TAYLOR-DUNN®

The Best Way To Go About Your Business

Shown with optional half cowl

Models Included:
Kalamazoo B4-2500

MANUAL MB4-250-00

Operation, Troubleshooting and Replacement Parts Manual

Revision: C

Serial Number Starting: 153802

TAYLOR-DUNN SERVICE CENTER

For more information about this and other Taylor-Dunn® manuals, please write Taylor-Dunn®:

Taylor-Dunn® Mfg.
2114 W. Ball Road
Anaheim, CA 92804
(Attn: Technical Writer)

B2-48 With Dump Bed Option

B2-10 Ambulance

B2-48 with Steel Cab, Foldaway 4-Passenger Seat ar

P2-50 30,000 Pound Tow Tractor

ET 3000

ET1-50 Full Size Truck

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Introduction

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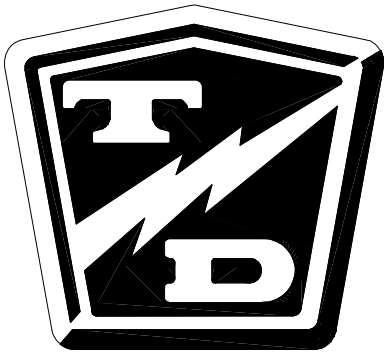


ABOUT THIS MANUAL

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.

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

This section gives specific information on the servicing of the vehicle and a schedule for maintenance checks.

Electrical

This section contains wiring diagrams and miscellaneous electrical information.

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:

⚠WARNING

or,

⚠WARNING

A shaded box with the word "Warning" on its left 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.

⚠CAUTION

The symbol at the left and the bold text contained within a box 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.

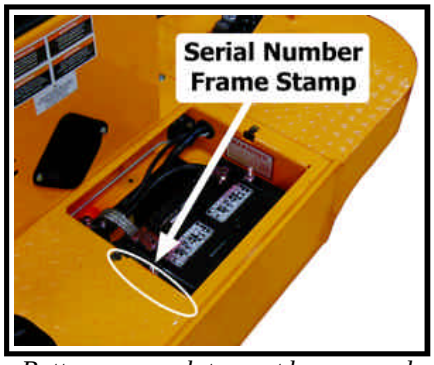
These vehicles are designed for driving on smooth surfaces in and around facilities such as industrial plants, nurseries, institutions, motels, mobile home parks, and resorts. They are not to be driven on public highways.

This vehicle conforms to requirements for Type G 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).

⚠WARNING

This vehicle is not designed to be driven on public roads or highways. It is available in maximum designed speeds ranging from 7.5 to 15 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 at more than 5 mph.

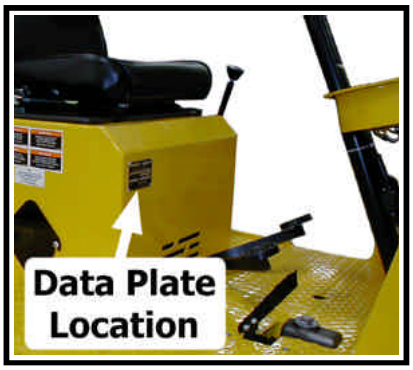
Depending on the age of your vehicle and what options were installed, the serial number frame stamp and data plate will be located in one of the locations illustrated below:



Battery cover plate must be removed

Engine cowling must be removed

Frame stamp locations



Data plate locations

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.

TAYLOR - DUNN

Safety Rules and Operating Instructions

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STANDARD SPECIFICATIONS BURDEN CARRIER*

***Refer to the engine manual for information regarding engine specifications. The part number for this manual is listed in the Engine Service section of this manual.*

ITEM	MODEL	SPECIFICATION
Occupancy		Driver
Dimensions		262 L x 107 W x 132 H Centimeters 103.3 L x 42 W x 52 H Inches
Turning Radius		422.9 Centimeters (166.5 Inches)
Dry Weight		658 kg (1,450 lbs)
Maximum Load Deck Dimensions		1,360 kg (3,000 lbs) 107 W x 135 L Centimeters (42 W x 54 L Inches)
Engine**	CH-18	18hp@3600rpm, Kohler® Specification # 62643
Rear Axles: Auxiliary Axle Driven Axle	S-12	 Automotive style with Hypoid Ring and Pinion Gears Dana® Specification # 012CA106X Chain Reduction to Full Floating Rear Hubs
Transmission	T96	3-Speed Manual with 1-Reverse Gear
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 Pneumatic Load Range C
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, Tail/Brake Light

** All specifications are for a base model vehicle. Specifications may vary if a vehicle is ordered with optional equipment or deck sizes.*

This vehicle conforms to requirements for Type G 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).

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

This vehicle is not designed to be driven on public roads or highways. It is available in maximum designed speeds ranging from 7.5 to 15 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.

⚠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.

- Do not drive this vehicle unless you are a qualified and trained operator.
- Keep all body parts (head, arms', legs') inside the vehicle while it is moving.
- Drive slowly when making a turn especially if the ground is wet or slippery.
- Drive slowly when driving on an incline.
- This vehicle may overturn easily if turned sharply while driven at high speeds, or on an incline.
- Drive only on level surfaces or on surfaces having an incline of no more than 10% (5.6 degrees).
- Do not drive over loose objects, holes, or bumps.
- Observe all traffic regulations and speed limits (see speed warning above).
- Keep to the right under normal conditions.
- Maintain a safe distance from all objects.
- 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.
- Keep a clear view ahead at all times.

⚠WARNING

Before working on a vehicle:

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 wheels to prevent vehicle movement.**
5. **Disconnect the positive and negative battery cables at the battery.**

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

Ignition Switch

A key-switch, located on the right center side of the instrument panel, starts the engine. Depress the clutch and rotate the key fully clockwise to start the engine. Once the enngine starts, release the key. Rotate the key counterclockwise to turn the engine 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.

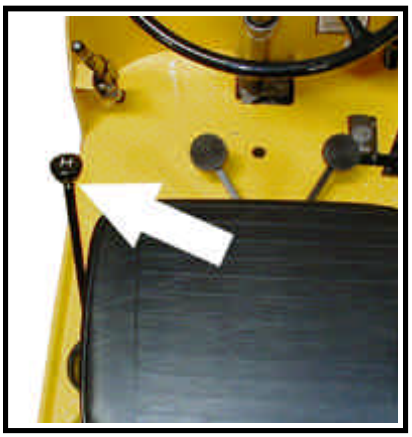
Horn Switch

The horn switch is located in the center of the steering wheel. Depress the switch to sound the horn, release it to turn it off.

Headlight Switch

The headlight switch is located to the right of the key switch. Push the switch forward to turn the lights on. Pull the switch to the rear to turn the light off.

Shift Lever



The shift lever is located to the left of the driver seat. The shift lever operates similar to an automobile with a manual transmission. The clutch pedal must be depressed when ever shifting gears. DO NOT shift into reverse until the vehicle has come to a complete stop.

Shift pattern:
1st gear - Left and back
2nd gear - Right and forward
3rd gear - Right and back
Reverse - Left and forward
Neutral - Center

Shift knob

Accessory Switch (Optional)

The accessory switch is located on the right side of the instrument panel. Push the switch forward to turn on the accessory. Pull the switch back to turn off the accessory. The accessory can be turned on with the key switch in the “OFF” position. The actual function of this switch will vary depending on what accesories are ordered with your vehicle.

Fuel Gauge

The fuel gauge is located on the right side of the instument panel. It operates the same as a fuel gauge in an automobile. The needle deflecting towards the “F” indicates a full tank of fuel. As fuel is used, the needle will move towards the “E.” The fuel tank should be refilled before the gauge reaches the “E.”

Hour Meter

The hour meter is located to the left of the fuel gauge. It records the number of hours the vehicle has been in operation.

Low Oil Light

The panel light on the left side of the instrument panel is a low oil indicator. If this light is on, it indicates that the oiling system in the engine has failed due to a loss of oil pressure. DO NOT operate the vehicle if the oil light is on. Remove the vehicle from service until the engine is repaired.

Ammeter (optional)

The ammeter (optional) is located on the lower left side of the instrument panel. The ammeter displays the current flowing into (+) or out of (-) the battery. A positive (+) current indicates that the battery is being charged. A negative current (-) while the engine is running may be an indication that the charging system has failed.

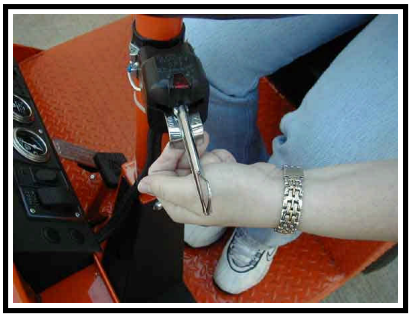
Steering

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.

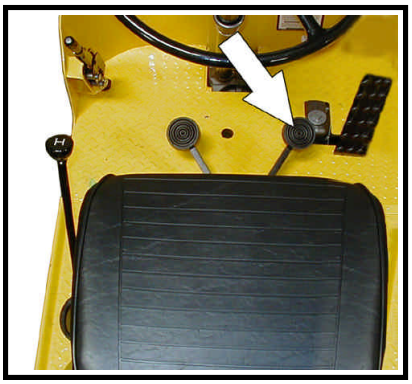
Directional Signals (Optional)

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)

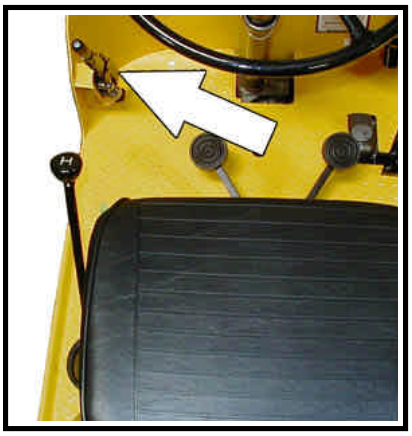


The hazard light switch is located on the left side of the steering column. The switch is a small tab. To activate the hazard lights, pull the tab out. To turn the hazard lights off, push forward or pull back the directional signal lever.



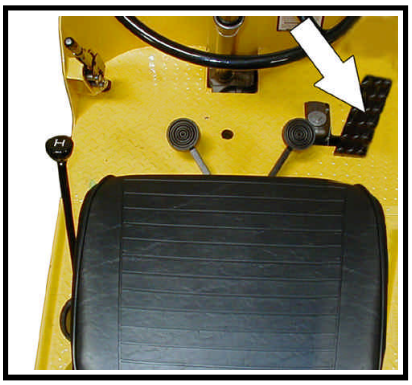
Foot Brake Pedal

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.



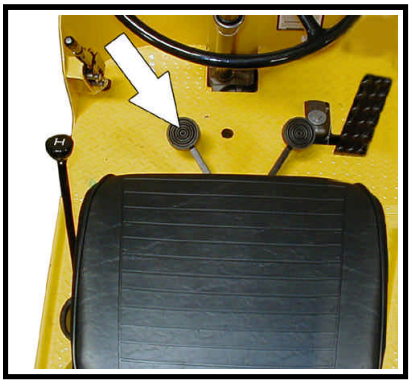
Park Brake

The parking brake is actuated with a hand lever, which is located on the left side of the cowl. To set the parking brake, push down on the brake pedal and pull the lever back until it locks. To release the park brake, depress the foot brake pedal and push the park brake handle forward.



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.

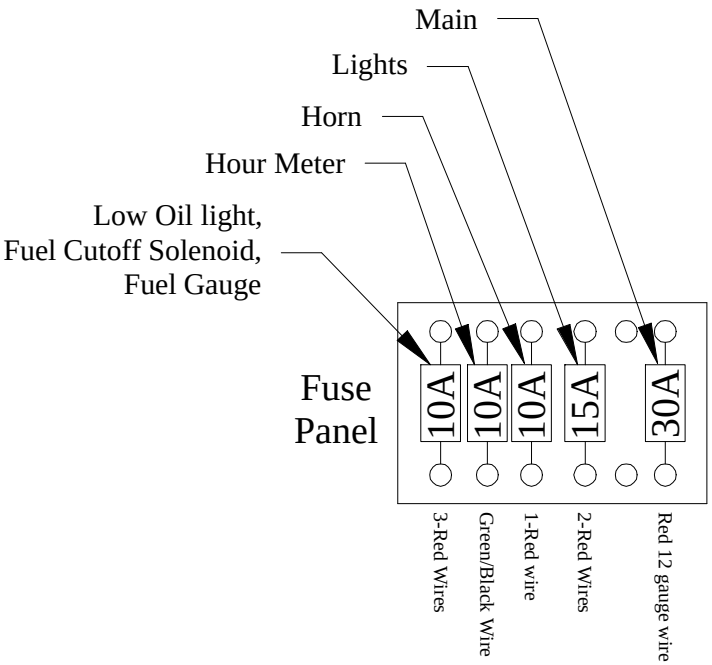


Clutch Pedal

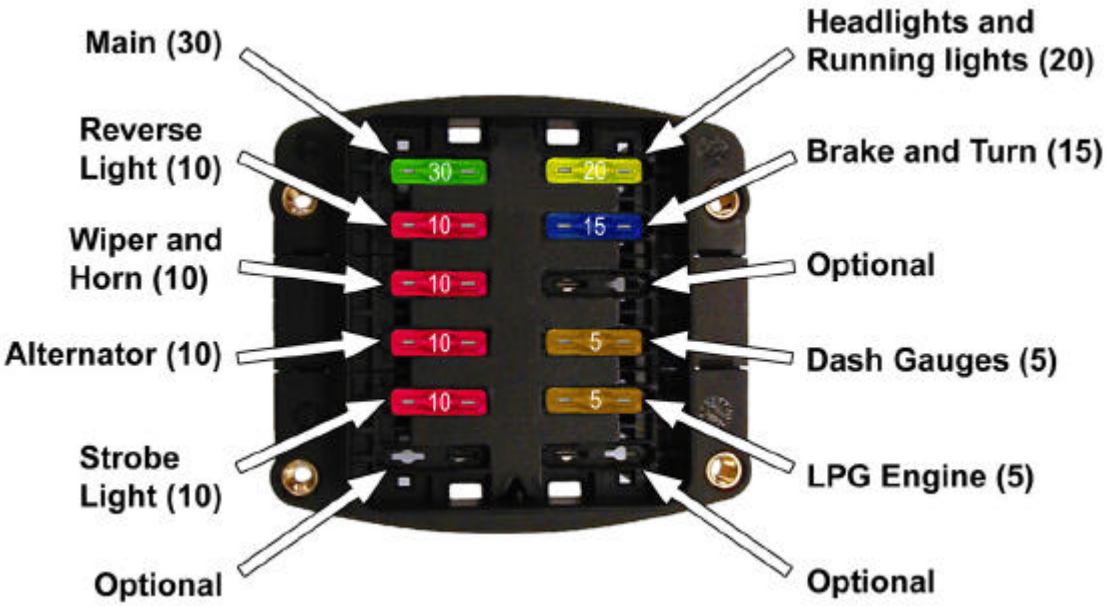
The clutch pedal is located to the left of the brake pedal. The clutch pedal must be depressed when changing gears. The clutch must also be depressed to start the engine.

Fuse Panel

Used ending serial number163333



Used starting serial number 164796



VEHICLE OPERATIONAL 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 or 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 and place the shift lever in the neutral position..
3. If the engine is cold, pull the choke knob out. ***Remember***: Push the choke knob back in once the engine has warmed up.
4. Hold down the foot brake and clutch pedal.
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. Shift the transmission into gear.
8. Release the parking brake and foot brake.
9. Slowly depress the accelerator pedal while at the same time, releasing the clutch. Shift into higher gears as required.

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.

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.
- Turn the key switch to the “OFF” position and remove the key.

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

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

Place the shift lever in the neutral position.

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.
- Refer to the engine manual for information regarding preparing the engine for storage.

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.
- Refer to the engine manual for information regarding preparing the engine for service after storage.

PERIODIC MAINTENANCE CHECKLIST (CHASSIS ONLY)*

Maintenance Item	Weekly (20hrs)	Monthly (80hrs)	Quaterly (250hrs)	Semi - Annual (500hrs)	Annualy (1000hrs)
Check Condition of Tires and Tire Pressure	●				
Check All Lights, Horns, Beepers and Warning Devises	●				
Check and Fill Battery	●				
Check Brake System		●			
Check Steering System		●			
Check for Fluid Leaks		●			
Lubricate Vehicle			●		
Adjust Drive Chains			●		
Clean and Tighten All Wire Connections			●		
Wash and Service Battery			●		
Check Park Brake				●	
Check Front Wheel Bearings				●	
Check Rear Axle Oil				●	
Change Rear Axle Oil					●
Check and Tighten all Nuts and Bolts					●
Clean and Repack Front Wheel Bearings					●

**Refer to the engine manual for information regarding engine periodic maintenance.*

⚠WARNING

Only properly trained and authorized technicians should perform maintenance or repairs to this vehicle. Repairs or maintenance by improperly trained or unauthorized personnel could cause improper operation of the vehicle or premature failure of components resulting in severe bodily injury and/or property damage.

MAINTENANCE GUIDELINES FOR SEVERE DUTY APPLICATIONS

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.

General Maintenance

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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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

⚠WARNING

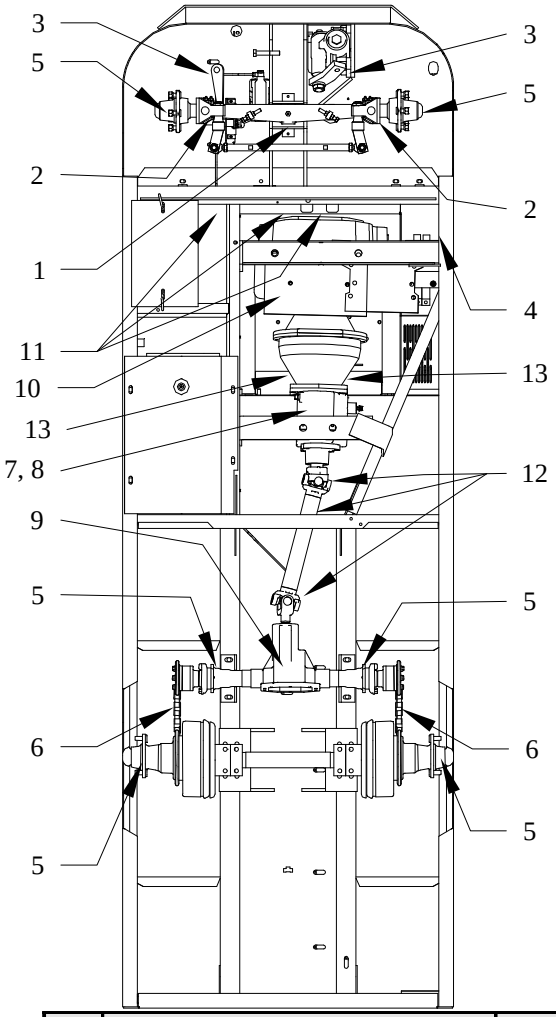
Read and follow all of the guidelines listed below. Failure to follow these guidelines may result in severe bodily injury and/or property damage.

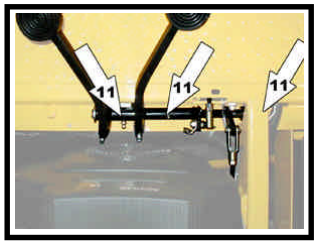
- Avoid fire hazards and have fire protection equipment present in the work area. Conduct vehicle performance checks in an authorized area where safe clearance exists.
- Before starting the vehicle, follow the recommended safety procedures in Section 2, "Safety Rules and Operational Information."
- Ventilate 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

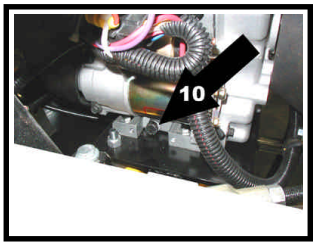
Symptom	Probable Cause
Steering Pulls in One Direction	Front End Out of Alignment
	Low Tire Pressure
Hard Steering	Dry Lube Points in Steering Linkage
	Damaged King Pin/Ball Joint
	Low Tire Pressure
Excessive Steering Play	Worn Ball Joints
	Mis-Adjusted or Worn Steering Gear
	Loose Steering Linkage
Lack of Power or Slow Operation	Brakes or Parking Brakes Dragging
	Worn Drive Gears
	Front End Out of Alignment
	Engine Problem (refer to the engine manual)
Abnormal Noise	Worn Drive Gears or Bearings
	Worn Front /Rear Axle Bearings
	Loose Lug Nuts
	Engine/Transmission Components Worn (refer to the engine manual for engine related problems)
	Drive Shaft out of Balance or u-joint bearings
Oil Leak in Auxiliary Axle Shaft	Axle Shaft Bearing and/or Gasket Failed
	Drive Over Filled
Brake Pedal Soft or Spongy	Air in Brake Lines
Brake Pedal Low	Brake Worn (1/16" Wear Limit)
	Brake Fluid Low
	Brakes Out of Adjustment
Braking Power Low	Brake Worn (1/16" Wear Limit)
	Brake Pads Contaminated with Fluid
	Brake Pedal Linkage Binding
	Brakes Out of Adjustment
	Air in Brake Lines

LUBRICATION CHART

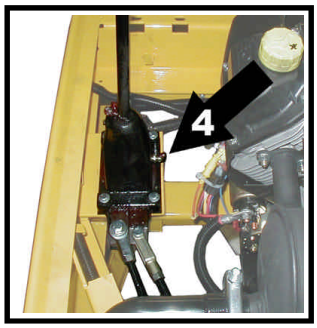




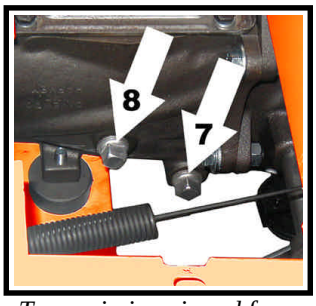
Pedal linkages with engine cowling removed



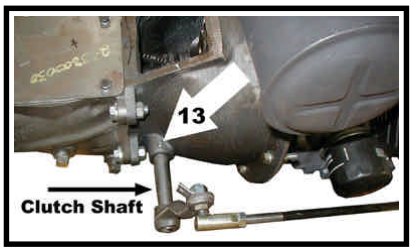
Engine drain plug under starter on left side of engine



Shifter



Transmission viewed from right side



Clutch shaft oil hole, 2 places (right side shown)

#	Description	Locations	Lubricant Type
1	Front Axle Pivot	1	General Purpose Grease
2	King Pin	2	General Purpose Grease
3	Drag Link Ball Joints	2	General Purpose Grease
4	Shifter	1	General Purpose Grease
5	Front or Rear Wheel Bearings	6	High Temperature Wheel Bearing Grease
6	Drive Chain	2	30 wt Motor Oil
7	Transmission Drain Plug	1	-
8	Transmission Fill /Level Plug	1	1.5 quarts 90wt Gear Oil
9	Auxiliary Axle	1	24 Ounces 90wt Gear Oil
10	Engine Oil	1	See Engine Manual
11	Pedal Linkage	3	General Purpose Grease
12	Drive Shaft Universal Joint and slip shaft	3	General Purpose Grease
13	Clutch Shaft	2	30 wt. Motor Oil

Front Axle Service

TABLE OF CONTENTS

INSPECT THE FRONT WHEEL BEARINGS AND KING PIN

⚠WARNING

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 rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support with jack stands.

⚠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.

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.

NOTE: Refer to the **Adjust Front Wheel Bearings** *section for information regarding the adjustment of the wheel bearings.*

NOTE: If the king pin is loose, then refer to **Replace the King Pins and Bushings** *for information regarding replacing the king pin bushings. There are no adjustments for the king pin or bushings.*

8. 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.*

9. Lower the vehicle.
10. Reconnect the main positive and negative cables at the batteries.
11. Remove the blocks from behind the wheels.
12. Release the park brake and test drive the vehicle.

ADJUST FRONT WHEEL BEARINGS

⚠WARNING

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 rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

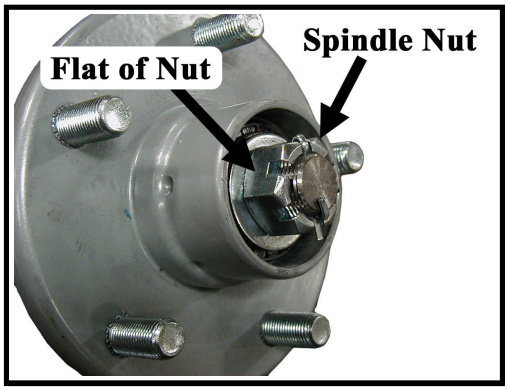
6. Raise the front of the vehicle and support with jack stands.

⚠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.

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.*



Hub with Dust Cap Removed

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.

FRONT AXLE REMOVAL AND INSTALLATION

Removal

⚠WARNING

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 rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support the frame with jack stands.

⚠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.

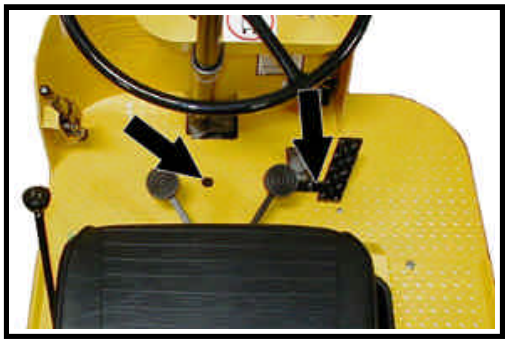
7. Remove both front wheels. Refer to ***Tires and Wheels*** section for information regarding removing the front wheels.
8. Disconnect the drag link ball joint or rod end from the steering knuckle or the steering gear pitman arm.

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

9. Loosen one of the front spring adjusters so that the front axle can pivot freely on the pivot pin.

   NOTE: Count the number of turns so that it can be tightened back in the same position.

10. Securely tie up the left and right end of the front axle so that it can not fall from the vehicle.
11. Remove the axle beam pivot pin set screw, and remove the pivot pin.
12. Lower the vehicle to the ground and remove the ties holding the front axle.



Spring adjustor access locations

13. Raise the front of the vehicle and support the frame with jack stands.
14. Remove the front axle from under the vehicle.

Installation

⚠WARNING

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 rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support with jack stands.

⚠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.

7. Install the front axle in reverse order of removal.

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

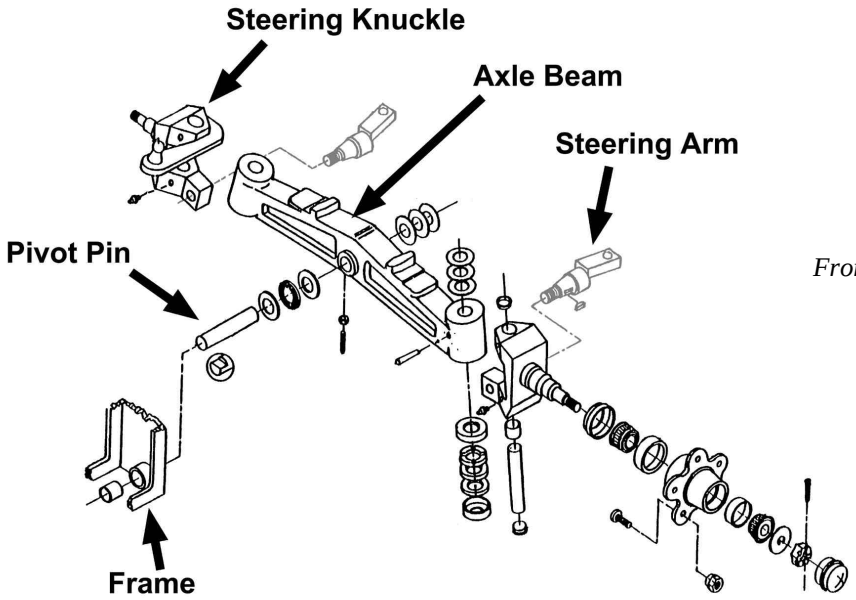
FRONT AXLE DISASSEMBLY

Disassembling and reassembling involves removing and replacing the left and right steering knuckles and king pin bushings. Refer to the following sections for information regarding these procedures:

Replace the Steering Knuckle

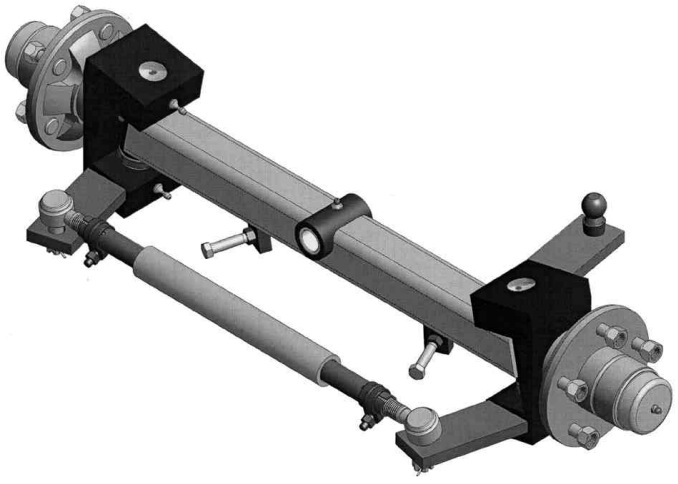
Replace the King Pins and Bushings

NOTE: The front axle does not have to be removed unless the axle beam must be replaced. Refer to **Front Axle Removal and Installation** *for information regarding removing the front axle.*



Front axle up to serial #160107

Front axle starting serial #161460



REPLACE FRONT WHEEL BEARINGS

⚠WARNING

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 rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support with jack stands.

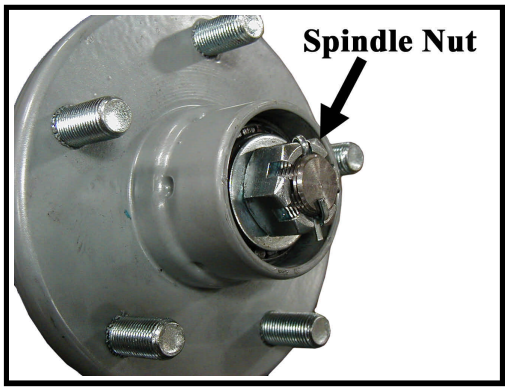
⚠WARNING

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.

7. Remove the tire/wheel assembly from the hub. Refer to ***Tires and Wheels*** section for information regarding removing the tire/wheel assembly.
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.*

   NOTE: Catch the outer bearing as it falls out.

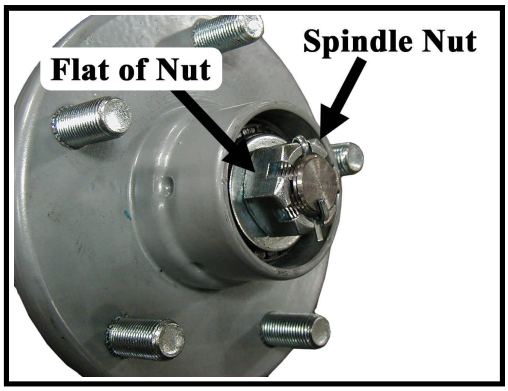


Hub with Dust Cap Removed

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.



Hub with Dust Cap Removed

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.

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.

⚠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.

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

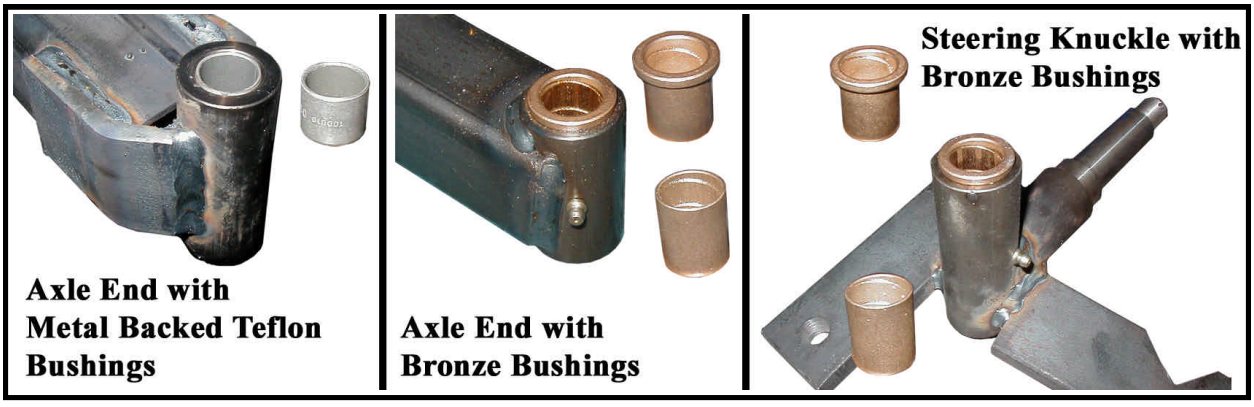
⚠WARNING

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 rear wheels to prevent vehicle movement.
5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support with jack stands.

⚠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.



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.

   a) Line up the grease hole in the bushing with the hole in the steering knuckle.

   b) Ream or broach bronze bushings to between 0.8620 and 0.8635 inches.

⚠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.**

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.

REPLACE THE STEERING KNUCKLE

⚠WARNING

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 rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support with jack stands.

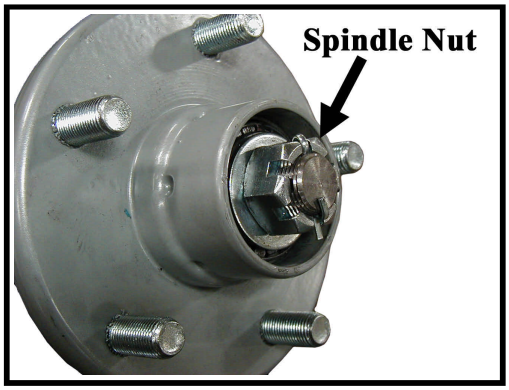
⚠WARNING

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.

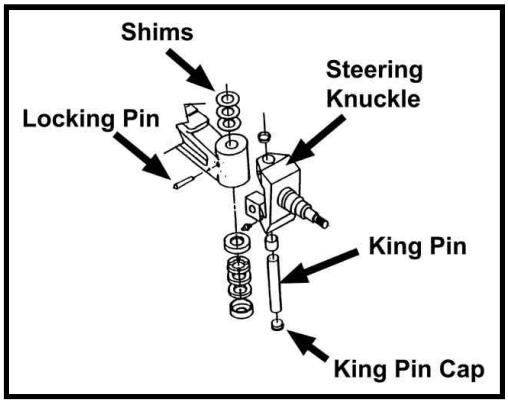
7. Remove the tire/wheel assembly. Refer to ***Tires and Wheels*** section for information regarding removing the tire/wheel assembly.
8. Remove the hub bearing cap, cotter pin and nut, then remove the hub from the steering knuckle.

   NOTE: Catch the outer bearing as it falls out.
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. Remove the upper and lower king pin caps and discard.
11. Up to serial #160107: Drive out the king pin locking pin and discard.
11. Starting serial #161460: Remove the set screw holding the king pin in the yoke.
12. While supporting the knuckle, remove the king pin and thrust bearing.
13. Remove the knuckle from the axle.
14. Thoroughly clean and/or replace all bearings, nuts, washers, and bushings.

    NOTE: Both the left and right side bushings and thrust bearings should be replaced as a set.



Hub with Dust Cap Removed



15. Assemble in reverse order.

    a) Use new king pin caps and locking pin.

    b) Kin pin shims are available in 0.003”, 0.010" and 0.030”. Shim the king pin as required to eliminate all vertical free play.

16. Pack the thrust bearing with grease.

    NOTE: Refer to **Replace Front Wheel Bearings** *for information regarding proper tightening of the spindle nut*

17. Install new cotter pins.

18. Realign the wheels.

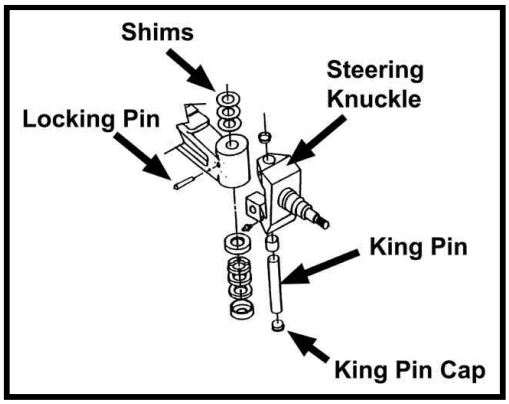
    NOTE: Refer to the **Steering** *section for information regarding realignment of the front wheels.*

19. Lower the vehicle.

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

21. Remove the blocks from behind the wheels.

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



Steering Component Service

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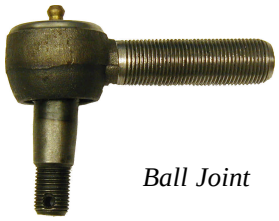
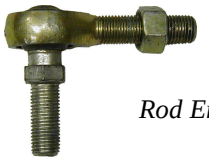
FRONT END ALIGNMENT

This section will refer to two different types of ball joints. One type has a grease fitting and a tapered shaft where it is fitted to the steering arm or pitman arm. The second type cannot be greased and has a straight shaft. See the illustrations to the right. Depending on the configuration of your truck, it may be equipped with one or both types of ball joints.

In this text:
The first type has a grease fitting and will be referred to as a "Ball Joint."
The second type has no grease fitting and will be referred to as a "Rod End."



Ball Joint



Rod End

Center the Steering

⚠WARNING

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 rear wheels to prevent vehicle movement.
5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support with jack stands.

⚠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.

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. Remove the pitman arm from the steering gear.

   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.

⚠WARNING

Do not drive the vehicle while the steering wheel or front wheels are tied in position. Driving the vehicle while the steering wheel or front wheels tied in the position may cause loss of control of the vehicle resulting in severe bodily injury and/or property damage.

11. Reinstall the pitman arm.
12. Untie the steering wheel and the front wheels.
13. Reconnect the main positive and negative cables at the batteries.
14. 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.
15. Remove the blocks from behind the wheels.
16. Release the parking brake and test drive the vehicle.

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.*

⚠WARNING

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 rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support with jack stands.

⚠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.

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.

⚠WARNING

Do not drive the vehicle while the steering wheel or front wheels are tied in position. Driving the vehicle while the steering wheel or front wheels tied in the position may cause loss of control of the vehicle resulting in severe bodily injury and/or property damage.

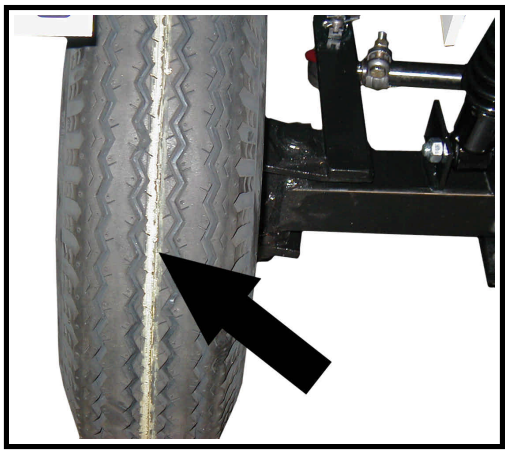
8. Using a piece of chalk, mark a line around the center of both front tires.

   HINT: Hold the chalk on the center of the tire and rotate the tire to mark the line.

9. Loosen the ball joint clamps or the rod end jam nuts on the tie rod.

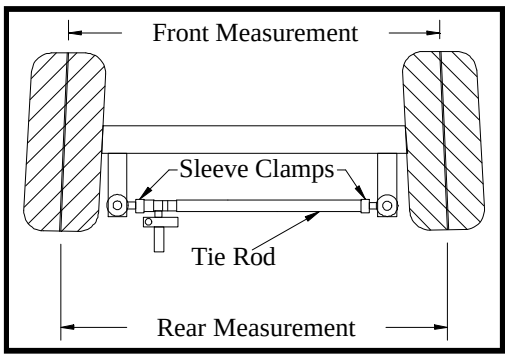
   NOTE: Remember the position and orientation of the ball joint clamps.

10. Lower the front wheels to the ground and push the vehicle back and forth a few feet to settle the suspension.



Tire with centerline marked

11. Measure the distance between the lines at the front of the tires.
12. Measure the distance between the 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 the same.
14. If equipped with ball joints, position the ball joint clamps in their original location and orientation.
15. Tighten the ball joint clamps (28-32 ft. lbs.) or the rod end jam nuts.
16. Untie the steering wheel.



⚠WARNING

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. Clamps positioned so that they contact other components may result in steering failure and loss of control of the vehicle causing severe bodily injury and/or property damage.

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.

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 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 rear wheels to prevent vehicle movement.

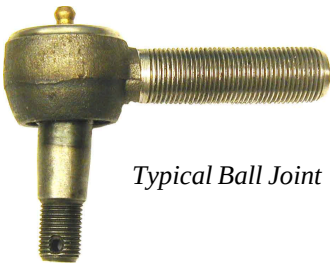
5. Disconnect the main positive and negative cables at the battery.

6. Tie off the front wheels so that they cannot turn.

⚠WARNING

Do not drive the vehicle while the steering wheel or front wheels are tied in position. Driving the vehicle while the steering wheel or front wheels tied in position may cause loss of control of the vehicle resulting in severe bodily injury and/or property damage.

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.



Typical Ball Joint

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 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 rear wheels to prevent vehicle movement.

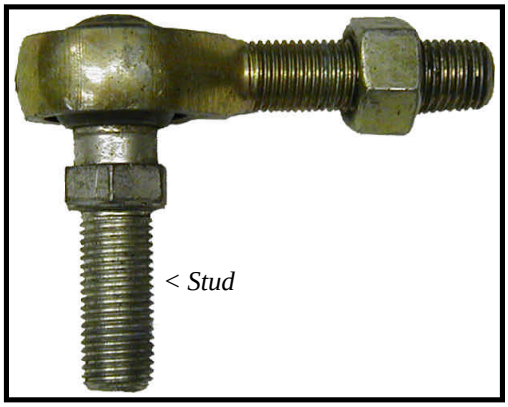
5. Disconnect the main positive and negative cables at the battery.

6. Visually inspect each rod end for any signs of play between the ball and the nylon or brass bushing in the housing.

⚠WARNING

Do not drive the vehicle while the steering wheel or front wheels are tied in position. Driving the vehicle while the steering wheel or front wheels tied in position may cause loss of control of the vehicle resulting in severe bodily injury and/or property damage.

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.



Typical rod end. Studded rod end shown, your vehicle may be equipped with spherical rod ends that do not have a stud.

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 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 rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

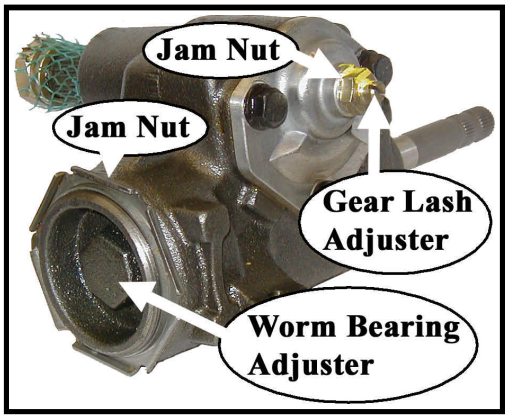
6. Raise the front of the vehicle and support with jack stands.

⚠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 serious bodily injury.

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 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.

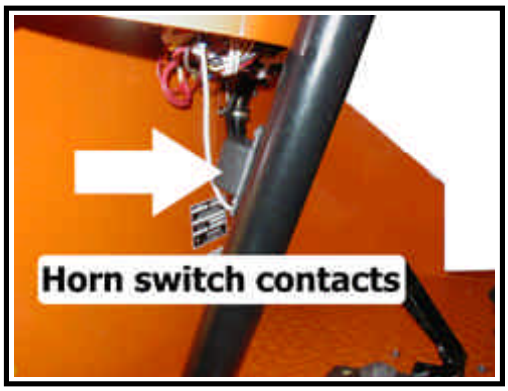
4. Place blocks under the rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Remove the steering wheel.

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

7. Remove the horn switch contacts cover and the horn switch contacts.
8. Remove the lower steering column tube bushing from the tube.
9. Loosen or remove the steering column tube clamp and remove the tube.
10. Loosen the coupler set screw and remove the steering shaft from the vehicle.
11. Lightly grease the steering gear input shaft splines, steering wheel splines, upper and lower steering shaft bushing.



12. Install the steering shaft in reverse order.
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.

REPLACE THE STEERING WHEEL

⚠WARNING

1. Make sure the key-switch is in the "OFF" position, then remove the key.

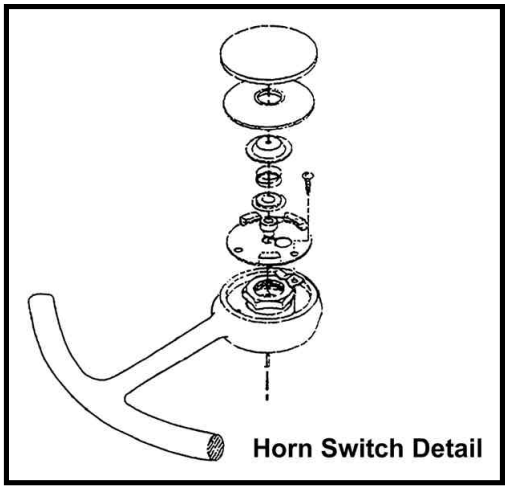
2. Place the Shift lever in the neutral position.

3. Set the park brake.

4. Place blocks under the rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Remove the horn 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.



Horn Switch Detail

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 28-32 ft lbs.
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.

REPLACE THE STEERING GEAR

⚠WARNING

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.

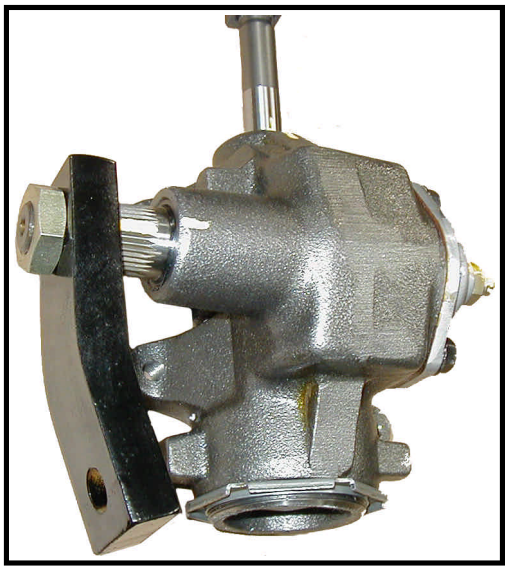
4. Place blocks under the rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Remove the steering wheel. Refer to ***Replace the Steering Wheel*** section for information regarding removing the steering wheel.
7. Remove the steering shaft. Refer to ***Replace the Steering Shaft*** section for information regarding removing the steering shaft.
8. Remove the pitman arm using a pickle fork.

   NOTE: On some vehicle configurations it may be required to remove the drag link from the pitman arm. Refer to **Replace the Ball Joints** *section for information regarding removing the ball joint from the pitman arm.*

9. Support the steering gear so that it cannot fall out of the vehicle.
10. Remove the bolts holding the steering gear to the vehicle frame and remove the steering gear from the vehicle.



Steering Gear with Pitman Arm

⚠WARNING

Failure to support the steering gear will result in the steering gear falling out of the vehicle and could cause property damage and/ or severe bodily injury.

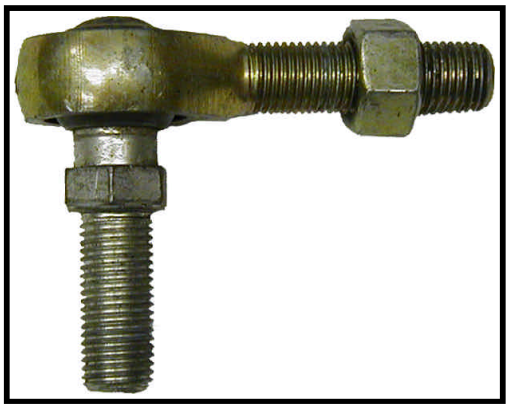
11. Center the steering gear. Refer to ***Center the Steering Gear*** section for information regarding centering the steering gear.
12. Install in reverse order. Torque the pitman arm nut to 75-100 ft-lbs.
13. Reconnect the main positive and negative cables at the batteries.
14. Remove the blocks from behind the wheels.
15. Release the parking brake and test drive the vehicle.

REPLACE THE BALL JOINTS, TIE RODS, AND DRAG LINK

This section will refer to two different types of ball joints. One type is has a grease fitting and a tapered shaft where it is installed on the steering arm or pitman arm. The second cannot be greased and has a straight shaft or bolt. See the illustrations to the right. Depending on the configuration of your vehicle, it may be equipped one or both types of ball joints.

In this text:
The first type will be referred to as a "Ball Joint."
The second type will be referred to as a "Rod End."

NOTE: If a rod end or ball joint is worn out, we recommend replacing all of the ball joints and/or rod ends as a set.



Typical rod end. Studded rod end shown, your vehicle may be equipped with spherical rod ends that do not have a stud.

Replacing a Rod End

⚠WARNING

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 rear wheels to prevent vehicle movement.
5. Disconnect the main positive and negative cables at the battery.

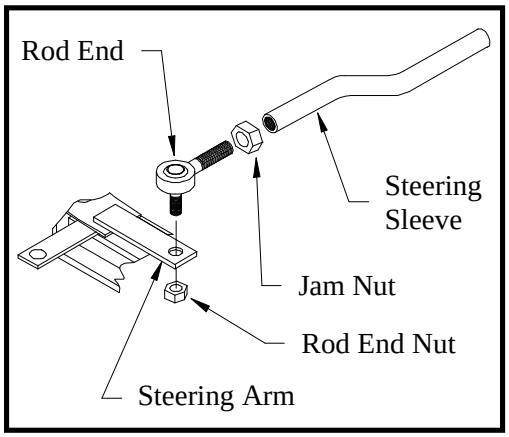
6. Raise the front of the vehicle and support with jack stands.

⚠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.

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.
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.

Replacing the Drag Link

The Drag Link is the linkage that connects the steering gear pitman arm to the steering knuckle. Refer to the illustration on the following page.

⚠WARNING

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 rear wheels to prevent vehicle movement.
5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support with jack stands.

⚠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.

7. Remove the ball joints from the steering knuckle and pitman arm.
8. Remove the drag link as an assembly.
9. Install in reverse order.
10. Realign the front wheels.

    NOTE: Refer to the **Front End Alignment** *section for information regarding realignment of the front wheels.*

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

Replacing the Tie Rod

The Tie Rod is the linkage that connects the two steering knuckles together. Refer to the illustration below..

⚠WARNING

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 rear wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the front of the vehicle and support with jack stands.

⚠WARNING

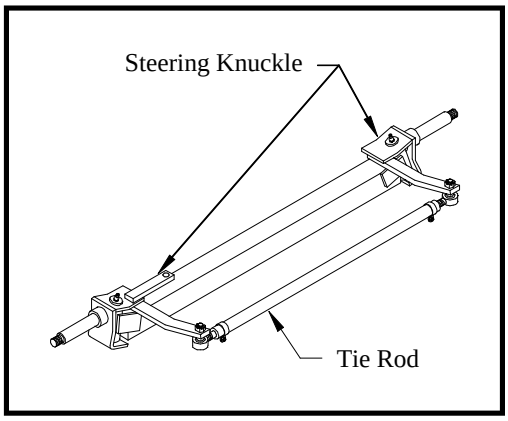
Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

7. Remove the ball joints or rod ends from the steering knuckles.

   NOTE: Refer to the **Replacing a Rod End** *section for information regarding the removal of the ball joints or rod ends.*

8. Remove the tie rod as an assembly.
9. Install in reverse order.
10. Realign the front wheels.

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



Typical Front Axle Assembly

11. Lower the vehicle.
12. Reconnect the main positive and negative cables at the batteries.
13. Remove the blocks from behind the wheels.
14. Release the park 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.

PITMAN ARM ALIGNMENT

1. Remove the drag link from the pitman arm. Refer to ***Replace the Ball Joints, Tie Rods, and Drag Link*** section for information regarding removing the drag link.
2. Center the steering gear. Refer to ***Center the Steering Gear*** section for information regarding centering the steering gear.
3. Install the pitman arm so that it is as close as possible to perpendicular to the ground.
4. Install the drag link back onto the pitman arm.
5. Align the front wheels. Refer to ***Front End Alignment*** for information regarding aligning the front wheels.

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.*

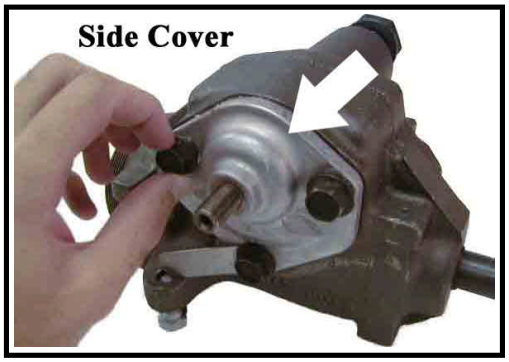
NOTE: The steering gear is packed with grease. Only perform maintenance on the steering gear in an area that will contain any grease that may spill out of the steering gear when it is disassembled.

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.

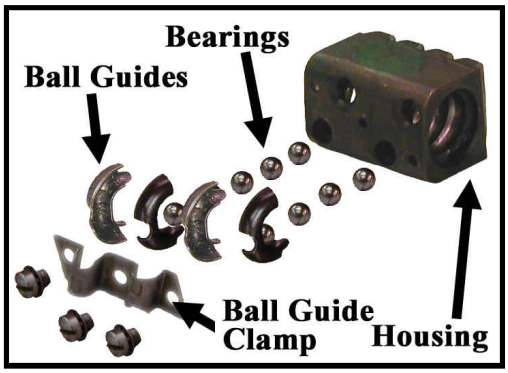
3. Remove the side cover/pitman shaft assembly by removing the three side cover bolts and then pulling the assembly out of the housing.

   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.

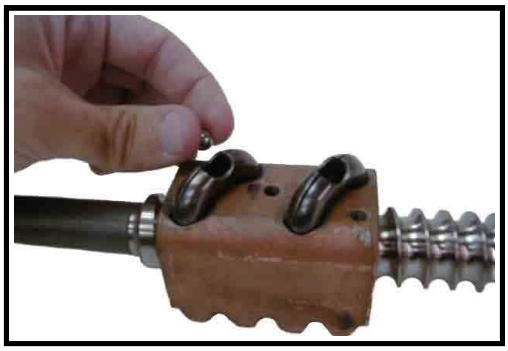
8. The ball nut assembly consists of two sets of ball bearings that recirculate in two channels in the ball nut housing. The bearings may fall out once the bearing guides are removed. Be careful not to lose any of the bearings.
9. Remove the ball guide clamps, ball guides and all of the ball bearings.
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.



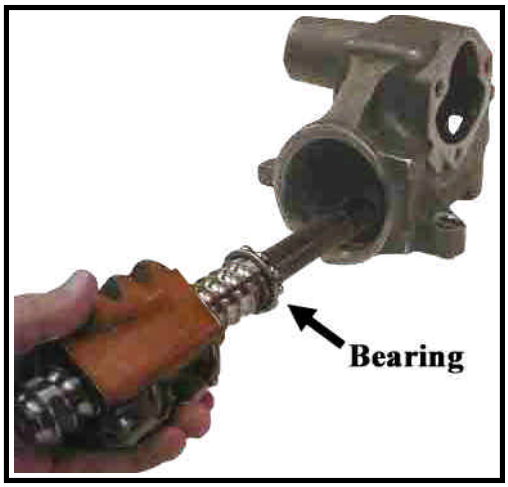
Reassembly

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.

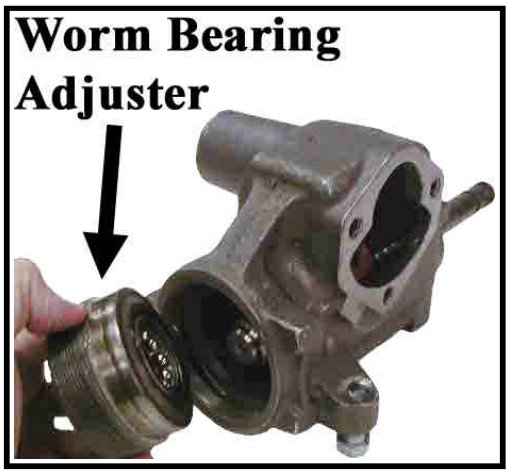


9. Place the upper worm bearing on the worm shaft and install the worm shaft/ball nut assembly into the housing being careful not to damage the worm shaft seal.



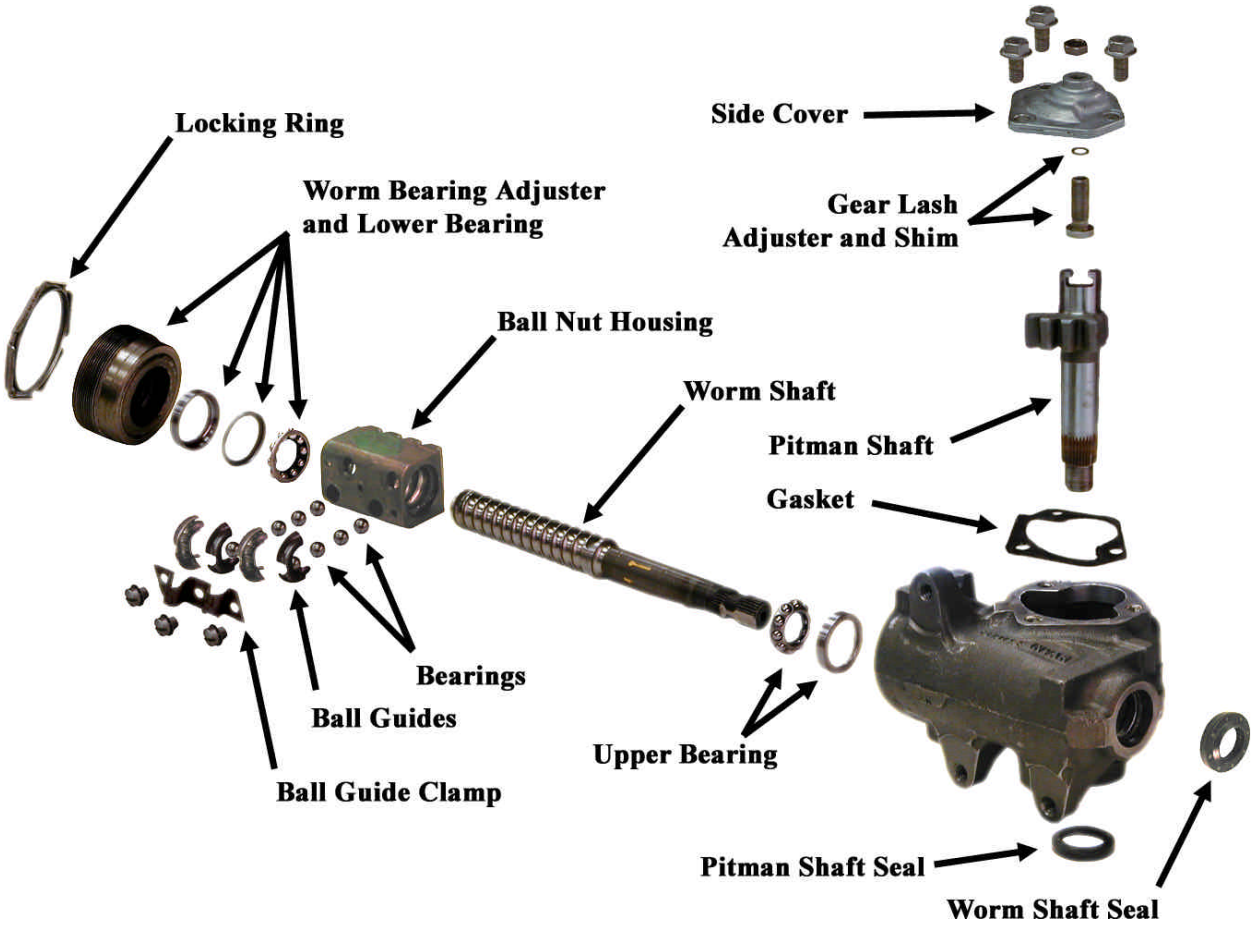
10. Install the assembled worm bearing adjuster into the housing and tighten just enough to remove all play in the worm shaft.
11. Install, but do not tighten the worm bearing adjuster lock nut.
12. Rotate the worm shaft to center the ball nut in the housing.
13. Place a new gasket onto the housing and 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



TAYLOR - DUNN

Brake Service

TABLE OF CONTENTS

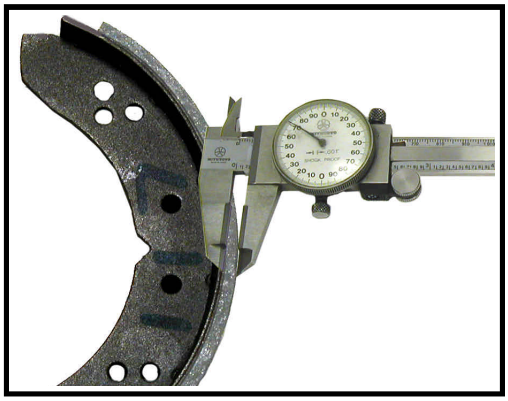
INSPECT THE SERVICE BRAKE

Brake Shoes

⚠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.

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 this is 1/16-inch or less then the brake shoe must 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

⚠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.

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

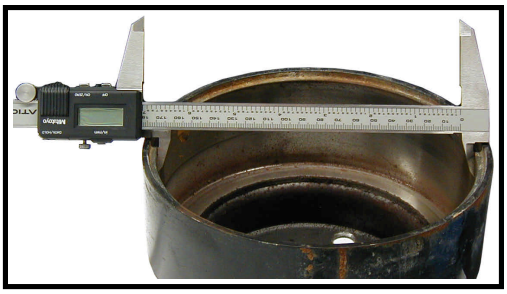
The service limit for the inside diameter of the brake drum is 9.015-inches. If the brake drum is grooved or worn beyond the service limit, then the brake drum must be replaced.

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

If the difference between any of the measurements exceeds 0.010-inches then the brake drum must be turned or replaced.

⚠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.



Inspecting the Auto-Adjust Brake Mechanism

NOTE: The act of inspecting the auto-adjust mechanism will require adjusting the brakes when the inspection is complete.

⚠WARNING

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 wheels to prevent vehicle movement.

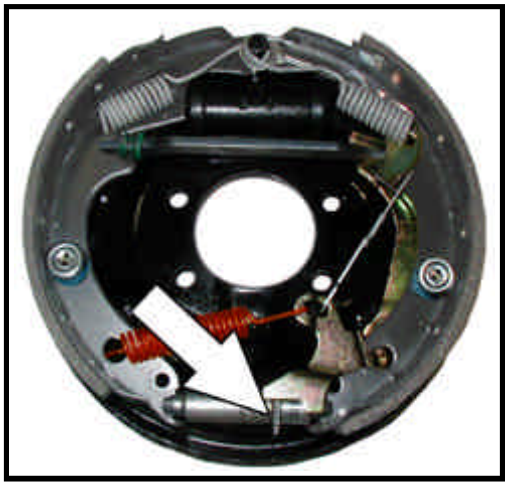
5. Disconnect the main positive and negative cables at the battery.

6. Raise the rear of the vehicle and support with jack stands.

⚠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 serious bodily injury.

7. Release the park brake.
8. Remove the wheel and brake drum.
9. Back off the auto adjuster star wheel one or two turns.
10. Reinstall the brake drum and depress the brake pedal.
11. As the brake pedal is depressed, the auto adjuster lever indexes the star wheel adjuster, rotating the adjuster screw.
12. Adjust the brake. Refer to ***Rear Drum Brake Adjustments*** section for information regarding adjusting the brakes.
13. Reinstall the brake drum and wheel.
14. Lower the vehicle.
15. Reconnect the main positive and negative at the batteries.
16. Remove the blocks from behind the wheels.
17. Test drive the vehicle



Auto adjust star wheel

ADJUST THE SERVICE BRAKES

Hydraulic Drum Brakes

The drum brakes in this system are automatically adjusted. A low brake pedal or lack of braking power could be caused by:

- Brake fluid level low in the master cylinder. See ***Check the Master Cylinder Fluid*** section.
- Air in the brake lines. See ***Bleed the Brakes*** section.
- Worn brake pads. See ***Inspect the Service Brake*** section.
- Worn brake drum. See ***Inspect the Service Brake*** section.
- Binding brake pedal linkage

If you are experiencing a low brake pedal or lack of braking power, the entire brake system should be inspected.

Rear Drum Brake Adjustments

NOTE: This vehicle is equipped with self-adjusting brakes. The need to adjust the brakes manually may be an indication that the auto-adjust mechanism is not functioning properly. Refer to **Inspecting the Auto-Adjust Brake Mechanism** *for information on the auto-adjust mechanism.*

⚠WARNING

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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the batteries.

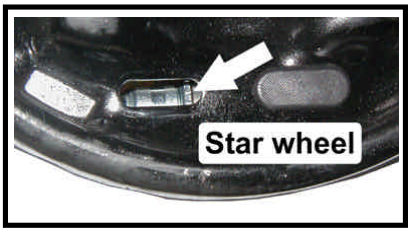
6. Raise the rear of the vehicle and support with jack stands.

⚠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 serious bodily injury.

7. Release the park brake.
8. To access the brake adjustor, remove the rubber plug located near the bottom of the brake backing plate.
9. Turn the star wheel until the brakes lock the wheel then back off the star adjusting nut until the wheel spins freely with a minimum of drag.

   NOTE: Use a screwdriver inserted through the access hole to disengage the indexing lever from the star wheel.



Rear view of brake backing plate.

10. Repeat steps 9 through 11 for the other side.
11. Lower the vehicle.
12. Reconnect the main positive and negative at the batteries.
13. Remove the blocks from behind the wheels.
14. Test drive the vehicle.
    a. Inspect the park brake adjustment. If required, refer to ***Adjust the Parking Brake*** section for information regarding adjusting the parking brake.

Close up of adjuster with brake drum removed. Arrow depicts the indexing lever.

ADJUST THE PARKING BRAKE

Rear Drum Brake

There are two adjustments for the parking brake. The primary adjustment is on the park brake handle itself. The secondary adjustment is the park brake cable. The park brake cable does not require routine adjustments. It should only be adjusted if any part of the brake linkages are replaced.

⚠WARNING

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. Hold the vehicle in place with the service brake.

Primary Adjustment (handle)

4. If the park brake is set, release the park brake.
5. Rotate the knob on the park brake handle clockwise to tighten the park brake or counter clockwise to loosen the park brake.
6. Set the park brake and check to be sure it is adjusted properly.
7. Release the park brake and test drive the vehicle.

Secondary Adjustment (cable)

⚠WARNING

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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the batteries.

6. Release the park brake.
7. Rotate the knob on the parking brake handle couterclockwise until it stops.
8. Loosen the park brake cable clevis jam nut.
9. Adjust the cable to remove all slack from the linkages.
10. Tighten the jam nut.
11. Perform the Primary Adjustment Procedure.

CHECK MASTER CYLINDER FLUID

⚠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.

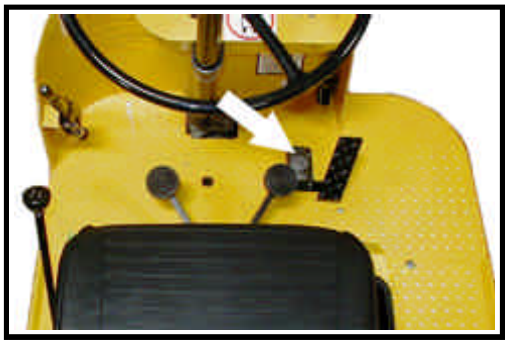
INGESTION

Get medical attention immediately.

⚠WARNING

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 wheels to prevent vehicle movement.**
5. **Disconnect the main positive and negative cables at the batteries.**

6. Thoroughly clean the area around the master cylinder cap.
7. Remove the master cylinder cap.
8. If the fluid in the master cylinder is contaminated then the entire brake system must be flushed. Refer to ***Bleed the Brakes*** for information regarding flushing the brake system.
9. Fill with brake fluid from a new sealed container to within 1/4-inch of the top of the master cylinder chamber and reinstall the cap.
10. Reconnect the main positive and negative cables at the batteries.
11. Remove blocks from behind the wheels.
12. Release the parking brake and test drive the vehicle.



Loaction of master cylinder

⚠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.**

BLEED THE BRAKE SYSTEM

⚠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

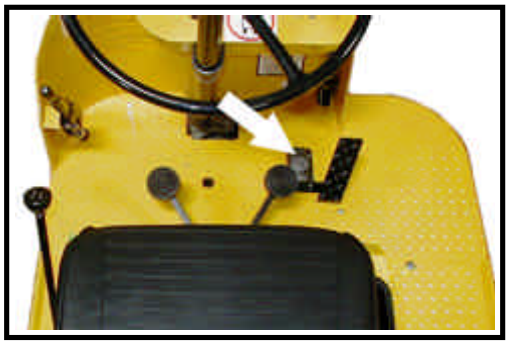
Get medical attention immediately.

NOTE: Start this procedure at the wheel furthest from the master cylinder, then work toward the wheel closest to the master cylinder.

⚠WARNING

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 wheels to prevent vehicle movement.**
5. **Disconnect the main positive and negative cables at the battery.**

6. Thoroughly clean the area around the master cylinder cap and remove the cap.



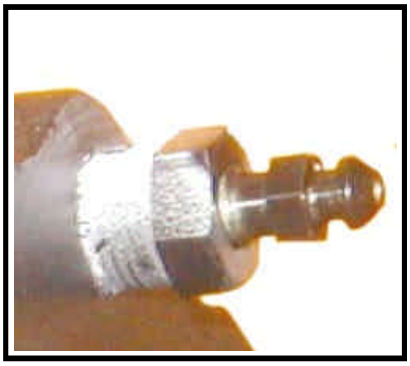
Loaction of master cylinder

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.

⚠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.**

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 bleeder valve on the hydraulic brake body.
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.



Typical bleeder valve

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.

⚠WARNING

Always use brake fluid from a new sealed container. Never reuse any brake fluid that has been removed from the brake system. Use of contaminated brake fluid will degrade the braking performance and may cause property damage or severe bodily injury.

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 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.

FLUSH THE BRAKE SYSTEM

⚠WARNING

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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the rear wheels off of the ground and support with jack stands.

⚠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.

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.

REPLACE THE BRAKE SHOES

⚠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

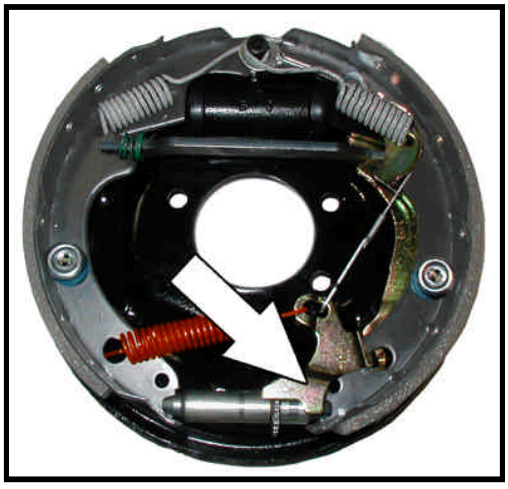
1. **Make sure the key-switch is in the "OFF" position, then remove the key.**
2. **Place the Shift lever in the neutral position.**
3. **Set the park brake.**
4. **Place blocks under the front wheels to prevent vehicle movement.**
5. **Disconnect the main positive and negative cables at the batteries.**

6. Raise the rear of the vehicle and support with jack stands.

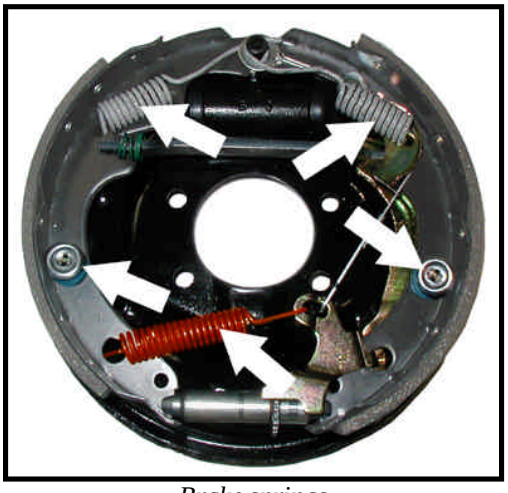
⚠WARNING

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.

7. Remove the brake drum. Refer to ***Replace Wheel Bearings*** in the ***Driven Axle*** section for information regarding removing the brake drum.
8. Disconnect the auto-adjust lever from the brake shoe.



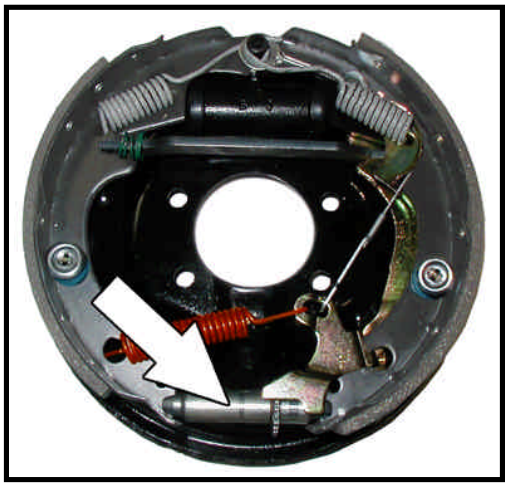
Auto adjust lever



Brake springs

9. Remove the upper and lower return springs and brake shoe retaining springs.

10. Remove the brake shoes.
11. Remove and thoroughly clean the adjustor assembly.
12. Lightly lubricate the adjustor screw threads with high temperature grease and install the adjustor screw all of the way into the adjustor nut.



Adjustor assembly

⚠WARNING

Do not allow grease to contact any of the braking surfaces. If any braking surface is contaminated with grease, it may cause the brakes to fail resulting in severe bodily injury and/or property damage.

13. Install in reverse order.
    a. Before installing the brake drum, inspect the auto-adjust mechanism for proper operation.
    b. Inspect the brake drum. Refer to ***Inspect the Service Brake*** section for information regarding inspecting the brake drum.
14. Adjust the brakes. Refer to ***Rear Brake Drum Adjustments*** section for information regarding adjusting the brakes.
15. Lower the vehicle.
16. Reconnect the main positive and negative at the batteries.
17. Remove the blocks from behind the wheels.
18. Test drive the vehicle.

REPLACE 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.

⚠WARNING

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 wheels to prevent vehicle movement.**
5. **Disconnect the main positive and negative cables at the battery.**

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

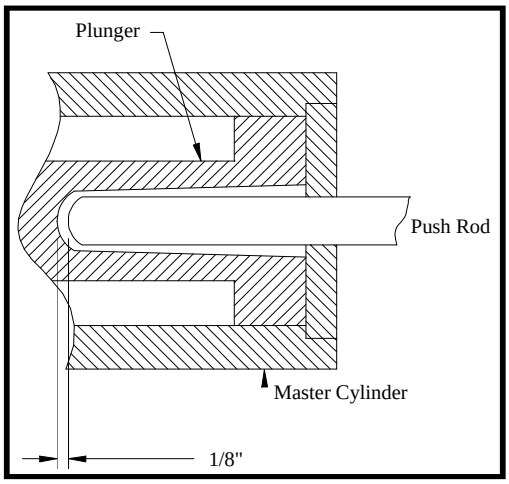
6. If required, raise the vehicle and support with jack stands.

⚠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.

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.



Cutaway of typical master cylinder showing the push rod clearance

⚠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.**

REPAIR THE MASTER CYLINDER

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. Refer to ***Replace the Master Cylinder*** section for information regarding removing the master cylinder.
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.

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

Throttle Linkage

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THROTTLE LINKAGE ADJUSTMENTS

⚠WARNING

Do not exceed locally imposed speed limits. Failure to observe locally imposed speed limits may result in severe personal injury and/or property damage.

⚠WARNING

Do not exceed the engine manufacturers maximum recommended engine RPM. Exceeding the maximum recommended engine RPM may result in damage to the engine. Refer to the engine service manual for information regarding maximum engine RPM.

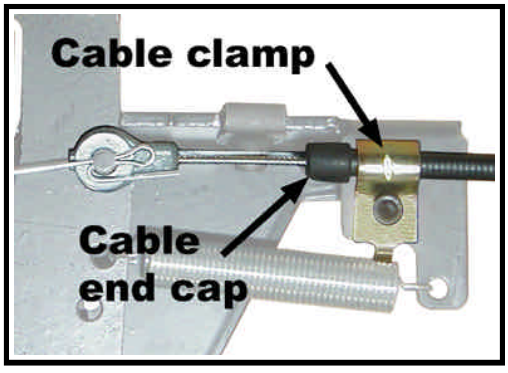
⚠WARNING

Do not exceed the speed rating for the set of sprockets on your vehicle. Exceeding the speed rating may result in damage to the vehicles drive system.

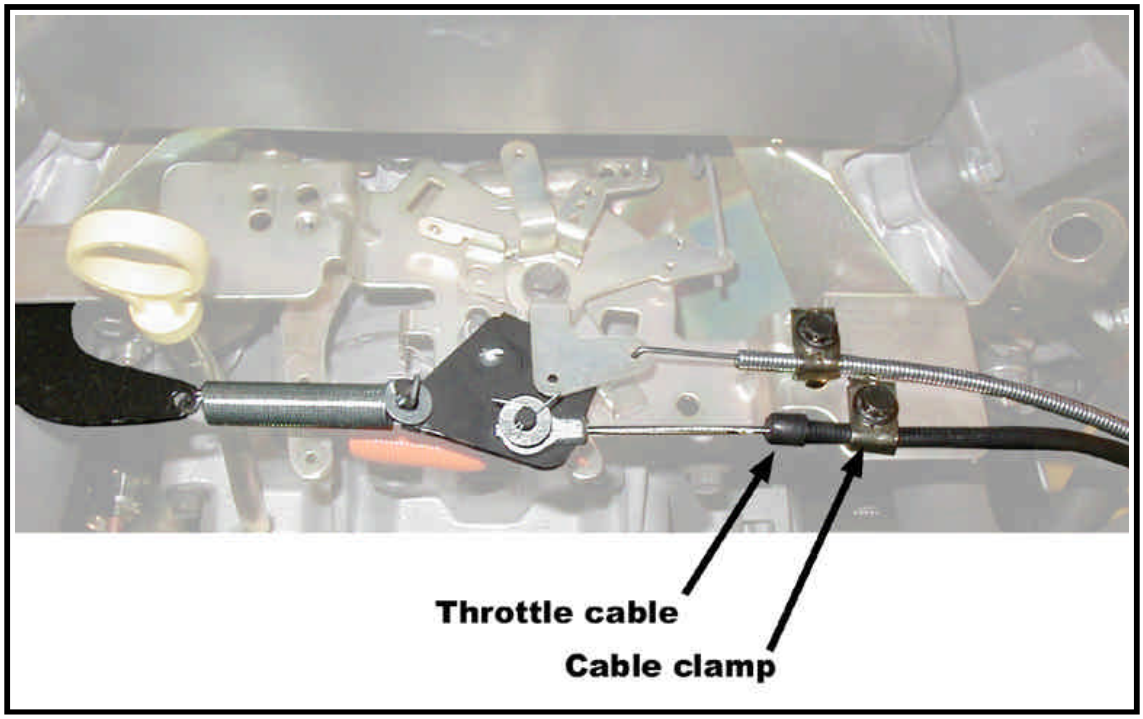
⚠WARNING

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 rear wheels to prevent vehicle movement.**
5. **Disconnect the main positive and negative cables at the battery.**

6. Loosen the cable clamp on the throttle module and adjust the cable so that the cable end cap is against the cable clamp. Tighten the cable clamp when complete.



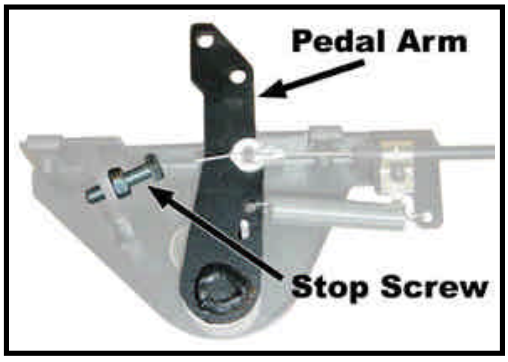
7. Loosen the cable clamp on the engine throttle linkage assembly and adjust the cable so that the throttle arm is against the idle stop. Tighten the cable clamp when complete.



NOTE: The model B4-2500 is available in various speed ranges determined by the secondary reduction chain drive. Refer to the Illustrated Parts section to determine the speed ranges for chain and sprockets.

NOTE: The vehicles governed speed may be limited to any speed from engine idle up to the specification listed for the sprockets installed. Refer to warnings at the start of this section.

8. Adjust the throttle pedal stop screw to obtain the desired governed speed in high gear (refer to notes and warnings above). Tighten the jam nut once the speed adjustment is complete.



TAYLOR - DUNN

Engine Service

The engine service and repair information is located in supplemental manual part number M7-001-19 which was supplied with your vehicle.

If you do not have this manual, it can be obtained through your local Taylor-Dunn® dealer.

TAYLOR - DUNN

Auxiliary Axle Service

The auxiliary axle assembly is located up under the frame, in front of, or to the rear of the driven axle. The driven axle is the axle that the wheels are mounted on.

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CHECK OIL LEVEL

The plug on the auxiliary differential axle cover is a fill plug only. The auxiliary axle does not have an oil level plug to allow inspection of the quantity of oil in the axle. The proper amount of oil should be installed at the time of assembly. If there is any doubt regarding the amount of oil in the auxiliary axle, then the oil should be drained and replaced. Refer to ***Change Auxiliary Axle Oil*** for information regarding changing the differential oil.

CHANGE AUXILIARY AXLE OIL

⚠WARNING

1. Make sure the key-switch is in the "OFF" position, then remove the key.

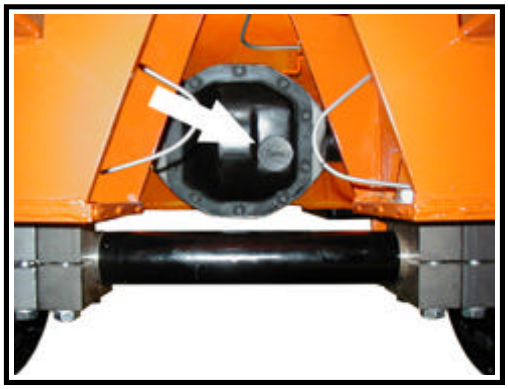
2. Place the Shift lever in the neutral position.

3. Set the park brake.

4. Place blocks under the front wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the batteries.

6. Place a drain pan that can hold a minimum of 3-quarts of oil under the auxiliary axle.
7. Loosen all of the differential cover plate screws so that there is 1/4" space between the screw head and the cover plate.
8. Carefully pry the bottom of the cover plate loose and allow the oil to drain.
9. Remove the cover plate and clean any residual gasket material or sealer form the cover and the differential housing.
10. Make sure that the sealing surfaces of the cover and differential housing are clean and dry.
11. Using a new gasket and/or gasket sealer, reinstall the differential cover.
12. Remove the fill plug and fill the auxiliary axle with 1.5 pints of oil. Refer to ***General Maintenance*** section for information regarding type of oil.
13. Reconnect the main positive and negative cables at the batteries.
14. Remove blocks from behind the wheels.
15. Test drive the vehicle.



Fill plug viewed from the rear of the vehicle

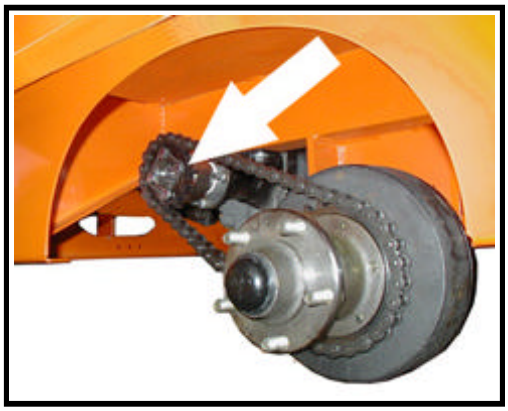
AUXILIARY AXLE SHAFT

NOTE: To remove the axle , the auxiliary axle assembly must be removed from the vehicle. Refer to **Auxiliary Axle Assembly** *for information regarding removing the auxiliary axle assembly.*

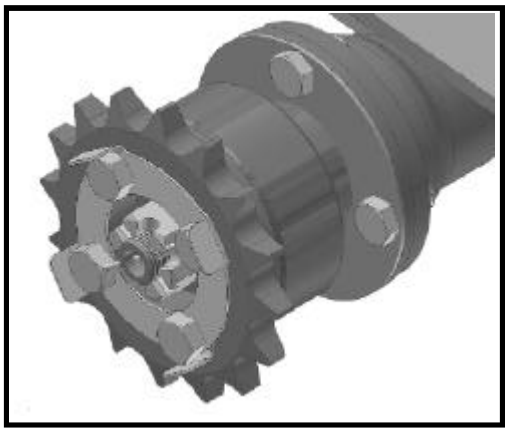
Remove and Install Axle

1. Remove the sprocket and axle hub.
2. Remove the four nuts around the axle flange.
3. Remove the axle from the transmission assembly.

   NOTE: The axle bearing race may remain in the housing. The race does not need to be removed unless the axle bearing is to be replaced.
4. Remove the axle seal from the axle housing.
5. Install the axle in reverse order.
   - Use a new axle seal, hub cotter pin and locking washer. Bend the four tabs on the locking washer against a flat on each bolt head..
   - Apply silicon gasket sealer to between the axle flange and bearing retainer.



Auxiliary Axle Shaft



Sprocket with locking washer

Replace the Axle Bearing

NOTE: The axle must be removed from the transmission for this procedure. Refer to **Auxiliary Axle Shaft** *for information regarding removing the rear axle.*

NOTE: The new bearing is a bearing/race assembly. It is not unusual for this assembly to come apart when the axle is removed from the housing, leaving the race inside of the housing. If the race does not come out with the axle, then it must be removed before the axle with new bearing assembly is installed.

1. Press the axle bearing off of the axle shaft and discard.
2. Press a new bearing onto the axle shaft.
3. If the axle is not to be immediately installed into a vehicle, pack the bearing with grease and wrap it in plastic to prevent corrosion.

AUXILIARY AXLE ASSEMBLY

Removal

⚠WARNING

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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the batteries.

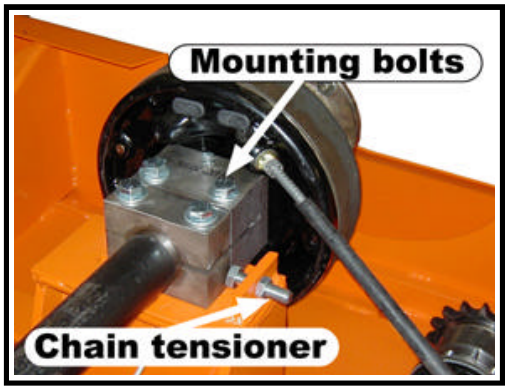
6. Raise the rear of the vehicle off of the ground and support with jack stands.

NOTE: Raise just high enough to allow clearance to get under 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.

7. Loosen the left and right driven axle mounting bolts and chain tensioners.
8. Disconnect the park brake cable at the equalizer.
9. Remove the left and right drive chains.
10. Remove the universal joint u-bolts from the yoke on the pinion shaft. Tie up the drive shaft so that it cannot fall to the ground.
11. Support the auxiliary axle so that it cannot fall to the ground and remove the ***auxiliary axle*** mounting bolts. Do not remove the driven axle mounting bolts.
12. Remove the auxiliary axle from the vehicle.



Driven axle right side as viewed from below

Installation

Install the auxiliary axle in reverse order.

NOTE: Refer to **Drive Chain Adjustment** *in section* **Driven Axle Service** *for information regarding adjusting the drive chains.*

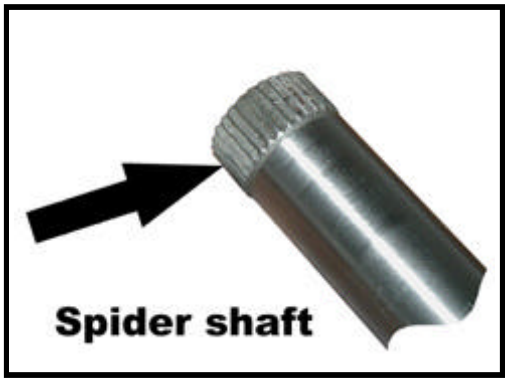
Disassemble

NOTE: Refer to the illustration on the following page for an exploded view of the axle assembly.

1. Remove the sprockets and hubs from the left and right axles.
2. Remove the left and right axles.
3. Remove the differential cover being careful not to bend the flange on the cover.
4. Mark the carrier bearing caps so that they can be installed in the same location.

   NOTE: The bearing caps MUST be installed on the same side that they were removed from. If the bearing caps are lost or damaged , then the complete axle assembly must be replaced.

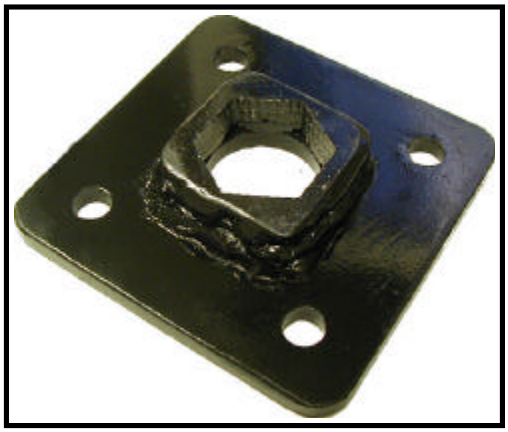
5. Remove the carrier bearing caps and remove the carrier from the housing.
6. Remove the ring gear mounting bolts.
7. Carefully tap the ring gear off of the carrier housing using a soft face hammer.
8. Locate the end of the spider gear shaft that has the knurling. Using a soft punch, drive the shaft out of the housing from the end ***without*** the knurling.



9. Remove the axle gears, axle gear washers, spider gears and spider gear washers from the housing.
10. If required, press off the carrier bearings and discard.

    NOTE: The carrier bearings are damaged when removed. If the bearings are removed they must be replaced.
    There are a set of shims behind one or both of the carrier bearings. DO NOT LOSE THESE SHIMS! These shims set the gear backlash. If the shims are lost and the total thickness of the shims is unknown, then the backlash will have to be reset.

11. Using a tool to hold the pinion nut (similar to the one shown to the right), place the yoke on the pinion shaft and insert a 1-1/16" diameter rod into the yoke.
12. Rotate the yoke clockwise to remove the pinion nut.



Pinion nut holding tool

NOTE: Do not let the pinion shaft fall from the housing when the nut is removed.

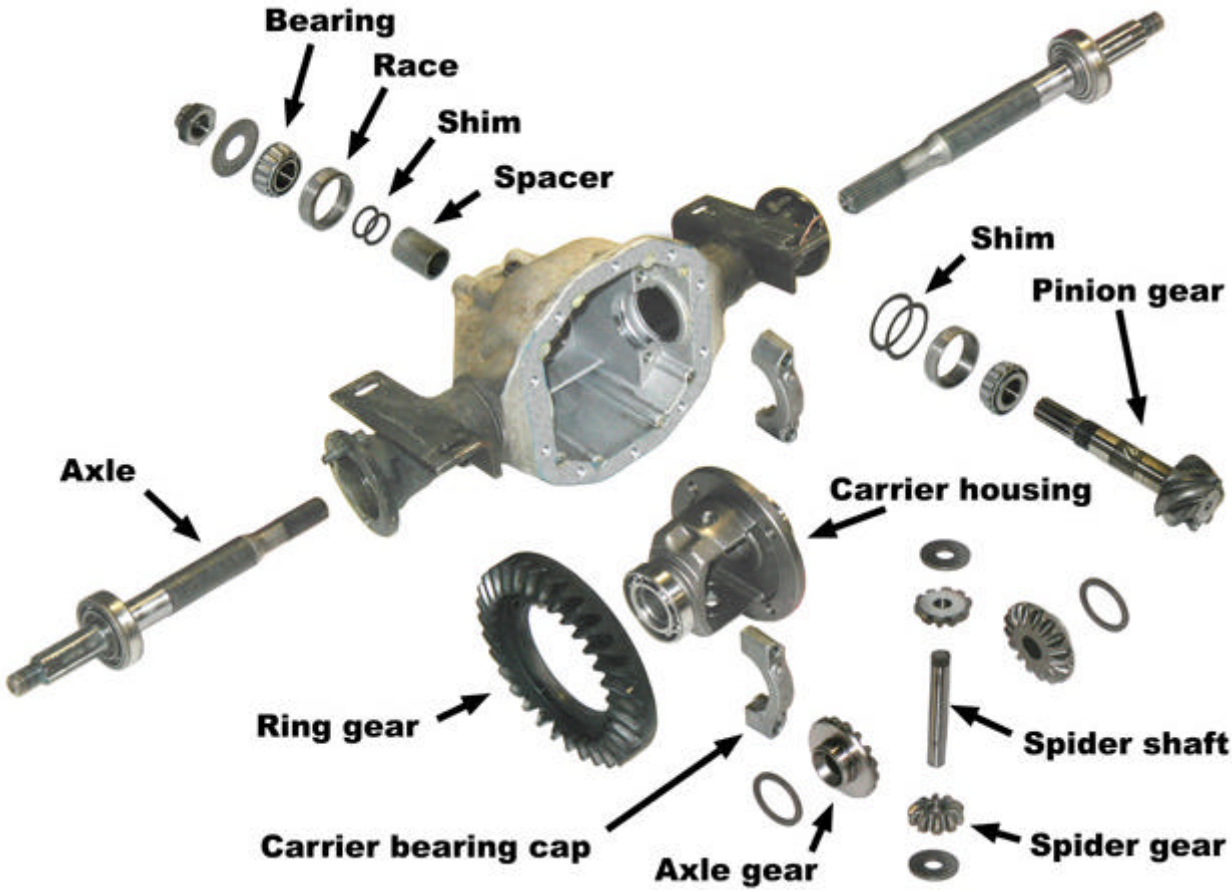
13. Remove the yoke and pinion nut tool, then remove the pinion shaft from the housing.

NOTE: A set of shims and a spacer should come out with the shaft.

14. Drive the inner and outer pinion bearing races from the housing.

NOTE: There are a set of shims under the inner race. DO NOT LOSE THESE SHIMS! These shims set the pinion depth. If the shims are lost and the total thickness of the shims is unknown, then the entire drive assembly must be replaced.

15. The inner pinion bearing is not a press fit and should slide off of the pinion shaft.



Exploded view of the auxiliary axle assembly

Inspection

Thoroughly clean all parts.

Apply a light lubricant to all bearings and races.

NOTES: If any one bearing or race is bad, then it is recommended to replace all bearings and races.

If a pressed on bearing is removed, then it should be replaced.

All seals and gaskets should be replaced.

Bearings

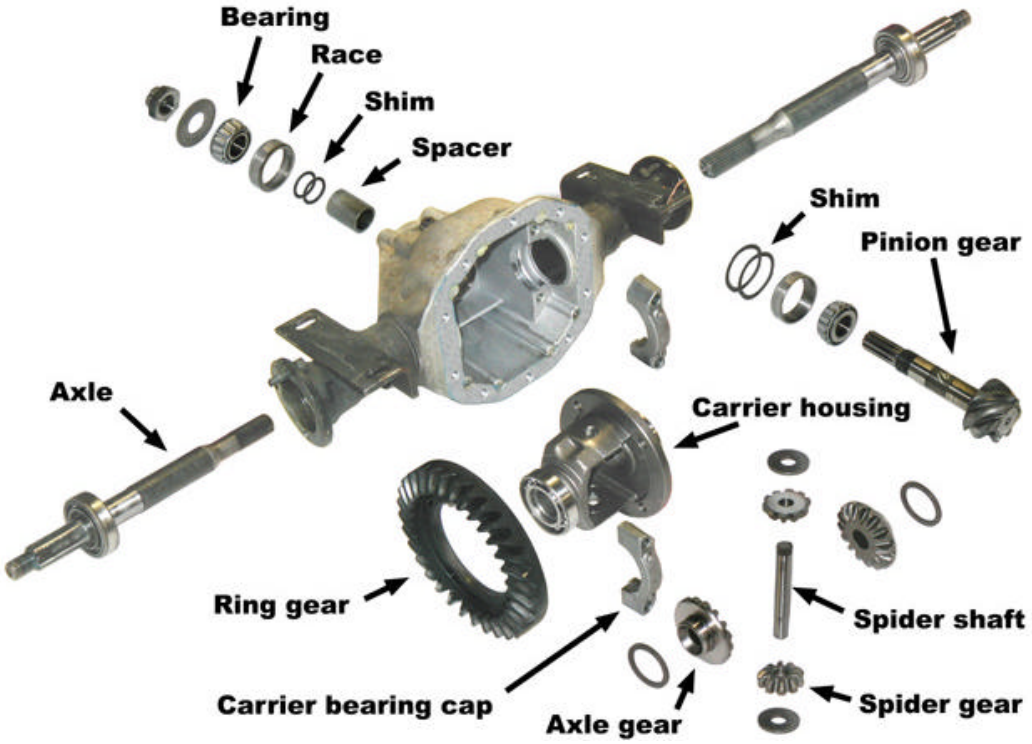
Place the tapered bearings into their races and rotate by hand. Any roughness is an indication of wear and they should be replaced.

Inspect the tapered races for cross hatching. If the cross hatching is worn away, then the bearing and race should be replaced.

Rotate the carrier bearings by hand. Any roughness is an indication of wear and they should be replaced.

Gears

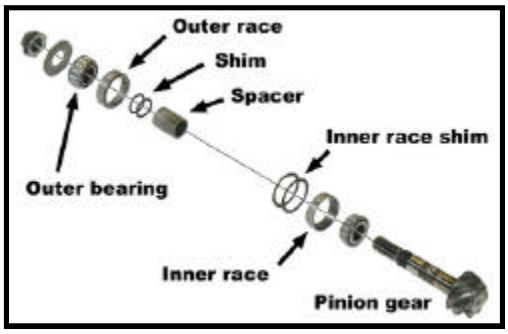
Inspect the contact face of all gears for any sign of abnormal wear and replace as required.



Exploded view of the auxiliary axle assembly

Assembly

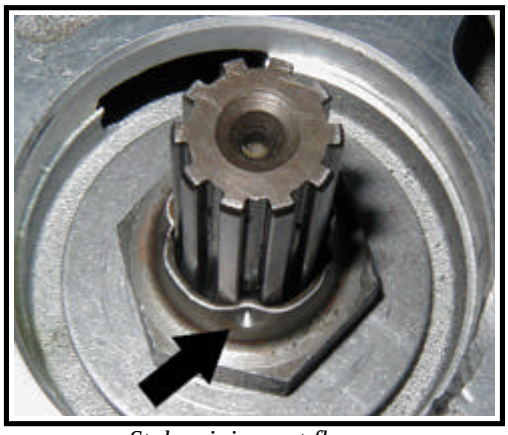
1. All parts should be clean and lightly lubricated.
2. If the pinion races were removed from the housing, install the shims back into the housing behind the inner race and press both races back into the housing.
3. Install the inner bearing onto the pinion gear.
4. Install the spacer and shims onto the pinion shaft and insert the pinion assembly into the housing.



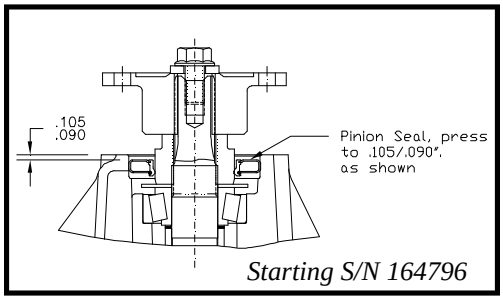
Pinion gear assembly

5. Install the outer pinion bearing, washer and pinion nut.
6. Using the same tool as when the pinion nut was removed, torque the pinion nut to 50-70 ft-lbs.
7. Check the pinion bearing preload. It should require between 2-13 in-lbs of torque to rotate the pinion shaft. If it is not within specifications, then add or subtract from the shims on the pinion shaft until it is within 2-13 in-lbs.
8. Stake the flange on the pinion nut to lock it in place.

   Note: A pinion seal is used starting with serial #164796. Press a new seal 0.090" to 0.105" below the end of the housing.


Stake pinion nut flange

9. If the bearings were removed from the carrier housing, install the shims in the same location where they were removed and press on new bearings.
10. Assemble the axle gears, spider gears and washers into the carrier housing. Press the spider shaft back into the housing in the same orientation as it was removed.
11. Install the ring gear onto the carrier housing. Cross tighten the bolts equally and in steps to pull the ring gear into place. Final torque is 35-45 ft-lbs.
12. Place the carrier assembly into the axle housing.
13. Install the bearing caps back in their original location. Torque the cap bolts to 35-45 ft-lbs.
14. Check the ring gear backlash. The backlash should be between .004-.008". If the backlash is not within specifications, then the shims behind the carrier bearings must be adjusted by moving shims from one side to the other.



Starting S/N 164796

15. Install the differential cover.
16. Install the axles, hubs and sprockets. Refer to ***Auxiliary Axle Shaft*** for information regarding installing the axle and sprocket.

Driven Axle Service

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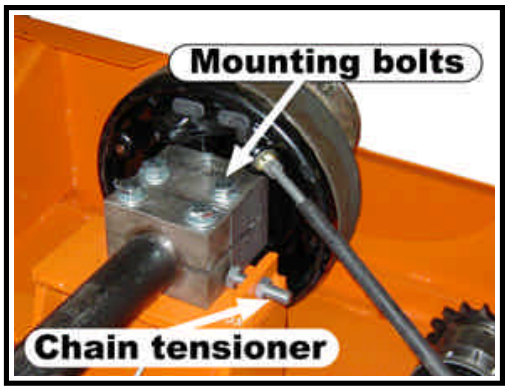
DRIVE CHAIN

Inspection and Adjustment

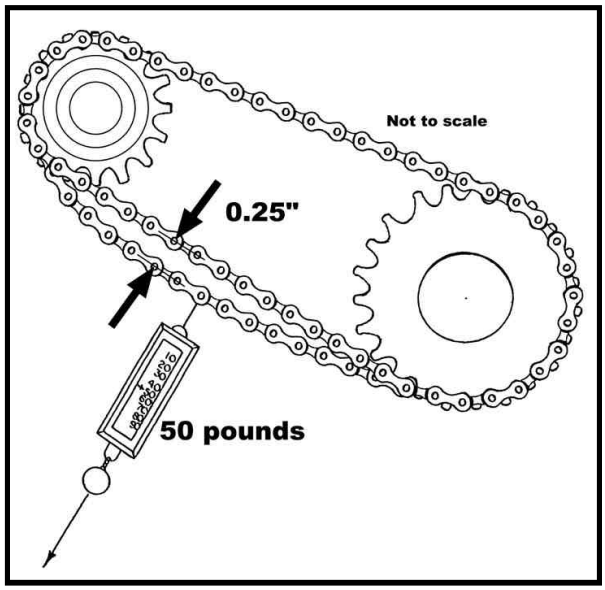
⚠WARNING

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 wheels to prevent vehicle movement.
5. Disconnect the main positive and negative cables at the battery.

6. Attach a pull scale midway between the driver and driven sprockets.
7. Loosen the left and right side axle block mounting bolts.
8. Loosen the left side chain tensioner.



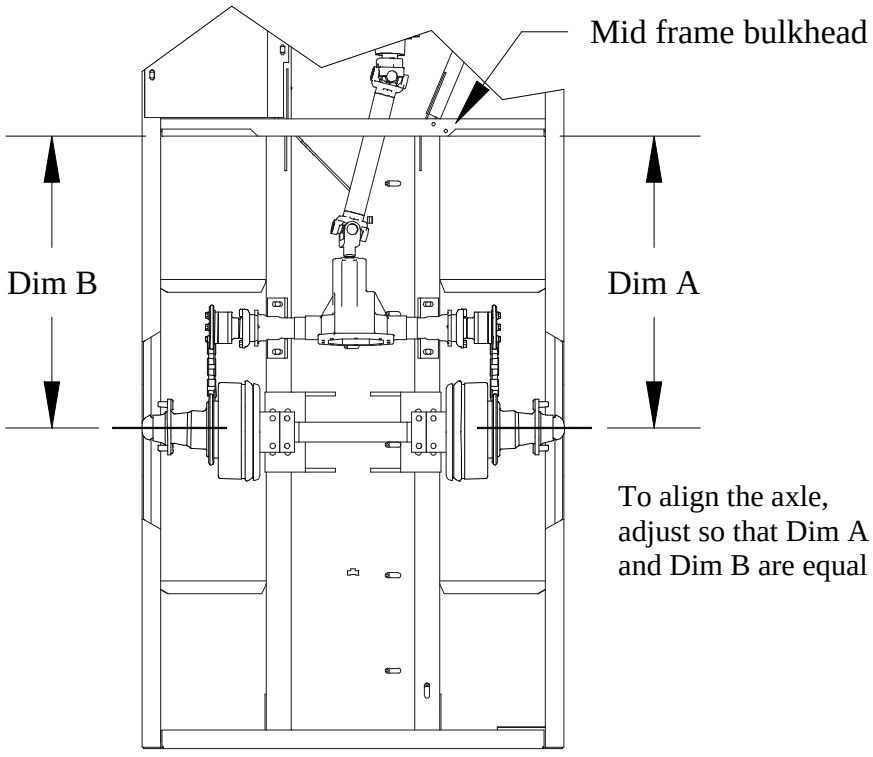
9. Adjust the right side chain tension bolt so that the chain deflects approximately 1/4" at 50 pounds.



10. Adjust the left side chain tension bolt so that the axle is square in the frame (refer to illustration below).
11. Inspect the tension of the left side chain. At 50 pounds (pull scale) it should deflect between 1/8 and 3/8 inches.

    *NOTE: If the the left or right side chain requires replacement, it is recommended that both the left **and** right side chains are replaced as a set.*

12. If the left chain is too loose:
    a. Readjust the right chain so that the chain deflects approximately 1/8" at 50 pounds.
    b. Adjust the left side chain tension bolt so that the axle is square in the frame.
    c. If the left chain is still too loose, then the chains must be replaced.
13. If the left chain is too tight:
    a. Readjust the right chain so that the chain deflects approximately 3/8" at 50 pounds.
    b. Adjust the left side chain tension bolt so that the axle is square in the frame.
    c. If the left chain is still too tight, then the chains must be replaced.
14. Tighten the chain tensioner bolt jam nuts.
15. Tighten the left and right side axle block bolts.
16. Reconnect the battery.
17. Remove the blocks from the front wheels and test drive.



WHEEL BEARINGS

Inspect Wheel Bearings

⚠WARNING

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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the rear of the vehicle and support with jack stands.

⚠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.

7. Release the park brake.
8. Remove the tire/wheel assembly from the hub. Refer to ***Tires and Wheels*** for information regarding removing the tire/wheel assembly.
9. Remove the drive chains. Refer to ***Axle Assembly*** for information regarding removing the drive chains.
10. Temporarily reinstall the tire/wheel assembly and 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.

    NOTE: Refer to **Adjust Wheel Bearings** *section for information regarding the adjustment of the wheel bearings.*

11. 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 **Replace Wheel Bearings** *section for information regarding the replacement of the wheel bearings.*

12. Install the drive chains. Refer to ***Axle Assembly*** for information regarding installing the drive chains.
13. Reinstall the tire/wheel assembly. Refer to ***Tires and Wheels*** for information regarding installing the tire/wheel assembly.
14. Set the park brake
15. Lower the vehicle.
16. Reconnect the main positive and negative at the batteries, remove the blocks from the wheels, release the park brake, and test drive the vehicle.

Adjust Wheel Bearings

The bearing adjustment for the driven axle hub is the same as for the front hubs. Refer to ***Adjust Front Wheel Bearings*** in the ***Front Axle Service*** section for information regarding adjusting the rear bearings.

Replace Wheel Bearings

⚠WARNING

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 wheels to prevent vehicle movement.
5. Disconnect the main positive and negative cables at the battery.

6. Raise the rear of the vehicle and support with jack stands.

⚠WARNING

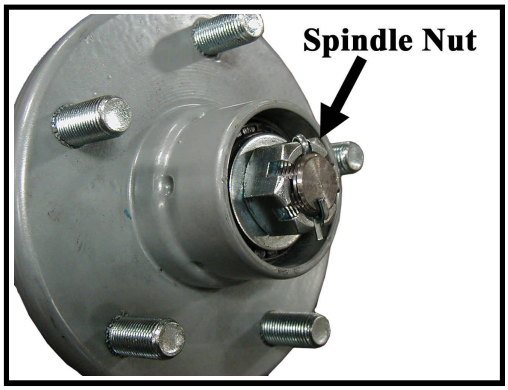
Always use a lifting strap, hoist, and jack stands, of adequate capacity to lift and support the vehicle. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.

7. Remove the tire/wheel assembly from the hub. Refer to ***Tires and Wheels*** for information regarding removing the tire/wheel assembly.
8. Remove the drive chains. Refer to ***Axle Assembly*** for information regarding removing the drive chains.
9. Remove the hub dust cap, cotter pin, and spindle nut.
10. Remove the hub from the axle.

    NOTE: Catch the outer bearing as it falls out.

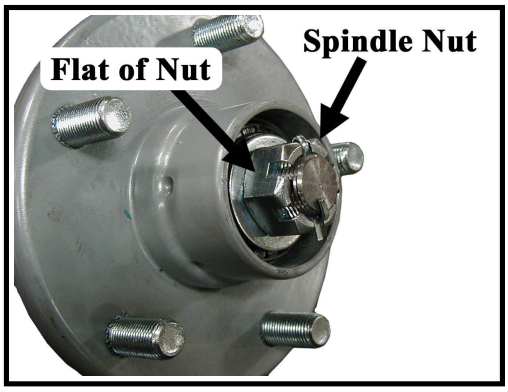
11. Thoroughly clean all grease from the inside of the hub and the bearings.
12. Inspect and replace the races and bearings as a set.

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



Hub with Dust Cap Removed

13. 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.
14. Install the hub dust cap.
15. Install the drive chains. Refer to ***Axle Assembly*** for information regarding installing the drive chains.



Hub with Dust Cap Removed

16. Reinstall the tire/wheel assembly. Refer to ***Tires and Wheels*** for information regarding installing the tire/wheel assembly.
17. Lower the vehicle.
18. Reconnect the main positive and negative cables at the battery.
20. Remove the blocks from behind the wheels.
21. Release the park brake and test drive the vehicle.

AXLE ASSEMBLY

Removal

⚠WARNING

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 wheels to prevent vehicle movement.

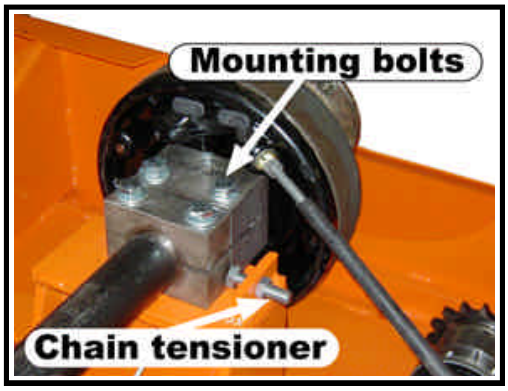
5. Disconnect the main positive and negative cables at the battery.

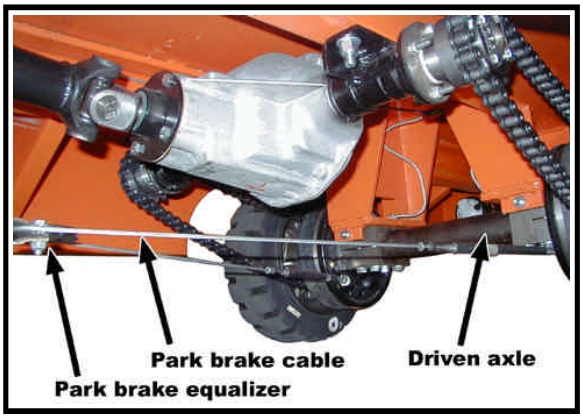
6. Raise the rear of the vehicle and support with jack stands.

⚠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.

7. Remove the tire/wheel assembly from the hub. Refer to ***Tires and Wheels*** section for information regarding removing the tire/wheel assembly.
8. Loosen the left and right side axle block mounting bolts.
9. Loosen the left and right side chain tensioners and remove the drive chains.
10. Disconnect the hydraulic brake lines from the left and right side brake.
11. Disconnect the parking brake cable from the equalizer.
12. Support the axle assembly so that it can not fall from the vehicle.
13. Remove the left and right side axle block mounting bolts and remove the axle assembly from the vehicle.





Installation

1. Install the driven axle in reverse order of removal.
   a. Refer to ***Drive Chain Adjustment*** section for information regarding adjusting the drive chains.
   b. Refer to ***Bleed the Brake System*** section in ***Brake Service*** for information regarding bleeding the brakes.
   c. Refer to ***Adjust the Parking Brake*** section in ***Brake Service*** for information regarding adjusting the parking brake.
   d. Refer to ***Tires and Wheels*** section for information regarding installing the tire/wheel assembly.
2. Lower the vehicle.
3. Reconnect the main positive and negative cables at the battery.
4. Remove the blocks from behind the wheels.
5. Release the park brake and test drive the vehicle.

Transmission Service

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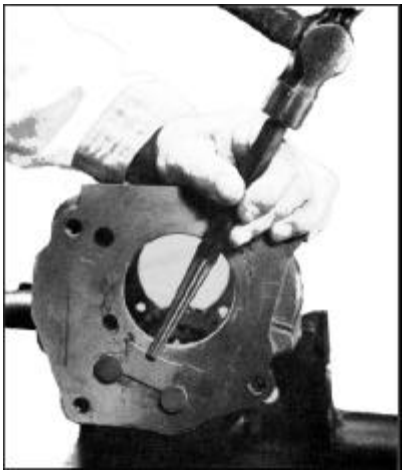
DISASSEMBLING

Refer to the exploded view of the transmission at the end of this section.

The transmission must be removed from the vehicle prior to disassembly.

1. Remove the transmission.
2. Drain all lubricant from the transmission.
3. Remove the case cover #7.
4. Remove the front bearing cap #50 and gasket #49 and discard the gasket.
5. Remove the main drive gear snap ring and lock ring #48 and #47.
6. Remove the front bearing and oil slinger from the main drive gear #46 and #45.
7. Remove the rear cover #1 and gasket #2 from transmission case, discard the gasket.
8. Move the main shaft assembly #22 1/2" to the rear of the transmission. Lower the front of the main drive gear #44, raising the rear of the of the gear over the countershaft gear and remove the shaft from the front of the transmission.
9. NOTE: There are 21 needle bearings (#43) inside the rear end of the main drive gear.
10. Remove the second/high gear fork #35.
11. Tilt the main shaft #22 and remove the synchro unit assembly #38-#41, 2nd speed gear #36, low/reverse gear #27, and low/reverse gear fork #28.
12. Remove the main shaft #22 and rear bearing #20 from the rear of the transmission case.
13. Remove the lock plate #25.



14. Using a dummy shaft machined to 0.977 x 5.875", drive the countershaft #15 out through the rear of the transmission. The dummy shaft will help retain the needle bearings in the assembly.
15. Leaving the dummy shaft in place, lower the countershaft gear #11 to the bottom of the transmission.
16. Remove the reverse idler gear #24 by driving the reverse idler shaft #23 out of the transmission case.
17. Remove the countershaft gear assembly.
18. Remove the outer shift levers #34 and #29 and lock pin #31.
19. Slowly remove the shifter shafts from the transmission case and catch the interlock balls #30.

REPAIRING

Refer to the exploded view of the transmission at the end of this section.

Work area must be clean and free of all dirt and contaminates.

Thoroughly clean all components in solvent and then apply a light coat of oil.

Bearings

Rotate the roller bearings by hand. If the bearing does not rotate freely or there is any roughness, the bearing should be replaced.

Inspect all needle bearing for signs of wear or pitting. If any one needle bearing has any indications of wear, then all needle bearings should be replaced.

Inspect the shafts or bores for the needle bearings. If any indication of wear is seen in the shaft/bore, then the shaft/bore should be replaced.

Gears

Inspect each gear for worn, cracked or chipped teeth. Slide each gear onto a new shaft. If a gear feels loose, then it should be replaced.

Slide each gear onto its original shaft. If the gear was good on a new shaft but is loose on the original shaft, then the shaft should be replaced.

Note: If a gear is replaced, also replace the gear that it meshes with.

Main shaft

Install the gears onto the main shaft to make sure that they slide on and off easily. They should fit smoothly with no excessive play between the splines. If the fit is too tight, check for burred edges on the spline.

Synchro Unit Assembly

Carefully inspect the synchronizer unit #38, synchronizer rings #37, and synchronizer spring wires #39. Slide the rings and wires into the synchronizer unit and clutch shaft. Replace the rings if there is excessive wear or the taper is pitted.

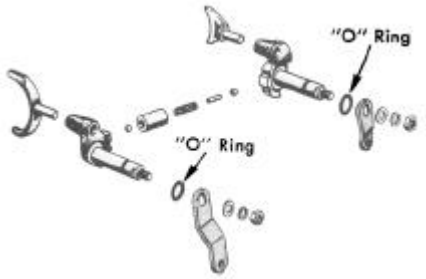
Transmission Case

Examine the surface of the bearing recesses in the transmission case. If they show signs of wear or scoring, it indicates that the bearings have been revolving in their housing. Examine the transmission case for cracks or other defects. If any sign of wear or damage is found, then the case should be replaced.

ASSEMBLING

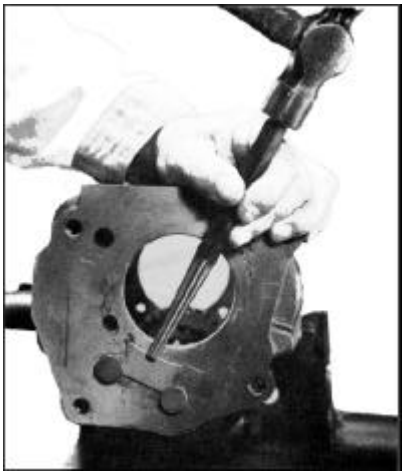
NOTE: Replace all seals, gaskets and retaining rings. Lubricate all components with gear oil before assembly. Petrolatum can be used to hold the needle bearings in place during assembly.

1. Install new o-rings onto the shifter shafts.



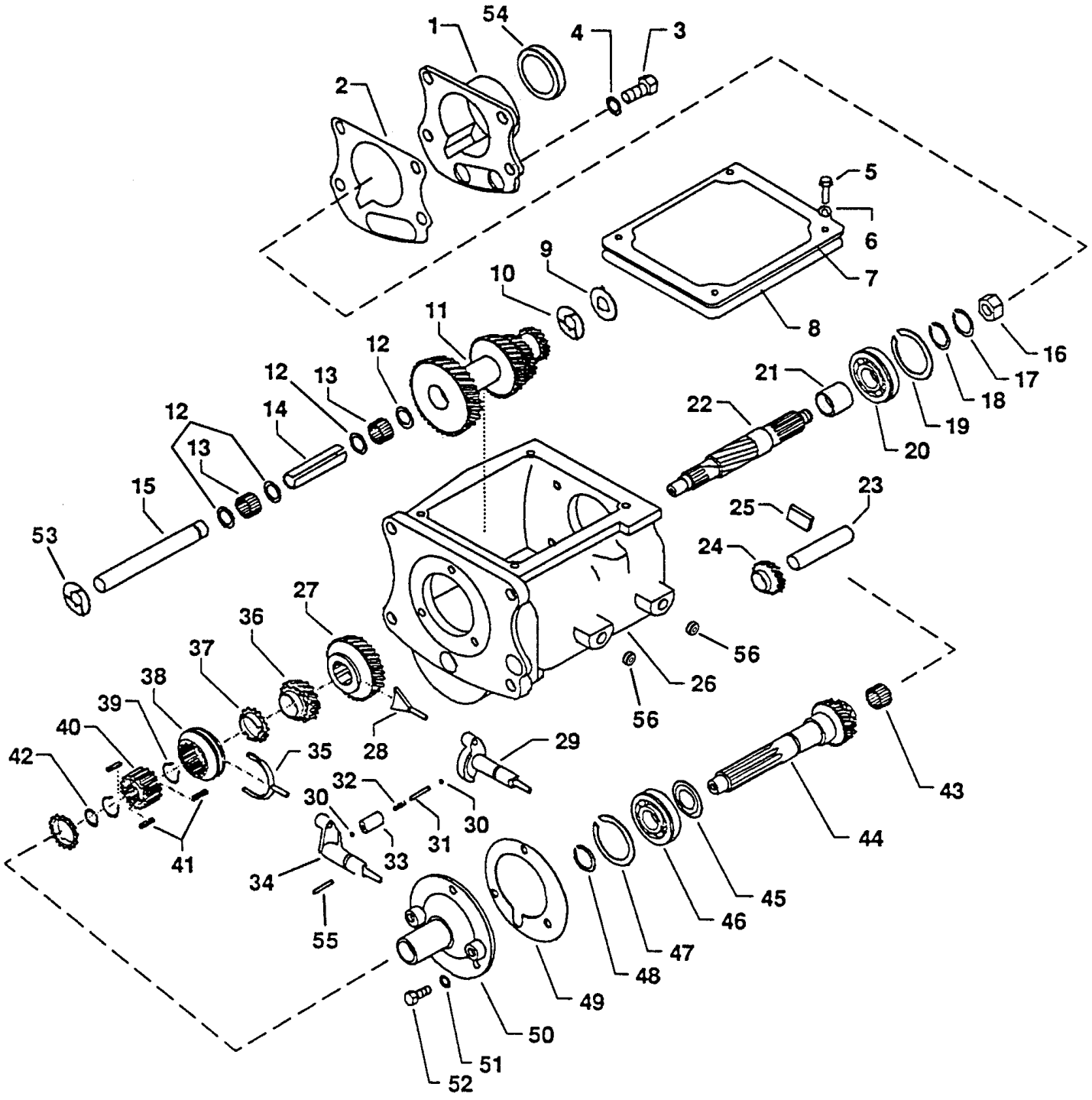
2. Install both outer shift levers #34 and #29.
3. Install the interlock sleeve #33, interlock balls #30, lock pin #31 and interlock spring #32.
4. Install a dummy shaft (0.677 dia. x 5.875 long) into the countershaft gear along with the bearings and spacers. Install the thrust washers. The indexed side of the bronze thrust washer must face the front of the transmission case, then position the other thrust washer and install the countershaft gear assembly in the bottom of the case. DO NOT install the countershaft into the countershaft gear assembly at this time.
5. Install reverse idler gear #24 and shaft #23 with the chamfered side of the gear facing the front of the transmission case
6. With the notched end of the reverse idler shaft to the rear, install the reverse idler shaft into the transmission case.
7. Align the slots in the reverse idler shaft and countershaft and install the countershaft into the transmission driving out the dummy shaft in the countershaft gear.

8. Install the lock plate #25.



9. Press the transmission rear bearing #20 onto the main shaft #22 and install the snap ring and washers.
10. Install both shift forks #28 and #35.
11. Slide the 1st/reverse speed gear #27 onto the main shaft.
12. Install the 2nd/high speed gear #36 and the synchro unit #38 onto the main shaft.
13. Install the synchro unit snap ring on the front of the main shaft.
14. Insert the 21 needle bearings #43 into the main drive gear #44.
15. Install the main drive gear onto the main shaft.
16. Move the main shaft rear bearing into the transmission case and align the shifter forks and gears into its bearing in the main drive gear.
17. Place the oil slinger #45 onto the main drive gear, with the concave side toward the rear of the transmission.
18. Install the front bearing #46 onto the main drive gear.
19. Install the snap ring and lock ring #48 and #47.
20. Place a new gasket between the front bearing retainer #50 and transmission case, then install the bearing retainer.
21. While rotating the main shaft, run the transmission through all gears and make sure there is no binding.
22. Using a new gasket, Install the cover #7. Fill to the proper level with oil before putting into service.

EXPLODED VIEW



Suspension

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REPLACE THE FRONT SPRINGS

To replace the front springs, the front axle must be removed. Refer to ***Front Axle Service*** section for information regarding removing the front axle.

Tires and Wheels

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TIRE INFLATION

⚠WARNING

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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

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 to the right 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 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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

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 to the right). 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.

REPLACE THE TIRE/WHEEL

⚠WARNING

1. Make sure the key-switch is in the "OFF" position, then remove the key.

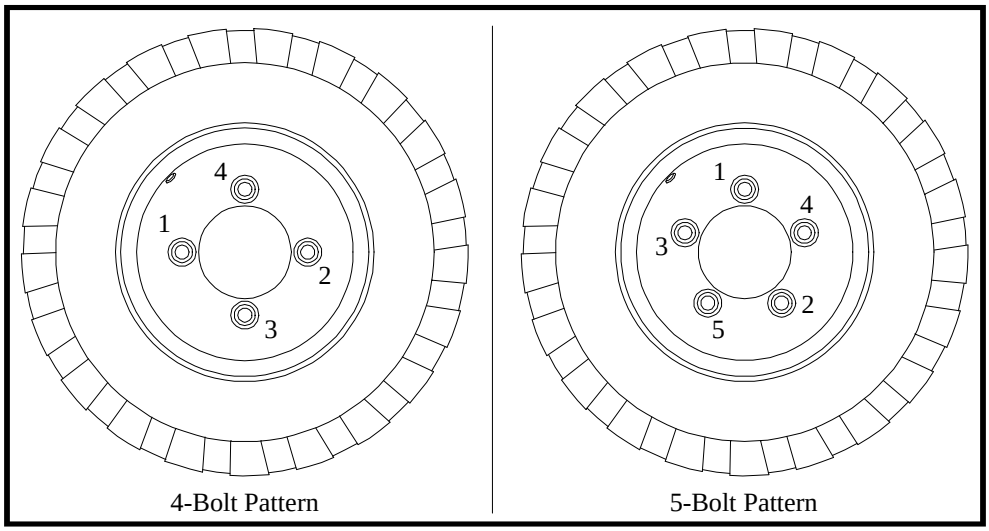
2. Place the Shift lever in the neutral position.

3. Set the park brake.

4. Place blocks under the front wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

6. Raise the wheel to be replaced off of the ground and support with jack stands.
7. Remove the 4 or 5 wheel nuts and remove the wheel.
8. Install in reverse order.
9. Following the pattern shown on the following page, cross tighten the wheel nuts in two stages as follows:
   1st stage to approximately 20 ft-lbs.
   2nd stage to 80-90 ft-lbs.
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.



Pattern for tightening the wheel nuts

⚠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.

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.

REPLACE THE TIRE (PNEUMATIC)

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.*

⚠WARNING

Explosion Hazard. Fully deflate the tire before attempting to remove the tire from the wheel. Do not over inflate the tire when seating the bead. Failure to deflate the tire or over inflating the tire to seat the bead may cause explosive failure of the tire resulting in severe bodily injury or death.

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.

TAYLOR - DUNN

Battery Service

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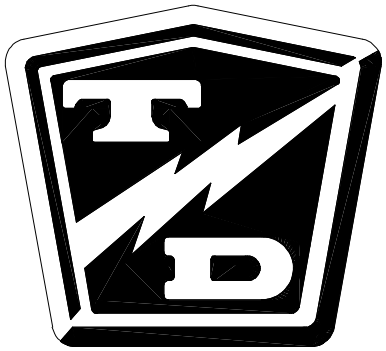

CLEANING

⚠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.

⚠WARNING

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

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.

⚠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 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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

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

NOTE: A combination of the Load Test and Specific Gravity Test should be used to accurately determine the condition of the battery.

⚠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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⚠WARNING

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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

Load Test

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

1. Clean the battery. Refer to ***Cleaning*** section for information on cleaning the battery.
2. Load test the battery using a battery load test meter (available at most auto parts distributors). Follow the instructions provided with the test meter.
   - If the battery fails the load test, then it should be replaced.
   - If all battery fails the test you should check the charging system before replacing the batteries. Refer to the ***engine manual*** for information on checking the charging system.

Specific Gravity Test

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 battery 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 is 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 the **engine manual** *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 that battery should be replaced.

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

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.

⚠WARNING

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

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.

⚠WARNING

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 wheels to prevent vehicle movement.
5. Disconnect the main positive and negative cables at the batteries.

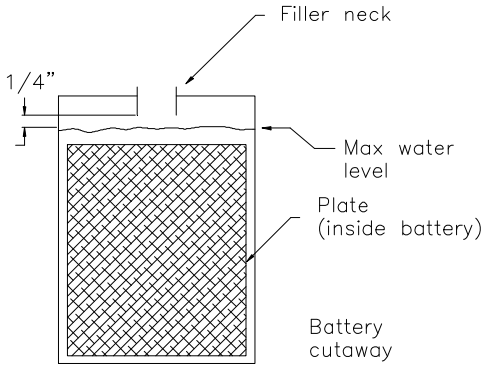
⚠WARNING

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 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.

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 a battery.
8. Reconnect the battery, remove the blocks from the wheels and test drive.



STORAGE AND RETURNING TO SERVICE

Storage

⚠CAUTION

If the battery is removed from the vehicle, do not place it directly on the ground, concrete or solid metal surface. It is recommended to store them on a wooden pallet or equivalent. Storing on the ground, concrete or solid metal surface will cause the battery to discharge and may result in premature failure of the battery.

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 in a cool, dry, well ventilated area.

If storing for more than one month, the battery 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

⚠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 property damage and or serious

⚠WARNING

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 serious bodily injury.

⚠WARNING

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 property damage and/or bodily injury.

⚠WARNING

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 wheels to prevent vehicle movement.

5. Disconnect the main positive and negative cables at the battery.

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

⚠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.

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.

TAYLOR - DUNN

Wire Diagrams

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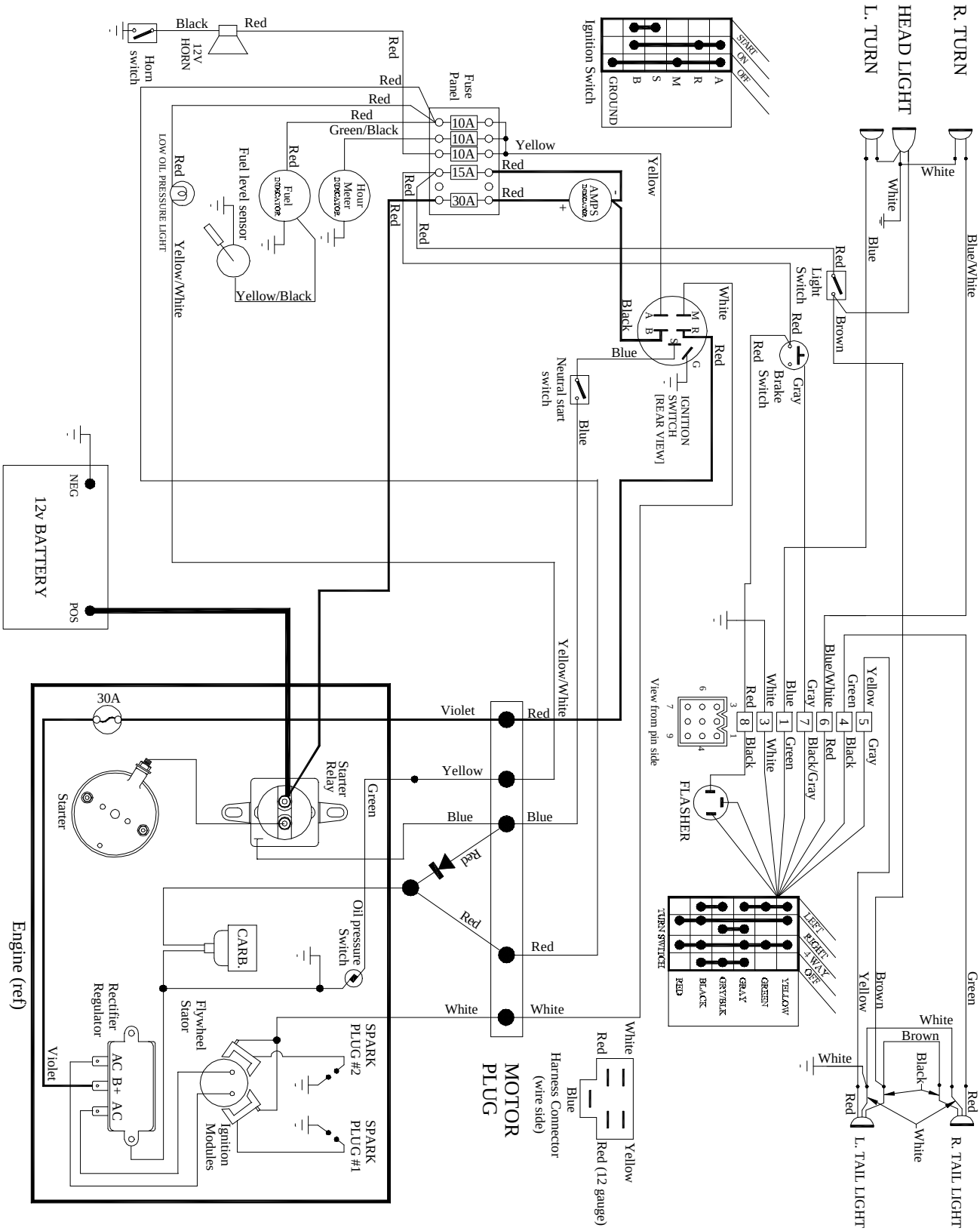
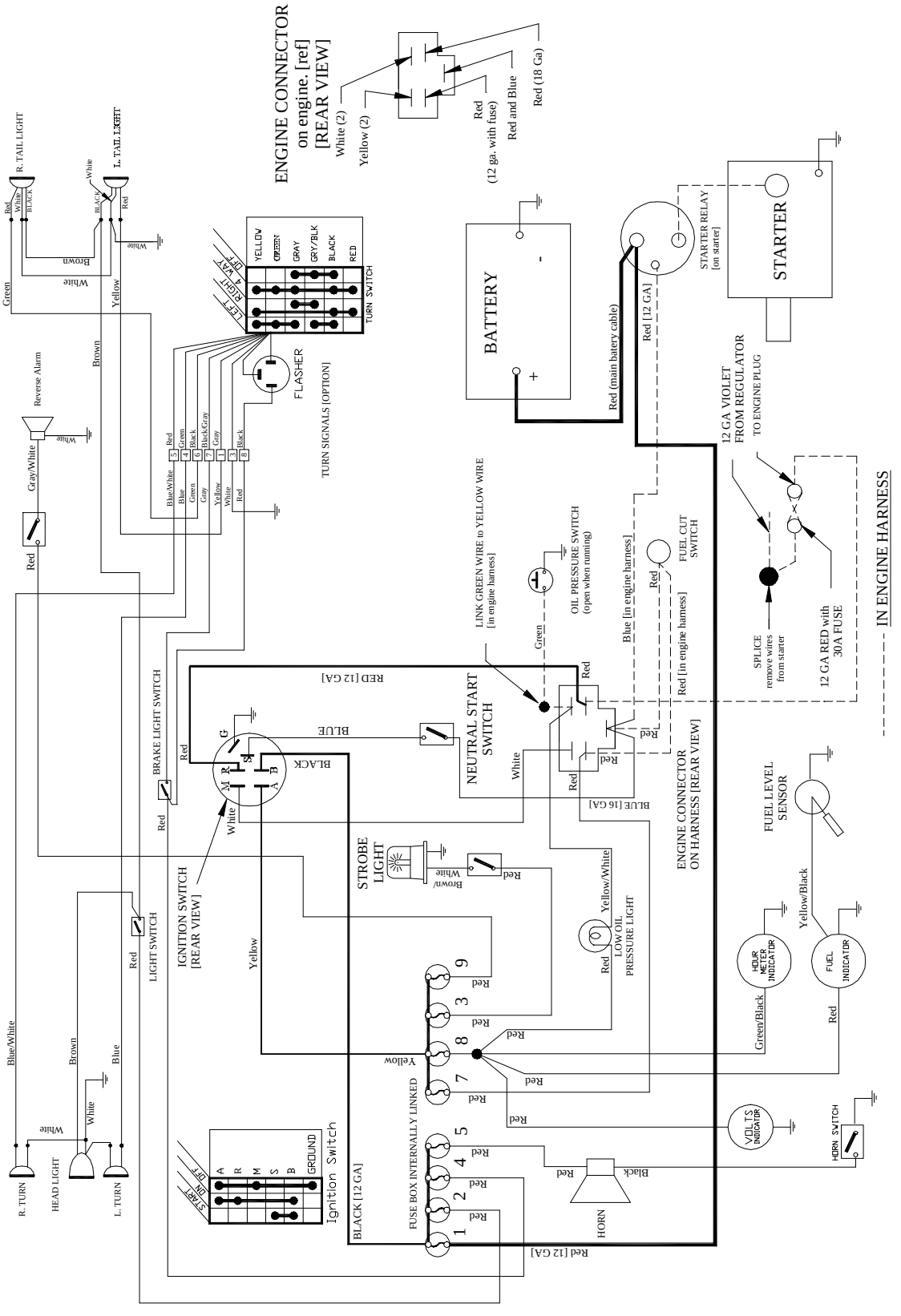
COMPLETE VEHICLE (ENDING S/N 163333)



COMPLETE VEHICLE (STARTING S/N 164796)



Illustrated Parts

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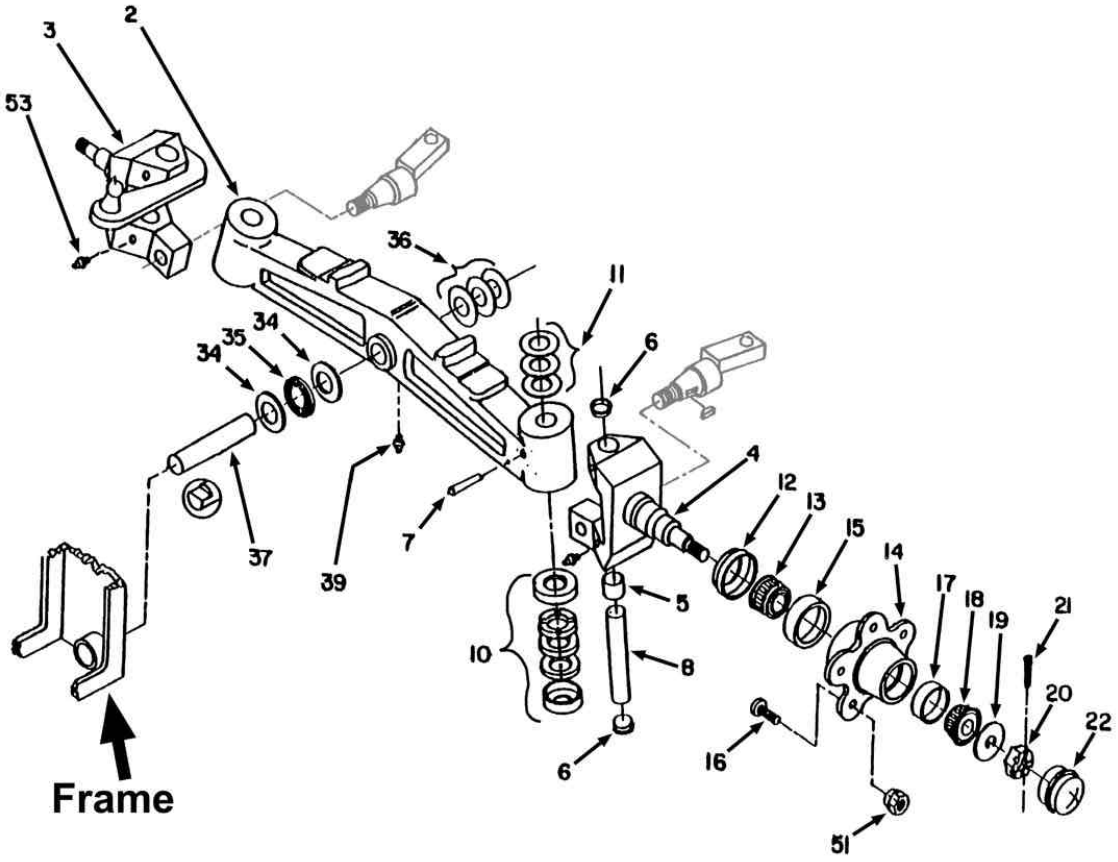
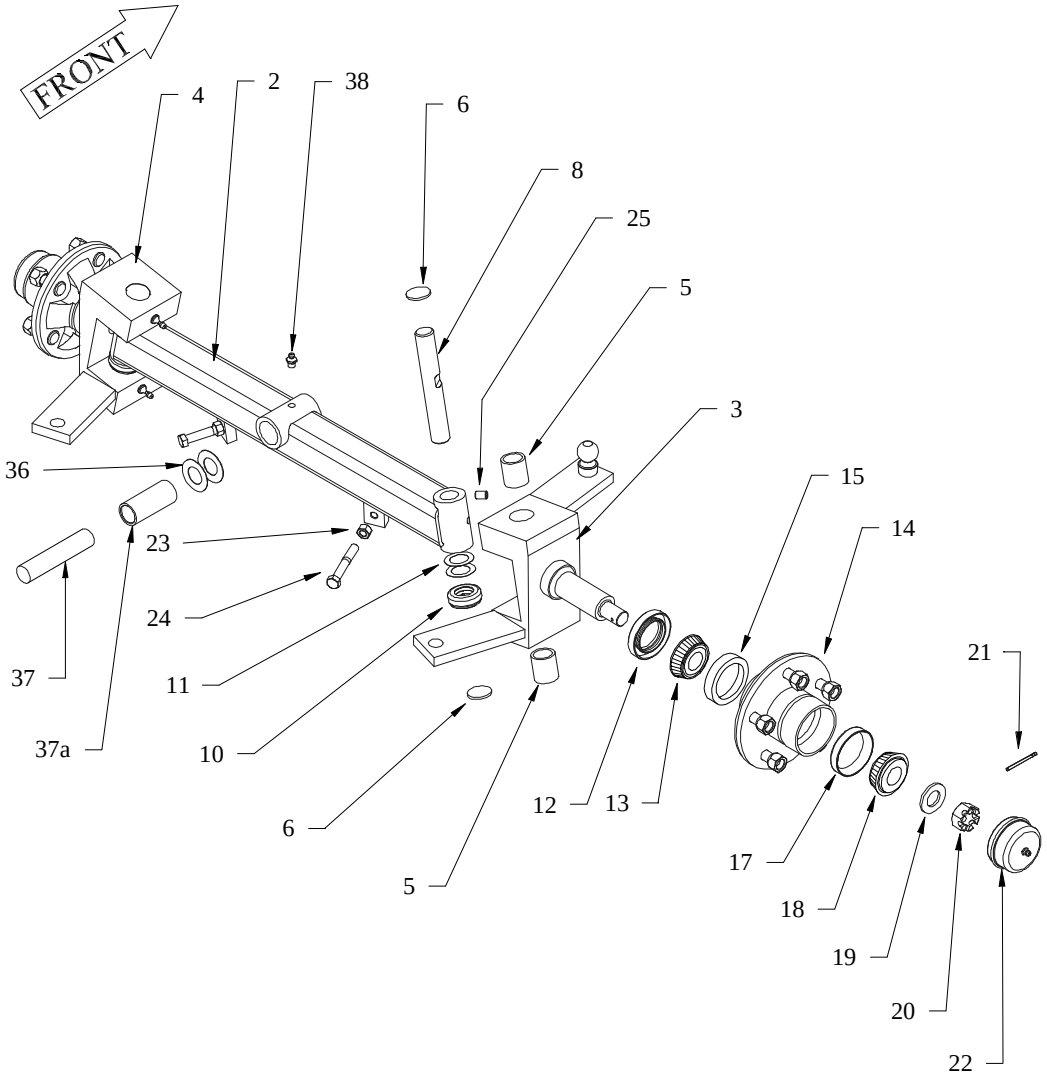
Front Axle and Steering Knuckle
Used up to Serial #160107



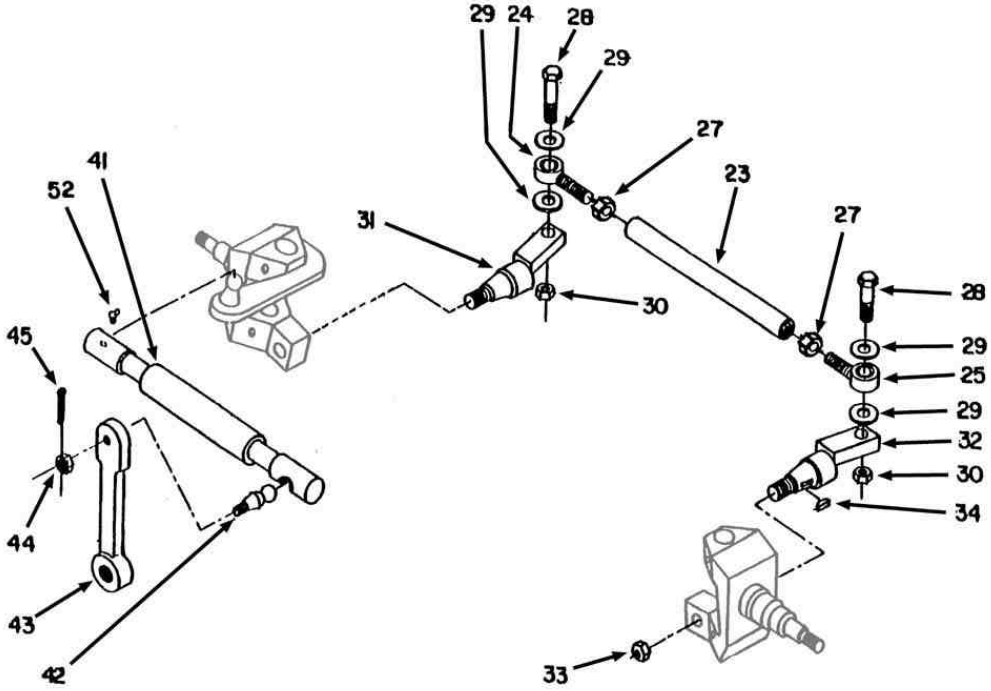
Front Axle and Steering Knuckle			
ITEM #	PART #	DESCRIPTION	QTY
2	800-00040	Front axle beam (includes #38 and pivot pin bushing)	1
3	800-00092	Right steering yoke	1
4	800-00106	Left steering yoke	1
5	313-00036	Bushing	4
6	341-00186	Cap, king pin	4
7	373-00041	Pin	2
8	826-00017	King pin	2
10	331-00102	Thrust bearing	2
11	358-00030	Shim, 0.003	As needed
	358-00031	Shim, 0.010	
	358-00032	Shim, 0.030	
12	110-00214	Seal	2
13	80-527-00	Bearing	2
-	342-00070	Hub assembly (includes #14, 15, 16, 17)	
14	342-00102	Hub	22
15	80-132-00	Race	2
16	331-00122	Wheel lug bolt	10
17	80-104-00	Race	2
18	80-528-00	Bearing	2
19	371-00140	Washer	2
20	88-199-86	5/8-18 Castle nut	2
21	88-527-14	1/8 x 1-1/2 Cotter pin	2
22	92-104-01	Bearing cap	2
34	306-00148	Race	2
36	Same as #11	Shim, 0.003	As needed
		Shim, 0.010	
		Shim, 0.030	
37	373-00163	Axle pivot pin	1
Not shown	408-00012	Pivot pin bushing (in axle beam)	2
38	109-00262	Grease fitting	2
51	97-236-00	Wheel nut	10
53	109-00262	Grease fitting	2

Front Axle and Steering Knuckle
Starting Serial #161460

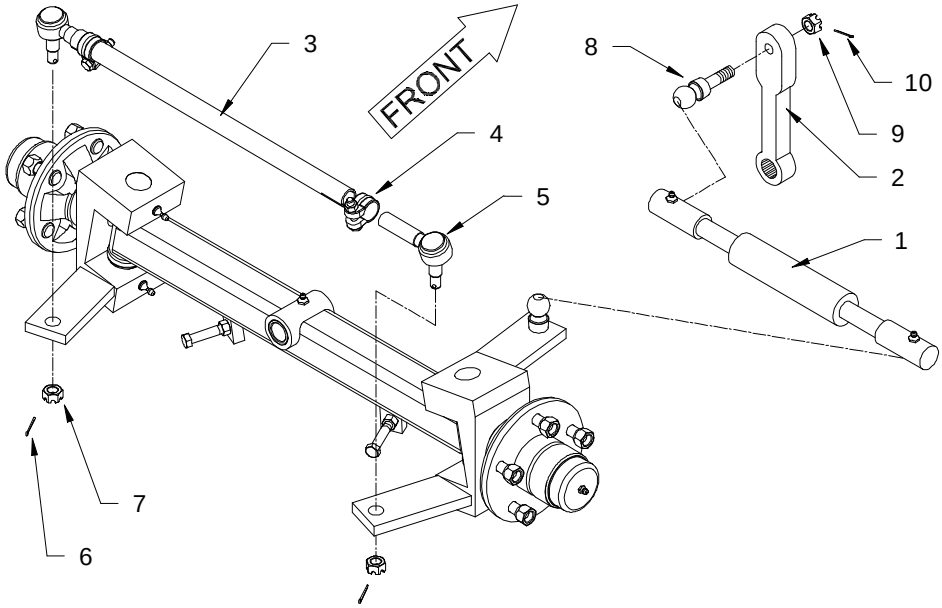


Front Axle and Steering Knuckle			
ITEM #	PART #	DESCRIPTION	QTY
2	15-660-15	Axle beam	1
3	14-660-89	Right steering knuckle	1
4	14-660-88	Left stering knuckle	1
5	32-204-10	Bushing	
6	97-198-10	Expansion plug	4
8	21-021-00	King pin	2
10	80-309-10	Thrust bearing	2
11	16-515-03	Shim, 0.003	As needed
	16-515-08	Shim, 0.010	
12	45-307-00	Seal	2
13	80-011-00	Bearing	2
14	12-115-00	Hub	2
15	80-102-00	Race	2
17	80-102-00	Race	2
18	80-011-00	Bearing	2
19	88-228-61	3/4 SAE Flat washer	2
20	88-239-85	3/4NF Slotted nut	2
21	88-527-14	1/8 x 1-1/2 Cotter pin	2
22	92-105-10	Dust cap	2
23	88-109-80	3/8NC Hex nut	2
24	88-101-18	3/8NC x 2-1/2 Hex bolt, grade 5	2
25	88-110-06	3/8NF x 1/2 Socket head set screw	2
36	358-000030	Shim, 0.003	As needed
	358-00031	Shim, 0.010	
	358-00032	Shim, 0.030	
37	373-00163	Axle pivot pin	1
37a	15-660-24	Pivot bushing	1
38	109-00262	Grease fitting	1

Steering Linkage
Used up to Serial #160107



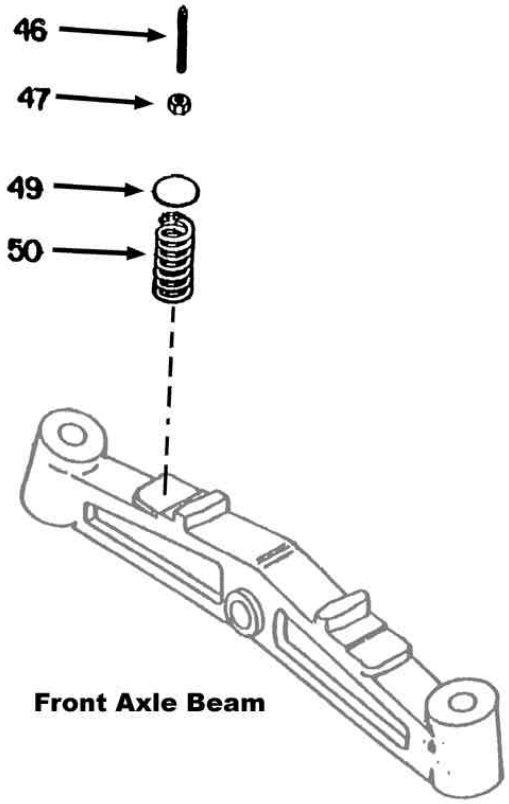
Steering Linkage
Starting Serial #161460



Steering Linkage used up to serial # 160107			
ITEM #	PART #	DESCRIPTION	QTY
23	18-000-00	Tie rod, standard	1
	18-000-01	Tie rod, heavy duty	1
24	306-00149	Rod end (right)	1
25	306-00368	Rod end (left)	1
27	331-00517	Jam nut (left thread)	2
	88-199-82	Jam nut (right thread)	2
28	88-180-18	5/8NC x 2-1/2 Hex bolt	2
29	349-00197	Spacer	4
30	88-189-82	5/8NC Thin pattern lock nut	2
31	355-00098	Steering arm (right)	1
32	355-00099	Steeering arm (left)	1
33	88-239-86	3/4NF Thin pattern lock nut	2
34	97-100-00	Woodruff key	2
41	345-00022	Drag link	1
42	331-00427	Ball stud	1
43	301-00473	Pitman arm	1
44	88-179-85	9/16NF Castle nut	1
45	88-527-20	5/32 x 2 Cotter pin	1
52	109-00267	Grease fitting	2

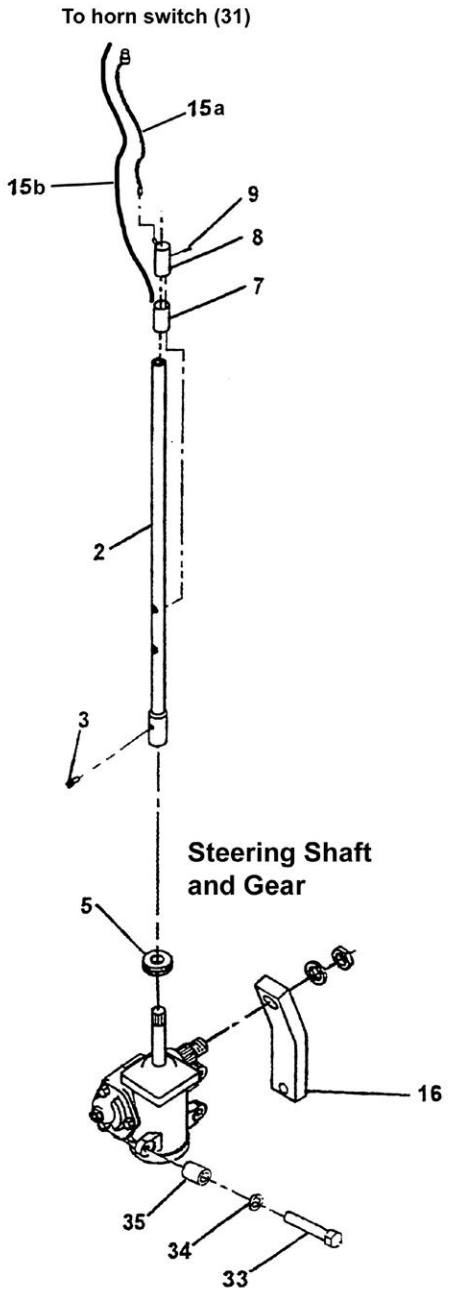
Steereing Linkage starting serial #161460			
ITEM #	PART #	DESCRIPTION	QTY
1	345-00022	Drag link	1
	109-00267	Grease fitting	2
2	301-00473	Pitman Arm	1
3	18-041-02	Tie rod, heavy duty	1
	18-041-06	Tie rod,standard	1
4	86-510-00	Ball joint clamp	2
5	86-501-98	Ball joint , left thread	1
	86-501-99	Ball joint, right thread	1
6	88-527-11	1/8 x 1 Cotter pin	2
7	88-159-85	1/2NF Slotted nut	2
8	331-00427	Ball stud	1
9	88-179-85	9/16NF Castle nut	1
10	88-527-20	5/32 x 2 Cotter pin	1

Front Suspension

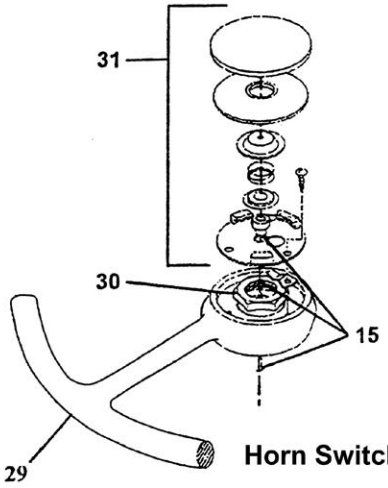


Front Suspension			
ITEM #	PART #	DESCRIPTION	QTY
46	88-140-21	1/2NC x 3-1/2 Hex bolt, grade 5	2
47	88-149-80	1/2NC Hex nut	2
48	-	-	-
49	350-00768	Spring retainer	2
50	362-00103	Spring	2

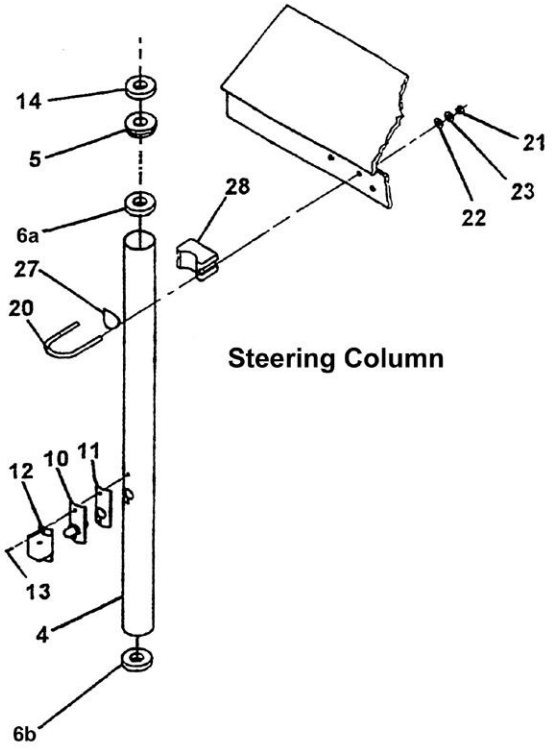
Steering Column



Steering Shaft and Gear



Horn Switch Detail

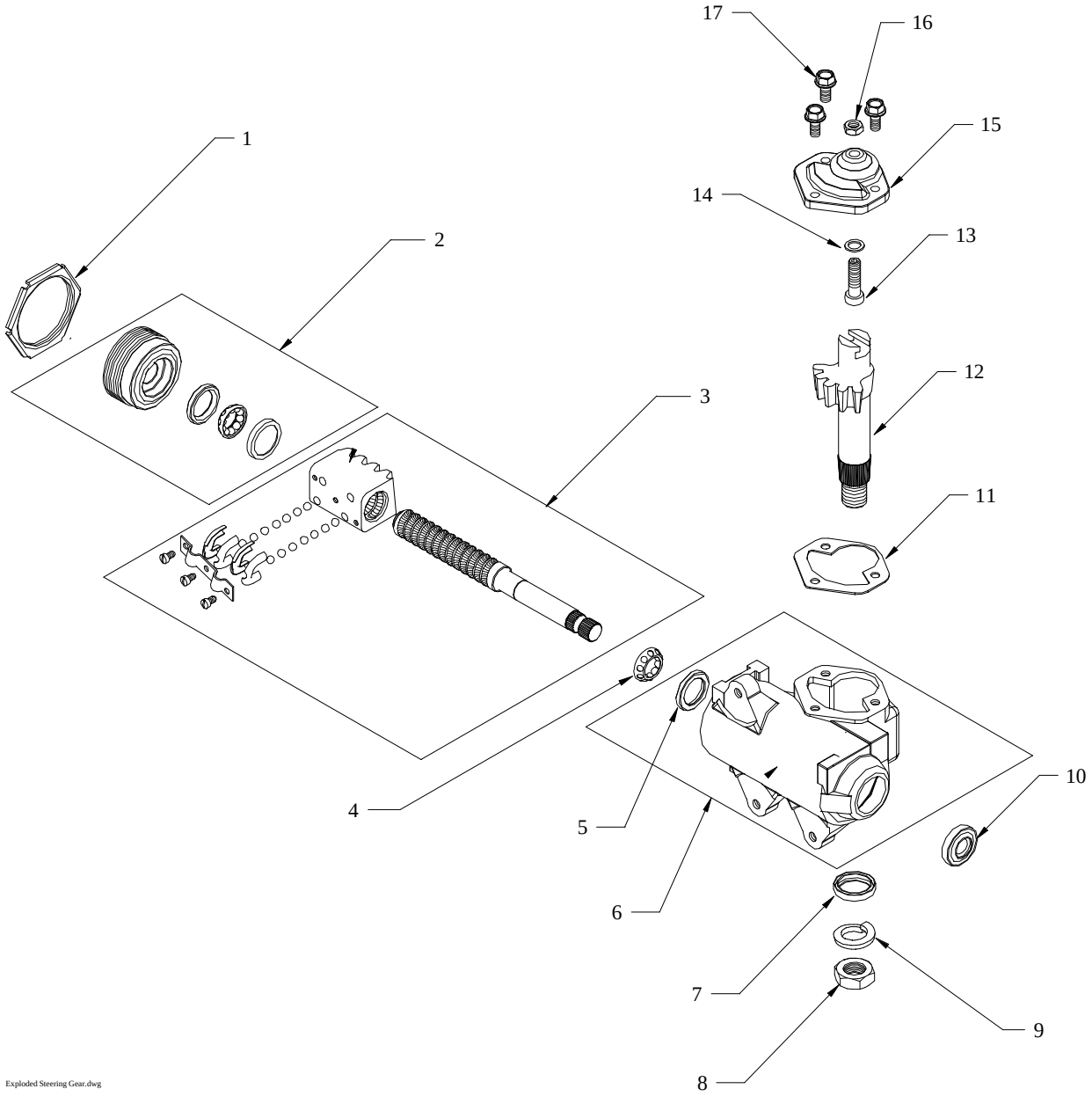


Steering Column

Item #6a is pressed to a depth of 12.5”
Item #6b is pressed to a depth of 5.25”

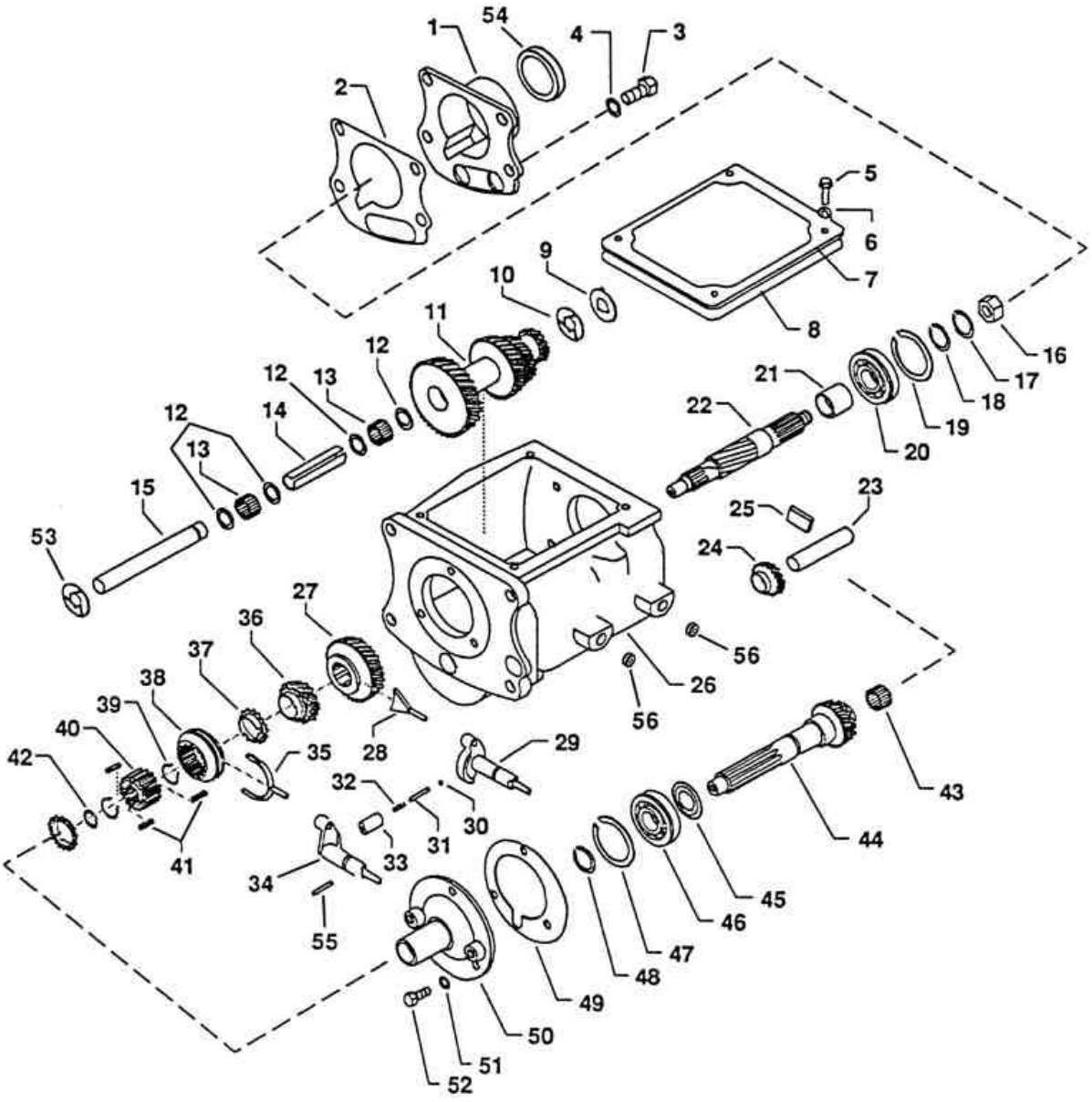
Steering Column			
ITEM #	PART #	DESCRIPTION	QTY
2	836-00100	Steering shaft	1
3	331-00558	5/15-18 x 1/4 Setscrew	1
4	349-00973	Steering column tube	1
5	408-00013	Bushing	2
6a	408-00014	Bushing, upper (not used after serial #164795)	1
6b		Bushing, lower	1
7	361-00129	Spacer	1
8	214-00029	Contact ring assembly	1
9	341-00608	8-32 Nylon machine screw	1
10	738-72	Horn contact	1
11	738-66	Spacer	1
12	794-80	Cover	1
13	627-40802	8-32 x 1/4 Sheet metal screw	2
14	903-00048	Dust seal	1
15a	75-146-91	Horn wire	1
15b	224-00042	Horn wire	1
16	See steering linkage	Pitman arm	1
20	341-00205	U-bolt	1
21	88-109-87	3/8NC KEPS nut	2
22	88-108-60	3/8 Cut flat washer	2
23	88-108-62	3/8 Split lock washer	2
27	350-03079	Saddle	1
28	417-00001	Block	1
29	836-00005	Steering wheel	1
30	88-199-82	5/8NF Jam nut	1
31	903-00097	Horn switch	1
33	88-120-17	7/16NC x 2-1/4 Hex bolt	3
34	88-128-62	7/16 Split Lock washer	3
35	361-00126	Spacer	

Steering Gear



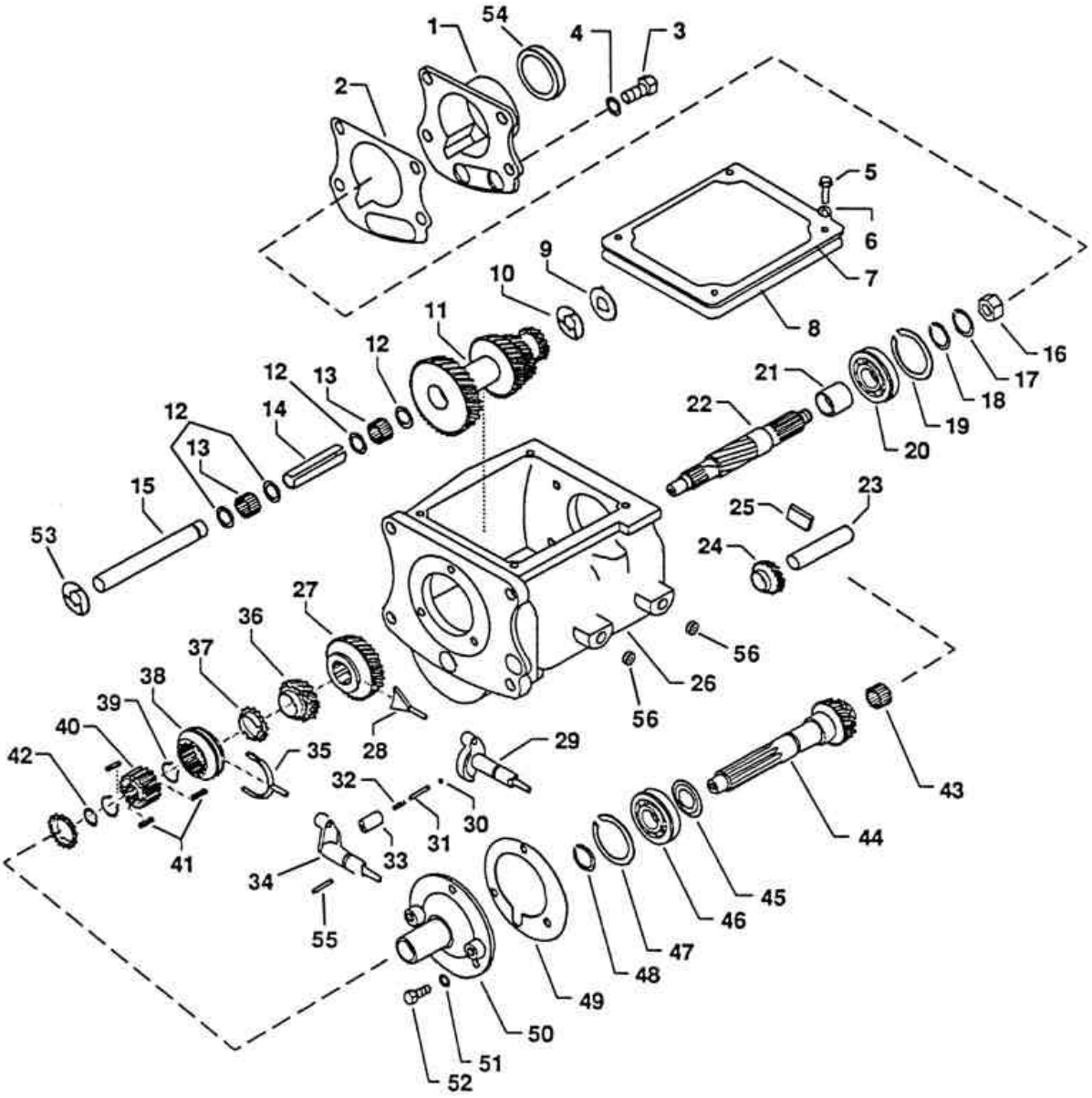
Steering Gear 18-308-15			
ITEM #	PART #	DESCRIPTION	QTY
1	18-308-70	Locknut	1
2	18-308-71	Adjuster assembly	1
3	18-308-73	Worm assembly	1
4	18-308-23	Upper worm bearing	1
5	18-308-22	Upper worm bearing race	1
6	18-308-77	Housing	1
7	18-308-78	Seal, pitman shaft	1
8	18-308-80	Nut, pitman shaft	1
9	18-308-81	Lock washer	1
10	18-308-79	Seal, input shaft	1
11	18-308-82	Gasket	1
12	18-308-76	Pitman shaft	1
13	18-308-75	Gear lash adjuster	1
14	18-308-85	Shim kit	1
15	18-308-84	Side cover	1
16	18-308-86	Jam nut	1
17	18-308-83	Bolt, side cover	3

3-Speed Transmission (page 1)



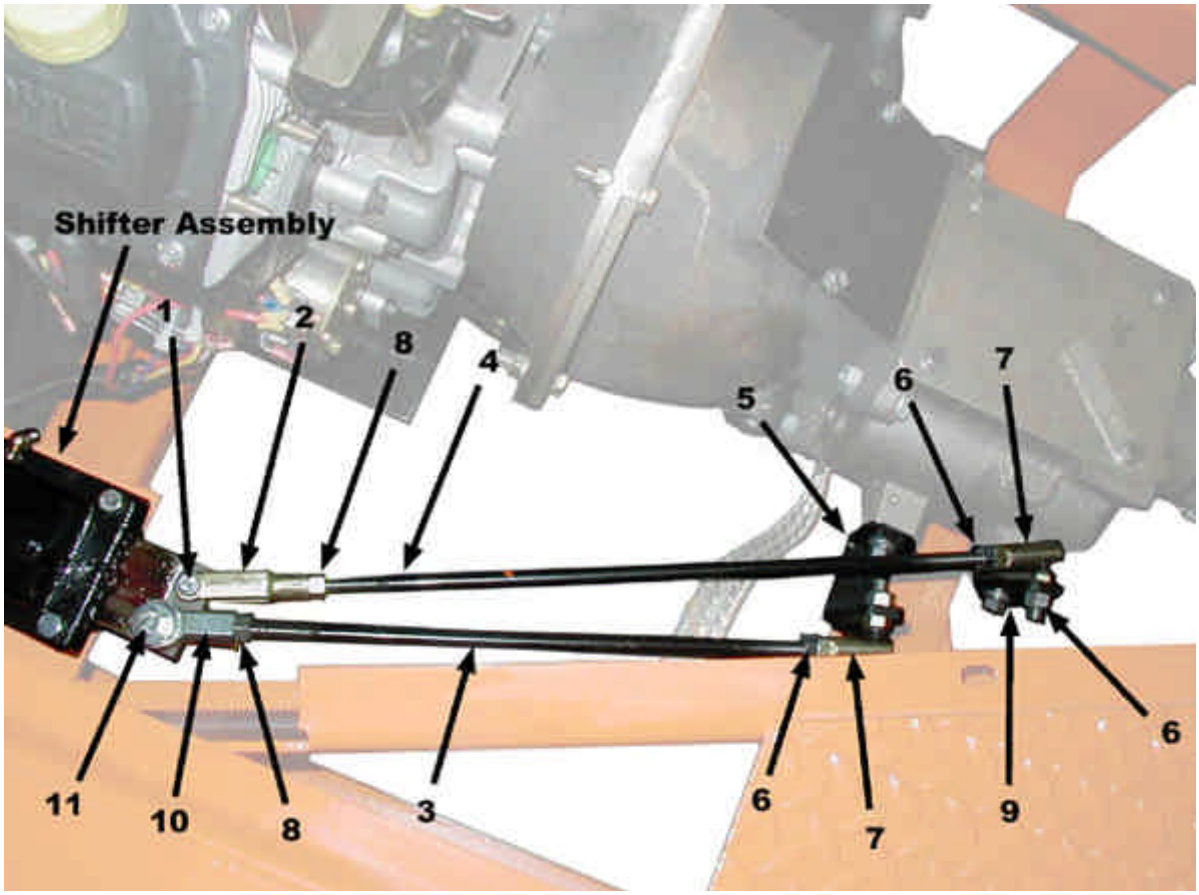
Transmission (66-500-00)			
ITEM #	PART #	DESCRIPTION	QTY
1	66-500-49	Retainer, rear bearing	1
2	Use kit 66-500-61	Gasket, retainer, rear bearing	1
3	96-243-00	Bolt, hex head, NC, 7/16 x 7/8	4
4	88-128-62	Lockwasher, 7/16	4
5	88-080-09	Screw, hex head, cap, 5/16 NCx 3/4	4
6	88-088-62	Lockwasher, 5/16	4
7	66-500-55	Cover, case	1
8	Use kit 66-500-61	Gasket, case cover	1
9	Use kit 66-500-60	Washer, thrust, rear	1
10	Use kit 66-500-60	Washer, rear, bronze	1
11	66-500-43	Gear, countershaft	1
12	Use kit 66-500-60	Spacer, bearing	2
13	Use kit 66-500-60	Bearing, roller	40
14	Use kit 66-500-60	Spacer, bearing	1
15	66-500-37	Countershaft	1
16	66-500-54	Nut, mainshaft	1
17	88-228-62	Washer,3/4 lock	1
18	66-500-53	Washer, special	1
19	66-500-28	Snap ring, bearing	1
20	66-500-27	Bearing	1
21	66-500-52	Spacer	1
22	66-500-18	Mainshaft	1
23	66-500-45	Shaft, reverse idler	1
24	66-500-46	Gear, reverse idler	1
	66-500-47	Bushing, reverse idler gear	1
25	66-500-48	Plate, lock	1
26	66-500-04	Case, transmission	1
27	66-500-19	Gear, low and reverse	1
28	66-500-11	Fork, low and reverse shift	1
29	66-500-10	Lever, low and reverse shift	1
30	66-500-16	Ball, steel	2
31	66-500-15	Plunger, interlock	1
32	66-500-14	Spring, shift lever	1
33	66-500-13	Sleve, interlock	1
34	66-500-08	Lever, 2nd and 3rd shift	1
35	66-500-09	Fork, 2nd and 3rd shift	1
36	66-500-20	Gear, 2nd speed	1

3-Speed Transmission (page 2)

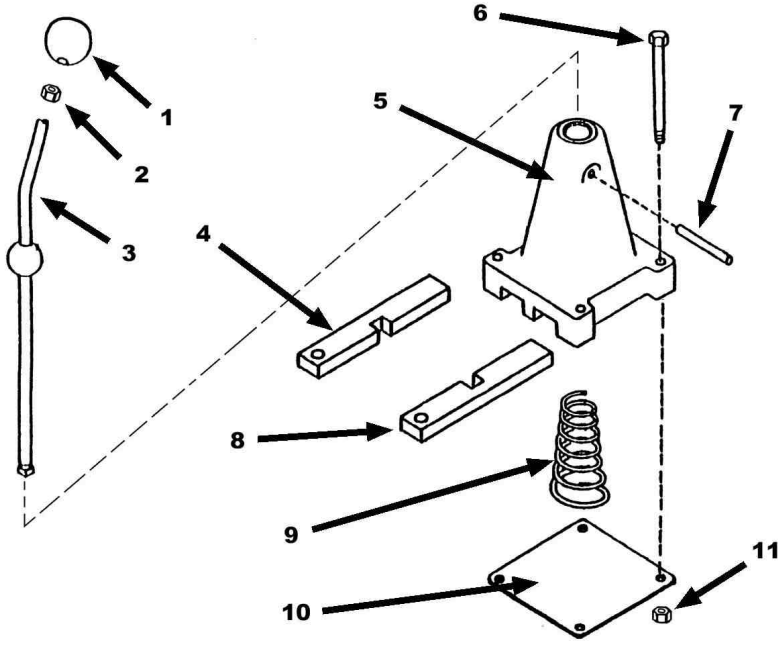


Transmission			
ITEM #	PART #	DESCRIPTION	QTY
37	66-500-21	Ring, synchronizer	2
38	66-500-22	Synchronizor unit	1
39	66-500-25	Wire, Synchronizor spring	2
40	66-500-23	Sleeve, Synchronizor, 2nd and 3rd	1
41	66-500-24	Plate, shifting	3
42	Use kit 66-500-60	Snap ring, clutch hub	1
43	66-500-34	Bearing, roller	13
44	66-500-29	Gear, main drive	1
45	66-500-30	Oil slinger	1
46	66-500-31	Bearing	1
47	66-500-32	Snap ring	1
48	66-500-33	Snap ring	1
49	Use kit 66-500-61	Gasket, retainer, bearing	1
50	66-500-36	Retainer, bearing	1
51	88-088-62	Lockwasher, 5/16	3
52	96-241-00	Bolt, hex head, 5/16 x 3/4	3
53	66-500-44	Washer, Front, Bronze	1
54	66-500-51	Seal, Rear	1
55	66-500-12	Pin, Taper	1
56	66-500-07	Seal, Shift Lever	2
-	66-500-61	Gasket kit (includes #2, 8, 49)	
-	66-500-60	Small parts kit (includes #9, 10, 40, 41, 14, 42))	

Shift Linkage



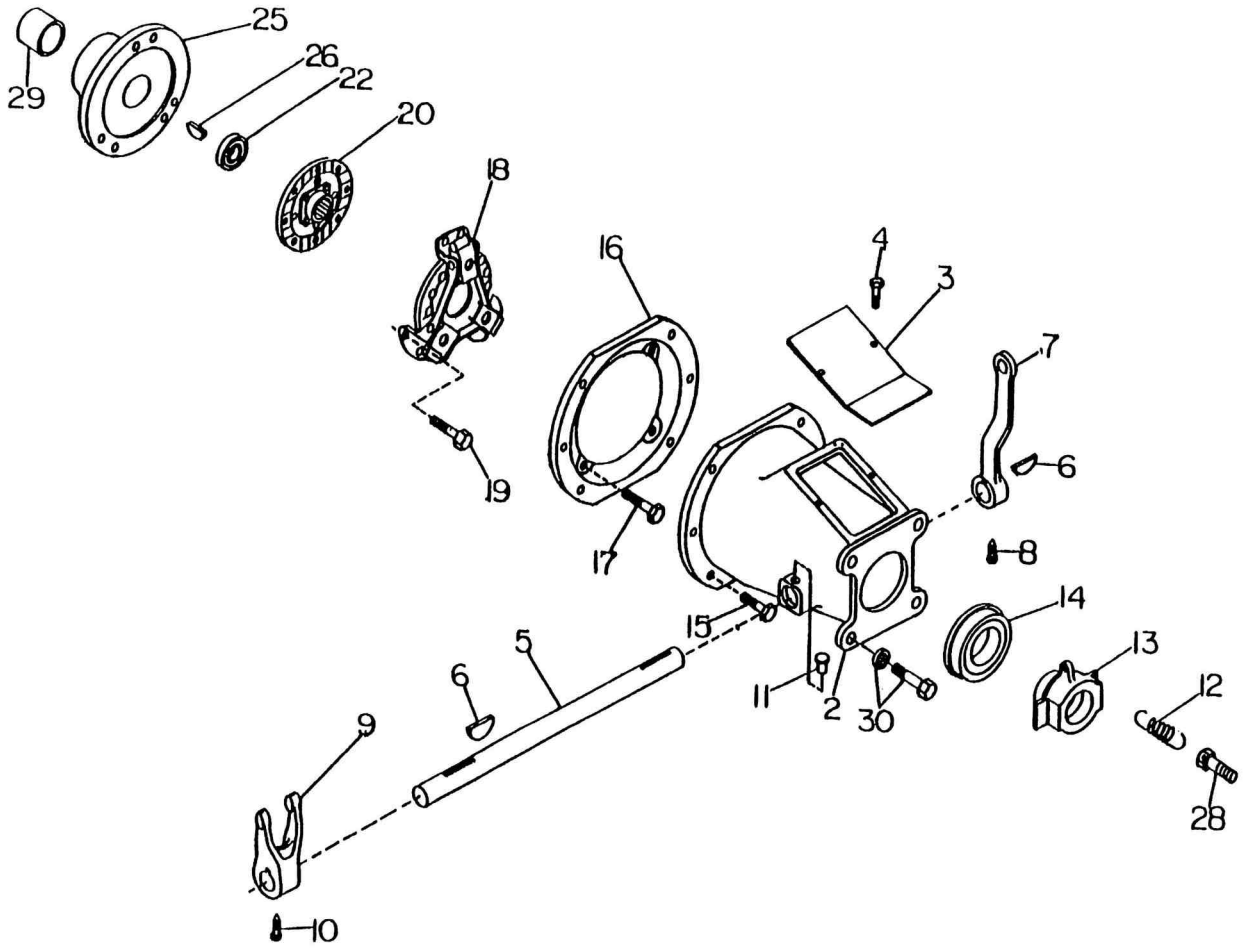
Shifter Assembly



Shift Linkage			
ITEM #	PART #	DESCRIPTION	QTY
1	96-772-00	3/8 x 1-1/8 Clevis pin	1
2	96-762-10	Clevis	1
3	66-501-00	Shift rod	1
4	66-501-02	Shift rod	1
5	66-501-04	Shift lever (2nd/3rd)	1
6	88-119-80	3/8NF Hex nut	2
7	341-00306	Rod end	2
8	97-202-50	3/8NF Hex nut, left hand thread	1
9	66-501-03	Shift lever (low/reverse)	1
10	86-520-10	Rod end	1
11	88-101-18	3/8NC x 2-1/2 Hex bolt, grade 5	1
	88-108-60	3/8 Cut flat washer	1
	88-109-87	3/8NC KEPS nut	1

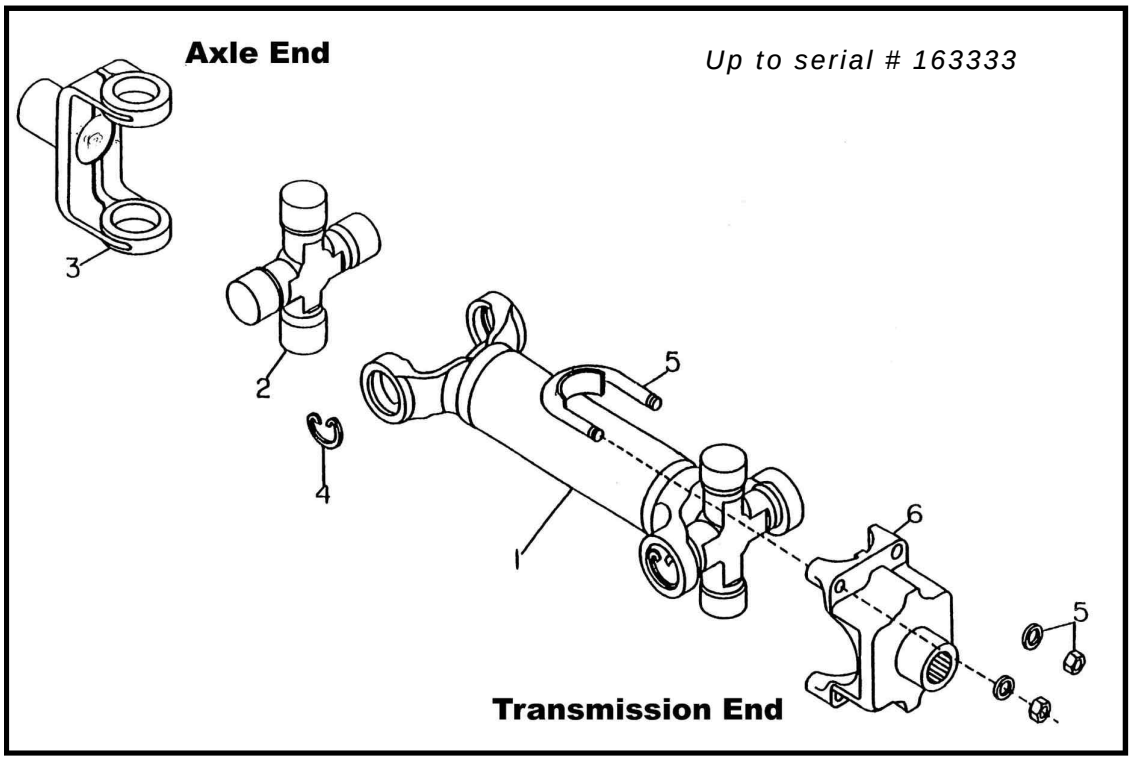
Shifter Assembly (317-00084)			
ITEM #	PART #	DESCRIPTION	QTY
1	412-00001	Shift knob	1
2	88-099-80	5/16NF Hex nut	1
3	301-00161	Shift lever	1
4	350-01171	Shift bar	1
5	317-00040	Housing	1
6	88-060-15	1/4NC x 1-3/4 Hex bolt	4
7	913-00249	pin	1
8	See #4	Shift bar	1
9	913-00250	Spring	1
10	812-00040	Base	1
11	88-069-81	1/4NC Lock nut	4
	88-068-61	1/4 SAE Flat washer	4

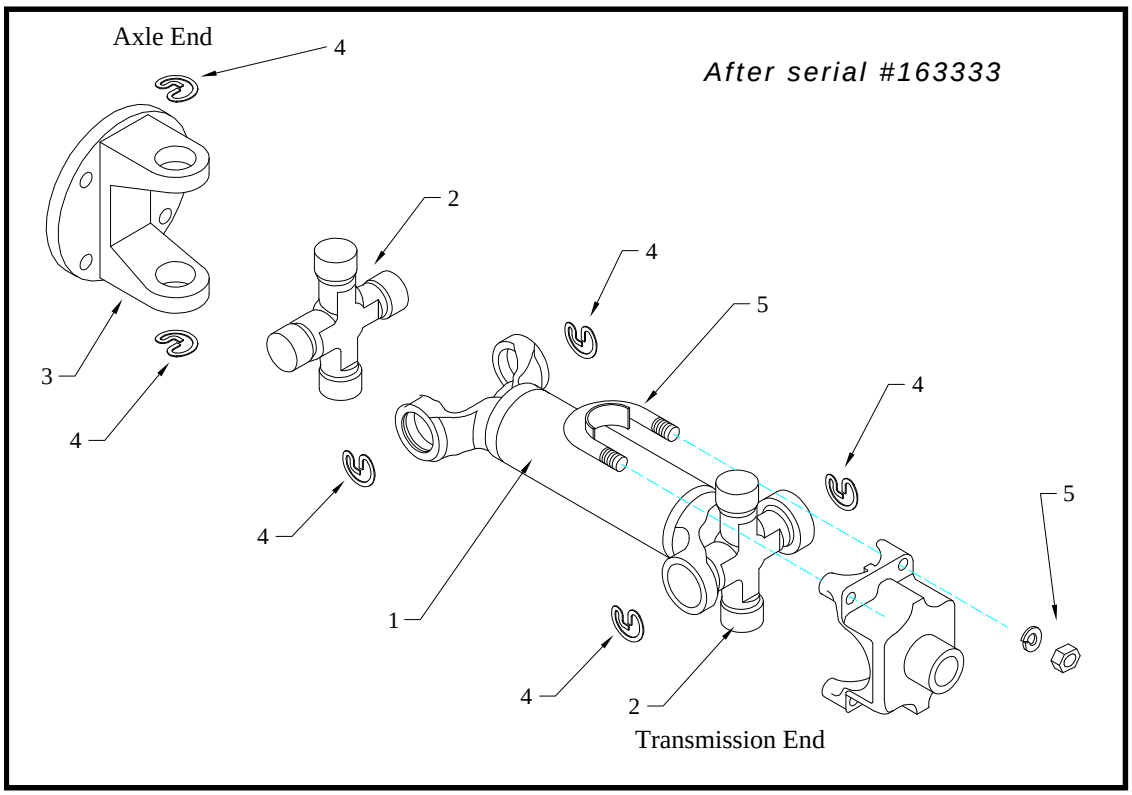
Clutch and Clutch Housing



Clutch and Clutch Housing			
ITEM #	PART #	DESCRIPTION	QTY
2	317-00044	Clutch housing	1
3	350-01262	Cover	1
4	88-065-08	1/4NC x 5/8 Truss head machine screw	2
	88-068-62	1/4 Split lock washer	2
	88-068-60	1/4 Cut flat washer	2
5	355-00193	Shaft	1
6	97-100-00	Woodruff key	2
7	301-00151	Lever	1
8	88-066-20	1/4NC x 3/4 Socket head cap screw	1
	88-069-81	1/4NC Nylon lock nut	1
9	332-00033	Throwout yoke	1
10	88-087-10	5/16-18 x 3/4 Set screw	1
	88-089-81	5/16NC Lock nut	1
11	104-00001	Oil hole cover	2
12	362-00037	Spring	1
13	332-00034	Clutch release sleeve	1
14	306-00044	Throwout bearing	1
15	88-081-14	5/16-24 x 1-1/2 Hex bol, grade 8	6
	88-089-81	5/16NC Lock nut	6
	88-088-61	5/16 SAE flat washer	6
16	317-00088	Flywheel housing	1
17	88-081-14	5/16NX x 1-1/2 Hex bolt, grade 8	4
	88-089-81	5/16NC Lock nut	
	88-088-61	5/16 SAE Flat washer	
18	66-499-00	Pressure plate	1
19	88-080-09	5/16NC x 3/4 Hex bolt	6
	88-088-61	5/16 SAE Flat washer	6
	88-080-09	5/16NC x 3/4 Hex bolt	6
20	804-00054	Friction plate	1
22	306-00086	Pilot bearing	1
23	-	-	-
24	-	-	-
25	368-00312	Flywheel	1
26	97-029-11	Woodruff key	1
27	-	-	-
28	331-00126	5/16NC x 1 Hex bolt with drilled head	1
29	321-00048	Taper collar	1
30	88-120-15	7/16-20 x 1-1/2Hex bolt, grade 5	4
	88-128-60	7/16 Washer	4
	88-129-81	7/16-20 Hex lock nut	4

Drive Shaft

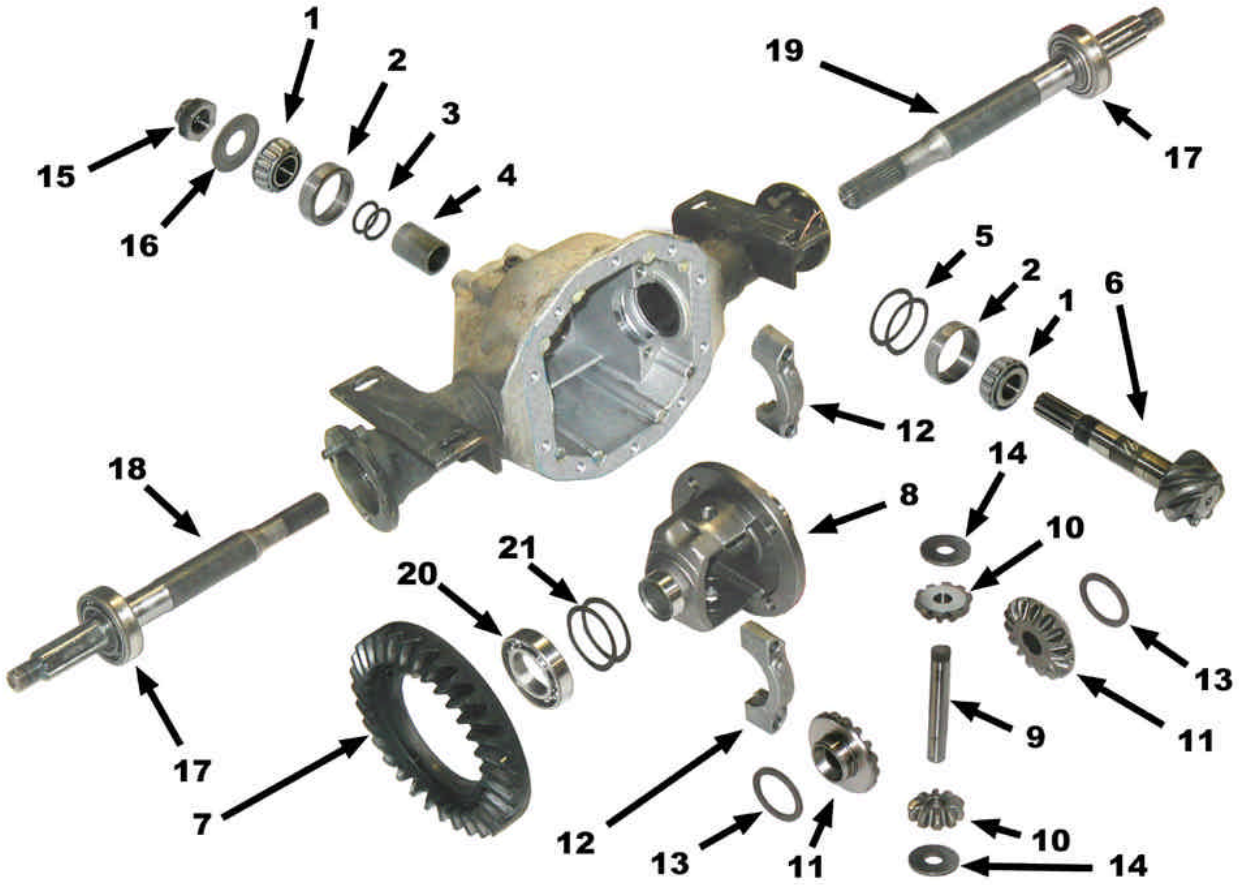

Axle End
Up to serial # 163333
3
2
4
5
1
6
5
Transmission End


Axle End
4
After serial #163333
2
4
5
3
4
4
4
5
1
4
2
Transmission End

Drive Shaft			
ITEM #	PART #	DESCRIPTION	QTY
1	812-00043	Drive shaft, 10-17/32 long (includes 2, 3, 4)	1
	812-00079	Drive shaft, 25-7/8 long (includes 2, 3, 4)	1
	86-556-01	Drive shaft, 30-1/2 long (includes 2, 3, 4)	1
	86-556-00*	* See note below, Drive shaft, 15-3/4 long (includes 2, 3, 4)	
	86-556-04*	* See note below, Drive shaft, 16.44 long (includes 2, 3, 4)	
	86-556-06*	* See note below, Drive shaft, 16-1/8 long (includes 2, 3, 4)	
	86-556-07	Drive shaft, slip, used after serial #163333 (includes #3)	1
2	904-00017	Universal joint	2
3	814-00007*	* See note below,Yoke (axle)	1
4	904-00012	Spring clip	6
5	301-00216	U-bolt	2
	88-088-62	5/16 Lock washer	4
	88-089-81	5/16NC Hex nut	4
6	904-00004	Yoke (transmisison)	1

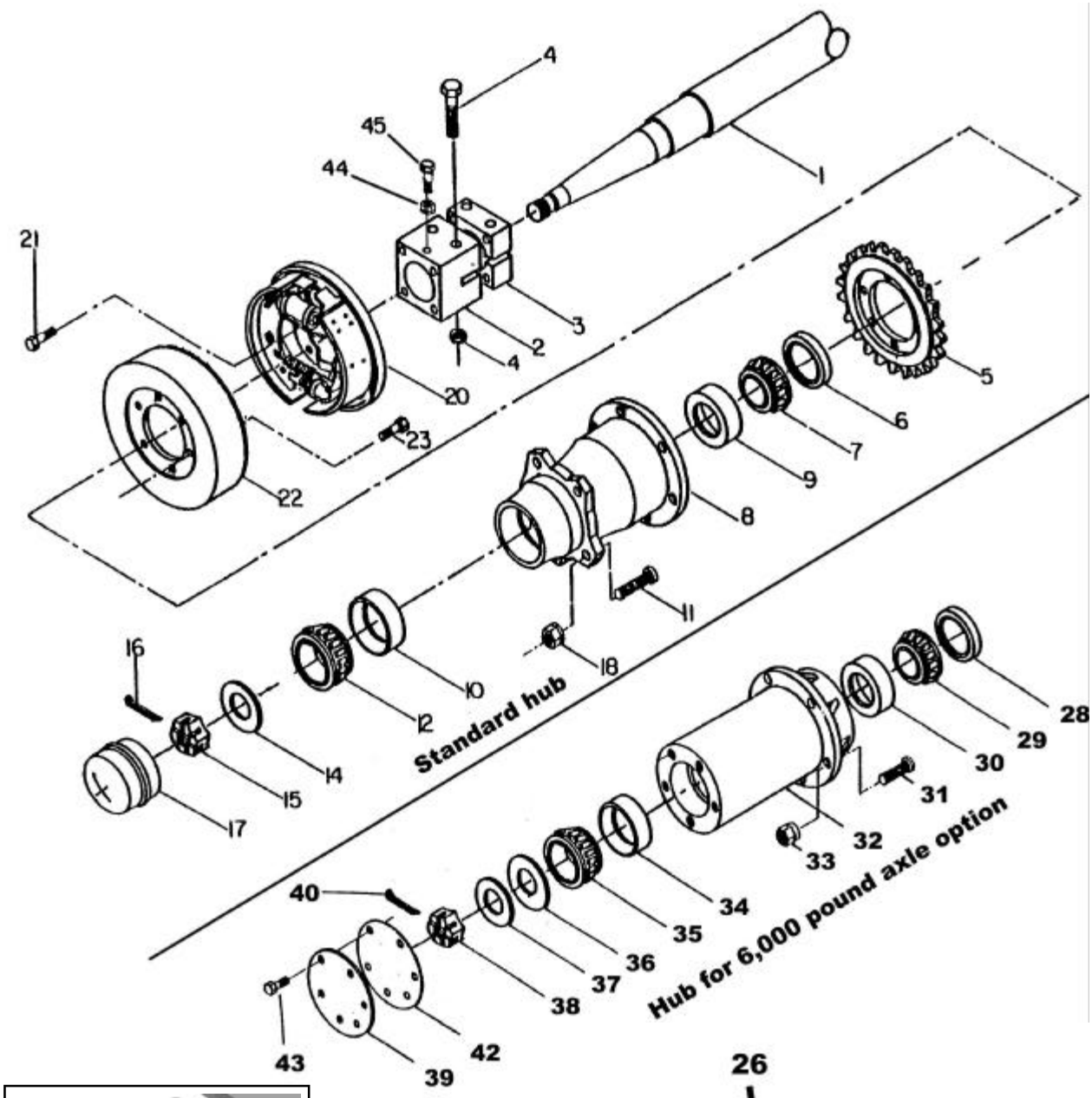
** - Used up to serial number 163333, drive shaft part numbers 86-556-00, -04, and -06 have been replaced with drive shaft kit part number 86-556-07-60. This kit includes a replacement yoke (item #3).*

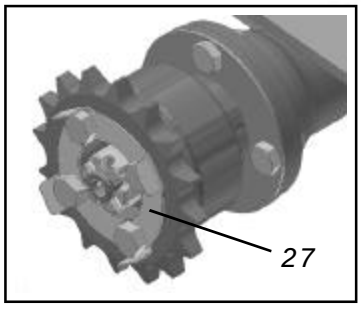
Auxiliary Axle Assembly



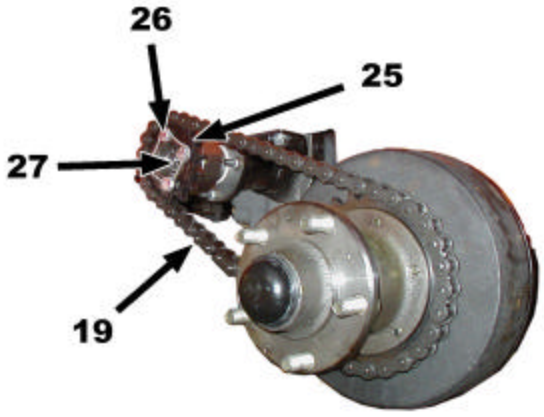
Auxiliary Axle (800-00054)			
ITEM #	PART #	DESCRIPTION	QTY
-	800-00051	Complete axle assembly	1
1	904-00229	Bearing (includes race)	2
2	Part of #1	Race	2
3	904-00235	Shim, 0.003	As needed
	904-00236	Shim, 0.005	
	904-00237	Shim, 0.010	
4	904-00217	Spacer	1
5	904-00230	Shim, 0.003	As needed
	904-00231	Shim, 0.005	
	904-00232	Shim, 0.010	
6	904-00203	Ring and Pinion gear set	1
7	See #6	Ring gear	1
8	904-00201	Differential carrior (includes spider and axle gears)	1
9	904-00224	Spider gear shaft	1
10	904-00222	Spider gear	2
11	904-00223	Axle gear	2
12	Not available seperatly	Carrior bearing cap	2
13	904-00227	Thrust washer	2
14	904-00226	Thrust washer	2
15	904-00114	Pinion nut (up to serial number 163333)	1
	41-160-67	Pinion nut (starting serial number 164796)	1
Not shown	41-160-68	Pinion seal (used starting serial number 164796)	1
16	904-00249	Washer	2
17	904-00200	Axle bearing assembly	2
18	904-00204	Axle shaft (left)	1
19	904-00205	Axle shaft (right)	1
20	904-00197	Carrior bearing	2
21	904-00242	Shim, 0.003	As needed
	904-00243	Shim, 0.005	
	904-00244	Shim, 0.010	
Not shown	335-00032	Pinion seal housing	1
	110-00022	Pinion seal	1
	335-00033	Pinion seal housing gasket	1

Driven Rear Axle and Chain (page 1)



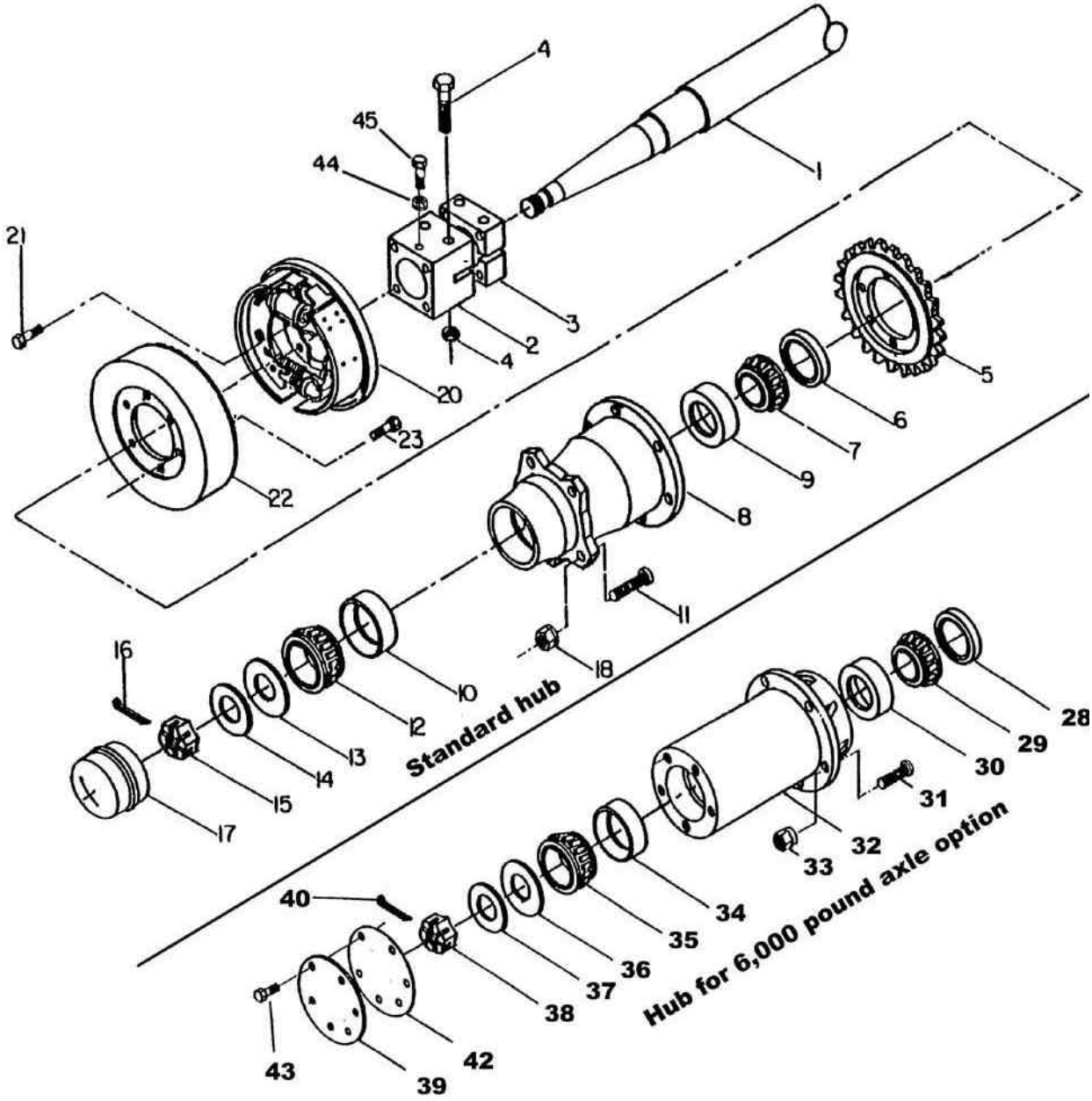


Starting S/N 164796



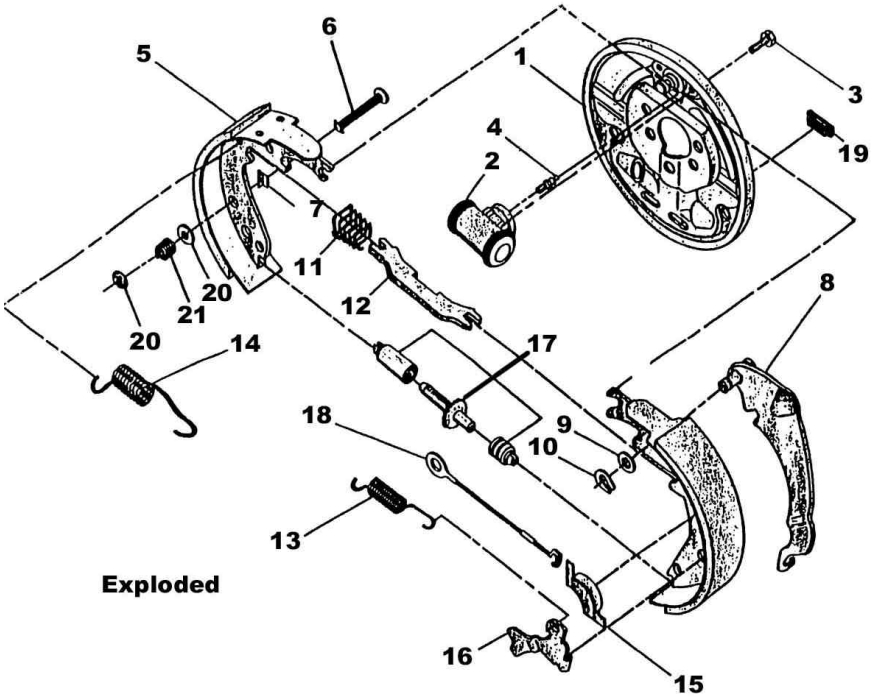
Driven Rear Axle and Chain			
ITEM #	PART #	DESCRIPTION	QTY
1	302-00169	Rear axle (standard)	1
	302-00182	Rear axle (6,000 pound option)	1
2	350-03150	Axle mounting block (large standard)	2
	350-03149	Axle mount block (large 6000 lb axle)	2
3	350-02465	Axle mount block (small standard)	2
	350-03047	Axle mount block (small 6000 lb axle)	2
4	88-140-25	1/2NC x 4-1/2 Hex bolt	8
	88-149-81	1/2NC Hex lock nut	8
5	351-00084	Driven sprocket, 34 teeth, 10 mph	1
	351-00083	Driven sprocket, 26 teeth, 15 mph	1
	351-00085	Driven sprocket, 48 teeth, 7.5 mph	1
6	110-00021	Seal	2
7	306-00087	Bearing	2
8	342-00086	Hub	2
9	306-00088	Race	2
10	80-104-00	Race	2
11	97-236-00	Wheel lug bolt	10
12	80-528-00	Bearing	2
13	-	-	-
14	88-228-61	3/4 SAE Flat washer	2
15	88-239-85	3/4NF Castle nut	2
16	88-527-20	5/32 x 2 Cotter pin	2
17	92-104-01	Bearing cap	2
18	97-236-00	Wheel lug nut	10
19	318-00010	Offset link in chain (not shown)	1
	318-00087	Chain	2
	318-00028	Chain, 37-1/2" long	1
	318-00029	Chain, 48" long	1
20	See Rear Brakes	Brake assembly	2
21	88-100-08	3/8NC x 5/8 Hex flange bolt	8
22	311-00203	Brake drum	2
23	88-100-13	3/8NF x 1-1/2 Hex bolt, grade 8	12
24	-	-	-
25	351-00082	Drive sprocket	2
Not shown	342-00149	Sprocket hub	2
	904-00212	Felt axle seal	2
26	88-101-14	3/8NC x 1-1/2 Hex bolt	8
27	41-160-63	WASHER, LOCKING, TAB,BOLT HEAD	2

Driven Rear Axle and Chain (page 2)

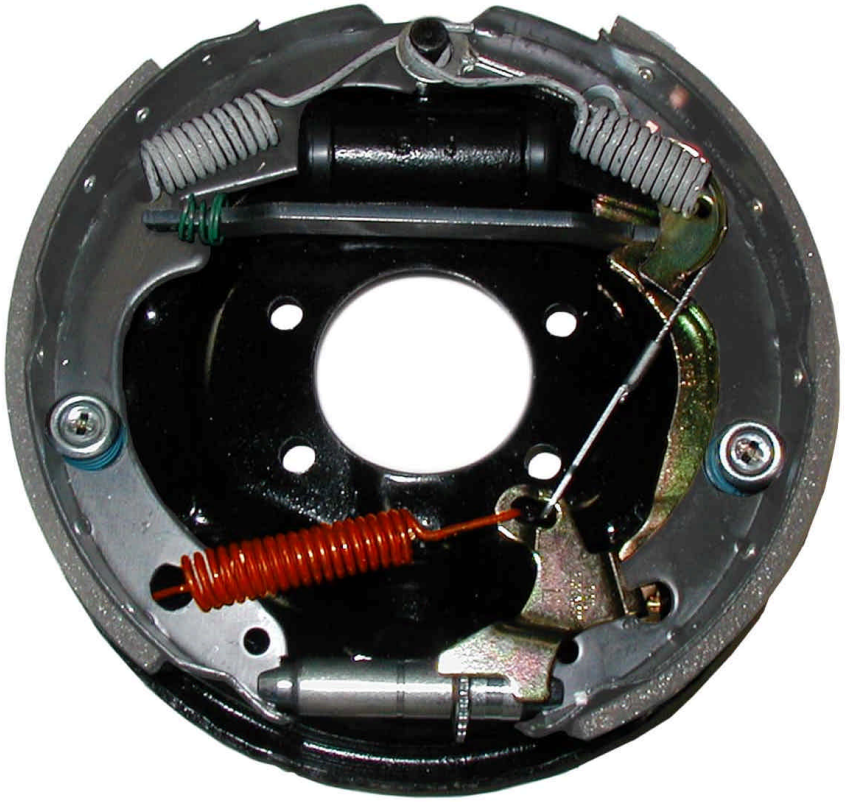


Driven Rear Axle and Chain			
ITEM #	PART #	DESCRIPTION	QTY
28	110-00238	Seal	2
29	306-00358	Bearing	2
30	306-00359	Race	2
31	331-00122	Sprocket lug bolt	12
32	342-00157	Hub (includes 30,31,341)	2
33	97-236-00	Sprocket lug nut	12
34	306-00359	Race	2
35	306-00358	Bearing	2
36	88-308-61	1" SAE Flat washer	2
37	88-308-61	1" SAE Flat washer	2
38	88-307-85	1NF Castle nut	2
39	350-03050	Bearing cap	2
40	88-527-20	Cotter pin	2
41	-	-	-
42	110-00240	Gasket	
43	88-060-06	1/4NC x 1/5 Hex bolt	6
	88-068-62	1/4 Split lock washer	6

Rear Brakes



Primary shoe



Secondary shoe

Rear Brakes			
ITEM #	PART #	DESCRIPTION	QTY
-	311-00204	Complete brake assembly (left)	1
-	311-00205	Complete brake assembly (right)	1
1		Backing plate	2
2	935-00040	Wheel cylinder	2
3	341-00365	Bolt and Lockwasher	4
4	904-00258	Bleeder screw	2
5	935-00044	Brake shoe (primary)	2
6	935-00045	Brake shoe (secondary)	2
7	-	-	-
8	935-00072	Park brake lever (left)	1
	935-00061	Park brake lever (right)	1
9	935-00004	Washer	2
10	935-00003	Horeshoe clip	2
11	935-00025	Spring	2
12	311-00168	Strut	2
13	935-00027	Spring	2
14	935-00026	Spring	2
15	935-00034	Cable guide	2
16	935-00020	Cam lever (left)	1
	935-00021	Cam lever (right)	1
17	935-00029	Adjustor screw (left)	1
	935-00030	Adjustor screw (right)	1
18	935-00028	Cable	2
19	935-00073	Inspection plug	2
20	935-00070	Cup	8
21	311-00178	Spring	4

Engine

Illustration not available

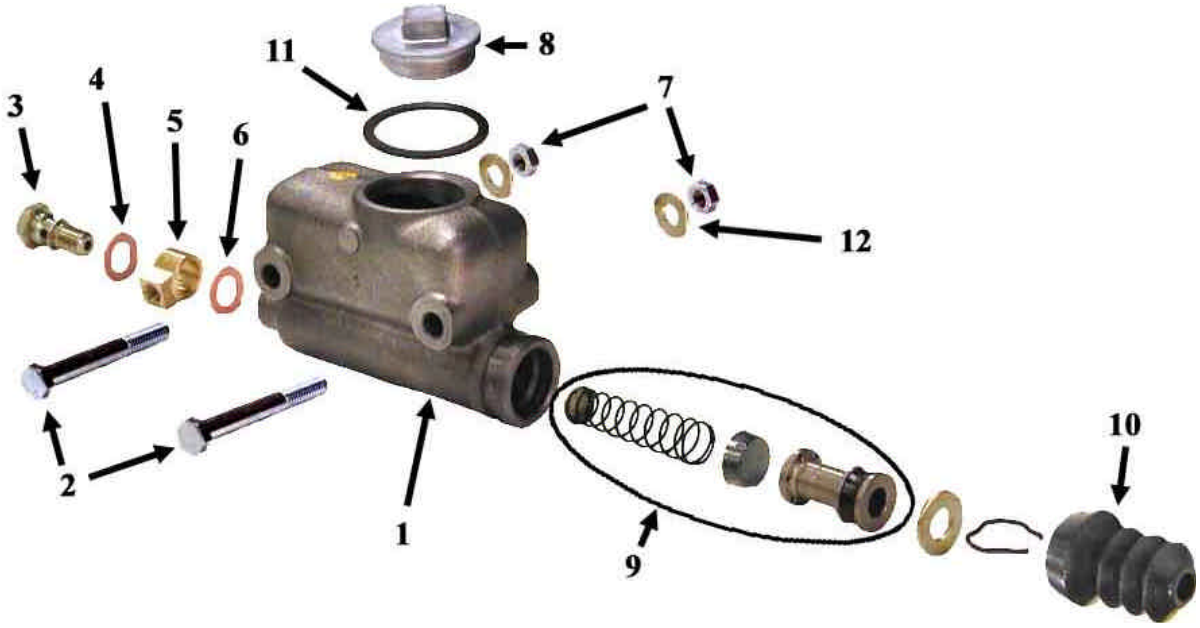
Exaust

Illustration not available

Engine			
ITEM #	PART #	DESCRIPTION	QTY
	349-00312	Spacer	2
	371-00064	Washer, Motor mount	4
	439-00001	Motor mount	4
	439-00002	Motor mount	4
	01-661-82	Motor mounting plate	1
	67-000-53	Engine	1

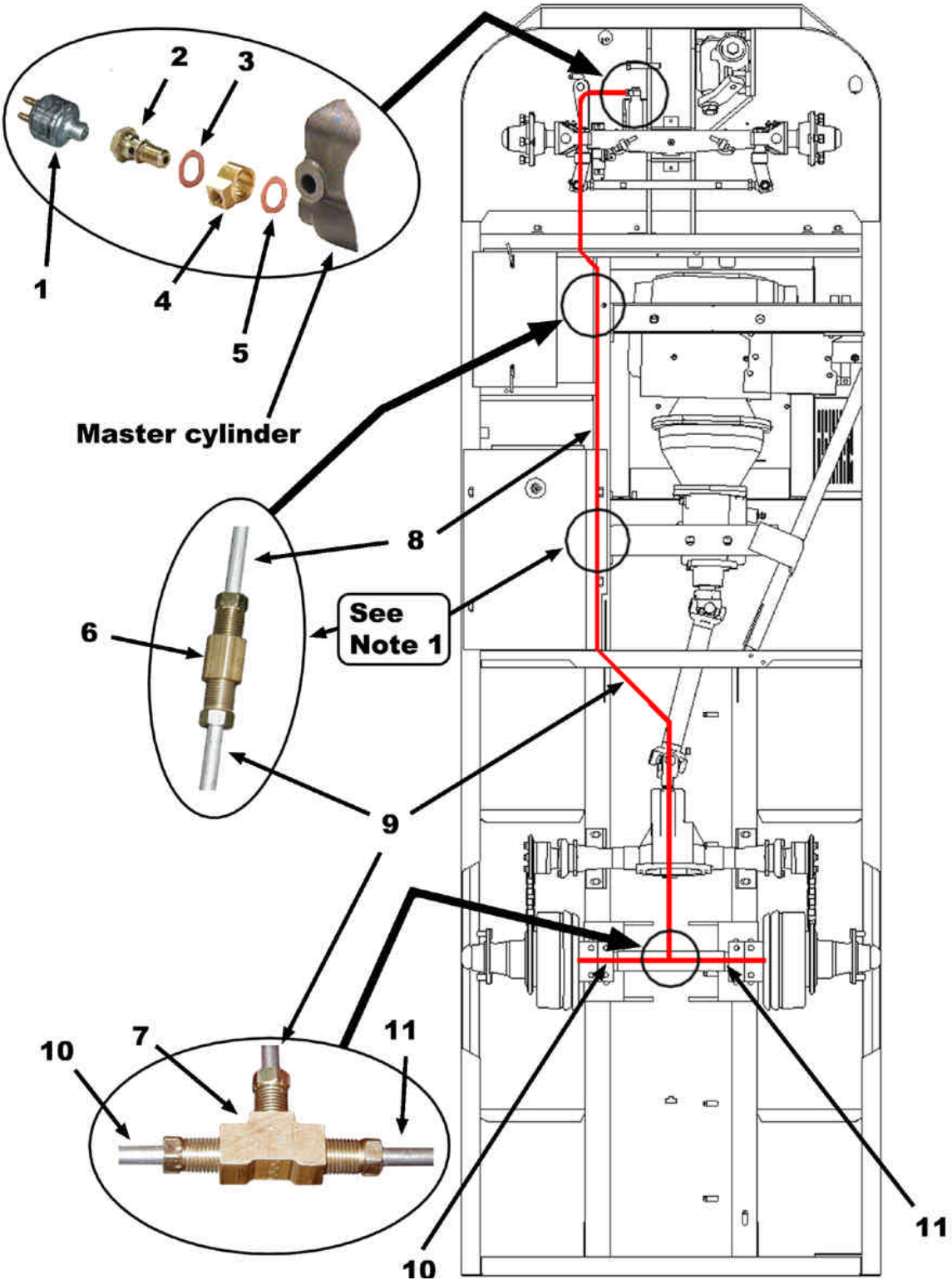
Exhaust			
ITEM #	PART #	DESCRIPTION	QTY
	66-400-03	Muffler	1
	66-400-25	Spark arrestor	1
	66-410-09	Exhust pipe	1
	KLR-4723704	Exhaust pipe clamp	1

Master Cylinder



Master Cylinder			
ITEM #	PART #	DESCRIPTION	QTY
1	99-510-02	Master cylinder assembly	1
2	88-101-20	Hex bolt	2
3	See brake lines	Fitting	
4	See brake lines	Washer	
5	See brake lines	Fitting	
6	See brake lines	Washer	
7	88-109-81	Hex lock nut	2
8	99-510-52	Cap	1
9	99-510-61	Rebuild kit for 1" bore	1
10	99-510-51	Boot	1
11	99-510-53	Gasket	1
12	88-108-60	flat washer	2
Not shown	341-00559	Push rod	1
	96-762-00	Clevis	1
	88-119-80	Jam nut	1

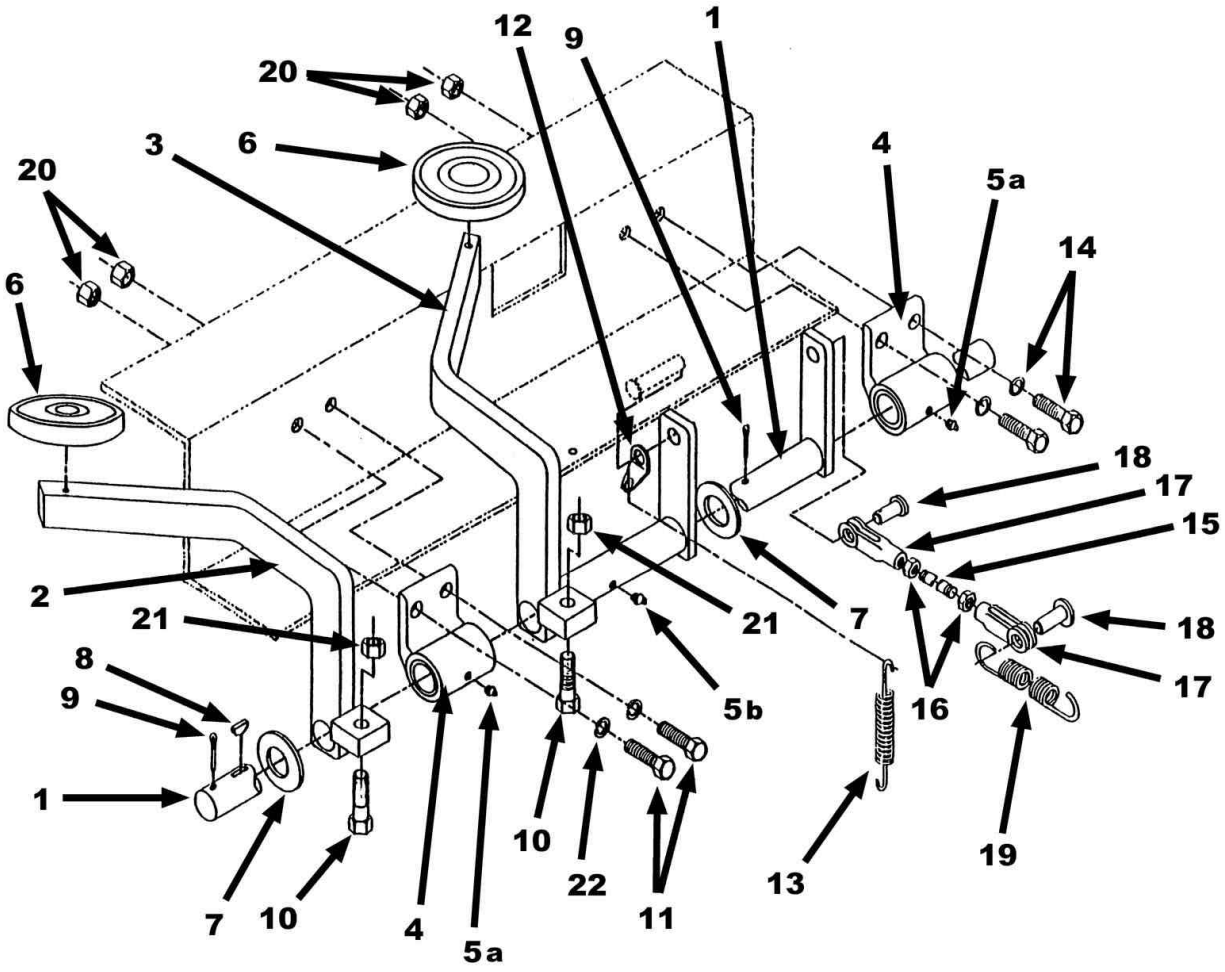
Brake Lines



Brake Lines			
ITEM #	PART #	DESCRIPTION	QTY
1	71-110-00	Brake light switch	1
2	99-579-00	Hydraulic bolt	1
3	99-572-00	Gasket	1
4	99-566-00	Hydraulic fitting	1
5	99-571-00	Gasket	1
6	99-575-00	Coupler	1 or 2
7	99-564-00	T-Fitting	1
8	99-605-02	Brake line (see note 1)	1
9	99-607-02	Brake line (see note 1)	1
10	99-604-02	Brake line	1
11	99-604-02	Brake line	1
Brake line extensions for extended frames, conncects between brake line #9 and T-fitting #7			
Not shown	99-604-01	Brake line extension, 82" wheel base	0 or 1
	99-606-02	Brake line extension, 98" wheel base	0 or 1
	99-575-00	Coupler	0 or 1

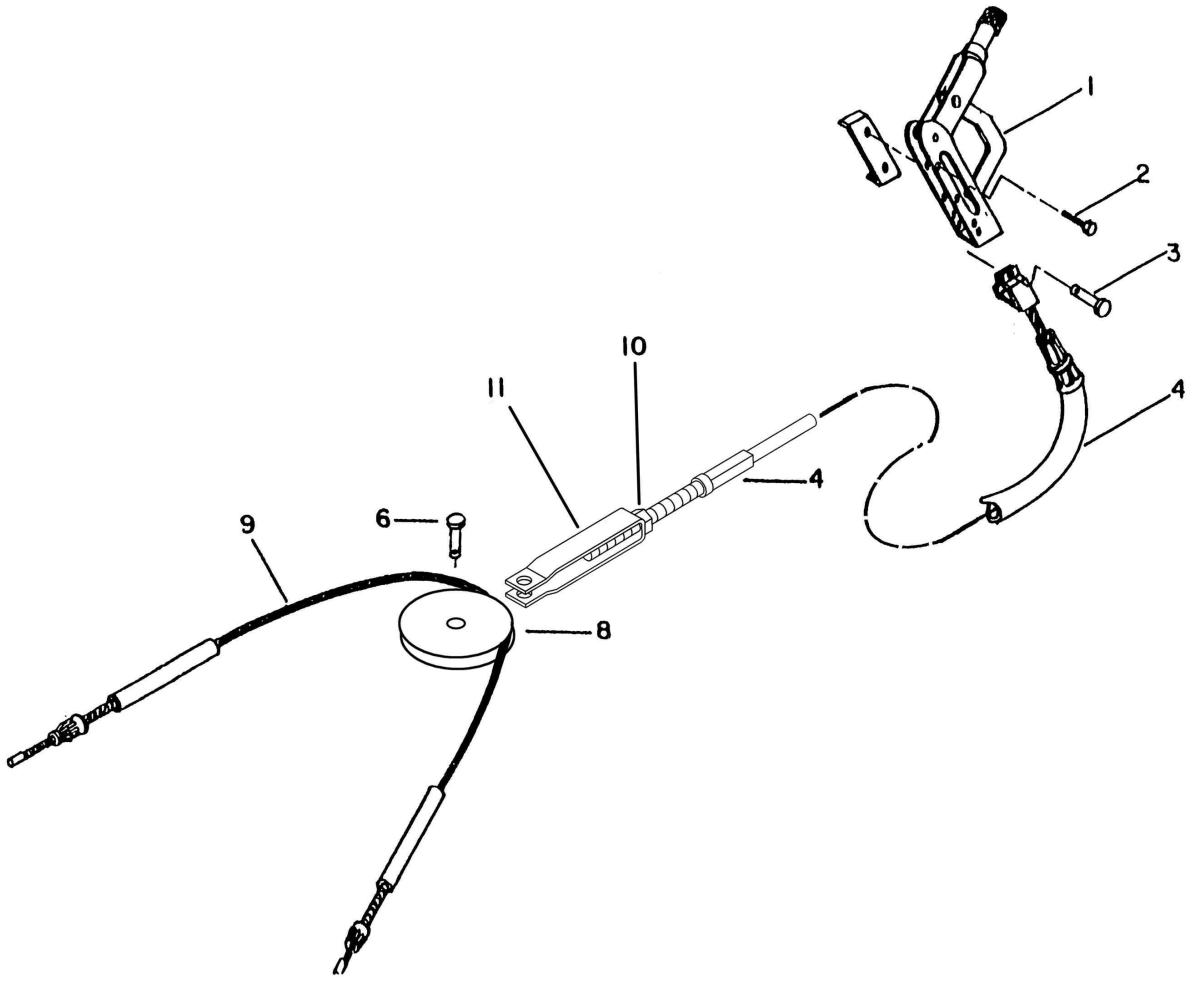
NOTE 1: Before serial number 159460 and including serial number 159837, the brake line coupler may be located by the transmission as indicated by the note arrow in the illustration. If the coupler is located by the transmission, the #8 and #9 brake lines must be replaced as a set.

Brake and Clutch Pedals



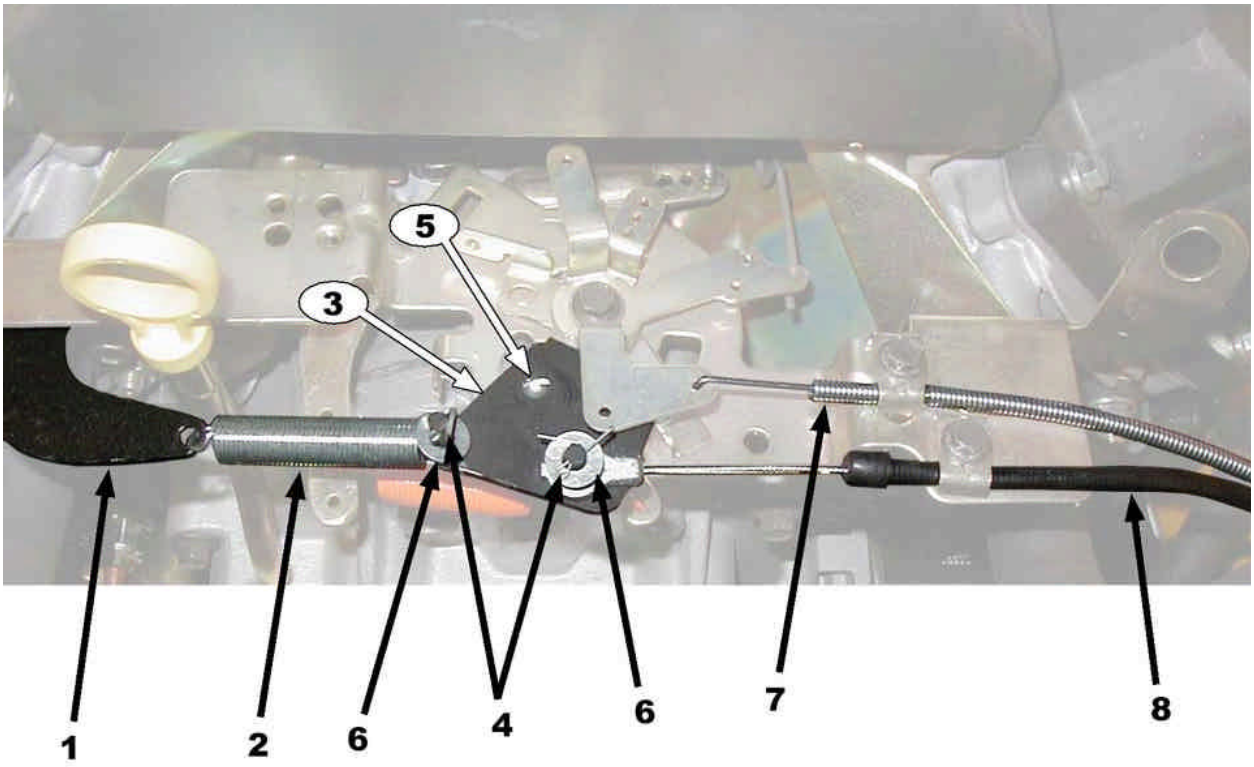
Brake and Clutch Pedals			
ITEM #	PART #	DESCRIPTION	QTY
1	355-00191	Clutch shaft	1
2	301-00164	Clutch pedal	1
3	301-00163	Brake shaft	1
4	306-00156	Linkage pivot bushing housing	2
	306-00329	Pivot bushing	2
5a	109-00267	Grease fitting, 1/8 90 degree	2
5b	115-00008	Grease fitting, 1/4-28 90 degree	1
6	616-81	Pedal pad	2
7	88-228-61	3/4 SAE Flat washer	2
8	97-100-00	Woodruff key	1
9	88-527-14	1/8 x 1-1/2 Cotter pin	2
10	88-110-14	3/8NF x 1-1/2 Hex bolt	2
11	88-100-11	3/8NC x 1 Hex bolt	4
12	320-00004	Spring anchor	1
13	362-00057	Spring	1
14	88-100-11	3/8NC x 1 Hex bolt	2
	88-108-61	3/8 SAE Flat washer	2
15	66-501-01	Clutch rod	1
16	97-202-50	3/8NF Hex nut, left hand thread	1
	88-119-80	3/8 NF Hex nut	1
17	96-762-10	Clevis, left hand thread	1
	96-762-00	Clevis	1
18	96-772-00	3/8 x 1-1/8 Clevis pin	2
19	362-00066	Spring	1
	01-661-80	Anchor bracket (not shown)	1
20	88-109-81	3/8NC Hex lock nut	4
21	88-119-81	3/8NF Hex lock nut	2
22	88-108-61	3/8 SAE Flat washer	2

Park Brake Linkage



Park Brake Linkage			
ITEM #	PART #	DESCRIPTION	QTY
1	51-340-30	Brake handle	1
2	88-080-16	5/16NC x 2 Hex bolt	2
	88-089-81	5/16NC Hex lock nut	2
	88-088-60	5/16 Cut flat washer	2
3	96-772-00	3/8 x 1-1/8 Clevis pin	1
4	96-827-15	Cable	1
5	-	-	-
6	96-772-00	Clevis pin	1
	88-527-11	1/8 x 1 Cotter pin	1
7	-	-	-
8	00-243-03	Equalizer	1
9	370-00035	Cable, (72.25")	1
10	88-099-80	5/16NF Hex nut	2
11	96-760-00	Clevis	1
Not shown	01-661-73	Cable extension (62" wheel base)	2
	41-301-11	Cable extension (82" wheel base	2
	41-301-13	Cable extension (98" wheel base)	2

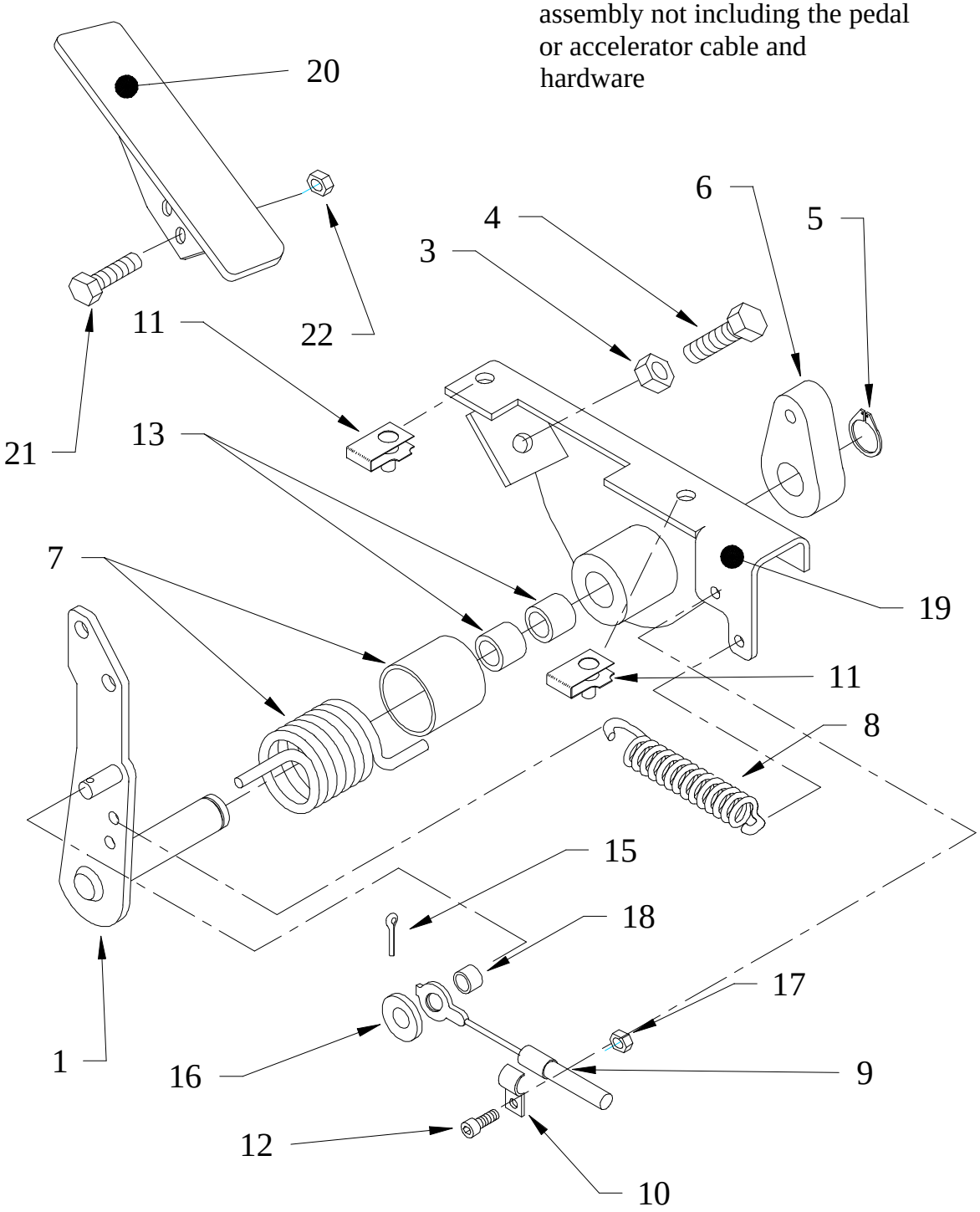
Throttle Linkage, Engine



Throttle Linkage, Engine			
ITEM #	PART #	DESCRIPTION	QTY
1	01-661-35	Spring bracket	1
2	85-209-09	Spring	1
3	00-661-11	Link plate	1
4	88-517-09	3/32 x 3/4 Cotter pin	2
5	88-005-09	4-40 x 3/4 Machine screw	2
	88-009-81	4-40 Lock nut	2
6	88-068-60	1/4 Cut flat washer	2
7	96-860-01	Choke cable	1
8	96-872-06	Throttle cable	1
Not shown	32-212-20	Bushing, plastic for for throttle cable	1

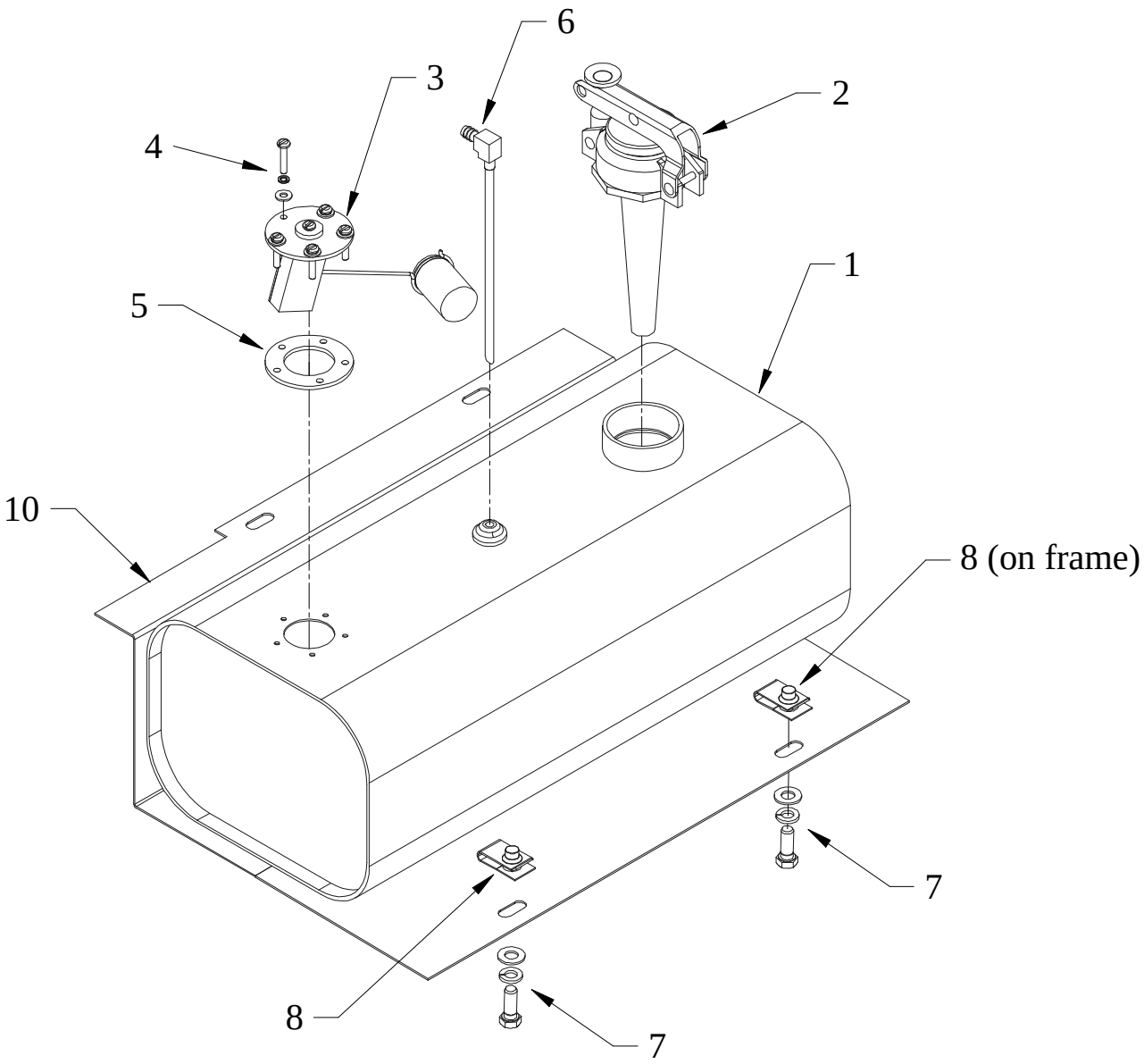
Throttle Linkage, Pedal

Item #2: Complete accelerator assembly not including the pedal or accelerator cable and hardware



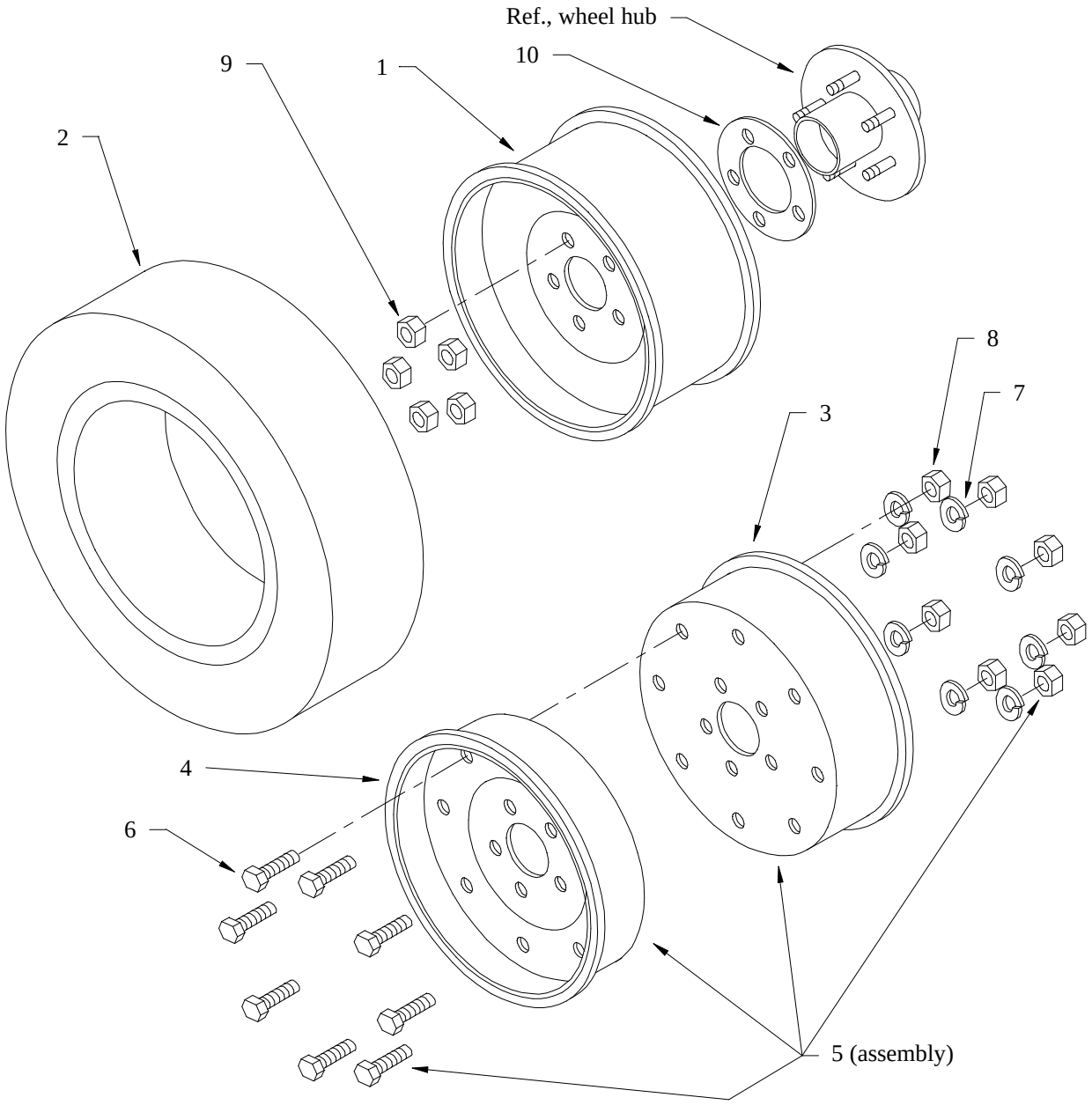
Throttle Linkage, Pedal			
ITEM #	PART #	DESCRIPTION	QTY
1	62-037-06	Throttle arm	1
2	62-037-05	Complete assembly (does not include (#9, 10, 12, 14, 15, 16, 17, 18, 20, 21, 22)	1
3	88-069-80	1/4NC Hex nut	1
4	88-067-12	1/4NC x 1 Hex bolt	1
5	88-840-08	Circlip	1
6	62-033-06	Cam	1
7	85-352-60	Spring/bushing kit	1
8	85-209-09	Spring	1
9	See Throttle Linkage, Engine	Throttle cable	1
10	96-871-01	Cable clamp	1
11	97-211-20	1/4NC U-nut	2
12	88-025-06	8-32 x 1/2 Truss head machine screw	1
13	32-215-50	Bushing	2
14	-	-	-
15	88-517-09	3/32 x 3/4 Cotter pin	1
16	88-068-60	1/4 Cut flat washer	1
17	88-029-86	8-32 Lock nut	1
18	32-212-20	Bushing	1
19	62-033-25	Mounting bracket (includes #13)	1
20	98-254-10	Accelerator pedal	1
21	88-060-11	1/4NC x 1 Hex bolt	2
22	88-069-81	1/4NC Nylon lock nut	2

Fuel Tank



Fuel Tank			
ITEM #	PART #	DESCRIPTION	QTY
	66-410-05	Fuel tank assembly (includes #1, 2, 3, 4, 5, 6)	1
1	309-00120	Fuel tank	1
2	316-00042	Gas cap	1
3	123-00006	Fuel level sender (includes #5)	1
4	88-045-11	10-32 x 1 Machine screw	5
	88-048-61	#10 Flat washer	5
	88-048-62	#10 Split lock	5
5	110-00046	Gasket (included with sender)	0
6	66-410-08	Fuel pick up tube	1
7	88-100-11	3/8NC x 1 Hex bolt	4
	88-108-60	3/8 Cut flat washer	4
	88-108-62	3/8 Split lock washer	4
8	97-211-30	3/8NC U-nut	4
9	-	-	-
10	01-661-79	Base support	1
11	98-512-00	Rubber fuel line (by the foot)	3.5'
Not shown	96-608-05	7/16 Hose clamp	2
	98-451-11	Foam tape, used between the fuel tank and base support (by the foot)	8'
	41-886-00	1/8 Pipe plug	1

Wheels and Tires



Wheels and Tires		
ITEM #	PART #	DESCRIPTION
1	Wheels	
	12-012-00	5 x 8" Tubeless
	12-020-00	8.5 x 8 Tubeless
	12-050-00	12-1/8 Diameter Cast Iron
	368-00127	Cast wheel
2	Tires	
	10-083-00	5.70 x 8 LR C
	10-086-00	5.00 x 8 Man-Toters with lugs (soft solid)
	442-00006	15.5 x 6 x 10 Solid Press on
	442-00007	15.5 x 5 x 10 Solid press on
	Split Rim Wheels	
3	12-041-12	Inner Wheel (2.5 bead)
4	12-041-13	Outer Wheel (2.5 bead)
5	12-041-00	Wheel Assembly, 2.5 bead width (includes #3, #4, #6, #7, #8)
3a	12-042-12	Inner Wheel (12-bolt)
4a	12-042-13	Outer Wheel (12-bolt)
5a	12-042-00	Wheel Assembly, 3.75 bead width (includes #3a, #4a, #6, #7, #8
6	88-110-09	3/8 x 3/4-NF Hex Bolt, grade 5
7	88-109-62	3/8 Split Lock Washer
8	88-119-80	3/8-NF Hex Nut
9	97-236-00	Wheel Nut
Not Shown	13-989-00	Valve stem, tubless tire only
Not Shown	11-040-00	5.70 x 8 Tube
	Tire and Wheel Assemblies	
	13-734-45	4.00 x 8 Man-Toter
	K1N-700-58	5.70 x 8 LR C Foam filled
	13-742-40	5.00 x 8 Man-Toter
	13-742-12	5.70 x 8 Split Rim LR C
	368-00134	15.5 x 6 x 10 Solid cushion
	368-00129	15.5 x 5 x 10 Solid cushion

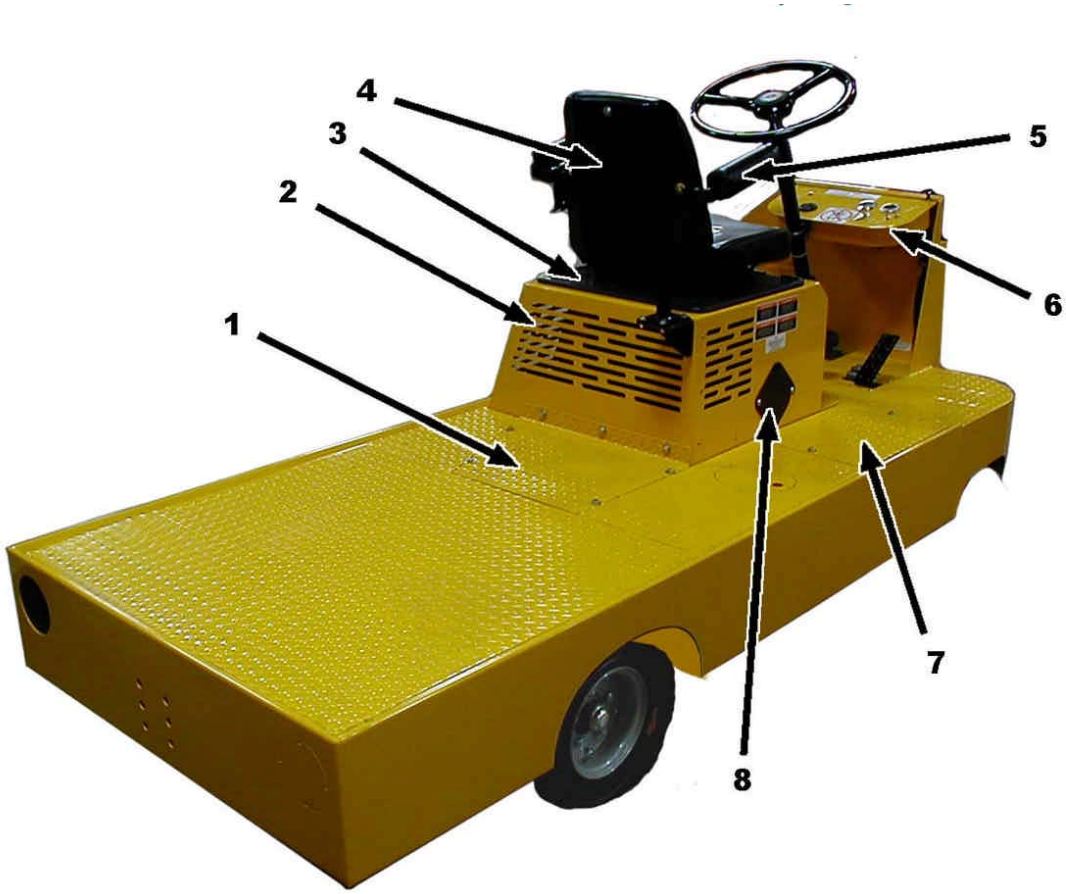
Instrument Panel (dash)

Instrument Panel			
ITEM #	PART #	DESCRIPTION	QTY
1	72-018-23	Panel light	1
2	216-00012	Ammeter	1
3	74-000-00	Hour Meter	1
4	235-00142	Key switch	1
5	74-009-20	Fuel gauge	1
6	71-100-00	Toggle switch	1
7	71-100-00	Toggle switch	Optional

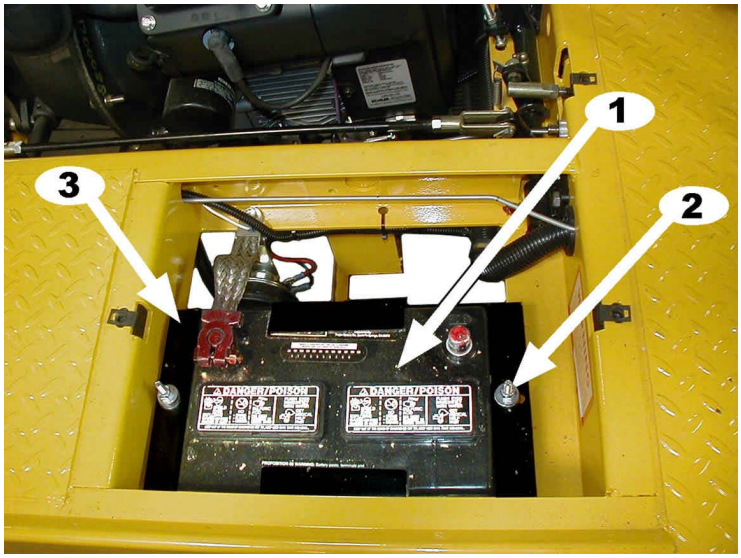
Miscellaneous Electrical

Miscellaneous Electrical			
ITEM #	PART #	DESCRIPTION	QTY
	202-00247	Positive battery cable	1
	221-00011	Fuse, 15 Amp Buss	
	235-00034	Neutral start switch	1
	73-004-10	Horn	1
	75-146-90	Main harness (ending serial # 163333)	1
	75-146-92	Main harness (starting serial # (164796)	1
	78-010-40	Fuse block (ending serial # 163333)	1
	78-010-31	Fuse block (starting serial # 164796)	1
	79-820-02	Fuse, 5 Amp ATO	
	79-820-04	Fuse, 10 Amp ATO	
	79-820-05	Fuse, 15 Amp ATO	
	79-820-06	Fuse, 20 Amp ATO	
	79-820-8	Fuse, 30 Amp ATO	
	79-824-00	Fuse, 30 Amp Buss	
	79-824-05	Fuse, 10 Amp Buss	
	202-00034	Battery ground strap	1
	202-00045	Engine ground strap	1
	72-005-00	Headlight	1 or 2
	72-072-00	Headllight bulb	
	71-141-21	Turn signal switch	1
	72-022-00	Tail light	1 or 2
	72-022-51	Tail light mouting ring	1 or 2
	71-900-05	Turn signal flasher	1
	207-00032	Front signal light	2
	73-005-04	Reverse alarm	1

Miscellaneous Frame and Body



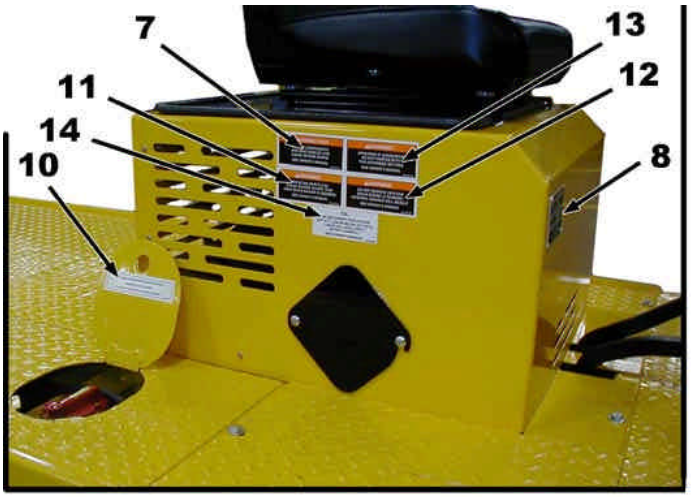
Battery

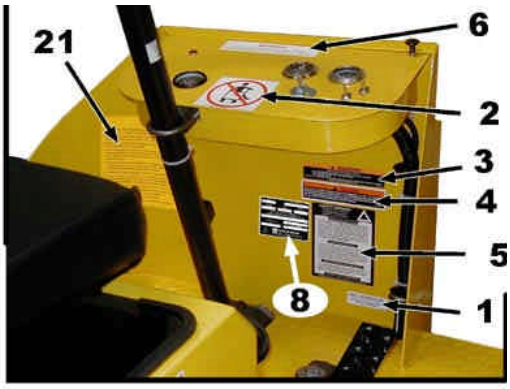


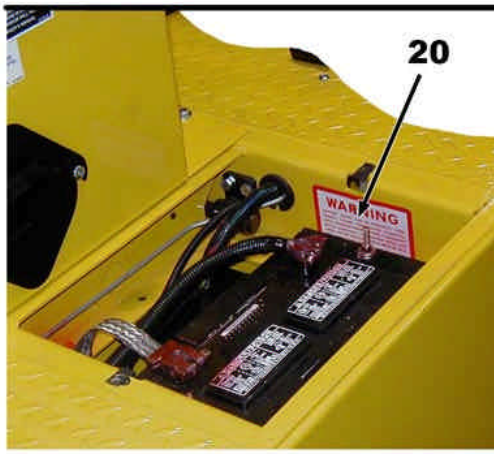
Frame and Body			
ITEM #	PART #	DESCRIPTION	QTY
1	01-661-68	Transmission access cover (not painted)	1
2	00-661-06	Engine cowling (not painted)	1
3	00-661-07	Seat mounting plate	1
4	458-55	Driver seat, standard	1
	90-160-70	Driver seat, optional (grammer seat)	
Not shown	90-160-71	Spacer for grammer seat	2
5	914-36	Arm rest, standard (left and right)	1
Not shown	90-160-60	Arm rest, optional for Grammer seat (left and right)	
6	00-661-09	Instrument panel (not painted)	1
7	350-01101	Battery access cover (not painted)	1
8	01-661-72	Spark plug access cover	2
Not shown	436-00034	Mud gaurd (behind front axle)	1

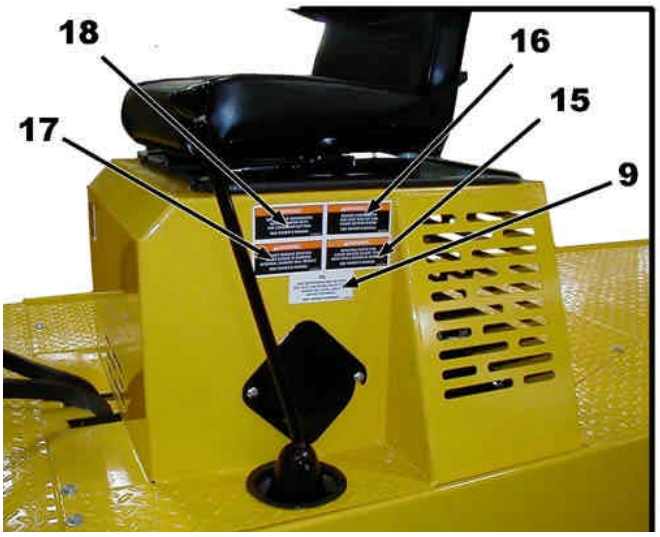
Battery			
ITEM #	PART #	DESCRIPTION	QTY
1	77-054-10	Battery	1
2	50-243-11	Battery hold down rod	2
	88-069-81	1/4NC Lock nut	2
	88-068-60	1/4 Cut flat washer	2
3	00-661-08	Battery hold down bracket	1

Decals









Decals			
ITEM #	PART #	DESCRIPTION	QTY
1	94-301-41	Brake fluid	1
2	94-301-44	Hands and feet	1
3	94-384-14	When leaving vehicle	1
4	94-384-01	Not a motor vehicle	1
5	94-313-20	Safety	1
6	94-309-00	Hand brake	1
7	94-306-03	Heat shields	1
8	94-373-17	Data plate, metal	1
	94-373-05	Data plate, decal	1
9	94-306-05	Oil type	1
10	94-306-01	Fuel	1
11	94-306-04	Rotating parts	1
12	94-306-06	Do not remove dipstick	1
13	94-306-02	Speeding	1
14	94-306-05	Oil type	1
15	Same as #11	Rotating parts	1
16	Same as #7	Heat shields	1
17	Same as #12	Do not remove dipstick	1
18	Same as #13	Speeding	1
19	962-91	Kalamazoo	1
20	703-00066	Battery	1
21	703-00060	Caution	1
Not shown	94-313-00	Battery warning	1
	94-319-00	Battery disconnect	1

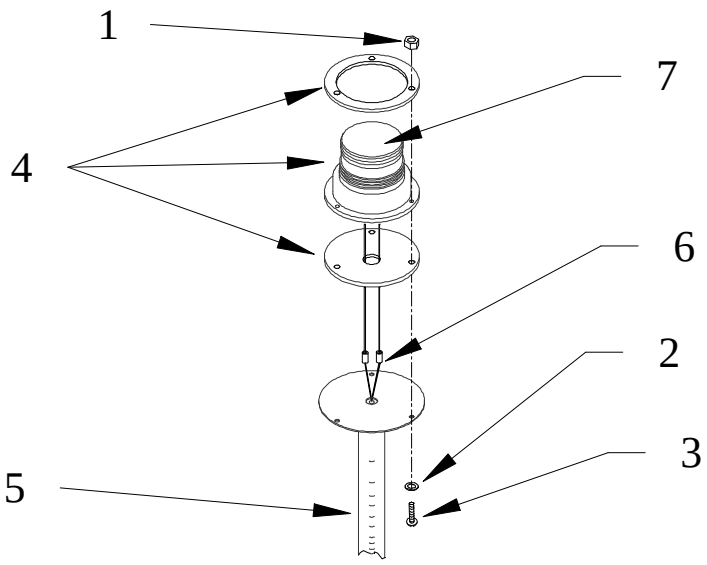
Trailer Hitches

Pintle Hitch

Auto Coupling Hitch

Trailer Hitches			
ITEM #	PART #	DESCRIPTION	QTY
	97-808-00	Automatic Coupling hitch	
	97-804-01	Pintle hitch	
	88-140-14	1/2NC x 1-1/2 Hex bolt	4
	88-149-80	1/2NC Hax nut	4
	88-148-62	1/2 Split lock washer	4

Strobe Light Option (on pole)



Passenger Seat Option

Illustration not available

Strobe Light on Pole			
ITEM #	PART #	DESCRIPTION	QTY
1	88-029-80	8-32 Hex nut	3
2	88-028-62	#8 lock washer	3
3	88-025-06	8-32 x 1/2 Machine screw	3
4	72-023-20	Strobe assembly (amber)	1
5	72-023-42	Mounting pole (top)	1
	72-023-44	Mounting pole (bottom)	1
6	75-106-16	Harness	1
7	72-023-22	Amber lens	1
	72-023-23	Red lens	1
Not shown	72-023-21	Replacement bulb	1
	00-661-10	Mounting bracket	1
	88-100-11	3/8NC x 1 Hex bolt (base mounting)	7
	88-109-81	3/8NC Lock nut (base mounting)	7
	88-108-61	3/8 SAE Flat washer	9
	88-100-15	3/8NC x 1-3/4 Hex bolt (pivot bolt)	1
	88-109-83	3/8NC Acorn nut (for pivot bolt)	1

Passenger Seat Option			
ITEM #	PART #	DESCRIPTION	QTY
	357-00020	Seat frame	1
	357-00021	Seat frame support	1
	437-00008	Seat back cushion	1
	437-00009	Seat cushion	1

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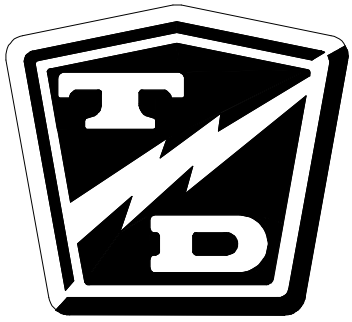
APPENDIX A-Special Tools



Special Tools

DESCRIPTION	PURPOSE	PART NUMBER
Pinion Seal Installation Tool	Used to install the pinion seal on all chain drive trucks with the band style brake or the speed sensor on the chain case cover.	43-201-50
Chain Case Centering Tool	Used to center the chain case on the pinion shaft on all chain drive trucks with the band style brake or the speed sensor on the chain case cover. Includes instructions.	41-532-50
Test Light	Used for testing electrical circuits. Powered by the truck batteries, switchable for 12, 24, 36, and 48 volts.	62-027-00
Accelerator Test Harness	Used to test the solid state accellerator module part number series 62-033-XX.	62-027-31
PMC Test Kit	Includes 62-027-00, 62-027-31, and supplementary troubleshooting manual M3-001-06. For controllers equipped with pins labeled KSI and #2 only.	62-027-60
Curtis® PMC Handheld Programmer	Used to test and program the 62-215-00 PMC speed control used on early model C4-25 Huskey.	62-027-10
GE® EV1 Analyzer	Used to test the GE® EV1 speed control.	62-027-20
PMT/C Meter Reset Module	Used to reset the PMT/C maintenance meter after a maintenance is completed.	96-500-43
Sevcon® Handset Analyzer (read only)	Used to test the Sevcon® control systems and reset the Smart View display (includes instructions).	62-027-61
Sevcon® Handset Analyzer with Speed Adjust Capability	Same as 62-027-61 (above) plus allows a limited range of speed adjustment.	62-027-62
Disc Brake Boot Installation Tool	Used to install the rubber boot on all disc brake bodies.	41-350-13
Pin Removing Tool	Used to remove pins and sockets from AMP connectors.	75-440-55
Pin Removing Tool	Used to remove pins and sockets from MOLEX connectors.	75-442-55
Hydrometer	Used to check the specific gravity of battery electrolyte.	77-200-00
Battery Filler	Used to safely add water to batteries.	77-201-00
Retaining Plate Depressor	Used to hold down the retaining plate when disassembling the steering gear on trucks equipped with the tilt steering.	96-500-39
Fork Collar Weld Jig	Used when replacing the fork collar on models MX-600 and SS5-36.	96-500-40
Secondary Sheave Holder	Used to hold the secondary sheave (pulley) from turning on models R6-80 and B6-10 with the Yamaha drive.	96-500-14
Solder Kit For Field Stud	Used to solder the aluminum field wire to the field stud. For use on motors with soldered connections only.	70-210-63
Pinion Gear Holding Tool	Used to align the Pinion Gear and Case during assembly and disassembly.	96-500-42

Appendix B: Standard Hardware Suggested Torque Limits

TABLE OF CONTENTS

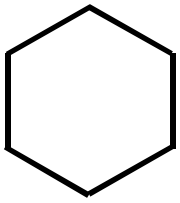
HARDWARE IDENTIFICATION

Standard Head Markings

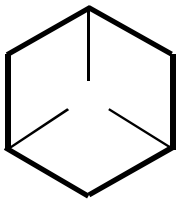
NOTE: Torque value used should be for lowest grade of hardware used. If a grade 2 nut is used on a grade 8 bolt, use grade 2 torque value.

NOTE: Toque values specified are for clean dry threads.

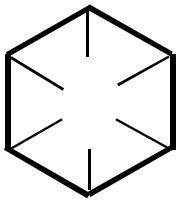
Hex Bolts



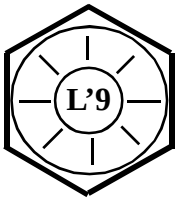
S.A.E. Grade 2



S.A.E. Grade 5



S.A.E. Grade 8



L'9

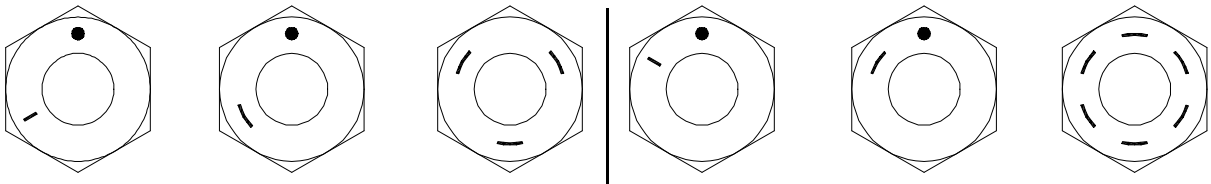
Other Bolts

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



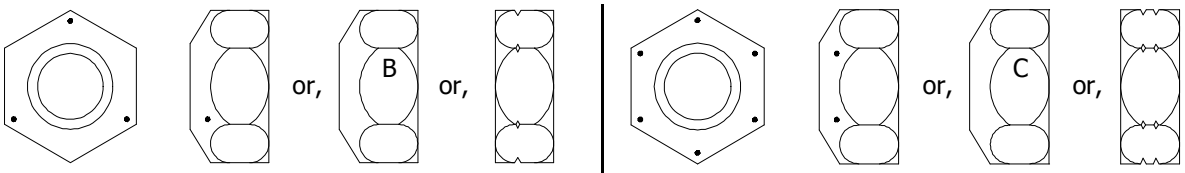
S.A.E. Grade 5

S.A.E. Grade 8

Hex Lock Nuts (stover)

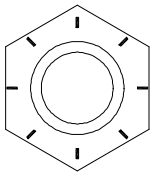
Lock nuts use a letter to indicate the grade of the nut. Grade A' locknuts would be the equivelent of Grade '2' hex nuts, Grade 'B' as Grade '5' and Grade 'C' as Grade '8'.

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



S.A.E. Grade B

S.A.E. Grade C



Grade L'9

Other Nuts

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

SUGGESTED TORQUE VALUES (non-critical hardware)

Diameter and TPI	Grade 2 Tightening Torque (ft-lb)	Grade 5 Tightening Torque (ft-lb)	Grade 8 Tightening Torque (ft-lb)	L'9 Tightening Torque (ft-lb)
1/4-20	4-7	7-10	10-14	11
1/4-28	5-8	8-12	11-16	12
5/16-18	9-14	14-21	20-29	22
5/16-24	10-15	15-23	22-33	25
3/8-16	16-24	25-37	35-52	40
3/8-24	18-27	28-42	40-59	45
7/16-14	26-38	40-59	56-84	65
7/16-20	29-43	44-66	62-93	70
1/2-13	39-59	60-90	85-128	95
1/2-20	44-66	68-102	96-144	110
9/16-12	56-84	87-131	123-184	140
9/16-18	63-94	97-146	137-206	160
5/8-11	78-117	120-180	170-254	195
5/8-18	88-132	136-204	192-288	225
3/4-10	138-207	213-319	301-451	350
3/4-16	154-231	238-357	336-504	390
7/8-9	222-334	344-515	485-728	565
7/8-14	245-367	379-568	534-802	625
1-8	333-500	515-773	727-1091	850
1-14	373-560	577-866	815-1222	930
1.125-7	472-708	635-953	1030-1545	1700
1.125-12	530-794	713-1069	1156-1733	1850
1.25-7	666-999	896-1344	1454-2180	2950
1.25-12	738-1107	993-1489	1610-2414	3330

SUGGESTED TORQUE VALUES *(critical hardware)*

Torque Table

Group	Description	Torque Range Ft-Lbs	In-Lbs	Nm
Brakes				
	Brake bolt (disc brake body)	11 - 11	132 - 132	15 - 15
	Brake line tube nut fittings	12 - 13	144 - 156	16.3 - 17.7
	Brake spider bolts (Dana 160mm hyd brakes)	25 - 35	300 - 420	34 - 47.6
	Brake spider bolts (Dana 160mm mech brakes)	15 - 19	180 - 228	20.4 - 25.8
	Brake spider bolts (Dana 7x1-3/4 brakes)	16 - 20	192 - 240	21.8 - 27.2
Electrical				
	Battery terminals	8 - 9	96 - 108	10.9 - 12.2
Front Axle				
	Front spindle nut	-	-	-
	Note: Refer to maintenance section in the service manual			
	King pin	-	-	-
	Note: Refer to maintenance section in the service manual			
Rear Axle/Transmission				
	3rd member Gear case cover (GT drive)	45 - 50	540 - 600	61.2 - 68
	Axle bolt (GT drive)	275 - 275	3300 - 3300	374 - 374
	Axle hub nut (Dana)	95 - 115	1140 - 1380	129.2 - 156.4
	Axle tube to center section (Dana F-N-R)	25 - 35	300 - 420	34 - 47.6
	Carrier cap bolts (Dana)	100 - 120	1200 - 1440	136 - 163.2
	Differential Cover plate (Dana H12)	18 - 25	216 - 300	24.5 - 34
	Drain plug (Dana H12)	25 - 40	300 - 480	34 - 54.4
	Drain plug (GT drive)	21 - 25	252 - 300	28.6 - 34
	Gear case to 3rd member (GT drive)	18 - 20	216 - 240	24.5 - 27.2
	Motor mounting (GT/Dana)	6.5 - 7	78 - 84	8.8 - 9.5
	Pinion nut (F2/F3)	175 - 175	2100 - 2100	238 - 238
	Pinion nut (GT drive)	154 - 169	1848 - 2028	209.4 - 229.8
	Ring gear (Dana)	35 - 45	420 - 540	47.6 - 61.2
	Wheel lug nut	75 - 90	900 - 1080	102 - 122.4
Steering				
	Ball joint clamp	28 - 32	336 - 384	38.1 - 43.5
	Ball joint nut	40 - 45	480 - 540	54.4 - 61.2
	Pitman nut (18-308-21 steering gear)	75 - 100	900 - 1200	102 - 136
	Pitman nut (18-308-25 steering gear)	181 - 217	2172 - 2604	246.2 - 295.1
	Rod end nut	20 - 25	240 - 300	27.2 - 34
	Steering shaft pinch bolt	24 - 26	288 - 312	32.6 - 35.4
	Steering wheel nut (18-308-21 steering gear)	28 - 32	336 - 384	38.1 - 43.5
	Steering wheel nut (18-308-25 steering gear)	72 - 86	864 - 1032	97.9 - 117
Suspension				
	Leaf spring hangers	-	-	-
	Note: Refer to maintenance section in the service manual			

A small sample of the many types of vehicles offered by Taylor-Dunn®

B 2-48-36 Equipped with optional hydraulic dump bed

B 1-00 Personnel carrier

BT 2-80 Eight passenger tram

MX 1600 Equipped with optional ladder rack and weld tanks

C 4-25 Huskey tow tractor

Appendix C

BRAKE LINING HANDLING PRECAUTIONS

⚠WARNING

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.

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.

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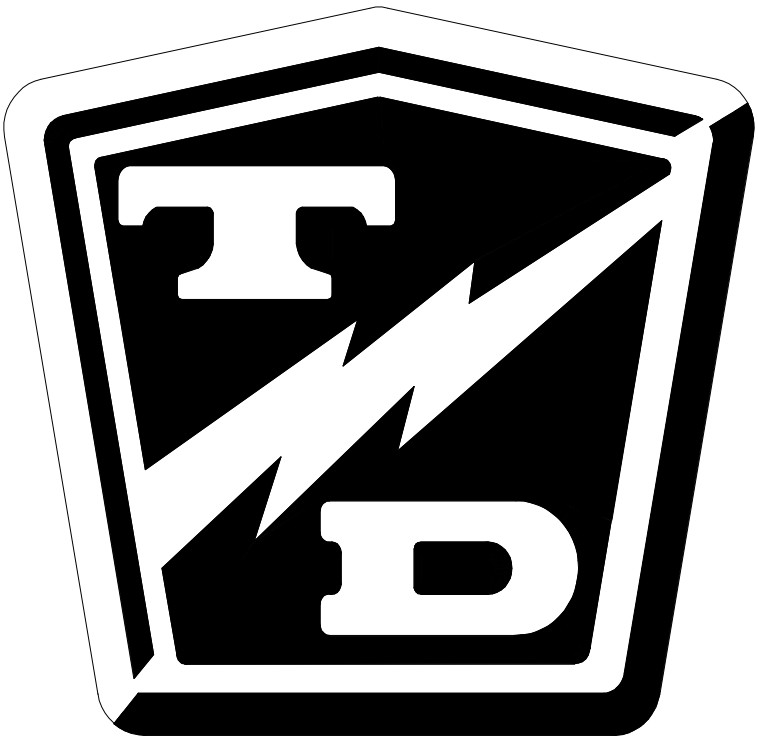

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