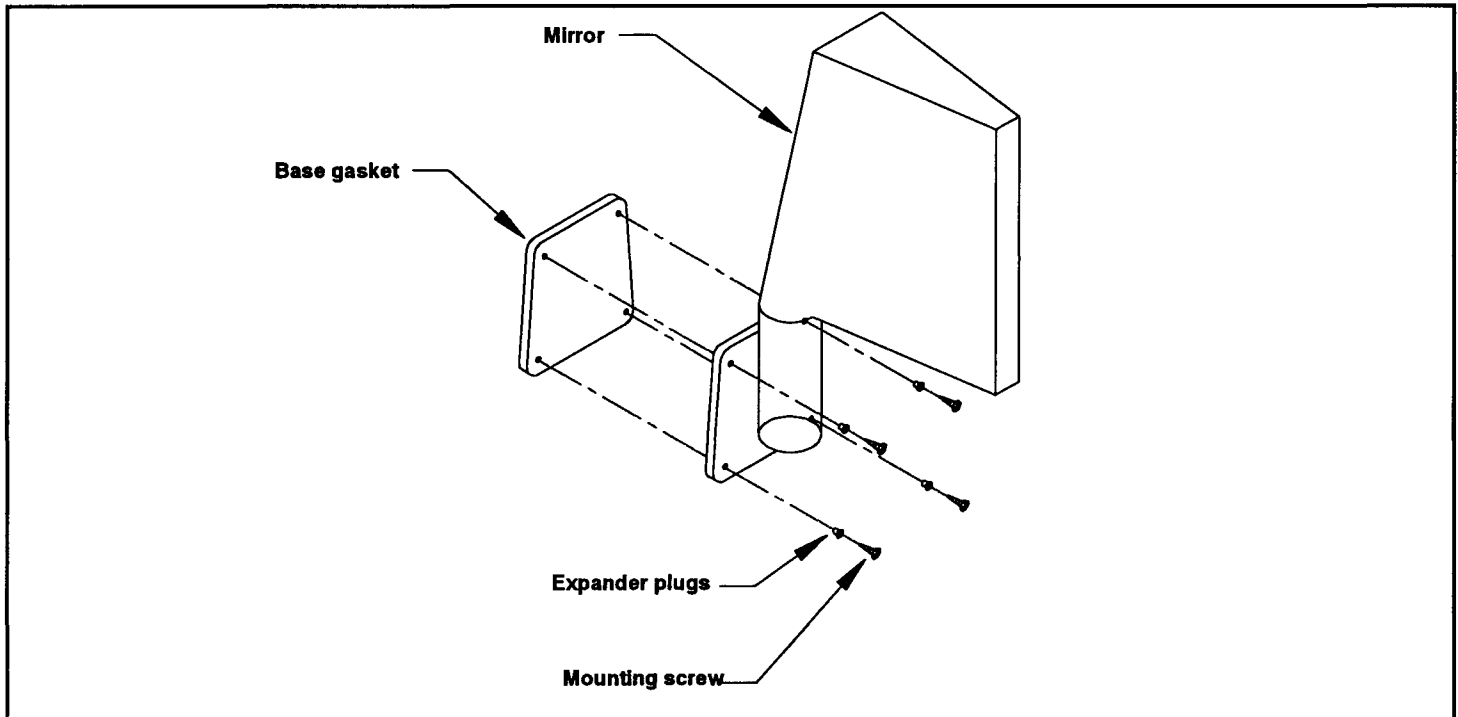
Note: *Spray water on the windshield while testing the wiper. This will prevent the wiper motor from overheating.*



Replacing the Horn

- 1** Disengage the wire terminals from the horn.
- 2** Remove the two mounting screws.
- 3** Install in reverse order.

Side Mirrors



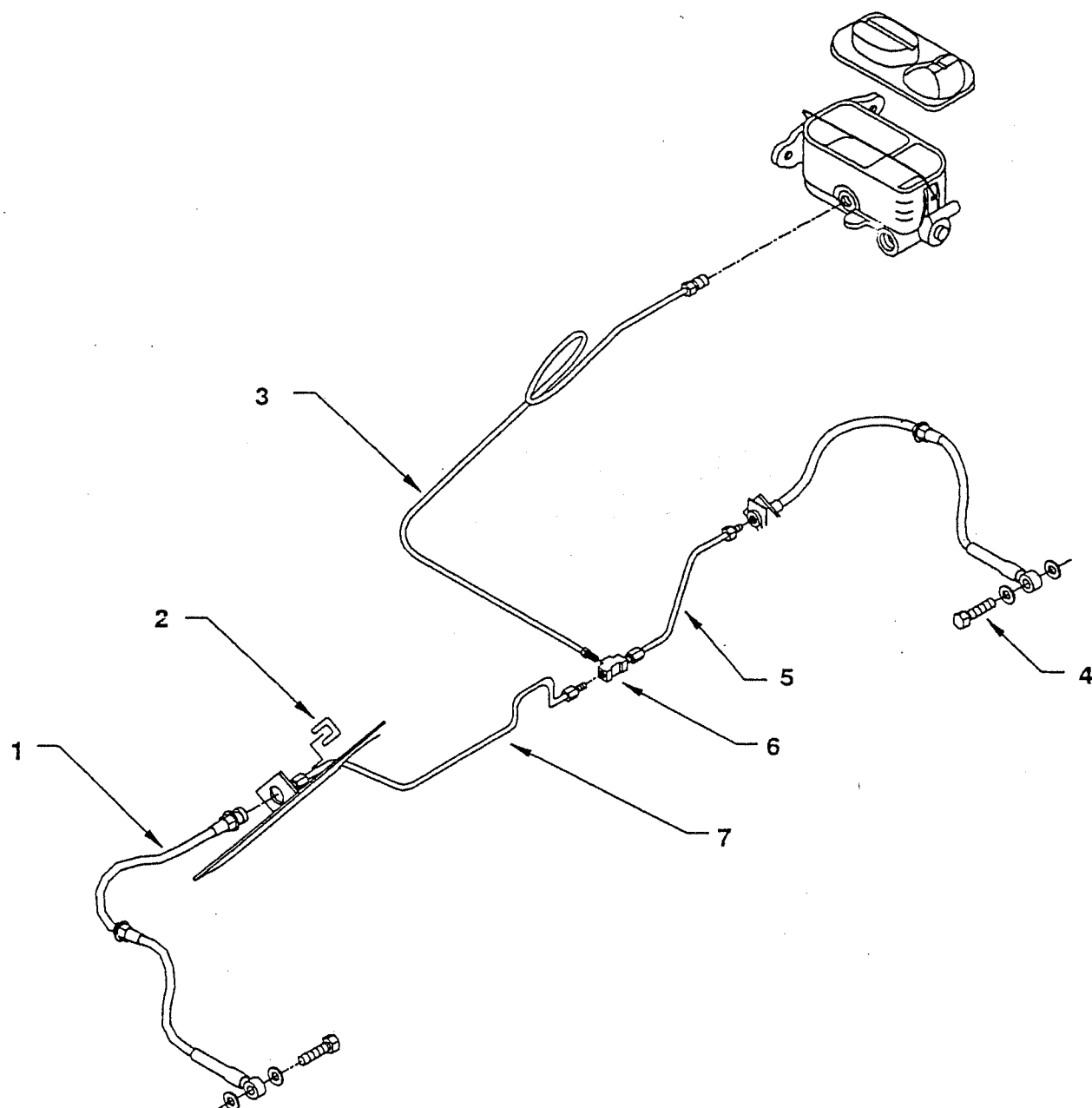
Replacing Side Mirrors

- 1** Unscrew four mounting screws. The side mirror will come off.
- 2** Remove expander plugs from mounting holes.
- 3** Place new expander plugs in mounting holes.
- 4** Align gasket holes and mirror base holes to plugs.
- 5** Install mirror with four mounting screws.

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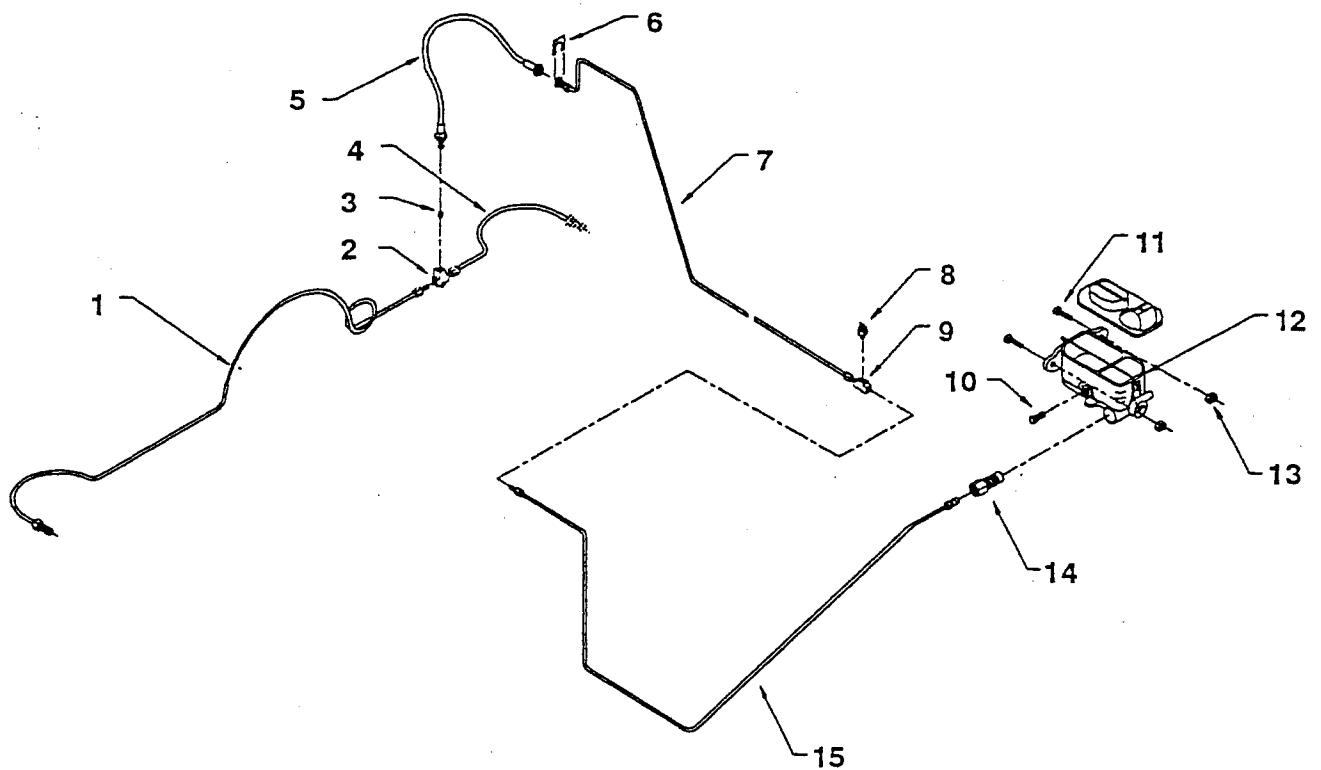
**ILLUSTRATED PARTS
BREAKOUT**

FRONT BRAKE LINES (Optional)



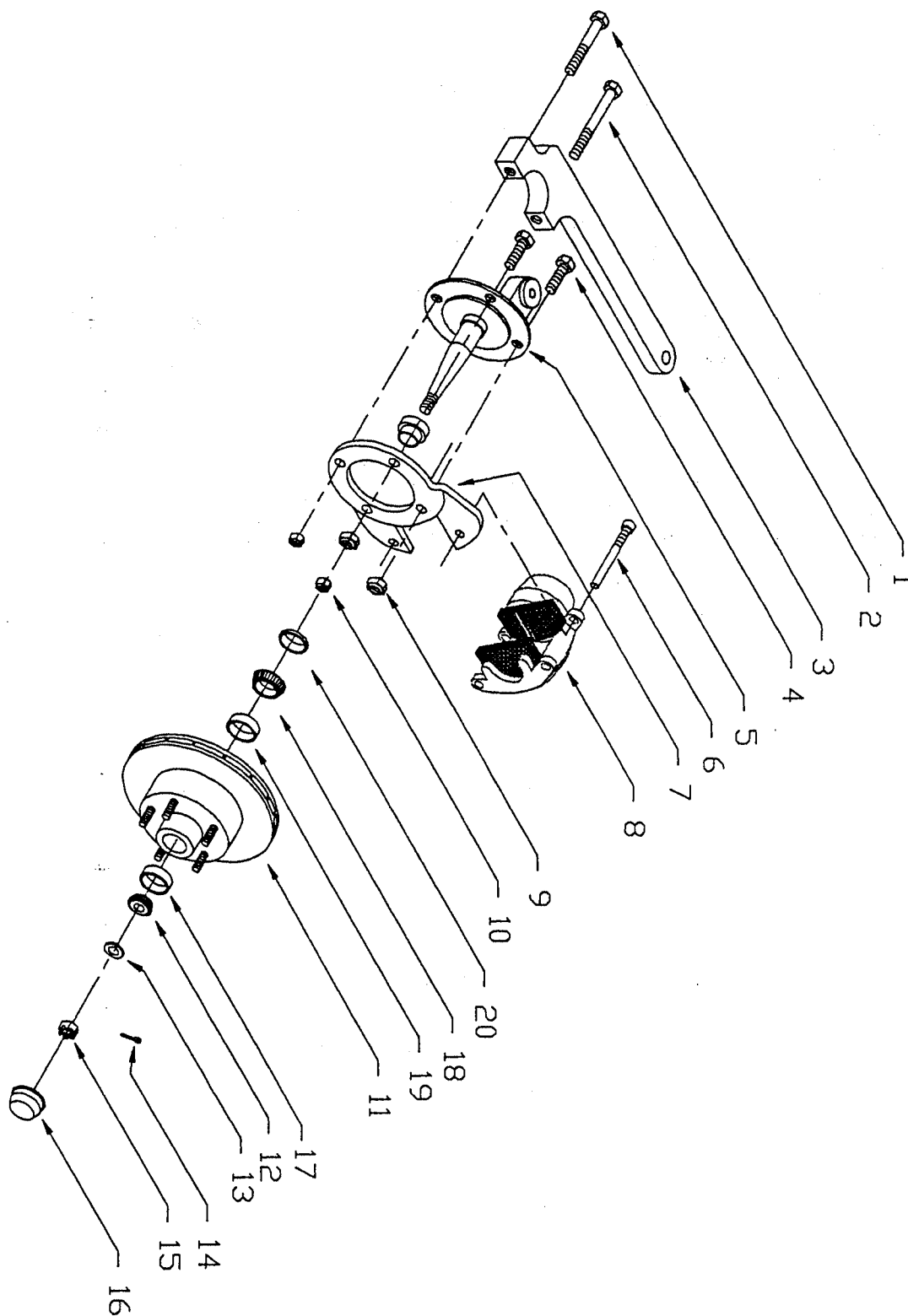
FRONT BRAKE LINES (Optional)			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	99-580-30	Hose, Brake, with Banjo	2
2	99-576-00	Clip	2
3	99-605-72	Brake Line, Front to Master Cylinder	1
4	99-580-31	Bolt, Brake, 10 mm	2
5	99-600-55	Brake Line, Formed, Front Left	1
6	99-591-00	Branch Tee	1
7	99-605-71	Brake Line, Formed, Front Right	1

REAR BRAKE LINES AND MASTER CYLINDER



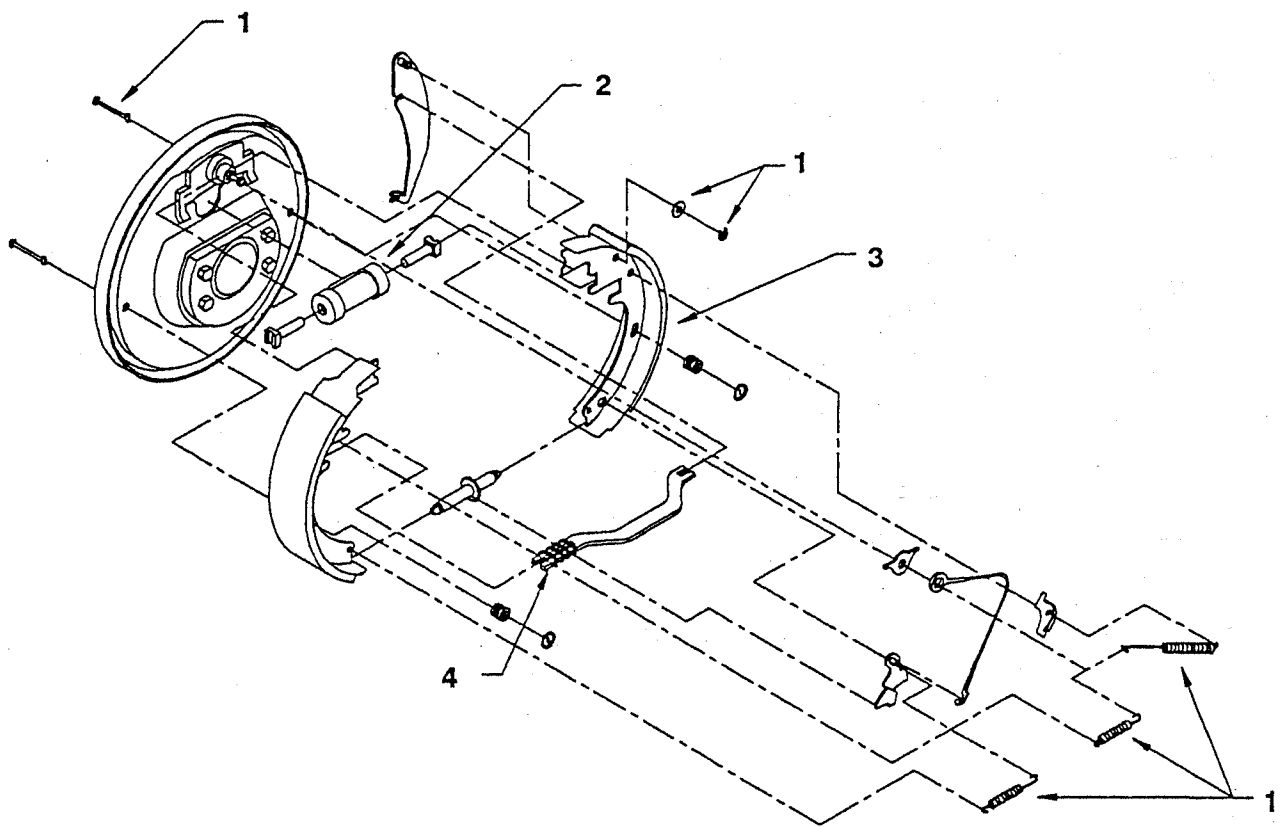
REAR BRAKE LINES			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	99-607-56	Brake Line, Formed, Rear Right	1
2	99-563-00	T-fitting with Mounting Hole	1
3	99-574-00	Ferrel	1
4	99-603-59	Brake Line, Formed, Rear Left	1
5	99-580-00	Hose, Brake, with $\frac{3}{8}$ -24M and $\frac{3}{16}$ TF	1
6	99-576-00	Clip	1
7	99-609-56	Brake Line, Formed, Rear Brake Hose to Switch	1
8	71-110-00	Brake Light Switch, Hydraulic	1
9	99-591-00	Female Branch Tee	1
10	99-598-00	Fitting, Brake Plug (for option without Front Brakes only)	1
11	88-100-15	$\frac{3}{8}$ x $1\frac{3}{4}$ " NC Hex Head Screw	2
12	99-511-50	Master Cylinder	1
13	88-109-81	$\frac{3}{8}$ " NC Locknut	2
14	99-575-20	Adapter, Master Cylinder	1
13	99-607-57	Brake Line, Switch to Master Cylinder	1

FRONT BRAKE ASSEMBLY (Optional)



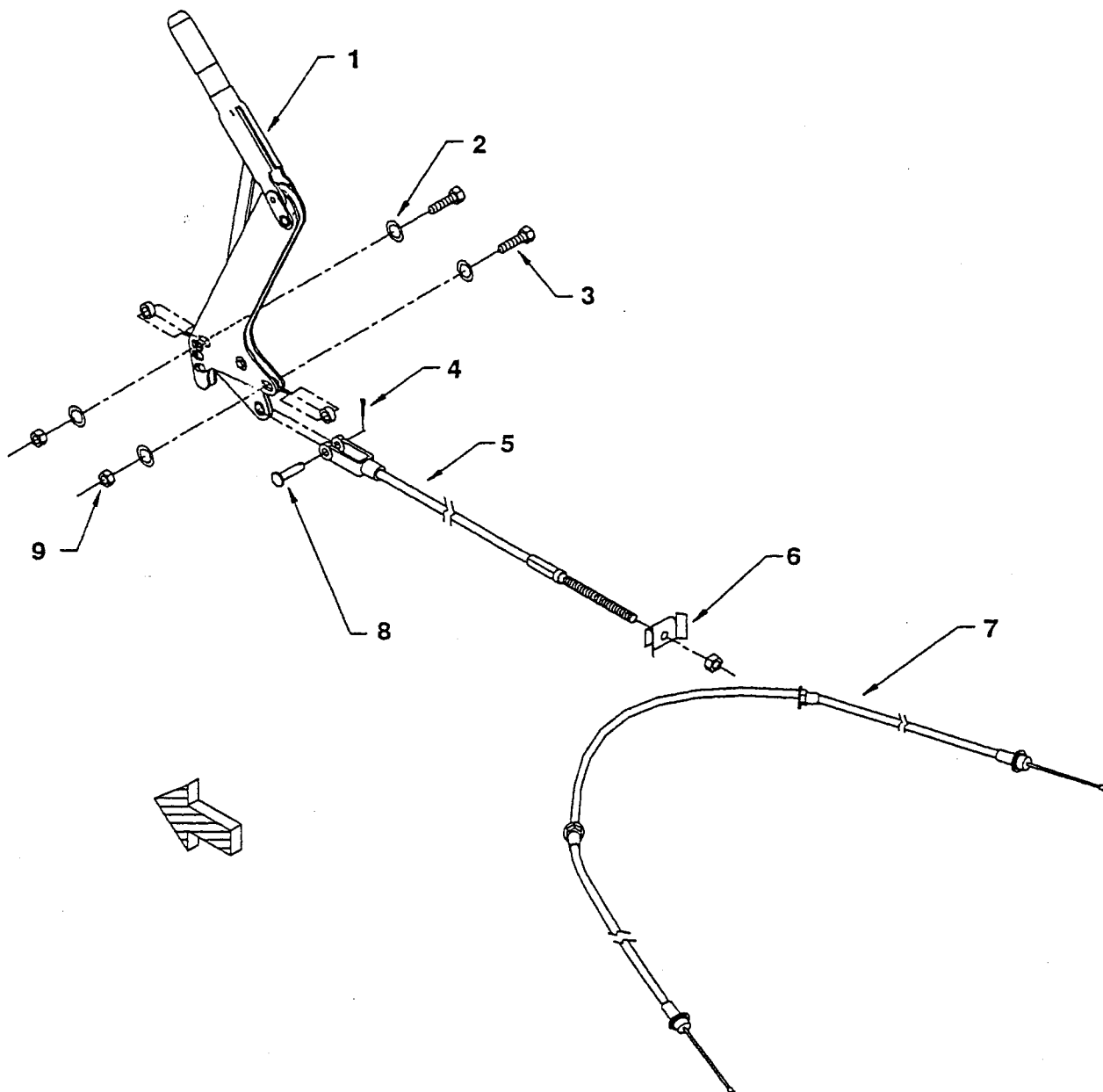
OPTIONAL FRONT BRAKE ASSEMBLY			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	88-130-20	7/16 x 3 NC grade 5 hex bolt	2
2	88-130-25	7/16 x 4 NC grade 5 hex bolt	2
3	*	Steering arm	2
4	88-157-13	1/2 x 1-1/4 NF hex socket bolt	4
5	*	Spindle	2
6	*	Caliper retaining bolt	4
7	41-349-02	Caliper Bracket, right 41-349-22 comes as a set	1
7	41-349-01	Caliper bracket, left with right & left spindles	1
8	41-239-00	Brake caliper W/ pads with kingpin sets	2
9	88-159-86	1/2 lock nut	4
10	88-130-86	7/16 lock nut	4
11	41-349-13	Disc rotor	2
12	80-514-00	Outer bearing	2
13	97-125-00	Washer	2
14	88-527-14	Cotter pin	2
15	88-239-85	Castle nut	2
16	*	Bearing cap	2
17	80-106-00	Outer bearing race	2
18	80-515-00	Inner bearing	2
19	80-108-00	Inner bearing race	2
20	45-309-00	Grease seal	2
	41-349-15	Brake pads (not shown)	2 sets
* Not available at time of printing. Contact your local Taylor-Dunn parts representative for more information.			

REAR BRAKE ASSEMBLY



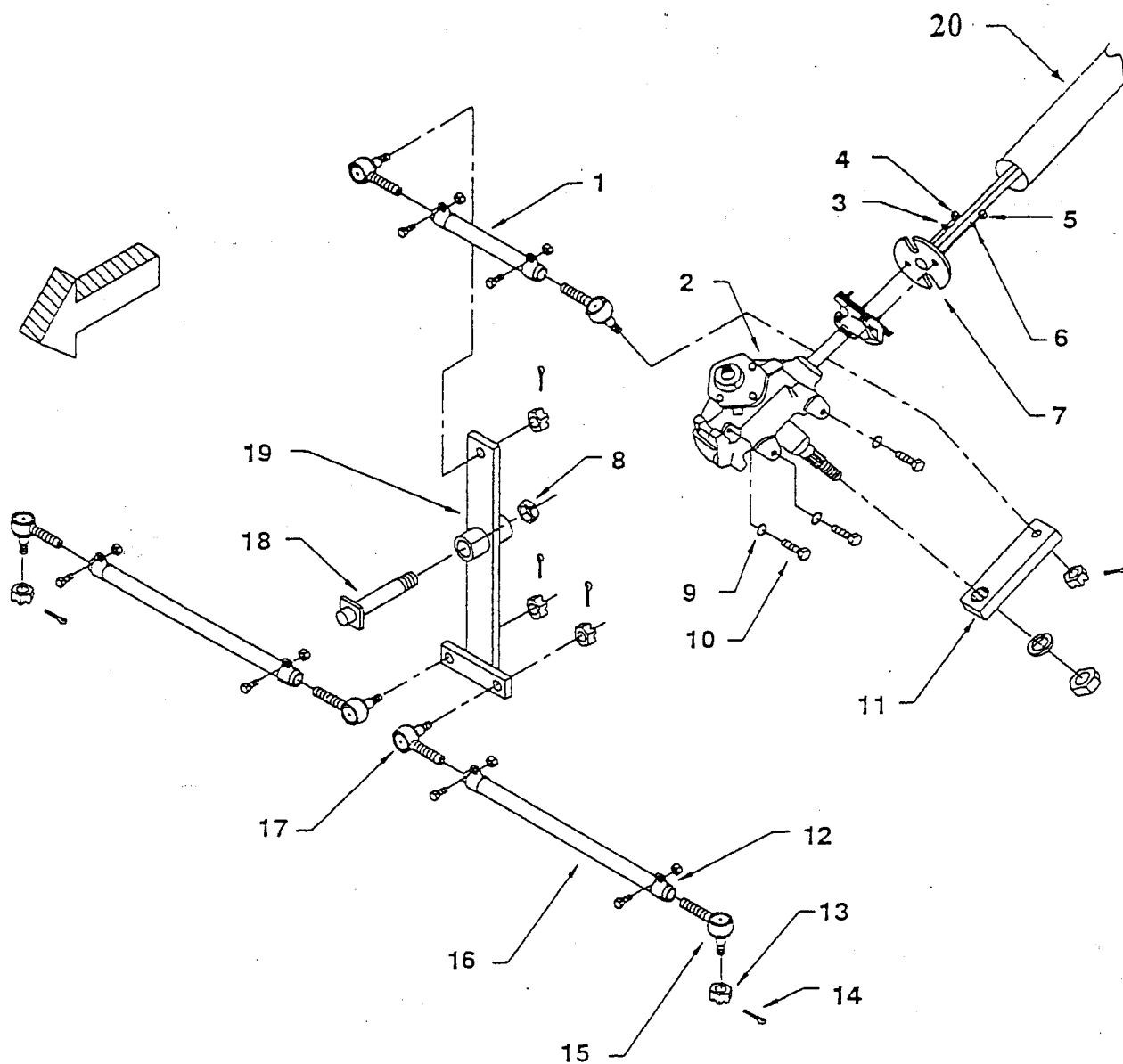
REAR BRAKE ASSEMBLY			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	85-205-61	Spring Kit	1
2	99-504-00	Cylinder, Wheel	2
3	41-632-00	Brake Shoes, 11" (Set of four)	1
4	85-000-02	Park Brake Link Spring	2

PARK BRAKE ASSEMBLY



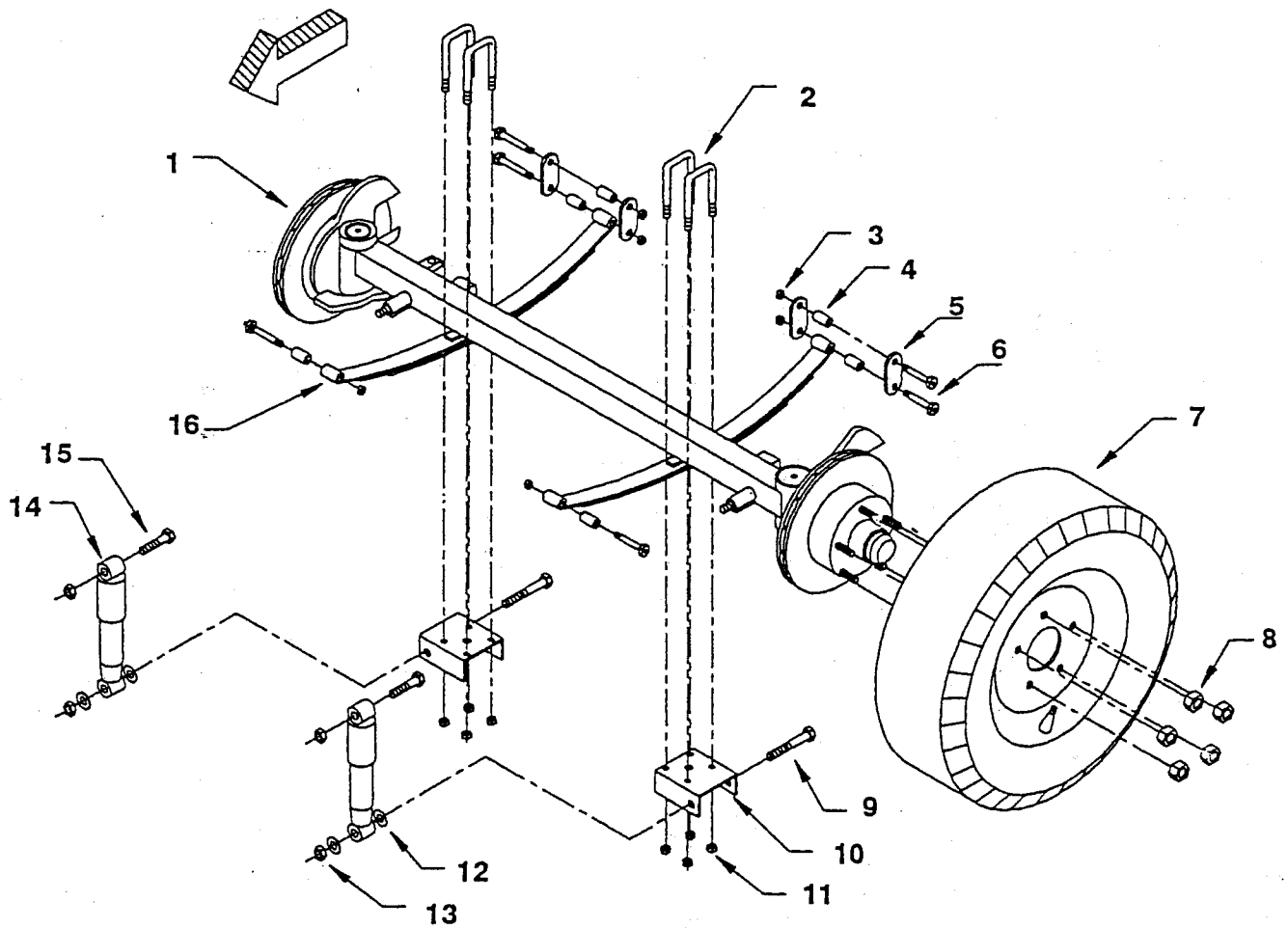
PARK BRAKE ASSEMBLY			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	51-340-00	Hand Park Brake Lever	1
2	88-108-60	$\frac{3}{8}$ " Washer	4
3	88-100-15	$\frac{3}{8}$ x $1\frac{3}{4}$ " Hexagonal Head Screw	2
4	88-527-14	$\frac{1}{8}$ x $\frac{1}{2}$ " Steel Cotter Pin	1
5	96-820-01	Cable Assembly, Adjustable	1
6	41-311-20	Equalizer, Loop Brake Cable	1
7	96-826-14	Cable, Park Brake	1
8	96-773-00	Pin, Clevis, $\frac{3}{8}$ x 1"	1
9	88-109-81	$\frac{3}{8}$ " NC Locknut	2

STEERING GEARBOX AND LINKAGES



STEERING GEARBOX AND LINKAGES			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	18-040-07	Steering sleeve	1
2	18-308-20	Steering gear	1
3	88-88-62	5/16 Split lock washer	1
4	88-099-80	5/16 NF Hex nut	1
5	88-119-80	3/8 NF Hex nut	1
6	88-108-62	3/8 Split lock washer	1
7	20-031-55	Steering shaft	1
8	88-289-81	7/8 Thin pattern lock nut	1
9	88-128-62	7/16 Split lock washer	3
10	88-120-11	7/16 x 1 NC Hex bolt	3
11	18-104-10	Steering lever	1
12	86-510-00	Ball joint clamp	6
13	88-159-85	1/2 NF Slotted (castle) nut	6
14	88-527-14	1/8 x 1 1/2 cotter pin	6
15	86-501-98	Ball joint (left)	3
16	18-045-00	Steering sleeve	2
17	86-501-99	Ball joint (right)	3
18	21-009-15	King pin	1
19	18-104-31	Steering pivot	1
20	00-155-35	Steering column	1
NOT SHOWN	19-011-20	Steering wheel	1
	88-199-82	Steering wheel nut	1
	71-501-56	Steering wheel cap	1
	71-501-55	Horn button	1

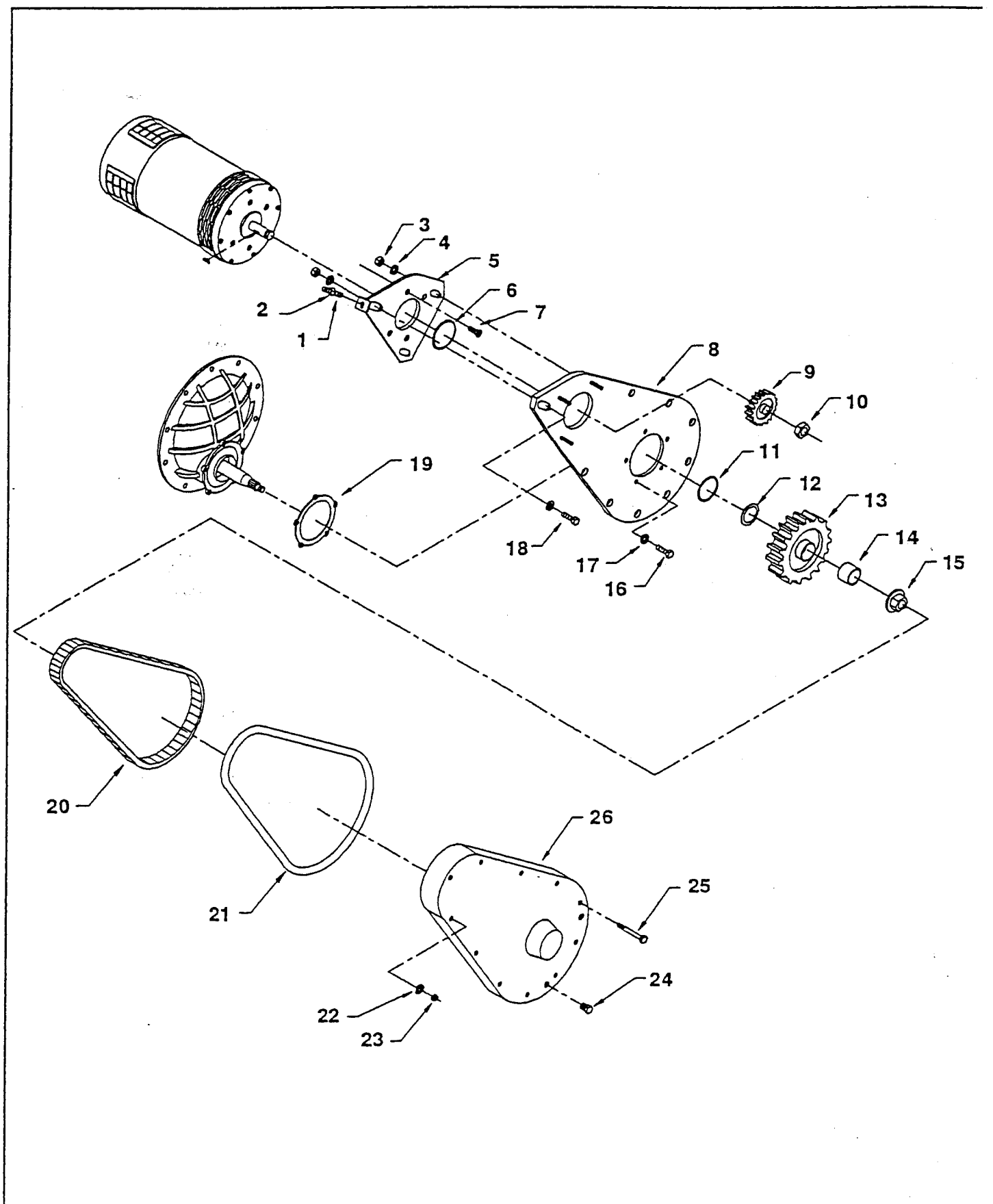
FRONT AXLE AND SUSPENSION



FRONT AXLE AND SUSPENSION			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	15-150-20	Axle, Front, w/o Brakes	1
1A	15-150-10	Axle, Front, w/ Optional Front Brakes (Not Shown)	1
2	96-123-02	U-bolt, $\frac{3}{8}$ NC x 2 x $4\frac{3}{4}$ " Long	4
3	88-169-82	Locknut, $\frac{9}{16}$ " NF, Grade C	6
4	32-213-00	Bushing, $\frac{3}{4}$ OD x 0.6 ID x 1.65	2
5	16-870-10	Link Plate, $2\frac{1}{4}$ ", Zinc Plated	6
6	96-248-01	Bolt, Spring, with Grease Fitting	6
7	13-770-00	Wheel	2
8	97-236-00	$\frac{1}{2}$ " Tapered Lug Nuts	10
9	88-180-31	$\frac{5}{8}$ x 6" NC Hex Head Screw	2
10	00-243-11	Plate, Spring	2
11	88-109-81	$\frac{3}{8}$ " NC Locknut	8
12	88-188-66	Washer, $\frac{5}{8}$ " SAE Plain	4
13	88-189-81	$\frac{5}{8}$ " NC Nylock Hex Nut	4
14	86-000-00	Shock Absorber	2
15	88-180-18	$\frac{5}{8}$ x $2\frac{1}{2}$ " NC Hex Head Screw	2
16	85-512-50	Spring, 3-leaf	2

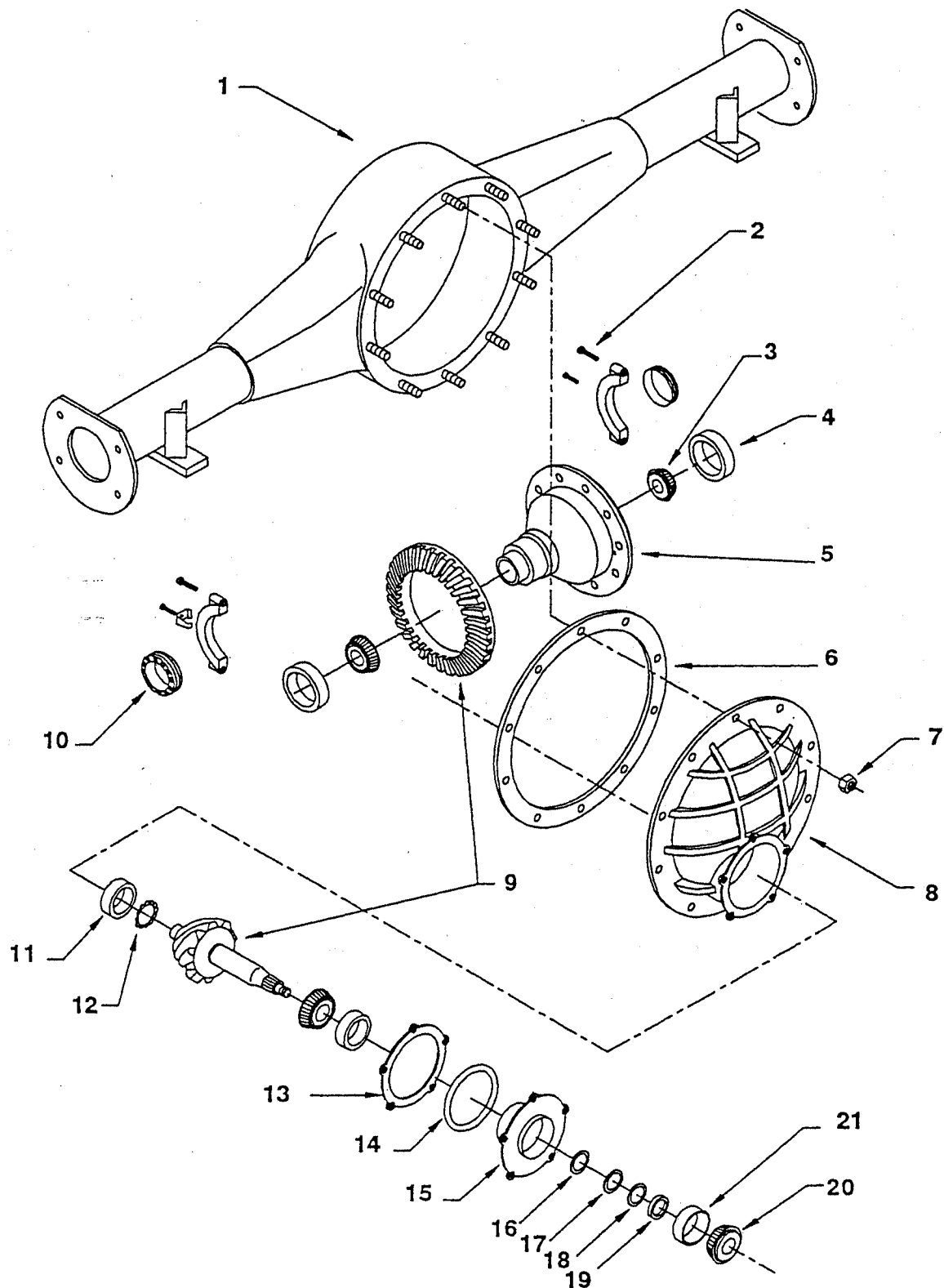
Replacement kit available for the king pins is now available. The part number is 21-012-20. This should be added to the front axle parts drawing. The kit includes two king pins, king pin bushings, thrust bearings felt and cap washers, hardware. Bushings must be reamed to 0.8135/0.8125 after installation.

POWER TRACTION DRIVE



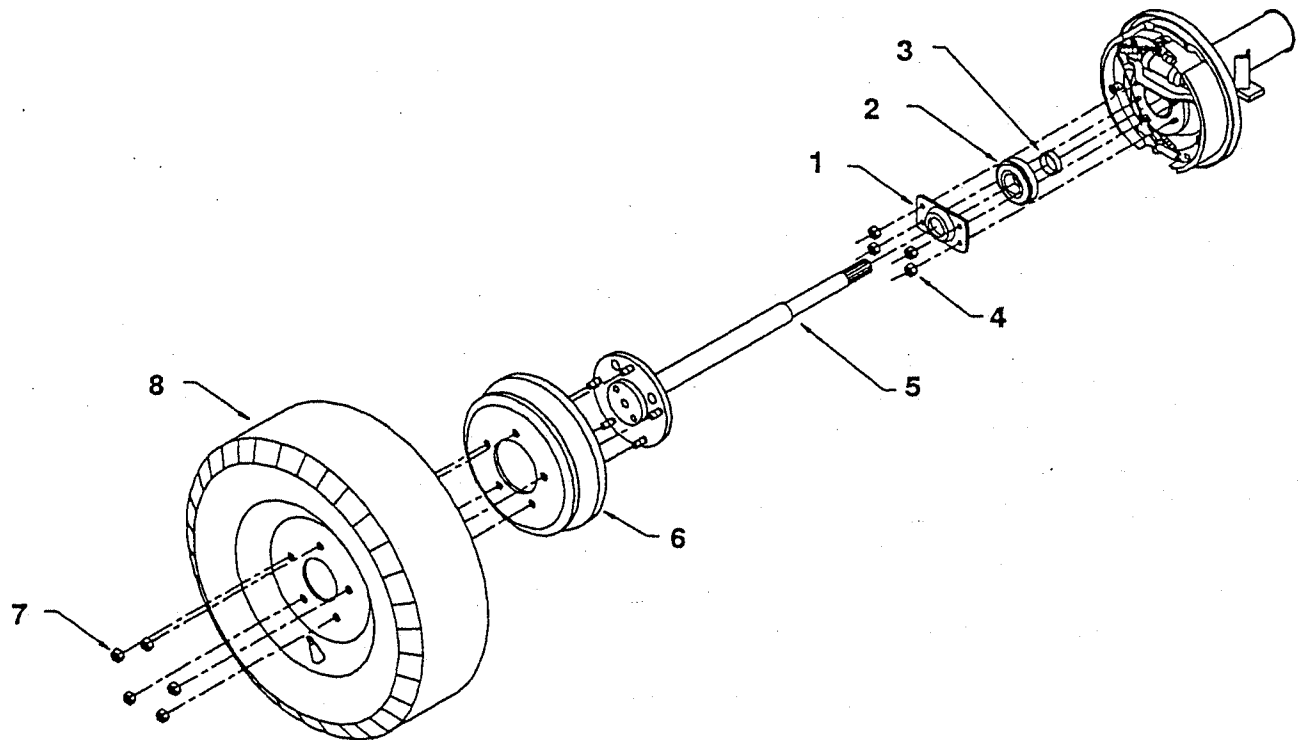
POWER TRACTION			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	88-087-11	5/16 x 1" NC Socket Set Screw	1
2	88-089-80	Nut, Hex Head, 5/16" NC	1
3	88-109-87	3/8 NC Keps Nut	3
4	88-108-60	3/8" Washer, Flat Cut	4
5	70-454-00	Plate, Motor Mounting and Adjusting	1
6	80-703-00	O-Ring, Motor Mount Plate Seal	1
7	88-103-09	3/8 x 3/4" Socket Flat Screw	4
8	44-352-53	Plate, Chain Case Backing	1
9	30-081-00	Sprocket, Silent Chain, 14 tooth	1
10	88-239-82	Hex Nut, 3/4" NF, Thin Pattern	1
11	16-420-00	Spacer, .010"	1
12	16-415-00	Spacer, F2 Axle	1
13	30-093-00	Sprocket, Silent Chain, 81 tooth	1
14	16-423-00	Spacer, Sprocket	1
15	97-250-00	Nut, Pinion, 3/4"	1
16	88-101-13	3/8 x 1 1/4" Grade 5 Bolt	5
17	88-108-63	Lockwasher, 3/8", Internal Tooth	5
18	88-101-13	3/8 x 1 1/4" Bolt	1
19	45-021-00	Gasket	1
20	30-508-20	Chain, Silent, Single Side Guide	1
21	45-002-00	Gasket, Gear Case	1
22	88-088-61	Washer, 5/16" SAE	12
23	88-089-81	Locknut, 5/16" NC	14
24	41-989-00	Drain Plug	2
25	88-080-20	5/16 x 3" NC Hex Bolt	9
26	43-201-20	Cover, Chain Case	1

DIFFERENTIAL



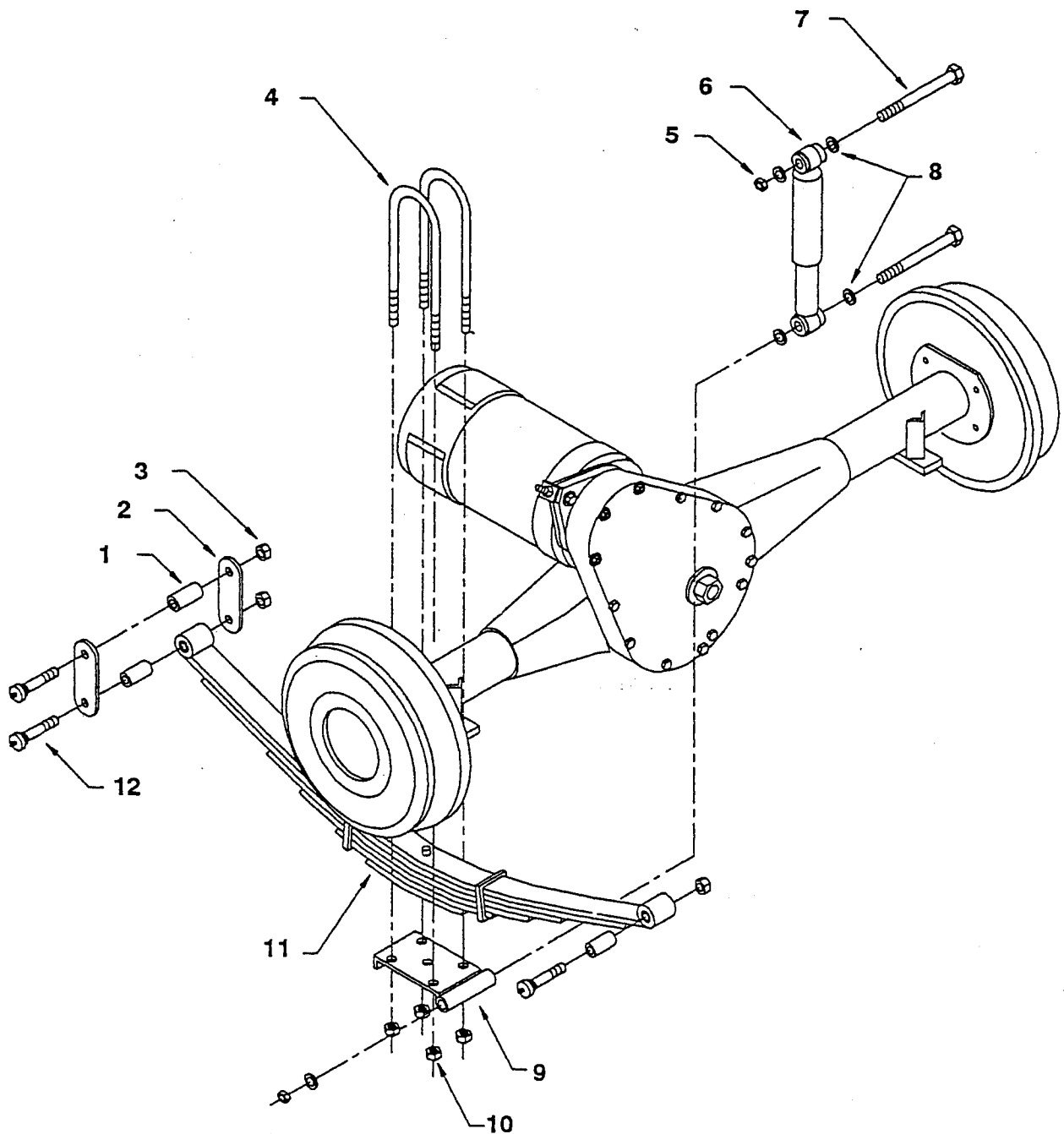
DIFFERENTIAL (4Z-078-22)			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	41-292-10	Housing, Differential, F2, 48.5" , Bottom Spring	1
2	88-140-16	Screw, Hex Head Cap, NC, 1/2 x 2"	2
3	80-513-00	Bearing, Roller	2
4	80-129-00	Bearing Race, Tapered	2
5	41-713-00	Differential Gear Base Assembly	1
6	45-042-00	Gasket, Differential Housing	1
7	88-119-80	3/8" NF Locknut	10
8	41-710-05	Cover, Differential Housing	1
9	31-239-50	Ring and Pinion gear set, 6.50 ratio	1
10	41-707-00	Adjusting Nut, Differential Bearing	2
11	80-555-00	Bearing, Ball Pinion	1
12	41-714-00	Retainer, Bearing	1
13	41-711-00	Shim, Pinion	1 - 3
14	80-702-00	O-ring, Pinion	1
15	44-340-91	Flange, Ring Gear, Pinion Bearing	1
16	16-415-00	Spacer, F2 Axle	1
17	16-419-00	Spacer, .002"	2 - 6
18	16-411-00	Spacer, .005"	2 - 6
19	16-420-00	Spacer, .010"	2 - 6
20	80-554-00	Pinion bearing	2
21	80-125-00	Bearing Race, Tapered	2
22	44-340-80	Differential assembly, with 6.5 ring and pinion ratio and 1330 U-joint yoke, F2 (includes items 2 - 5, 7 - 21)	1
* Available from Manufacturer at time of printing. Contact Taylor-Dunn or your local Taylor-Dunn dealer for more information.			

REAR AXLE AND WHEEL



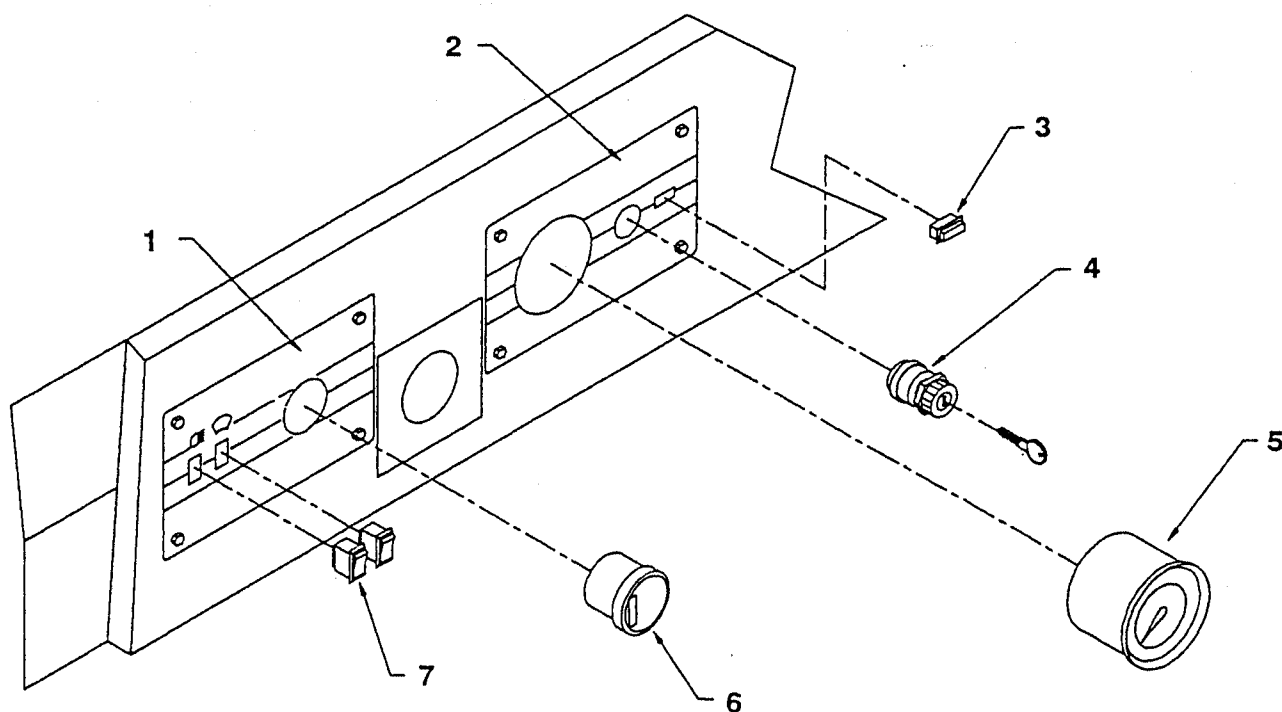
REAR AXLE			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	32-514-02	Plate, Retainer, Rear Axle	2
2	80-503-00	Ball Bearing, Rear Axle	2
3	32-515-00	Ring, Retainer, Rear Axle	2
4	88-159-84	Locknut, 1/2" NF	8
5	41-168-20	Axle, Rear, 26", with Short Stud and Bearing	2
6	41-533-02	Drum, Brake, 11" ID, 5 x 5 1/2"	2
7	97-236-00	1/2" Tapered Lug nuts	10
8	13-770-00	Wheel	2

REAR AXLE SUSPENSION



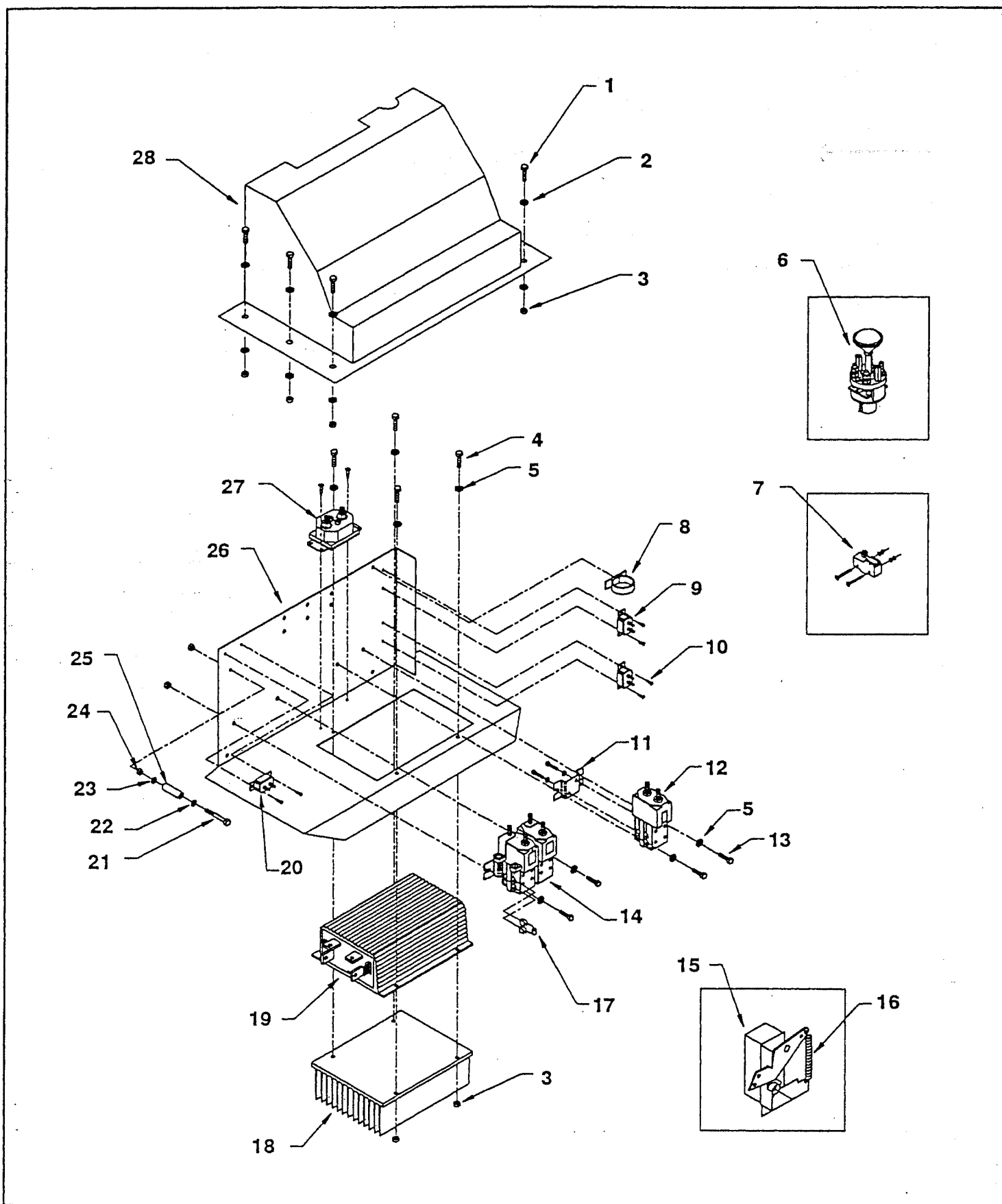
REAR AXLE SUSPENSION			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	32-213-00	Bushing	2
2	16-871-02	Strap, Shackle, 3½" Centers	4
3	88-169-82	Locknut, 9/16" NF, Grade C	6
4	96-122-00	U-bolt, Differential	4
5	88-189-81	5/8" NC Nylock Hex Nut	4
6	86-000-00	Shock Absorber	2
7	88-180-31	5/8 x 6" NC Hex Head Screw	4
8	88-188-66	Washer, 5/8" SAE Plain	8
9	00-243-06	Weldment, Shock Mount, Lower	2
10	88-159-84	1½-20 Locknut	8
11	85-515-00	Spring, 6-leaf	2
12	96-248-01	Bolt, Spring, with Grease Fitting	6

INSTRUMENT PANEL



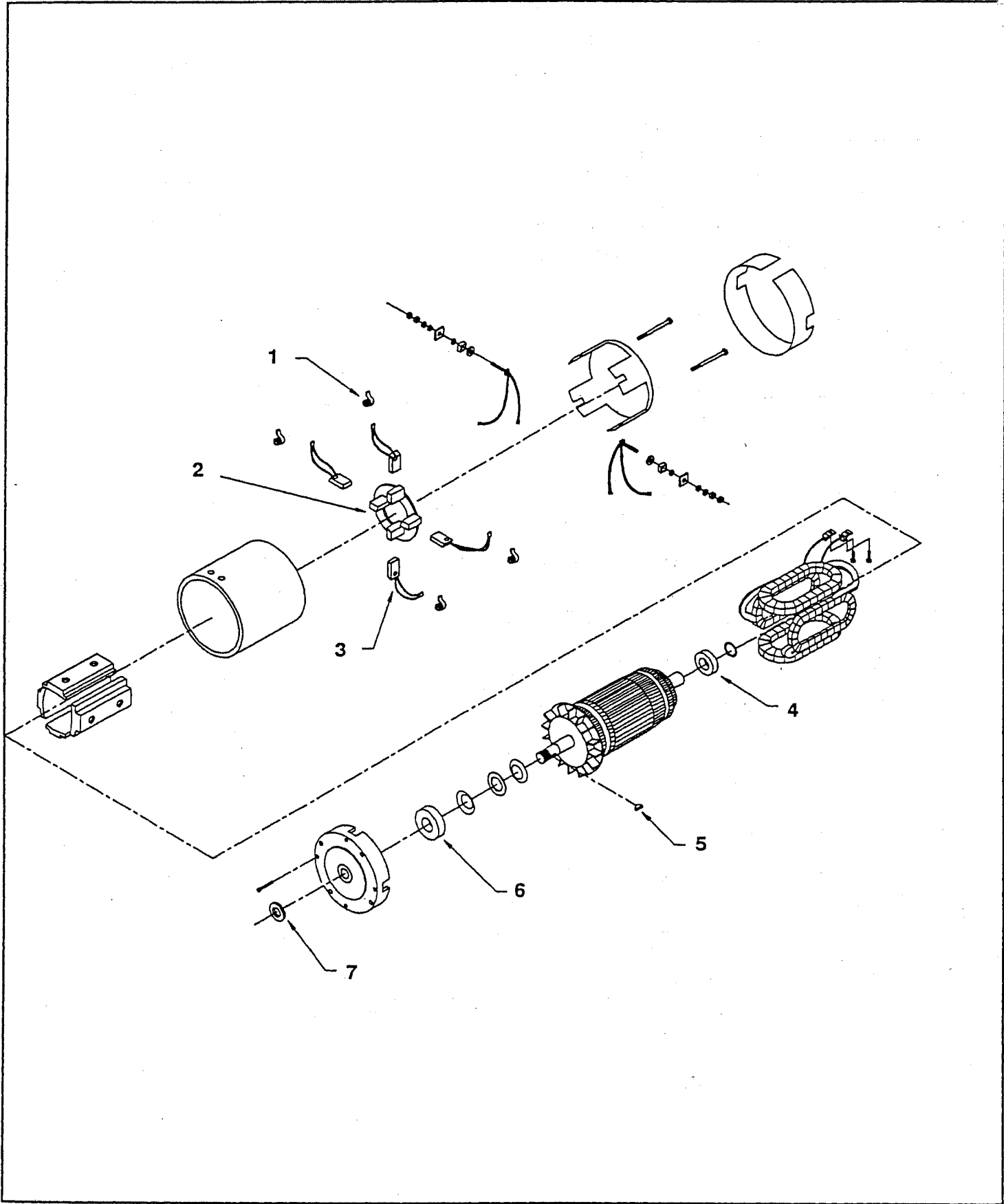
INSTRUMENT PANEL			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	94-313-11	Panel, Dash, Left (Includes #6 & 7)	1
2	94-313-12	Panel, Dash, Right (Includes #3, 4 and 5)	1
3	72-028-25	Power-on Light	1
4	71-120-00 →	Keyswitch and Key 71-121-10	1
5	74-020-00	Speedometer	1
6	74-009-30	Indicator, Battery Status	1
7	71-038-10	Switch, Rocker	2

SPEED CONTROL



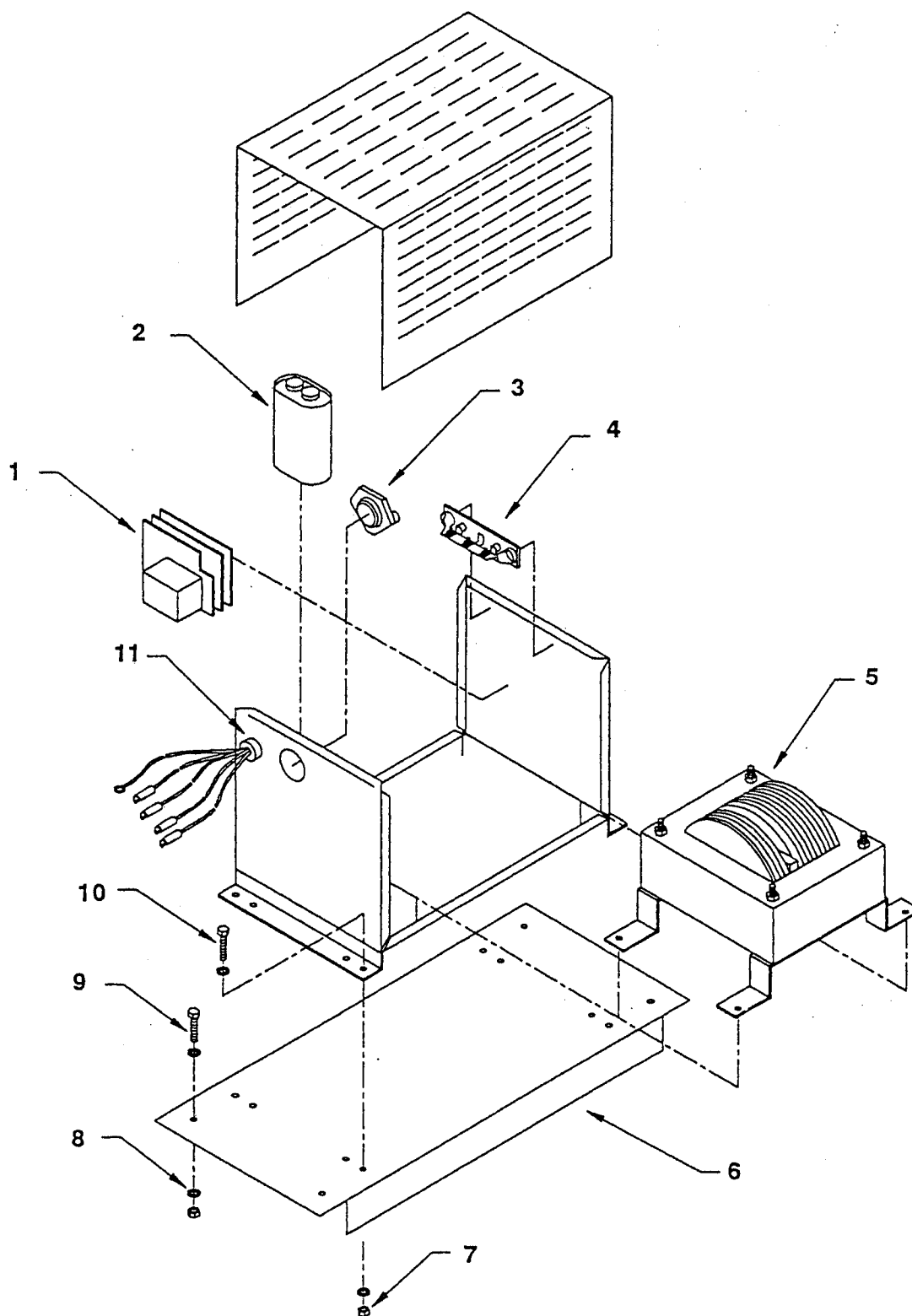
SPEED CONTROL			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	88-060-12	1/4 x 1 1/8" NC Hex Bolt	6
2	88-068-60	1/4" Cut Washer	6
3	88-069-81	1/4" NC Nylon Insert Lock Nut	15
4	88-067-12	1/4 x 1" NC Hex Bolt	4
5	88-068-62	1/4" Lock Washer	8
6	71-124-00	Switch, Emergency Disconnect	1
7	71-130-01	Switch, Forward-Reverse	2
8	96-642-00	Clamp, 3/4 Wire, Push Mount	2
9	79-840-20	Circuit Breaker, 20A, Auto-reset	1
10	88-818-06	#8 x 1/2" Pan Head Screw, Type B Threaded	8
11	71-300-01	Bracket, Mounting	1
12	71-300-00	Contactor, Isolator	1
13	88-060-09	1/4 x 3/4" NC Hex Bolt	4
14	71-300-10	Contactor, Forward-Reverse	2
15	62-033-56	Assembly, Accelerator Module, 48/72 Volts (Includes 15A and 16)	1
15A	85-352-35	Spring, Torsion (Not Shown)	1
16	85-295-00	Spring, Extension	1
17	79-730-05	Diode Assembly with Terminals	3
18	62-209-71	Heatsink, 1209-Type Control	1
19	62-209-70	Controller, 400A, 48 - 72 Volts, EEC	1
20	79-840-00	Circuit Breaker, 10A, Auto-reset	1
21	88-060-18	1/4 x 2 1/2" NC Hex Head Screw	1
22	88-088-61	5/16" SAE Washer	1
23	97-126-10	3/8" Washer, Wavy	1
24	88-069-87	1/4" NC Hex Keps Nut	1
25	78-308-23	Resistor, 700 Ohms, 12 W	1
26	01-155-79	Panel, Control	1
27	79-844-20	Circuit Breaker, 200A, Auto-reset	1
28	62-209-73	Cover, Control Panel	1
29	75-148-91	Control Harness, Control Panel (Not Shown, Includes #25)	1
30	75-149-91	Power Harness, Control Panel (Not Shown)	1

MOTOR



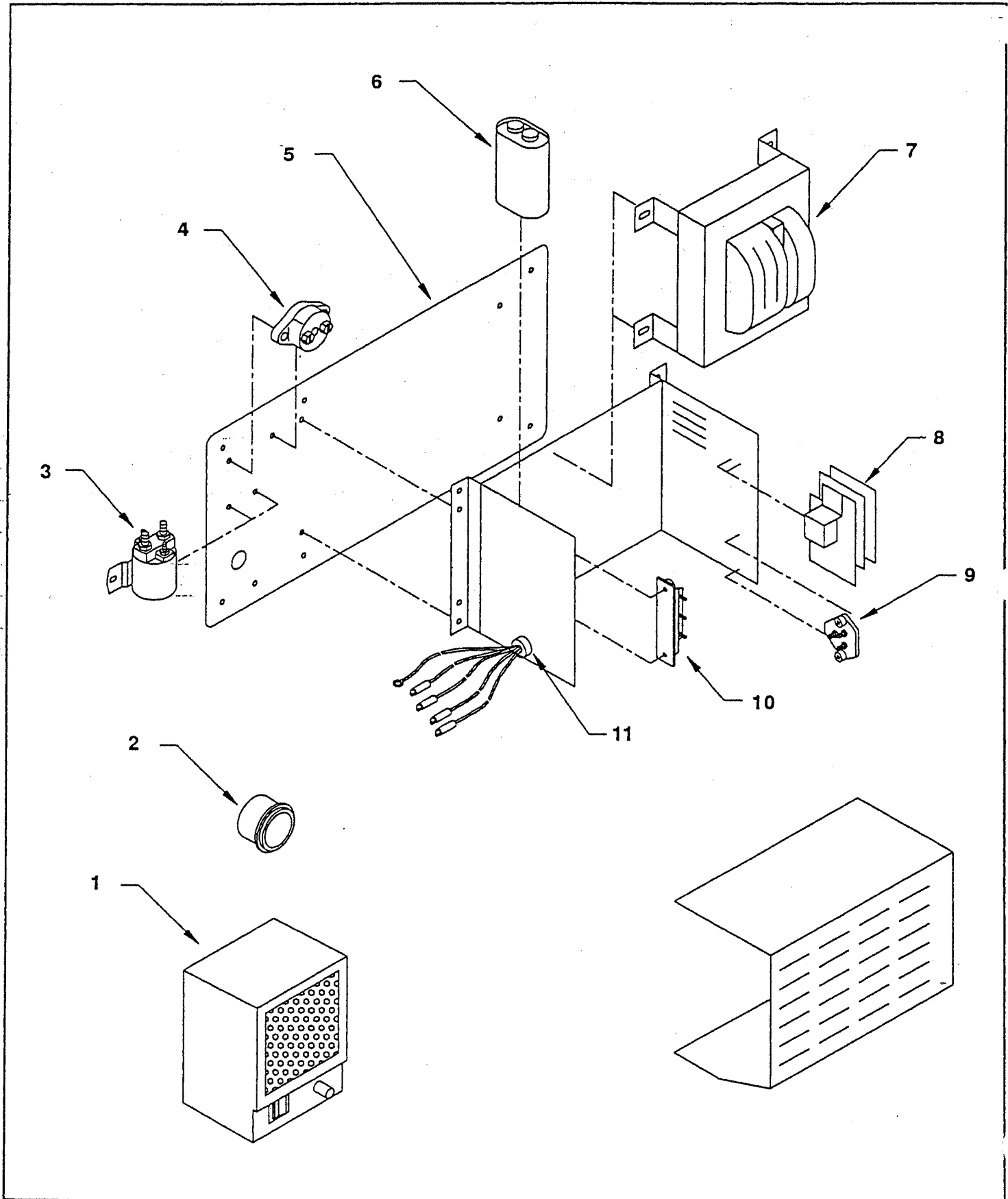
MOTOR (70-061-00)			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	85-398-00	Brush Spring	8
2	70-171-00	Brush Holder	1
3	70-112-00	Brushes, With Terminal	4
4	80-504-00	Ball Bearing, CE	1
5	79-100-00	Key, Woodruff	
6	80-211-00	Ball Bearing, DE	1
7	45-507-00	Ball Bearing, CE	1
* Available from Manufacturer at time of printing. Contact Taylor-Dunn or your local Taylor-Dunn dealer for more information.			

CHARGER AND CHARGER MOUNTS



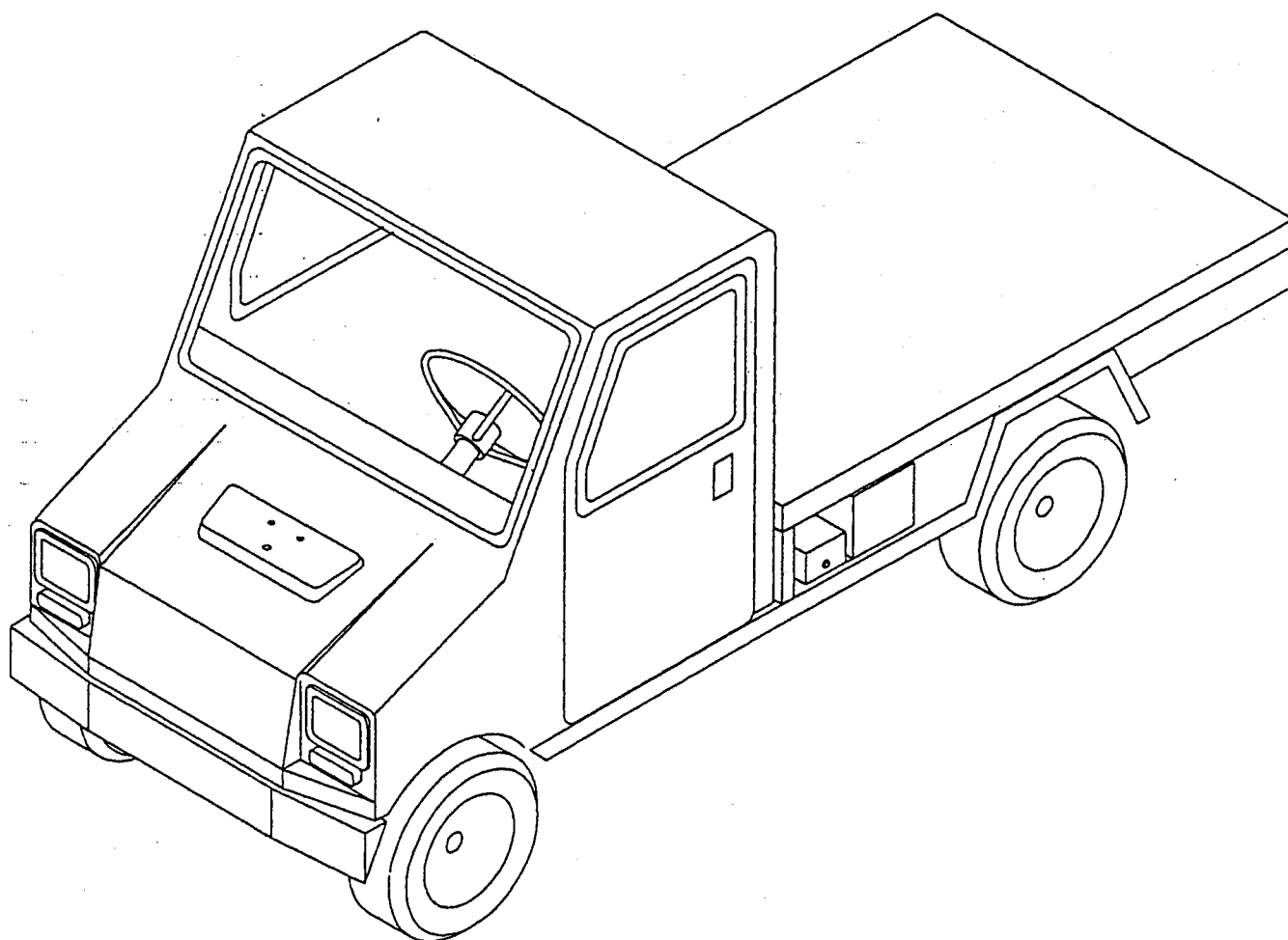
CHARGER AND CHARGER MOUNTS			
ITEM #	PART NUMBER	DESCRIPTION	QTY
	79-309-10	Charger, 48V, 25A, 115V 60 Hz	1
1	79-805- 65 68	Timer Assembly <i>79-805-65 Portable Charger</i>	1
2	79-902-00	Capacitor, 6.0 mfd, 660 VAC	1
3	79-831-00	Fuse Assembly	1
4	79-749-13	Heat Sink Assembly with Diodes	1
5	79-603-10	Transformer	1
6	01-155-57	Mount, Charger	1
7	88-069-81	1/4" NC Nylon Insert Lock Nut	12
8	88-068-60	1/4" Cut Washer	24
9	88-060-11	1/4 x 1" NC Hex Head Cap Screw	8
10	88-060-09	1/4 x 3/4 " NC Hex Head Cap Screw	8
11	79-530-00	Bushing, Insulator for AC Cord	1
* - Available from Manufacturer at time of printing. Contact Taylor-Dunn or your local Taylor-Dunn dealer for more information.			

HEATER AND HEATER CHARGER (Optional)



HEATER AND HEATER CHARGER (Optional)			
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	K4-071-99	Heater	2
2	74-009-10	Indicator, Charge, 24 V	1
3	72-501-12	Solenoid, SPST, 12V, 100 Amp	1
4	K4-072-35	Circuit Breaker, 50 Amp, 24 V DC	1
5	00-155-47	Mounting Plate, Heater Charger	1
6	79-902-00*	Capacitor, 6.0 mfd, 660 VAC	1
7	79-644-29*	Transformer	1
8	79-805-66*	Timer Assembly	1
9	79-831-00*	Fuse Assembly	1
10	79-749-13*	Heat Sink Assembly with Diodes	1
11	79-530-00*	Bushing, Insulator for AC Cord	1
12	79-301-05	Charger, 48V, 25A, 115V 60 Hz Built-in (Includes Items 6 - 11)	1
13	K1-181-34	Wires and Terminals, Heater (Not shown)	1
14	88-060-09	1/4 x 3/4" NC Hex Head Cap Screw (Not shown)	9
15	88-060-11	1/4 x 1" NC Hex Head Cap Screw (Not shown)	6
16	88-068-61	1/4" SAE Washer (Not shown)	4
17	88-069-81	1/4" NC Nylon insert Locknut, Plated (Not shown)	24
18	88-088-66	5/16 Washer x 1.5 OD, Tin/Lead (Not shown)	2
* Available from Manufacturer at time of printing. Contact Taylor-Dunn or your local Taylor-Dunn dealer for more information.			

ET 1-50 48 Volts



ET 1-50 48 Volts	
PART NUMBER	DESCRIPTION
00-155-31	Brake Pedal
00-155-40	Catch, Hood
00-243-21	Speedo Gear (Optional)
00-243-22	Speedo Sender (Optional)
19-011-20	Wheel, Steering
50-009-10	Push rod, Brake
71-040-95	Door Lock Assembly
71-141-20	Turn Signal Assembly
71-501-55	Horn Button
71-501-56	Collar, Horn Button
71-900-05	Flasher, Turn Signal, 12V, 3-terminal
72-022-00	Stop/Tail Light
72-035-00	Back-up Light
72-050-00	Turn Signal Light, Front
72-076-00	Head Light Assembly, Adjustable
73-004-20	Horn
74-050-00	Wiper Motor and Mounting Hardware
74-051-10	Wiper Arm
74-052-10	Wiper Blade
85-250-00	Spring
98-200-00	Rubber, Brake Pedal Pad
98-254-00	Accelerator Pedal Pad, Aluminum

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