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TAYLOR-DUNN[®]



Models Included: BG-015-00 (G 1-50)



*Kohler Command V-Twin Engine
CARB Certified*

MANUAL MG-150-04

*Operation, Troubleshooting and
Replacement Parts Manual*

Serial Number Starting: 184311
Ending Serial Number: 190039
Excluding S/N 184374

Taylor-Dunn Contact information

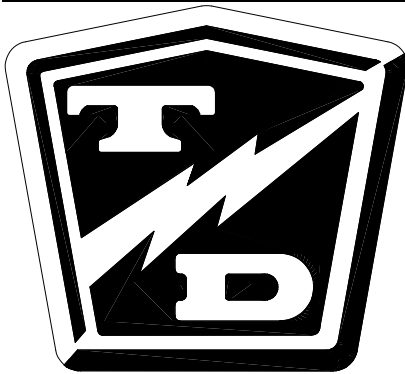
Service, Parts, Sales:

Taylor-Dunn has a network of dealers distributed around the globe to support our vehicles. Information regarding vehicle sales, replacement parts, or service should be obtained through your local dealer. A dealer locator can be found on the Taylor-Dunn website at www.taylor-dunn.com.

If you do not have access to the internet, you can call the factory direct at:
01 (714) 956-4040

Feedback regarding this or any Taylor-Dunn vehicle manual can be sent to:
Taylor-Dunn Manufacturing
Attn: Tech Writer
2114 West Ball Road
Anaheim, CA 92804





Taylor-Dunn®

Model BG-015-00

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This quick reference section index guide will assist you in locating a desired topic or procedure.

Refer to each sectional Table of Contents for the page number location for specific topics or procedures.



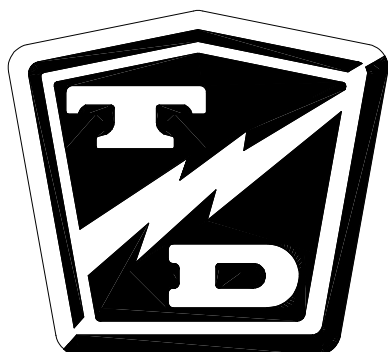


Model B 1-00

Chapter - 1

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Introduction

ABOUT THIS MANUAL

The purchase of this vehicle shows a belief in high quality products manufactured in the USA. Taylor-Dunn®, a leading manufacturer of electric burden and personnel carriers since 1949, wants to be sure this vehicle provides years of reliable service. Please continue to read this manual and enjoy this high quality Taylor-Dunn® vehicle.

This manual is to serve as a guide for the service, repair, and operation of Taylor-Dunn® vehicles and is not intended as a training guide. Taylor-Dunn® has made every effort to include as much information as possible about the operation and maintenance of this vehicle.

Included in this manual are:

- Vehicle Description
- Safety Rules and Guidelines
- Operational Information
- Operator Responsibilities
- Owner Responsibilities
- Control Operation and Location Information
- Maintenance and Troubleshooting Information
- Standard Parts List

Before servicing, operating, training or performing maintenance on this or any other Taylor-Dunn® vehicle, read the appropriate Taylor-Dunn® manual.

Each Taylor-Dunn® manual references the applicable models and serial numbers on the front cover.

Please, be aware of all cautions, warnings, instructions, and notes contained in this manual.

WHO SHOULD READ THIS MANUAL

This manual is intended for use by anyone who is going to operate, own, perform maintenance on, service, or order parts for this Taylor-Dunn® vehicle. Each person should be familiar with the parts of this manual that apply to their use of this vehicle.

RESPONSIBILITIES

Of the Owner...

The owner of this or any Taylor-Dunn® vehicle is responsible for the overall maintenance and repairs of the vehicle, as well as the training of operators. Owners should keep a record of conducted training and maintenance performed on the vehicle. (OSHA Regulation, 29 CFR 1910.178 Powered Industrial Truck Operator Training).

Of the Operator...

The operator is responsible for the safe operation of the vehicle, preoperational and operational checks on the vehicle, and the reporting of any problems to service and repair personnel.

Of the Service Personnel...

The service personnel are responsible for the service and maintenance of the vehicle. At no time should a service person allow any untrained personnel to service or repair this or any Taylor-Dunn® vehicle. For the purposes of training, a qualified service person may oversee the repairs or services being made to a vehicle by an individual in training. At no time should an untrained individual be allowed to service or repair a vehicle without supervision. This manual is not a training guide.

Of the Passengers ...

The passengers are responsible to remain fully seated, keeping their hands, arms, and legs inside the vehicle at all times. Each passenger should be fully aware of the vehicle's operation. All forms of recklessness are to be avoided. Do not engage in horseplay.



Model B 2-10 shown with stake sides and steel cab with doors options

HOW TO USE THIS MANUAL

This manual is organized into five main sections:

INTRODUCTION

This section describes how to use this service manual and how to identify your vehicle.

Safety Rules and Operating Instructions

This section outlines the safety and operational issues, location and operation of controls, and the operational checks that are to be performed on this vehicle. It also includes various subjects that should be included in the operator and service training program.

Maintenance Service and Repair

These sections gives specific information on the servicing of the vehicle and a schedule for maintenance checks.

Electrical and Charger Troubleshooting

This section identifies the troubleshooting procedures for testing the electrical system and battery charger.


Illustrated Parts

This section provides an illustrated view of various assemblies. The illustrations are accompanied by tables identifying the parts.


Conventions

Symbols and/or words that are used to define warnings, cautions, instructions, or notes found throughout this manual. Refer to the examples below.


WARNING

A shaded box with the word "Warning" and the symbol  above denotes a warning. A warning alerts the reader of a hazard that may result in injury to themselves or others. Be sure to follow any instructions contained within a warning and exercise extreme care while performing the task.

WARNING

A shaded box with and the word "Warning" and the symbol  above denotes a warning. This warning alerts the reader of a high voltage hazard that may result in injury to themselves or others. Be sure to follow any instructions contained within a warning and exercise extreme care while performing the task.

CAUTION

A box with the word "CAUTION" and the symbol  above denotes a caution and is used to inform the reader that property damage may occur. Be sure to exercise special care and follow any instructions contained with in a caution.

Note: Alerts the reader to additional information about a subject.

HOW TO IDENTIFY YOUR VEHICLE

This manual applies to vehicles with the same model and serial numbers listed on the front cover.

These vehicles are designed for driving on smooth surfaces in and around facilities such as industrial plants, nurseries, institutions, motels, mobile home parks, and resorts. They are not to be driven on public highways.

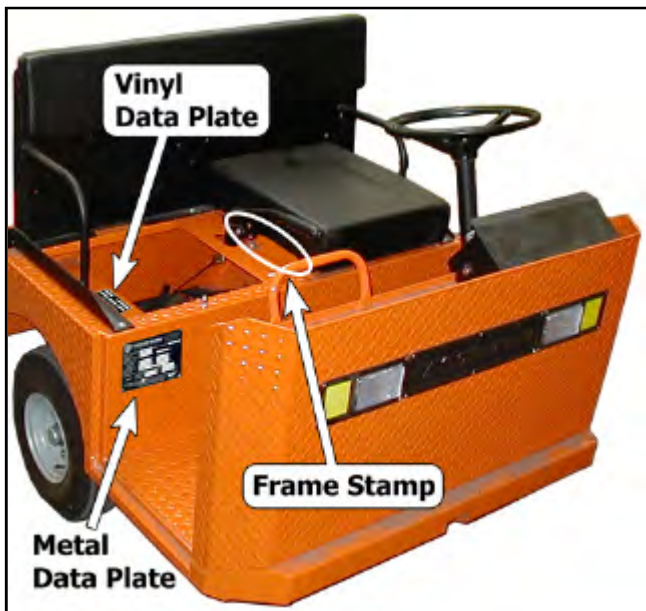
WARNING

This vehicle is not designed to be driven on public roads or highways. It is available in maximum designed speed of 18 mph. Do not exceed the maximum designed speed. Exceeding the maximum designed speed may result in steering difficulty, motor damage, and/or loss of control. Do not exceed locally imposed speed limits. Do not tow this vehicle at more than 5 mph.

This vehicle conforms to requirements for Type E vehicles as described in O.S.H.A. Standard Section 29 CFR 1910.178 (Powered Industrial Trucks) and with all applicable portions of the American National Standard for Personnel and Burden Carriers (ANSI B56.8).

As of the date of manufacture, this vehicle conforms to the California EVP regulations for small off road engines under 13CCR section 2766(b)

The locations of the model and serial numbers are illustrated below:



This is a typical Kohler engine data plate. Refer to the data plate on your engine for the correct specifications.

Engine Data Plate



Transmission Data Plate



Model BG-150

TAKING DELIVERY OF YOUR VEHICLE

Inspect the vehicle immediately after delivery. Use the following guidelines to help identify any obvious problems:

- Examine the contents of all packages and accessories that may have come in separate packages with the vehicle.
- Make sure everything listed on the packing slip is there.
- Check that all wire connections, battery cables, and other electrical connections are secure.
- Check battery cells to be sure they are filled.
- Check the tire pressure, tightness of lug nuts, and for any signs of damage.

Check the operation of each of the following controls:

- Accelerator
- Brake
- Parking Brake
- Key-Switch
- Forward/Reverse Switch
- Reverse Beeper (if equipped)
- Front Headlight Switch
- Steering Wheel
- Horn

What To Do If a Problem is Found

If there is a problem or damage as a result of shipping, note the damage or problem on the bill of lading and file a claim with the freight carrier. The claim must be filed within 48 hours of receiving the vehicle and its accessories. Also, notify your Taylor-Dunn® dealer of the claim.

If there is a problem with the operation of the vehicle, **DO NOT OPERATE THE VEHICLE**. Immediately contact your local Taylor-Dunn® distributor and report the problem. The report must be made within 24 hours of receiving the vehicle and its accessories.

The only personnel authorized to repair, modify, or adjust any part of this or any Taylor-Dunn® vehicle is a factory authorized service technician.

⚠ WARNING

The only personnel authorized to repair, modify, or adjust any part of this or any Taylor-Dunn® vehicle is a factory authorized service technician. Repairs made by unauthorized personnel may result in damage to the vehicles systems which could lead to an unsafe condition resulting in severe bodily injury and/or property damage. Unauthorized repairs may also void the vehicles warranty.



Model C-426



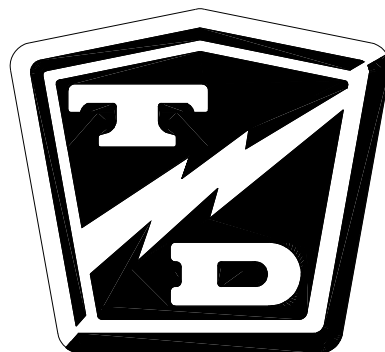
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Chapter - 2

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Safety Rules and Operating Instructions



STANDARD SPECIFICATIONS BURDEN CARRIER (CHASSIS ONLY*)

ITEM	MODEL	SPECIFICATION
Occupancy		1-driver, 1-passenger
Dimensions		304.8 L x 112.4W x 122H Centimeters 120L x 44.25W x 48H Inches
Turning Radius		317.5 Centimeters (125 Inches)
Dry Weight		517 kg (1140 lbs)
Maximum Load Deck dimensions		681kg (1,500 lbs) 91.44W x 193L Centimeters (36W x 76-25L Inches)
Engine*	CH18S	18hp@3600rpm, Kohler® specification # PA-CH620-3015
Transmission	H12 F-n-R	Automatic Variable Pitch V-Belt Primary with Helical Gear Forward and Reverse Switching Gear Box Dana® Specification # 012AJ281-3
Brakes		Rear Wheel Hydraulic Disc, Hand Operated Park Brake 4 Wheel Hydraulic Disc, Hand Operated Park Brake
Steering		Automotive Steering 24:1
Tires		5.70 x 8 Load Range B
Frame		Steel Unitized Body, Heavy Duty 16 Gauge Steel, Diamond Plate
Instrumentation		Battery Discharge Indicator, Key Switch, Horn Button, Forward/Reverse Switch, Headlight Switch Hour Meter
Light Accessories		Headlight, Dual Tail/Brake Lights

**Refer to the engine manual for information regarding engine specifications.*

This vehicle conforms to requirements for Type E vehicles as described in O.S.H.A. Standard Section 1910.178 (Powered Industrial Trucks) and with all applicable portions of the American National Standard for Personnel and Burden Carriers (ANSI B56.8).

** - Specifications are subject to change without notice.*



SAFETY RULES AND GUIDELINES

It is the responsibility of the owner of this vehicle to assure that the operator understands the various controls and operating characteristics of this vehicle (extracted from the American National Standards Institute Personnel and Burden Carriers ANSI B56.8). As well as, following the safety rules and guidelines outlined in ANSI B56.8 and listed below.

These vehicles are designed for driving on smooth surfaces in and around facilities such as industrial plants, nurseries, institutions, motels, mobile home parks, and resorts. They are not to be driven on public highways.

⚠ WARNING

These vehicles are not designed to be driven on public roads or highways. They are available in maximum designed speeds 18 mph. Do not exceed the maximum designed speed. Exceeding the maximum designed speed may result in steering difficulty, motor damage, and/or loss of control. Do not exceed locally imposed speed limits. Do not tow this vehicle at more than 5 mph.

Refer to *Vehicle Operational Guidelines, Safety Guidelines* section for important safety information regarding operating this vehicle.

⚠ WARNING

Read and follow all of the guidelines listed below. Failure to follow these guidelines may result in severe bodily injury and/or property damage.

⚠ WARNING Before working on a vehicle:

- 1. Make sure the key-switch is in the "OFF" position, then remove the key.**
- 2. Place the forward-reverse switch in the center "OFF" position.**
- 3. Set the park brake.**
- 4. Place blocks under the front wheels to prevent vehicle movement.**
- 5. Disconnect the main positive and negative cables at the batteries.**

DRIVER TRAINING PROGRAM

According to ANSI B56.8, the owner of this vehicle shall conduct an Operator Training program for all those who will be operating this vehicle. The training program shall not be condensed for those claiming to have previous vehicle operation experience. Successful completion of the Operator Training program shall be required for all personnel who operate this vehicle.

The Operator Training program shall include the following:

- Operation of this vehicle under circumstances normally associated with your particular environment.
- Emphasis on the safety of cargo and personnel.
- All safety rules contained within this manual.
- Proper operation of all vehicle controls.
- A vehicle operation and driving test.

Driver Qualifications.

Only those who have successfully completed the Operator Training program are authorized to drive this vehicle. Operators must possess the visual, auditory, physical, and mental ability to safely operate this vehicle as specified in the American National Standards Institute Controlled Personnel and Burden Carriers ANSI B56.8.

The following are minimum requirements necessary to qualify as an operator of this vehicle:

- Demonstrate a working knowledge of each control.
- Understand all safety rules and guidelines as presented in this manual.
- Know how to properly load and unload cargo.
- Know how to properly park this vehicle.
- Recognize an improperly maintained vehicle.
- Demonstrate ability to handle this vehicle in all conditions.



VEHICLE CONTROLS

DASH

Key-Switch

A key-switch, located on the right center side of the instrument panel, turns on the vehicle. Rotate the key clockwise to turn the vehicle power on, counterclockwise to turn the vehicle power off.

The key-switch should be in the "OFF" position whenever the operator leaves the vehicle. This switch is also designed to secure and disable the vehicle. The key can only be removed when the key-switch is in the "OFF" position.



Shift Lever

The shift lever is located between the driver and front passenger seats. The shift lever locks into the position selected. Push the knob down to unlock the lever, and move the lever into the desired direction, forward to shift into the forward direction or pull back to shift into the reverse direction. The center position is neutral. Allow the vehicle to come to a complete stop before shifting gears.



Horn Switch

The horn switch is located on the right side of the instrument panel. Depress the switch to sound the horn, release it to turn it off.



Headlight Switch

The headlight switch is located on the left side of the instrument panel. Push the top of the switch to turn the lights on. Push the bottom of the switch to turn the lights off.



5) Accessory Switch (Optional)

The accessory switch is located on the left side of the instrument panel and to the right of the headlight switch. Push the top of the switch to turn on the accessory. Push the bottom of switch to turn off the accessory. The accessory can be turned on with the key switch in the "OFF" position. If a vehicle is equipped with windshield wipers and one or more accessories, the windshield wipers are controlled from this switch. Other accessories are controlled from the auxiliary switch.



3) Hour Meter

The hour meter is located to the right of the battery status indicator. It records the number of hours the vehicle has been in operation.





Fuel Gauge

The fuel gauge is located to the left of the hour meter. The needle pointing to “F” indicates a full tank of fuel, “E” indicates an empty tank of fuel.



Steering

The steering wheel and steering system are similar to an automobile. To turn right, turn the steering wheel clockwise. To turn left, turn the steering wheel counter-clockwise. If equipped with tilt steering, the release lever is located on the lower left of the steering column. Pull the lever up to reposition the steering wheel.



Foot Brake Pedal

The foot brake pedal, is located to the right of the steering column, it is for operation with the right foot only. It works similar to the brake in an automobile. Applying pressure to the brake pedal slows the vehicle according to the amount of pressure applied. Relieving pressure from the pedal releases the braking action.



Accelerator Pedal

The accelerator pedal is located to the right of the brake pedal. It controls the speed of the vehicle and operates similar to the accelerator pedal in an automobile. Depress the pedal to increase speed and release the pedal to decrease speed.



Park Brake

The parking brake is actuated with a hand lever, which is located to the right of the driver. To set the parking brake, push down on the brake pedal and pull the lever up until it locks. To release the park brake, depress the foot brake pedal, pull up on the park brake handle, push the release button, and lower the handle.





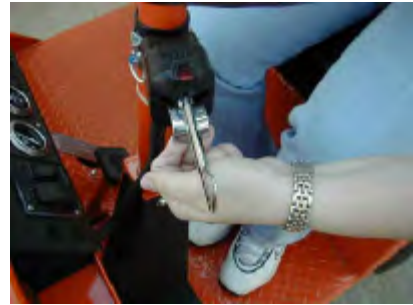
Directional Signals (Optional)

The turn signal lever is located on the left side of the steering column. Push the lever forward to activate the right turn signal and pull the lever back to activate the left turn signal.



Hazard Light Switch (Optional)

The hazard light switch is located on the left side of the steering column. The switch is a small tab. To activate the hazard lights, pull the tab out. To turn the hazard lights off, push forward or pull back the directional signal lever.



Seat Interlock Switch

A switch located under the driver's seat disables the engine's ignition system when the driver leaves the seat. The driver must be seated for the engine to run.

Whenever the driver leaves the vehicle, the driver should turn the ignition switch off and set the park brake and place the shift lever in the neutral position.

⚠ WARNING

The seat interlock switch is only one part of the vehicle safety system. The interlock switch should not be relied upon as the only safety feature used to disable or disengage this vehicle. Doing so could result in unexpected movement of the vehicle causing severe bodily injury



VEHICLE OPERATION GUIDELINES

Safety Guidelines

- Only qualified and trained operators may drive this vehicle.
- Drive only on level surfaces or on surfaces having an incline of no more than 10% (5.6 degrees).
- Drive slowly when making a turn, especially if the ground is wet or when driving on an incline.
- This vehicle may overturn easily if turned sharply when driven at high speeds.
- Observe all traffic regulations and speed limits.
- Keep all body parts (head, arms, legs) inside this vehicle while it is moving.
- Keep the vehicle under control at all times.
- Yield right of way to pedestrians, ambulances, fire trucks, or other vehicles in emergencies.
- Do not overtake another vehicle at intersections, blind spots, or other dangerous locations.
- Do not drive over loose objects, holes, or bumps.
- Yield right of way to pedestrians and emergencies vehicles.
- Stay in your driving lane under normal conditions, maintaining a safe distance from all objects.
- Keep a clear view ahead at all times.

Starting:

1. Make sure the Shift lever is in the neutral position.
2. Set the parking brake.
3. Hold down the foot brake.
4. If the engine is cold, Pull the choke knob out. Remember: Push the choke knob back in once the engine has warmed up.
5. Insert the key and turn it to the "ON" position.
6. Rotate the key to the start position until the engine starts and then release.

NOTE: If the engine does not start within 5-seconds, release the key and wait 10-seconds before attempting to start again.

7. Place the shift lever in the desired direction of travel.
8. Release the parking brake.
9. Release the foot brake.
10. Slowly depress the accelerator pedal.

While driving:

- Slow down and sound the horn to warn pedestrians or when approaching a corner or other intersection.
- No reckless driving.
- Do not drive this vehicle on steep inclines or where prohibited.
- Immediately report any accidents or vehicle problems to a supervisor.

Changing Direction

1. Slow down and come to a COMPLETE STOP allowing the engine to idle.
2. Move the shift lever to the desired direction of travel.

Failure to follow these steps will result in premature failure of the transmission.

Loading and Unloading

- Do not carry more than the maximum number of passengers allowed for this vehicle.
- Do not exceed the cargo load capacity.
- Do not load cargo that can fall off.
- Be careful when handling cargo that is longer, wider, or higher than this vehicle, be sure to properly secure all loads.

Parking

Before leaving the vehicle:

- Set the parking brake.
- Place the shift lever in the neutral position.
- Rotate the start switch to the "OFF" position.

In addition:

- If parking this vehicle on an incline, turn the wheels to the curb, or block the wheels.
- Do not block fire aisles, emergency equipment, stairways, or exits.



Towing This Vehicle

To tow this vehicle, attach a tow strap to the front bumper tow-bar.

NOTE: If the vehicle is equipped with the automatic electric park brake, do not tow the vehicle with the drive wheels on the ground.

Use another driver to steer this vehicle while it is being towed. Be sure the driver uses the brakes when the towing vehicle slows or stops. Do not tow the vehicle faster than 5 m.p.h. or its maximum designed speed, whichever is lower.

If at all possible, this vehicle should be placed on a carrier, rather than towing.

STORING AND RETURNING TO SERVICE

Both storing your vehicle and returning it to service should only be performed by authorized personnel.

Storing Your Vehicle

- Clean the battery, then fill and charge before putting the vehicle in storage. Do not store batteries in a discharged condition.
- Lube all grease fittings.
- Clean, dry, and check all exposed electrical connections.
- Inflate tires to proper pressure (if applicable).
- For extended storage, the vehicle should be elevated so that the tires do not touch the ground.

If stored for a prolonged period, the batteries should be charged as follows:

Storage Temperature (F)	Charging Interval (months)
Over 60	1
Between 40 and 60	2
Below 40	6

Returning to Service

- Check the state of charge of the battery and charge if required.
- Perform ALL maintenance checks in the periodic checklist.
- Remove any blocks from the vehicle and/or place the vehicle down on to the ground.
- Test drive before putting into normal service.





PERIODIC MAINTENANCE CHECKLIST

A full page copy of this check list can be found on the Vehicle Documentaion CD provided with your vehicle.

**Taylor-Dunn
Preventative Maintenance Schedule for BG-150**

Date: _____ Model #: _____ Hour Meter: _____
 Inspected By: _____ Serial #: _____
 Serviced By: _____ Unit ID#: _____

This check list is for the chassis only and does not include the engine. Refer to the engine service manual for service information. Kohler manuals are available at www.kohlerengines.com.

Interval (hours) ¹	Inspected ²	Service Required	Service Complete	Item Description
Operator Daily Checklist				Master cylinder fluid level
				Parking brake for secure hold
				Battery water level
				Tire inflation (pneumatic tires)
				Tire tread / damage
				All lights (head, tail, brake, warning, dash panel)
				Steering (hard steering, excessive play, unusual noises)
				Inspect brake and throttle pedal (play, binding, noise)
				Horn
				Motion alarm (if equipped)
500				Fluid leaks (brakes, rear axle, battery, engine)
				Adjust service and park brake systems
				Inspect all steering linkages and hardware
				Tighten steering shaft to steering gear coupler (if equipped)
				Lubricate the vehicle
				Wash battery and clean terminals
				Inspect for fluid leaks
				Check all electrical interlocks for proper operation
1000				Inspect wheel bearings for play and noise
				Inspect and tighten all hardware (first 500 hours only, then 1000 hours and every 1000 hours)
				Inspect and tighten all hardware
				Clean and repack front wheel bearings, replace grease seals
				Tighten all electrical connections
				Inspect all wiring for cracks, fraying or wear
2000				Inspect motor brushes and commutator
				Inspect steering king pins for play
				Align front end
				Change rear axle oil
				Flush hydraulic brake system
			Inspect suspension bushings (spring, shock)	
			Inspect suspension bumpers	
			Inspect frame for damage	

Notes (1) and (2), Refer to "Maintenance Guidelines for Severe Duty" in the vehicles service manual



Daily Visual inspection:

Tire condition and pressure.

External frame damage (body).

Operation of all lights and warning alarms and/or horns.

Smooth and proper operation of all controls such as but not limited to:

- Accelerator pedal, Brake pedal, Steering, Parking brake, etc.
- Proper operation of all locking devices such as but not limited to:
- Tool box, Removable battery trays, Cargo box, Cab doors, etc.
- Proper operation of all interlocking switches such as but not limited to:
- Key switch, Seat interlock switch, Charger interlock switch, etc.

Inspect for leaking fluids or grease.

MAINTENANCE GUIDELINES FOR SEVERE DUTY APPLICATIONS

1. This maintenance checklist is based on the average application. If the vehicle is operated under "severe conditions", service procedures should be conducted more frequently than specified. The frequency of service under severe conditions is determined by the use of the vehicle. The owner/operator must evaluate the operating environment to determine the increase in maintenance frequency.

In addition, the whole vehicle should be inspected monthly for signs of damage. The damage must be repaired immediately.

The following list is meant as a guide and is not all-inclusive of a "severe duty" application.

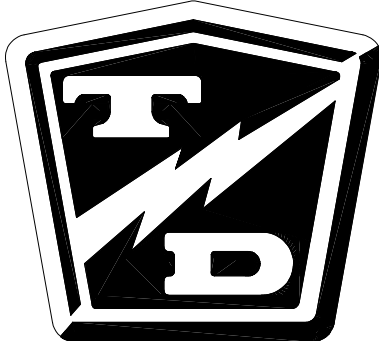
- Extreme temperature.
 - Bumpy, dusty, or ill maintained roads.
 - Excessively wet areas.
 - Corrosive or contaminated areas.
 - Frequent loading of vehicle at/near capacity.
 - Use on multiple shifts.
2. Any deficiencies found during an inspection should corrected before the vehicle is returned to service.
 3. Battery water level should be inspected on a weekly schedule.



Chapter - 3

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General Maintenance



Maintenance Guidelines

⚠ WARNING

Periodic maintenance and service must be performed on this vehicle. Failure to complete these scheduled maintenance and service procedures can result in severe bodily injury and/or property damage. It is the owner and/or operators responsibility to insure that proper service and maintenance is performed on the vehicle, described in this manual.

⚠ WARNING

Before starting any repairs:

- 1. Make sure the key-switch is in the "OFF" position, then remove the key.**
- 2. Place the shift lever in the neutral position.**
- 3. Set the park brake.**
- 4. Place blocks under the front or rear wheels to prevent vehicle movement.**
- 5. Disconnect the main positive and negative cables at the batteries.**

⚠ CAUTION

Turn the Key switch OFF BEFORE disconnecting the batteries. Disconnecting the batteries with the key switch ON may corrupt the controller programming resulting in a fault code 1 (refer to the fault table in the troubleshooting section).

⚠ WARNING

Read and follow all of the guidelines listed below. Failure to follow these guidelines may result in severe bodily injury and/or property damage.

- Avoid fire hazards and have fire protection equipment present in the work area. Conduct vehicle performance checks in an authorized area where safe clearance exists.
- Before starting the vehicle, follow the recommended safety procedures in Section 2, "Safety Rules and Operational Information."
- Ventilate the work area properly.
- Regularly inspect and maintain in a safe working condition, brakes, steering mechanisms, speed and directional control mechanisms, warning devices, lights, governors, guards, and safety devices.
- Inspect and maintain battery limit switches, protective devices, electrical conductors, and connections in conformance with Taylor-Dunn's® recommended procedures.
- Keep the vehicle in clean condition to minimize fire hazards and facilitate detection of loose or defective parts.
- Do not use an open flame to check level or leakage of battery electrolyte.
- Do not use open pans of fuel or flammable fluids for cleaning parts.
- Only properly trained and authorized technicians should perform maintenance or repairs to this vehicle.

Troubleshooting Guide

Symptom	Suspect Component or System	Action
Steering Pulls Left or Right	Front end out of alignment	Realign front end
	Low tire pressure	Inspect tire pressure
Difficult Steering	Lack of lubrication	Lubricate steering linkages
	Damaged or worn steering components	Inspect all steering components
	Low tire pressure	Inspect tire pressure
Excessive Play in Steering	Damaged or worn steering linkages	Inspect steering linkages
	Loose steering linkages	Tighten all hardware
	Loose steering wheel	Inspect steering wheel nut
	Loose front spring hardware	Tighten all hardware
Soft and/or Low Brake Pedal	Air in brake lines	Bleed brake system
	Master cylinder fluid level low	Fill master cylinder and bleed system
	Brake pedal linkage out of adjustment	Adjust linkages
Hard Brake Pedal	Faulty master cylinder	Inspect master cylinder
Lack of Braking Power	Contaminated brake pads	Replace brake pads
	Worn brakes	Replace brakes
	Air in brake lines	Bleed brake system
Brakes Dragging	Brake pedal linkage out of adjustment	Adjust linkages
	Faulty master cylinder	Inspect master cylinder
	Faulty brake caliper	Inspect brake calipers
	Debris in brakes	Inspect brakes
	Parking brake applied	Release parking brake, inspect linkage
Low Power or Running Slow	Faulty or discharged battery	Test battery and charge
	Brakes dragging	Inspect brake system
	Fault in motor control system	Refer to motor control fault codes
Noise, Front End	Loose wheel nuts	Tighten all hardware
	Damaged or worn wheel bearings	Inspect wheel bearings
	Damaged, worn, or debris in brakes	Inspect brakes
	Loose components	Tighten all hardware
	Damaged or worn suspension mounts	Inspect suspension
Noise, Rear End	Loose wheel nuts	Tighten all hardware
	Damaged or worn internal transaxle components	Inspect transaxle
	Damaged or worn suspension mounts	Inspect suspension

Note: This list is provided as a guide only. It is not all inclusive of causes that may result in a specific symptom.

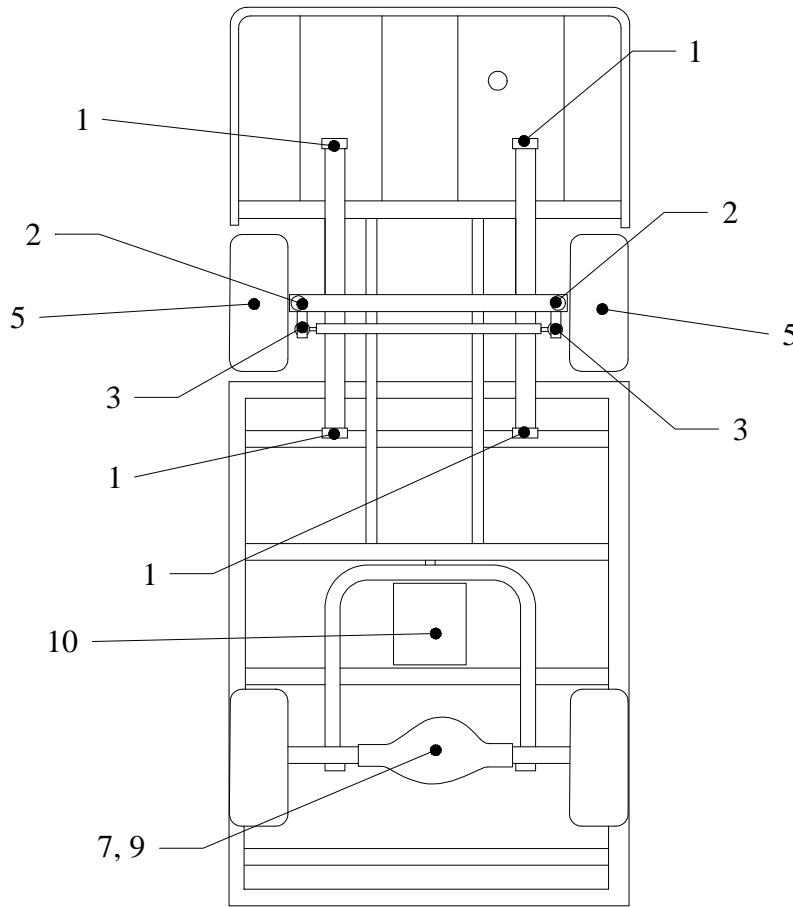


Lubrication and Fluids Chart

Assembly	Component	#	Capacity	Lubricant
<u>Front Axle:</u>				
	King Pin, Upper	2	-	NLGI Grade 2 lithium multi-purpose grease
	King Pin, Lower	2	-	NLGI Grade 2 lithium multi-purpose grease
	Ball Joint	2	-	NLGI Grade 2 lithium multi-purpose grease
	Rod End	2	-	NLGI Grade 2 lithium multi-purpose grease
	Wheel Bearing	2	-	NLGI Grade 2 lithium high temp Bearing Grease
<u>Brake Fluid:</u>				
	Master Cylinder	1		DOT 3, Meets or exceeds SAE J1703
<u>Linkages:</u>				
	Brake pedal pivot	2	-	Multi-purpose spray lubricant
	Master cylinder linkage	?	-	Multi-purpose spray lubricant
	Park brake handle	2	-	Multi-purpose spray lubricant
	Park brake cable	4	-	Multi-purpose spray lubricant
	Shift lever	?	-	Multi-purpose spray lubricant
<u>Rear Transaxle:</u>				
	Differential gear box	1	20-24 ounces	30 Weight Motor Oil
<u>Engine:</u>				
	Refer to engine service manual. Kohler manuals are available at www.kohlerengines.com			



Lubrication Chart



Transmission #7 and #9 as viewed from left rear

#	Description	Locations	Lubricant Type
1	Front Leaf Springs	6	General Purpose Grease
2	King Pin	2	General Purpose Grease
3	Ball Joints	4	General Purpose Grease
4			
5	Front Wheel Bearings	2	High Temperature Wheel Bearing Grease
6			
7	Transmission Drain Plug	1	
8			
9	Transmission Fill Plug	1	20-24 oz. 30 Weight Motor Oil
10	Engine Oil		See engine manual



Notes: _____



Chapter - 4

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Front Axle Service

INSPECT THE FRONT WHEEL BEARINGS AND KING PIN

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Grab the top and bottom of the tire/wheel assembly. Feel for any movement or play while pulling and pushing on the top and bottom of the tire. Any movement or play is an indication of loose wheel bearings or king pin.
8. Spin the wheel and listen for any grinding noise. Any grinding noise may be an indication of worn or damaged wheel bearings.
9. Lower the vehicle.
10. Reconnect the battery.
11. Reconnect the battery, remove the blocks from behind the wheels and test drive the vehicle.



ADJUST FRONT WHEEL BEARINGS

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

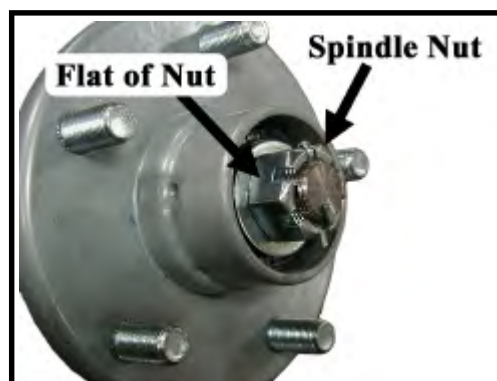
⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Remove the hub dust cap and cotter pin.
8. While rotating the hub, tighten the spindle nut to 30 ft-lbs. This seats the bearings.
9. Back off the spindle nut one flat until the hub turns, but is not loose.
10. Spin the wheel and listen for any grinding noise. Any grinding noise may be an indication of worn or damaged wheel bearings.

NOTE: Refer to the Replace Front Wheel Bearings section for information regarding the replacement of the wheel bearings.

11. Install a new cotter pin.
12. Install the dust cap.
13. Lower the vehicle.
14. Reconnect the main positive and negative cables at the batteries.
15. Remove the blocks from behind the wheels.
16. Release the park brake and test drive the vehicle.



Hub with Dust Cap Removed



FRONT WHEEL ALIGNMENT

NOTE: It is recommended to center the steering before aligning the front wheels. Refer to the Center the Steering section for information.

Tow In Setting = 0 to +1/4" (6.3mm)

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

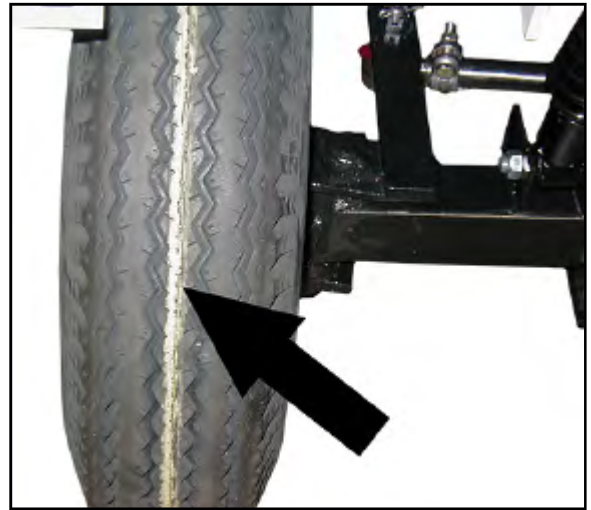
⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

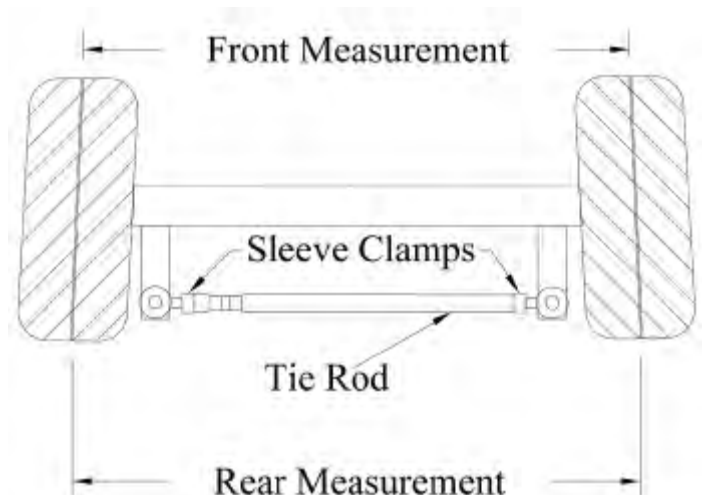
6. Raise the front of the vehicle and support with jack stands.
7. Turn the front wheels so that they are in the straight ahead position and tie off the steering wheel so that it cannot rotate.
8. Using a piece of chalk, mark a line around the center of both front tires.
9. Loosen the ball joint clamps or the rod end jam nuts on the tie rod.

NOTE: Remember the position and orientation of the ball joint clamps.

10. Lower the front wheels to the ground and push the vehicle back and forth a few feet to settle the suspension.
11. Measure the distance between the chalk lines at the front of the tires.
12. Measure the distance between the chalk lines at the rear of the tires.
13. Adjust the tie rod so that the distance at the front and rear of the tires is within the toe in specification listed above..
14. If equipped with ball joints, position the ball joint clamps in their original location and orientation.
15. Tighten the ball joint clamps or the rod end jam nuts.
16. Untie the steering wheel.
17. Reconnect the main positive and negative cables at the batteries.
18. Remove the blocks from behind the wheels.
19. Release the parking brake and test drive the vehicle.



Wheel marked with chalk





FRONT AXLE REMOVAL AND INSTALLATION

Removal

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Remove both front wheels. Refer to Tires and Wheels section for information regarding removing the front wheels.
8. Tie up or support the front axle so it can not fall out of the vehicle.
9. Disconnect the drag link ball joint or rod end from the steering knuckle or the steering gear pitman arm.

NOTE: Refer to the Replacing the Ball Joints section for information regarding the removal of the ball joints or rod ends.

10. If equipped with front brakes, disconnect the hydraulic brake lines from the brake bodies.
11. Disconnect the front axle beam from the front springs and remove the axle from the vehicle.

NOTE: In some configurations the front springs and or shocks will have to be removed in order to remove the axle beam. Refer to section Front Suspension for information regarding removing the springs and shocks.

Installation

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Install the front axle in reverse order of removal.

NOTE: Use all new cotter pins.

NOTE: Refer to the Replacing the Ball Joints section for information regarding the installing the ball joints or rod ends.

NOTE: Refer to Tires and Wheels section for information regarding removing the front wheels.

8. Realign the front wheels. Refer to Steering Component Service section for information regarding realigning the front wheels.
9. If equipped with front brakes, bleed the brakes. Refer to Brake Service section for information regarding bleeding the brakes.
10. Lower the vehicle.
11. Reconnect the main positive and negative cables at the batteries.
12. Remove the blocks from behind the wheels.
13. Release the park brake and test drive the vehicle.



REPLACE FRONT WHEEL BEARINGS

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Remove the tire/wheel assembly from the hub. Refer to Replace the Steering Knuckle for information regarding removing the steering knuckle.
8. Remove the hub dust cap, cotter pin, and spindle nut.
9. Remove the hub from the steering knuckle.

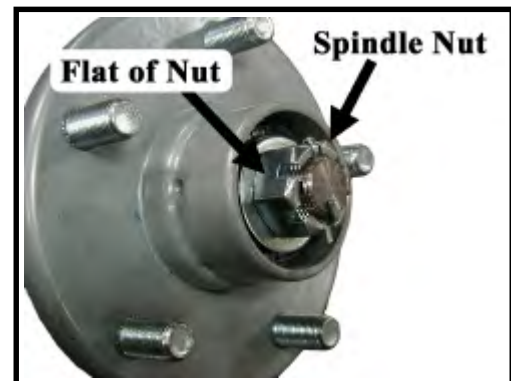
NOTE: For a front disc brake option you must remove the brake body before removing the hub. Refer to the Brakes section for information regarding the removal of the brake body.

10. Thoroughly clean all grease from the inside of the hub and the bearings.
11. Inspect and replace the races and bearings as a set.

NOTE: It is recommended to replace all four bearings and races in the left and right wheels as a set.

12. Assemble in reverse order, using new grease seals.
 - a. Pack inner and outer bearings with grease.
 - b. While rotating the hub, tighten the spindle nut to 30 ft-lbs. This seats the bearings.
 - c. Back off the spindle nut one flat until the hub turns, but is not loose.
 - d. Install a new cotter pin.
13. Install the hub dust cap.
14. Reinstall the brake body and the tire/wheel assembly.

NOTE: Refer to the Brakes section for information regarding the installation of the brake body.
15. Lower the vehicle.
16. Reconnect the main positive and negative cables at the batteries.
17. Remove the blocks from behind the wheels.
18. Release the park brake and test drive the vehicle.



Hub with Dust Cap Removed



Hub with Dust Cap Removed

REPLACE THE STEERING KNUCKLE

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

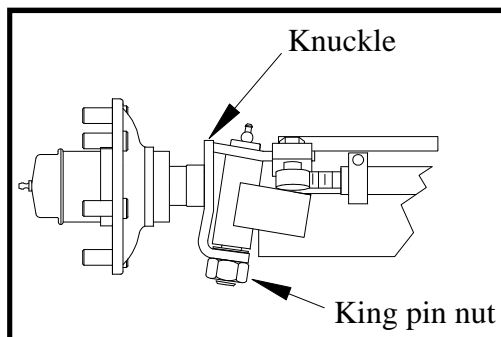
⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Remove the tire/wheel assembly. Refer to Tires and Wheels section for information regarding removing the tire/wheel assembly.
8. Remove the hub bearing cap, cotter pin and nut, then remove the hub from the steering knuckle.

NOTE: For a front disc brake option you must remove the brake body before removing the hub. Refer to the Brakes section for information regarding the removal of the brake body. Do not remove the hydraulic brake line from the brake body. If the brake line is removed then it will be necessary to bleed the brakes.

9. Remove the drag link and/or tie rod from the steering knuckle. Refer to Replace the Ball Joints, Tie Rods, Drag Link in this section for information regarding removal of the drag link or tie rod.
10. While supporting the knuckle, remove the king pin and thrust bearing.
11. Remove the knuckle from the axle.





REPLACE THE KING PINS AND BUSHINGS

There are different types of king pin bushings depending on the configuration of your vehicle.

- Bronze bushings in the axle beam.
- Bronze bushings in the steering knuckle.
- Metal backed teflon bushings in the axle beam or suspension arm.

NOTE: Bronze bushings must be reamed or broached to the proper diameter after they are pressed into the axle beam or steering knuckle.

Refer to the illustration below for the type of bushing in your vehicle.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Remove the steering knuckle. Refer to Replace the Steering Knuckle for information regarding removing the steering knuckle.

NOTE: It is not necessary to remove the tie rod or drag link for this procedure.

8. Press the king pin bushings out from the axle, steering knuckle or suspension arm.
9. Press new bushings into the axle, steering knuckle or suspension arm.

10. Inspect the king pin for damage or wear. If any damage or wear is noted then the king pin must be replaced.

11. Reassemble in reverse order.

NOTE: Refer to Replace the Steering Knuckle for information on installing the steering knuckle.

NOTE: It is recommended that the thrust washers or bearing be replaced whenever replacing the king pin bushings. Refer to the Replacement Parts section for the orientation of the bearing or washers in your vehicle.

12. Grease the bushings (bronze only).

13. Lower the vehicle.

14. Reconnect the main positive and negative cables at the batteries.

15. Remove the blocks from behind the wheels.

16. Release the park brake and test drive the vehicle.

⚠ WARNING

Failure to correctly broach or ream bronze bushings may result in steering difficulty and loss of control of the vehicle causing severe bodily injury and /or property damage.





HARDWARE TORQUE

If hardware is not listed here, refer to standard torque values in the appendix.

Description	Foot Pounds	Newton Meters
Ball Joint Clamp	28-32	38-43

Chapter - 5

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Steering Component Service



INSPECT BALL JOINTS

NOTE: A set of ball joints and/or rod ends will wear at the same rate. If a ball joint and or rod end is worn out, then all should be replaced as a set.

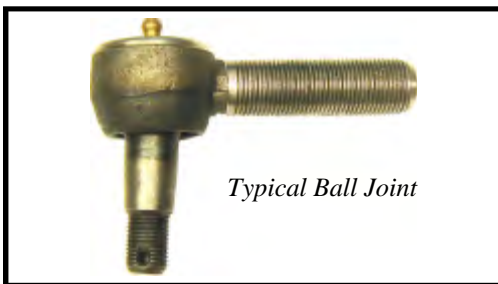
⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Tie off the front wheels so that they cannot turn.
7. While watching the ball joints, rapidly rotate the steering wheel to the left and right.
8. If the ball joint housing moves up or down then the ball joint is worn out and should be replaced. Refer to section Replacing a Ball Joint for information regarding replacing ball joints.
9. Untie the front wheels.
10. Reconnect the main positive and negative cables at the batteries.
11. Remove the blocks from behind the wheels.
12. Release the parking brake and test drive the vehicle.



INSPECT ROD ENDS

NOTE: A set of ball joints and/or rod ends will wear at the same rate. If a ball joint and or rod end is worn out, then all should be replaced as a set.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Visually inspect each rod end for any signs of play between the ball and the nylon or brass bushing in the housing.
7. If any play is evident, then the rod end is worn out and should be replaced. Refer to section Replace the Ball Joints, Tie Rods, and Drag Link for information regarding replacing ball joints.
8. Reconnect the main positive and negative cables at the batteries.
9. Remove the blocks from behind the wheels.
10. Release the parking brake and test drive the vehicle.



ADJUST THE STEERING GEAR

NOTE: In some vehicle configurations it may be necessary to remove the steering gear to perform this procedure. Refer to *Replace the Steering Gear* for information regarding removing the steering gear.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

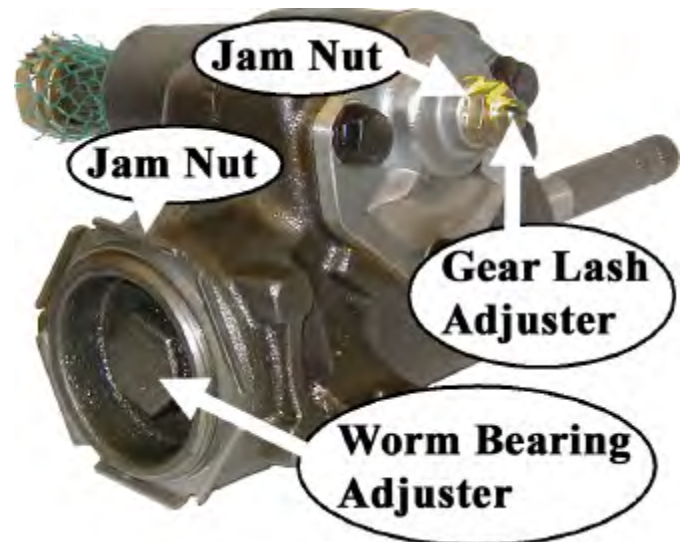
⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Disconnect the drag link from the pitman arm.

NOTE: Refer to *Replace the Ball Joints* section for information regarding removing the ball joint from the drag link.

8. Loosen the gear lash jam nut and the worm bearing adjuster jam nut.
9. Unscrew the gear lash adjuster all of the way to the stop.
10. Loosen the worm bearing adjuster and then tighten just enough to remove all end play from the input shaft and then an additional 1/8 turn more.
11. While holding the worm bearing adjuster so that it cannot turn, tighten the worm bearing adjuster jam nut.
12. Find the center position of the steering shaft:
 - A. Turn the steering shaft all of the way in one direction.
 - B. While counting the rotations, turn the steering shaft all of the way in the opposite direction.
 - C. Turn the steering shaft 1/2 the number of turns in the original direction.
13. While rotating the input shaft back and forth through its centered position, adjust the gear lash adjusting screw so that there is a slight drag as the steering gear is rotated through its centered position.
14. While holding the gear lash adjusting screw so that it cannot turn, tighten the gear lash adjusting screw jam nut.
15. Reconnect the main positive and negative cables at the batteries.
16. Remove the blocks from behind the wheels.
17. Release the parking brake and test drive the vehicle.



REPLACE THE STEERING SHAFT

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. If equipped with a horn switch in the steering wheel, remove the switch, disconnect the wires from the switch and cut the terminals off of the wires.
7. Remove the steering wheel.

NOTE: Refer to Replace the Steering Wheel section for information regarding removing the steering wheel.

8. Remove the upper steering shaft bushing or bearing from the steering column.
9. Remove the steering gear access cover from the steering column (if equipped).
10. Remove and discard the pinch bolt and nut from the steering shaft coupler.

NOTE Most vehicle configurations will now allow the steering shaft to slide off of the steering gear input shaft and then back down out of the steering column. If there is not enough clearance for this procedure then the steering gear must be removed. Refer to Replace the Steering Gear for information regarding removing the steering gear.

11. Remove the steering shaft from the vehicle.
12. Lightly grease the input shaft splines, steering wheel splines and the upper steering shaft bushing.
13. Install the steering shaft in reverse order using a new pinch bolt. Orientate the shaft so that the pinch bolt is opposite the flat in the steering gear shaft. See the illustration to the right.
14. Tighten the pinch bolt per torque listed in the Hardware Torque table at the end of this section.
15. Reconnect the main positive and negative cables at the batteries.
16. Remove the blocks from behind the wheels.
17. Release the parking brake and test drive the vehicle.

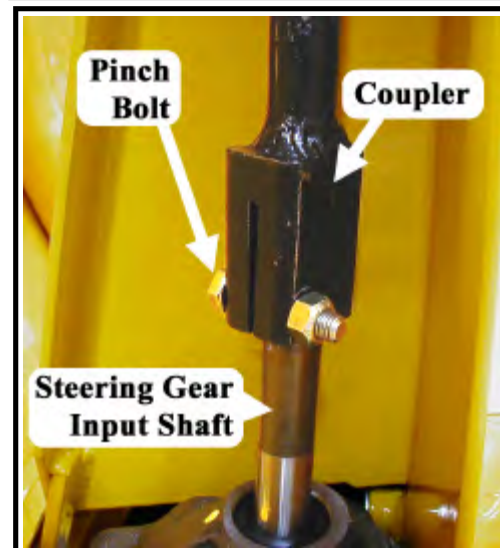


⚠ WARNING

Make sure that the pinch bolt is not aligned with the flat on the steering shaft. Aligning the bolt with the flat could result in failure of the steering and loss of control of the vehicle. This could lead to property damage and/or severe bodily injury.

⚠ WARNING

Do not use the original pinch bolt and nut. Failure to replace the pinch bolt and nut may result in failure of the steering causing loss of control of the vehicle. This could lead to property damage and/or severe bodily injury.





REPLACE THE STEERING WHEEL

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. If equipped with a horn switch in the steering wheel, remove the switch and disconnect the wires from the switch.
7. Remove the steering wheel nut.
8. Using a steering wheel puller, remove the steering wheel.
9. Position the front wheels in the straight ahead position.
10. Lightly grease the steering wheel splines and install the replacement steering wheel orientated as shown in the illustration to the right.
11. Tighten the steering wheel nut to torque listed in the Hardware Torque table at the end of this section.
12. Reinstall the horn switch (if equipped).
13. Reconnect the main positive and negative cables at the batteries.
14. Remove the blocks from behind the wheels.
15. Release the parking brake and test drive the vehicle.



Straight Ahead Position

REPLACING A BALL JOINT

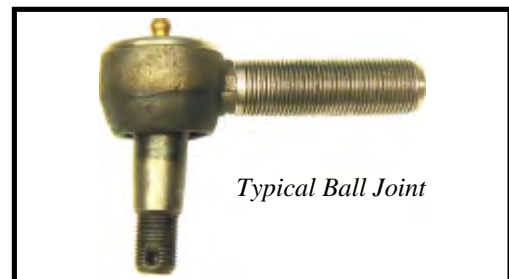
⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
 7. Loosen the ball joint clamp on the steering sleeve.
 8. Remove the cotter pin and ball joint nut.
 9. Using a pickle fork, remove the ball joint from the steering arm.
 10. Remove the ball joint from the steering sleeve.
- HINT:* Count the number of turns required to remove the ball joint from the sleeve. This will make it easier to realign the wheels.
11. Install the new ball joint into the steering sleeve. Screw it into the sleeve the same number of turns counted in the previous step. Do not tighten the ball joint clamp at this time.
 12. Install the ball joint into the steering arm. Tighten the ball joint nut per torque listed in the Hardware Torque table at the end of this section and install a new cotter pin.
 13. Realign the front wheels.
- NOTE:* Refer to the Steering section for information regarding realignment of the front wheels.
14. Lower the vehicle.
 15. Reconnect the main positive and negative cables at the batteries.
 16. Remove the blocks from behind the wheels.
 17. Release the park brake and test drive the vehicle.



Typical Ball Joint

REPLACING A ROD END

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

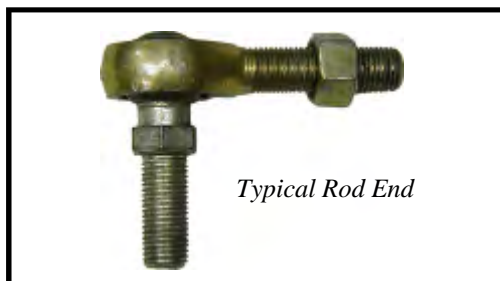
6. Raise the front of the vehicle and support with jack stands.
7. Loosen the rod end jam nut or clamp on the steering sleeve.
8. Remove the rod end nut.
9. Remove the rod end from the steering arm.

HINT: Count the number of turns required to remove the rod end from the steering sleeve. This will make it easier to realign the wheels.

10. Install the new rod end into the steering sleeve. Screw it into the sleeve the same number of turns counted in the previous step. Do not tighten the rod end clamp or jam nut at this time.
11. Install the rod end into the steering arm. Tighten the rod end nut to 20-25 ft-lbs.
12. Realign the front wheels.

NOTE: Refer to the Steering section for information regarding realignment of the front wheels.

13. Lower the vehicle.
14. Reconnect the main positive and negative cables at the batteries.
15. Remove the blocks from behind the wheels.
16. Release the park brake and test drive the vehicle.



PITMAN SHAFT ALIGNMENT

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Center the steering gear. Refer to Center the Steering Gear section for information regarding centering the steering gear.
7. Tie the steering wheel in position so that it cannot rotate.
8. Install the pitman shaft on the steering gear so that it is as close as possible to centered between the steering stops. Torque the pitman arm nut per torque listed in the Hardware Torque table at the end of this section.
9. Adjust the drag link as required to position the front wheels to the straight ahead position.
10. Untie the steering wheel.
11. If required, remove and reposition the steering wheel. Refer to Replace the Steering Wheel section for information regarding repositioning the steering wheel.
12. Reconnect the main positive and negative cables at the batteries.
13. Remove the blocks from behind the wheels.
14. Release the parking brake and test drive the vehicle.

CENTER THE STEERING GEAR

NOTE: The drag link must be disconnected from the pitman arm or the pitman arm removed from the steering gear to perform this procedure. Refer to the appropriate section for details.

1. Remove the pitman arm.
2. Rotate the input shaft clockwise until it stops.
3. While counting the rotations, rotate the input shaft counter clockwise until it stops.
4. Rotate the input shaft clockwise 1/2 the rotations counted in the previous step.
4. Mark the input and pitman shaft in relation to the housing.



CENTER THE STEERING

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Turn the front wheels so that they are in the straight ahead position and then tie off the wheels so that they cannot turn from the straight ahead position.
8. Disconnect the drag link from the pitman arm.

NOTE: Refer to Replace the Ball Joints section for information regarding removing the ball joint or rod end from the drag link.

9. Center the steering gear and tie off the steering wheel so that it cannot rotate.

NOTE: Refer to Center the Steering Gear section for information regarding centering of the steering gear.

10. At this point both the steering wheel and the front wheels should be tied up and held in position. If one or the other is not tied up then you must start from the beginning.
11. Loosen the ball joint clamps or the rod end jam nuts on the drag link.

NOTE: Remember the position and orientation of the clamps.

12. Adjust the drag link so that it can be easily inserted into the pitman arm.
13. Tighten the ball joint or rod end nut as specified in the hardware torque table at the end of this section:
14. If equipped with ball joints, position the ball joint clamps in their original location and orientation.
15. Tighten the ball joint clamps as specified in the hardware torque table at the end of this section:
16. Untie the steering wheel and the front wheels.
17. Reconnect the main positive and negative cables at the batteries.
18. Rotate the steering wheel from a full left turn to a full right turn and make sure that the ball joint clamps do not contact any other component.
19. Remove the blocks from behind the wheels.
20. Release the parking brake and test drive the vehicle.





REPAIR THE STEERING GEAR

Disassembly

NOTE: The steering gear must be removed from the vehicle for this procedure. Refer to *Replace the Steering Gear* section for information regarding removing the steering gear.

NOTE: The steering gear is packed with grease. Only perform maintenance on the steering gear in an area that will contain any grease that may spill out of the steering gear when it is disassembled.

Refer to the illustration at the end of this section for a blown up view of the steering gear assembly.

1. Center the steering gear.
 - A. Turn the steering shaft all of the way in one direction.
 - B. While counting the rotation, turn the steering shaft all of the way in the opposite direction.
 - C. Turn the steering shaft 1/2 the number of turns in the original direction.
2. Remove the worm bearing adjuster locking ring and the worm bearing adjuster.
3. Remove the side cover/pitman shaft assembly by removing the three side cover bolts and then pulling the assembly out of the housing.

NOTE: The side cover/pitman shaft assembly normally does not have to be disassembled.

4. Remove the worm shaft and ball nut assembly from the bottom of the housing.
5. Remove the worm shaft seal.
6. Remove the pitman shaft seal.
7. Remove the upper worm bearing and bearing cup from the housing.
8. The ball nut assembly consists of two sets of ball bearings that recirculate in two channels in the ball nut housing. The bearings may fall out once the bearing guides are removed. Be careful not to lose any of the bearings.
9. Remove the ball guide clamps, ball guides and all of the ball bearings.
10. Remove the ball nut from the worm shaft.
11. Thoroughly clean and inspect all parts for signs of corrosion, damage or wear and replace as required.





Reassembly

1. Lightly lubricate all parts before reassembly.
2. Install a new worm shaft seal and pitman shaft seal into the housing.
3. Install the upper worm bearing cup.
4. Divide the ball bearing into two equal groups.
5. Position the ball nut onto the worm as shaft as shown in the illustration.
6. Insert the ball guides into the ball nut.
7. Insert each group of bearings into the ball guides.

NOTE: Do not rotate the worm shaft while installing the bearings. This may cause one or more of the bearings to enter the crossover passage in the ball nut, causing improper operation.

8. Install the ball guide clamp.
9. Place the upper worm bearing on the worm shaft and install the worm shaft/ball nut assembly into the housing being careful not to damage the worm shaft seal.
10. Install the assembled worm bearing adjuster into the housing and tighten just enough to remove all play in the worm shaft.
11. Install, but do not tighten the worm bearing adjuster lock nut.
12. Rotate the worm shaft to center the ball nut in the housing.
13. Place a new gasket onto the housing and install the assembled pitman shaft/side cover onto the housing using two of the three mounting bolts.
14. Pack the steering gear with grease through the open side cover bolt hole and then install the bolt.
15. Adjust the steering gear.

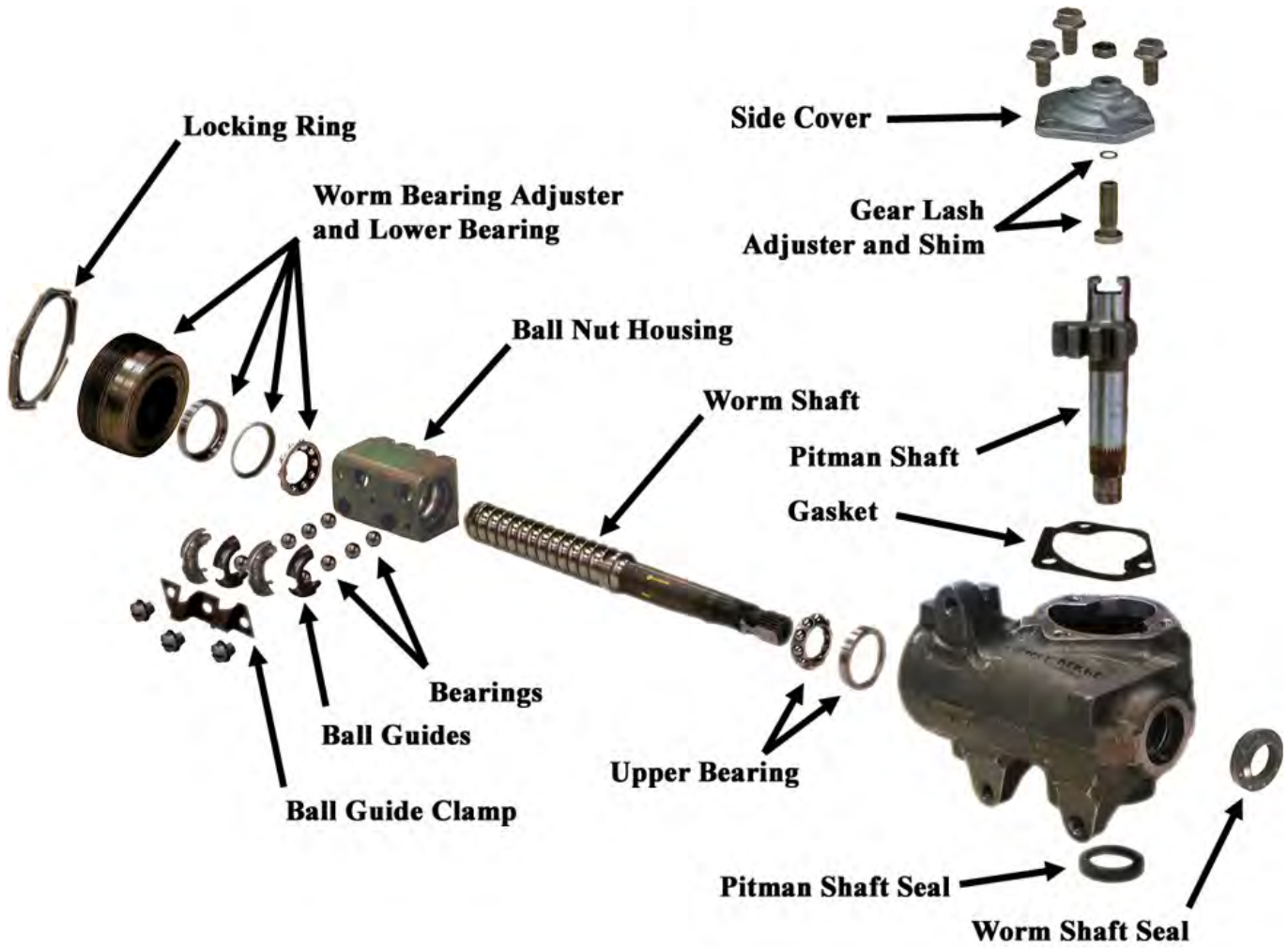
NOTE: Refer to Adjust the Steering gear section for information regarding adjusting the steering gear.

16. Once the adjustments are completed, make sure that the locking ring and jam nut are tight.





Exploded View of Steering Gear





WHEEL ALIGNMENT

Refer to Front Axle section

HARDWARE TORQUE

If hardware is not listed here, refer to standard torque values in the appendix.

Description	Foot Pounds	Newton Meters
Steering wheel nut	28-32	38-43
Ball Joint Clamp	28-32	38-43
Ball joint Nut	40-45	54-61
Rod End Nut	20/25	27-34
Steer Shaft Pinch Bolt	24-26	32-35
Pitman Arm Nut	75-100	102-135

Notes: _____



Chapter - 6

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Brake Service

⚠ CAUTION

Hydraulic fluid and components must be kept clean. Thoroughly clean exterior of any hydraulic component before disconnecting hoses or fittings. Perform all maintenance and repairs in a clean environment. Do not use cloth or paper towels to clean components due to possible contamination with lint or other fiber. Failure to follow these guidelines will result in premature failure of hydraulic system components.

⚠ WARNING

Current Taylor-Dunn® brakes are asbestos free. However, there is the possibility that the original brakes were replaced with aftermarket parts containing asbestos. Since this possibility exists, all brake parts should be handled as if they contain asbestos. Refer to Appendix C for recommended handling precautions.

⚠ WARNING

- Only use DOT 3 brake fluid from a new sealed container.
- DOT 3 brake fluid is corrosive and will damage paint finishes.
- Dispose of brake fluid in accordance with local state and federal regulations.
- Read and follow all warnings on the brake fluid container.

FRONT BRAKE

Service Limits:

Brake pad Thickness: 0.062 inches (1.57 mm).

Rotor Thickness: 0.200 inches (5.08 mm).

Rotor runout: 0.005 inches (0.127 mm).

Inspection

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the forward-reverse switch in the center "OFF" position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the front of the vehicle and support with jack stands.
7. Remove the front wheels.
8. Measure the brake lining (not including the metal backing plate) of each pad at it's thinnest point. If any one of the brake pads are equal to or less that the service limit then all pads should be replaced.
9. Measure the rotor thickness in three places. If the rotor thickness is less than the service limit then the rotor must be replaced.
10. Measure the rotor runout. If the runout exceeds the service limit, then the rotor must be resurfaced. After resurfacing the rotor, measure the rotor thickness. If the rotor thickness is less than the service limit, then the rotor must be replaced.
11. Lower the vehicle.
12. Reconnect the battery, remove the blocks from behind the wheels and test drive the vehicle.

⚠ WARNING

Current Taylor-Dunn® brakes are asbestos free. However, there is the possibility that the original brakes were replaced with aftermarket parts containing asbestos. Since this possibility exists, all brake parts should be handled as if they contain asbestos. Refer to Appendix C for recommended handling precautions.





Replace Front Disc Brake Pads

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the forward-reverse switch in the center "OFF" position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

NOTE: It is recommended that both the left and right brake pads be replaced as a set.

NOTE: Installing new brake pads will raise the brake fluid level in the master cylinder.

6. Thoroughly clean the area around the master cylinder cap.
7. Remove fluid from the master cylinder until it is 1/2 full.
8. Raise the front of the vehicle and support with jack stands.
9. Remove the tire/wheel assembly. Refer to Tires and Wheels section for information on removing the tire and wheel assembly.

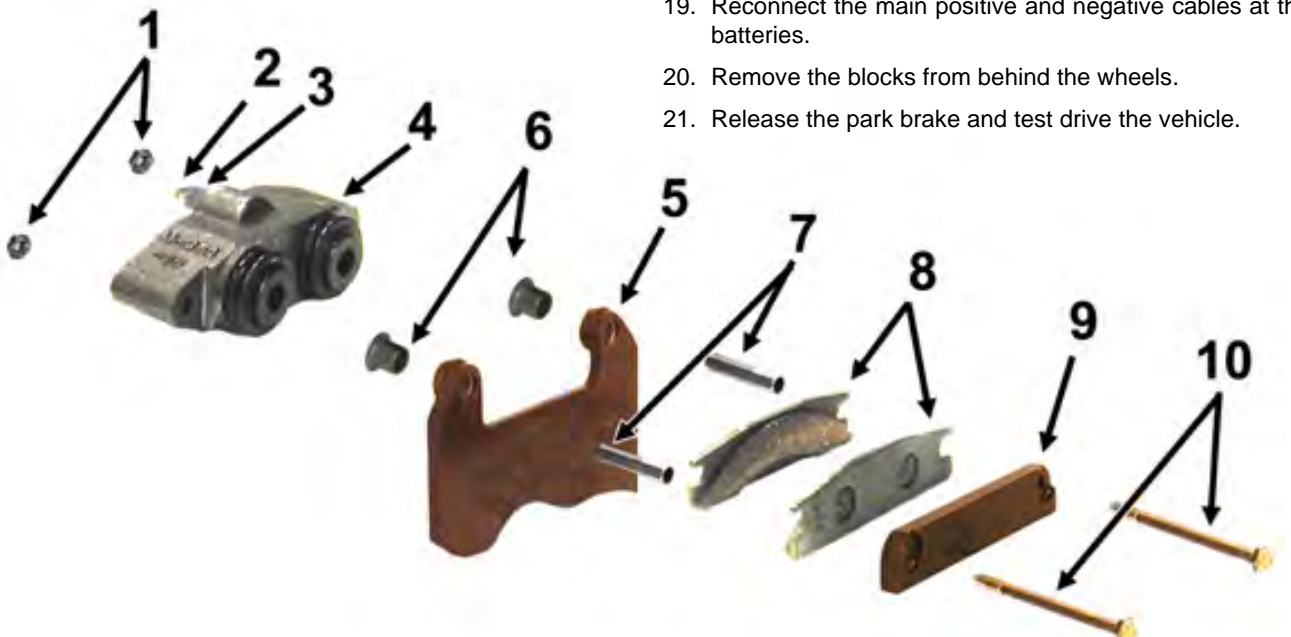
NOTE: Refer to the illustration below for the following steps.

10. Remove the brake body bolts (10) and discard the lock nuts (1) and brake pads (8).

⚠ WARNING

Current Taylor-Dunn® brakes are asbestos free. However, there is the possibility that the original brakes were replaced with aftermarket parts containing asbestos. Since this possibility exists, all brake parts should be handled as if they contain asbestos. Refer to Appendix C for recommended handling precautions.

11. Remove the spacer bushings (6) from the mounting bracket (5) and discard the bushings.
12. Inspect the brake rotor. See Inspect the Service Brakes section for information regarding inspecting the brake rotor.
13. Inspect the spacers (7) and replace if any wear or damage is found.
14. Install new spacer bushings in the mounting bracket.
15. Install new brake pads in reverse order. Torque the mounting bolts per torque listed in the Hardware Torque table at the end of this section.
16. Repeat this procedure for the other wheel.
17. Install the tire/wheel assembly and lower the vehicle to the ground.
18. Fill the master cylinder to the proper level. Refer to Check Master Cylinder Fluid section for information on the proper master cylinder fluid level.
19. Reconnect the main positive and negative cables at the batteries.
20. Remove the blocks from behind the wheels.
21. Release the park brake and test drive the vehicle.



REAR BRAKE

Service Limits:

Brake lining thickness: .062 inches (1.57 mm).

Brake Drum ID: 7.060 inches (179.3 mm)

Drum runout: 0.010 inches (0.254 mm).

Inspection

Brake Shoes

NOTE: The wheel must be removed to accurately measure the brake shoes. Refer to Tires and Wheels section for information on removing the wheel.

Measure the brake shoe lining at the thinnest point on the shoe. If any one of the brake shoe linings are equal to or less than the service limit then all shoes should be replaced.

NOTE: If this is a riveted lining, then the measurement must be to the top of the rivets.

It is recommended to replace the left and right side brake shoes as a set.

Brake Drum

NOTE: The wheel must be removed to accurately measure the brake drum. Refer to Tires and Wheels section for information on removing the wheel.

If the brake drum is grooved or worn beyond the service limit then the brake drum must be replaced.

Measure the inside diameter of the brake drum in 3-places.

If the difference between any of the measurements exceeds the service limit then all shoes should be replaced.

⚠ WARNING

Current Taylor-Dunn® brakes are asbestos free. However, there is the possibility that the original brakes were replaced with aftermarket parts containing asbestos. Since this possibility exists, all brake parts should be handled as if they contain asbestos. Refer to Appendix C for recommended handling precautions.



⚠ WARNING

Do not use a brake drum that is worn beyond its service limits. A drum worn beyond its service limits could fail and cause loss of brakes resulting in severe bodily injury and/or property damage.



Adjust


NOTE: The brake adjustment is inside of the left and right brake. Do not adjust the brake by means of the brake cables as this will cause mis-operation of the brakes. If you hear a single "clunking" noise while braking it may be due to mis-adjustment of the brake cables or linkage. Refer to Replace Brake Linkages/Cables for information regarding proper adjustment of the cables and linkages.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the wheel off of the ground and support with jack stands.
7. Release the park brake.
8. Remove the tire/wheel assembly. Refer to Tires and Wheels section for information on removing the wheel.
9. Align the adjusting access slot in the brake drum with the adjusting star wheel at the bottom of the brake.
 
10. While rotating the brake drum back and forth, rotate the brake adjuster star wheel until the brake is tight enough so that brake drum cannot be rotated.
11. Back off the star wheel just enough so that the brake drum rotates freely.
12. Install the tire/wheel assembly.
13. Repeat this procedure for the opposite side brake.
14. Set the park brake.
15. Reconnect the main positive and negative cables at the batteries.
16. Remove blocks from behind the wheels.
17. Release the park brake and test drive the vehicle.

⚠ WARNING

Adjusting the brakes by means of the brake cables could cause a hard brake pedal with little or no braking power. This could cause loss of control of the vehicle resulting in severe bodily injury and/or property damage.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

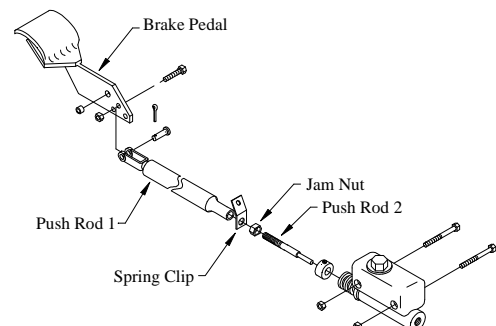
⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

Adjust the Mechanical Brake Linkages

Do not use this procedure to adjust the brakes. This procedure should only be performed when replacing any of the mechanical brake linkages or it is found that the linkages have been adjusted incorrectly.

6. Release the park brake.
7. Loosen the jam nut on the master cylinder push rod.
8. Remove the brake pedal return spring.
9. Adjust push rod 2 so that there is between 1/16" and 1/8" free play between the push rod and the master cylinder plunger.
10. Tighten the jam nuts on the master cylinder push rod.
11. Install the brake pedal return spring.
12. Set the park brake.
13. Reconnect the main positive and negative cables at the batteries.
14. Remove blocks from behind the wheels.
15. Release the park brake and test drive the vehicle.



Replace Shoes

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever NEUTRAL position.
3. Place blocks under the front wheels to prevent vehicle movement.
4. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

NOTE: It is recommended that both the left and right brake pads be replaced as a set.

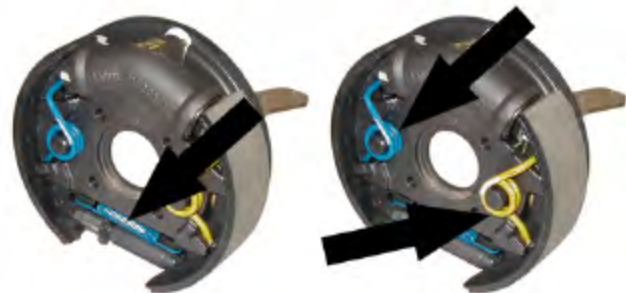
6. Release the park brake.
7. Raise the rear wheels off of the ground and support with jack stands.
8. Remove the tire/wheel assembly. Refer to Tires and Wheels section for information on removing the wheel.
9. Remove and inspect the brake drum. Refer to Inspect the Service Brake section for information regarding inspecting the brake drum.
10. Remove the retracting spring and torsion springs from the brake shoes.
11. Remove the hair pin clips from the actuating arms and discard.
12. Remove the brake shoes and brake adjuster assembly from the backing plate.
13. Thoroughly clean and inspect the adjuster assembly. Replace parts as required.
14. Apply a very light coating of high temperature grease to the adjuster screw threads.
15. Install in reverse order.
16. Repeat for the opposite side.
17. Adjust the brakes. See Adjust the Service Brakes section for information regarding adjusting the brakes.
18. Set the park brake.
19. Reconnect the main positive and negative at the batteries.
20. Lower the wheels to the ground.
21. Remove the blocks from behind the wheels.
22. Release the park brake and test drive the vehicle.

⚠ WARNING

Current Taylor-Dunn® brakes are asbestos free. However, there is the possibility that the original brakes were replaced with aftermarket parts containing asbestos. Since this possibility exists, all brake parts should be handled as if they contain asbestos. Refer to Appendix C for recommended handling precautions.

⚠ WARNING

The hair pin clips are damaged when they are removed. Do not install the old hair pin clips. Reinstalling old hair pin clips could lead to brake failure, property damage and/or severe bodily injury.



Retracting spring

Torsion springs



Hair Pin Clips



Adjuster Assembly



REBUILD DISC BRAKE BODY

This procedure assumes that the component has been removed from the vehicle. Refer to the component assembly removal instructions for details and warnings regarding the removal and installation procedure.

⚠ WARNING

Do not ingest brake fluid or allow contact with skin or eyes. Always wear protective clothing and a face shield when working with or around brake fluid.

SKIN CONTACT

Flush area immediately with water for several minutes. If a rash or skin irritation develops, get medical attention immediately.

EYE CONTACT

Immediately flush the eye with water for 15 minutes and call physician.

INGESTION

Get medical attention immediately.

⚠ WARNING

Current Taylor-Dunn® brakes are asbestos free. However, there is the possibility that the original brakes were replaced with aftermarket parts containing asbestos. Since this possibility exists, all brake parts should be handled as if they contain asbestos. Refer to Appendix C for recommended handling precautions.

⚠ WARNING

Hydraulic brake system components must be kept clean. Make sure your work area is free from dirt and debris and will contain any brake fluid spills. Any debris or contaminants left in the brake system could lead to brake failure and result in property damage and/or severe bodily injury.

⚠ WARNING

The pistons are very fragile. If the piston is damaged it must be replaced. Failure to replace a damaged piston could lead to brake failure and result in property damage and/or severe bodily injury.

1. Pull the pistons out of the brake body.
2. Remove the piston rubber boot.
3. Remove the piston o-ring from inside of the brake body.
4. Inspect and replace parts as required.
5. Lubricate the brake parts with clean brake fluid from a sealed container.
6. Install the o-rings into the brake body. Make sure that the o-rings are installed into the second groove and that they are not twisted (Fig 1).
7. Using tool #41-350-13 (optional), slide the rubber boots onto the pistons as shown. The boot should be hanging off of the end of the piston (Fig 2).
8. Insert the rubber boot/piston into the brake body making sure that the boot is properly seated in the groove (Fig 3).
9. Press the pistons all the way down into the brake body making sure that the boot seats properly into the upper groove on the piston.
10. Install any fittings or plugs that were removed from the brake body using teflon tape thread sealant.
11. *If the brake body assembly is not to be immediately installed onto a vehicle, plug the brake hose fitting hole to prevent any contaminants from entering the brake body.*



Figure 1



Figure 2



Assembled Brake Body

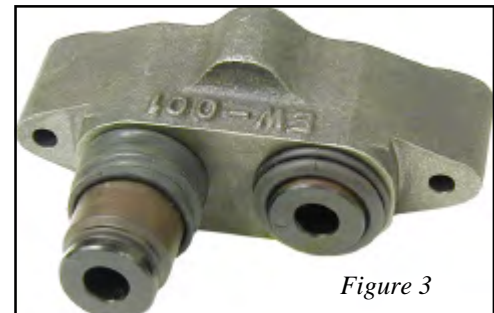


Figure 3



MASTER CYLINDER

Replace the Master Cylinder

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

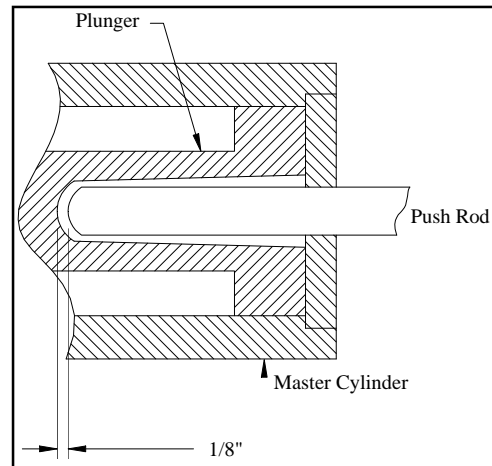
Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

NOTE: Most vehicle configurations do not require lifting the vehicle to remove the master cylinder. Lifting the vehicle may not be required.

6. If required, raise the vehicle and support with jack stands.
7. Place a drain pan under the master cylinder.
8. Disconnect the brake line(s) to the master cylinder and pump out the fluid in the master cylinder by depressing the pedal several times.
9. Remove the master cylinder bolts and remove the master cylinder from the vehicle.
10. Install in reverse order.
11. Adjust the master cylinder push rod so that it is approximately 1/8 inch away from the master cylinder plunger when the brake pedal is up.
12. Fill the master cylinder with brake fluid from a sealed container.
13. Pump the brake pedal a short distance of one to two inches until no bubbles are seen coming from the inlet ports inside of the master cylinder chamber.
14. If the vehicle was raised, lower it to the ground.
15. Bleed the brakes. refer to Bleed the Brakes section for information regarding bleeding the brakes.
16. Reconnect the main positive and negative cables at the batteries.
17. Remove the blocks from behind the wheels.
18. Release the park brake and test drive the vehicle.

⚠ WARNING

- Only use DOT 3 brake fluid from a new sealed container.
- DOT 3 brake fluid is corrosive and will damage paint finishes.
- Dispose of brake fluid in accordance with local state and federal regulations.
- Read and follow all warnings on the brake fluid container.



Cutaway of typical master cylinder showing the push rod clearance



Rebuild

NOTE: Hydraulic brake system components must be kept clean. Make sure your work area is free from dirt and debris and will contain any brake fluid spills.

1. Remove the master cylinder from the vehicle. See Replace the Master Cylinder section .
2. Drain all fluid from the master cylinder and discard.
3. Remove the rubber boot.
4. Depress the plunger and remove the plunger spring clip retainer.
5. Pull the plunger and all seals out of the master cylinder bore.
6. Thoroughly clean, inspect and replace parts as required.
7. If any damage is found in the bore of the master cylinder then it must be replaced.
8. Lubricate all parts with clean brake fluid from a sealed container.
9. Reassemble in reverse order.

NOTE: If the master cylinder is not to be immediately installed onto a vehicle, plug the brake line fitting hole to prevent any contaminants from entering the master cylinder.

⚠ WARNING

Do not ingest brake fluid or allow contact with skin or eyes. Always wear protective clothing and a face shield when working with or around brake fluid.

SKIN CONTACT

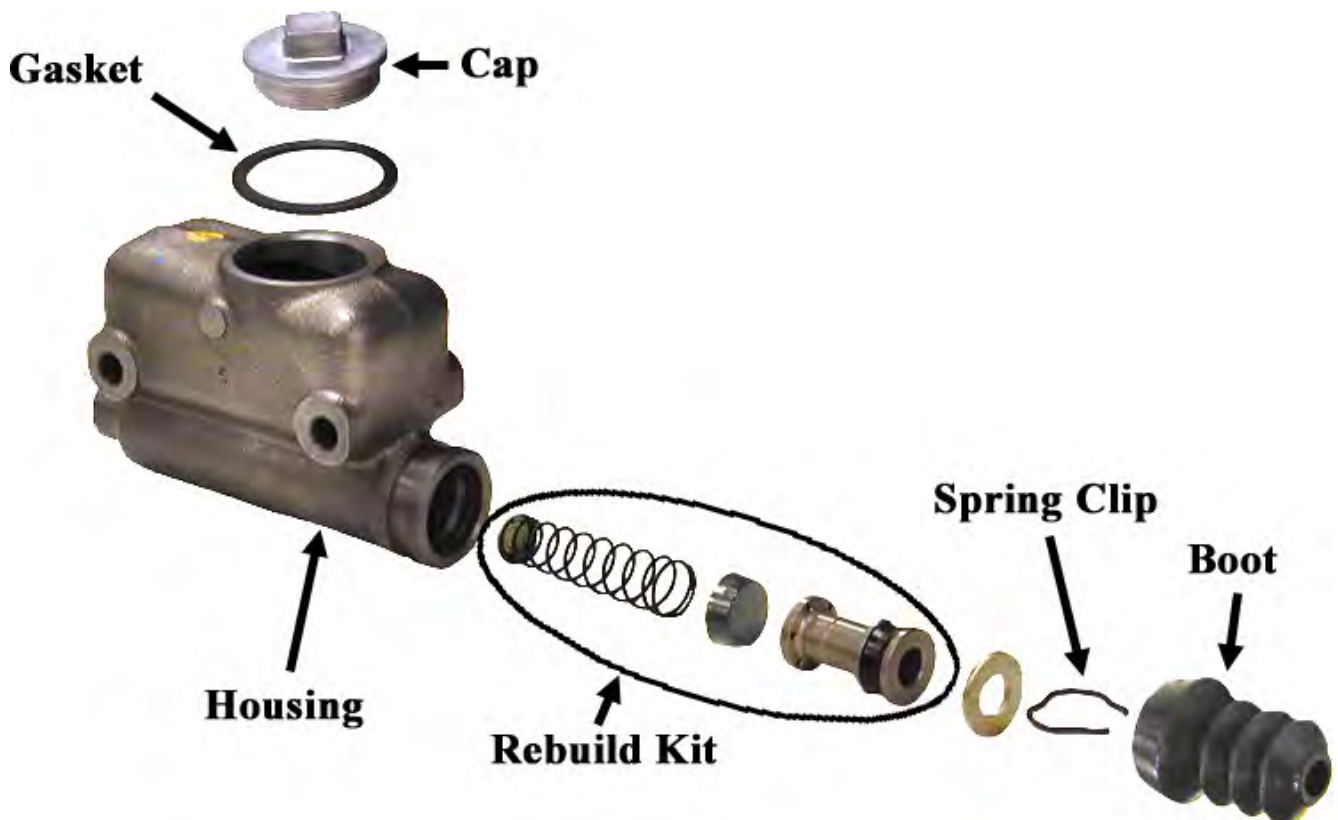
Flush area immediately with water for several minutes. If a rash or skin irritation develops, get medical attention immediately.

EYE CONTACT

Immediately flush the eye with water for 15 minutes and call physician.

INGESTION

Get medical attention immediately.





BLEED BRAKE SYSTEM

⚠ WARNING

- Only use DOT 3 brake fluid from a new sealed container.
- DOT 3 brake fluid is corrosive and will damage paint finishes.
- Dispose of brake fluid in accordance with local state and federal regulations.
- Read and follow all warnings on the brake fluid container.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

NOTE: Start this procedure at the wheel furthest from the master cylinder, then work toward the wheel closest to the master cylinder. The rear bleeder valves can be accessed through the center rear inspection cover.

6. Thoroughly clean the area around the master cylinder cap and remove the cap.
7. Add brake fluid from a new sealed container to the master cylinder. Fill to 1/4" from the top of the master cylinder chamber.
8. The master cylinder fluid level will drop as the brakes are bled. Periodically check and fill the master cylinder during this procedure. Do not allow the fluid level in the master cylinder to drop too low as this will allow air into the brake lines.
9. Attach a clear hose to the bleeder valve on the brake cylinder that is to be bled. Route the hose into a clear container for waste brake fluid.
10. Pump the brake pedal a few times and then press and hold light pressure to the brake pedal.

11. Open the brake bleeder valve.
12. Depress the foot pedal to the floor and then close the bleeder valve. Do not release pressure on the brake pedal until the bleeder valve is closed.
13. Slowly release the foot pedal, allowing it to return to its released position.

NOTE: Check and fill the master cylinder frequently during the bleeding process. Do not allow the fluid level in the master cylinder to drop low enough to allow air to enter the brake lines. If air enters the brake lines during the bleeding process, then you will have to start again from the beginning.

14. Repeat the above steps until you are sure that all of the air is expelled from the brake line. Any air bubbles that can be seen in the clear hose attached to the bleeder is an indication that there is still air in the brake lines.
15. Repeat this process with each of the other wheels.

NOTE: When finished, top off the master cylinder with fluid. See Check Master Cylinder Fluid for information on filling the master cylinder.

16. Reconnect the battery, remove the blocks from behind the wheels and test drive the vehicle.



FLUSH THE BRAKE SYSTEM

⚠ WARNING

- Only use DOT 3 brake fluid from a new sealed container.
- DOT 3 brake fluid is corrosive and will damage paint finishes.
- Dispose of brake fluid in accordance with local state and federal regulations.
- Read and follow all warnings on the brake fluid container.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

6. Raise the rear wheels off of the ground and support with jack stands.
7. If equipped with front brakes, raise the front wheels off of the ground and support with jack stands.
8. Release the park brake.
9. Remove both rear wheels and, if equipped with front brakes, the front wheels. Refer to Tires and Wheels section for information regarding removing the wheels.
10. Remove the wheel cylinders from each axle. Refer to Replace the Wheel Cylinder section for information regarding removing the wheel cylinder.
11. Attach a clear hose to the bleeder valve on each of the wheel cylinders and route the hoses into a container for waste brake fluid.
12. Position the wheel cylinders so that the bleeder screw is pointing to the ground and open all bleeder screws.
13. Pump the master cylinder until all fluid has been pumped from the brake lines and all wheel cylinders.
14. Close all bleeder screws.
15. Fill the master cylinder with fluid.
16. Open one of the bleeder screws and pump the master cylinder until all fluid has been pumped from the master cylinder and close the bleeder screw.
17. Repeat the above two steps for each wheel cylinder.
18. Reinstall the wheel cylinders and bleed the brakes. Refer to Bleed the Brakes for information regarding bleeding the brakes.
19. Set the park brake.
20. Install the wheels and lower the vehicle to the ground.
21. Reconnect the main positive and negative cables at the batteries.
22. Release the park brake and test drive the vehicle.

⚠ WARNING

Do not ingest brake fluid or allow contact with skin or eyes. Always wear protective clothing and a face shield when working with or around brake fluid.

SKIN CONTACT

Flush area immediately with water for several minutes. If a rash or skin irritation develops, get medical attention immediately.

EYE CONTACT

Immediately flush the eye with water for 15 minutes and call physician.

INGESTION

Get medical attention immediately.

ADJUST PARKING BRAKE

Park Brake Handle

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

NOTE: The service brake must be properly adjusted before attempting to adjust the parking brake. Refer to Adjust the Service Brakes for information regarding adjusting the service brakes.

The parking brake is adjusted by means of the knob on the end of the parking brake handle. Do not adjust the parking brake using the brake linkage. The brake linkage should only require adjustment when any part of the brake system is repaired or replaced.

6. Release the park brake.
7. Rotate the knob on the end of the parking brake handle clockwise to tighten or counter clockwise to loosen the park brake.

NOTE: The park brake should hold firmly with no brake drag when released.

12. Set the park brake.
13. Reconnect the main positive and negative cables at the batteries.
14. Remove blocks from behind the wheels.
15. Release the park brake and test drive the vehicle.



Adjustment Knob

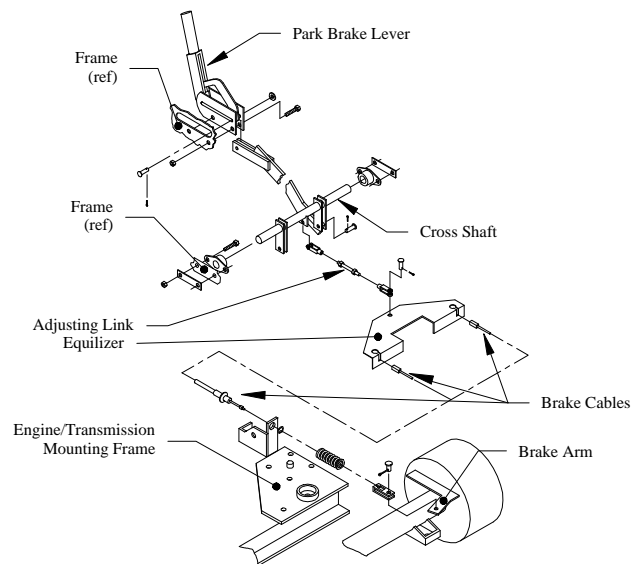
Park Brake Linkage

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

NOTE: Do not use this adjustment for routine adjustments to the parking brake. This adjustment should only be performed when any part of the brake system has been repaired or replaced.

6. Release the park brake.
7. Loosen the jam nuts on the adjusting link.
8. Adjust the adjusting link so that all free play is removed from the brake cables without actuating the arms at the wheels.
9. Tighten the jam nuts on the adjusting link.
10. Set the park brake.
11. Reconnect the main positive and negative cables at the batteries.
12. Remove blocks from behind the wheels.
13. Release the park brake and test drive the vehicle.

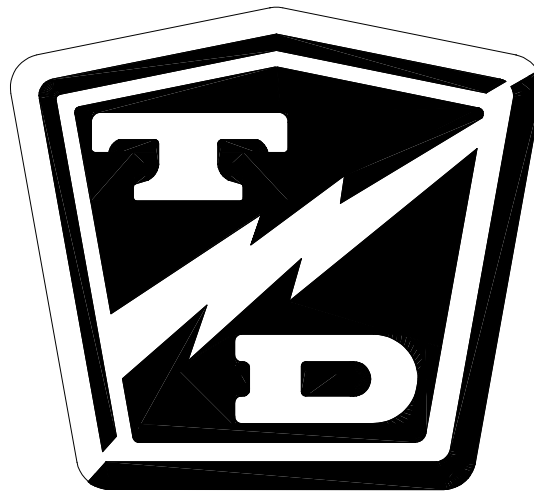




HARDWARE TORQUE

If hardware is not listed here, refer to standard torque values in the appendix.

Description	Foot Pounds	Newton Meters
Brake Body Bolts	11	14.9





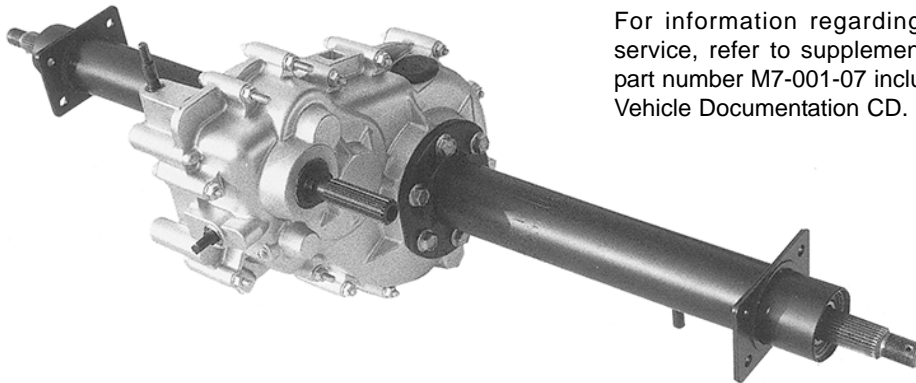
Notes: _____



Chapter - 7

Kohler engine service manual can be downloaded from the Kohler website: www.kohlerengines.com

Refer to the specifications page in this manual for the Kohler Engine model and spec number.



For information regarding Rear Axle service, refer to supplementary manual part number M7-001-07 included on your Vehicle Documentation CD.

The CVT drive belt wear limit is 1.031 inches (26.2 mm)



Engine / Transmission

Chapter - 8

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Adjustement 2

Shift Linkage

ADJUSTMENT

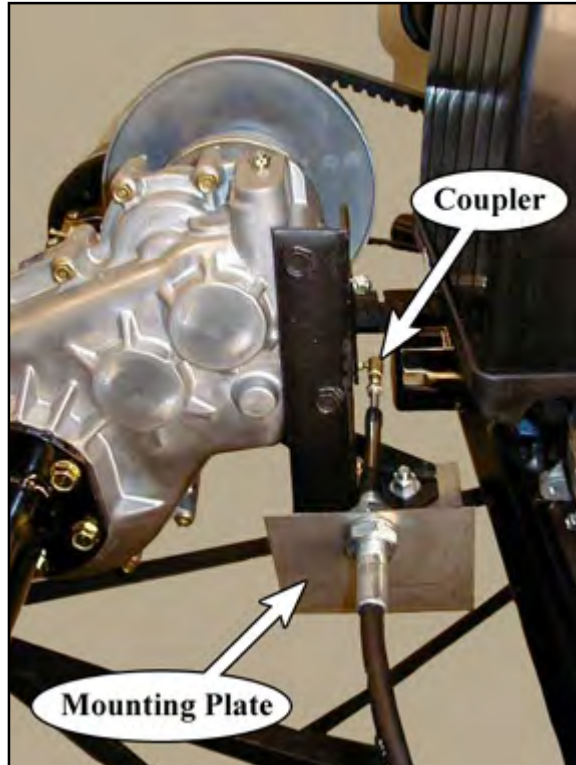
⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery.

6. Loosen the ball joint jam nut and the cable mounting nuts on the spring steel mounting plate.
7. Disconnect the coupler from the ball joint at the transmission.
8. Place the shift lever in forward.
9. Move the transmission shift lever to the forward detent.
10. Using the cable nuts and/or the ball joint coupler, adjust the linkage so that the coupler easily slides onto the ball joint.
11. Tighten all mounting and jam nuts.
12. While slowly rotating the transmission input sheave, shift the transmission from forward to reverse and back to forward to confirm proper adjustment.
13. Reconnect the battery and test drive.

⚠ WARNING

Do not modify the stainless steel shift cable mounting plate at the transmission. This mounting plate is spring steel and functions as an active part of the shifting mechanism. Modification of this mounting plate may cause improper operation of the shift linkage resulting in damage to the transmission.



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Tires and Wheels

TIRE INFLATION

There are many tire options available with varying tire pressures. Refer to the side wall of your tire for information regarding the tire pressure for your tires.

The illustration below is an example of the side wall information on a tire.

Tire pressures must be checked when the tire is cold.



TIRE INSPECTION

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery connector from the vehicle.

6. Check the tire pressure. Refer to **Tire Inflation** section for information on checking the tire pressure.
7. Inspect the tire tread depth. Minimum recommended tread depth is 1/16-inch. There are a series of tread depth wear indicators around the circumference of the tire. They will appear as 1/2-inch bands across the tread as the tire approaches its wear limit (see illustration below). Replace the tire if any tread depth indicator can be seen or any part of the tread depth is 1/16-inch or less. Refer to **Replace the Tire** section for information regarding replacing the tire.
8. Inspect for uneven tire wear on the front tires. Uneven tire wear could be a result of an improperly inflated tire or a misaligned or damaged front end.

*NOTE: Refer to **Tire Inflation** section or **Steering Component Service** section for information on proper tire inflation or front end wheel alignment.*

9. Inspect the inner and outer side walls for cracks. If any cracks are seen, then the tire should be replaced. Refer to **Replace the Tire** section for information regarding replacing the tire.
10. Inspect the valve stem for cracks. If any cracks are seen, then the valve stem should be replaced. It is also recommended that the valve stem be replaced whenever the tire is replaced.

*NOTE: Refer to **Replace the Tire** section for information regarding replacing the valve stem.*

11. Inspect the tread and side walls for debris in the rubber that could lead to a puncture. If any debris is found it should be removed and the tire inspected for a leak.





TIRE/WHEEL ASSEMBLY, REMOVE

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery connector from the vehicle.

⚠ WARNING

Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

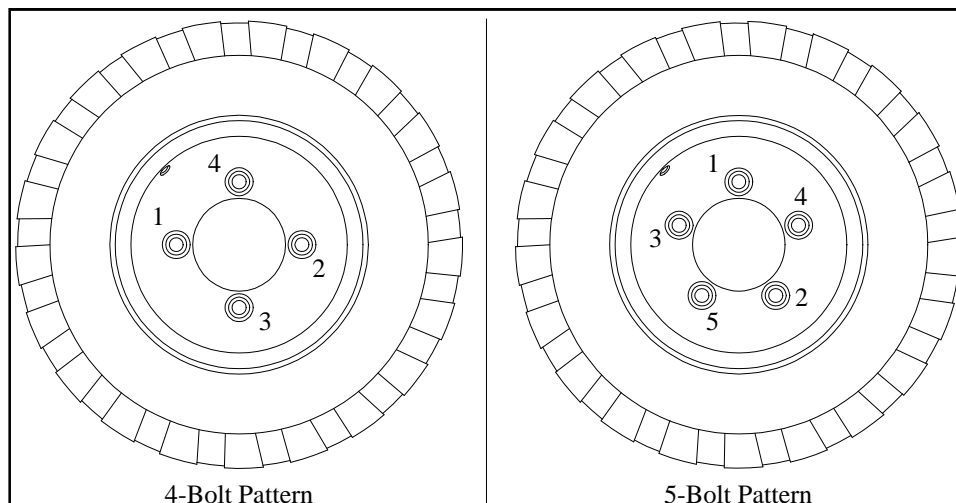
Remove/Install

6. Raise the wheel to be replaced off of the ground and support with jack stands.
7. Remove the wheel nuts and remove the wheel.
8. Install in reverse order.
9. Cross tighten the wheel nuts in two stages as follows:
1st stage to approximately 20 foot pounds (27 newton meters).
2nd stage to torque listed in the Hardware Torque table at the end of this section.

10. Reconnect the main positive and negative cables at the batteries.
11. Lower the wheel to the ground.
12. Remove the blocks from behind the wheels.
13. Release the parking brake and test drive the vehicle.

⚠ WARNING

Re-torque all wheel nuts to their final value after 1-week (20-hours) of operation. Failure to re-torque the wheel nuts may result in the wheel coming off of the vehicle causing severe bodily injury and/or property damage.



Pattern for tightening the wheel nuts



REPLACE THE TIRE (PNEUMATIC)

⚠ WARNING

Improper assembly or disassembly of a split rim wheel can result in tire explosion causing severe injury. Refer tire/wheel repair to a qualified tire supplier.

NOTE: To replace the tire, the tire/wheel assembly must be removed from the vehicle. Refer to Replace the Tire/Wheel section for information on removing the tire/wheel assembly.

Tire replacement should only be performed by personnel trained in tire replacement.

The tire replacement procedure will be unique to the type of replacement equipment being used. Refer to the instructions provided with your equipment.

Always use a new valve stem when replacing a tire.

1. Remove the tire from the wheel.
2. Cut the old valve stem off of the wheel.
3. Remove the valve stem cap from the new valve stem.
4. Lubricate the valve stem with liquid soap.
5. Install a new valve stem using a valve stem tool.

NOTE: The valve stem tool is available at most auto repair shops.

6. Install the tire onto the wheel following the instructions provided with your tire replacement equipment.
7. Inflate the tire to the proper pressure and check for leaks.
8. Install the valve stem cap.

REPAIR THE TIRE (PNEUMATIC)

⚠ WARNING

Do not attempt to repair a tire with a damaged side wall or a slice in the tread. This type of repair could fail prematurely resulting in severe bodily injury and/or property damage.

NOTE: To properly repair a puncture, the tire must be removed from the wheel. Refer to Replace the Tire section for information on removing the tire from the wheel.

It is recommended to repair a tire with a combination vulcanized plug and internal patch.

Tire repairs should only be performed by personnel trained in tire repair.

The tire repair procedure will be unique to the type of repair equipment or repair components used. Refer to the instructions provided with your equipment or repair components.



HARDWARE TORQUE

If hardware is not listed here, refer to standard torque values in the appendix.

Description	Foot Pounds	Newton Meters
Wheel Nut	85	115

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⚠ WARNING

- Explosive mixtures of Hydrogen gas are present within battery cells at all times. Do not work with or charge battery in an area where open flames (including gas furnace or water heater pilots), sparks, cigarettes, or any other sources of combustion are present. Always provide ample ventilation in rooms where batteries are being charged. Failure to do so may result in severe bodily injury and/or property damage.
- A battery is a live electrical source. It cannot be disconnected or neutralized. Do not drop any tool or conductive object onto the battery. A conductive object that comes in contact with the battery terminals will initiate a short circuit of the battery. This could cause the battery to explode resulting in severe bodily injury and/or property damage.
- Battery electrolyte is poisonous and dangerous. It contains sulfuric acid. Avoid contact with skin eyes or clothing. Wear rubber gloves and safety glasses while servicing batteries. **DO NOT INGEST!** This may result in severe bodily injury.

Battery Service



CLEANING

⚠ WARNING

· Explosive mixtures of Hydrogen gas are present within battery cells at all times. Do not work with or charge battery in an area where open flames (including gas furnace or water heater pilots), sparks, cigarettes, or any other sources of combustion are present. Always provide ample ventilation in rooms where batteries are being charged. Failure to do so may result in severe bodily injury and/or property damage.

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· Battery electrolyte is poisonous and dangerous. It contains sulfuric acid. Avoid contact with skin eyes or clothing. Wear rubber gloves and safety glasses while servicing batteries. **DO NOT INGEST!** This may result in severe bodily injury.

⚠ CAUTION

Battery electrolyte will stain and corrode most surfaces. Immediately and thoroughly clean any surface outside of the battery that the battery electrolyte comes in contact with. Failure to clean may result in property damage.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery connector from the vehicle.

6. Dry dirt can be readily blown off with low-pressure air or brushed off.
7. Wetness or wet dirt on the battery indicates battery acid. Using a nonmetallic brush with flexible bristles, wash the battery off with a strong solution of baking soda and hot water (1 lb. of soda to a gallon of water). Continue until all fizzing stops, which indicates that the acid has been neutralized. Then rinse thoroughly with clear water. **DO NOT** get any of the solution into the battery cells.
8. Reconnect the battery, remove the blocks from the wheels and test drive.



TESTING

⚠ WARNING

- Explosive mixtures of Hydrogen gas are present within battery cells at all times. Do not work with or charge battery in an area where open flames (including gas furnace or water heater pilots), sparks, cigarettes, or any other sources of combustion are present. Always provide ample ventilation in rooms where batteries are being charged. Failure to do so may result in severe bodily injury and/or property damage.
- A battery is a live electrical source. It cannot be disconnected or neutralized. Do not drop any tool or conductive object onto the battery. A conductive object that comes in contact with the battery terminals will initiate a short circuit of the battery. This could cause the battery to explode resulting in severe bodily injury and/or property damage.
- Battery electrolyte is poisonous and dangerous. It contains sulfuric acid. Avoid contact with skin eyes or clothing. Wear rubber gloves and safety glasses while servicing batteries. DO NOT INGEST! This may result in severe bodily injury.

⚠ CAUTION

Battery electrolyte will stain and corrode most surfaces. Immediately and thoroughly clean any surface outside of the battery that the battery electrolyte comes in contact with. Failure to clean may result in property damage.

Specific Gravity

NOTE: The battery must be fully charged before performing this test.

The specific gravity of a cell is an indication of the actual state of charge of the cell. A fully charged cell should have a reading of 1275 to 1300 (see the illustration to the right). A discharged cell will read 1100. Ideally, all cells in a battery will have the same reading. Any cells in a battery that vary by more than 30-points may be an indication of a bad cell.



Typical
Hydrometer
Float

Clean the battery. Refer to **Cleaning** section for information on cleaning the battery.

Using part number **77-200-00** hydrometer, check and record the specific gravity of each cell in the battery.

If, after charging, none of the cells exceed a hydrometer reading of 1250 then there may be a fault in the charging system. If the charging system checks OK then the battery is no longer accepting a charge and should be replaced.

*NOTE: Refer to **Charger Troubleshooting** for information on checking the charging system.*

The highest reading will be the cell that is accepting the most charge. This reading will be used to gauge all other cells.

Compare the specific gravity readings to the highest reading, if the difference between any of the cells is more than 30-points, then the cell or battery should be replaced.

NOTE: Contact the battery manufacturer for information regarding replacing individual cells in the battery.

WATERING

⚠ WARNING

- Explosive mixtures of Hydrogen gas are present within battery cells at all times. Do not work with or charge battery in an area where open flames (including gas furnace or water heater pilots), sparks, cigarettes, or any other sources of combustion are present. Always provide ample ventilation in rooms where batteries are being charged. Failure to do so may result in severe bodily injury and/or property damage.
- A battery is a live electrical source. It cannot be disconnected or neutralized. Do not drop any tool or conductive object onto the battery. A conductive object that comes in contact with the battery terminals will initiate a short circuit of the battery. This could cause the battery to explode resulting in severe bodily injury and/or property damage.
- Battery electrolyte is poisonous and dangerous. It contains sulfuric acid. Avoid contact with skin eyes or clothing. Wear rubber gloves and safety glasses while servicing batteries. **DO NOT INGEST!** This may result in severe bodily injury.

⚠ CAUTION

Battery electrolyte will stain and corrode most surfaces. Immediately and thoroughly clean any surface outside of the battery that the battery electrolyte comes in contact with. Failure to clean may result in property damage.



Battery Filler

⚠ WARNING

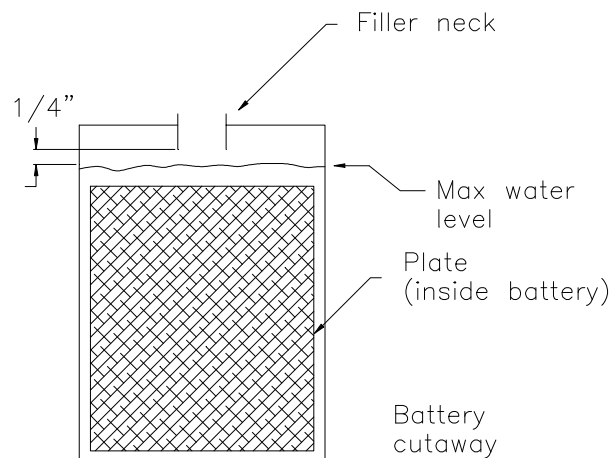
Do not overfill the batteries. Over filling the batteries may cause the batteries to boil over and result in severe bodily injury or property damage.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.
5. Disconnect the battery connector from the vehicle.

NOTE: The electrolyte level in a battery rises while charging and will be close to its highest level after the end of a charging cycle. It is recommended to fill the battery at the end of a charging cycle. If the electrolyte is below the top of the battery plates then fill just enough to cover the plates and then top off when the charging cycle is complete.

6. Clean the battery. Refer to **Cleaning** section for information on cleaning the battery.
7. Check the electrolyte level in all battery cells. If low, fill to the correct level with distilled water using part number **77-201-00** battery filler, never add additional battery electrolyte to the batteries.
8. Reconnect the battery, remove the blocks from the wheels and test drive.



CHARGING

Refer to the Operator Section for charging information.

⚠ WARNING

- **Explosive mixtures of Hydrogen gas are present within battery cells at all times. Do not work with or charge battery in an area where open flames (including gas furnace or water heater pilots), sparks, cigarettes, or any other sources of combustion are present. Always provide ample ventilation in rooms where batteries are being charged. Failure to do so may result in severe bodily injury and/or property damage.**
- **A battery is a live electrical source. It cannot be disconnected or neutralized. Do not drop any tool or conductive object onto the battery. A conductive object that comes in contact with the battery terminals will initiate a short circuit of the battery. This could cause the battery to explode resulting in severe bodily injury and/or property damage.**
- **Battery electrolyte is poisonous and dangerous. It contains sulfuric acid. Avoid contact with skin eyes or clothing. Wear rubber gloves and safety glasses while servicing batteries. DO NOT INGEST! This may result in severe bodily injury.**

STORING

Storage

Thoroughly clean the battery and battery compartment. Refer to **Cleaning** in this section for information regarding cleaning the battery.

Check the electrolyte level and charge the battery. Refer to **Watering** in this section for information regarding checking the electrolyte level.

Store the vehicle or battery (if removed) in a cool, dry, well ventilated area.

If storing for more than one month, the battery should be charged per the table below.

Storage Temperature (F)	Charging Interval (months)
Over 60	1
Between 40 and 60	2
Below 40	6

Returning to Service

⚠ WARNING

- 1. Make sure the start switch is in the "OFF" position, then remove the key.**
 - 2. Place the shift lever in the neutral position.**
 - 3. Set the park brake.**
 - 4. Place blocks under the front wheels to prevent vehicle movement.**
 - 5. Disconnect the battery connector from the vehicle.**
6. Thoroughly clean the battery and battery compartment. Refer to **Cleaning** in this section for information regarding cleaning the battery.
 7. Check the electrolyte level and charge the battery. Refer to **Watering** in this section for information regarding checking the electrolyte level.
 8. Test the battery. Refer to **Testing** section for information on testing the battery.
 9. The battery is now ready to be put back into service.



REMOVE/INSTALL

⚠ WARNING

- Explosive mixtures of Hydrogen gas are present within battery cells at all times. Do not work with or charge battery in an area where open flames (including gas furnace or water heater pilots), sparks, cigarettes, or any other sources of combustion are present. Always provide ample ventilation in rooms where batteries are being charged. Failure to do so may result in severe bodily injury and/or property damage.

- A battery is a live electrical source. It cannot be disconnected or neutralized. Do not drop any tool or conductive object onto the battery. A conductive object that comes in contact with the battery terminals will initiate a short circuit of the battery. This could cause the battery to explode resulting in severe bodily injury and/or property damage.

- Battery electrolyte is poisonous and dangerous. It contains sulfuric acid. Avoid contact with skin eyes or clothing. Wear rubber gloves and safety glasses while servicing batteries. **DO NOT INGEST!** This may result in severe bodily injury.

⚠ WARNING

1. Make sure the start switch is in the "OFF" position, then remove the key.
2. Place the shift lever in the neutral position.
3. Set the park brake.
4. Place blocks under the front wheels to prevent vehicle movement.

5. Using an insulated wrench, disconnect the negative cable, then the positive cable.
6. Remove the battery hold down.
6. Using a lifting strap or hoist, remove the battery from the vehicle.
7. Inspect the battery compartment for corrosion. If there is significant corrosion, all batteries should be removed and the compartment cleaned and painted.
8. Install the battery and torque the battery terminal hardware per torque listed in the Hardware Torque table at the end of this section.

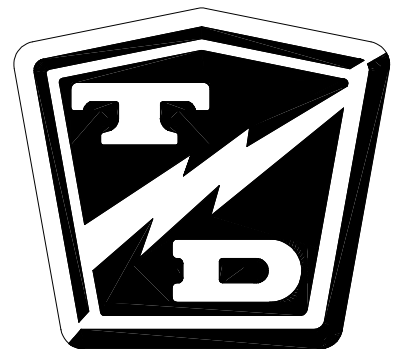
HARDWARE TORQUE

If hardware is not listed here, refer to standard torque values in the appendix.

Description	Inch Pounds	Newton Meters
Battery Terminal (clamp)	48-60	5.4-6.7
Battery Terminal (stud)	120-130	13.5-14.5

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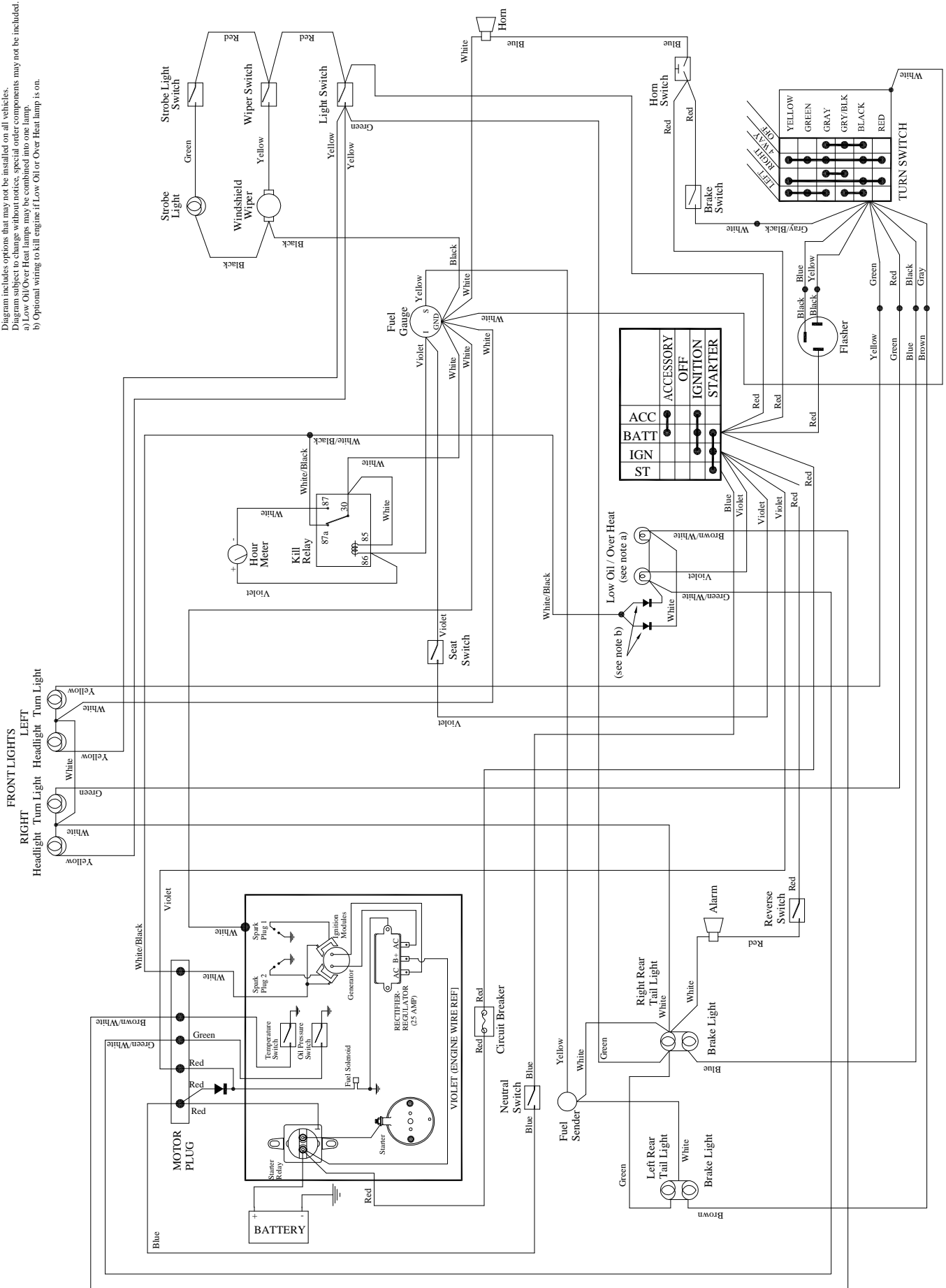
Full size diagrams (22 x 17) are included on the CD in PDF format. You can access the diagrams from a button on the CD menu.



Wire Diagrams



NOTES:
 Diagram includes options that may not be installed on all vehicles.
 Diagram subject to change without notice, special order components may not be included.
 a) Low Oil/Over Heat lamps may be combined into one lamp.
 b) Optional wiring to kill engine if Low Oil or Over Heat lamp is on.



Model BG-150 with Kohler CH18 Engine - Serial number 173365 through 999999 except for serial number 173451

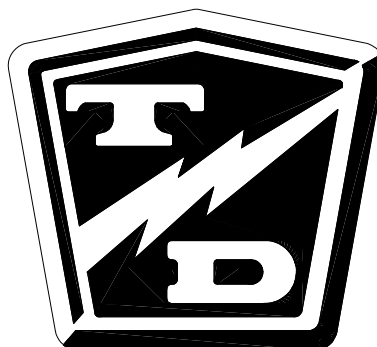
SCH-00015, 10/8/2007, Revision A

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Illustrated Parts

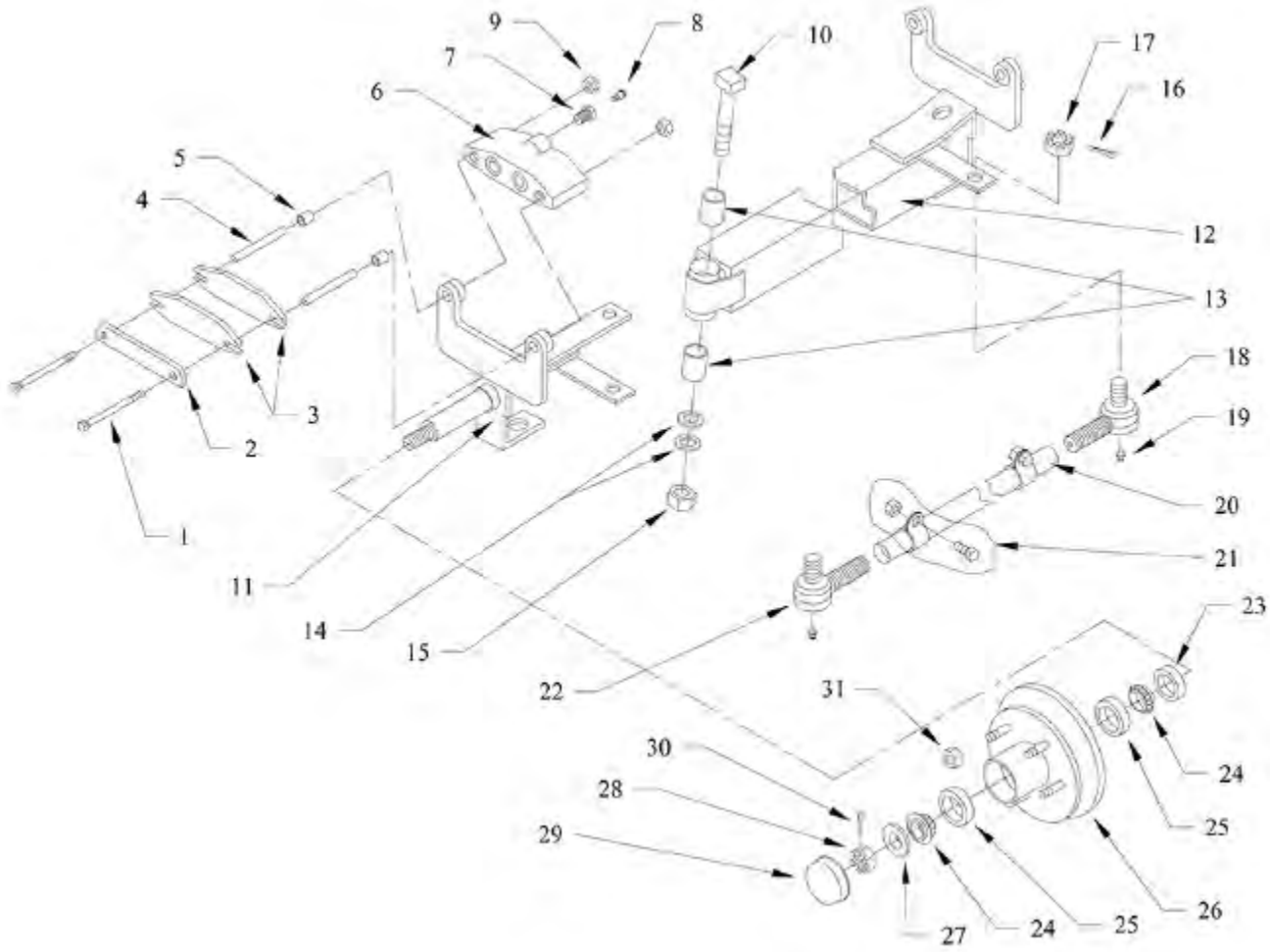
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Axle and Brake Assembly, Front



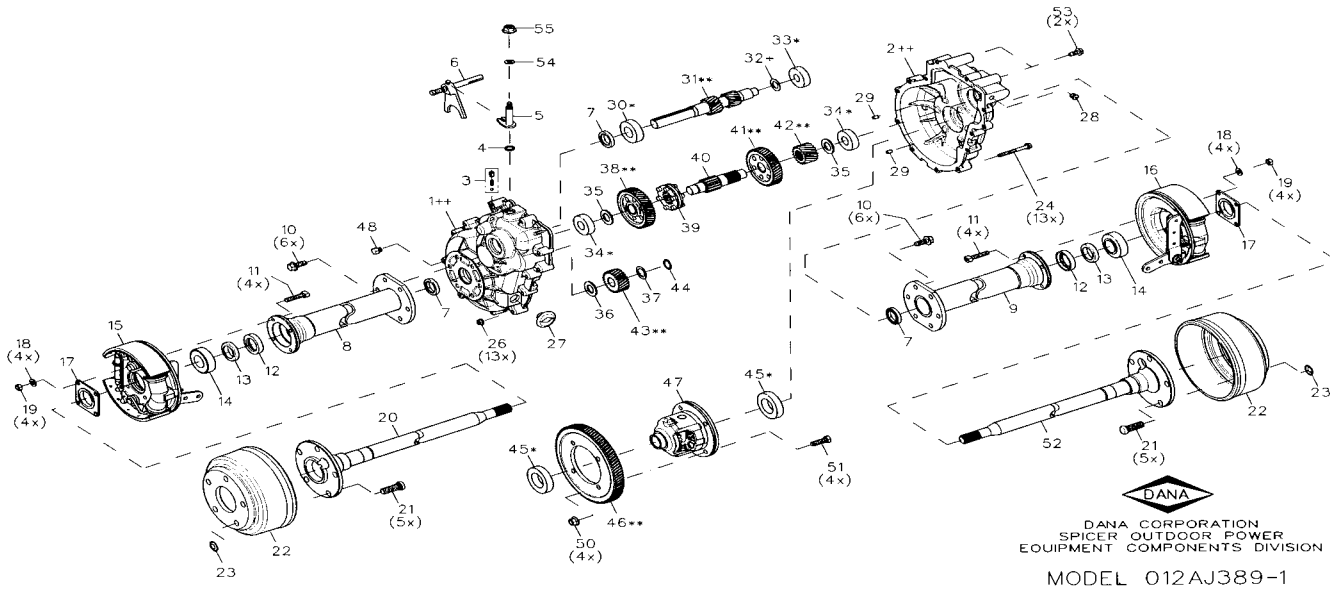


Axle Assembly and Brakes, Front

Item No.	Part No.	Description	Qty
1	88-067-21	Brake Body Bolt (grade 8)	4
2	41-350-51	Brake Pad Backing Plate	2
3	41-348-70	Brake Pad	4
4	41-348-52	Spacer	4
5	32-240-40	Bushing	4
6	41-350-70	Brake Body (Rebuild kit 41-350-66)	2
7	99-588-01	Brake Bleeder Fitting	2
8	88-069-82	Brake Body nut (grade 8,) DO NOT REUSE!	4
9	99-588-00	Brake Bleeder Valve	2
10	21-020-15	King Pin	2
11	14-210-88	Left (driver) Side Steering Yoke	1
11	14-210-89	Right (passenger) Side Steering Yoke	1
12	15-210-00	Front Axle Weldment	1
13	32-240-55	Upper/Lower King Pin Bushing	2
14	97-180-55	Thrust Washer	4
15	88-189-81	King Pin Nut	2
16	88-527-11	1/8" x 1" Cotter Pin	2
17	88-159-85	Ball Joint Nut	2
18	86-501-99	Ball Joint (right thread)	1
19	87-074-00	Grease Fitting	2
20	18-041-00	Tie Rod	1
21	86-510-00	Ball Joint Clamp w/Nut and Bolt	2
22	86-501-98	Ball Joint (left thread)	1
23	45-338-00	Grease Seal	2
24	80-017-00	Inner/Outer Wheel Bearing	4
25	80-103-00	Inner/Outer Race	4
26	12-158-10	Front Hub (w/Rotor), Note: Rotor N/A separately	2
27	88-228-61	3/4" SAE Flat Washer	2
28	88-239-85	Wheel Bearing Nut	2
29	92-104-00	Wheel Bearing Cap	2
30	88-527-11	Cotter Pin	2
31	97-236-00	Wheel Nut	10



Axle Assembly, Rear



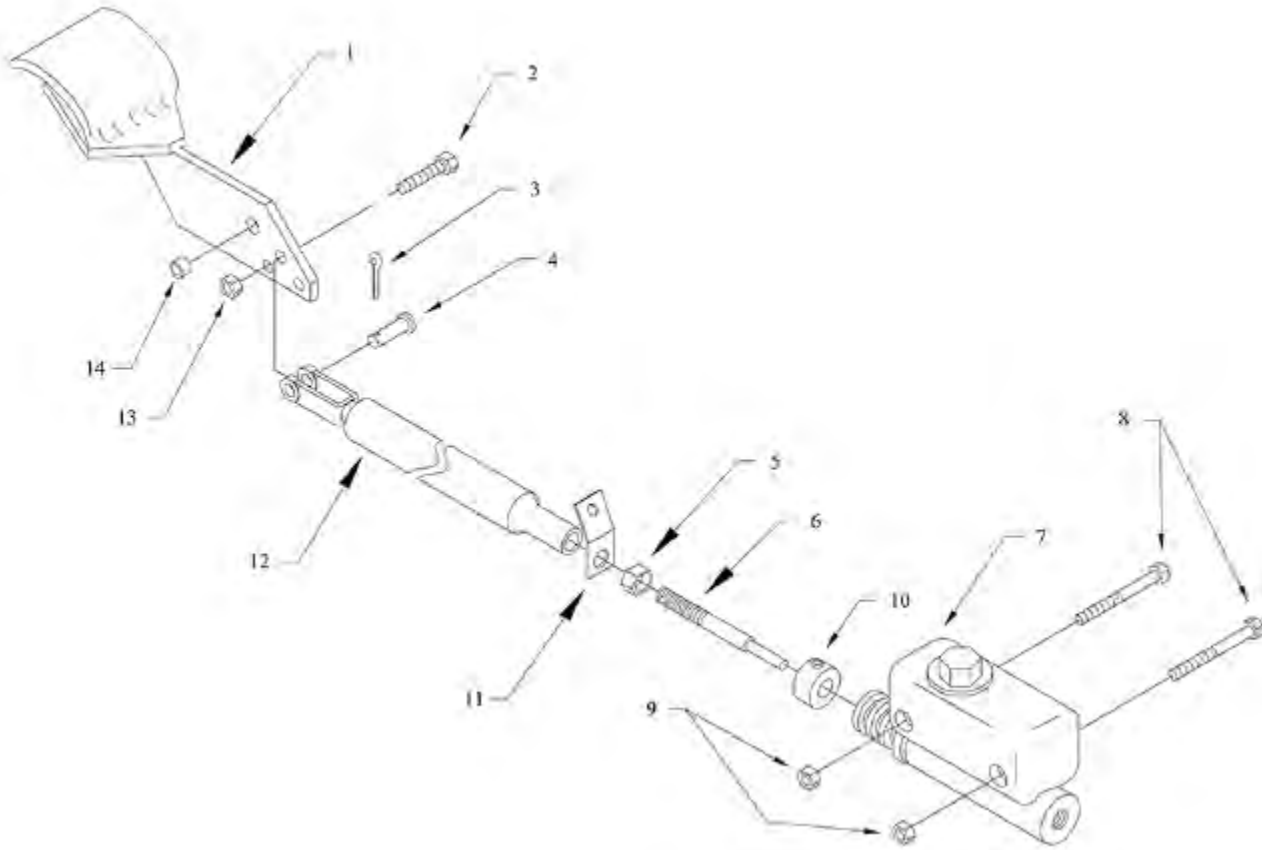
Axle Assembly, Rear

Item No.	Part No.	Description	Qty
-	4C-610-40	Axle Assembly, Complete (012AJ389-1)	1
1	*	Housing, w/idler shaft	1
2	*	Case	1
3	66-610-82	Detent kit	1
4	66-610-29	Seal	1
5	66-611-20	Shift actuator assembly	1
6	66-611-19	Shift rod assembly	1
7	45-303-30	Seal	1
8	66-610-75	Axle tube	1
9	66-610-76	Axle tube	1
10	66-610-74	Flange head screw	12
11	66-610-79	Flange head screw	8
12	45-303-00	Seal	2
13	32-509-10	Retaining ring	2
14	80-505-10	Bearing	2
15	41-347-28	Brake assembly, hydraulic, Lt	1
16	41-347-29	Brake assembly, hydraulic, Rt	1
17	45-303-10	Seal	1
18	66-610-72	Washer	8
19	66-610-80	Lock nut	8

20	41-127-95	Axle shaft (L)1	
21	66-610-28	Wheel stud	10
22	41-516-00	Brake drum	1
24	66-610-65	Flange head screw	13
26	66-610-69	Lock nut	13
27	66-610-59	Rubber plug	1
28	*	Vent	1
29	*	Dowel pin	1
30	80-480-02	Bearing	1
31	**	Input shaft	1
32	66-610-88	Shim kit	1
33	66-610-35	Bearing	1
34	80-480-01	Bearing	1
35	*	Spacer	1
36	*	Shim	1
37	*	Thrust washer	1
38	**	Forward gear assm.	1
39	66-610-85	Clutch gear	1
40	66-610-84	Intermediate shaft	1
41	**	Reverse gear assm.	1
42	**	Pinion gear	1
43	**	Idler gear assm.	1
44	66-610-83	Snap ring	1
45	80-480-00	Bearing	1
46	**	Ring gear	1
47	*	Differential Assembly	1
48	*	Drain plg	1
50	*	Nut	1
51	*	Hex bolt	1
52	41-127-96	Axle shaft (R)	1
53	66-610-68	Hex tap screw	2
54	66-610-72	Washer	1
55	66-610-73	Lock nut	1
**	66-610-87	Gear Kit, 31, 38, 41, 42, 43, 46	



Brakes, Brake Pedal Linkage



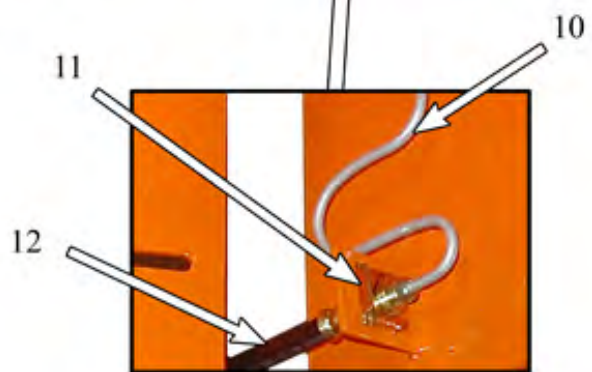
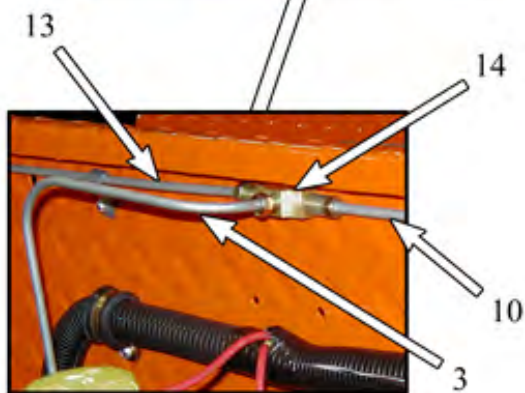
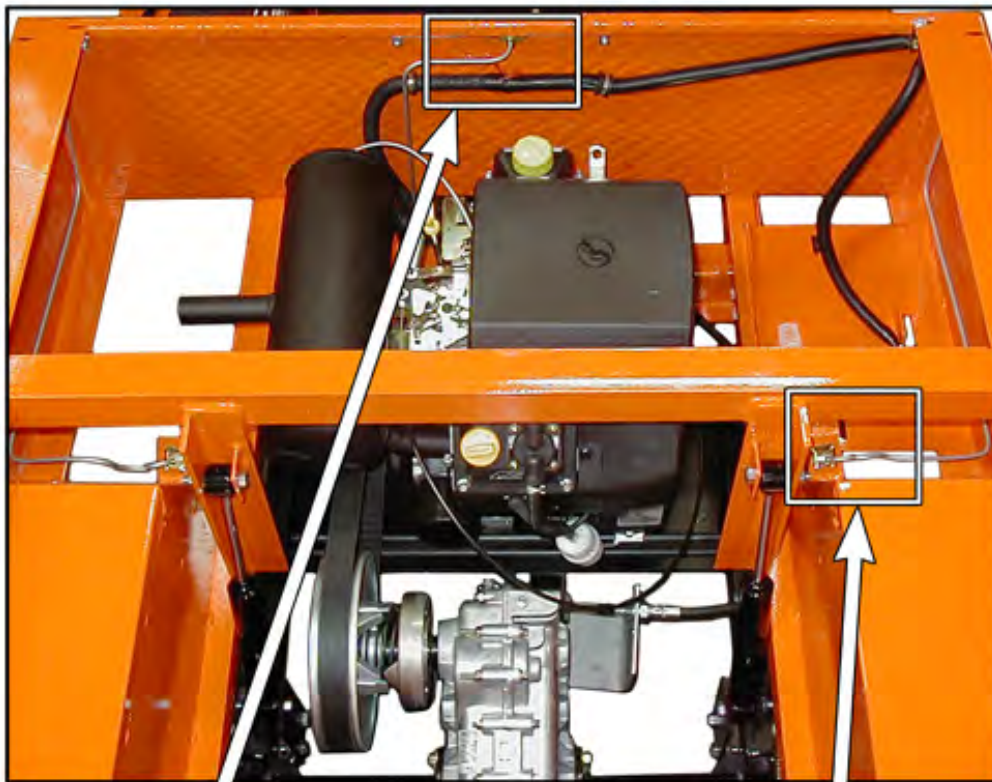
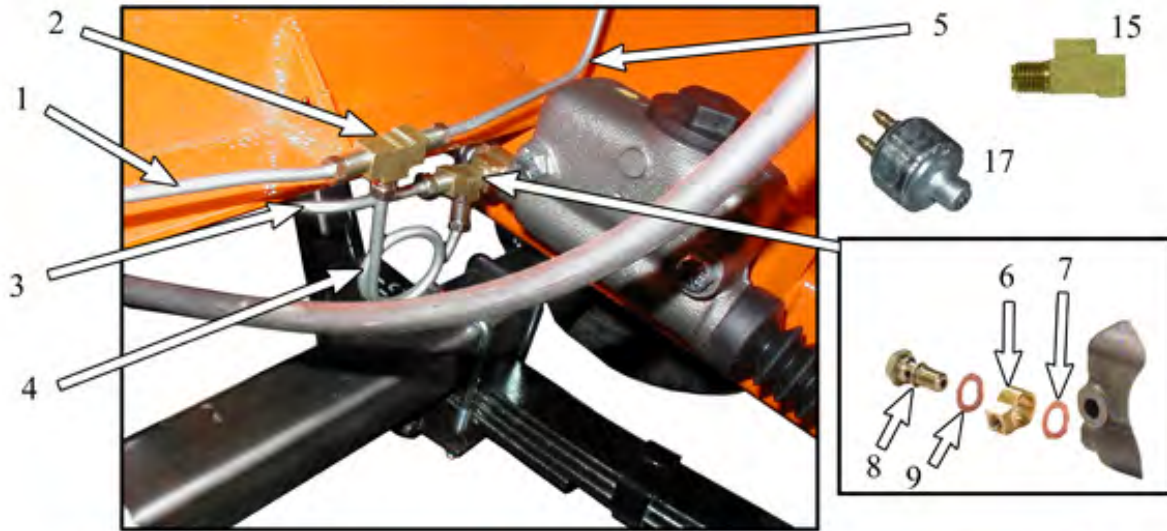


Brake Pedal Linkage

Item No.	Part No.	Description	Qty
1	05-210-97	Brake Pedal	1
2	88-100-11	3/8" X 1" NC Hex Bolt	1
3	85-517-09	Cotter Pin	1
4	96-772-00	Clevis Pin	1
5	88-119-80	3/8" NF Hex Nut	1
6	50-009-00	Push Rod	1
7	See Master Cylinder	Master Cylinder Assembly	1
8	88-101-20	3/8" X 3" Grade 5 Hex Bolt	2
9	88-109-81	3/8" NC Locknut	2
10	17-104-00	Collar	1
11	06-210-03	Return Spring Mounting Clip	1
12	00-210-08	Push Rod	1
13	88-109-81	3/8" NC Locknut	1
14	32-240-40	Bushing	1



Brakes, Brake Lines

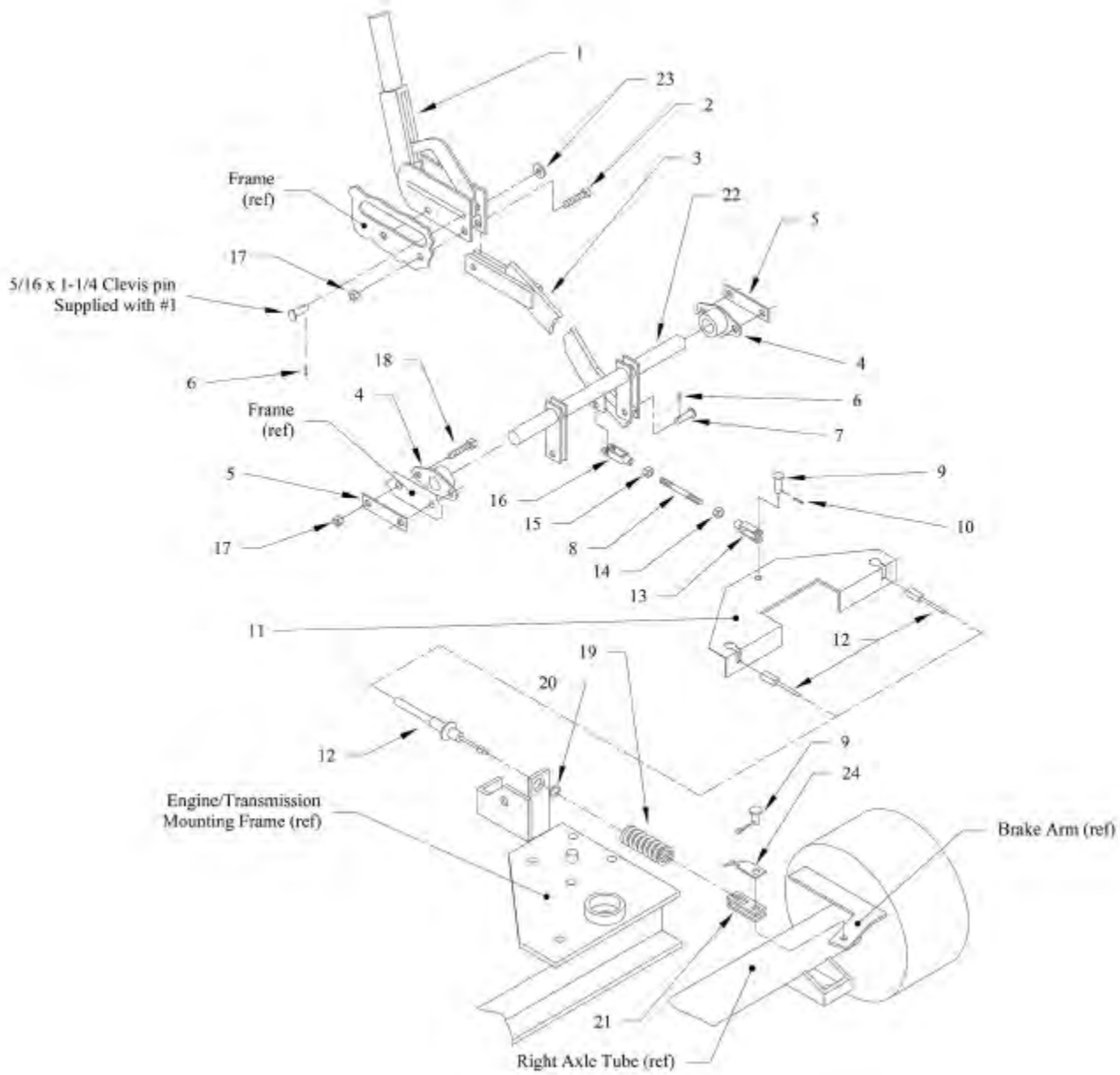


Brake Lines

Item No.	Part No.	Description	Qty
1	99-603-53	Brake line, right front	1
2	99-564-00	T-Fitting	1
3	99-607-65	Brake line, rear	1
4	99-603-54	Brake line, front	1
5	99-603-53	Brake line, front left	1
6	99-566-00	Banjo Fitting	1
7	99-571-00	Washer, Copper 0.50 ID	1
8	99-578-00	Fillting, Master Cylinder Bolt	1
9	99-572-00	Washer, Copper 0.594 ID	1
10	99-605-66	Brake Line, Right	1
11	99-576-00	Hose Clip	4
12	99-580-10	Brake Hose, Rear	2
13	99-605-65	Brake Line, Left	1
14	99-564-00	T-Fitting	1
15	99-559-00	T-Union	1
16	-	-	-
17	71-110-00	Brake Light Switch (mounted to front of #8)	1
Not Shown	99-580-20	Brake hose, Front	2



Brakes, Parking Brake Linkage

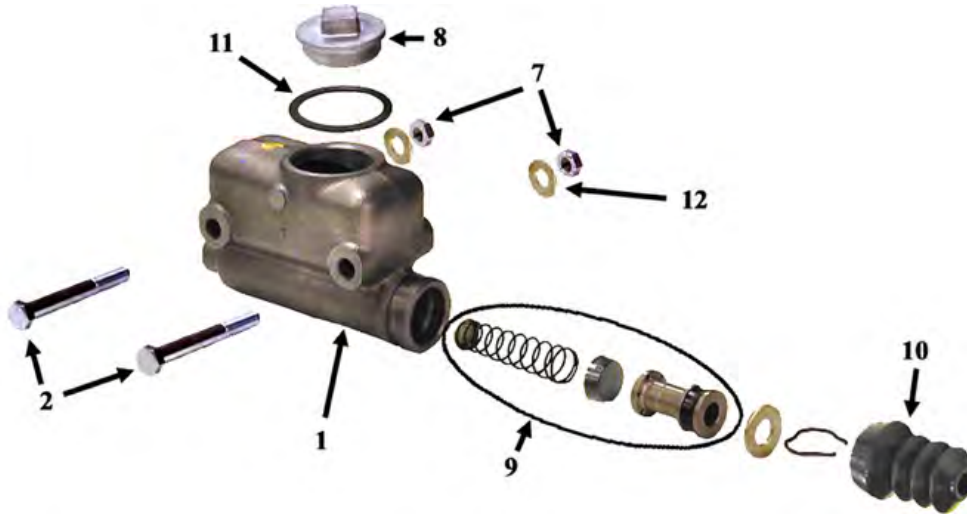




Parking Brake Linkage			
Item No.	Part No.	Description	Qty
1	51-340-30	Parking Brake Lever	1
2	88-100-15	3/8" x 1-3/4" NC hex bolt	2
3	00-610-20	Parking Brake Linkage Weldment	1
4	80-410-20	Flanged Bearing	2
5	02-610-25	Bearing Cover Plate	2
6	88-517-09	3/32" x 3/4" Cotter Pin	4
7	96-772-00	3/8" x 1" Clevis Pin	2
8	96-343-00	Adjusting Link	1
9	96-773-00	5/16" x 1" Clevis Pin	4
10	88-527-11	1/8" x 1" Cotter Pin	3
11	02-610-16	Equalizer	1
12	96-826-12	Parking Brake Cable	2
13	96-763-00	5/16" Clevis	1
14	88-099-80	5/16" NF Hex Nut	1
15	88-099-81	5/16" NF Hex Nut (left thread)	1
16	96-765-00	5/16" Clevis (left thread)	1
17	88-109-81	3/8" NC Lock Nut	4
18	88-100-09	3/8" x 3/4" NC Hex Bolt	1
19	85-126-00	Spring	2
20	88-847-08	Retainer Ring	2
21	96-762-00	Brake Cable Clevis	2
22	00-610-15	Cross Shaft	1
23	88-088-61	5/16" SAE Flat Washer	1



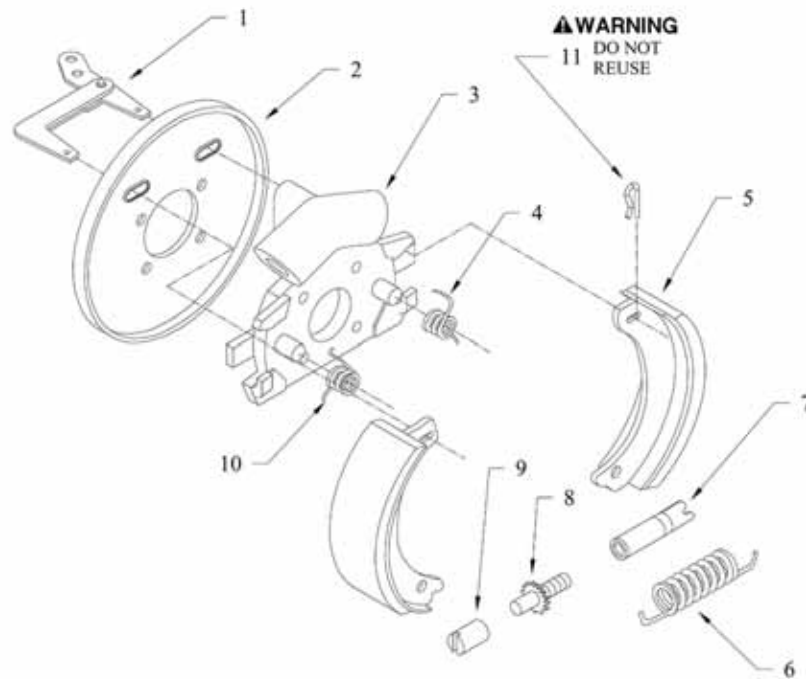
Brakes, Master Cylinder



Master Cylinder

Item No.	Part No.	Description	Qty
1	99-510-52	Boot	1
2	99-510-52	Cap	1
3	99-510-53	Gasket	1
4	99-510-61	Rebuild Kit	1
5	99-510-01	Master Cylinder Assembly	1

Brakes, Rear Axle



Brakes, Rear Axle (41-347-28 and 41-347-29)

Item No.	Part No.	Description	Qty
1	41-347-15	Parking Brake Actuator	2
2	41-347-00	Backing Plate	2
3	41-347-36	Spider, w/Wheel Cylinder	2
4	85-411-10	Torsion Spring	2
5	41-635-00	Brake Shoes	2
6	85-215-00	Spring	2
7	41-347-33	Adjustment Body	2
8	41-347-31	Star Wheel Adjuster	2
9	41-347-30	Socket	2
10	85-411-15	Torsion Spring	2
11	41-347-34	Parking Brake Actuator-Retaining Clip. DO NOT REUSE!	4
Not Shown	K5N-600-10	Spring clip (behind brake shoe)	4



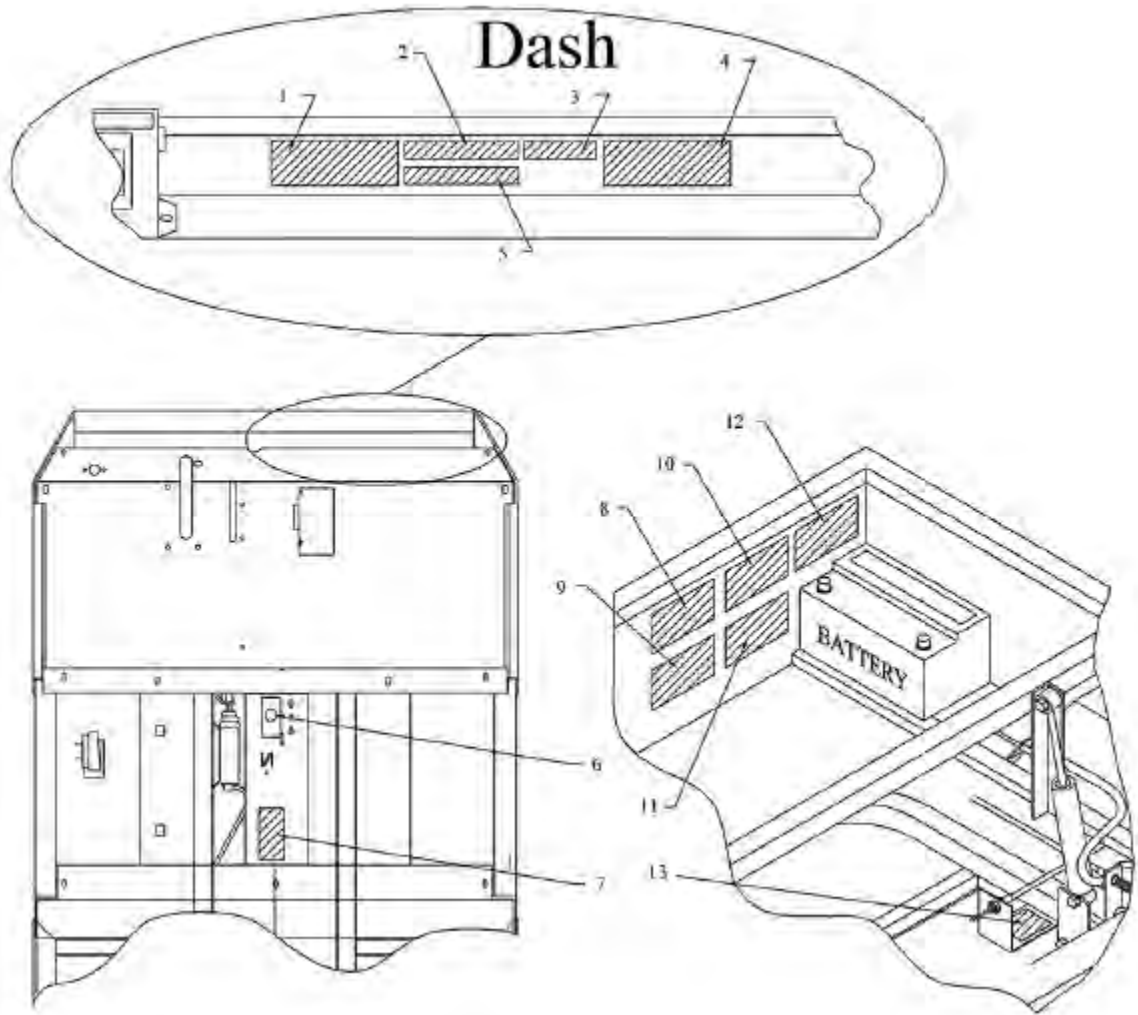
Control System, Instrument Panel



Instrument Panel

Item No.	Part No.	Description	Qty
1	71-120-01	Start Switch	1
2	71-501-00	Horn Switch	1
3	71-039-11	Switch, Rocker	1 or 2
4	71-100-00	Switch, Toggle	0, 1, or 2
5	72-018-21	Light	1
6	74-009-20	Fuel Gauge	1
7	74-000-00	Hour Meter	1
8	94-304-09	Dash panel	1
9	88-817-07	Screw	6
10	00-610-01	Housing	1
11	71-039-20	Cover	1

Decals



Decals

Item No.	Part No.	Description	Qty
1	94-306-00	Operator Warning	1
2	94-384-01	"Not a Motor Vehicle"	1
3	94-306-01	Fuel /Oil Check	1
4	94-306-02	Speed Warning	1
5	94-373-05	Data Plate	1
6	94-306-07	"Push to Shift"	1
7	94-306-09	Do Not Shift While Moving	1
8	94-306-03	Heat Warning	1
9	94-306-04	Rotating Parts Warning	1
10	94-306-05	Oil Type	1
11	94-306-06	Dipstick Warning	1
12	94-313-00	Battery Warning	1
13	94-306-08	Do Not Drill (Spring Steel)	1
Not Shown	94-373-73	CARB Certification (on fuel tank)	1



Electrical, Miscellaneous

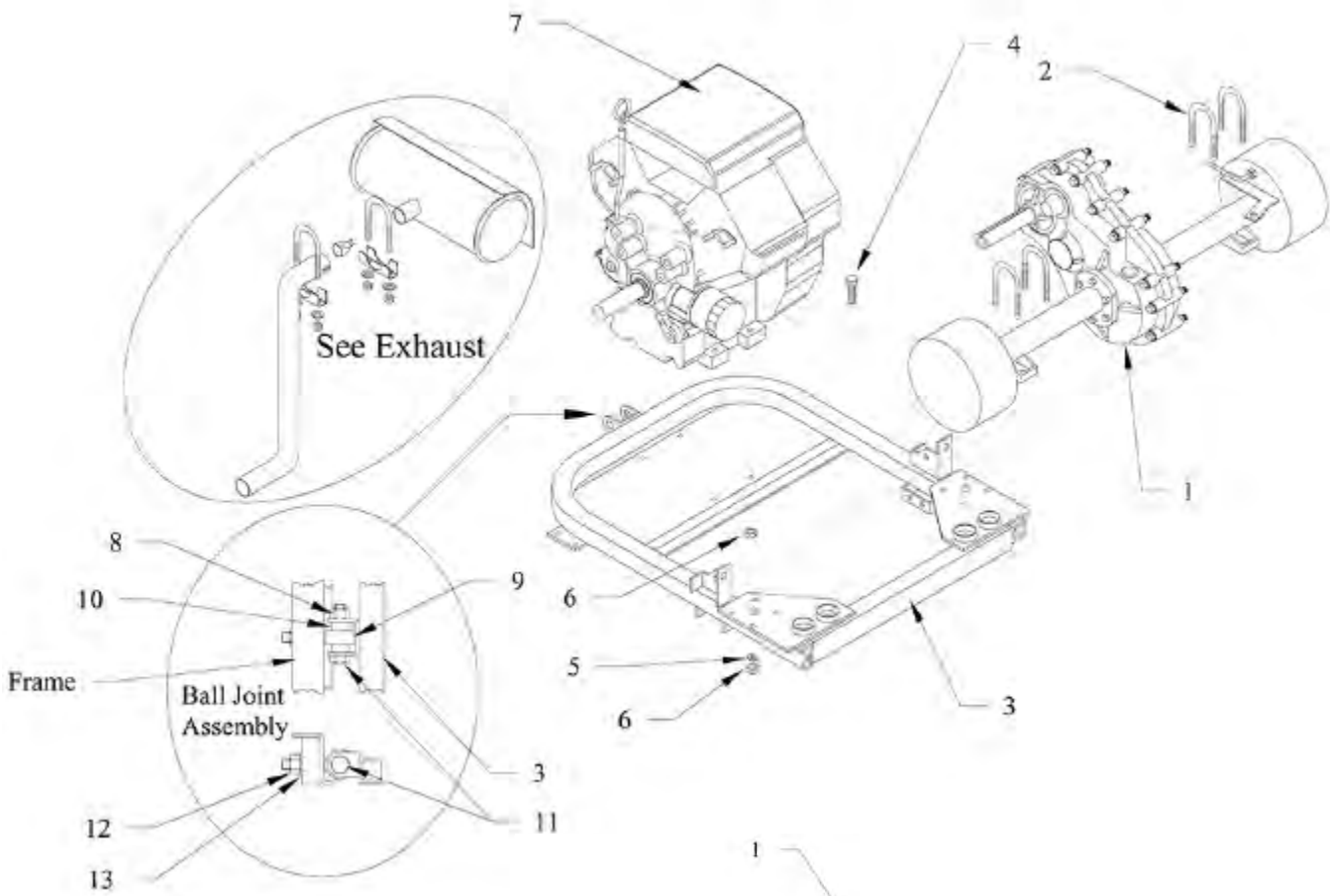
Electrical			
Item No.	Part No.	Description	Qty
	71-120-01	Key Switch	1
	71-130-01	Neutral Start Switch	1
	71-110-00	Brake Light Switch	1
	71-135-01	Reverse light switch	1
	71-141-20	Turn Signal Switch	1
	71-039-10	Light Switch	1
	73-004-20	Horn	1
	71-102-10	Seat Switch	1
	71-122-20	Horn Button	1
	71-303-01	Engine Kill Relay (behind dash panel)	1
	71-900-05	Signal Flasher	1
	72-082-01	Headlight Bulb	2
	72-082-10	Front Turn Signal Bulb	2
	72-082-20	Turn Signal Bulb Socket	2
	72-025-00	Tail/Stop Light (w/rubber gasket and pigtail)	2
	75-146-85	Harness	1
	79-840-20	20 Amp Circuit Breaker, Auto Reset	1
	77-054-10	Battery	1

CVT Belt Drive

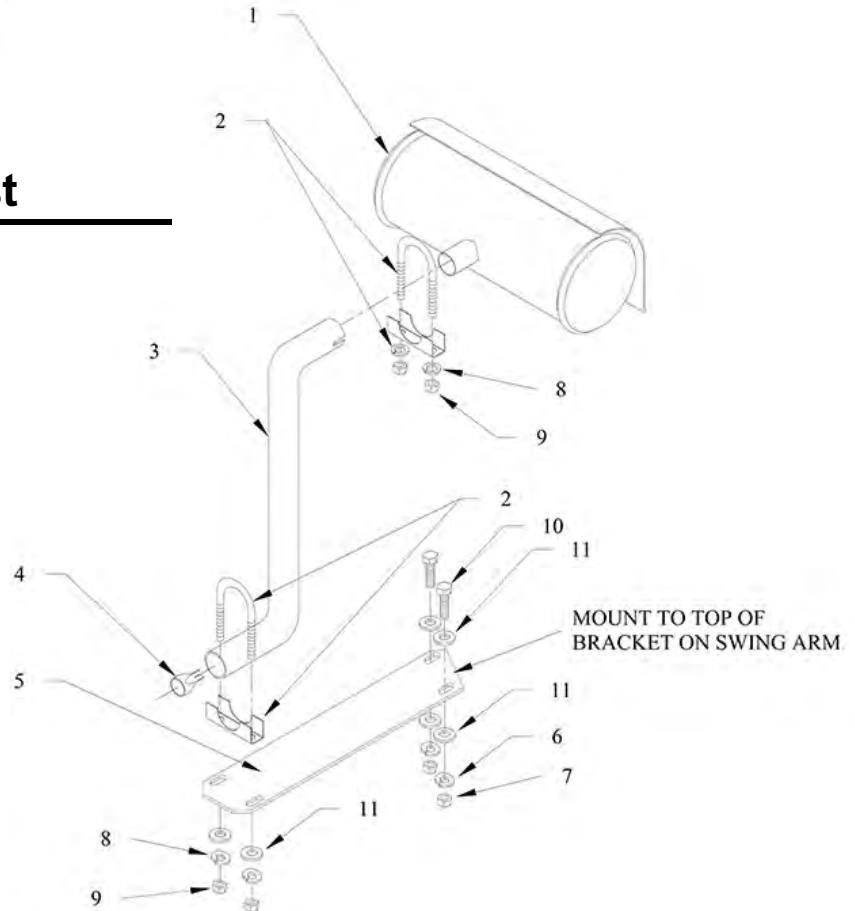
Item No.	Part No.	Description	Qty
-	30-682-00	Drive belt	1
-	30-181-00	Primary sheave (motor)	1
-	30-182-00	Secondary sheave (transmission)	1
-	30-180-50	Ramp shoe	3



Engine, Mounting



Engine, Exhaust



Engine, Mounting

Item No.	Part No.	Description	Qty
1		Refer to Rear Axle Assembly	
2	96-123-50	U-Bolt	4
3	00-610-54	Swing Arm	1
4	88-101-13	3/8" X 1-1/4" Hex Head Screw	4
5	88-108-62	3/8" Lock Washer	8
6	88-109-81	3/8"NC Lock Nut	14
7	67-000-53	Engine Assembly	1
8	88-229-81	Nut	1
9	86-523-99	Spherical Rod End	1
10	16-406-00	Spacer	2
11	88-220-22	Bolt	1
12	88-239-80	Nut	1
13	88-229-62	Washer	1
-	41-998-11	Oil drain nipple (starting S/N 185092)	1
-	44-998-12	Oil drain elbow (starting S/N 185092)	1

Engine, Exhaust

Item No.	Part No.	Description	Qty
1	66-400-05	Muffler	1
2	KLR-4723704	U-bolt assembly	2
3	00-610-95	Tail pipe	1
4	66-400-25	Spark arrestor	1
5	66-400-06	Tail pipe mounting bracket	1
6	88-088-62	5/16 Split lock washer	2
7	88-089-80	5/16NC Hex nut	2
8	88-088-62	5/16 Split lock washer	4
9	88-089-80	5/16NC Hex nut	4
10	88-080-11	5/16NC x 1 Hex bolt	2
11	88-088-61	5/16 SAE Flat washer	6



Frame and Body



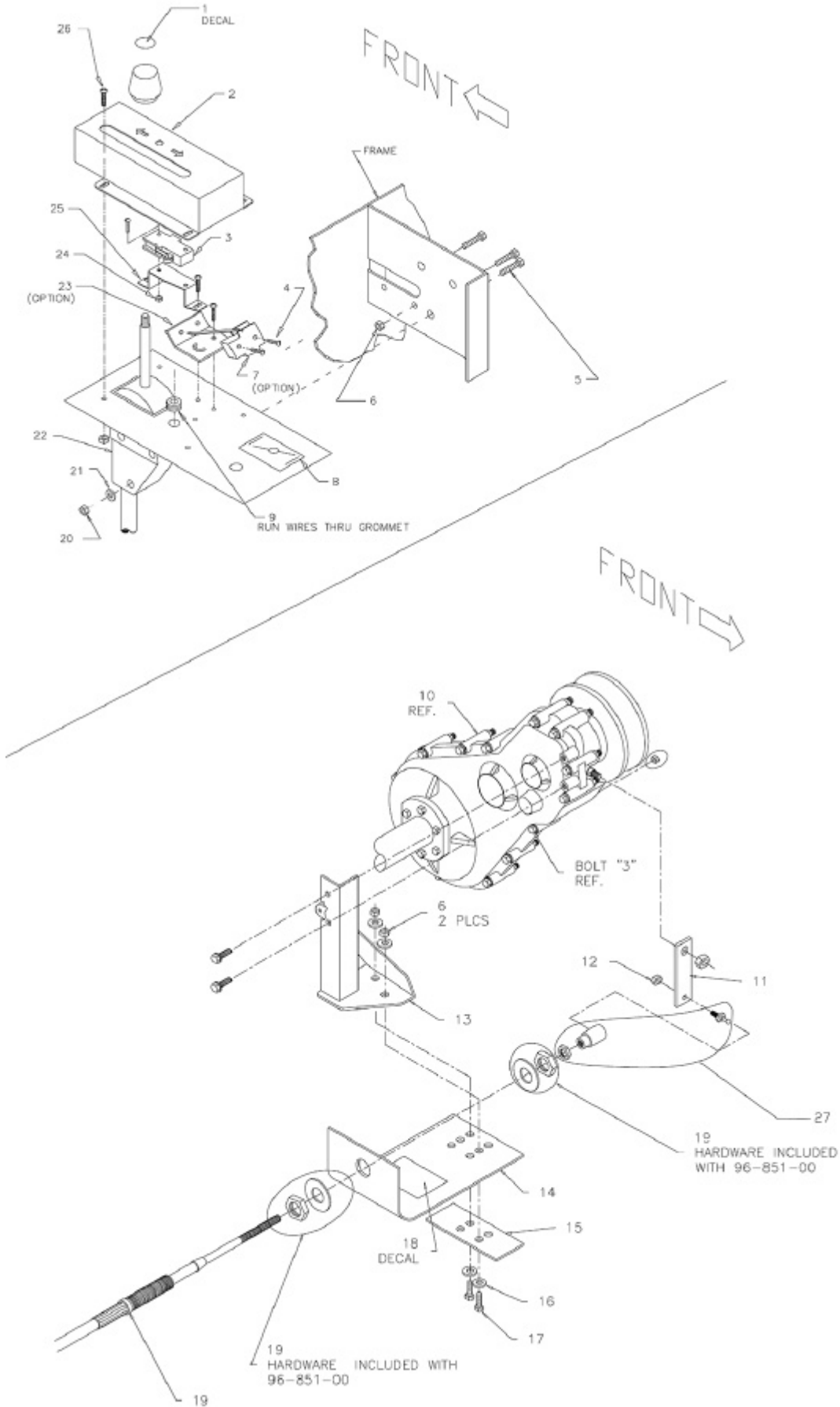


Frame and Body

Item No.	Part No.	Description	Qty
1	90-444-20	Deckboard (std)	1
2	00-210-14	Side Rail	2
	00-210-18	End Rail	1
3	90-179-00	Cushion, Seat Back	1
4	00-210-04	Support, Seat Back	1
5	90-174-00	Cushion, Passenger	1
6	90-174-00	Cushion, Driver	1
7	00-610-01	Instrument Housing	1
8	00-610-08	Front Cowl (not painted)	1
9	00-210-22	Guard, Light	1
10	02-210-25	Guard, Harness	1
11	94-050-11	Headlight Assembly, Right	1
12	94-201-10	Name Plate	1
13	94-050-10	Headlight Assembly, Left	1



Shifter Linkage



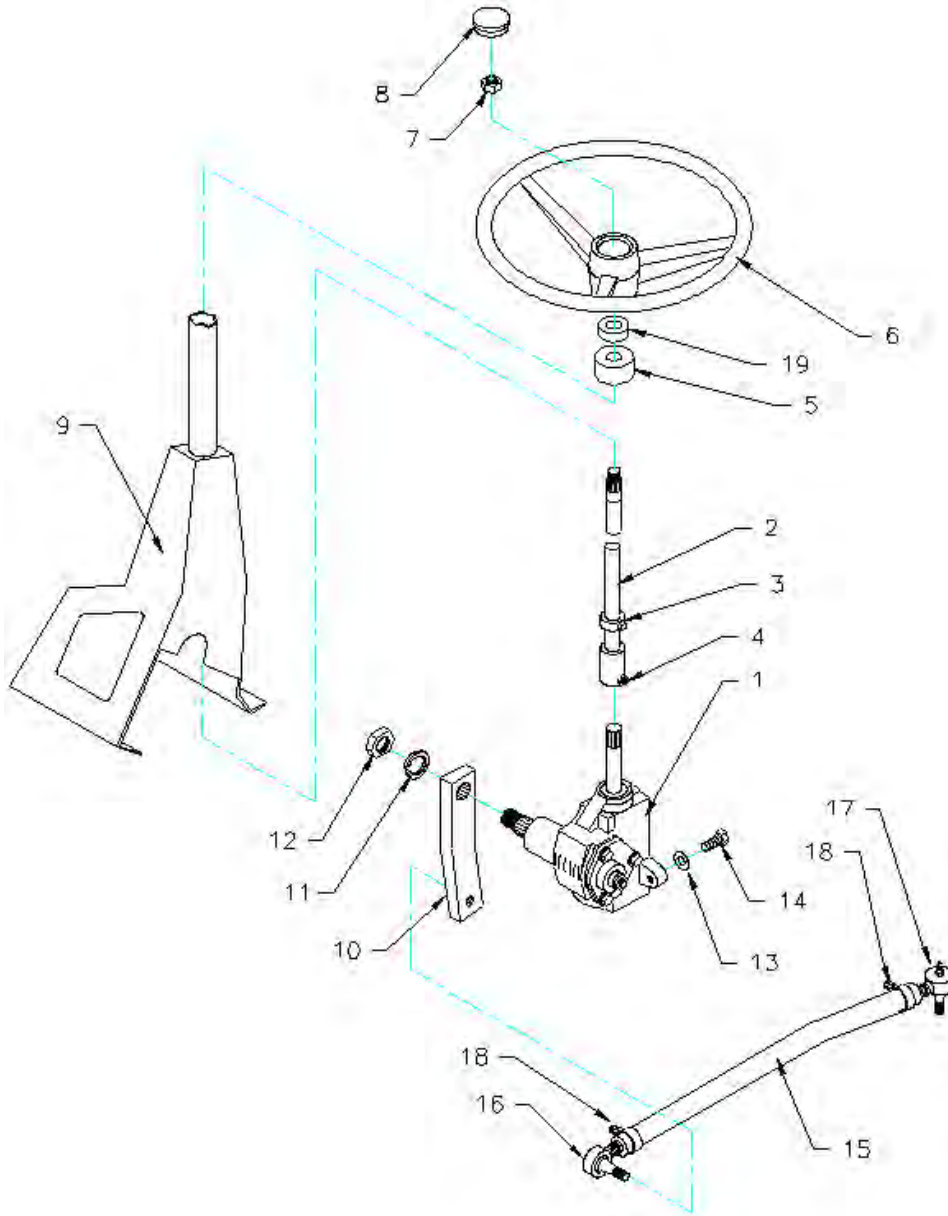


Shifter Linkage

Item No.	Part No.	Description	Qty
1	94-306-07	"Push to Shift" Decal	1
2	00-610-37	Shift Cover	1
3	71-130-01	Neutral Start Switch	1
4	88-014-13	Screw	2 or 4
5	88-080-18	5/16" x 2-1/2" Hex Bolt	3
6	88-089-81	5/16" Lock Nut	1
7	71-135-01	Micro-Switch (Optional)	1
8	96-306-12	Choke Decal	1
9	98-603-00	Rubber Grommet, 3/8" ID	1
10	Refer to Rear Axle Assembly		
11	00-610-80	Shift Lever	1
12	88-079-85	1/4"NF Lock Nut	1
13	02-610-84	Shift Cable Mount Weldment	1
14	00-610-25	Mounting Bracket	1
15	00-610-83	Plate, Shift Cable Mount	1
16	88-108-61	3/8" SAE Washer	4
17	88-100-11	3/8" X 1" NC Hex Head Screw	2
18	94-306-08	Spring Steel Decal	1
19	96-851-00	Shift Cable	1
20	89-089-81	5/16" NC Lock Nut	1
21	88-088-61	5/16" SAE Washer	3
22	96-853-10	Shift Quadrant	1
23	00-610-36	Bracket for #3 (Optional)	1
24	88-019-86	Nut	2 or 4
25	00-610-35	Neutral Switch Bracket	1
26	88-025-06	8-32 X 1/2" Truss Head Machine Screw	8
27	96-852-00	Shift Cable Ball Joint	1



Steering Linkage

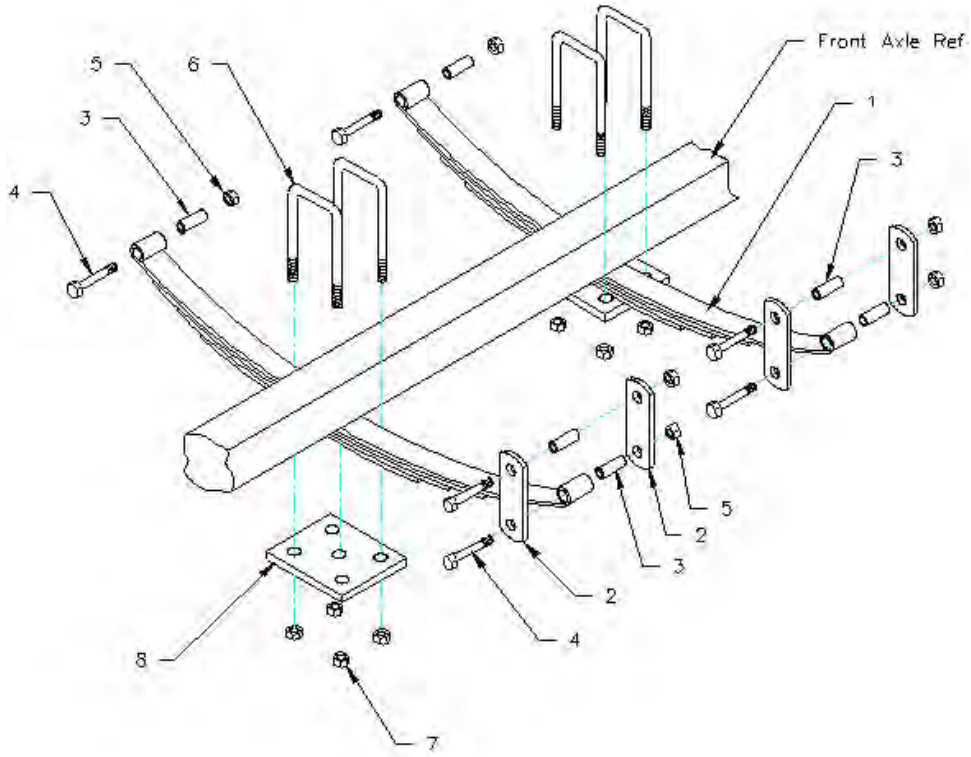


Steering Linkage

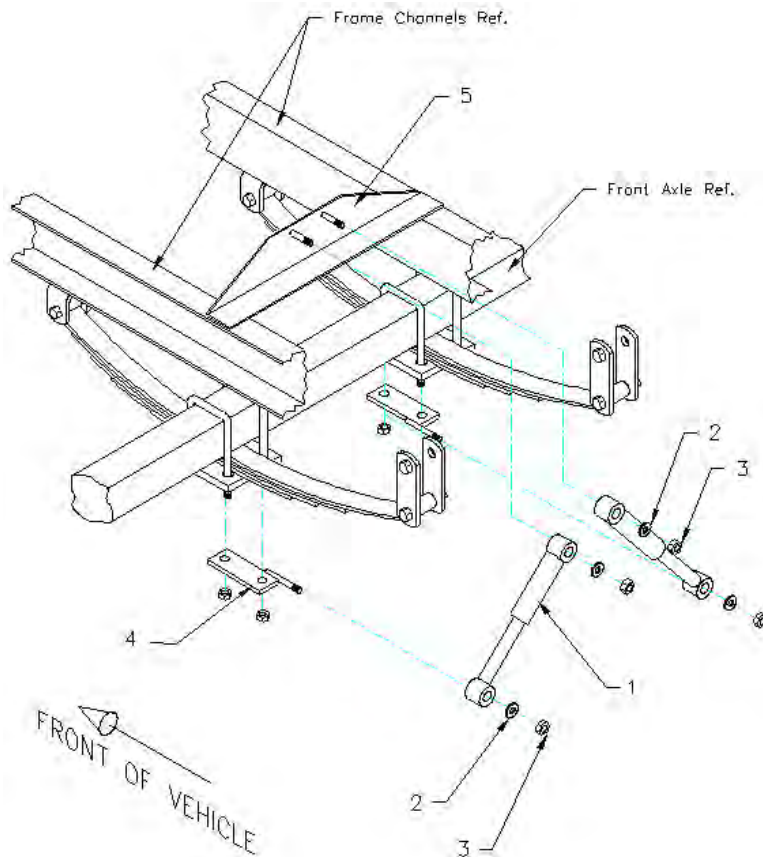
Item No.	Part No.	Description	Qty
1	18-308-21	Steering Gear	1
2	21-031-13	Steering Shaft, 17.938" Long	1
3	17-110-00	Collar, 3/4" Shaft	1
4	88-080-04	Bolt, 5/16NC x 3/8" Hex Hd	1
5	80-400-10	Sealed Bearing, 3/4" (up to 4/1/2002)	1
	32-248-10	Bushing, plastic (after 4/1/2002)	1
6	19-011-20	Steering Wheel	1
7	88-199-82	Jam Nut, 5/8NF	1
8	19-011-25	Cover, Steering Wheel	1
9	00-210-17	Steering Column Weldment	1
10	18-111-30	Pitman Arm	1
11	88-268-62	Lock Washer, 7/8"	1
12	88-279-82	Jam Nut, 7/8NF	1
13	88-128-62	Lock Washer, 7/16"	3
14	88-120-15	Bolt, 7/16NC x 1" Hex Hd	3
15	18-057-11	Sleeve, Drag Link	1
16	86-501-98	Ball Joint, Left	1
17	86-501-99	Ball Joint, Right	1
18	86-510-00	Clamp, Ball Joint	2
19	97-200-00	Dust Washer	1



Suspension, Front Springs



Suspension, Front Shocks





Front Suspension (Springs)

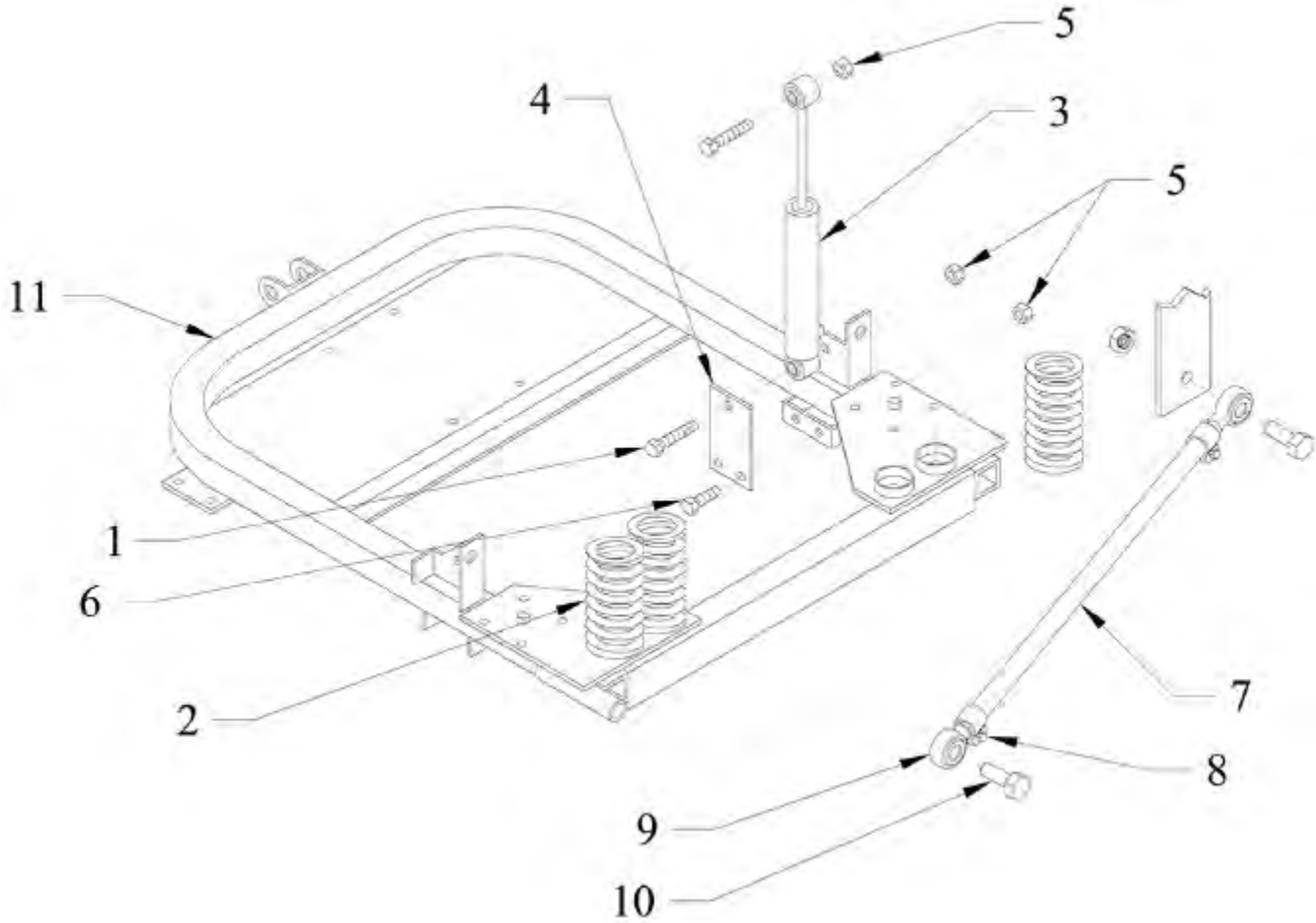
Item No.	Part No.	Description	Qty
1	85-51210	Spring	2
2	16-870-10	Hanger	4
3	32-213-00	Bushing, Spring eye	6
4	96-248-01	Bolt	6
5	88-169-82	Nut	6
6	96-123-02	U-Bolt	4
7	88-109-81	Nut	8
8	16-865-02	Spring Plate	2

Front Suspension (Shocks)

Item No.	Part No.	Description	Qty
1	86-602-00	Shock	2
2	88-128-60	Washer	4
3	88-129--81	Nut	4
4	86-602-13	Shock Mount, Lower	2
5	86-602-25	Shock Mount, Upper (bolt on)	1
-	86-602-61	Kit, Field Installation	

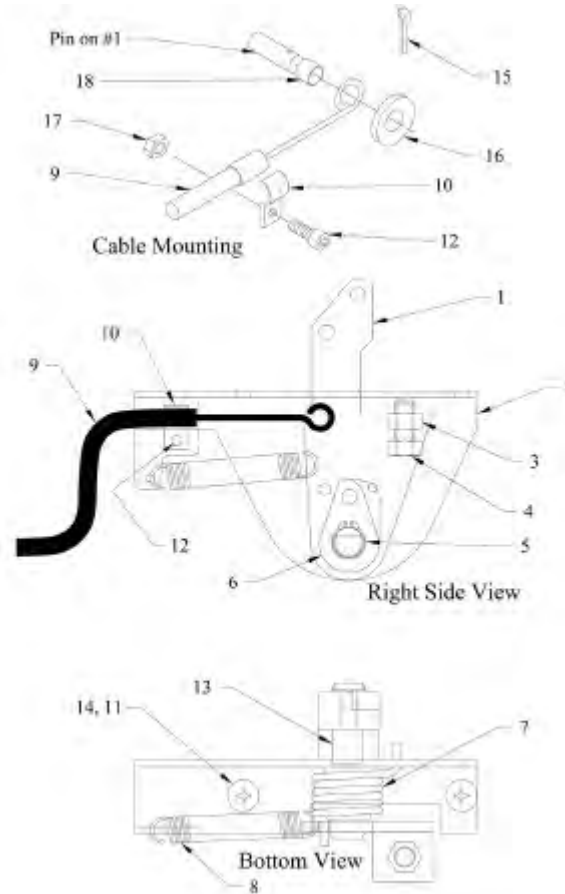


Suspension, Rear



Item No.	Part No.	Description	Qty
1	88-120-17	7/16" x 2-1/4" Hex Bolt	4
2	85-142-00	Spring	4
3	86-602-00	Shock	2
4	41-403-00	Shock Bracket	2
5	88-129-81	7/16" Lock Nut	8
6	88-120-11	7/16" x 1" Hex Bolt	4
7	41-402-00	Traction Bar	1
8	86-510-00	Clamp, Rod End	2
9	86-521-98	Rod End (left thread)	1
	86-521-99	Rod End (right thread)	1
10	88-180-15	Bolt	2
	88-189-81	Nut	1
11	See Engine Mount		

Throttle Linkage



Item No.	Part No.	Description	Qty
1	62-037-03	Rotor	1
2	62-033-16	Backing Plate Assembly	1
3	88-119-80	3/8" NF Hex Nut	1
4	88-110-09	3/8" x 3/4" NF Hex Bolt (gr. 5)	1
5	88-840-08	Circlip	1
6	62-033-06	Cam	1
7	85-352-38	Return Spring (torsion)	1
8	85-209-09	Return Spring (extension)	1
9	96-872-07	Throttle Cable	1
10	96-871-01	Clamp	1
11	88-069-81	1/4" NC Lock Nut (not pictured)	2
12	88-025-05	8-32 Socket Head Machine Screw	1
13	32-215-50	Bushing	2
14	88-065-06	1/4" x 1/2" Truss Head Screw	2
15	88-517-11	Cotter Pin	1
16	88-068-61	1/4" SAE Flat Washer	1
17	88-029-86	8-32 Lock Nut	1
18	32-212-20	3/16"ID Plastic Bushing	1
NOT SHOWN	98-254-10	Accel. Pedal	1
	88-065-09	Accel. Pedal Mounting Bolts	2
	88-069-81	Accel. Pedal Mounting Nuts	2
	62-037-02	Complete Accelerator Assembly (less cable and hardware)	1
	85-352-60	Accelerator Spring Kit	1



Wheels and Tires

There are many tire/wheel options available.

This is a generic listing of the most common tires and wheels available.

Refer to your original sales order for the tires and wheels installed on your vehicle.

Tires

Item No.	Part No.	Description
-	10-075-00	4.80 x 8 LR B Pneumatic
-	10-076-00	4.80 x 8 LR C Pneumatic
-	10-081-00	5.70 x 8 LR B Pneumatic
-	10-082-00	5.70 x 8 Extra Grip
-	10-083-00	5.70 x 8 LR C
-	10-093-00	8.50 x 8 LR B
-	10-091-10	8.50 x 8 Knobby
-	10-092-00	8.50 x 8 LR C
-	10-074-00	4.00 x 8 Man-Toterwith ribs
-	10-074-10	4.00 x 8 Man-Toterwith ribs (non-marking)
-	10-086-00	5.00 x 8 Man-Toterwith lugs
-	10-264-00	20 x 8 x 10 LR E
-	10-250-00	16 x 4 x 12 Solid rubber

Tubes

Item No.	Part No.	Description
-	11-030-00	4.80 x 8
-	11-040-00	5.70 x 8
-	11-041-00	8.50 x 8, 9.50 x 8

Wheels

Item No.	Part No.	Description
-	12-012-00	5 x 8 tubeless, 5-hole
-	12-022-10	5 x 8 tubeless, 4-hole
-	12-020-00	8.50 x 8 tubeless, 5-hole
-	12-022-04	8.50 x 8 tubeless, 4-hole Chrome
-	12-030-01	16 x 6 Steel, 8-holes
-	12-041-00	Split Wheel Assembly, 8 x 2.5" Bead, 5-hole
-	12-042-00	Split Wheel Assembly, 8 x 3.75" Bead, 5-hole
-	12-042-20	Split Wheel Assembly, 8", 5-holes
-	12-050-00	Wheel, Cast Iron, 12-1/8, 5-hole
-	12-0054-00	Wheel, Cast Iron, 11-1/4, 5-hole
-	12-055-00	Wheel, Cast Iron, 14, 8-hole
-	12-055-10	Wheel, Cast Iron, 14, 5-hole
-	12-056-00	Wheel, Cast Iron, 15, 8-hole
-	13-089-00	Valve Stem, tubeless wheel
-	97-236-00	Wheel Nut, 1/2"



Tire/Wheel Assemblies

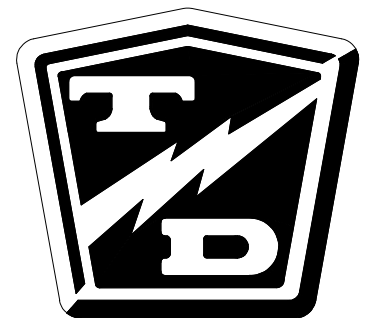
Item No.	Part No.	Description
-	13-734-00	4.80 x 8, tubeless LR B, 5-hole
-	13-734-12	4.80 x 8 tubeless LR B, 4-hole
-	13-734-11	4.80 x 8 Split Rim LR B, 5-hole
-	13-739-10	4.80 x 8 Split Rim LR C, 5-hole
-	13-734-15	4.80 x 8 Split Rim LR B, 4-hole
-	13-576-10	4.80 x 8 3/4" Bearing Center Hub LR B
-	13-734-50	400 x 8 Man-Toter, Ribbed, 4-hole
-	13-734-51	400 x 8 Man-Toter, Ribbed, 4-hole, Non-marking
-	13-742-25	500 x 8 Man-Toter, 4-hole
-	13-742-35	500 x 8 Man-Toter, 5-hole
-	13-742-50	500 x 8 Man-Toter, 5-hole, Non-Marking
-	13-742-40	500 x 8 Man-Toter, 5-hole, Lugged
-	13-746-10	18 x 8.50 x 8 LR B, 5-hole
-	13-746-13	18 x 8.50 x 8 LR C, 5-hole
-	13-749--00	18 x 8.50 x 8 Ribbed, 5-hole
-	13-754-00	18 x 8.50 x 8 Chrome wheel, 4-hole

Notes: _____



Contents

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Hardware Identification	4
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Appendixes



APPENDIX A: SPECIAL TOOLS

Note: This is a listing of all tools available. Not all tools would be required for all vehicles. Refer to the Maintenance, Repair, and Troubleshooting sections for information on tools required.



62-027-32: Throttle Module Analyzer
Tests the throttle module in or out of the vehicle



75-089-00: Throttle Module Test Harness
Used in conjunction with a volt meter to test the throttle module. The module must be installed in a working control system.
Note: Part # 62-027-31 includes instructions



41-532-50: Chain Case Centering Tool
Used to center the chain case cover on all vehicles equipped with the Power Traction primary reduction and a pinion brake or speed sensor. Includes instructions.



43-201-50: Pinion Seal Installation Tool
Used to install the pinion seal on all vehicles equipped with the Power Traction primary reduction and a pinion brake or speed sensor.



62-027-00: Test Light
Used for testing electrical circuits. Switchable for 12, 24, 36, 48 volt systems.
Required to complete troubleshooting provided in the vehicle service manuals.



62-027-61 and -62: Sevcon System Handset
Diagnostics and adjustments (-62 only) of the Sevcon Power Pak and Micro Pak control systems.



62-027-64 and -65: Curtis AC System Handset
Diagnostics and adjustments (-65 only) of the Curtis AC control system.



96-500-43: PMT/C Meter Reset Module
Required to reset the PMT/C maintenance meter (special order option).

APPENDIX A: SPECIAL TOOLS



75-442-55: Pin Removing Tool
Removes pins from Molex Mini-Fit harness connectors.



41-350-13: Disc Brake Boot Installation Tool
Assists in installing the rubber boot onto the disc brake piston.



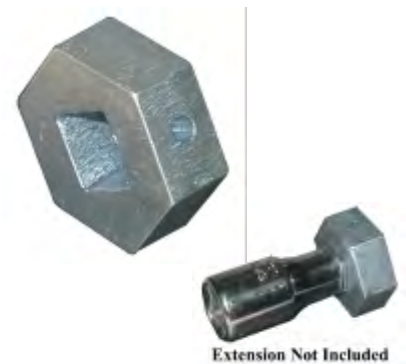
70-440-55: Pin Removing Tool
Removes pin from Amp circular harness connectors.



77-200-00: Hydrometer
Used for testing battery electrolyte. Illustration is of a typical hydrometer, actual hydrometer type may vary.



72-201-00: Battery Filler
Used to safely add water to batteries. Equipped with splash guard and auto-shutoff when cell is full.



96-500-48: GT Drive Oil Fill Plug Tool
Used to remove the oil fill plug on GT drives. It is used with a 3/8" drive extension (not included).



Molex # 11-300-02: Pin Removing Tool
Removes 0.062 diameter pins from Molex rectangular harness connectors. Not available from Taylor-Dunn. Purchase from any local electronics distributor.



Molex # 11-300-06: Pin Removing Tool
Removes 0.093 diameter pins from Molex rectangular harness connectors. Not available from Taylor-Dunn. Purchase from any local electronics distributor.

APPENDIX B: SUGGESTED TORQUE LIMITS FOR STANDARD HARDWARE

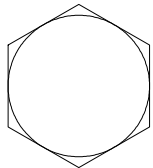
HARDWARE IDENTIFICATION

Standard Head Markings

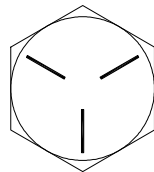
NOTE: Torque value used should be for lowest grade of hardware used. If a grade 2 nut is used on a grade 8 bolt, use grade 2 torque value.

NOTE: Torque values specified are for clean dry threads.

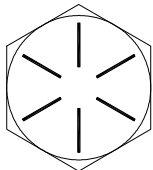
Hex Bolts



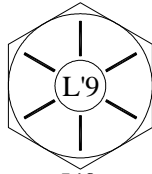
S.A.E. Grade 2



S.A.E. Grade 5



S.A.E. Grade 8



L'9

The grade of a metric bolt is cast directly on the head. Below is an example of a 10.9. the location and style of the text will vary.



Other Bolts



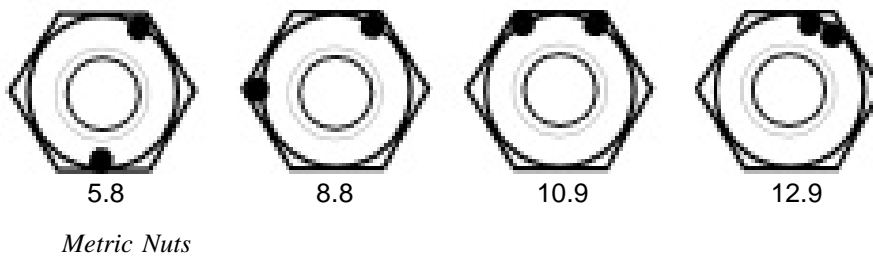
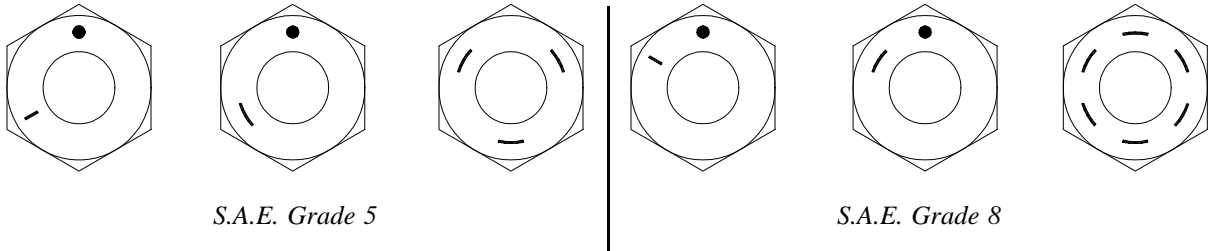
Truss Head, grade 2



*Carriage Bolt, grade 2
(unless marked as above)*

Hex Nuts

Nuts with no markings are to be treated as S.A.E. Grade 2

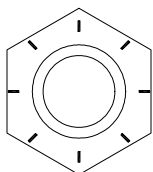
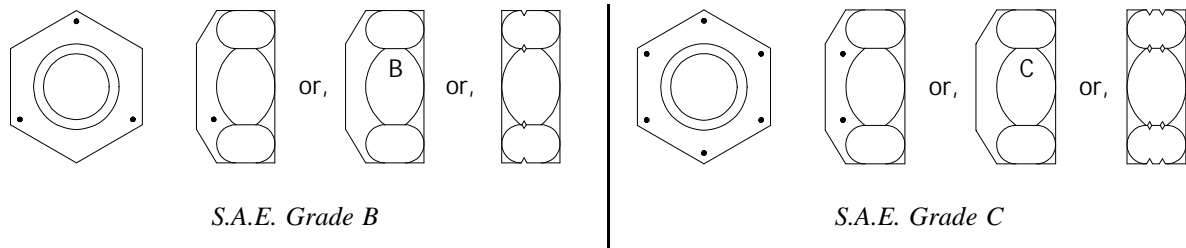


Metric Nuts

Hex Lock Nuts (stover)

Lock nuts use a letter to indicate the grade of the nut. Grade A' locknuts would be the equivalent of Grade '2' hex nuts, Grade 'B' as Grade '5' and Grade 'C' as Grade '8'.

NOTE: Nuts with no markings are to be treated as S.A.E. Grade A



Grade L'9

Other Nuts

Other nuts used by Taylor-Dunn® should be treated as S.A.E. grade A



Appendixes

Generic Torque Values

All torque values are for clean dry zinc plated threads in noncritical steel assemblies of the same hardness specification. Reduce torque approximately 10-15% for lubricated threads.

Refer to the service section assembly procedure for critical torque values.

Imperial (inch), Foot Pounds						Imperial (inch), Newton Meters					
Dia.	Pitch	Grade, SAE				Dia.	Pitch	Grade, SAE			
		2	5	8	L9			2	5	8	L9
#4	40	*	*	*	*	#4	40	*	*	*	*
#6	32	*	*	*	*	#6	32	*	*	*	*
#8	32	*	*	*	*	#8	32	*	*	*	*
#10	32	*	*	*	*	#10	32	*	*	*	*
#12	32	*	*	*	*	#12	32	*	*	*	*
1/4	20	5.5	8.5	12.5	11	1/4	20	7.4	11.5	16.9	14.9
	28	6.5	10.5				28	8.8	14.2		
5/16	18	12.0	17.5	24.5	22	5/16	18	16.2	23.7	33.2	29.8
	24	12.5	19.0	*	*		24	16.9	25.8	*	*
3/8	16	20	30	43	40	3/8	16	27.1	41	58	54
	24	22.5	33	50	45		24	30.5	45	68	61
7/16	14	27	50	70	65	7/16	14	37	68	95	88
	20	36	55	77	70		20	49	75	104	95
1/2	13	49	75	106	95	1/2	13	66	102	144	129
	20	55	85	120	110		20	75	115	163	149
9/16	12	70	109	153	140	9/16	12	95	148	614	190
	18	78	121	171	160		18	106	164	232	217
5/8	11	97	150	212	195	5/8	11	132	203	287	264
	18	110	170	240	225		18	149	230	325	305
3/4	10	172	275	376	350	3/4	10	233	373	510	475
	16	192	297	420	390		16	260	403	569	529
7/8	9	278	429	593	565	7/8	9	377	582	804	766
	14	306	473	818	625		14	415	641	1109	847
1	8	416	644	909	850	1	8	564	873	1232	1152
	14	466	721	1018	930		14	632	978	1380	1261
1-1/8	7	590	794	1287	1700	1-1/8	7	800	1076	1744	2304
	12	662	891	1444	1850		12	897	1208	2364	2508
1-1/4	7	832	1120	1817	2950	1-1/4	7	1128	1518	2463	4000
	12	922	1241	2012	3330		12	1250	1682	2727	4514

Conversion Formulas:

$$\text{Foot Pounds} = \text{Newton Meters} \times 0.737562149$$

$$\text{Newton meters} = \text{Foot Pounds} \times 1.355817948$$

All torque values are for clean dry zinc plated threads in noncritical steel assemblies of the same hardness specification. Reduce torque approximately 10-15% for lubricated threads.

Refer to the service section assembly procedure for critical torque values.

Metric, Newton Meters						Metric, Foot Pounds					
Dia.	Pitch	Grade, N-m				Dia.	Pitch	Grade, N-m			
		4.6	8.8	10.9	12.9			4.6	8.8	10.9	12.9
3	0.50	0.51	*	*	*	3	0.50	0.38	*	*	*
4	0.70	0.95	3.1	*	*	4	0.70	0.7	2.3	*	*
5	0.80	2.28	6.1	*	*	5	0.80	1.7	4.5	*	*
6	1.00	3.92	10.4	15.5	*	6	1.00	2.9	7.7	11.4	*
8	1.00	*	27.0	*	*	8	1.00	*	19.9	*	*
	1.25	9.48	25.0	37.0	*		1.25	7	18.4	27.3	*
10	1.00	*	57.0	*	*	10	1.00	*	42	*	*
	1.25	*	54.0	*	*		1.25	*	40	*	*
	1.50	19.1	51.0	75.0	*		1.50	14.1	38	55	*
12	1.25	*	96.0	*	*	12	1.25	*	71	*	*
	1.50	*	92.0	*	*		1.50	*	68	*	*
	1.75	32.6	87.0	160	*		1.75	24	64	118	*
14	1.50	*	150	*	*	14	1.50	*	111	*	*
	2.00	51.9	140	205	*		2.00	38	103	151	*
16	1.50	*	*	*	*	16	1.50	*	*	*	*
	2.00	79.9	215	310	*		2.00	60	158	229	*
18	1.50	*	*	*	*	18	1.50	*	*	*	*
	2.00	*	*	*	*		2.00	*	*	*	*
	2.50	110	300	*	*		2.50	81	221	*	*
20	1.50	*	*	*	*	20	1.50	*	*	*	*
	2.00	*	*	*	*		2.00	*	*	*	*
	2.50	156	430	*	*		2.50	115	317	*	*
22	1.50	*	*	*	*	22	1.50	*	*	*	*
	2.00	*	*	*	*		2.00	*	*	*	*
	2.50	211	580	*	*		2.50	156	428	*	*
24	2.00	*	*	*	*	24	2.00	*	*	*	*
	3.00	270	740	*	*		3.00	199	524	*	*
27	3.00	*	*	*	*	27	3.00	*	*	*	*
	3.00	398	*	*	*		3.00	293	*	*	*
30	2.00	*	*	*	*	30	2.00	*	*	*	*
	3.50	540	*	*	*		3.50	398	*	*	*

*Not available at time of printing



APPENDIX C: BRAKE LINING HANDLING PRECAUTIONS

Taylor-Dunn does not currently supply asbestos fiber-brake pads/shoes with any vehicle. However, there is the possibility that the original brake pads/shoes were replaced with aftermarket pads/shoes containing asbestos. Since this possibility does exist, the brake pads/shoes should be handled as if they do contain asbestos.

Never use compressed air or dry brush to clean the brake assemblies. Use an OSHA approved vacuum cleaner or any alternate method approved by OSHA to minimize the hazard caused by airborne asbestos fibers and brake dust.

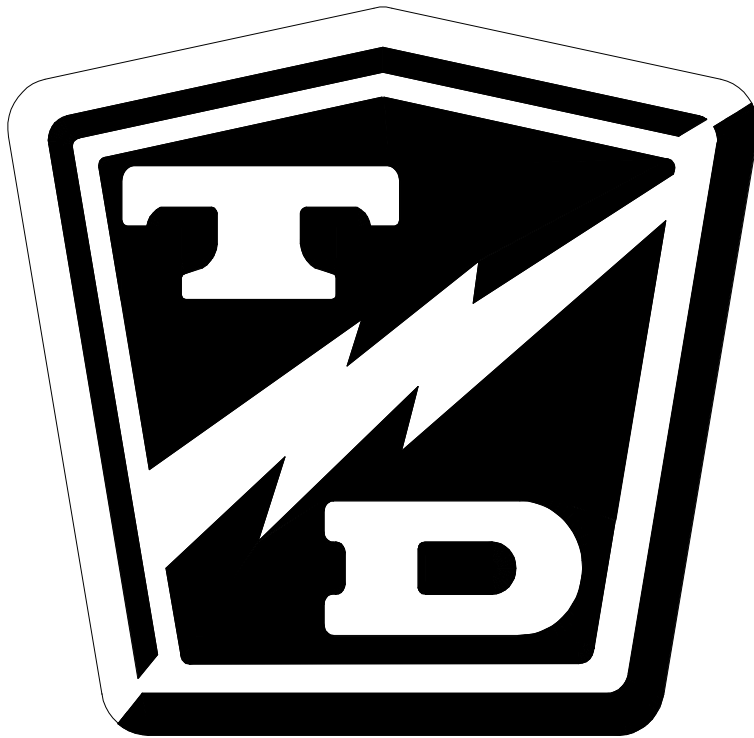
⚠ WARNING

Do not grind, sand, break, or chisel the brake pads/shoes, as this will cause unnecessary dust, possibly releasing asbestos fibers in the air.

Always wear protective clothing and a respirator when working on the brake pads/shoes or their associated components.

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

Do not drive the vehicle if any worn or broken part is detected in any part of the brake system. The cause of the damage must be repaired immediately.



Taylor-Dunn® Mfg.
2114 W. Ball Rd.
Anaheim, CA 92804
(800)-688-8680
(714) 956-4040
(FAX) (714) 956-0504

Visit our Website:
www.taylor-dunn.com