

# TM 1-1740-221-13&P

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TECHNICAL MANUAL

OPERATOR AND FIELD MAINTENANCE MANUAL

INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST

FOR

**MT3 STANDARD AIRCRAFT TOWING SYSTEM (SATS)**

**Part No. 47400 NSN 1740-01-575-5662 (EIC NA)**

DISTRIBUTION STATEMENT A – Approved for public release, distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

15 OCTOBER 2010



## **WARNING SUMMARY**

### **WARNING SUMMARY**

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel.

### **WARNING**

#### **PRECAUTIONARY DATA**

Personnel performing instructions involving operations, maintenance procedures and practices included in this technical manual, shall observe all of the following instructions. Disregard of these warnings and precautionary information can cause serious injury, death, or an aborted mission.

### **WARNING**

#### **DEATH**

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under these components being lifted or suspended. Use suitable lifting equipment for heavy components. Failure to follow these instructions can result in serious injury or death.

### **WARNING**

#### **EXPLOSION**

DO NOT use ether as a starting aid. The engine is equipped with glow plugs. Highly flammable ether and similar starting aids exposed to these devices can cause a fire or an explosion.

### **WARNING**

#### **ELECTRIC SHOCK**

Severe burns may result if personnel fail to observe safety precautions. Disconnect the battery connector before removing and installing components. Remove all rings, watches, and other jewelry when performing maintenance on this equipment. Do not attempt to service or otherwise make any adjustments, connections, or re-connections of wires until SATS is shut down and batteries are disconnected.

**WARNING**

**HYDRAULIC FLUID**

Hydraulic fluid is combustible. Do not use or store near flames, sparks, or hot surfaces. Use only in a well-ventilated area. If hydraulic fluid is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist can cause dermatitis and severe skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. Remove contaminated clothing and launder before reuse. If liquid contacts eyes, flush eyes with water immediately. If fluid is swallowed, do not try to vomit; fluid may enter the lungs and cause severe injury. Get immediate medical attention. When handling liquid, wear rubber gloves and impervious clothing to minimize contact. If prolonged contact with mist is likely, wear NIOSH/MSHA approved respirator.

**WARNING**

**FUEL (JP-8)**

Fuel (JP-8) vapors create fire and explosion hazards. Do not allow any open flame, smoking materials, or other potential ignition sources near fuel or the fuel system.

**WARNING**

**SEAT BELTS**

To prevent serious injury or death, all passengers on this vehicle must ride in the seats provided and fasten their safety belts.

**WARNING**

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death. If there is any prolonged contact with skin, wash contacted area with soap and water. Remove contaminated clothing and launder before reuse. If liquid contacts eyes, flush eyes with water immediately. If fluid is swallowed, do not try to vomit; fluid may enter the lungs and cause severe injury. Get immediate medical attention. When handling liquid, wear rubber gloves and impervious clothing to minimize contact. If prolonged contact with mist is likely, wear NIOSH/MSHA approved respirator.

**WARNING**

**DANGEROUS GASES**

Batteries generate explosive gas during charging: therefore, utilize extreme caution, do not smoke, or use open flame in the vicinity of the SATS vehicle when servicing batteries.

Exhaust discharge contains noxious and deadly flames and is very hot. Do not operate SATS vehicle in enclosed areas unless exhaust discharge is properly vented to the outside.

To avoid sparking between filler nozzle and fuel tank, always maintain metal to metal contact between filler nozzle and fuel tank when filling fuel tank. Don't smoke or use open flame in the vicinity of the SATS vehicle while refueling.

**WARNING**

**CLEANING COMPOUND SOLVENT, MIL-PRF-680**

Cleaning Compound Solvent, MIL-PRF-680, is combustible and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas (or use approved respirator as determined by local safety/industrial hygiene personnel). Keep away from open flames or other sources of ignition. When using solvents, clean parts in a well-ventilated area. Avoid inhalation of solvent fumes and prolonged exposure to skin to cleaning solvent. Wash exposed skin thoroughly. Cleaning compound solvent (MIL-PRF-680) used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 100 ° to 138 °F (38° to 59 °C).

**WARNING**

**HEARING LOSS**

The use of HEARING PROTECTION is required while the vehicles engine is operating and the engine cover is open or removed. The engine noise decibel level exceeds the limits of safety standards prescribed by OSHA.

**WARNING**

**WHOLE BODY VIBRATION**

Do not operate vehicle for more than 3 continuous hours. Minor body injury may occur.



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WASHINGTON, D.C., 15 OCTOBER 2010

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**OPERATOR AND FIELD MAINTENANCE MANUAL  
FOR**

**STANDARD AIRCRAFT TOWING SYSTEM MT3 SATS  
NSN 3930-01-575-5662**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can improve this manual. If you find mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter directly to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMA-NP, Redstone Arsenal, AL35898-5000. A reply will be furnished to you. You may also provide DA Form 2028 information to AMCOM via e-mail, fax or the World Wide Web. Our fax number is: DSN788-6546 or Commercial (256) 842-6546. Our e-mail address is 2028@redstone.army.mil. Instructions for sending an electronic 2028 may be found at the back of this bulletin. For the World Wide Web use: <https://amcom2028.redstone.army.mil>.

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**Current as of 15 October 2010**



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## HOW TO USE THIS MANUAL

### Purpose and Scope

This technical manual provides Operator's and Maintainer's usage and maintenance information for the MT3 Standard Aircraft Towing System (SATS), P/N 47400. The information includes component and assembly description, usage information, maintenance and supporting data.

### ARRANGEMENT, IDENTIFICATION, AND LOCATION OF FRONT MATTER, CHAPTERS, WORK PACKAGES, AND REAR MATTER

#### Front Matter

The front matter includes such items as the Warning Summary, List of Effective Pages, Table of Contents and How to Use instructions.

#### Chapters and Work Packages

The WP's contain information pertinent to the performance of specific tasks. Each WP is maintained as a separate entity. The WP's are grouped into Chapters based on overall content. WP's are arranged in numerical sequence regardless of chapter division. The chapter divisions and the WP's contained within the chapters are listed in the Table Of Contents.

**Chapter 1** – General Information, Equipment Description, and Theory of Operation. Information required providing the user with a physical and functionally explaining how the equipment operates.

**Chapter 2** – Operator Instructions. This chapter provides a description of the operator controls and indicators and provides instructions for operating the equipment in detail.

**Chapter 3** – Troubleshooting Procedures. The troubleshooting procedures are presented according to the fault symptoms observed during the operational check procedures in Chapter 4.

**Chapter 4** – Maintenance Instructions. This chapter provides information on performing preventive and corrective maintenance actions. Included are instructions concerning inspection, preventive maintenance checks and services, operational check and repair actions including subassembly/component removal installation procedures.

**Chapter 5** – Maintenance Instructions. This chapter provides information to support the inspection procedures in Chapter 4. Included are a list of Work Packages used to perform maintenance actions on the SATS vehicle and several supporting work packages.

**Chapter 6** – Parts Information. This chapter provides information on components used in repair procedures for the SATS. Part numbers, stock numbers and cage codes when applicable are used by the maintainer to gain access to inventory in the Army supply system.

**Chapter 7** – Supporting Information. This chapter provides support information used by operators and maintainers. The Maintenance Allocation Chart (MAC), Expendables and Durable Items List, Standard Torque Chart and additional support information is provided.

### FINDING INSTRUCTIONS YOU NEED

Primary paragraph title heads in bold upper case letters. Secondary level paragraphs are denoted by bold headings set in Upper and Lower Case Type. These paragraphs always relate to and are subordinate to the most recent primary paragraph heading. Figures and Tables are titled, numbered, and listed in the table of contents under the chapter and WP they appear and if you follow the leader line the last digit is the page number of the WP where the table is shown.

### Levels of Maintenance Accomplishment

(A) Army users shall refer to the MAC for tasks and levels of maintenance to be performed on the SATS.

### WARNINGS, CAUTIONS AND NOTES

Warnings, Cautions and Notes are inserted throughout the TM and should always be observed by the operator and maintainer. **Warnings**, if not observed can cause death or personal injury, **Cautions**, if not observed can cause damage to equipment and **Notes** are procedures that must be highlighted.



## **CHAPTER 1**

# **GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION**





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**FIELD MAINTENANCE****GENERAL INFORMATION**

---

**SCOPE**

This technical manual contains instructions for operation and maintenance of the MT3 Standard Aircraft Towing System (SATS).

Type of Manual:	Operator and Field Maintenance
Equipment Name:	MT3 SATS
Purpose of Equipment:	The MT3 SATS is a stand-alone unit of aviation ground support equipment.
	The MT3 SATS primary function is to tow and reposition Army Aviation Ground Support Equipment (AGSE) and all Army aircraft.

**MAINTENANCE FORMS, RECORDS, AND REPORTS**

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual; DA PAM 738-751, Functional Users Manual for the Army Maintenance Management Systems (TAMMS) DA PAM 738-750, Functional Users Manual for the Army Maintenance Management Systems - Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.

**REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR) and PRODUCT QUALITY DEFICIENCY REPORTS (PQDR).**

If your MT3 SATS Tow Vehicle needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. If you have Internet access, the easiest and fastest way to report problems or suggestions is to go to <https://aeps.ria.army.mil/aepspublic.cfm> (scroll down and choose the "Submit Quality Deficiency Report" bar). The Internet form lets you choose to submit an Equipment Improvement Recommendation (EIR), a Product Quality Deficiency Report (PQDR) or a Warranty Claim Action (WCA). You may also submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 via e-mail, regular mail, or facsimile using the addresses/facsimile numbers specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

**CORROSION PREVENTION AND CONTROL (CPC)**

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking.

SF Form 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

**DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE**

Destruction of Army material to prevent enemy use shall be in accordance with TM 750-244-6.

**PREPARATION FOR SHIPPING OR STORAGE**

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to assure operational readiness.

**WARRANTY INFORMATION**

The Standard Aircraft Towing System (SATS) is warranted for two (2) years. The warranty starts on the date found in block 23 of DA Form 2408-9, Equipment Control Record. Report all defects to your supervisor, who will take appropriate action.

**LIST OF ABBREVIATIONS/ACRONYMS**

The following abbreviations/acronyms are used in the manual.

AGSE Aviation Ground Support Equipment  
CCA Cold Cranking Amps  
GMTK General Mechanic's Tool Kit  
SATS Standard Automotive Tool System  
NBC Nuclear, Biological, and Chemical  
SAE Society of Automotive Engineers  
SATS Standard Aircraft Towing System  
PSI Pounds Per Square Inch

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE  
EQUIPMENT DESCRIPTION AND DATA**

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**EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

**EQUIPMENT DESCRIPTION**

**Intended Use**

The MT3 SATS is a towing vehicle capable of repositioning Army aircraft while transporting two crew members, a standard aircraft towing bar, aircraft ground handling wheels, and two NATS toolboxes (or equivalent). The MT3 SATS provides Army aviation units with a standardized, all weather, day or night capability to quickly, safely, and efficiently reposition Army aircraft and AGSE.

**LOCATION AND DESCRIPTIONS OF MAJOR COMPONENTS**

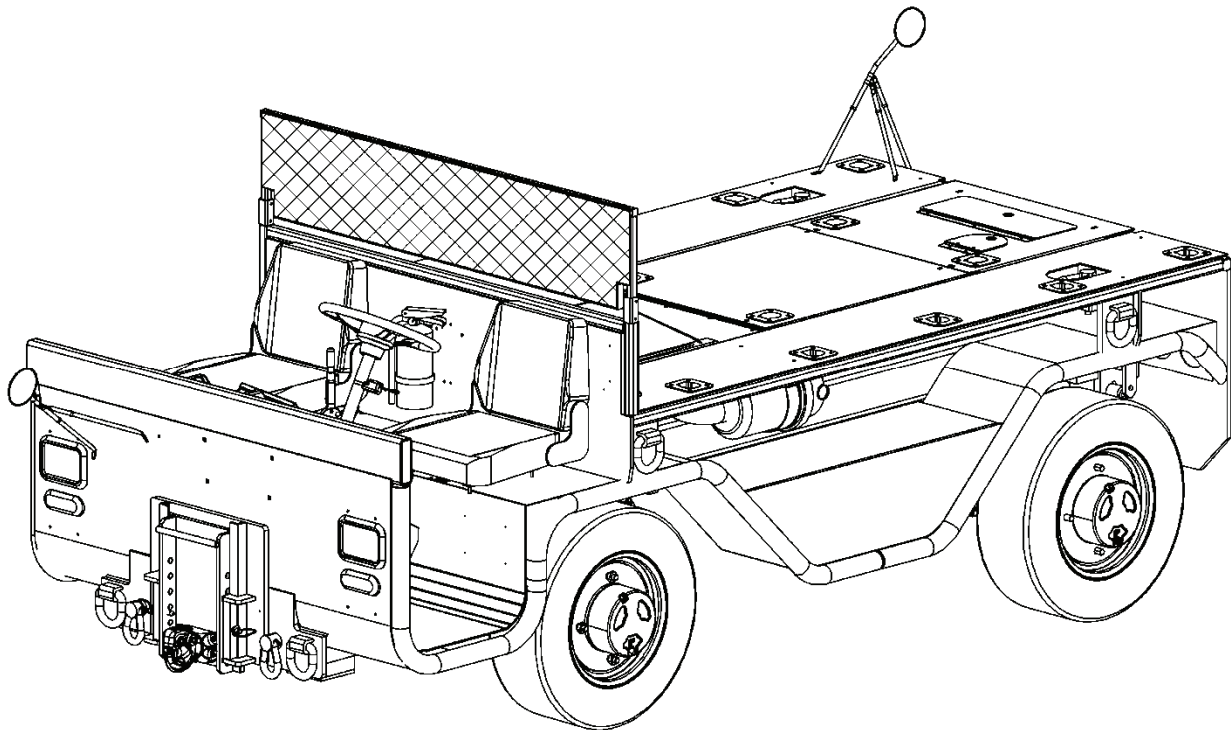


Figure 1. MT3 Standard Aircraft Towing System (SATS).

**Frame, Chassis Assembly**

Heavy-duty precision aligned, 1-piece steel tubing and plate welded structure. All frame and body surfaces are shot blasted, primed, and painted with weather resistant paint. Standard bolts are SAE grade 5, zinc-phosphate coated to resist corrosion.

**Cooling System**

A radiator system is provided for engine cooling. The radiator is mounted to the engine cradle and is insulated from vibration. An oil cooler mounted to the front side of the radiator provides transmission cooling.

### **Transmission**

The ITL Model PS750 Powershift automatic provides one reverse and two forward speed ranges. Forward and reverse speed ranges are obtained through the use of electrically controlled solenoids and hydraulically actuated multiple disc clutches.

The power from the engine is transmitted to the transmission through a torque converter. The use of the torque converter has two distinct advantages, one is the converter is essentially a fluid drive, there is no direct mechanical connection. This feature creates smooth and shock free drive eliminating engine stalling and lugging.

An input clutch assembly contains two hydraulically operated clutches; one clutch provides a forward low ratio drive and the other a forward high ratio drive. A three-position solenoid is energized by the shift lever to direct pressurized oil to either the forward low or the forward high clutch.

Likewise, when the shift lever is used to select reverse, the three-position solenoid is energized to direct pressurized oil to reverse clutch.

The transmission park position is achieved by an electric actuator operating a caliper on the brake disc mounted to the transmission output shaft whenever the shift lever is placed in Park. When the shift lever is moved out of Park the electric actuator releases this caliper.

### **Lubrication System**

An oil pump draws oil through a strainer in the oil pan and circulates the oil through the engine. Before entering the engine, all the oil from the pump passes through the oil filter. Surplus oil drains back into the pan. Engine oil pressure is maintained by a spring-loaded, pressure-relief valve in the oil pump.

The screw-on oil filter has an internal relief valve to bypass the filter if the element becomes clogged.

### **Fuel System**

A lift pump draws fuel from the fuel tank through a fuel water separator. This fuel water separator has a manual lift pump on it. Fuel is delivered through an inline fuel filter and then a final filter mounted on the engine. The fuel exits the final fuel filter and flows to the four injectors.

### **Air Intake Cleaner**

The air cleaner is a dry element type and is located on the left side of the tractor. It prevents dirt and other foreign materials from entering the engine.

### **Exhaust System**

The exhaust system consists of an exhaust manifold, exhaust pipe, muffler, and tail pipe. The exhaust manifold has large radius curves which permit exhaust gases to leave the cylinders with a minimum of back pressure and power loss. All parts of the exhaust system are well supported with clamps and hangers.

### **Electrical System**

Battery. The batteries are conventional 12-volt maintenance free type with a positive cable and a negative ground cable. The batteries are connected in parallel. Each battery has a minimum 800 CCA. The cables have protective boots at the battery end.

Alternator. Electrical power is supplied by a belt-driven 90 amp alternator mounted on the front of the engine. It produces three-phase alternating current and voltage, rectified to DC. The alternator does not require a cutout relay.

A current regulator is part of the alternator assembly. It determines output current according to load, such as headlights, rear lights, etc.

Starter. A starter lockout switch prevents starter and ring gear damage when engine is running. Tractor starts only in Park. All circuits are protected with circuit breakers and/or fuses.

The starter motor is a gear reduction type and is used to turn the engine fast enough to start the engine.

Lights and Accessories. Two headlights are on the front of the tractor. The stop/tail lights and rear backup lights are in the rear body. The backup lights can also be used as work lights (there is a separate switch for this purpose). Turn signal lights are below the headlights on the front and combined with taillights on the rear.

**Dash Panel**

The dash panel is a NEMA 4, rain tight enclosure with automotive type instrumentation. Indicator lights are provided to give visual status of various operations and functions. A rotary dimmer switch allows varying the back light intensity of the instrumentation. Indicator lights are “iris” adjustable type to vary the intensity of the light.

**Axles**

Front and rear brakes are driven and contain wet disc packs for service brakes. Front axles are steerable.

**Brake System**

Service Brake. Brakes are four wheel service brakes. Dual brake system serves front and rear wheels independently. In the event of an engine failure, braking is still by application of the service brake pedal.

The brake pedal is located on the floor, to the right of the steering column. The service brakes, both front and rear, are “wet” disc type, fully enclosed and oil cooled. They will withstand repetitive use without excessive fading, provide short stopping distances, and are spark free.

Parking Brake. The parking disc brake is located on the transmission output shaft. It is applied manually with the park brake lever. The park brake should always be applied and released as required. An indicator light on the dash will come on whenever the parking brake is applied.

**Steering System**

The system is hydraulically assisted orbital and uses a single hydraulic cylinder built into the front axle to pivot the wheel hubs. A hydraulic reservoir is provided for hydraulic oil supply and an engine driven pump provides hydraulic pressure.

In case of engine failure, emergency steering is manual only, and will only be possible if the tow tractor is rolling.

**Table 1. Specifications and Capabilities**

<b>TOW TRACTOR</b>	
Type of Vehicle:	All Wheel Drive, Model MT3 Towing Tractor
Gross Weight (Approx)	9950 lb
Drawbar Pull (on improved surfaces)	8000 lb
Speed in D1 Loaded	5 mph
Speed in D2 Empty	17 mph
Fuel Tank Capacity	20 gal. (76 L)

<b>ENGINE</b>	
Model	Kubota V3600-T-E3b
Type	4 Cycle Diesel
Emissions	Tier 3
Displacement	221ci (3.6l)
Hp @2600 Rpm	84
Torque, Peak	212 ft-lb @ 1600 rpm
Number of Cylinders	4
Aspiration	Turbocharged
Dry Weight	606 lb
Hydraulic Pump	Direct Driven
<b>TRANSMISSION</b>	
Make	ITL, Four Speed Fully Automatic
Type	Power Shift W/Torque Converter
Model	PS750
Control	ECU
Selectable Ranges	Park (P), Reverse (R), Neutral (N), D1 (low range), D2 (hi range)
<b>AXLES, SUSPENSION</b>	
Axles	ITL Model SD40
Front Axle	Steering Single Steer Cylinder
Rear Axle	Limited Slip
Weight w/o Wheels	540 lb
Input Yoke	1480
Mounting	Pad Mounted to Leaf Springs
Wheel Bolt	3/4-UNF 4 Bolt
Suspension	Front and Rear Leaf Springs W/Shock Absorbers
<b>TIRES</b>	
Tire	LT225/75R16 - 10 PR, Tubeless
Inflation Pressure	80 psi
<b>BRAKES, SERVICE</b>	
Application	Hydraulic, Foot Operated
Type	Oil Immersed Multi-Plate Disc Located in Axles
Power	Hydraulic Assist, Non Powered
<b>BRAKE, PARK POSITION</b>	
Application	Applied with gear selector in the Park Position
Type	Caliper actuated on Transmission output disc
<b>ELECTRICAL SYSTEM (12 Volts)</b>	
Alternator Output	90 amps, current regulated
Batteries (2), Maintenance Free	800 CCA, Connected in parallel
<b>INSTRUMENTATION &amp; CONTROLS</b>	
Dash Panel	Raintight, NEMA 4 enclosure
Gauges and Switches	Automotive type, weather resistant

Lighting	Front sealed beam headlamps, front turn signal lights rear combination red tail/brake/turn lights rear backup lights, rear work lights
Horn	Button in steering wheel
Service Brake and Accelerator Pedals	Automotive type, foot actuated
Transmission Shift Control	Electronic quadrant type shifter
Hand Brake	Manual lever applied
<b>PINTLE HITCHES</b>	
Mounting	Front and Rear, swivel w/spring cushions
Model	Holland PH-30SA41
Drawbar Eye Dimensions	2" to 3" ID w/ 1.25" to 1.63" Ø section
<b>STANDARD EQUIPMENT, OTHER</b>	
Operator and Passenger Seat Belts and Hip	
Guards	
Mirror Kit	
Backup Alarm	
Fire Extinguisher, 10 lb. Dry, tractor mounted	
<b>DIMENSIONAL DATA</b>	
See WP 0119 00, Figure 1 for unit dimensions.	

**END OF WORK PACKAGE**





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## FIELD MAINTENANCE

### THEORY OF OPERATION

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#### INTRODUCTION

The MT3 tow vehicle was designed for the primary function of towing and repositioning of Army Aircraft and Aviation Ground Support Equipment (AGSE). The operation of the MT3 tow vehicle does not require any unique skills more than the operation of standard automotive controls.

The MT3 was developed as a small to mid-range tow vehicle with a drawbar pull of 8000 lb and a work deck for use as a multi-purpose vehicle. It is a 4-wheel drive, rubber wheeled tow vehicle with main components of a welded frame structure, Kubota 3.6L Turbo Tier 3 compliant engine that is Jet-A compatible and coupled with an automatic 4-speed forward electronic shift transmission.

The SATS vehicle includes automotive style lighting, turn signals, and safety belts.

The braking system includes dual master cylinder with a pressure differential brake valve with red warning indicator light which illuminates if there is a loss of brake pressure in the front or rear brakes for safe operation.

The steering system is backed up by steering orbital valve that provides steering if the hydraulic pressure is lost.

It includes an audible warning for reverse operation and interlocks that require the park brake to be engaged and gear shifter in park to start the engine. It is designed to operate from -25 to 125 °F (52 to -32 °C).

This work package explains how the components and systems of the MT3 work together. A functional description is provided for each major system.

The MT3 tow vehicle consists of the following functional systems:

- Drive Train
- Fuel System
- Air Intake System
- Brake System
- Exhaust System
- Cooling System
- Instrumentation
- Hitches
- Steering System
- Electrical System

#### DRIVE TRAIN

The drive train of the MT3 consists of a Kubota V3600-T-E3b engine and an ITL Model PS750 fully automatic transmission that is connected to driveshaft's that connect to ITL Model SD40 axles with front axle steering with single steer cylinder.

The engine is 4-cycle diesel Tier 3 with four in-line cylinders. It generates 84 horsepower at a governed speed of 2600 rpm. Coupled with the ITL automatic transmission, it provides power to handle all requirements of the tow vehicle's mission. The MT3 tow vehicle provides Army aviation units with a standardized, all weather, day or night capability to quickly, safely, and efficiently reposition Army aircraft and AGSE.

A preheat (glow plug) system assists in cold-weather starting below 23 °F (-5 °C) as well as an engine block heater for extreme cold operation.

The transmission is coupled with a torque converter which provides one reverse and one forward speed in D1 and three forward speeds in D2. Forward and reverse speed ranges are obtained through the use of electrically controlled solenoids and hydraulically actuated multiple disc clutches.

#### FUEL SYSTEM

The fuel system uses a mechanical lift pump to draw fuel from the fuel tank through a fuel water separator. The fuel water separator is equipped with a manual push button primer pump used to remove air from fuel lines during the air bleed process. Fuel is delivered from the mechanical pump through a

filter mounted on the engine. The fuel exits the fuel filter and enters the injection pump and then to the four injectors.

Fuel for combustion is supplied by the low-pressure fuel system. The low-pressure fuel system also supplies excess fuel flow to cool the HEUI injectors and to remove air from the system. Components of the low-pressure system are:

- Fuel tank (20 gal (76 L) capacity)
- Fuel water separator and fuel filter
- Mechanical fuel transfer pump
- Fuel pressure regulator (Controls fuel flow back to the fuel tank).

## **AIR INTAKE SYSTEM**

The air intake system consists of a dual dry element type filter that is housed in the air cleaner assembly. The filter is located on the left side of the vehicle. It prevents dirt and other foreign materials from entering the engine.

## **BRAKE SYSTEM**

The MT3 tow vehicle is equipped with a service brake system that controls pressure application to the front and rear axles. This dual brake system serves front and rear wheels independently. In the event of an engine failure, braking is still by application of the service brake pedal. The service brakes, front and rear, are "wet" disc type, fully enclosed and oil cooled. They withstand repetitive use without excessive fading, provide short stopping distances, and are spark free. They are operated by a floor-mounted brake pedal to the right of the steering column.

The MT3 is equipped with a hand brake that actuates a caliper located on the transmission output shaft disc. It is applied and released manually.

The MT3 is also equipped with a park position motor that engages a caliper also located on the transmission output shaft disc when gear shifter is placed in the park position and disengages the caliper when the gear shifter is moved from the park position.

## **EXHAUST SYSTEM**

The exhaust system consists of an exhaust manifold, exhaust pipe, muffler, and tail pipe. Exhaust gases are removed from the engine through the exhaust manifold which has large radius curves which permit exhaust gases to leave the cylinders with a minimum of back pressure and power loss. The gases flow into exhaust pipes and a muffler to the atmosphere above and to the right side of the cab.

The exhaust manifold and all parts of the exhaust system are well supported with clamps and hangers.

## **COOLING SYSTEM**

The MT3 is equipped with a radiator and cooling fan to provide engine cooling. The radiator is insulated from vibration by rubber radiator isolator mounts.

An oil cooler is mounted to the front side of the radiator to provide transmission cooling.

The cooling system cools the engine by circulating (water pump) ethylene glycol-based coolant through the engine and radiator.

## **INSTRUMENTATION**

The dash panel is a NEMA 4, rain tight enclosure with automotive type instrumentation. Indicator lights are provided to give visual status of various operations and functions.

## **HITCHES**

A Holland PH-30SA41 hitch with swivel w/spring cushion is mounted at the front and rear of the vehicle. Drawbar eye dimensions are 2" to 3" ID w/1.25" to 1.63" Ø section with a drawbar pull of 8000 lb.

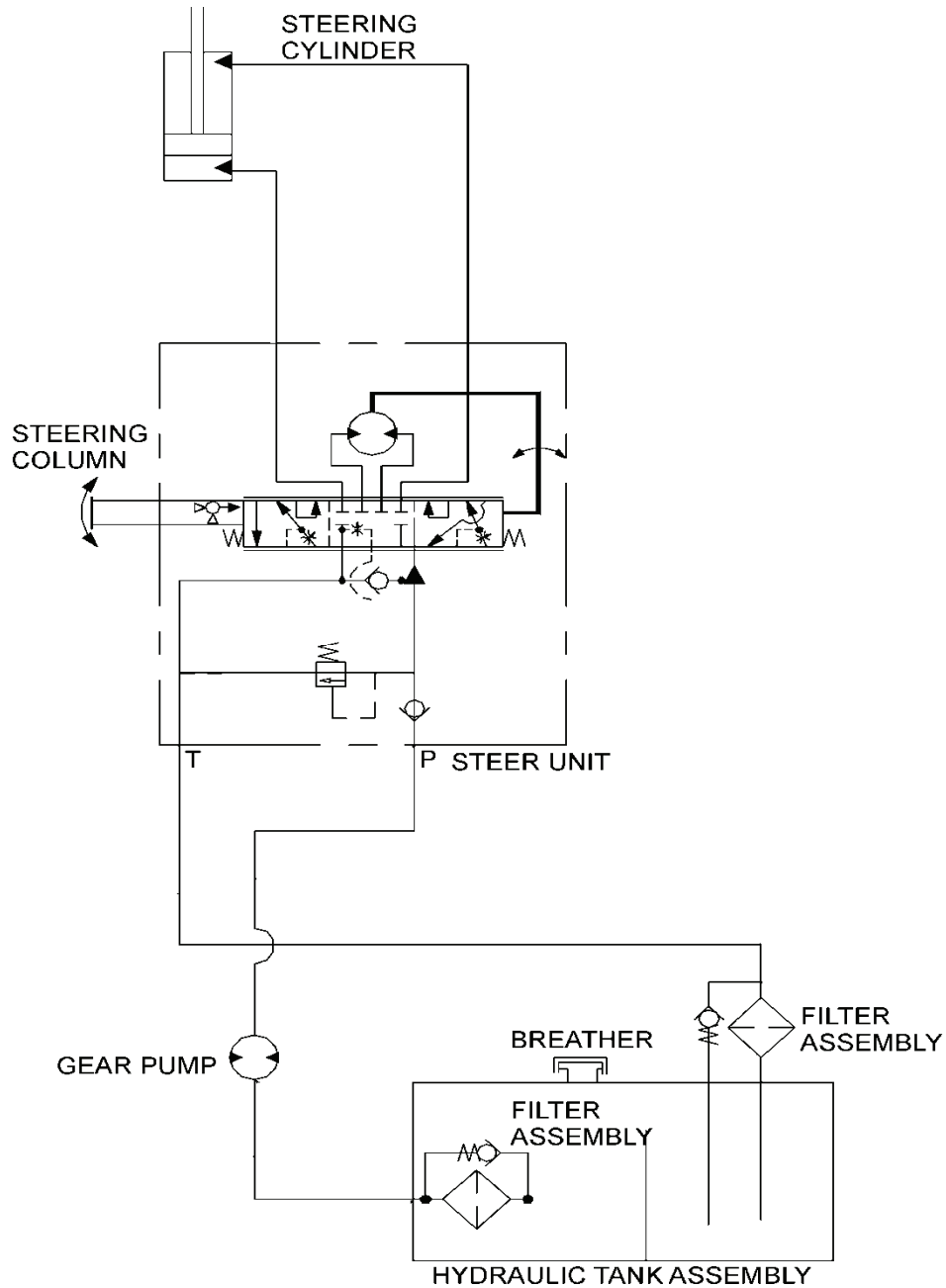


Figure 1. Steering System – Hydraulic Diagram.

**STEERING SYSTEM**

The power steering system (Figure 1) uses a gear pump to move hydraulic fluid from the hydraulic tank to the steering components as needed. The system uses a hydraulically assisted orbital valve to direct pressure to a single steering cylinder mounted on front axle to pivot the wheel hubs. Steering linkage connects to the left side of the ITL Model SD40 front steer axle.

## ELECTRICAL SYSTEM

### CAUTION

The SATS operates on a 12 volt negative ground system. Do not jumpstart or slave with a 24 volt system.

### GENERAL INFORMATION

The electrical system (FO-1) consists of two 12-volt maintenance free batteries connected in parallel to provide the cranking amps necessary for starting. Electrical power to keep the batteries charged is supplied by a belt-driven 90 amp alternator mounted on the front of the engine. It produces three-phase alternating current and voltage, rectified to DC. The alternator does not require a cutout relay. A current regulator is an integral part of the alternator. This current regulator determines output current depending on the load, such as headlights, rear lights, etc.

The starter motor is a gear reduction type and is used to turn the engine fast enough to start the engine. A starter lockout switch prevents starter and ring gear damage when engine is running. The vehicle starts only in park and the hand brake engaged. All circuits are protected with circuit breakers and/or fuses. Two headlights are on the front of the vehicle. The stop/tail lights and rear backup lights are in the rear. Turn signal lights are below the headlights on the front and combined with the taillights on the rear.

## ELECTRICAL SYSTEM, FO-1

### BATTERY CIRCUIT

Battery positive power is applied to the open contacts of the engine starter motor and the starter relay contacts (SR) and also through the 80 amp Glow Plug thermal circuit breaker CB1 to the open contacts of glow plug relay (GP), to the alternator battery output terminal and also through a 30 amp fuse 3FU to the battery contact terminal on the ignition switch and also through a 20 amp fuse 9FU to the open contacts of transmission circuit relay (CRT). Battery power is also applied through a 60 amp fuse 2FU to the open contacts of the accessory relay (CRA).

### IGNITION SWITCH CIRCUITS

Ignition switch in the run position, battery power is applied through a 5 amp fuse 8FU to the hold position on the fuel solenoid 50 also through a 10 amp fuse 5FU to the transmission ECU, through a 5 amp fuse 8FU which energizes the transmission circuit relay (CRT) also through the hand brake limit switch (hand brake lever engaged) energizing the starter interlock relay (CRSI), the hand brake relay (CRHB) and then power is also applied to the hand brake on indicator light on the operator panel which now illuminates. Also, power is applied to the accessory relay (CRA) from the ACC terminal on the ignition switch in the run position.

When the ignition switch is placed in the start position, battery power is applied to the starter relay (SR) (FO-1, line 9) as long as the starter interlock relay (CRSI) is energized (handbrake lever engaged) and the park relay (CRS) is energized (transmission shifter in the park position).

With the start relay (SR) energized a set of contacts (FO-1, line 2) is closed which applies power to the pull side of the fuel solenoid (max fuel position) and applies power to the starter solenoid which when energized closes the starter motor contacts allowing the Kubota engine to be started.

Ignition switch in the run position, power is applied through a 5 amp fuse 7FU to the operator panel indicator lights and gauges. With power applied to this circuit, the following occurs:

### HOURLY METER (G1) – Records Engine Operating Hours

NOT OPERATIONAL until engine is started, engine oil pressure closes the normally open oil pressure switch, therefore the hour meter only records actual engine operating hours.

**INDICATOR LIGHT, ENGINE OIL PRESSURE (PL6) – Operator Warning Light**

Illuminates with a loss of engine oil pressure. This light is on until the engine is started. The normally closed oil pressure switch supplies ground to the indicator light until engine has oil pressure. This engine oil pressure removes the ground from the circuit which allows the light to go out or extinguish, as long as the engine has oil pressure.

**INDICATOR LIGHT, ENGINE OVER-TEMP (PL7) – Operator Warning Light**

Light illuminates if engine coolant temperature switch in the circuit closes. Temperature switch closes if coolant temperature reaches 220 degrees.

**ENGINE COOLANT TEMP GAUGE (G2) – Indicates Engine Coolant Temperature**

Temperature sending unit in the circuit allows current to flow to the gauge proportional to the coolant temperature in the engine.

**FUEL GAUGE (G3) – Indicates Amount of Fuel in the Tank**

Fuel sending unit inside the fuel tank allows current to flow to the gauge proportional to the level of fuel in the tank.

**ENGINE OIL PRESSURE GAUGE (G4) – Indicates Engine Oil Pressure**

Oil Pressure sending unit in the circuit allows current to flow to the gauge proportional to the amount of oil pressure in the engine.

**TRANSMISSION TEMP GAUGE (G5) – Indicates Transmission Fluid Temperature**

Transmission temp sending unit in the circuit allows current to flow to the gauge proportional to the amount of fluid temp in the transmission.

**VOLTMETER, BATTERY CHARGING (G6) – Indicates Battery Charging Rate**

Battery charging current is provided by the 90 amp alternator. The charging rate is determined by battery condition, load and circuit condition.

**INDICATOR LIGHT, BRAKE FAILURE (PL2) – Operator Warning Light**

Light illuminates if the service brake system experiences a loss of brake pressure in any part of the system. If the service brakes loose system pressure, pressure switch BFS located on top of the brake valve closes and turns on PL2.

The following is a brief description of the various relays used to control various electrical circuits on the SATS vehicle.

**STARTER INTERLOCK RELAY (CRSI)**

Energized with the hand brake lever engaged, which allows the engine starter relay to be energized as long as the transmission shifter is in park.

**HAND BRAKE REAY (CRHB)**

When energized (hand brake lever engaged), opens a set of contacts (FO-1, line 41) which prevents the transmission from being engaged and closes a set of contacts (FO-1, line 40) which allows relays (CRI) and (CRP) to be energized.

When de-energized (hand brake lever released), the hand brake relay contacts switch positions which allows the transmission to be engaged.

**TRANSMISSION CIRCUIT RELAY (CRT)**

When energized power is applied from the CRT relay contacts (FO-1, line19), to the park position brake release and engages circuits, through the transmission shifter assembly (park position) to energize the park relay (CRS).

**ACCESSORY RELAY (CRA)**

When energized power is applied from the CRA relay contacts (FO-1, line 24), to the glow plug circuit, park position motor circuit, fuel heater circuit, horn circuit and all vehicle lighting circuits.

**GLOW PLUG RELAY (CRGP)**

This relay is energized when the glow plug switch (SW7) is placed to the on position. When energized a set of contacts is closed (FO-1, line 3) which allows power to the glow plugs during cold weather starting.

**TIME DELAY RELAY (TRD)**

This relay provides a power removal delay of one second to the transmission shifter assembly; this allows the transmission to be fully disengaged after placing the transmission shifter to the park position.

**PARK POSITION (TRANSMISSION) BRAKE RELEASE RELAY (CRR)**

This relay is energized when the transmission shifter is moved to any position other than park, which allows the park position motor (FO-1, line 31) to disengage the caliper located on the transmission output shaft disc. Power to this relay is controlled by the limit switch LS-PR (FO-1, line 35).

**PARK POSITION (TRANSMISSION) BRAKE ENGAGE RELAY (CRP)**

This relay is energized when the transmission shifter is moved to the park position, which allows the park position motor (FO-1, line 31) to engage the caliper located on the transmission output shaft disc. Power to this relay is controlled by the limit switch LS-PE (FO-1, line 37).

**PARK RELAY (CRS)**

This relay is energized with the transmission shifter in the park position, which closes a set of contacts (FO-1, line 9) which will allow the engine starter to be engaged. The hand brake must also be engaged.

**INTERLOCK RELAY (CRI)**

This relay works in conjunction with the park position brake limit switches LS-PR and LS-PE to engage and disengage the park position brake caliper located on the transmission output shaft disc. The park position motor (FO-1, line 31) moves a caliper actuator rod up and down, engaging and disengaging the brake caliper as the transmission gear shifter is shifted from park to any gear selection and back to park.

**FUEL HEATER CIRCUIT**

Power is applied through a 25 amp fuse (10FU) to a fuel heater coil located inside the fuel water separator assembly. This heater aids with engine starting.

**HORN CIRCUIT**

Power is applied through a 5 amp fuse (11FU) to a horn located under the front of the vehicle. A push button horn switch located on the steering wheel provides ground to energize the horn when pressed.

**HEADLIGHT CIRCUIT**

Power is applied through a 20 amp fuse (12FU) to the headlight switch (SW3) located on the operator dash panel. With the headlight switch in the on position power is applied through the headlight dimmer switch to turn on either the high or low beam lights. If the dimmer switch is in the high beam position power is also applied to the high beam indicator (PL4) located on the operator dash panel.

**PARKING LIGHTS**

Power is applied through a 20 amp fuse (12FU) to the headlight switch (SW3) located on the operator panel. With the headlight switch on power is applied to both right and left front parking lights.

**TAIL LIGHTS**

Power is applied through a 20 amp fuse (13FU) to the lower portion of the headlight switch (SW3). With the headlight switch on power is applied to the left and right rear tail lights.

**GAUGE LIGHTS**

Power is applied through a 20 amp fuse (13FU) to the gauge light dimmer rheostat (FO-1, Line 60) located on the operator dash panel. The operator uses the rheostat to light up the operator dash panel gauges during night operations.

**BRAKE AND TURN SIGNAL LIGHTS**

Power is applied through a 20 amp fuse (13FU) to the service brake stoplight switch and to the flasher (turn signal) relay. When the brake pedal is depressed the normally open stoplight switch (LS-SL) is closed and will illuminate the left and right rear brake lights through the directional turn signal switch (SW-5).

The turn signal flasher relay receives power from the 20 amp fuse (13FU) and operates the appropriate turn signals through the turn signal switch (SW-5).

**BACKUP ALARM (WARNING HORN)**

When the transmission gear shifter is placed in the reverse position, power is applied through the shifter assembly to the backup alarm to alert personnel of the hazard.

**REVERSE LIGHTS (BACKUP)**

When the transmission gear shifter is placed in the reverse position, power is applied through the shifter assembly to diode REC1 (FO-1, line 72). Power applied to the anode of REC1 forward biases the diode allowing the reverse lights to illuminate.

**WORK LIGHTS**

Power is applied through a 20 amp fuse (13FU) to the work light switch (SW6) located on the operator dash panel. When the work light switch is turned on power is applied to the work lights at the rear of the vehicle for night time operations.

**END OF WORK PACKAGE**





**CHAPTER 2**  
**OPERATOR INSTRUCTIONS**



**FIELD MAINTENANCE**  
**DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS**

**INTRODUCTION**

The following tables and illustrations provide description and use of the controls and indicators pertaining to the dash panel, accelerator pedal, brake pedal, high/low beam switch, and seats.

**Dash Panel**

All driver instruments are conveniently located on the dash panel.

**Accelerator Pedal**

The accelerator pedal is to the right of the brake pedal on the floor board.

**Brake Pedal**

The brake pedal is to the left of the accelerator pedal on the floor board. In the event of an engine failure, braking is still by application of the brake pedal.

**High/Low Beam Switch**

The High/Low beam switch is a floor-mounted switch and toggles the high-beam lights on/off.

**Seats**

The operator and passenger seats are adjustable for fore and aft, backrest inclination, and for body weight. Each seat position is provided with hip guards.

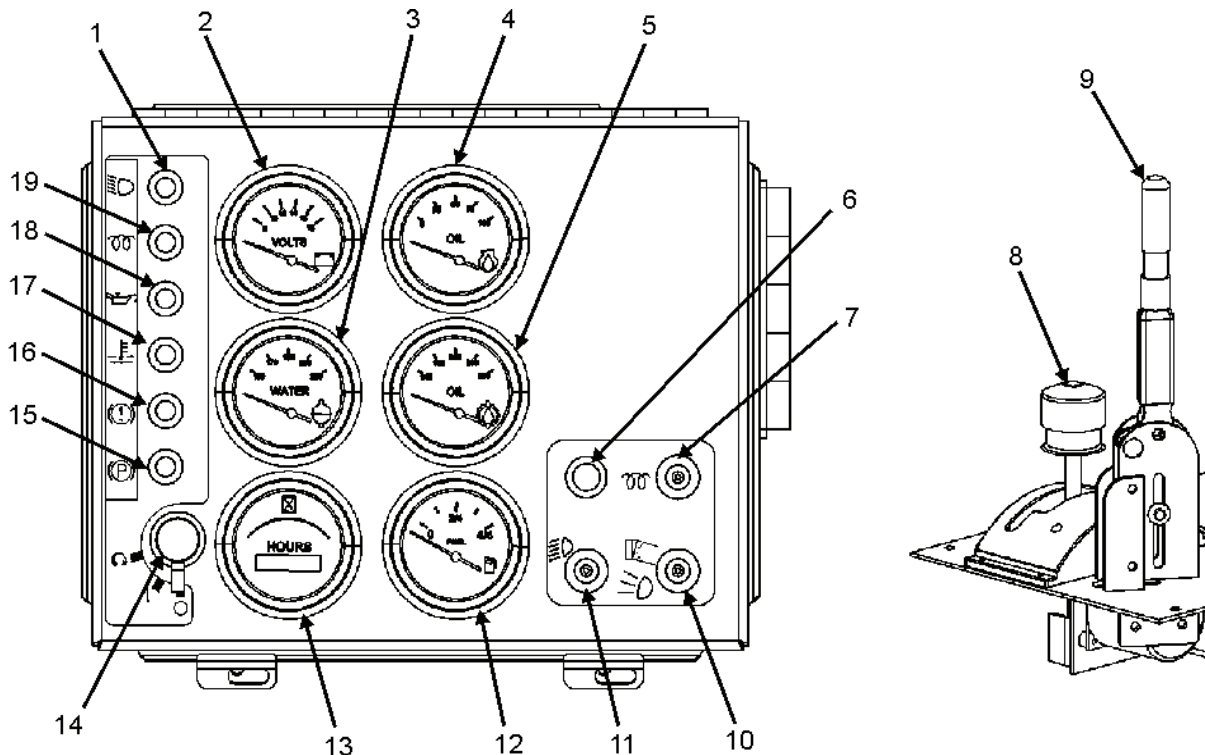


Figure 1. Dash Panel Controls and Indicators.

Table 1. Dash Panel Controls and Indicators

Key	Control/Indicator	Function
1	High Beam Indicator	When lit, indicates the high beam lights are in use.
2	Voltmeter	Registers voltage across the battery terminals. The needle must read 12-14 VDC while the vehicle is operating. If the needle registers in the red while the vehicle is operating, this is an indication that the battery is not being charged by the alternator. Stop the vehicle and inspect the battery, cables, and alternator connections
3	Engine Coolant Temperature Gauge	Shows the coolant temperature in the engine's water jacket. The gauge needle should rise when the engine is started, then level out at between 160 °F and 200 °F as the engine warms up. If the needle goes beyond 210 °F, stop the engine and check for a cooling system problem.
4	Oil Pressure Gauge	Indicates oil pressure only (not oil level). It is marked 0 to 100 PSI with intermediate index marks. If the gauge registers less than 20 psi or more than 60 PSI at operating rpm, stop the engine and troubleshoot the cause.
5	Transmission Temperature Gauge	Shows the temperature of the transmission fluid. Normal operating temperature is in the 160 to 200 °F range. If the needle goes past 250 °F, stop the engine and troubleshoot the cause.
6	Rotary Dimmer Switch	Controls intensity of back lit dash panel.
7	Glow Plug Switch	Controls glow plugs to preheat combustion chambers.
8	Gear Shift Lever	Permits selection of forward or reverse gears and a neutral and park position.
9	Park Brake Lever	Provides emergency braking.
10	Work Light Switch	Controls the rear work lights.
11	Headlight/Tail Light Switch	Turns on low beam headlights and the tail lights.
12	Fuel Gauge	Shows the amount of fuel in the fuel tank. A sending unit in the tank is connected to the gauge. The gauge is marked 0, 2/4, and 4/4 to indicate the relative quantity of fuel in the tank. Be sure you have sufficient fuel to complete your planned operation.

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13	Hour Meter	Registers how many hours the engine has operated. It is sealed and can record 99999.9 hours before it returns to zero.
14	Ignition Switch	A rotary type with OFF, RUN, and START positions.
15	Park Brake Applied Indicator	Indicates that the park brake is engaged.
16	Brake System Failure Indicator	Indicates a fault in the brake system.
17	Engine High Temperature Indicator	Indicates the engine temperature.
18	Engine Warning Low Oil Pressure Indicator	Indicates the engine oil is low.
19	Engine Pre-Heater	(Glow Plug) Indicator Indicates the engine is pre-heated.

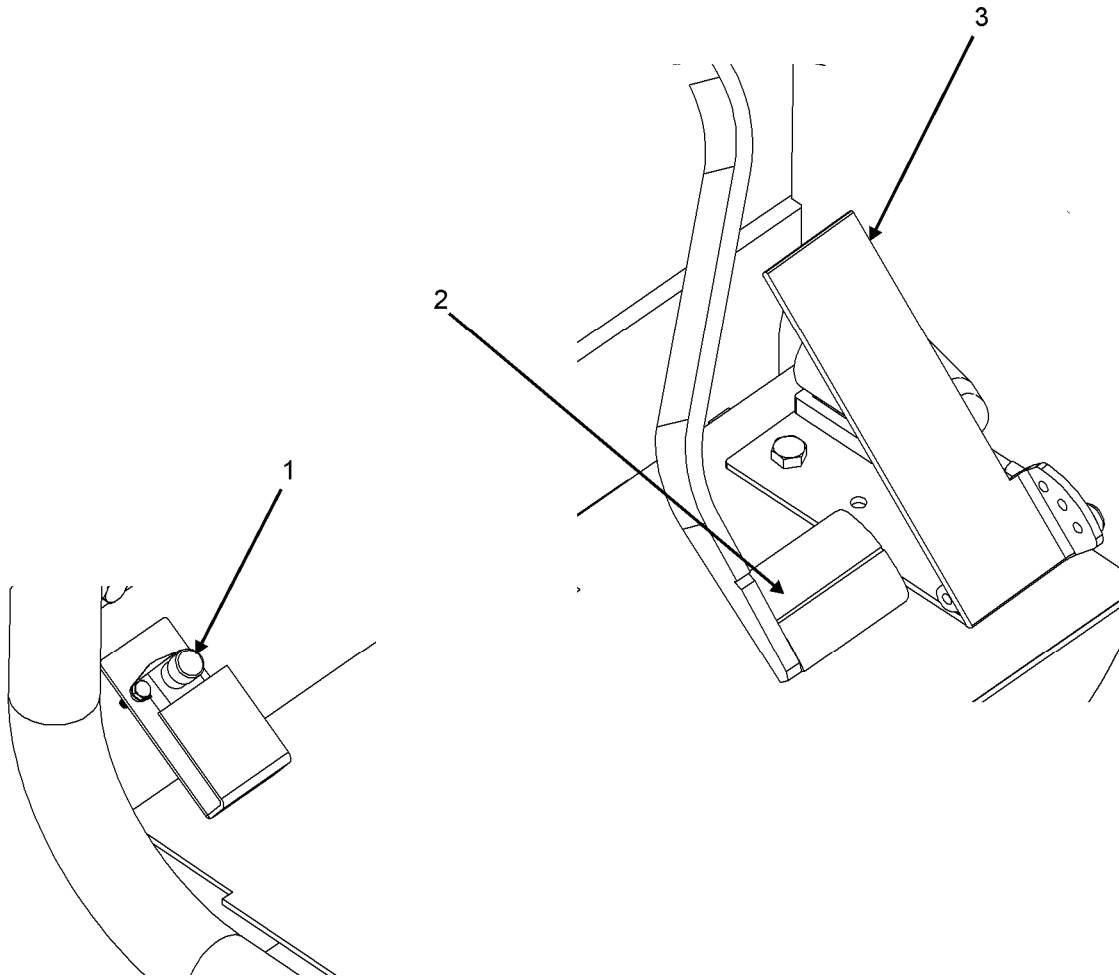


Figure 2. High/Low Beam and Pedal Controls

Table 2. High/Low Beam and Pedal Controls

Key	Control/Indicator	Function
1	High/Low Beam Switch	Switches the headlight from high to low beam.
2	Brake Pedal	Stops or slows the tow vehicle.
3	Accelerator Pedal	Increases the speed of the tow vehicle.

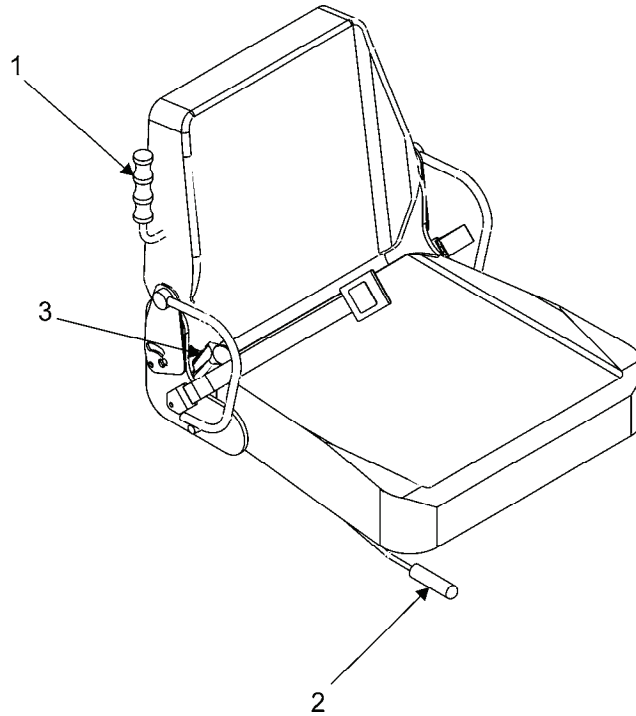


Figure 3. Seat Controls.

Table 3. Seat Controls

Key	Control/Indicator	Function
1	Back Adjust Lever	Allows the operator to adjust the lumbar support of the seat.
2	Fore/Aft Lever	Allows the operator to move the seat forward and backward in a range from 0 to 4.5 in.
3	Weight Adjust Knob	Allows the operator to adjust the seat for weight in a range from 110 to 320 lb.

END OF WORK PACKAGE





**OPERATOR MAINTENANCE  
OPERATION UNDER USUAL CONDITIONS**

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0017

WP 0070

WP 0119

**Tools and Special Tools**

N/A

**Materials/Parts**

N/A

**Personnel Required**

CMF 15 Series

**Equipment Condition**

N/A

**INSPECTION**

Operator will conduct a review of the forms to ensure no entries exist that will preclude operation. Perform all BEFORE, DURING and AFTER operation checks as outlined in the PMC prior to, during, and after operation of the vehicle.

**Table 1. Operator Level Preventive Maintenance Checks and Services for MT3 SATS Tow Tractor**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1	Before	SATS Vehicle	Perform walk around inspecting all systems and components for evidence of leaks, or damage affecting serviceability.	Class III leakage evident or component damage.
2	Before	Engine and Engine Fan Belt.	Check engine oil level and check that fan belt is installed and tight (WP 0025).	If oil level is low or high or fan belt is not installed or not tight.
3	Before	Cooling System and Coolant Level Check	Check overflow bottle coolant level is between the minimum and maximum marks. Cold engine- remove radiator cap, check fluid level is above the core. Inspect radiator, hoses and associated components for leaks or damage (WP 0045).	Coolant level is low or associated components are leaking or damaged.
4	Before	Transmission and Fluid Level Check	Check under transmission for evidence of leaks. Check transmission fluid level (WP 0036). It is necessary to start vehicle then shut down to properly check.	Transmission fluid level does not fall in operating range or transmission has a class III leak.
5	Before	Fuel Level	Check fuel level on the gauge or at tank.	Fuel level inadequate.
6	Before	Brake Reservoirs	Check brake reservoirs for proper fluid level (WP 0074). (DO NOT USE DOT 3)	Brake reservoir fluid level low.
7	Before	Hydraulic Tank (Steering)	Check hydraulic tank for proper fluid level (WP 0111).	Hydraulic tank fluid level low.
8	Before	Throttle System	Check throttle reservoir for proper fluid level, throttle slave cylinder and return spring for mount security, lines and components for leaks (WP 0107).	Throttle reservoir level low, slave cylinder leaking, missing or broken return spring or damage affecting serviceability.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
9	Before	Fuel Water Separator	Open petcock and drain a small amount of fuel into a cup or visually check the separator bowl (WP 0056) for evidence of contamination.	Presence of contamination in the fuel water separator bowl or drained fuel sample.
10	Before	Battery Cables and Batteries	Check that the batteries are properly installed and the cables are secure with no corrosion (WP 0090 and WP 0091).	Batteries improperly installed or battery cables loose or corroded.
11	Before	All Vehicle Lights.	Turn ignition switch on and verify that all vehicle lights operate (WP 0005).	Any lights not operable.
12	Before	Horn	Turn ignition switch on and activate the horn button and verify the horn works.	Horn inoperable.
13	Before	Backup Warning	Turn ignition switch on and place the gear selector in reverse and verify the backup alarm sounds.	Backup alarm inoperable.
14	Before	Axles	Visually inspect axles for evidence of leaks and mount security (WP 0066).	Class 3 leaking axles or loose mounting bolts.
15	Before	Service Brakes	Visually inspect brake lines and fitting for evidence of leaks or damage (WP 0075).	Any brake fluid leak or damage to brake lines, vehicle inoperative.
16	Before	Wheels and Tires	Visually inspect all tires for excessive tread wear. Tread should not be worn beyond level of wear bar (1/16 in.). Inspect tire tread for uneven wear and for FOD. Inspect tires for cuts, cracks, bulges, dry rot and for any damage affecting serviceability.	Excessive tread wear (to the wear bar), cuts, cracks, bulges, and dry rot exposing the cord. Tires exhibit excessive inner and outer wear or balance.
			Check for missing or loose wheel studs and lug nuts. Tighten loose lug nuts and have unit maintenance torque to proper value. Check wheels for bent or cracked rims.	Any wheel stud or lug nut loose or missing or any tire rims bent excessively or cracked wheel assemblies.
17	Before	Mirrors	Check for mount security, broken or missing mirrors. Adjust as necessary.	Mirrors are missing or damaged.
18	Before	Pintle Hitch	Inspect pintle hitch for mount security, proper latching and ensure the presence of height adjustment pins to include retaining cotter pins. (WP 0005 & WP 0086)	Loose mount bolts, damaged hitch or missing cotter pins/height adjustment pins renders the vehicle inoperable.
19	Before	Fire Extinguisher	Check that fire extinguisher is present and mounted properly. Check gauge for adequate charge (WP 0089).	Is extinguisher is missing, damaged or is discharged.
20	Before	Seat and Seat Belts (WP 0087/0088)	Check all seatbelts for security, damage, and operation of buckle and clasp ends.	If seatbelt is missing or damaged.
			Check operation of seat adjusting mechanism (driver's seat only).	Seat adjustment lock is broken or missing.
21	Before	Instrument Panel	Visually check the instrument panel for broken gauges, lights and switches.	Replace or repair before operation.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
22	During	Controls and Indicators	Monitor fuel gauge, engine oil pressure gauge, coolant temperature gauge and voltmeter. Monitor warning lights for illumination (WP 0005).	Fuel level inadequate fuel to perform operations. Engine oil pressure gauge reads less than 20 or more than 60 PSI. Coolant temperature gauge reads greater than 210. Voltmeter indicates 12 volts or less. Any warning indicator lights illuminated.
23	During	Brakes	Check brakes for pulling, grabbing or reduced capability (WP 0005).	Brakes pull, grab or exhibit unsafe operation.
			Check hand brake holding ability (WP 0079).	Hand brake will not hold vehicle.
24	During	Steering	Check for smooth, controlled steering without pulling or drifting. Be alert for vibration, excessive sway and unstable handling. Check steering response for unusual free play, binding, or shimmy (WP 0005).	Steering is erratic. Handling is unstable; turning is difficult or free play, binding, or shimmy detected.
25	During	Accelerator Pedal	Check response to accelerator foot pedal. Check for sticking/binding pedal (WP 0005).	Pedal sticking or binding.
26	During	Drive-train	Monitor vehicle operation for unusual noises or vibrations from engine, transmission, drive-shaft, or wheels (WP 0005).	Unusual noise or vibration detected.
27	During	Transmission	Check the transmission gear selector works properly, transmission for slippage, engaging or shifting problems (WP 0005).	Transmission slips or will not engage or shift properly.
28	During	Vehicle for fluid leaks	Be alert for burning scents or smoke, monitor gauges which can provide evidence of unobserved leaks (WP 0005).	No fuel leaks are permissible. Class III engine oil, coolant, transmission, brakes, or any other evidence of excessive fluid leaks.
29	After	Transmission Fluid Level Check	Check transmission fluid level (WP 0036) immediately after shut down. Service as necessary	Transmission fluid level does not fall in operating range.
30	After	Coolant Level Check	Check overflow bottle coolant level is between the minimum and maximum marks (WP 0045).	Coolant level is low.
31	After	Engine Oil Level	Check engine oil level, service as necessary (WP 0025).	If oil level does not fall within operating range.
32	After	Fuel Level	Check fuel level on the gauge or at tank. Service as necessary.	Fuel level inadequate.
33	After	Brake Reservoirs	Check brake reservoirs for proper fluid level (WP 0074).	Brake reservoir fluid level low.
34	After	Hydraulic Tank (Steering)	Check hydraulic tank for proper fluid level (WP 0111)	Hydraulic tank fluid level low.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
35	After	Throttle System	Check throttle reservoir for proper fluid level (WP 0104).	Throttle reservoir level low.
36	After	SATS Vehicle	Perform walk around inspecting all systems and components for evidence of leaks, or damage affecting serviceability.	Class III leakage evident or component damage.

**END OF TASK****OPERATION PROCEDURES****STARTING THE ENGINE****WARNING**

It is essential for personnel to read and understand the Technical Manual (TM) before operating this machine. Failure to follow the safety instructions could result in serious injury or death.

**WARNING**

DO NOT use ether as a starting aid. The engine is equipped with glow plugs. Highly flammable ether and similar starting aids exposed to these devices can cause a fire or an explosion.

**NOTE**

Transmission gear selector must be in the **PARK** position and the handbrake **ENGAGED** or the vehicle will not start.

1. Review forms for discrepancies which will preclude operation.
2. Rotate the Ignition Switch (Figure 1, Item 17) to the **RUN** position.

**Table 2 – Glow Plug Heating Time**

Ambient Air Temperature	Glow Plug Heating Time
Above 50 °F (10 °C)	Not required
23 to 50 °F (-5 to 10 °C)	5 seconds
Below 23 °F (-5 °C)	10 seconds
Limit continuous use to	20 seconds

3. If necessary, hold the glow plug switch (Figure 1, Item 12) in the up position until indicator light, (Figure 1, Item 5) is illuminated, and allow the glow plugs to heat for the appropriate duration (Table 1).
4. Release Glow Plug switch.

**NOTE**

If the engine does not start within 20 seconds, return the start switch to the off position. Allow starter to cool for 1 minute before attempting a re-start. If engine fails to start on the second attempt, turn off switch and troubleshoot the engine start fault.

5. Rotate the Ignition Switch (Figure 1, Item 17) to the **START** position and hold until engine cranks, release the start switch (switch is spring loaded to the RUN position).

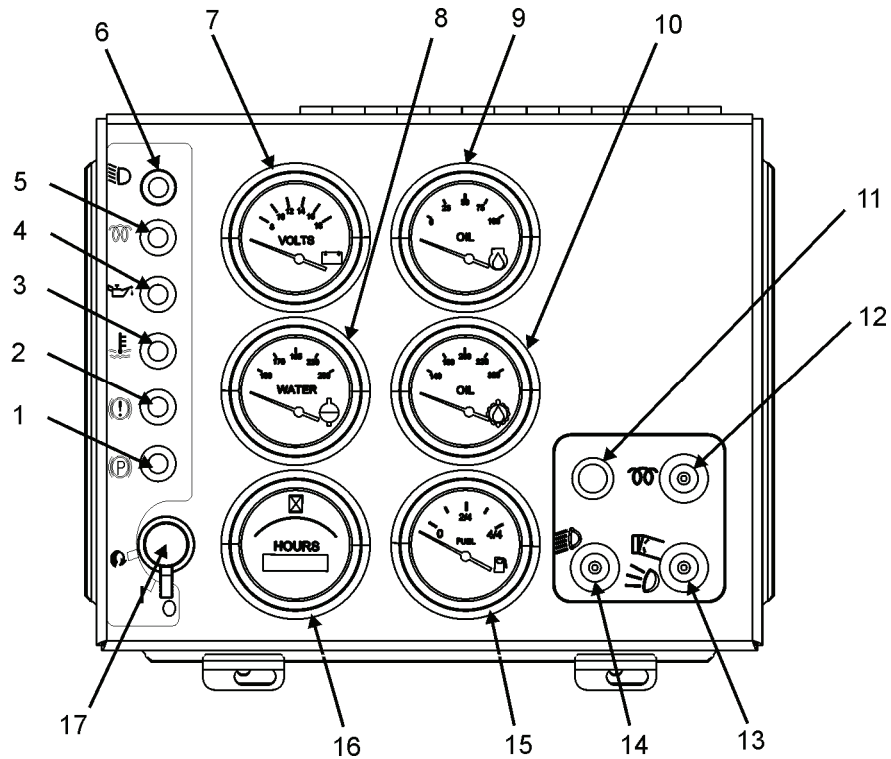


Figure 1. Gauge Cluster

6. Immediately after engine starts observe the following:
  - Engine oil pressure (Figure 1, Item 9) rises (above 20 and below 60) and low oil pressure light (Figure 1, Item 4) goes out.
  - Battery voltmeter (Figure 1, Item 7) indicates charging rate of approximately 13-14 volts.
  - Engine hour meter (Figure 1, Item 16) is functioning.
7. Allow cold engine to idle for 3 minutes before driving the vehicle.
8. Shut down vehicle if any abnormal condition exists or is observed.

**END OF TASK**

**OPERATING (DRIVING) THE VEHICLE****WARNING**

To prevent serious injury, all riders must ride in the passenger seat with the safety belt fastened.

**CAUTION**

Always check local ordinances before driving a vehicle on public roads or streets. Comply with all regulations and obey all traffic signs to prevent an accident.

Be extremely alert during hazardous operating conditions. Operating conditions can change as work progresses and as weather changes.

Always approach turns slowly and carefully. When approaching blind corners or steering around obstructions, reduce speed and proceed cautiously.

1. Position the driver's seat and fasten your seat belt. Passengers require seat belt usage.
2. Turn on the headlights (Figure 1, Item 14).
3. When the engine is warmed up, the vehicle is ready for work.
4. During operation monitor all operator panel gauges and warning lights.
5. Apply foot pressure to the service brake pedal.
6. Release or disengage the hand brake.

**NOTE**

Selecting D1 allows the transmission to remain in low range for the duration of operation. D1 and Reverse is used to tow aircraft. Selecting D2 (transport) allows the transmission to automatically shift to high-speed range when the load permits.

The vehicle is equipped with a throttle verification switch. If D2 is selected and the vehicle begins to accelerate by gravity on downhill inclines, this switch will not allow the transmission to automatically up shift if the accelerator is released.

7. Place the gearshift lever in the desired position (R, D1 or D2).
8. Release service brake foot pressure and press the accelerator. Drive vehicle to the desired location and proceed as necessary maneuvering the SATS vehicle.

**CAUTION**

When towing, allow vehicle to decelerate by releasing accelerator pedal before applying foot brake.

When driving or towing, avoid the tendency to over steer and turn too sharply. Allow enough clearance for the load being towed.

9. To stop vehicle, remove your foot from the accelerator and smoothly place pressure on the brake to bring the vehicle to a stop.

**WARNING**

Be sure that the shift control lever is secure in the park detent and the park brake is applied to prevent unintended movement that could result in serious injury or death.

**NOTE**

The hand brake is designed to hold the vehicle after it has come to a complete stop. It is not to be used to stop the vehicle.

10. With the vehicle completely stopped, keep pressure on the service brake pedal, place shift lever in the Park position and apply or engage the hand brake.

## END OF TASK

### PINTLE HITCH HOOKUP

#### CAUTION

On the aircraft or equipment being towed, ensure the tow bar (if possible) is flat on the surface before positioning the vehicle.

Before using pintle hitch, inspect for proper operation; worn, damaged, or missing parts; and secure mounting. Correct any defects found.

1. Position vehicle at the aircraft tow bar or ground support equipment.
2. Keep pressure on the service brake pedal.
3. Engage the hand brake.
4. Place gear selector in the park position, wait 3 seconds then release the service brake pedal.
5. Exit vehicle.
6. Open the pintle hook by lifting the latch handle.

#### WARNING

Two person lift is required for adjustment of front and rear towing hitches. One person will use both hands to hold center bar while second person adjust pins. Hitch side weights 78 lbs, when adjusting height avoid all pinch areas.

7. Set position of pintle hitch by removing the retaining pin from the ring pin on both sides of the hitch frame. Lift the weight off the hitch and remove the ring pins. Move the hitch up or down as required. Align the nearest holes and reinsert the ring pins. Secure ring pins with retaining pins.
8. Open the latch by lifting the latch handle.
9. Position the tow bar eye over the hook of the pintle and lower into place.

#### CAUTION

**DO NOT** strike on any part of the pintle hook or latch during hookup or damage the latching mechanism may occur.

10. Push the pintle latch closed. When locked, the latch handle will rotate and move up until it is flush with the top of the latch.
11. Board vehicle.
12. Apply foot pressure to the service brake pedal.
13. Release or disengage the hand brake.
14. Place the gearshift lever in the desired position (R, D1 or D2).
15. Release service brake foot pressure and press the accelerator.
16. Drive vehicle to the desired location and proceed as necessary maneuvering the SATS vehicle.

## END OF TASK

### SHUTTING DOWN THE VEHICLE

#### WARNING

Always set the gear selector to park and engage the hand brake when parking the machine. Failure to apply the hand brake and placing the gear selector to "park" could allow unexpected movement resulting in crushing injury or death.

1. Bring vehicle to a safe and complete stop and apply the hand brake while still holding foot pressure on the service brakes.
2. Place gear shift lever in Park and wait 3 seconds. This allows the transmission to disengage and the park brake to engage.
3. Engage the Hand Brake.
4. Turn off all lights.

### **CAUTION**

Failure to allow the engine to cool properly prior to engine shut down will cause premature turbocharger damage and or failure.

5. If the engine has been used at full load, allow it to cool for 3-5 minutes at idle. Failure to do this will result in turbocharger damage.
6. It is now safe to turn off the ignition switch (Figure 1, Item 17) and exit the tow vehicle.
7. Perform AFTER operation PMCS this work package.
8. Document any vehicle discrepancies on the DA Form 2404.

### **END OF TASK**

### **TOWING THE VEHICLE**

1. If there is no transmission damage, the vehicle may be towed for a distance of approximately 1 mile (1.5 km) using a rigid tow bar after disconnecting both drive shafts.
2. If towing vehicle, restrict towing speed to 5 mph (8 kph).
3. If the vehicle must be moved more than stated, it must be loaded and secured on a trailer or towing dolly (WP 0119). Do not allow the wheels to be propelled.

### **WARNING**

Removal or disconnection of the drive shafts will disable the park brake. It is essential that the following procedure be followed.

4. Position vehicle on firm level ground and block wheels securely to prevent any movement.
5. Release park brake.
6. Disconnect drive shafts (WP 0070) from axles and tie up shafts securely well clear of rotating axle yokes, or remove them completely.
7. Connect towing vehicle to vehicle before removing blocks from wheels. Restrict the towing speed to 5 mph.
8. When towing is complete, block wheels securely before removing tow bar and reconnecting drive shafts and set hand brake.

### **END OF TASK**

### **END OF WORK PACKAGE**



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## OPERATOR MAINTENANCE OPERATION UNDER UNUSUAL CONDITIONS

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### INITIAL SETUP:

**Test Equipment**

N/A

**References**

WP 0017

**Tools and Special Tools**

N/A

**Materials/Parts**

N/A

**Personnel Required**

CMF 15

**Equipment Condition**

N/A

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### INSPECTION

Operator will conduct a review of the forms to ensure no entries exist that will preclude operation. Perform all BEFORE, DURING and AFTER operation checks as outlined in the PMCS prior to, during, and after operation of the vehicle, WP 0017.

### END OF TASK

### WARNING

It is essential for personnel to read and understand the Technical Manual (TM) before operating this machine. Failure to follow the safety instructions could result in serious injury or death.

### INTRODUCTION

This work package provides operation instructions for the MT3 SATS under unusual conditions. The discussions include operating the MT3 SATS in extreme heat, in extreme cold, in salt water areas, in dusty, sandy, or snowy conditions, high altitudes, and in windy conditions.

### UNUSUAL ENVIRONMENT/WEATHER

#### Operation in Extreme Heat

Observe the following precautions when operating the MT3 SATS in extreme heat:

1. No special procedures are required when operating at extreme hot temperatures of 159.8 °F (71 °C) or below.
2. Airflow should circulate freely around engine.

#### Fuel System

Do not over service SATS fuel tank. Allow sufficient room for expansion. Ensure the fuel is clean, and not contaminated with water. Any water that forms in the fuel tank will be carried to the fuel/water separator. It may be necessary to drain the fuel/water separator more frequently under extreme heat conditions. If fuel tank contamination is suspected, drain the tank.

## **Body and Chassis**

Paint pitting and blistering will occur in hot climates. Spot paint heat damaged exterior as necessary to protect from heat deterioration.

## **Operation in Extreme Cold**

### **General**

Extreme cold will cause lubricants to thicken or congeal; freeze batteries or prevent them from furnishing sufficient amperage for cold weather starting; crack insulation and cause electrical short circuits; prevent fuel from vaporizing and properly combining with air to form a combustible mixture for starting. Extreme cold will also cause the various materials or components to become hard, brittle, and easily damaged or broken. The operator must always be on the alert for any indication of the effects of cold weather on the SATS. The operator must be very cautious when starting, towing, or operating the SATS after a shutdown for extended periods of time. Congealed lubricants may cause failure of parts. Tires may be frozen to the ground or frozen in the shape of a flat spot while under-inflated. Brake part may freeze and stick in the on or off position. All of these conditions must be taken into account while operating the SATS in extreme cold climates.

### **Engine**

The engine is equipped with an engine block heater located on the right side of the engine. Plug the block heater into a standard electrical outlet using an extension cord. This device will heat the engine oil which will aid during engine startup.

### **Parking**

Park the SATS (if possible) in a sheltered spot, out of the wind, when not in use. For longer shutdown periods, if high and dry ground is not available, park on a footing of wooden planks. Chock in place if necessary. Also, under conditions below -25 °F (-32 °C), exercise care; park the vehicle on a level surface to relieve distortion or body twist.

### **Battery**

Ensure that battery is fully charged at all times. The battery should be removed and stored in a warm place if the SATS is not in use.

### **Electrical System**

Remove ice and snow from electrical components and wiring prior to starting the engine. Try not to move wiring when cleaning since it becomes brittle with extreme cold temperature.

### **Exhaust System**

Prior to starting the SATS in extreme cold temperatures, ensure the exhaust is clear and unobstructed.

### **Air Intake System**

If possible remove ice from the air intake before starting the SATS. Failure to do this may result in the vehicle not starting.

**Fuel System**

Service the fuel tank at more frequent intervals during extreme cold temperatures. Keep the fuel tank full during period of nonuse to prevent condensation inside the fuel tank.

**Operation in Salt Water Areas****General**

Salt water causes higher levels of corrosion on metal surfaces. Care must be taken to avoid contact with salt water. If the unit is exposed to salt water or spray, wash the unit thoroughly with clean, fresh water.

**Protection**

Keep unit clean, and free from dirt and grease that can trap salt water. If possible, wash unit down with fresh water weekly.

Salt water causes corrosion. Examine all harness connectors for corrosion. Report any corrosion to immediate supervisor.

**Operation in Dusty, Sandy, or Snowy Conditions****Protection**

Keep all doors closed, and access covers installed. Keep the unit as clean as possible, paying special attention to air cleaner, electrical controls, and moveable parts.

**Lubrication**

In dusty or sandy areas, filters and strainers must be serviced more frequently than under normal conditions. Change engine oil, hydraulic oil and filters more frequently in dusty areas. Clean all lubrication points carefully before and after lubrication. Be sure that all lubricant containers are tightly sealed and stored in an area as free from dust and sand as possible.

**Fuel System**

Take all necessary precautions to keep dirt and grit out of the fuel tank. Fuel filters should be serviced more frequently.

**Operation at High Altitudes**

No special procedures are required for operation at high altitudes.

**Operation in Windy Conditions**

No special procedures are required for operation in windy conditions.

**END OF TASK**

**END OF WORK PACKAGE**



**CHAPTER 3**  
**TROUBLESHOOTING PROCEDURES**



**FIELD MAINTENANCE  
TROUBLESHOOTING INDEX**

**MALFUNCTION**

**PROCEDURE**

**ENGINE**

- 1. Engine Will Not Crank..... WP 0008 00
- 2. Engine Cranks, Will Not Start..... WP 0008 00
- 3. Engine Cranks, Will Not Start In Cold Weather (Fuel Supply Good)..... WP 0008 00
- 4. Engine Starts, But Immediately Shuts Down With Engine Switch Is In..... WP 0008 00  
The Run Position
- 5. Engine Starter Cranks, Fails To Engage Flywheel Properly..... WP 0008 00
- 6. Engine Starter Fails To Disengage..... WP 0008 00
- 7. Engine RPM Will Not Return to Idle Position..... WP 0008 00
- 8. Engine Has Low Power, Air Filter Not Clogged..... WP 0008 00
- 9. Engine Runs Hot..... WP 0008 00

**ENGINE ELECTRICAL**

- 1. Alternator Output Low or High..... WP 0009 00
- 2. Dash Panel Gauges Inoperative ..... WP 0009 00
- 3. Hour Meter Inoperative With Engine Running, Other Gauges Working..... WP 0009 00
- 4. Low Oil Pressure Light Remains On With Engine Running..... WP 0009 00
- 5. Engine Coolant Temperature 220 Degrees, No Warning Light..... WP 0009 00
- 6. Engine Over-Temperature Warning Light Illuminates, Temp Normal..... WP 0009 00
- 7. Engine Coolant Temperature Gauge Inoperative, Temp Normal..... WP 0009 00
- 8. Fuel Gauge Inoperative..... WP 0009 00
- 9. Engine Oil Pressure Gauge Inoperative (Warning Light Extinguished)..... WP 0009 00
- 10. No Indication on the Transmission Temperature Gauge..... WP 0009 00
- 11. No Indication on the Battery Voltmeter..... WP 0009 00

**TRANSMISSION**

- 1. Transmission Will Not Engage..... WP 0010 00
- 2. Transmission Will Not Engage (Hand Brake Circuit Functional)..... WP 0010 00
- 3. Transmission Power Output Low..... WP 0010 00
- 4. Transmission Will Not Shift From D1 to D2..... WP 0010 00

**CHASSIS ELECTRICAL**

- 1. Horn Inoperative..... WP 0011 00
- 2. Low or High Beam Lights Inoperative..... WP 0011 00
- 3. Head Lights Inoperative, Lamps Good..... WP 0011 00
- 4. Gauge and Tail Lights Inoperative..... WP 0011 00
- 5. Low and High Beam Lights Inoperative (Gauge Lights Operate)..... WP 0011 00
- 6. All Vehicle Turn Signal Lights Inoperative..... WP 0011 00
- 7. Work Lights Inoperative..... WP 0011 00
- 8. Backup Lights Inoperative (Gear Selector in Reverse)..... WP 0011 00
- 9. Backup Alarm (Warning Horn) Inoperative..... WP 0011 00
- 10. All Gauge Lights Inoperative..... WP 0011 00

**PARK POSITION BRAKE**

- 1. Park Position Brake Will Not Engage..... WP 0012 00
- 2. Park Position Brake Will Not Disengage..... WP 0012 00

**MALFUNCTION**

**PROCEDURE**

**POWER STEERING**

- 1. Steering Wheel Difficult to Turn Either Direction..... WP 0013 00

**SERVICE BRAKES**

- 1. Brake Pedal Spongy..... WP 0014 00
- 2. Brake System Performance Inadequate..... WP 0014 00
- 3. Brake Fail Warning Light Illuminated..... WP 0014 00
- 4. Brake Stop Lights Always Illuminated..... WP 0014 00
- 5. Brake Stop Lights Will Not Illuminate..... WP 0014 00

**TIRES, FRONT AND REAR AXLES**

- 1. Tire or Tires Tread Wear Uneven..... WP 0015 00
- 2. Excessive Rear End Noise..... WP 0015 00
- 3. Excessive Front End Noise..... WP 0015 00

**END OF WORK PACKAGE**



**FIELD MAINTENANCE  
ENGINE**

**INITIAL SETUP**

<b>Test Equipment</b>	WP 0047
Multimeter (WP 0125, Item 6)	WP 0056
	WP 0057
<b>Tools and Special Tools</b>	WP 0058
General Mechanic Tool Box (WP 0125, Item 8)	WP 0059
Load Tester (WP 0125, Item 17)	WP 0060
	WP 0061
<b>Personnel Required</b>	WP 0064
91B, Light Wheel Vehicle Mechanic (2)	WP 0065
	WP 0090
<b>References:</b>	WP 0091
WP 0005	WP 0100
WP 0020	WP 0101
WP 0024	WP 0102
WP 0025	WP 0103
WP 0026	WP 0105
WP 0028	
WP 0031	<b>Materials/Parts</b>
WP 0033	N/A
WP 0034	
WP 0044	<b>Equipment Condition</b>
WP 0045	Engine Cool
WP 0046	

**ENGINE TROUBLESHOOTING PROCEDURES**

**WARNING**

Do not attempt to service or otherwise make any adjustments, connections, or re-connections of wires until SATS is shut down and batteries are disconnected. Remove all rings, watches, and other jewelry when performing maintenance on this equipment.

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**ENGINE WILL NOT CRANK**

**STEP**

1. Check that the gearshift lever is in park and hand brake is engaged (WP 0005).

**CONDITION/INDICATION**

Is the gear selector in park and the hand break engaged?

**DECISION**

YES - Proceed to Step 2.

NO – Place the Gear Shift in Park and/or engage the hand brake.

**STEP**

2. Load test batteries (WP 0090).

**CONDITION/INDICATION**

Did batteries load test satisfactory?

**DECISION**

YES – Proceed to step 3.

NO - Remove and Replace Batteries (WP 0090).

**STEP**

3. Continuity test, all engine start circuit fuses, 3FU, 4FU and 6FU (WP 0101).

**CONDITION/INDICATION**

Is any fuse defective?

**DECISION**

YES – Replace defective fuse(s) (WP 0101).

NO – Proceed to step 4.

**STEP**

4. Inspect all start circuit wiring (FO-1) for loose connections, broken or corroded wiring and functional grounds.

**CONDITION/INDICATION**

Is start circuit wiring defective?

**DECISION**

YES – Repair faulty wiring or connections, FO-1.

NO – Proceed to Step 5.

**STEP**

5. Remove and test relays CRS and CRSI (WP 0102).

**CONDITION/INDICATION**

Did relays ohms test satisfactory?

**DECISION**

YES – Proceed to step 6.

NO – Replace defective CRS Park Relay or CRSI Start Interlock relay (WP 0102).

**STEP**

6. Remove center console panel (WP 0020). Place engine ignition in the start position, check for 12 volts at the Engine Start Relay (WP 0103) wire 7 (FO-1, Line 9).

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Proceed to step 7.

NO – Repair defective circuit wiring (FO1).

**STEP**

7. Remove wire 3 from the starter solenoid (WP 0026), place engine ignition in the start position, check for 12 volts at the removed wire (FO-1, Line 2).

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Test starter (WP 0026) replace starter if test fails.

NO – Replace defective Starter Relay (SR), or repair circuit wiring (FO-1).

**END OF TASK**

# ENGINE CRANKS, WILL NOT START

### STEP

1. Check fuel level at the fuel tank (WP 0054).

#### CONDITION/INDICATION

Is the fuel supply low?

#### DECISION

YES – Refuel vehicle and bleed air from fuel system (WP 0056).	NO – Proceed to step 2.
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### STEP

2. Drain small amount of fuel from Fuel Water Separator and check for contamination (WP 0056).

#### CONDITION/INDICATION

Is fuel contaminated?

#### DECISION

YES – Remove contamination, replace filters and bleed air from fuel lines (WP 0056).	NO – Proceed to Step 3.
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### STEP

3. Inspect engine air filter for damage, dirty or clogged condition (WP 0063).

#### CONDITION/INDICATION

Is filter dirty or clogged?

#### DECISION

YES – Replace filter assembly (WP 0061).	NO – Proceed to step 4.
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### STEP

4. Remove fuel solenoid electrical connector. Place ignition switch in the run position and check for 12 volts at wire 50 of the fuel solenoid connector (WP 0057).

#### CONDITION/INDICATION

Is 12 volts present?

#### DECISION

YES – Proceed to Step 5.	NO – Replace fuse 8 (WP 0101) or repair faulty fuel solenoid wiring, FO-1.
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### STEP

5. Perform fuel solenoid ohms/rod movement test (WP 0057).

#### CONDITION/INDICATION

Did the fuel solenoid test satisfactory?

#### DECISION

YES – Proceed to Step 6.	NO – Replace faulty fuel solenoid (WP 0057).
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### STEP

6. Test mechanical fuel pump (WP 0058).

#### CONDITION/INDICATION

Did the fuel pump test satisfactorily (fuel present)?

#### DECISION

YES - Proceed to Step 7.	NO – Replace fuel pump (WP 0058).
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### STEP

7. Remove fuel input line at any or all fuel injectors (WP 0060) and crank engine.

#### CONDITION/INDICATION

Is fuel present at the injectors?

#### DECISION

YES - Proceed to Step 8.	NO – Proceed to step 9.
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**STEP**

8. Replace faulty injectors (WP 0060).

**CONDITION/INDICATION**

Does engine start?

**DECISION**

YES – No further action.

NO – Proceed to step 9.

**STEP**

9. Remove and Replace fuel injection pump (WP 0059).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK****ENGINE CRANKS, WILL NOT START IN COLD WEATHER (FUEL SUPPLY GOOD)****STEP**

1. Ohms test pre-heater fuse 14 (WP 0102) for continuity (FO-1, Line 28).

**CONDITION/INDICATION**

Does fuse 14 have continuity?

**DECISION**

YES – Proceed to step 2.

NO – Replace the glow plug fuse 14, (WP 0102).

**STEP**

2. With engine ignition switch in the run position, place the glow plug toggle switch in the on position.

**CONDITION/INDICATION**

Does the glow plug indicator light illuminate?

**DECISION**

YES – Proceed to step 3.

NO – Replace faulty light, toggle switch SW7 (WP 0100), or repair faulty wiring (FO-1, Line 28).

**STEP**

3. Check for 12 volts at wire number 4 (red) of the glow plug circuit breaker CB1 (WP 0103).

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Proceed to step 4.

NO – Replace defective CB1 (WP 0103) or repair faulty wiring (FO-1, Line 3).

**STEP**

4. With engine ignition switch in the run position and the glow plug toggle switch held on check for 12 volts input power to all glow plugs at wire 5 (WP 0034) on the glow plug rail.

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Test and replace defective glow Plugs (WP 0034).

NO – Test/replace glow plug relay CRGP (WP 0103) or repair defective wiring (FO-1, Line 28).

**END OF TASK**

## ENGINE STARTS BUT IMMEDIATELY SHUTS DOWN WITH ENGINE SWITCH IN THE RUN POSITION

### STEP

1. Test/replace fuel solenoid (WP 0057).

#### CONDITION/INDICATION

N/A

#### DECISION

YES – N/A

NO – N/A

### END OF TASK

## ENGINE STARTER CRANKS, FAILS TO ENGAGE ENGINE FLYWHEEL PROPERLY

### STEP

1. Remove starter assembly (WP 0026) and inspect starter for broken or damaged gear teeth.

#### CONDITION/INDICATION

Is starter gear teeth damaged?

#### DECISION

YES – Replace starter assembly (WP 0026).

NO – Proceed to step 2.

### STEP

2. With starter removed, inspect engine flywheel (rotating engine is necessary) for damaged or missing gear teeth.

#### CONDITION/INDICATION

Are flywheel gear teeth broken or damaged?

#### DECISION

YES – Replace engine flywheel (WP 0031).

NO – N/A

### END OF TASK

## ENGINE STARTER FAILS TO DISENGAGE

### STEP

1. Disconnect batteries and ohms test engine ignition switch SW1 (WP 0100) for continuity (FO-1, Line 9).

#### CONDITION/INDICATION

Switch continuity test good?

#### DECISION

YES – Proceed to step 3.

NO – Remove and Replace SW1 (WP 0100).

### STEP

2. Ohms check starter relay (WP 0103) contacts (FO-1, Line 2) for shorted condition.

#### CONDITION/INDICATION

Contacts shorted?

#### DECISION

YES – Replace starter relay (WP 0103).

NO – Remove and Replace starter (WP 0026).

### END OF TASK

**ENGINE RPM WILL NOT RETURN TO IDLE POSITION****STEP**

1. Check throttle reservoir for proper fluid level (WP 0017).

**CONDITION/INDICATION**

Is throttle reservoir properly serviced?

**DECISION**

YES – Proceed to step 2.

NO – Service reservoir (WP 0017).

**STEP**

2. Inspect throttle return spring for damage, disconnection or spring missing (WP 0105).

**CONDITION/INDICATION**

Throttle spring damaged or missing?

**DECISION**

YES – Repair or replace throttle return spring  
(WP 0105).

NO – Proceed to step 3.

**STEP**

3. Check throttle slave cylinder linkage for damage or binding condition (WP 0105).

**CONDITION/INDICATION**

Slave cylinder linkage damaged or binding?

**DECISION**

YES – Repair or replace damaged slave cylinder  
(WP 0105).

NO – Proceed to step 4.

**STEP**

4. Repair or replace throttle master cylinder (WP 0106).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK****ENGINE HAS LOW POWER, AIR FILTER NOT CLOGGED****STEP**

1. Inspect fuel system for loose, damaged or leaking connections (WP 0056).

**CONDITION/INDICATION**

Are fuel system components damaged, leaking or loose?

**DECISION**

YES – Repair damaged fuel system  
Components (WP 0056).

NO – Proceed to step 2.

**STEP**

2. Inspect engine exhaust system and muffler for damage or restrictions (WP 0064 and WP 0065).

**CONDITION/INDICATION**

Is exhaust system damaged or restricted?

**DECISION**

YES – Replace damaged or restricted  
components (WP 0064 and WP 0065).

NO – Proceed to step 3.

**STEP**

3. Inspect engine fuel filters (WP 0056).

**CONDITION/INDICATION**

Engine fuel filters dirty, clogged or sucking air.

**DECISION**

YES – Remove and replace fuel filter and fuel water separator and bleed air from fuel system (WP 0056). NO – Proceed to Step 4.

**STEP**

4. Inspect engine turbocharger for damage affecting serviceability (WP 0028).

**CONDITION/INDICATION**

Is turbocharger damaged?

**DECISION**

YES – Remove and replace turbocharger (WP 0028). NO – Proceed to Step 5.

**STEP**

5. Test engine mechanical fuel pump (WP 0057).

**CONDITION/INDICATION**

Did fuel pump test satisfactory?

**DECISION**

YES – Proceed to step 10. NO – Replace faulty fuel pump (WP 0057).

**STEP**

6. Remove fuel input line at any or all fuel injectors (WP 0060) and crank engine.

**CONDITION/INDICATION**

Is fuel present at the injectors?

**DECISION**

YES - Proceed to Step 11. NO – Proceed to step 12.

**STEP**

7. Replace faulty injectors (WP 0060).

**CONDITION/INDICATION**

Does engine start?

**DECISION**

YES – No further action. NO – Proceed to step 12.

**STEP**

8. Remove and Replace fuel injection pump (WP 0059).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK**

**ENGINE RUNS HOT**

**STEP**

1. Check radiator coolant level (WP 0045).

**CONDITION/INDICATION**

Is coolant level low?

**DECISION**

YES – Fill radiator and coolant recovery tank to proper level (WP 0044). NO – Proceed to step 2.

**STEP**

2. Check engine radiator cooling fan belt (WP 0033).

**CONDITION/INDICATION**

Is fan belt in place and fan working?

**DECISION**

YES – Proceed to step 3.

NO – Replace fan belt (WP 0033).

**STEP**

3. Check engine oil level (WP 0025).

**CONDITION/INDICATION**

Is engine oil level low?

**DECISION**

YES – Fill engine oil crankcase to proper lubricating level (WP 0025).

NO – Proceed to step 4.

**STEP**

4. Check radiator cooling fin condition (WP 0044).

**CONDITION/INDICATION**

Radiator fins clogged, damaged, leaking or dirty?

**DECISION**

YES – Clean or replace radiator (WP 0044).

NO – Proceed to Step 5.

**STEP**

5. Check that engine radiator cap installed (WP 0045).

**CONDITION/INDICATION**

Is radiator cap installed properly?

**DECISION**

YES – Proceed to step 6.

NO – Replace or install radiator cap (WP 0043).

**STEP**

6. Inspect cooling system thermostat (WP 0047).

**CONDITION/INDICATION**

Thermostat stuck closed, corroded or defective?

**DECISION**

YES – Replace thermostat (WP 0047).

NO – Proceed to Step 7.

**STEP**

7. Inspect cooling system water pump for leaks (WP 0046).

**CONDITION/INDICATION**

Is water pump leaking or defective?

**DECISION**

YES – Replace water pump (WP 0046).

NO – Check engine.

**END OF TASK**

**END OF WORK PACKAGE**



FIELD MAINTENANCE  
ENGINE ELECTRICAL

INITIAL SETUP:

<b>Test Equipment</b>	WP 0030
Multimeter (WP 0125, Item 6)	WP 0043
	WP 0050
<b>Tools and Special Tools</b>	WP 0051
General Mechanic Tool Box (WP 0125, Item 8)	WP 0052
	WP 0055
<b>Personnel Required</b>	WP 0100
91B, Light Wheel Vehicle Mechanic	WP 0101
<b>References:</b>	<b>Materials/Parts</b>
WP 0004	N/A
WP 0025	
WP 0027	<b>Equipment Condition</b>
WP 0029	Engine Cool

ENGINE ELECTRICAL TROUBLESHOOTING PROCEDURES

WARNING

Do not attempt to service or otherwise make any adjustments, connections, or re-connections of wires until SATS is shut down and batteries are disconnected. Remove all rings, watches, and other jewelry when performing maintenance on this equipment.

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

ALTERNATOR OUTPUT LOW OR HIGH  
(NORMAL VOLTMETER READING BETWEEN 13.8 TO 14.8 VOLTS)

STEP

- 1. Inspect/Test battery charging/alternator circuits (WP 0027).

CONDITION/INDICATION

Did alternator fail test?

DECISION

Yes - Replace alternator (WP 0027). NO - N/A

END OF TASK

DASH PANEL GAUGES INOPERATIVE

STEP

- 1. Replace defective fuse 7 (WP 0101) or repair faulty wiring (FO-1, Line 7).

CONDITION/INDICATION

N/A

DECISION

N/A

END OF TASK

**HOURLY METER INOPERATIVE WITH ENGINE RUNNING, OTHER GAUGES WORKING****STEP**

1. With engine running check for 12 volts at wire 28 on the hour meter (WP 0100).

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Replace hour meter G1 (WP 0100).

NO – Replace defective hour meter pressure switch (WP 0029) or repair faulty wiring (FO-1).

**END OF TASK****LOW OIL PRESSURE LIGHT REMAINS ON WITH ENGINE RUNNING****STEP**

1. Check engine oil pressure gauge for engine oil pressure reading (WP 0004).

**CONDITION/INDICATION**

Is pressure indicated on oil pressure gauge?

**DECISION**

YES – Test/replace engine oil pressure switch (Warning light) (WP 0029).

NO – Shutdown, check engine oil level, (WP 0025) or repair faulty wiring, FO-1.

**END OF TASK****ENGINE COOLANT TEMPERATURE 220 DEGREES, NO WARNING LIGHT****STEP**

1. Ohms check coolant temperature dash panel light for continuity.

**CONDITION/INDICATION**

Does panel light have continuity?

**DECISION**

YES – Remove and replace engine coolant temperature switch (WP 0051) or repair faulty wiring (FO-1).

NO – Replace defective indicator bulb, or bulb holder (WP 0100).

**END OF TASK****ENGINE OVER-TEMP LIGHT ILLUMINATES, ENGINE TEMPERATURE NORMAL****STEP**

1. Test/replace engine coolant temperature switch (WP 0051).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK**

**ENGINE COOLANT TEMP GAUGE INOPERATIVE, ENGINE AT TEMPERATURE****STEP**

1. Ohms check engine coolant temperature sending unit for continuity (WP 0052).

**CONDITION/INDICATION**

Does sending unit have continuity?

**DECISION**

YES – Replace coolant temp gauge (WP 0100) or repair faulty wiring (FO-1).

NO – Replace coolant temp sending unit, (WP 0052) or repair faulty wiring (FO-1).

**END OF TASK****FUEL GAUGE INOPERATIVE****STEP**

1. Ohms check fuel gauge sending unit for continuity and proper operation (WP 0055).

**CONDITION/INDICATION**

Does fuel-sending unit have continuity and operate properly?

**DECISION**

YES – Replace fuel gauge (WP 0100) or repair faulty wiring (FO-1).

NO – Replace fuel tank sending unit (WP 0055).

**END OF TASK****ENGINE OIL PRESSURE GAUGE INOPERATIVE (WARNING LIGHT EXTINGUISHED)****STEP**

1. Ohms check engine oil pressure sending unit for continuity (WP 0030).

**CONDITION/INDICATION**

Does oil pressure sending unit have continuity?

**DECISION**

YES – Replace oil pressure gauge (WP 0100) or repair faulty wiring (FO-1).

NO – Replace oil pressure sending unit, (WP 0030).

**END OF TASK****NO INDICATION ON THE TRANSMISSION TEMP GAUGE WITH TRANSMISSION AT TEMPERATURE****STEP**

1. Ohms check transmission temp sending unit (WP 0043) for continuity.

**CONDITION/INDICATION**

Does transmission temp sending unit have continuity?

**DECISION**

YES – Replace transmission temp gauge, (WP 0100) or repair faulty wiring (FO-1).

NO – Replace transmission temp sending unit, (WP 0043).

**END OF TASK**

**NO INDICATION ON THE BATTERY VOLTMETER, ALL OTHER METERS OPERATE****STEP**

1. Replace defective battery voltmeter G6 (WP 0100) or repair faulty wiring (FO-1, Line 23).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
TRANSMISSION**

**INITIAL SETUP:**

<b>Test Equipment</b>	WP 0039
Multimeter (WP 0125, Item 6)	WP 0040
	WP 0041
<b>Tools and Special Tools</b>	WP 0079
General Mechanic Tool Box (WP 0125, Item 8)	WP 0082
	WP 00100
<b>Personnel Required</b>	WP 0101
91B, Light Wheel Vehicle Mechanic (2)	WP 0102
	FO-1
<b>References:</b>	
WP 0006	<b>Materials/Parts</b>
WP 0017	N/A
WP 0021	
WP 0035	<b>Equipment Condition</b>
WP 0036	N/A
WP 0038	

**TRANSMISSION TROUBLESHOOTING PROCEDURES**

**WARNING**

Do not attempt to service or otherwise make any adjustments, connections, or re-connections of wires until SATS is shut down and batteries are disconnected. Remove all rings, watches, and other jewelry when performing maintenance on this equipment.

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**TRANSMISSION WILL NOT ENGAGE**

**STEP**

1. Check transmission fluid level (WP 0036).

**CONDITION/INDICATION**

Is fluid level correct?

**DECISION**

YES – Proceed to step 2.

NO – Service the transmission (WP 0036).

**STEP**

2. Check that the hand brake is released or disengaged.

**CONDITION/INDICATION**

Is hand brake released?

**DECISION**

YES – Proceed to step 3.

NO – Release hand brake.

**STEP**

3. With handbrake released check that the hand brake on light (WP 0004) goes out or extinguishes.

**CONDITION/INDICATION**

Does the handbrake light go out?

**DECISION**

YES – Proceed to Transmission Will Not Engage (Hand Brake Circuit Functional)

NO – Proceed to step 4.

**STEP**

4. Ohms test hand brake switch for continuity (WP 0082).

**CONDITION/INDICATION**

Did the hand brake switch test satisfactory?

**DECISION**

YES – Repair or replace faulty hand brake lever (WP 0079).

NO – Replace hand brake switch (WP 0082).

**TRANSMISSION WILL NOT ENGAGE (Hand Brake Circuit Functional)****STEP**

1. Check transmission fluid level and condition (WP 0036).

**CONDITION/INDICATION**

Is fluid level and condition correct?

**DECISION**

YES – Proceed to step 2.

NO – Service the transmission (WP 0036).

**STEP**

2. Ohms check Transmission Circuit Fuse 9 (WP 0100) (FO-1, Line 17) for continuity.

**CONDITION/INDICATION**

Does fuse have continuity?

**DECISION**

YES – Proceed to step 3.

NO – Replace defective fuse (WP 0100).

**STEP**

3. Ohms check transmission/ECU Fuse 5 (WP 0101) (FO-1, Line 12) for continuity.

**CONDITION/INDICATION**

Does fuse have continuity?

**DECISION**

YES – Proceed to step 4.

NO – Replace defective fuse (WP 0101).

**STEP**

4. Ohms test the hand brake relay CRHB (WP 0102).

**CONDITION/INDICATION**

Did the hand brake relay ohms check satisfactory?

**DECISION**

YES - Proceed to Step 5.

NO – Replace defective relay CRHB (WP 0102) or repair circuit wiring (FO-1, Line 40).

**STEP**

5. Check that the transmission shifter indicator light is illuminated.

**CONDITION/INDICATION**

Is the transmission shifter indicator light illuminated?

**DECISION**

YES - Proceed to Step 6.

NO – Replace defective transmission relay CRT (WP 0102) or repair circuit wiring (FO-1, Line 19).

**STEP**

6. Ohms test transmission shifter assembly (WP 0038) for proper operation.

**CONDITION/INDICATION**

Did transmission shifter assembly ohms test satisfactory?

**DECISION**

YES - Proceed to Step 7.

NO – Replace transmission shifter assembly (SW2) (WP 0038).

**STEP**

7. Chock wheels. Engine running, hand brake released and service brakes engaged. Place gearshift selector in REVERSE and D1 and test input voltage to the transmission solenoid valve assemblies (WP 0041).

**CONDITION/INDICATION**

Is 12 volts input present at the test locations to the solenoid valve assemblies?

**DECISION**

YES - Proceed to Step 8.

NO – Replace faulty transmission speed sensor (WP 0039), or ECU (WP 0040) or repair circuit wiring (FO-1).

**STEP**

8. Ohms test all of the transmission solenoid valve assembly coils (WP 0041).

**CONDITION/INDICATION**

Did the transmission solenoid valves ohms test satisfactory?

**DECISION**

YES - Proceed to Step 9.

NO – Replace defective solenoid valve coils (WP 0041).

**STEP**

9. Remove transmission solenoid valve assemblies (WP 0041) and inspect for visible damage or obvious defects (metal particles, other contamination, sticking valves).

**CONDITION/INDICATION**

Do the solenoid valve assemblies check satisfactory?

**DECISION**

YES - Proceed to Step 10.

NO – Replace all transmission solenoid valve assemblies (WP 0041).

**STEP**

10. Replace defective transmission assembly (WP 0035).

**CONDITION/INDICATION**

N/A

**DECISION**

YES – N/A

NO – N/A

**END OF TASK****TRANSMISSION POWER OUTPUT LOW****STEP**

1. Check transmission fluid level (WP 0036).

**CONDITION/INDICATION**

Is fluid level correct?

**DECISION**

YES – Proceed to step 2.

NO – Service the transmission (WP 0036).

**STEP**

2. Check condition of transmission fluid and fluid filters (WP 0036).

**CONDITION/INDICATION**

Is fluid or filters dirty, clogged or contaminated?

**DECISION**

YES – Service transmission (WP 0036).

NO – Proceed to step 3.

**STEP**

3. Ohms test all six solenoid valve coils (WP 0041).

**CONDITION/INDICATION**

Did transmission solenoid valves ohms check properly?

**DECISION**

YES – Proceed to step 4.

NO – Replace faulty solenoid valve coils

**STEP**

4. Remove transmission solenoid valve assemblies (WP 0041) and inspect for visible damage or obvious defects (metal particles, other contamination, sticking valves).

**CONDITION/INDICATION**

Do the solenoid valve assemblies check satisfactory?

**DECISION**

YES - Proceed to Step 5.

NO – Replace all transmission solenoid valves assemblies (WP 0041).

**STEP**

5. Replace defective transmission assembly (WP 0035).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK****TRANSMISSION WILL NOT SHIFT FROM D1 TO D2****STEP**

1. Check transmission fluid level (WP 0036).

**CONDITION/INDICATION**

Is fluid level correct?

**DECISION**

YES – Proceed to step 2.

NO – Service the transmission (WP 0036).

**STEP**

2. Check condition of transmission fluid and fluid filters (WP 0036).

**CONDITION/INDICATION**

Is fluid or filters dirty, clogged or contaminated?

**DECISION**

YES – Service transmission (WP 0036).

NO – Proceed to step 3.

**STEP**

3. Ohms test transmission shifter assembly (WP 0038) for proper operation.

**CONDITION/INDICATION**

Did transmission shifter assembly ohms test satisfactory?

**DECISION**

YES - Proceed to Step 4.

NO – Replace transmission shifter assembly (SW2) (WP 0038).

**STEP**

4. Lift vehicle all 4 wheels (WP 0021). **Use extreme caution.** Remove D2 solenoid valve electrical connectors (WP 0041). Start engine and release hand brake. Place gear shift selector in D2 and increase wheel speed to the known point of shifting from D1 to D2. Test input voltage to the 2 transmission solenoid valve D2 assemblies (WP 0041).

**CONDITION/INDICATION**

Is 12 volts input present at the D2 test locations to the solenoid valve assemblies?



**DECISION**

YES - Proceed to Step 5.

NO – Replace faulty transmission speed sensor (WP 0039), or ECU (WP 0040) or repair circuit wiring (FO-1).

**STEP**

5. Ohms test all of the transmission solenoid valve assembly coils (WP 0041).

**CONDITION/INDICATION**

Did the transmission solenoid valves ohms test satisfactory?

**DECISION**

YES - Proceed to Step 6.

NO – Replace defective solenoid valve coils (WP 0041).

**STEP**

6. Remove transmission solenoid valve assemblies (WP 0041) and inspect for visible damage or obvious defects (metal particles, other contamination, sticking valves).

**CONDITION/INDICATION**

Do the solenoid valve assemblies check satisfactory?

**DECISION**

YES - Proceed to Step 7.

NO – Clean/inspect/replace all transmission solenoid valve assemblies (WP 0041).

**STEP**

7. Replace defective transmission assembly (WP 0035).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK**

**END OF WORK PACKAGE**



**FIELD MAINTENANCE  
CHASSIS ELECTRICAL**

**INITIAL SETUP:**

<b>Test Equipment</b>	WP 0095
Multimeter (WP 0125, Item 6)	WP 0098
	WP 0099
<b>Tools and Special Tools</b>	WP 0100
General Mechanic Tool Box (WP 0125, Item 8)	WP 0101
	WP 0102
<b>Personnel Required</b>	WP 0108
91B, Light Wheel Vehicle Mechanic (2)	FO-1
<b>References:</b>	<b>Materials/Parts</b>
WP 0004	N/A
WP 0038	
WP 0093	<b>Equipment Condition</b>
WP 0094	N/A

**CHASSIS ELECTRICAL TROUBLESHOOTING PROCEDURES**

**WARNING**

Do not attempt to service or otherwise make any adjustments, connections, or re-connections of wires until SATS is shut down and batteries are disconnected. Remove all rings, watches, and other jewelry when performing maintenance on this equipment.

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**HORN INOPERATIVE**

**STEP**

1. Set brakes and chock vehicle. Turn Ignition switch on and check for 12 volts at wire 91 (FO-1, Line 51) at the horn (WP 0108).

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Proceed to step 2.

NO – Replace horn fuse 11 (WP 0102) or repair defective wiring (FO-1).

**STEP**

2. Disconnect wire 2, (FO-1, Line 51) at the horn (WP 0108) and ohms check from wire 2 to ground with the horn button depressed.

**CONDITION/INDICATION**

Does circuit have continuity?

**DECISION**

YES – Replace horn assembly (WP 0108).

NO – Repair wiring (FO-1) or replace horn button (WP 0108).

**END OF TASK**

**LOW OR HIGH BEAM (ONE SIDE OR THE OTHER) HEADLIGHT INOPERATIVE****STEP**

1. Replace appropriate headlight bulb (WP 0093) or repair defective wiring (FO-1).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK****HEADLIGHTS INOPERATIVE, LAMPS GOOD****STEP**

1. Ohms check headlight circuit fuse 12 for continuity (WP 0102).

**CONDITION/INDICATION**

Did fuse have continuity?

**DECISION**

YES – Proceed to step 2.

NO – Replace defective fuse 12 (WP 0102).

**STEP**

2. Ignition switch and headlight switch on, test for 12 volts at wire 96 and wire 101 at the headlight switch (WP 0102).

**CONDITION/INDICATION**

Does switch have 12 volts output?

**DECISION**

YES – Proceed to step 3.

NO – Replace headlight switch (WP 0102) or repair circuit wiring (FO-1 line 53).

**STEP**

3. Ignition switch and headlight switch on, check for 12 volts at wire 97 (dimmer switch in low beam position) and wire 98 (dimmer switch in the high beam position) at the dimmer switch SW4 (WP 0094).

**CONDITION/INDICATION**

Is voltage check satisfactory?

**DECISION**

YES – Proceed to step 4.

NO – Replace headlight dimmer switch SW4 (WP 0094) or repair circuit wiring (FO-1 line 53).

**STEP**

4. Test for 12 volts at both headlight connectors with ignition switch on and headlight switch on (WP 0102).

**CONDITION/INDICATION**

Does both headlight connectors have 12 volts?

**DECISION**

YES – Replace both headlight bulbs (WP 0093).

NO – Repair defective circuit wiring (FO-1 line 53).

**END OF TASK**

**GAUGE AND TAIL LIGHTS INOPERATIVE****STEP**

1. Ohms check light circuit Fuse 13 for continuity (WP 0102).

**CONDITION/INDICATION**

Does fuse have continuity?

**DECISION**

YES – Proceed to step 2.

NO – Replace defective fuse 13 (WP 0101) or repair circuit wiring (FO-1, Line 58).

**STEP**

2. Replace run light switch SW3 (WP 0100) or repair circuit wiring (FO-1, Line 53).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK****LOW AND HIGH BEAM LIGHTS INOPERATIVE (GAUGE PANEL LIGHTS OPERATE)****STEP**

1. Replace headlight dimmer switch SW4 (WP 0094) or repair defective circuit wiring (FO-1, Line 53).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK****ALL VEHICLE TURN SIGNAL LIGHTS INOPERATIVE****STEP**

1. Ohms check light circuit Fuse 13 for continuity (WP 0102).

**CONDITION/INDICATION**

Does fuse have continuity?

**DECISION**

YES - Proceed to Step 2.

NO – Replace fuse 13 (WP 0102) or repair faulty wiring, (FO-1, Line 58).

**STEP**

2. Ohms check SATS signal flasher relay (WP 0100) for continuity, (FO-1, Line 67).

**CONDITION/INDICATION**

Ohms check satisfactory?

**DECISION**

YES - Proceed to Step 3.

NO – Replace flasher relay (WP 0100).

**STEP**

3. Replace directional signal arm assembly (WP 0095) or repair faulty circuit wiring, (FO-1, Line 62-67).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK**

**WORKLIGHTS INOPERATIVE, WITH WORKLIGHT SWITCH ON (GEAR SELECTOR IN PARK)****STEP**

1. Ignition switch/work light switch SW6 on (WP 0004), check for 12 volts at wire 109 (FO-1, Line 73) reverse/work light lamps.

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Replace work light lamps (WP 0098).      NO – Replace work light switch (WP 0100),  
or repair faulty wiring, (FO-1, Line 73).

**END OF TASK****REVERSE/WORKLIGHTS INOPERATIVE (GEAR SELECTOR IN REVERSE)****STEP**

- Ohms test diode REC1 (WP 0100) for proper operation.

**CONDITION/INDICATION**

Ohms test satisfactory?

**DECISION**

YES – Repair faulty circuit wiring      NO – Replace diode REC1 (WP 0100).  
(FO-1, Line 72).

**END OF TASK****BACKUP ALARM (WARNING HORN) INOPERATIVE (GEAR SELECTOR IN REVERSE)****STEP**

1. Chock Wheels. With gear selector in reverse, hand brake released, test for 12 volts at wire 66 (FO-1, Line 72) on the backup alarm (WP 0099).

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Replace backup alarm (WP 0099).      NO – Proceed to step 2.

**STEP**

2. Test transmission shifter assembly (WP 0038).

**CONDITION/INDICATION**

Did transmission shifter test satisfactory?

**DECISION**

YES – Repair faulty circuit wiring      NO – Replace shifter assembly (WP 0038).  
(FO-1, Lines 40 to 72).

**END OF TASK**

**ALL GAUGE LIGHTS INOPERATIVE****STEP**

1. Ignition switch on, turn on head light switch SW3 (WP 0004).

**CONDITION/INDICATION**

Are gauge lights operational?

**DECISION**

YES – No further action required.

NO – Proceed to step 2.

**STEP**

2. Ignition switch and headlight switch on, turn gauge light dimmer switch counter clockwise (WP 0004).

**CONDITION/INDICATION**

Do gauge lights illuminate?

**DECISION**

YES – No further action required.

NO – Proceed to step 3.

**STEP**

3. Repair faulty wiring (FO-1, Line 58-62) or replace gauge panel dimmer rheostat (WP 0100).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK****END OF WORK PACKAGE**





**FIELD MAINTENANCE  
PARK POSITION BRAKE**

**INITIAL SETUP:**

<b>Test Equipment</b>	WP 0076
Multimeter (WP 0125, Item 6)	WP 0077
	WP 0078
<b>Tools and Special Tools</b>	WP 0101
General Mechanic Tool Box (WP 0125, Item 8)	WP 0102
<b>Personnel Required</b>	<b>Materials/Parts</b>
91B, Light Wheel Vehicle Mechanics (2)	N/A
<b>References:</b>	<b>Equipment Condition</b>
WP 0005	Engine Shut Down
WP 0075	

**PARK POSITION BRAKE TROUBLESHOOTING PROCEDURES**

**WARNING**

Do not attempt to service or otherwise make any adjustments, connections, or re-connections of wires until SATS is shut down and batteries are disconnected. Remove all rings, watches, and other jewelry when performing maintenance on this equipment.

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**PARK POSITION BRAKE WILL NOT ENGAGE**

**STEP**

1. Ohms test park position circuit breaker CB2 (WP 0102) for continuity (FO-1, Line 31).

**CONDITION/INDICATION**

Does park position circuit breaker CB2 have continuity?

**DECISION**

YES – Proceed to step 2.

NO – Replace park position circuit breaker CB2 (WP 0102).

**STEP**

2. Check that the transmission gear selector is in the park position (WP 0005).

**CONDITION/INDICATION**

Is gear selector in the park position?

**DECISION**

YES – Proceed to step 3.

NO – Place the gear selector in park (WP 0005).

**STEP**

3. Perform this step (two person operation) in order to simplify troubleshooting. Hand brake disengaged or off, engine start switch in the run position (engine not running), move gear selector to the Drive position (5 sec) and then return the gear selector to Park and observe the park position motor operates to engage the park position brake.

**CONDITION/INDICATION**

Did the park position motor operate applying the park position brake caliper?

**DECISION**

YES – Proceed to step 4.

NO – Proceed to step 5.

**STEP**

4. Inspect park position caliper assembly (WP 0078).

**CONDITION/INDICATION**

Is the park position caliper damaged?

**DECISION**

YES – Proceed to step 5.

NO – Replace defective component(s) (WP 0078).

**STEP**

5. Ohms test upper limit switch (LS-PE) (WP 0077) for proper operation (FO-1, Line 37).

**CONDITION/INDICATION**

Did the upper limit switch (LS-PE) ohms check satisfactory?

**DECISION**

YES – Proceed to step 6.

NO – Replace upper limit switch LS-PE (WP 0077).

**STEP**

6. Ohms check park position engage relay CRP (WP 0101) for continuity (FO-1, Line 37).

**CONDITION/INDICATION**

Does park brake engage relay (CRP) ohms check properly?

**DECISION**

YES – Proceed to step 7.

NO – Replace defective park brake relay CRP,  
(WP 0101).**STEP**

7. Ohms test the park position motor winding at wiring connector J7 (WP 0076) for continuity (FO-1, Line 31).

**CONDITION/INDICATION**

Does park position motor have continuity?

**DECISION**YES – Repair faulty wiring in the circuit  
(FO-1, Line 31).

NO – Replace park position motor (WP 0076).

**END OF TASK****PARK POSITION BRAKE WILL NOT DISENGAGE****STEP**

1. Ohms test park position circuit breaker CB2 (WP 0102) for continuity (FO-1, Line 31).

**CONDITION/INDICATION**

Does park position circuit breaker CB2 have continuity?

**DECISION**

YES – Proceed to step 2.

NO – Replace park position circuit breaker CB2 (WP  
0102).**STEP**

2. Check that the transmission gear selector in the park position (WP 0005).

**CONDITION/INDICATION**

Is gear selector in the park position?

**DECISION**

YES – Proceed to step 3.

NO – Place the gear selector in park (WP 0005).

**STEP**

3. Perform this step (two person operation) in order to simplify troubleshooting. Hand break disengaged or off, engine start switch in the run position (engine not running), Move gear selector to the drive position and observe the park position motor operates to disengage the park position brake.

**CONDITION/INDICATION**

Did the park position motor operate disengaging the park position brake caliper?

**DECISION**

YES – Proceed to step 4.

NO – Proceed to step 5.

**STEP**

4. Inspect park position caliper assembly (WP 0078).

**CONDITION/INDICATION**

Is the park position caliper damaged?

**DECISION**

YES – Proceed to step 5.

NO – Replace defective component(s) (WP 0078).

**STEP**

5. Ohms test lower limit switch (WP 0077) (LS-PR) for proper operation (FO-1, Line 35).

**CONDITION/INDICATION**

Did the lower park position limit switch LS-PR ohms check ok?

**DECISION**

YES – Proceed to step 6.

NO – Replace lower limit switch LS-PR (WP 0077).

**STEP**

6. Ohms test park position release relay CRR (WP 0101) for continuity (FO-1, Line 31).

**CONDITION/INDICATION**

Does park brake release relay (CRR) ohms check properly?

**DECISION**

YES – Proceed to step 7.

NO – Replace defective park brake release relay CRR (WP 0101).

**STEP**

7. Ohms test the park position motor winding at wiring connector J7 (WP 0076) for continuity (FO-1, Line 31).

**CONDITION/INDICATION**

Does park brake motor have continuity?

**DECISION**

YES – Repair faulty wiring in the circuit (FO-1, Line 31).

NO – Replace park position motor (WP 0076).

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE  
POWER STEERING**

**INITIAL SETUP:**

<b>Test Equipment</b>	WP 0112
N/A	WP 0113
	WP 0115
<b>Tools and Special Tools</b>	WP 0116
General Mechanic Tool Box (WP 0125, Item 8)	WP 0117
<b>Personnel Required</b>	<b>Materials/Parts</b>
91B, Light Wheel Vehicle Mechanic	N/A
<b>References:</b>	<b>Equipment Condition</b>
WP 0111	N/A

**POWER STEERING TROUBLESHOOTING PROCEDURES**

**WARNING**

Do not attempt to service or otherwise make any adjustments, connections, or re-connections of wires until SATS is shut down and batteries are disconnected. Remove all rings, watches, and other jewelry when performing maintenance on this equipment.

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**STEERING WHEEL DIFICULT TO TURN, EITHER DIRECTION**

**STEP**

1. Check steering system components (WP 0115, WP 0116 and WP 0117), lines and fittings for leaks and or damage.

**CONDITION/INDICATION**

Is steering system components leaking or damaged.

**DECISION**

- |  |                         |
|--|-------------------------|
| YES – Repair leaking, damaged lines or fittings<br>(WP 0115, WP 0116 and WP 0117). | NO – Proceed to step 2. |
|--|-------------------------|

**STEP**

2. Check steering hydraulic tank fluid level (WP 0111).

**CONDITION/INDICATION**

Is hydraulic tank fluid level low?

**DECISION**

- |   |                         |
|---|-------------------------|
| YES – Fill power steering hydraulic tank,<br>(WP 0111). | NO – Proceed to step 3. |
|---|-------------------------|

**STEP**

3. Inspect power steering filter (WP 0112) and hydraulic fluid for contamination.

**CONDITION/INDICATION**

Is hydraulic system contaminated?

**DECISION**

YES – Proceed to step 4.

NO – Proceed to step 5.

**STEP**

4. Service power steering hydraulic system (WP 0112 and WP 0113).

**CONDITION/INDICATION**

Is power steering functional?

**DECISION**

Yes – No further action

NO – Proceed to step 5.

**STEP**

5. Remove gear pump output pressure line at orbital valve (WP 0116) and place in a drip pan. Crank engine for 5 seconds and check that gear pump has output (WP 0114).

**CONDITION/INDICATION**

Did power steering gear pump have output?

**DECISION**

YES – Replace steering cylinder (WP 0117).

NO – Proceed to step 6.

**STEP**

6. Replace power steering gear pump (WP 0115).

**CONDITION/INDICATION**

Is power steering functional?

**DECISION**

YES – No further action.

NO – Proceed to step 7.

**STEP**

7. Replace power steering orbital valve (WP 0116).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE  
SERVICE BRAKES**

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**INITIAL SETUP:****Test Equipment**

Multimeter (WP 0125, Item 6)

WP 0073

WP 0074

WP 0075

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

WP 0095

WP 0096

WP 0097

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

WP 0102

FO-1

**References:**

WP 0017

WP 0068

WP 0069

WP 0071

WP 0072

**Materials/Parts**

N/A

**Equipment Condition**

N/A

---

**SERVICE BRAKE TROUBLESHOOTING PROCEDURES**

**WARNING**

Do not attempt to service or otherwise make any adjustments, connections, or re-connections of wires until SATS is shut down and batteries are disconnected. Remove all rings, watches, and other jewelry when performing maintenance on this equipment.

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**BRAKE PEDAL SPONGY****STEP**

1. Check front and rear brake reservoir fluid levels (WP 0074).

**CONDITION/INDICATION**

Is brake reservoir(s) fluid level low?

**DECISION**

YES - Refill brake reservoirs (WP 0074), bleed and inspect system for leaks (WP 0075).      NO – Proceed to Step 2.

**STEP**

2. Bleed air from brake system (WP 0075).

**CONDITION/INDICATION**

Is brake system performance satisfactory?

**DECISION**

YES – No further action.      NO – Proceed to step 3.

**STEP**

3. Check brake lines and fittings for leaks and damage (WP 0075).

**CONDITION/INDICATION**

Are brake lines or fittings leaking or damaged?

**DECISION**

YES – Repair leaking or damaged lines and fittings (WP 0075).                      NO – Proceed to step 4.

**STEP**

4. Check brake master cylinder for proper operation (WP 0071).

**CONDITION/INDICATION**

Is master cylinder defective?

**DECISION**

YES – Replace master cylinder (WP 0071).                      NO – N/A

**END OF TASK****BRAKE SYSTEM PERFORMANCE INADEQUATE, NO SYSTEM DEFECTS OBSERVED****STEP**

1. Perform brake friction disc replacement procedures (WP 0068 and WP 0069).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK****BRAKE FAIL WARNING LIGHT ILLUMINATED****STEP**

1. Inspect front and rear brake system for leaks (WP 0071, WP 0073, WP 0074 and WP 0075).

**CONDITION/INDICATION**

Is brake fluid leaking?

**DECISION**

YES – Repair defective brake system components (WP 0071, WP 0073, WP 0074 and WP 0075).                      NO – Proceed to step 2.

**STEP**

2. Ohms test normally open brake fail switch (BFS) (WP 0073) for no continuity (FO-1, Line 24).

**CONDITION/INDICATION**

Did brake fail switch ohms test satisfactory?

**DECISION**

Yes – Proceed to step 3.                      NO – Replace brake fail switch (WP 0073)

**STEP**

3. Replace brake valve assembly (WP 0073).

**CONDITION/INDICATION**

N/A

**DECISION**

Yes – N/A                      NO – N/A

**END OF TASK**



**BRAKE STOP LIGHTS ALWAYS ILLUMINATED WITH ENGINE RUNNING****STEP**

1. Check brake stop light switch adjustment (WP 0072).

**CONDITION/INDICATION**

Is brake stop light switch out of adjustment?

**DECISION**

YES – Adjust brake switch (WP 0072).

NO – Replace switch (WP 0072) or repair faulty wiring.

**END OF TASK****BRAKE STOP LIGHTS WILL NOT ILLUMINATE, BRAKE PEDAL ACTUATED****STEP**

1. Ohms check fuse 13 (FO-1, Item 58) for continuity (WP 0102).

**CONDITION/INDICATION**

Does fuse have continuity?

**DECISION**

YES – Proceed to step 2.

NO – Replace defective fuse 13 (WP 0102).

**STEP**

2. With engine start switch in the run position (engine not running) and the brake pedal pressed check for 12 volts at wire 102 (FO-1, Line 62) on the brake stop light switch, LS-SL (WP 0072).

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Proceed to step 3.

NO – Replace defective stop light switch (WP 0072) or repair faulty wiring (FO-1, Line 62).

**STEP**

3. With engine start switch in the run position (engine not running) and the brake pedal pressed check for 12 volts at wires 106 and 107 (FO-1, Lines 65 and 66) at the brake stop lights.

**CONDITION/INDICATION**

Is 12 volts present?

**DECISION**

YES – Replace defective light(s) (WP 0097).

NO – Replace defective directional signal arm assembly SW5 (WP 0095) or repair faulty wiring, (FO-1, Lines 65 and 66).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**TIRES, FRONT AND REAR AXLES**

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**INITIAL SETUP:**

<b>Test Equipment</b> N/A	WP 0067 WP 0070 WP 0083
<b>Tools and Special Tools</b> General Mechanic Tool Box (WP 0125, Item 8)	WP 0084 WP 0085
<b>Personnel Required</b> 91B, Light Wheel Vehicle Mechanic	<b>Materials/Parts</b> N/A
<b>References:</b> WP 0017 WP 0066	<b>Equipment Condition</b> N/A

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**TIRE, REAR AXLE AND FRONT AXLE TROUBLESHOOTING PROCEDURES**

**WARNING**

Do not attempt to service or otherwise make any adjustments, connections, or re-connections of wires until SATS is shut down and batteries are disconnected. Remove all rings, watches, and other jewelry when performing maintenance on this equipment.

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**TIRE (S) TREAD WEAR UNEVEN**

**STEP**

1. Check pressure on all four tires (WP 0083).

**CONDITION/INDICATION**

Is tire pressure 80 PSI in each tire?

**DECISION**

YES – Proceed to step 2.

NO – Inflate tires to 80 PSI.

**STEP**

2. Check leaf springs for damage and proper mounting (WP 0085).

**CONDITION/INDICATION**

Are leaf springs secure with no damage?

**DECISION**

YES – Proceed to step 3.

NO – Secure or replace defective leaf springs (WP 0085).

**STEP**

3. Check shock absorbers for damage, leaks or loose mounting bolts (WP 0084).

**CONDITION/INDICATION**

Is shock absorbers damaged or leaking?

**DECISION**

YES – Replace defective shock or tighten loose mounting bolts (WP 0084).

NO – Inspect wheel assemblies, (WP 0083).

**END OF TASK****EXCESSIVE REAR END NOISE WHEN DRIVING VEHICLE****STEP**

1. Check rear axle oil level (WP 0067).

**CONDITION/INDICATION**

Is rear axle oil level satisfactory?

**DECISION**

YES – Proceed to step 2.

NO – Service the rear axle (WP 0067).

**STEP**

2. Inspect rear drive shaft universal joints for proper lubrication (WP 0017).

**CONDITION/INDICATION**

Are rear axle universal joints properly lubricated?

**DECISION**

YES – Proceed to step 3.

NO – Perform u-joint lubrication (WP 0017).

**STEP**

3. Inspect rear drive shaft universal joints for excessive wear or damage (WP 0070).

**CONDITION/INDICATION**

Are rear axle universal joints loose or damaged?

**DECISION**

YES – Replace worn or damaged universal Joints (WP 0070).

NO – Proceed to step 4.

**STEP**

4. Check rear axle mounting bolts for security and or damage (WP 0066).

**CONDITION/INDICATION**

Are rear axles U-Bolts secure and not damaged?

**DECISION**

YES – Proceed to step 5.

NO – Secure or replace damaged rear axle mount bolts (WP 0066).

**STEP**

5. Inspect rear axle leaf springs for loose, broken, or damaged springs (WP 0085).

**CONDITION/INDICATION**

Are rear axle springs loose, broken or damaged?

**DECISION**

YES – Replace or secure rear axle Springs (WP 0085).

NO – Proceed to step 6.

**STEP**

6. Replace rear axle assembly (WP 0066).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK**

**EXCESSIVE FRONT END NOISE WHEN DRIVING VEHICLE****STEP**

1. Check front axle oil level (WP 0067).

**CONDITION/INDICATION**

Is front axle oil level satisfactory?

**DECISION**

YES – Proceed to step 2.

NO – Service the front axle (WP 0067).

**STEP**

2. Inspect front drive shaft universal joints for proper lubrication (WP 0017).

**CONDITION/INDICATION**

Are front axle universal joints properly lubricated?

**DECISION**

YES – Proceed to step 3.

NO – Perform u-joint lubrication (WP 0017).

**STEP**

3. Inspect front drive shaft universal joints for excessive wear or damage (WP 0070).

**CONDITION/INDICATION**

Are front axle universal joints loose or damaged?

**DECISION**

YES – Replace worn or damaged universal  
Joints (WP 0070).

NO – Proceed to step 4.

**STEP**

4. Check front axle mounting bolts for security and or damage (WP 0066).

**CONDITION/INDICATION**

Are front axle mount bolts secure and not damaged?

**DECISION**

YES – Proceed to step 5.

NO – Secure or replace damaged front axle mount bolts,  
(WP 0066).

**STEP**

5. Inspect front axle leaf springs for loose, broken, or damaged springs (WP 0085).

**CONDITION/INDICATION**

Are front axle springs loose, broken or damaged?

**DECISION**

YES – Replace or secure front axle  
springs (WP 0085).

NO – Proceed to step 6.

**STEP**

6. Replace front axle assembly (WP 0066).

**CONDITION/INDICATION**

N/A

**DECISION**

N/A

**END OF TASK**

**END OF WORK PACKAGE**



**CHAPTER 4**  
**MAINTENANCE INSTRUCTIONS**





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## FIELD MAINTENANCE PMCS INTRODUCTION

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### GENERAL

When performing a PMCS or simple routine checks, observe all **WARNINGS** listed in the WARNING SUMMARY at the beginning of this manual and interspersed throughout.

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of problems, to reduce downtime, and to maintain equipment in serviceable condition. To ensure that the equipment is always ready for a mission, perform the scheduled Preventive Maintenance Checks and Services (PMCS) WP 0017.

This section lists the required Preventive Maintenance Checks and Services for the MT3 SATS. Always keep in mind the Warnings listed in the **WARNING SUMMARY**. To ensure that the MT3 SATS is ready for operation at all times, it must be inspected systematically so defects may be discovered and corrected before they result in serious damage of equipment failure. The necessary preventive maintenance checks and services that are to be performed by operator personnel are listed and described in WP 0017.

### CAUTION

During operation if a deficiency is noted stop operation to prevent damage to equipment. Defects, deficiencies and shortcomings together with the corrective action will be recorded on DA Form 2404 or DA Form 5988-E and submitted to the Maintenance Office.

Routine maintenance like cleaning, washing, corrosion control, storage and shipping etc., are not listed as part of the PMCS. These tasks should be performed when they are needed.

### Determining PMCS Intervals

Operator PMCS on the MT3 SATS should be performed on a BEFORE, DURING and AFTER operation of the SATS. Field level PMCS is performed on a weekly, monthly, semi-annually or annually basis as indicated in WP 0017.

### PMCS for Units in Continuous Operation

The running time meter is used to determine SATS operating time. For PMCS performed on an operating time basis, perform PMCS as close as possible to the time intervals indicated. For units in continuous operation, perform PMCS before starting operation (WP 0017). If continuous operation extends service past that which is shown, perform PMCS or scheduled service upon completion of mission or before next operation.

### Defects

Deficiencies that cannot be corrected must be reported on DA Form 2404 or DA Form 5988-E to maintenance personnel. Records and reports of preventive maintenance must be filed and maintained IAW DA PAM 750-8.

### EXPLANATION OF COLUMNS

#### Item No. Column

The item numbers are listed sequentially and indicate the minimum requirements for the checks and services. This column shall be used as a source of item numbers for the TM Number Column on DA Form 2404, or DA Form 5988-E. Use Equipment Inspection and Maintenance Worksheet, IAW DA PAM 750-8 when recording results of the PMCS.

**Interval Column**

Indicates the time interval upon which the checks and services must be performed. Intervals are divided as follows:

**Designated Intervals**

- 1) **BEFORE** checks and services of PREVENTIVE MAINTENANCE must be performed prior to placing vehicle or its components in operation.
- 2) **DURING** checks and services of PREVENTIVE MAINTENANCE must be performed while the vehicle and/or its components/systems are in operation.
- 3) **AFTER** checks and services of PREVENTIVE MAINTENANCE must be performed after the vehicle and/or its components/systems have been in operation.
- 4) **WEEKLY** checks and services of PREVENTIVE MAINTENANCE must be performed every 7 days.
- 5) **MONTHLY** checks and services of PREVENTIVE MAINTENANCE must be performed every 30 days.
- 6) **QUARTERLY** checks and services of PREVENTIVE MAINTENANCE must be performed every 90 days.
- 7) **SEMI-ANNUAL** checks and services of PREVENTIVE MAINTENANCE must be performed every 180 days.
- 8) **ANNUALLY** checks and services of PREVENTIVE MAINTENANCE must be performed every 365 days.

**Item to be Inspected/Service Column**

Indicates items and components to be inspected and or serviced.

**Procedures Column**

Indicates the procedure by which the inspection or service is to be performed. When replacement or repair of a component is required, the procedures column will direct personnel to the appropriate task/work package.

**Equipment Not Ready/ Available If**

Indicates vehicle should not be used if the listed discrepancies exist.

**CORROSION PREVENTION AND CONTROL (CPC)**

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking.

SF Form 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

**FLUID LEAKS****CAUTION**

Equipment operation is allowed with minor leakage's (Class I). Consideration must be given to fluid capacity in the item/system being checked or inspected. When in doubt, notify your supervisor.

When operating with Class I leak, continue to check fluid levels as required in the PMCS.

It is necessary for you to know how fluid leakage affects the status of the MT3 SATS vehicle. The following are types/classes of leakage you need to know to be able to determine the status of systems. Learn these leakage definitions and remember- when in doubt, notify your maintenance supervisor. All Class II and III leaks should be reported immediately to your maintenance supervisor.

- Class I - Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
- Class II - Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked or inspected.
- Class III - Leakage of fluid great enough to form drops that fall from item being checked or inspected.

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE  
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

**INITIAL SETUP:**

<b>Test Equipment</b>	WP 0075
N/A	WP 0079
	WP 0089
<b>Tools and Special Tools</b>	WP 0090
N/A	WP 0091
	WP 0104
<b>Personnel Required</b>	WP 0107
N/A	WP 0111

**References**

WP 0005  
 WP 0025  
 WP 0033  
 WP 0036  
 WP 0045  
 WP 0056  
 WP 0063  
 WP 0066  
 WP 0067  
 WP 0074

**Materials/Parts**

Oil, Axle; Mobile Fluid 424 (WP 0127, Item 60)  
 Grease, Automotive and Artillery GAA (WP 0127, Item 15)  
 Hydraulic Fluid (WP 0127, Item 18)  
 Oil, Lubricating OE/HDO-15/40 (WP 0127, Item 21)  
 Lubricating Oil OE/HDO 30 (WP 0127, Item 25)  
 5W-30 Synthetic (WP 0127, Item 61)

**Equipment Condition**

N/A

**Table 1. Preventive Maintenance Checks and Services for MT3 SATS Tow Tractor, Initial Startup Only**

<b>INTERVAL</b>	<b>ITEM TO BE INSPECTED OR SERVICED</b>	<b>PROCEDURE</b>	<b>NOT FULLY MISSION CAPABLE IF:</b>
8, 50, 100 H	Wheels	Torque lug nuts (WP 0083).	Loose, missing
50 H	Engine	Service engine (WP 0025).	
10, 50, 100 H	Hand Brake	Check brake holding power (WP 0079).	Hand Brake Inoperable
100 H	Transmission	Service transmission (WP 0036).	
100 H	Axles	Service front and rear axles (WP 0067).	
100H	Pintle Hitch (Front and Rear)	Check mounting bolt torque (WP 0086).	Mount Bolts Loose

Table 2. Field Level Preventive Maintenance Checks and Services for MT3 SATS Tow Tractor

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1	Weekly	Tires and Wheels	Check tire tread depth. Tread should not be worn beyond level of wear bar (1/16 in.) (15.9 mm or less). Wear bars are molded across the tread pattern in the valley between the center rib and lugs. The Tread Wear Indicator (TWI) letters are molded on the sidewall to aid in locating the wear bar.	Any tread is worn even to height of tread wear indicator (1/16 in. (1.59 mm) or less). Any cut, gouge, or crack that extends to the cord body or any bulges. Tires exhibit excessive inner and outer wear or balance.
			Check for missing or loose wheel studs and lug nuts. Tighten loose lug nuts and have unit maintenance torque lug nuts to proper torque.	Any wheel stud or lug nut is broken or missing or loose.
2	Weekly	Fan Belt	Open engine cover and check for loose, damaged or missing fan belt.	Fraying, cuts, loose or missing drive belt.
3	Weekly	Exhaust System	Check exhaust system for security of all mounts, tightness of clamps and bolts, rusted conditions, damaged pipes, and any indication of an exhaust leak.	Any mounts are broken, pipes are rusted through or broken, or any indication of an exhaust leak.
4	Weekly	Shock Absorbers	Visually inspect shock absorbers for leaks, damage, and security of mounting.	Class III leakage or damage is evident; mounting damaged or loose.
5	Weekly	Alternator Brackets	Visually check alternator mount brackets for cracks, damage, or loose bolts.	Bracket is cracked or mounts bolts damaged or loose.
6	Weekly	Batteries and battery cables.	Check battery hold-downs for looseness or damage.	Damaged battery hold-down.
			Inspect batteries for cracked case and evidence of leaking.	Damaged or leaking batteries.
			Check for missing, broken, split or frayed battery cables.	Damaged or corroded cables.
			Check for damaged battery posts.	Loose or damaged battery posts.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
			Check for rust, corrosion and cleanliness.	Excessive rust or corrosion.
7	Weekly	Pintle Hitch	Check pintle hook for looseness and damaged locking mechanism	If pintle hook latch when closed has play in excess of 3/16" of an inch. If locking mechanism is damaged.
8	Weekly	Hand Brake and Park Position Brake	Check hand brake and park position brakes for proper operation, loose, missing or damaged components.	Hand brake or park position brakes damaged or not operating properly.
9	Weekly	Engine	Fluid leaks such as oil, coolant or fuel.	Any fuel or Class III oil or coolant leaks are evident.
			Damaged coolant hoses.	Coolant hoses have cuts or chafing.
			Damaged electrical harnesses.	Electrical harness has cuts, fraying.
10	Weekly	Exhaust System	Check exhausts system for loose or missing mounting hardware.	Hardware is missing or loose.
11	Monthly/ 50 hours	Corrosion	Visually inspect vehicle for indication of corrosion or cracks and/or breaks	Any corroded-through condition, cracks or breaks that would affect vehicle operation.
12	Monthly/ 50 hours	All Systems	All systems exercised. Start engine and run at idle for 10 minutes. While vehicle is warming up, perform a walk around inspection, checking for evidence of leaks. After vehicle has idled for 5 minutes, begin to operate all controls slowly. Transmission in all ranges. Brakes and parking brake applied and released. Check steering for binding and unusual noises.	Class III oil, coolant or hydraulic leaks are evident. Any brake fluid or fuel leaks are evident.
	<b>250 Hour/ Quarterly</b>		<b>NOTE</b> The 250 hour service includes the services performed at the monthly/50 hour service along with the following:	

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
13	Quarterly/ 250 hour	Brakes -All	Inspect brake lines and components.	No brake line or component leaks are acceptable.
	<b>500 hour/ Semi-Annual</b>		<b>NOTE</b> The 500 hour service includes the services performed at the 250 hour and 50 hour service along with the following:	
14	Semi-Annually/ 500 hour	Engine	Service Engine (WP 0025). Service Fuel System (WP 0056). Replace air cleaner primary and secondary filters (WP 0063). Clean radiator fins and inspect engine fan belt (WP 0033).	
15	Semi-Annually/ 500 hour	Engine Coolant	Inspect for contamination and test for concentration level. Check radiator hoses and clamps.	Coolant contaminated.
16	Semi-Annually/ 500 hour	Front and Rear Differentials/ Outer Hubs.	Inspect axles for damage and signs of leakage. Check oil levels (WP 0067).	Class III leaks or visible damage to front or rear axles.
17	Semi-Annually/ 500 hour	Brakes	Inspect brake system for leaks, test brakes for proper operation.	Leaking brake system, inadequate performance.
18	Semi-annually/ 500 hour	Hand Brake	Check holding power (WP 0079). Adjust as required. Lubricate moving parts.	Hand brake holding test fails.
19	Semi-annually/ 500 hour	Electrical System	Clean and inspect all vehicle wiring, wiring harnesses, batteries and battery cables. Inspect for corrosion.	Damaged wiring, wiring harnesses battery cables or batteries. Wiring corrosion problems.
20	Semi-annually/ 500 hour	Transmission	Service transmission (WP 0036).	
21	Semi-annually/ 500 hour	All SATS Vehicle Grease Fittings	Lubricate all grease fittings; see lubrication chart this work package.	Missing or damaged grease fittings.
22	Semi-annually/ 500 hour	Drive Shafts	Check Universal Joint mounting security (WP 0066).	Loose or damaged Universal Joints.



ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
	<b>1000 hours/ annually</b>		<p><b>NOTE</b> The 1000 hour service includes the services performed at the 500, 250, and 50 hour service along with the following:</p>	
23	Annually/ 1000 hour	Front and Rear Differentials/ Outer Hubs.	Drain and refill axle differentials and all axle outer hubs (WP 0067). Inspect axles for damage and signs of leakage.	Class III leaks or visible damage to front or rear axles.
24	Annually/ 1000 hour	Engine Coolant	Drain engine and radiator coolant and replace with 50/50 mixture (WP 0045).	
25	Annually/ 1000 hour	Hydraulic Tank (Steering)	Drain, clean, and refill hydraulic tank, replace filter and clean pressure and return strainers (WP 0111, WP 0112 and WP0113).	

**END OF TASK**

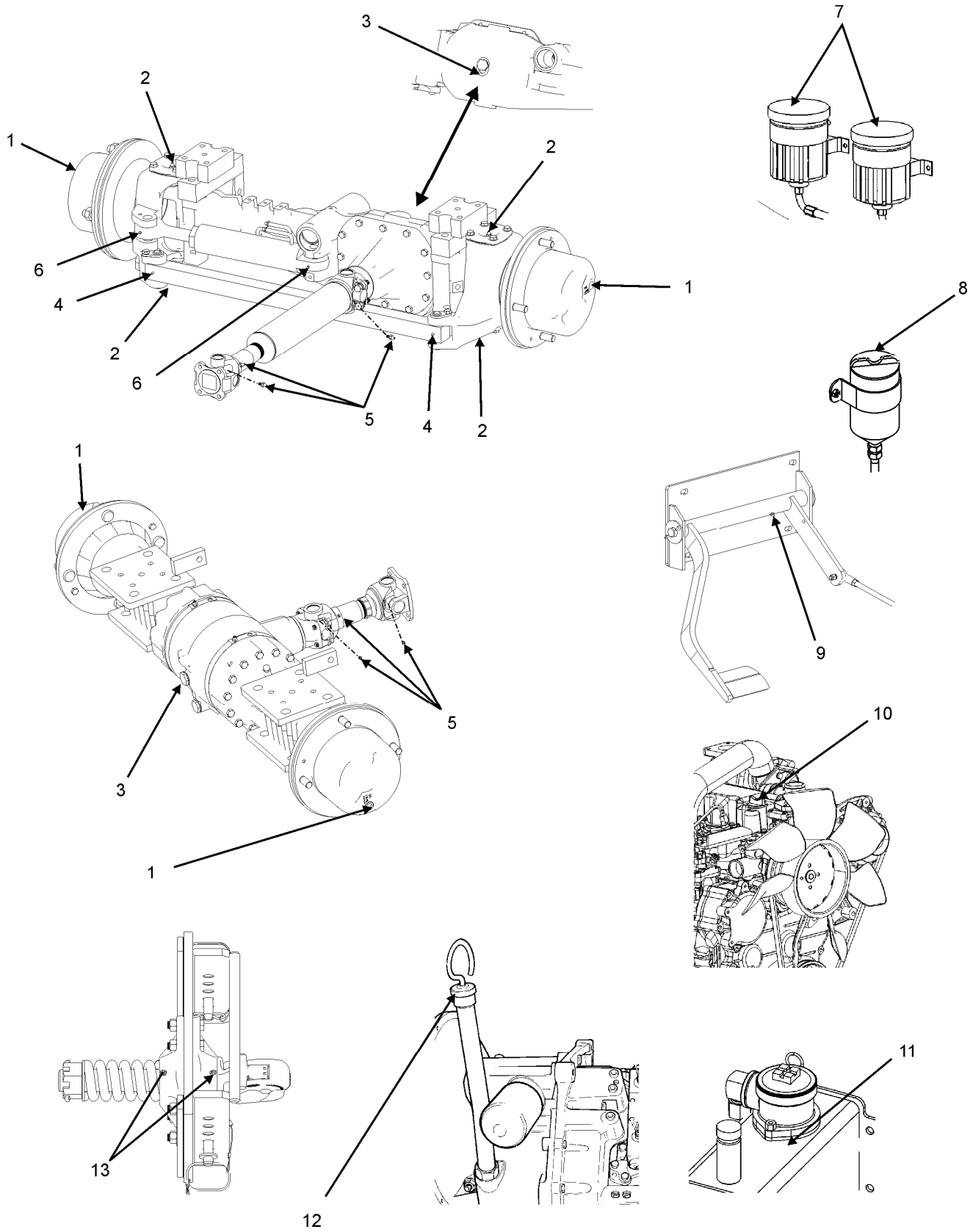


Figure 1. Lubrication Locations

**Table 3. Lubrication Locations**

ITEM NO.	ITEM TO BE CHECKED OR SERVICED	LUBRICATION REQUIRED
1	Planetary Hubs and Wheel Bearings	Oil, Axle; Mobile Fluid 424
2	Steering Knuckle	Grease, Automotive and Artillery GAA, MIL-G-10924 (81349) (SAE-J-310)
3	Axles	Oil, Axle; Mobile Fluid 424
4	Steering Tie Rod	Grease, Automotive and Artillery GAA, MIL-G-10924 (81349) (SAE-J-310)
5	Universal Joints and Driveshafts	Grease, Automotive and Artillery GAA, MIL-G-10924 (81349) (SAE-J-310)
6	Steering Cylinder	Grease, Automotive and Artillery GAA, MIL-G-10924 (81349) (SAE-J-310)
7	Brake Reservoirs	Hydraulic Fluid (81349) MIL-PRF-5606
8	Throttle Reservoir	Hydraulic Fluid (81349) MIL-PRF-5606
9	Brake Pedal Pivot	Grease, Automotive and Artillery GAA, MIL-G-10924 (81349) (SAE-J-310)
10	Engine Crankcase:	24 °F (-5 °C) and above: Oil, Lubricating OE/HDO-15/40, MIL-PRF-2104 (81349)
		3 °F (-5 °C) to 10 °F (24 °C): Lubricating Oil: internal combustion engine, tactical service, OE/HDO 30 (81349) MIL-PRF-2104
		-9 °F (-23 °C) and below: Lubricating Oil, Engine 5W-30 Grade Synthetic Base
11	Hyd. Reservoir	Oil, Lubricating, Transmission/Hydraulic OE/HDO-10 MIL-L-2140D (81349)
12	Transmission	Oil, Lubricating, Transmission/Hydraulic OE/HDO-10 MIL-L-2140D (81349)
13	Pintle Hook	Grease, Automotive and Artillery GAA, MIL-G-10924 (81349) (SAE-J-310)

**END OF TASK**

**END OF WORK PACKAGE**



**CHAPTER 5**  
**MAINTENANCE INSTRUCTIONS**



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**FIELD MAINTENANCE  
SERVICE UPON RECEIPT**

---

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0017

**Tools and Special Tools**  
General Mechanic Tool Kit (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
N/A

---

**SERVICE UPON RECEIPT****Unpacking**

1. The tractor is shipped with all fluids except fuel. As a precaution, however, check all fluid levels, brakes, electrical system, engine, steering, axles, and transmission as described in (WP 0017) and perform the prescribed lubrication.
2. The fire extinguisher may have been stored remotely to prevent loss during shipping. Before operating, move extinguisher to its operating location between seats. Be sure it is securely clamped in its storage bracket for operation.
3. Inspect unit for shipping damage and broken glass, mirrors, or lights.

**END OF TASK**

**END OF WORK PACKAGE**





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**FIELD MAINTENANCE  
GUIDELINES FOR CLEANING TOW TRACTOR**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

N/A

**Tools and Special Tools**

N/A

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Shut Down

---

**WARNING**

Shut off and tag out the machine before cleaning or otherwise servicing. Failure to do so could result in unexpected startup and could result in injury or death.

**GUIDELINES FOR CLEANING TOW TRACTOR**

The following are general instructions for cleaning tractor components within the capabilities of the using organization. Common shop practices are not described. Use the exploded views in parts manual, for reference.

**Cleaning**

When cleaning, keep related parts together so reassembly is easier. Special cleaning instructions are given where required.

**Using Compressed Air**

Compressed air may be used for cooling, cleaning, and drying applications as long as: Air flow is restricted to less than 15 PSI, a safety nozzle is used and eye protection (safety glasses with shield or safety goggles) is also used.

Other less hazardous means, including vacuuming and wet sweeping, should be considered. By no means shall compressed air be used to clean one's clothing.

Use low-pressure compressed air to remove debris and dirt as necessary.

**Frame, Engine, and Transmission****NOTE**

Be sure all openings are closed or covered adequately before cleaning to prevent the entry of water into internal parts.

Structural parts are best cleaned using soap and water and suitable brushes. Steam cleaning may also be done before disassembly to remove heavy accumulations of grease, oil, and dirt from exterior of engine, transmission, and rear axle assembly.

**Metal Parts**

Metal parts shall be cleaned in an appropriate cleaning solvent. Allow to air dry. Do not use compressed air to dry parts. The moisture generally present in air systems may cause corrosion. Lubricate metal parts as soon as possible after cleaning.

**Bearings**

1. Wash bearings in a bearing washer or immerse in solvent and scrub clean with a soft brush. Remove all grease and oil from bearing recesses. Allow to air dry.
2. Apply a thin film of lubricating oil to bearings and check for free movement between inner and outer race. Worn bearings must be replaced.

**Gears**

Clean gears using a soft bristle brush and cleaning solvent. Remove foreign matter from the gears.

**END OF TASK**

**END OF WORK PACKAGE**

---

**FIELD MAINTENANCE  
ACCESSORY ACCESS**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0087

**Tools and Special Tools**

Tape Measure (WP 0125, Item 14)  
General Mechanic Tool Kit (WP 0125, Item 8)  
Chocking Blocks (WP 0126, Item 1)

**Materials/Parts**

N/A

**Equipment Condition**

Wheels Chocked

**Personnel Required**91B, Light Wheel Vehicle Mechanic (2)

---

**INSPECTION**

Inspect all accessory access components for dents, broken mounts, security of mounting, corrosion or any damage affecting serviceability.

**WARNING**

2-man lift is required for REMOVAL of engine cover and deck plates.

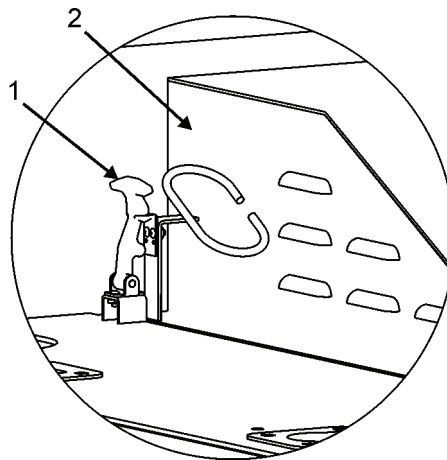
**REMOVAL****ENGINE COVER ASSEMBLY**

Figure 1. Rubber Hood Latch

1. Release 2 rubber latches (1 per side) (Figure 1, Item 1) from engine cover (Figure 1, Item 2).

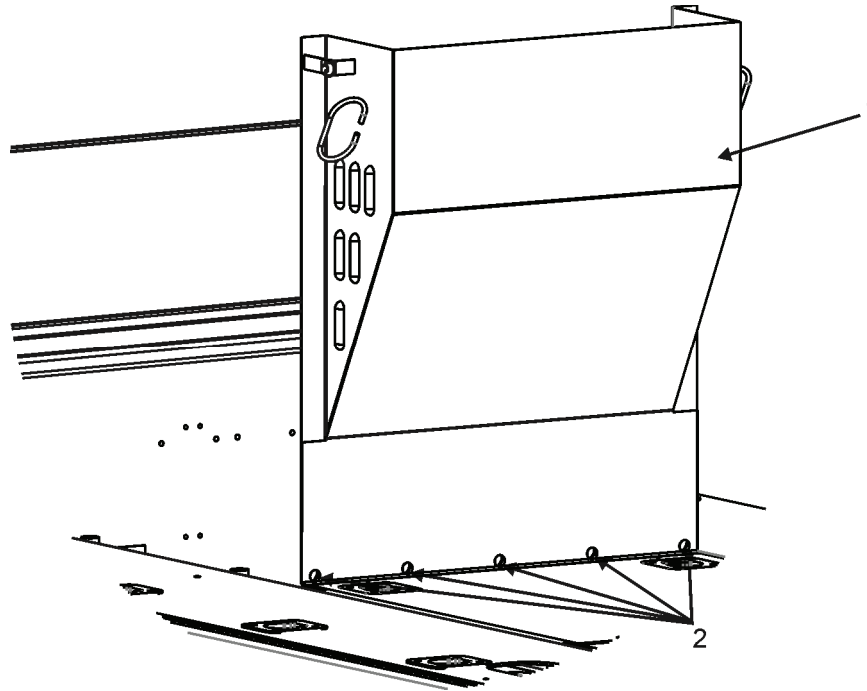


Figure 2. Engine Hood Removal

**NOTE**

Support engine cover in vertical position while removing bolts.

2. Raise engine cover (Figure 2, Item 1) to the vertical position.
3. Remove 5 screws (Figure 2, Item 2) washers and nuts (not shown).
4. Remove engine cover (Figure 2, Item 1) from vehicle.

**END OF TASK****INSTALLATION****ENGINE COVER ASSEMBLY**

1. Position engine cover (Figure 2, Item 1) on deck support bracket.
2. Install 5 screws (Figure 2, Item 2) washer and nuts (not shown).
3. Attach rubber latches (2) (Figure 1, Item 1) to engine cover (Figure 1, Item 2).

**END OF TASK****REMOVAL****CENTER DECK PLATE**

1. Remove 4 screws (Figure 3, Item 2).
2. Remove center deck plate from vehicle (Figure 3, Item 3).

**END OF TASK**

**INSTALLATION**

**CENTER DECK PLATE**

1. Position center deck plate (Figure 3, Item 3) on the vehicle.
2. Install 4 screws (Figure 3, Item 2) and secure center deck plate.

**END OF TASK**

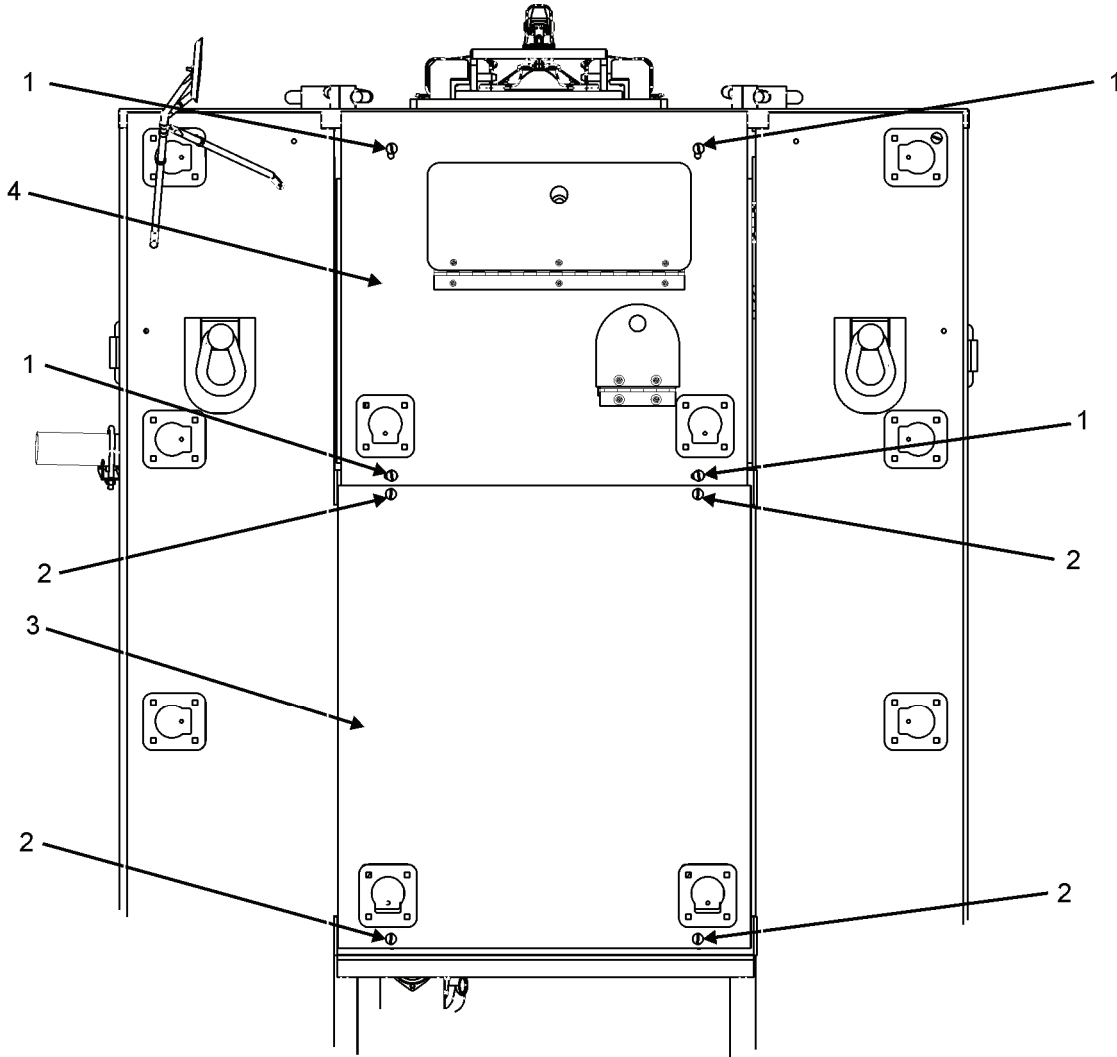


Figure 3. Center and Rear Deck Plates

**REMOVAL**

**REAR DECK PLATE**

1. Remove 4 screws (Figure 3, Item 1).
2. Remove rear deck plate from vehicle (Figure 3, Item 4).

**END OF TASK**

**INSTALLATION****REAR DECK PLATE**

1. Position rear deck plate (Figure 3, Item 4) on the vehicle.
2. Install 4 screws (Figure 3, Item 1) and secure rear deck plate.

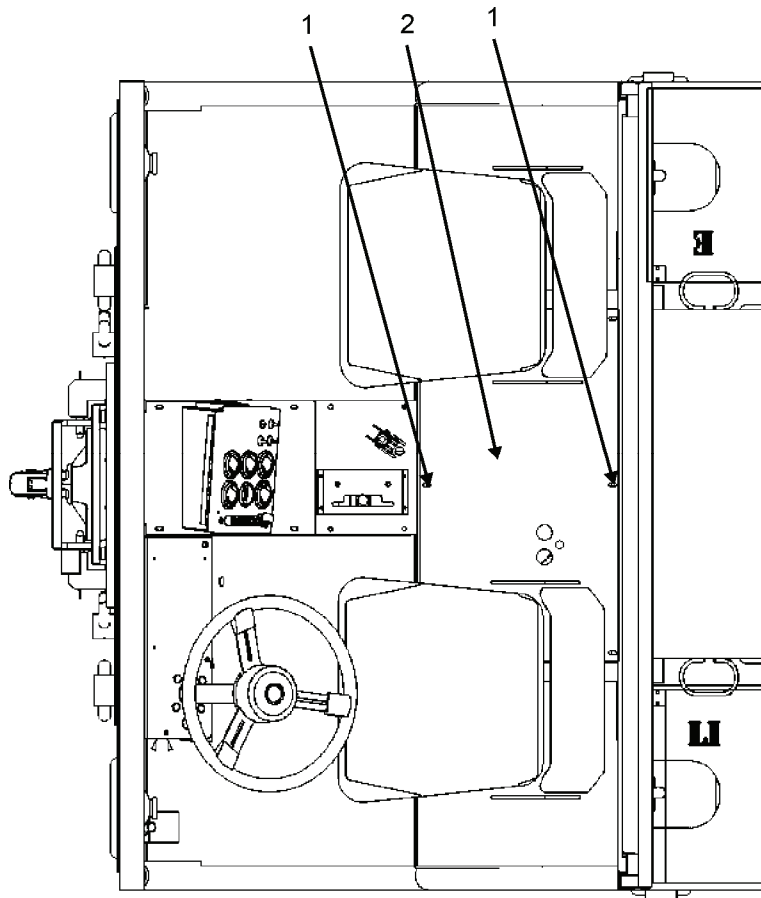
**END OF TASK**

Figure 4. Center Console Deck Plate (Removal and Installation)

**REMOVAL****CENTER CONSOLE DECK PLATE**

1. Remove driver and passenger seats (WP 0087).
2. Remove 6 screws (Figure 4, Item 1) (4 under the seats).
3. Remove center console deck plate (Figure 4, Item 2).

**END OF TASK**

**INSTALLATION**

**CENTER CONSOLE DECK PLATE**

1. Position center console deck plate (Figure 4, Item 2).
2. Install 6 screws (Figure 4, Item 1) (4 under the seats) and secure.
3. Install driver and passenger seats (WP 0087).

**END OF TASK**

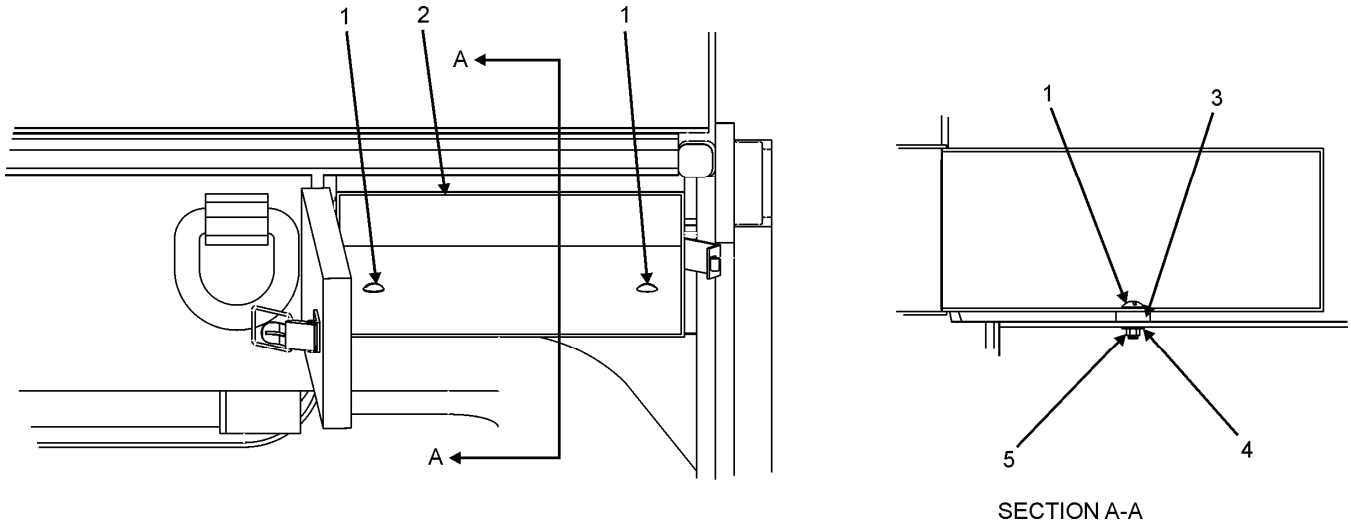


Figure 5. Tool Box (Left Hand Shown)

**REMOVAL**

**TOOL BOX**

**NOTE**

Both Left Hand and Right Hand toolbox removal and installation tasks are identical.

1. Open toolbox to access mounting bolts.
2. Remove 2 screws (Figure 5, Item 1) washers (Figure 5, Item 4) and nuts (Figure 5, Item 5).
3. Remove toolbox (Figure 4, Item 2).
4. Remove toolbox spacers (Figure 4, Item 3).

**END OF TASK**

**INSTALLATION**

**TOOL BOX**

1. Place spacers (Figure 5, Item 3) in position on vehicle frame.
2. Position toolbox (Figure 5, Item 2).

**NOTE**

Ensure proper door function before installing screws, washers and nuts.

3. Install 2 screws (Figure 5, Item 1), washers (Figure 5, Items 4) and nuts (Figure 5, Item 5) and secure tool box.

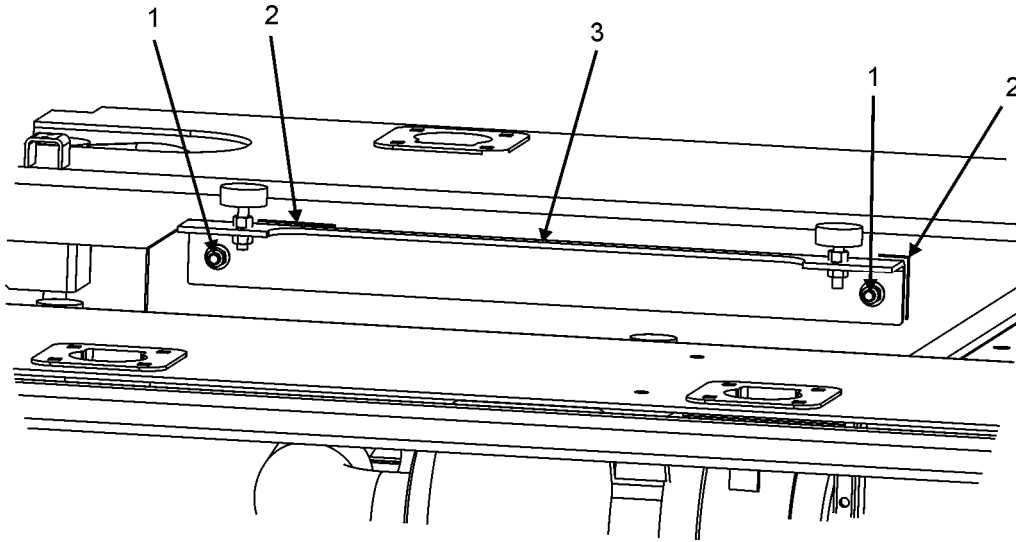
**END OF TASK**

Figure 6. Engine Cover Supports

**REMOVAL****ENGINE COVER SUPPORTS (RH AND LH)**

1. Open gear access door.
2. Mark position of engine cover supports (Figure 6, Item 2) to aid in reinstallation.
3. Remove 2 nuts/washers/bolts (Figure 6, Item 1). (1 set per end)
4. Remove LH or RH engine cover support (Figure 6, Item 3).

**END OF TASK****INSTALLATION****ENGINE COVER SUPPORTS (RH AND LH)****NOTE**

Adjusting the height on engine cover support may be necessary for proper engine cover fit.

1. Position LH/RH engine cover support (Figure 6, Item 3).
2. Install 2 bolts/washers/nuts (Figure 6, Item 1). (1 set per end)
3. Tighten 2 mount bolts (Figure 6, Item 1).

**END OF TASK**



**REMOVAL****ENGINE COVER SUPPORT (REAR)**

1. Mark position of engine cover support to aid in reinstallation.
2. Remove 8 nuts/washers/bolts (4 sets per side) (Figure 7, Item 2).
3. Remove engine cover support (Figure 7, Item 1).

**END OF TASK****INSTALLATION****ENGINE COVER SUPPORT (REAR)**

1. Position engine cover support (Figure 7, Item 2).
2. Install 8 bolts/washers/nuts (4 sets per side) (Figure 7, Item 2) and snug.

**NOTE**

Adjust height of engine cover support (Figure 6, Item 1) to 3/16" below the surface of the deck surface using a straight edge and tape measure.

3. Tighten 8 nuts/washers/bolts (4 per side) (Figure 7, Item 2).

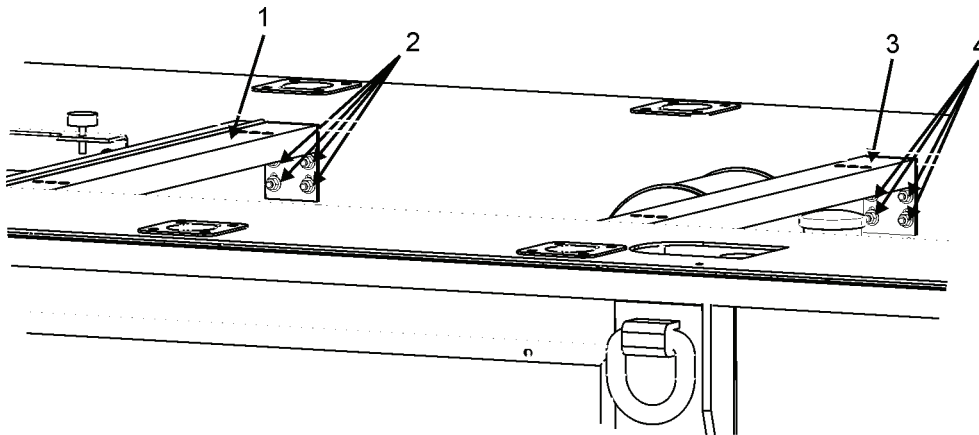
**END OF TASK**

Figure 7. Engine Cover Support (Rear) and Center Deck Plate Support

**REMOVAL****CENTER DECK SUPPORT**

1. Remove 8 nuts/washers/bolts (4 sets per side) (Figure 7, Item 4).
2. Remove center deck support (Figure 7, Item 3).

**END OF TASK**

## INSTALLATION

### CENTER DECK SUPPORT

1. Position center deck support (Figure 7, Item 3).
2. Install 8 bolts/washers/nuts (4 sets per side) (Figure 7, Item 4) and snug.

### NOTE

Adjust height of center deck support (Figure 7, Item 3) to 3/16" below the surface of the deck surface using a straight edge and tape measure.

3. Tighten 8 nuts/bolts (4 per side) (Figure 7, Item 4).

### END OF TASK

## REMOVAL

### REAR DECK SUPPORT

1. Remove 8 nuts/washers/bolts (4 sets per side) (Figure 8, Item 1).
2. Remove rear deck support (Figure 8, Item 2).

### END OF TASK

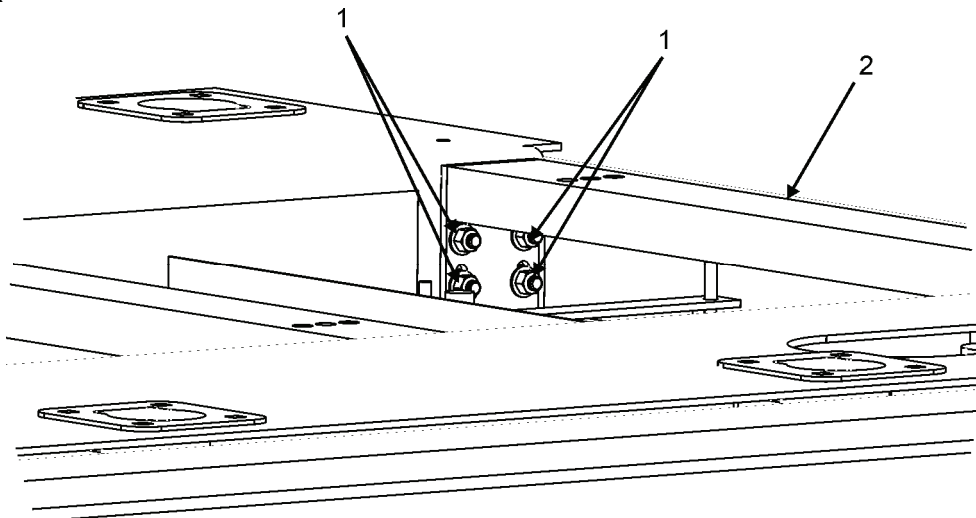


Figure 8. Rear Deck Support

## INSTALLATION

### REAR DECK SUPPORT

1. Position rear deck support (Figure 8, Item 2).
2. Install 8 bolts/washers/nuts (4 sets per side) (Figure 8, Item 1) and snug.

### NOTE

Adjust height of rear deck support (Figure 8, Item 2) to 3/16" below the surface of the deck surface using a straight edge and tape measure.

3. Tighten 8 nuts/bolts (4 per side) (Figure 8, Item 1).

### END OF TASK

### END OF WORK PACKAGE

**FIELD MAINTENANCE  
JACKING PROCEDURES**

**INITIAL SETUP:**

**Test Equipment**

N/A

**References**

N/A

**Tools and Special Tools**

Hydraulic Floor Jack, 5 Ton (WP 0125, Item 15)

Jack Stand, 5 Ton (WP 0125, Item 16)

Chocking Blocks (WP 0126, Item 1)

**Materials/Parts**

N/A

**Equipment Condition**

Wheels Chocked During Raising and Lowering

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

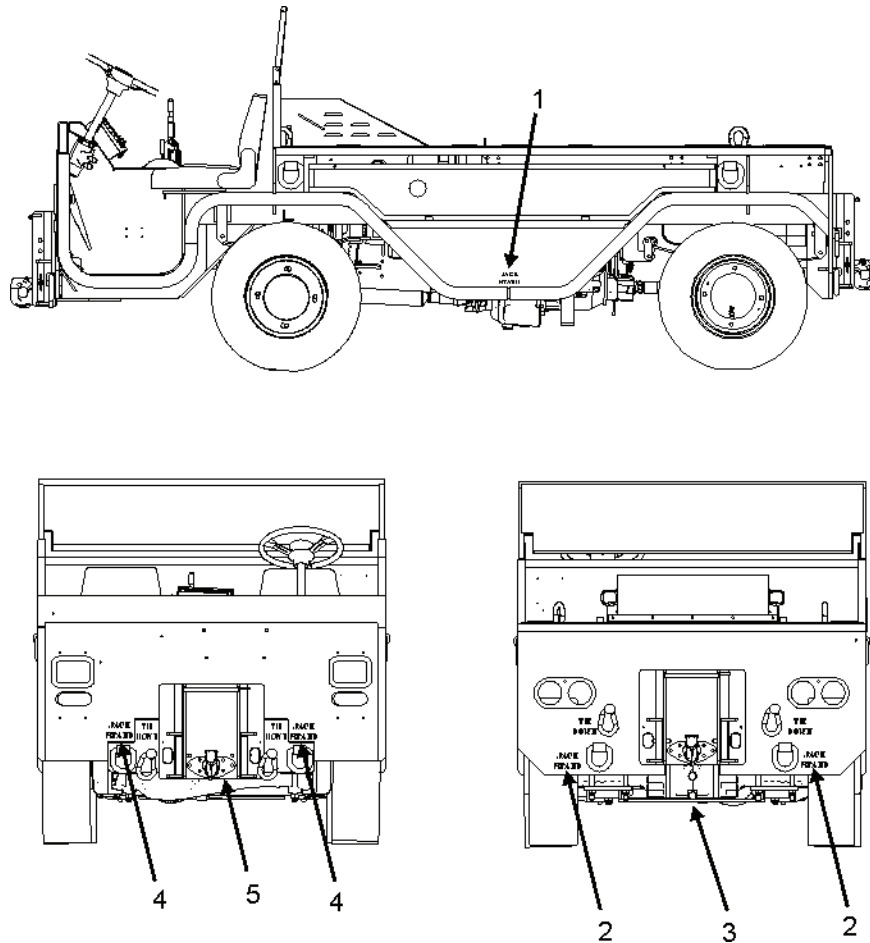


Figure 1. Jack Stand Locations

**Front Jacking**

1. Chock rear wheels.

**CAUTION**

Raise the tractor by placing the jack under the hitch plate and not the pintle hook. Damage to the pintle will occur if jack is placed under the hook.

2. Locate jack in the center of the tractor under the hitch (Figure 1, Item 5).
3. Jack front of tractor until the tractor wheels are off of the ground.
4. Place 2 jack stands under the front of the tractor located on the corners of the front bumper. Location is marked on the front of the tractor (Figure 1, Item 4).
5. Lower jack so all of the vehicle weight is on the jack stands.

**END OF TASK****Rear Jacking**

1. Chock front wheels.

**CAUTION**

Raise the tractor by placing the jack under the hitch plate and not the pintle hook. Damage to the pintle will occur if jack is placed under the hook.

2. Locate jack in the center of the tractor under the hitch (Figure 1, Item 3).
3. Jack rear of tractor until the tractor wheels are off of the ground.
4. Place 2 jack stands under the rear of the tractor located on the corners of the rear bumper. Location is marked on the rear of the tractor (Figure 1, Item 2).
5. Lower jack so all of the vehicle weight is on the jack stands.

**END OF TASK****Lowering Tractor Front End**

1. Chock rear wheels.

**CAUTION**

Raise the tractor by placing the jack under the hitch plate and not the pintle hook. Damage to the pintle will occur if jack is placed under the hook.

2. Locate jack in the center of the tractor under the hitch (Figure 1, Item 5).
3. Jack front of tractor until jack stands are free.
4. Remove the 2 jack stands.
5. Lower jack so vehicle wheels are on the ground.
6. Remove jack.
7. Remove chock blocks.

**END OF TASK****Lowering Tractor Rear End**

1. Chock front wheels.

**CAUTION**

Raise the tractor by placing the jack under the hitch plate and not the pintle hook. Damage to the pintle will occur if jack is placed under the hook.

2. Locate jack in the center of the tractor under the hitch (Figure 1, Item 3).
3. Jack rear of tractor until jack stands are free.
4. Remove the 2 jack stands.
5. Lower jack so vehicle wheels are on the ground.
6. Remove jack.
7. Remove chock blocks.

**END OF TASK****Complete Vehicle Raising****CAUTION**

Raise the tractor by placing the jack under the hitch plate and not the pintle hook. Damage to the pintle will occur if jack is placed under the hook.

1. Chock front or rear wheels.
2. Perform Front and Rear jacking procedures this Work Package.

**END OF TASK****Complete Vehicle Lowering**

1. Locate jack in the center of the tractor under the hitch (Figure 1, Item 5).

**CAUTION**

Raise the tractor by placing the jack under the hitch plate and not the pintle hook. Damage to the pintle will occur if jack is placed under the hook.

2. Jack front of tractor until jack stands are free.
3. Remove the 2 jack stands.
4. Lower jack so vehicle wheels are on the ground.
5. Chock front wheels.
6. Locate jack in the center of the tractor under the hitch (Figure 1, Item 3).

**CAUTION**

Raise the tractor by placing the jack under the hitch plate and not the pintle hook. Damage to the pintle will occur if jack is placed under the hook.

7. Jack rear of tractor until jack stands are free.
8. Remove the 2 jack stands.
9. Lower jack so vehicle wheels are on the ground.
10. Remove jack.
11. Remove chock blocks.

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE  
STENCILS, PLACARDS AND LABELS**

**INITIAL SETUP:**

**Test Equipment**  
N/A

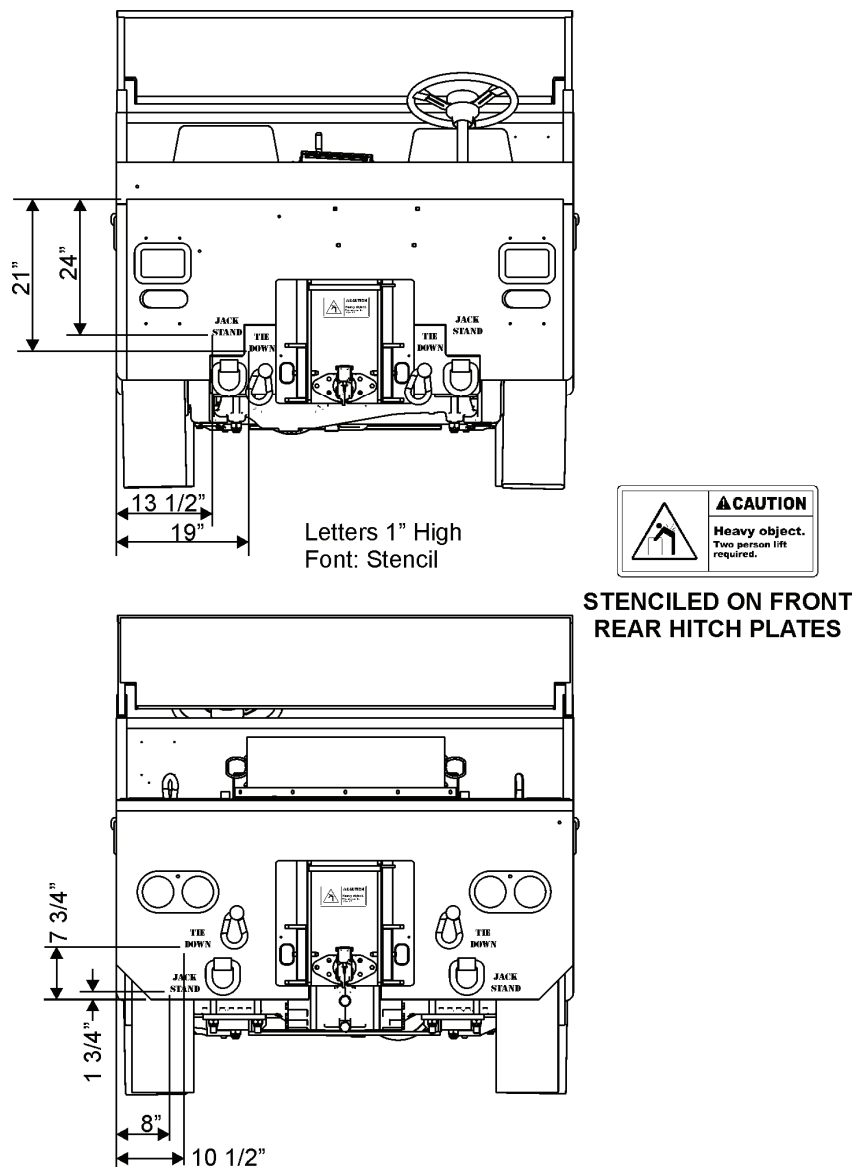
**References**  
N/A

**Tools and Special Tools**  
N/A

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
N/A



**STENCILED ON FRONT  
REAR HITCH PLATES**

Figure 1. Stencil Locations

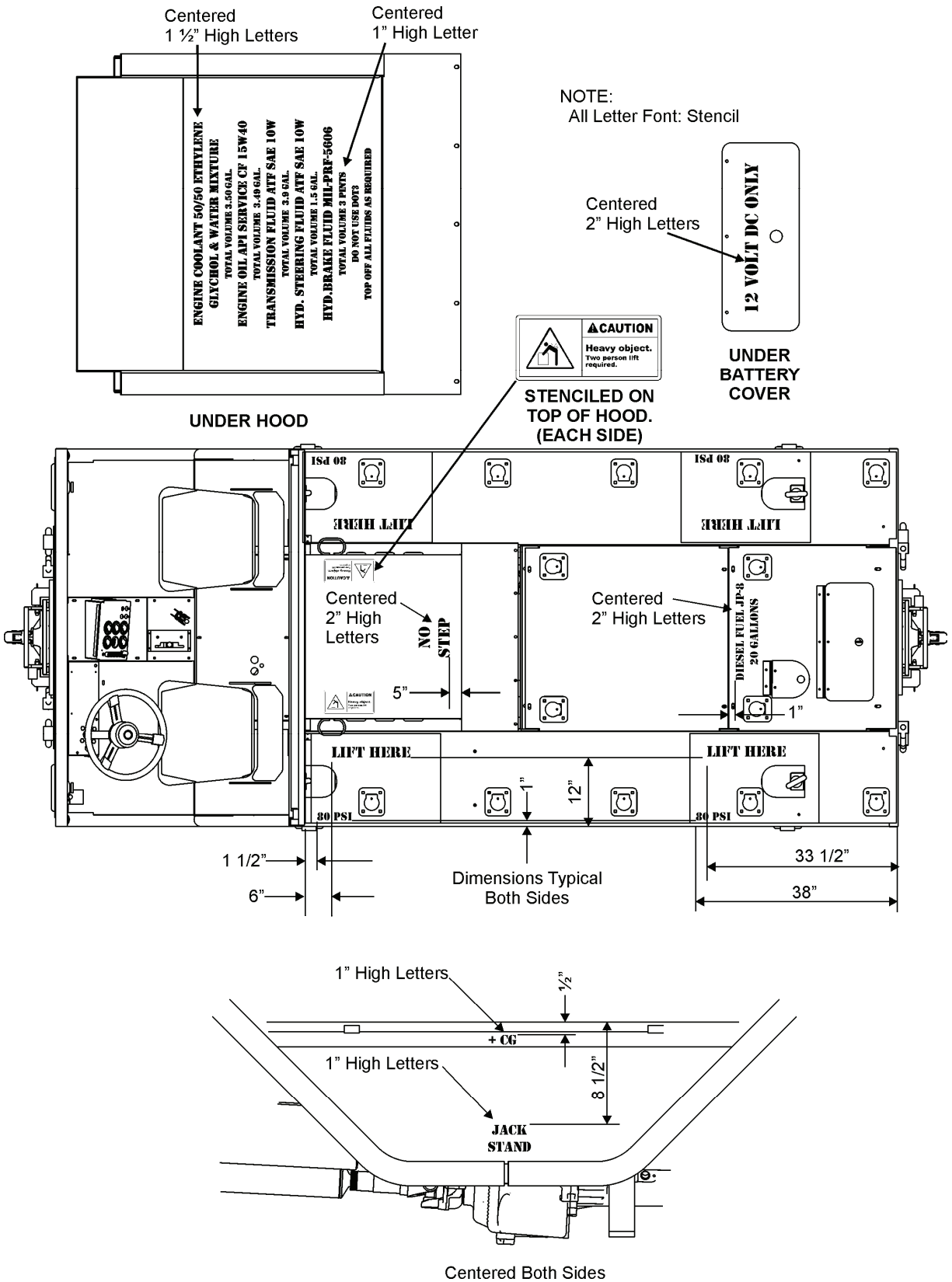
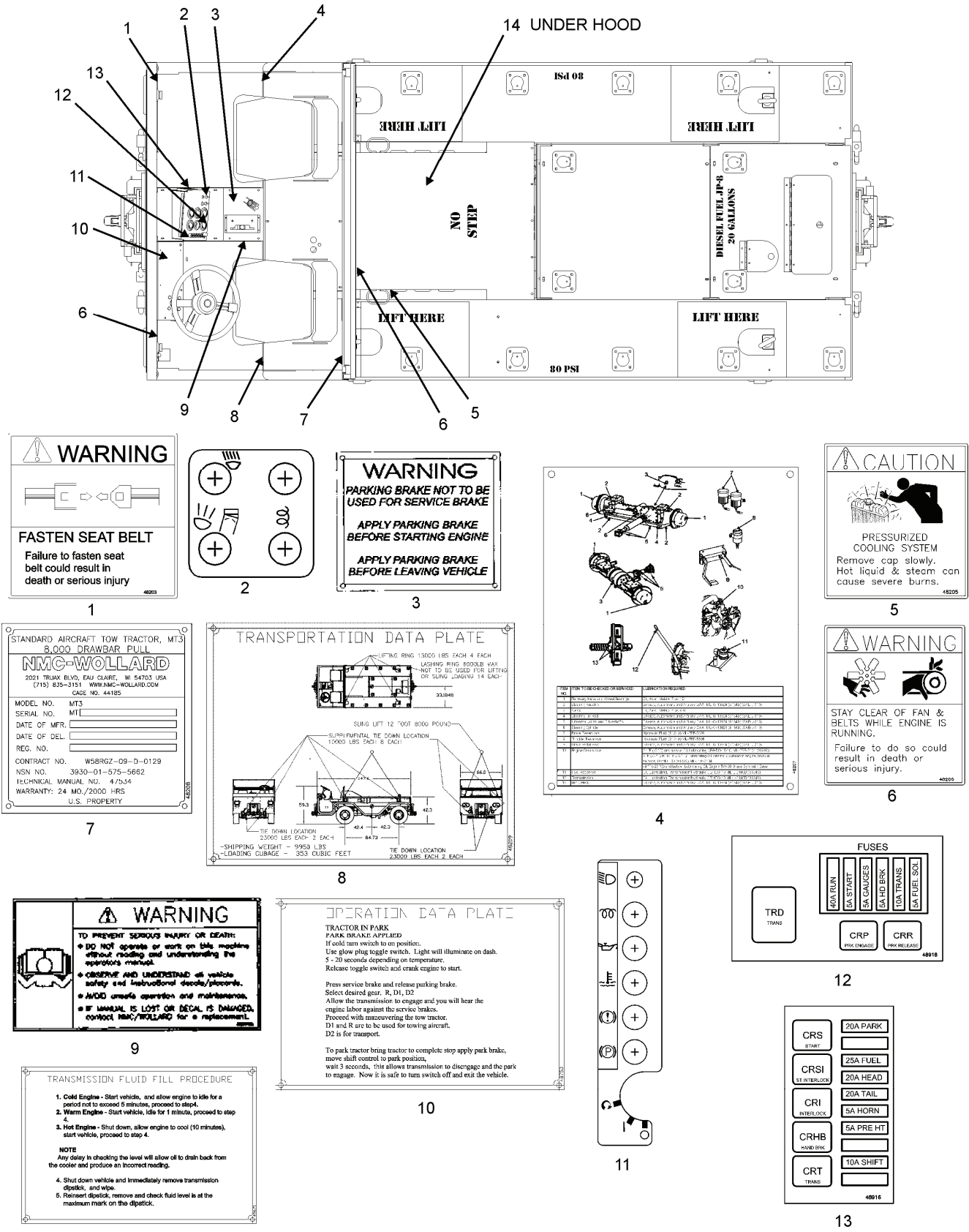


Figure 2. Stencil Locations





**WARNING**

**FASTEN SEAT BELT**  
Failure to fasten seat belt could result in death or serious injury.

48203

1

2

**WARNING**  
PARKING BRAKE NOT TO BE USED FOR SERVICE BRAKE  
APPLY PARKING BRAKE BEFORE STARTING ENGINE  
APPLY PARKING BRAKE BEFORE LEAVING VEHICLE

48204

3

NO.	HOW TO CHECK OR TEST ITEM	LUBRICATION REQUIRED
1	Check for cracks in the body of the ring.	None
2	Check for cracks in the lashing ring body.	None
3	Check for cracks in the lashing ring body.	None
4	Check for cracks in the lashing ring body.	None
5	Check for cracks in the lashing ring body.	None
6	Check for cracks in the lashing ring body.	None
7	Check for cracks in the lashing ring body.	None
8	Check for cracks in the lashing ring body.	None
9	Check for cracks in the lashing ring body.	None
10	Check for cracks in the lashing ring body.	None
11	Check for cracks in the lashing ring body.	None
12	Check for cracks in the lashing ring body.	None
13	Check for cracks in the lashing ring body.	None

48207

4

**CAUTION**

**PRESSURIZED COOLING SYSTEM**  
Remove cap slowly. Hot liquid & steam can cause severe burns.

48205

5

STANDARD AIRCRAFT TOW TRACTOR, MT3  
8,000 DRAWBAR PULL  
**NMC-WOLLARD**  
2021 TRUXAV BLVD, EAU CLAIRE, WI 54703 USA  
(715) 835-3151 WWW.NMC-WOLLARD.COM  
CAGE NO. 44185

MODEL NO. MT3  
SERIAL NO. MT  
DATE OF MFR.  
DATE OF DEL.  
REC. NO.

CONTRACT NO. W5BRGZ-09-D-0129  
NSN NO. 3930-01-575-5662  
TECHNICAL MANUAL NO. 47D54  
WARRANTY: 24 MO./2000 HRS  
U.S. PROPERTY

48208

7

**TRANSPORTATION DATA PLATE**

LIFTING RING 13000 LBS EACH 4 EACH  
LASHING RING 800LB EACH  
NOT TO BE USED FOR LIFTING OR SLING LOADING 14 EACH

SLING LIFT 12 7000 8000 POUND  
SUFFICIENT THE DOWN LOCATION  
10000 LBS EACH 6 EACH

59.3 48.4 44.2 42.3 64.79 64.8

TIE DOWN LOCATION 23000 LBS EACH 2 EACH  
SHIPPING WEIGHT - 9960 LBS  
LOADING CUBAGE - 353 CUBIC FEET  
TIE DOWN LOCATION 23000 LBS EACH 2 EACH

48209

8

**WARNING**

**TO PREVENT SERIOUS INJURY OR DEATH:**

- DO NOT operate or work on this machine without reading and understanding the operators manual.
- OBSERVE AND UNDERSTAND all vehicle safety and instructional decals/placards.
- AVOID unsafe operation and maintenance.
- IF MANUAL IS LOST OR DECAL IS DAMAGED, CONTACT NMC/WOLLARD for a replacement.

48210

9

**OPERATION DATA PLATE**

TRACTOR IN PARK  
PARK BRAKE APPLIED  
If cold turn switch to on position.  
Use glow plug toggle switch. Light will illuminate on dash. 5 - 20 seconds depending on temperature.  
Release toggle switch and crank engine to start.

Press service brake and release parking brake.  
Select desired gear. R, D1, D2  
Allow the transmission to engage and you will hear the engine labor against the service brakes.  
Proceed with maneuvering the tow tractor. D1 and R are to be used for towing aircraft. D2 is for transport.

To park tractor bring tractor to complete stop apply park brake, move shift control to park position, wait 3 seconds, this allows transmission to disengage and the park to engage. Now it is safe to turn switch off and exit the vehicle.

48211

10

48212

11

**FUSES**

TRD TRANS

MAX TURN  
SA START  
SA GAUGES  
SA HD BRK  
10A TRANS  
SA FUEL SOL

CRP PRK ENGAGE  
CRR PRK RELEASE

48918

12

CRS START  
CRSI ST INTERLOCK  
CRI INTERLOCK  
CRHB HORN BRK  
CRT TRANS

20A PARK  
25A FUEL  
20A HEAD  
20A TAIL  
5A HORN  
5A PRE HT  
10A SHIFT

48916

13

**TRANSMISSION FLUID FILL PROCEDURE**

- Cold Engine - Start vehicle, and allow engine to idle for a period not to exceed 5 minutes, proceed to step 4.
- Warm Engine - Start vehicle, idle for 1 minute, proceed to step 4.
- Hot Engine - Shut down, allow engine to cool (10 minutes), start vehicle, proceed to step 4.

**NOTE**  
Any delay in checking the level will allow oil to drain back from the cooler and produce an incorrect reading.

- Shut down vehicle and immediately remove transmission dipstick, and wipe.
- Reinsert dipstick, remove and check fluid level is at the maximum mark on the dipstick.

14

Figure 3. Placard Locations

**Placard Care**

1. Keep placards clean and legible at all times.
2. Replace placards that are missing or have become illegible.
3. Placards are available from your dealer.

**Installation of Mylar Placards**

1. Be sure that the installation area is clean and dry.
2. Remove the smallest portion of the split backing paper.
3. Align the placard over the specified area and carefully press the small portion with the exposed adhesive backing in place.
4. Remove second backing and press remaining decal in place.

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
POWER PACK ASSEMBLY**

**INITIAL SETUP:**

<b>Test Equipment</b>	WP 0054
N/A	WP 0055
	WP 0056
<b>Tools and Special Tools</b>	WP 0057
Sling 3 Ton (WP 0125, Item 7)	WP 0061
Wheel Chocks (WP 0126, Item 1)	WP 0062
Stand Weldment, Engine Pack (WP 0125, Item 10)	WP 0070
Trans Lift Weldment (WP 0125, Item 13)	WP 0074
Maintenance Mounts (WP 0125, Item 11)	WP 0075
Maintenance Mounts (WP 0125, Item 12)	WP 0076
	WP 0077
<b>Personnel Required</b>	WP 0080
91B Light Wheel Vehicle Mechanic (2)	WP 0091
	WP 0097
	WP 0098
<b>References</b>	WP 0099
WP 0004	WP 0105
WP 0020	WP 0107
WP 0021	WP 0111
WP 0026	WP 0115
WP 0027	
WP 0029	
WP 0030	<b>Materials/Parts</b>
WP 0034	N/A
WP 0040	
WP 0043	<b>Equipment Condition</b>
WP 0051	Engine Shut Down
WP 0052	

**REMOVAL**

**CAUTION**

2-man lift is required for removal of deck plates.

**NOTE**

Stand Weldment, Engine Pack (Illustrated List of Manufactured Items, WP 0120) must be procured prior to the power pack assembly removal to prevent damage to assembly components. Cap and plug all hoses and fittings when disconnecting from components. Tag or label all wiring connectors and terminals when disconnecting from components. Engine, transmission and radiator are mounted on a power pack frame and removed as an assembly. Note orientation and routing of all wire harnesses and hose assemblies before removal from components and routing out of vehicle chassis assembly. Wire ties and clamps must be removed to facilitate maintenance.

1. Chock wheels.
2. Turn ignition switch to on position, release hand brake lever and place the transmission shift lever in drive position (WP 0004).
3. Verify park position brake is disengaged (WP 0076).
4. Turn ignition switch to off position (WP 0004).
5. Disconnect battery cables (WP 0091).
6. Remove rear deck plate (WP 0020).

7. Remove center deck plate (WP 0020).
8. Remove engine cover (WP 0020).
9. Remove engine cover support (rear) and engine cover supports (RH and LH) (WP 0020).
10. Remove LH/RH toolbox (WP 0020).

### NOTE

Exhaust system can be removed as an assembly from the tow vehicle.

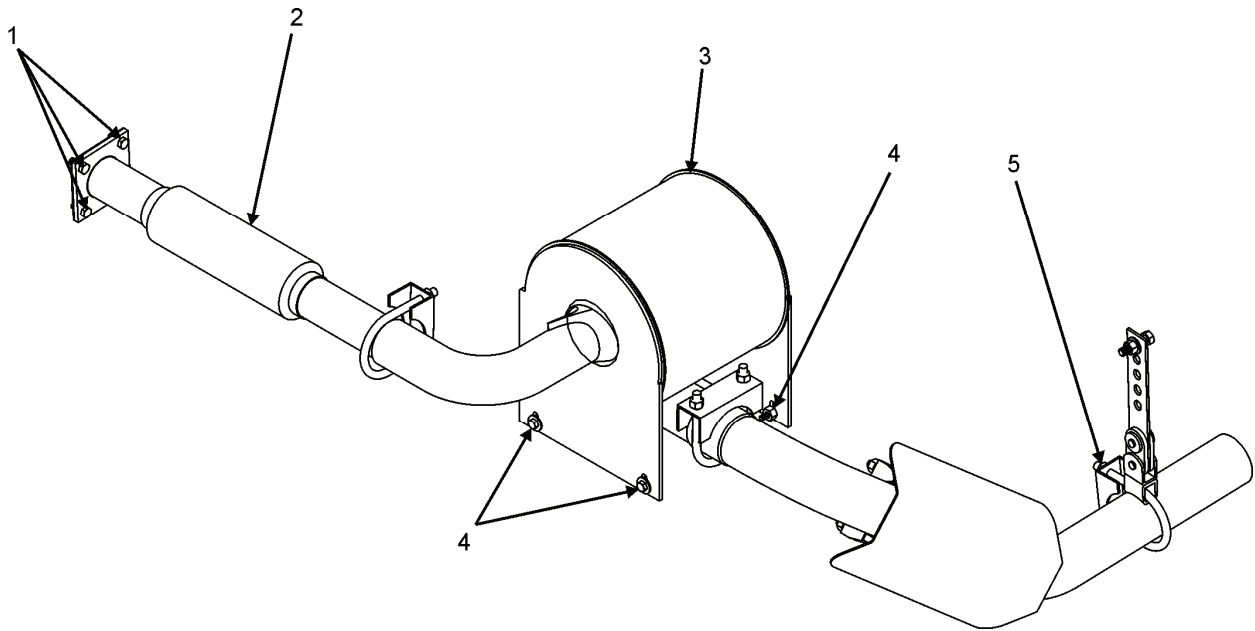


Figure 1. Exhaust Removal Complete

### NOTE

To prevent FOD cover turbo exhaust outlet on engine.

11. Remove 4 bolts/lock washers ( Figure 1, Item 1) (one not shown) securing forward exhaust pipe (Figure 1, Item 2) to turbo charger flange.
12. Remove 4 bolts/washers/nuts (Figure 1, Item 4) (one not shown) securing muffler (Figure 1, Item 3) to engine mounting bracket.
13. Loosen exhaust pipe hanger clamp (Figure 1, Item 5).
14. Remove exhaust system from vehicle.

### WARNING

Failure to use the proper lifting equipment (jack) when lifting tow vehicle may result in serious injury or death.

15. Raise vehicle per complete vehicle raising (WP 0021).
16. Disconnect front drive shaft (WP 0070) from transmission (leave driveshaft connected to axle). Lower drive shaft to the ground.
17. Disconnect rear drive shaft (WP 0070) from transmission (leave driveshaft connected to axle). Lower drive shaft to the ground.
18. Disconnect hand brake cable from hand brake caliper and cable mount (WP 0080). Pull cable to front of vehicle to avoid any interference when removing power pack assembly.
19. Disconnect and plug fuel lines from fuel tank. Roll and place lines on top of fuel/water separator (WP 0054).

**NOTE**

Label all engine and transmission electrical connectors and note routing of wiring, wiring clamps and placement of wire ties to aid in reinstallation.

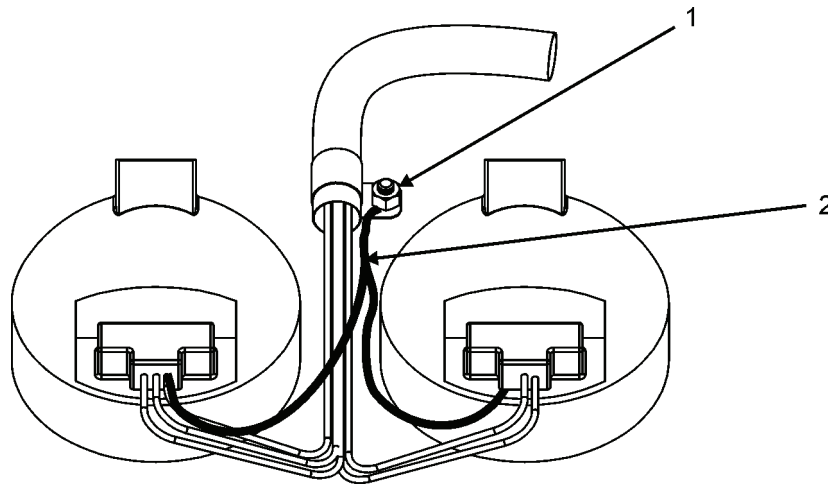


Figure 2. Ground Wire Connection

20. Disconnect bolt, star washer and nut LH & RH (Figure 2, Item 1).
21. Remove stoplight and backup light ground wires and clamp LH & RH (Figure 2, Item 2).
22. Remove stoplight wiring LH & RH (WP 0097).
23. Remove backup light wiring LH & RH (WP 0098).
24. Disconnect rear wiring harness from backup alarm and tag (WP 0099).
25. Disconnect rear wiring harness from fuel tank sending unit and tag (WP 0055).
26. Remove four bolts, eight washers and 4 nuts (Figure 5, Item 1), wire harness clamp Figure 5, Item 2) and fuel hose clamp (Figure 5, Item 3) attaching power pack frame to tow tractor chassis.
27. Pull rear wiring harness through chassis to front of tractor.
28. Disconnect wiring connector and ground wire from fuel/water separator (WP 0056).
29. Disconnect wiring from upper park position limit switch assembly (WP 0077).
30. Remove lower park position limit switch assembly (WP 0077).
31. Unplug wire connector from park position motor (WP 0076).
32. Disconnect wire from transmission temperature sending unit (WP 0043).
33. Disconnect wire from engine oil pressure switches (WP 0029).
34. Disconnect wire from engine oil pressure (gauge) sending unit (WP 0030).
35. Disconnect wire from glow plug rail (WP 0034).
36. Unplug fuel solenoid wire (WP 0057).
37. Disconnect wires from throttle validation switch (WP 0105).
38. Disconnect starter wiring (WP 0026).
39. Disconnect alternator wiring (WP 0027).
40. Disconnect wire from coolant temperature switch (WP 0051).
41. Disconnect wire from coolant temperature sending unit (WP 0052).

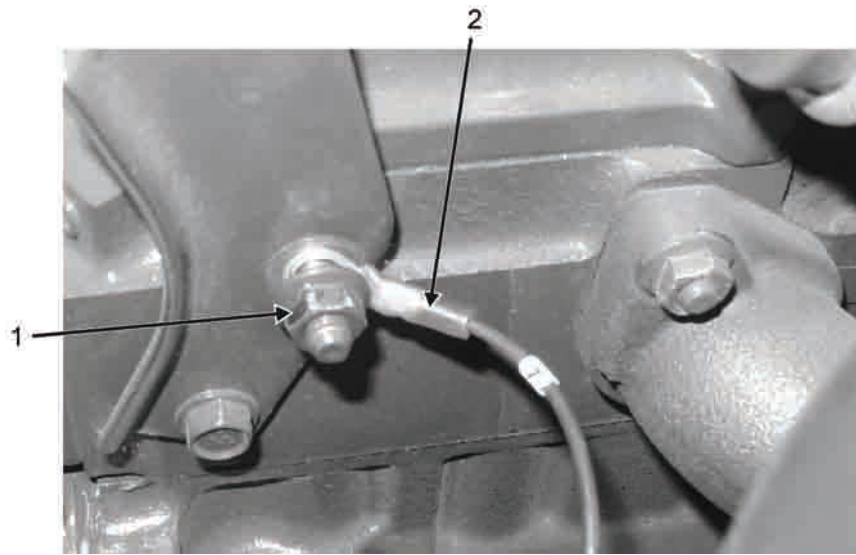


Figure 3. Engine Block Ground Wire (Removal And Installation)

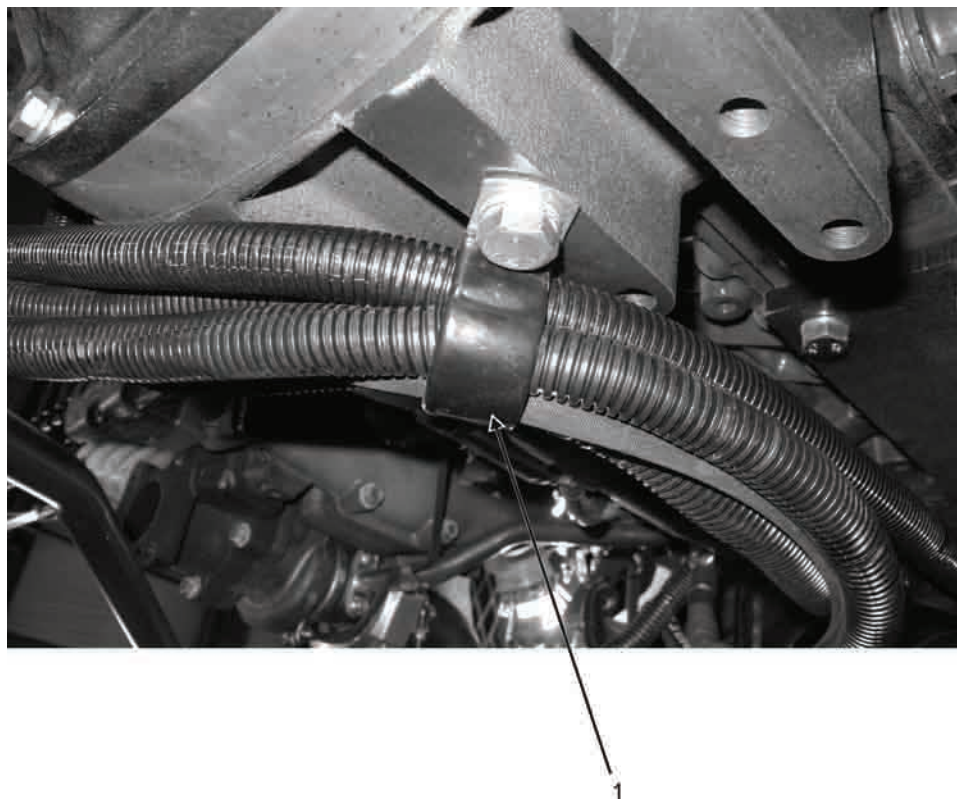


Figure 4. Wiring Clamp On Bell Housing

42. Disconnect engine block ground nut and wire (Figure 3, Item 1 and 2).
43. Figure 4, Item 1).from bell housing.
44. Pull positive battery cable from chassis.
45. Pull all wires from engine power pack.
46. Pull all engine pack wiring over axle to front of vehicle.
47. Disconnect rear transmission plug wire from ECU (WP 0040).
48. Coil ECU wire harness and secure to transmission.

### NOTE

Place drip pan under or shop towels at the appropriate location to collect draining hoses and components.

49. Disconnect hydraulic return hose from hydraulic tank (WP 0111).
50. Disconnect hydraulic pressure hose from gear pump (WP 0115).
51. Pull both hoses over axle to front of vehicle.
52. Disconnect the hose from throttle slave cylinder assembly (WP 0105).
53. Disconnect main brake hose from rear axle tee and pull to front of vehicle, routing over front axle (WP 0075).

### NOTE

Do not remove hose from throttle reservoir.

54. Disconnect throttle reservoir from firewall and move to the side (WP 0107).
55. Remove brake reservoirs (WP 0074).
56. Route brake reservoir hoses down and over front axle.
57. Disconnect air intake tube assembly (WP0061).

### WARNING

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under and engine, transmission being lifted or suspended. Use suitable lifting equipment for heavy components. Power pack assembly weight is 1800 lbs.

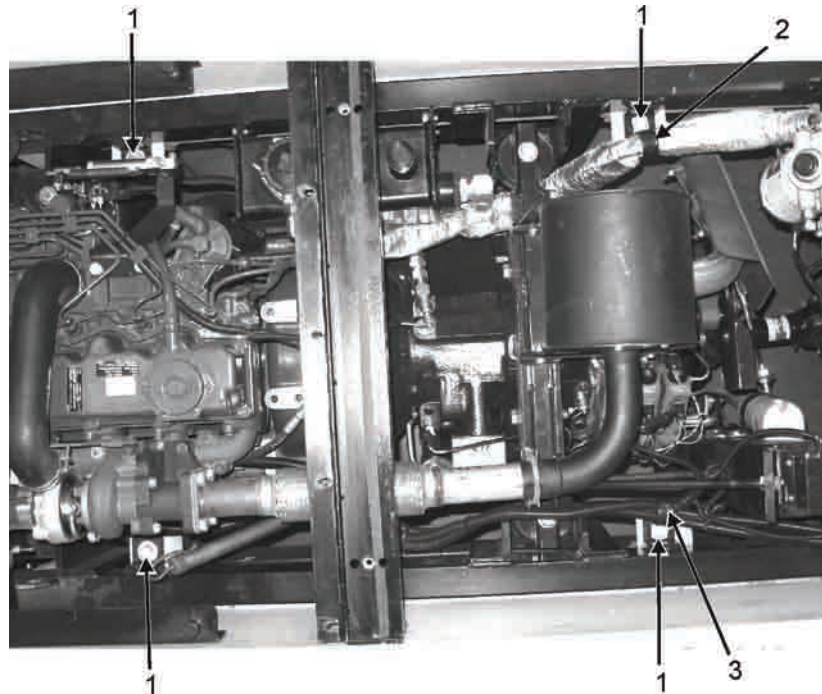


Figure 5. Power Pack Assembly Mount Bolts

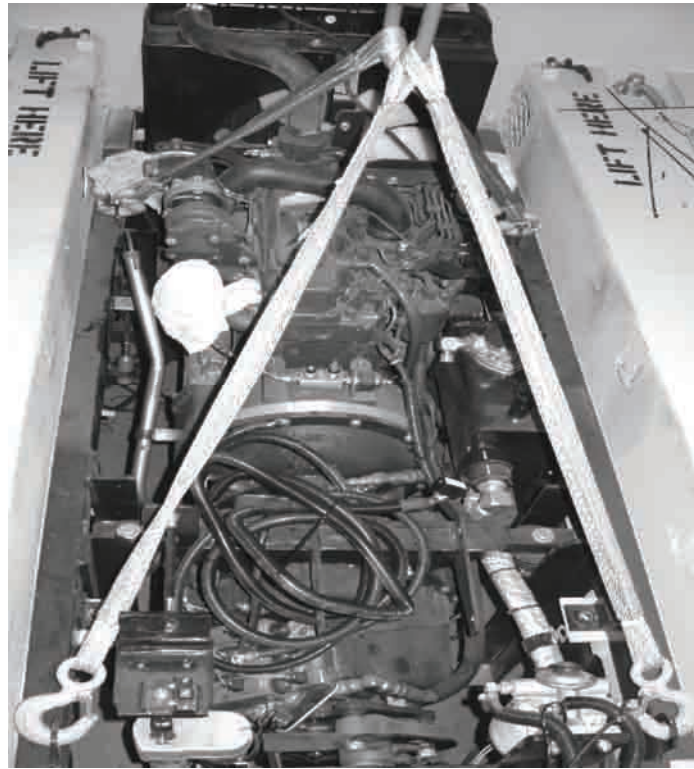


Figure 6. Power Pack Assembly (Removal And Installation)

#### NOTE

To ease with the power pack assembly lifting process, use slings or chains of proper length (as shown 3 foot length in front and 4 foot length in rear).

58. Attach sling to power pack assembly lifting eyes as illustrated in (Figure 6).
59. Attach overhead hoist to sling (Figure 6).
60. Carefully lift power pack assembly (Figure 7) from mounting brackets while continuously observing that all harnesses, hoses, and pipes are not interfering with the removal of power pack assembly and place in engine power pack cradle (Figure 8).



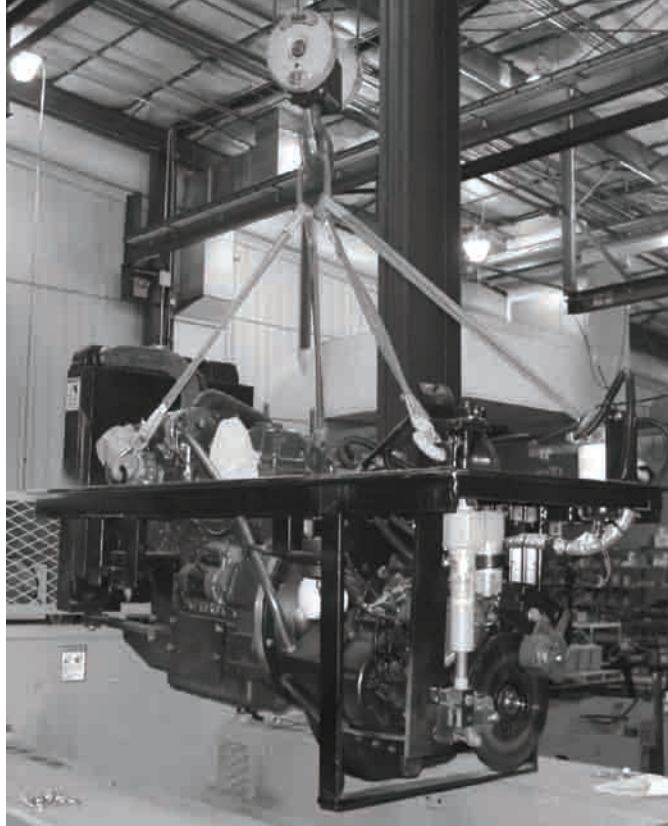


Figure 7. Power Pack Assembly (Removal And Installation)

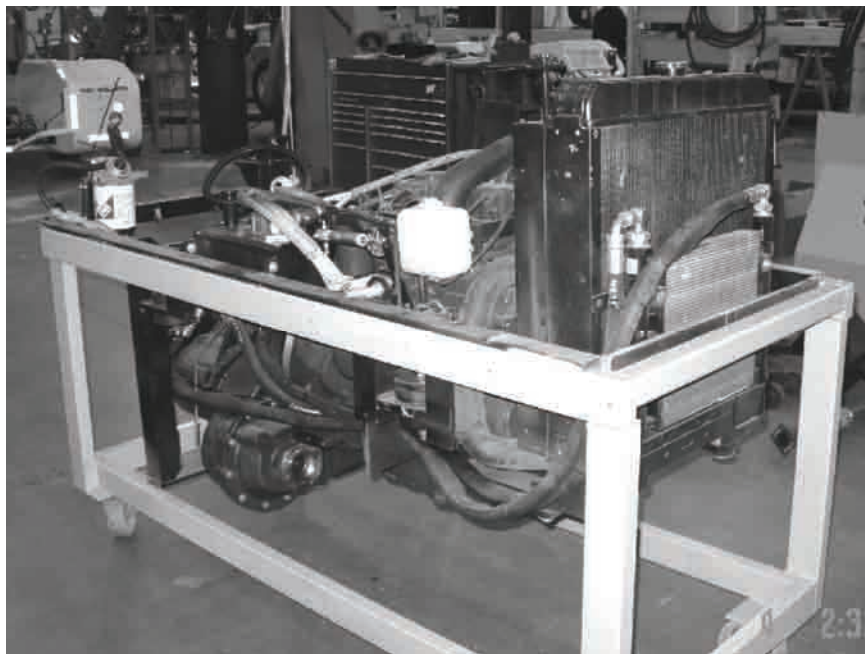


Figure 8. Power Pack Assembly (In Stand)

**END OF TASK**

**INSTALLATION****WARNING**

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under and engine, transmission being lifted or suspended. Use suitable lifting equipment for heavy components. Power pack weight is 1800 lbs.

**NOTE**

To ease with the power pack assembly lifting process, use slings or chains of proper length (as shown 3 foot length in front and 4 foot length in rear).

1. Attach sling to power pack assembly lifting eyelets (Figure 6).
2. Attach overhead hoist to sling (Figure 6).
3. Lift power pack assembly and position over vehicle chassis (Figure 7).
4. Carefully lower power pack assembly into tow tractor while continuously observing that all harnesses, hoses and pipes are not interfering with power pack frame.

**NOTE**

Ensure cradle mount holes are aligned with frame mount holes.

**NOTE**

The two rear mount bolts will be installed after wire and hose routing is complete.

5. Install front two bolts, four washers and two nuts (Figure 5, Item 1) torque nuts to 78 ft lbs.
6. Remove slings.
7. Connect air intake tube assembly (WP 0062).
8. Route brake hoses and throttle reservoir back to connection location.
9. Install brake reservoirs (WP 0074).
10. Connect throttle reservoir to firewall (WP 0107).
11. Route main brake line and hand brake cable over radiator mount and along frame under tabs.

**NOTE**

Do not bend hose and cable chassis tabs down at this time.

12. Connect main brake line to rear axle tee (WP 0075).
13. Connect hand brake cable to hand brake caliper bracket (WP 0080).
14. Bend tabs down to secure hand brake cable.
15. Connect the slave cylinder supply hose to throttle slave cylinder assembly (WP 0105).
16. Route hydraulic hoses back to connection locations.
17. Connect hydraulic pressure line to gear pump (WP 0115).
18. Connect hydraulic tank return line to tank (WP 0111).
19. Uncoil transmission ECU wire harness and feed to front of vehicle and plug into the rear of ECU (WP 0040).

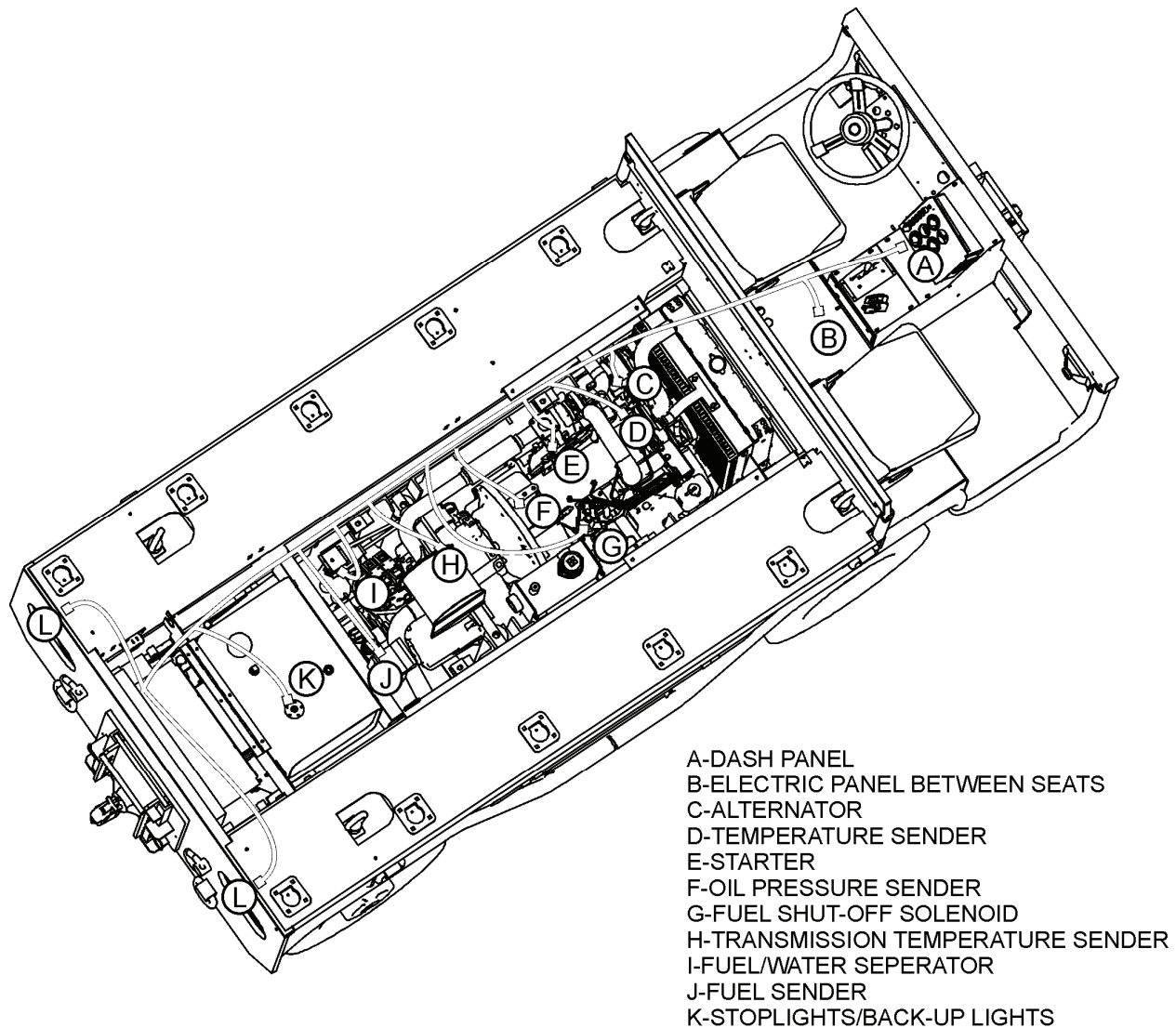


Figure 9. Electric Wire Routing

20. Route all engine pack wiring (Figure 9) as previously noted into vehicle.
21. Connect engine block ground wire (Figure 3, Item 2) with nut (Figure 3, Item 1).
22. Connect wire to engine coolant temperature sending unit (WP 0052).
23. Connect wire to engine coolant temperature switch (WP 0051).
24. Connect wiring to alternator (WP 0027).
25. Connect wires to starter (WP 0026).
26. Connect wires to throttle validation switch (WP 0105).
27. Plug in fuel solenoid wire (WP 0057).
28. Connect wire to glow plug rail (WP 0034).
29. Connect wire to engine oil pressure (gauge) sending unit (WP 0030).
30. Connect wire to engine oil pressure switches (WP 0029).
31. Connect wire to transmission temperature sending unit (WP 0043).
32. Plug wire connector to park position motor (WP 0076).
33. Install lower park position limit switch assembly (WP 0077).

34. Connect wiring to upper park position limit switch assembly and install guard (WP 0077).
35. Connect wire connector and ground wire to fuel/water separator (WP 0056).
36. Connect wiring to fuel tank sending unit (WP 0055).
37. Connect wiring and ground wire to backup alarm (WP 0099).
38. Position backup light and stoplight ground wires (Figure 2, Item 2).
39. Insert bolt, star washer and nut (Figure 2, Item 1).
40. Connect backup light wiring connector LH & RH (WP 0098).
41. Connect stoplight wiring connector LH & RH (WP 0097).
42. Connect fuel lines to fuel tank. (WP 0054).
43. Connect front drive shaft to front transmission output yoke flange (WP 0070).
44. Connect rear drive shaft to rear transmission brake disc (WP 0070).
45. Position exhaust assembly on the engine and hold in position.
46. Connect muffler (Figure 1, Item 5) to engine mounting bracket with 4 bolts, washers and nuts (Figure 1, Item 4) (one not shown). Do not tighten.
47. Connect turbo charger flange (Figure 1, Item 2) with 4 bolts and lockwashers (Figure 1, Item 1) (one not shown).
48. Tighten muffler bolts, washers and nuts (Figure 1, Item 4).
49. Tighten exhaust pipe hanger clamp (Figure 1, Item 5).
50. Install LH/RH toolbox (WP 0020).
51. Install engine cover supports, rear and (LH/RH) (WP 0020).
52. Install clamp (Figure 4, Item 1) to secure wiring harness onto bell housing, top hole on left.
53. Install left rear wiring harness clamp (Figure 5, Item 2), secure with left rear engine mount bolt, washers and nut (Figure 5, Item 1) torque nuts to 78 ft lbs.
54. Install right rear fuel line harness clamp (Figure 5, Item 3), secure with right rear engine mount bolt, washers and nut (Figure 5, Item 1) torque nuts to 78 ft lbs.

**NOTE**

Remove all tags and labels from wiring connectors and terminals. Secure all wiring with wire ties as previously noted.

55. Bleed brakes (WP 0075).
56. Service engine (WP 0025).
57. Service throttle system (WP 0104).
58. Service steering hydraulic tank (WP 0111).
59. Service cooling system (WP 0045).
60. Bleed air from fuel system (WP 0056).
61. Connect battery (WP 0091).
62. Service transmission (WP 0036).
63. Lower vehicle (WP 0021).
64. Remove all chocks from wheels.
65. Perform Maintenance Operation Check.
66. Chock all wheels.
67. Install rear deck plate (WP 0020).
68. Install engine cover (WP 0020).
69. Install center deck plate (WP 0020).
70. Remove all chocks from wheels.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE  
ENGINE POWER PACK**

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**INITIAL SETUP:****Test Equipment**

N/A

WP 0032

WP 0035

WP 0056

**Tools and Special Tools**

Sling 2 Ton (WP 0125, Item 7)

General Mechanic Tool Box (WP 0125, Item 8)

WP 0111

WP 0120

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**Materials/Parts**

N/A

**References**

WP 0023

WP 0025

**Equipment Condition**

N/A

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**REMOVAL****CAUTION**

Stand Weldment, Engine Pack (Illustrated List of Manufactured Items, WP 0120) must be procured and installed prior to the engine power pack being placed on a level surface to perform maintenance.

1. Remove power pack assembly (WP 0023).
2. Drain transmission oil now if engine/transmission assembly is being separated (WP 0036).
3. Drain engine oil now if engine is being replaced. (WP 0025).
4. Remove fuel/water separator housing assembly (WP 0056).
5. Drain and remove hydraulic tank (WP 0111).

**NOTE**

Bottom right front isolator must be identified for reinstallation in same location and position.

6. Remove 4 engine power pack mount nuts, washers, bolts and lower ½ of isolators (WP 0032).

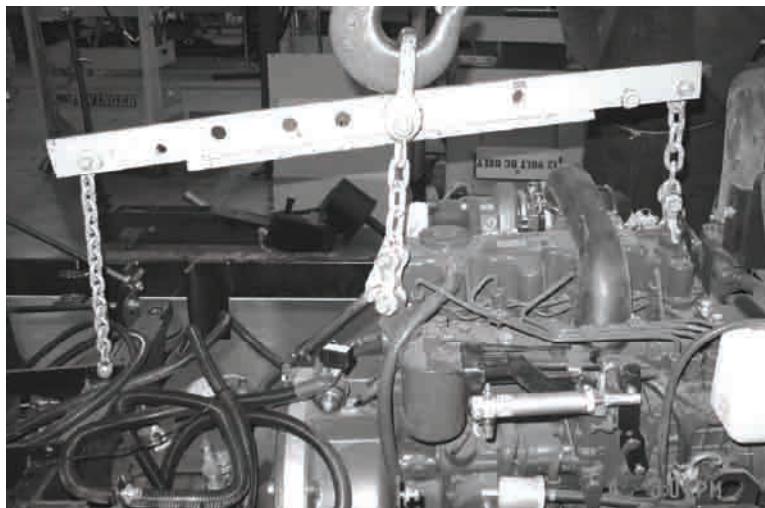


Figure 1. Engine Power Pack (Removal and Installation)

7. Attach power pack sling to engine lift points (Figure 1).

**WARNING**

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under and engine, transmission being lifted or suspended. Use suitable lifting equipment for heavy components. Power pack weight is 1800 lbs.

8. Carefully lift engine power pack from cradle while continuously observing that all harnesses, hoses, and pipes are not interfering with the removal process.

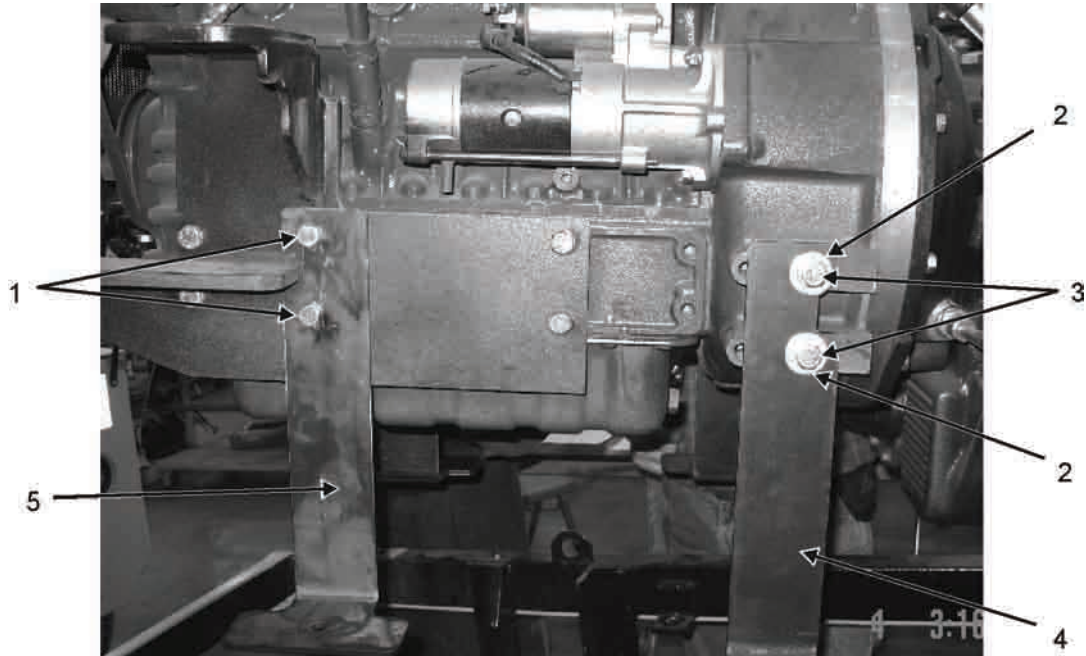


Figure 2. Engine Power Pack Maintenance Mounts, LH (Removal and Installation)

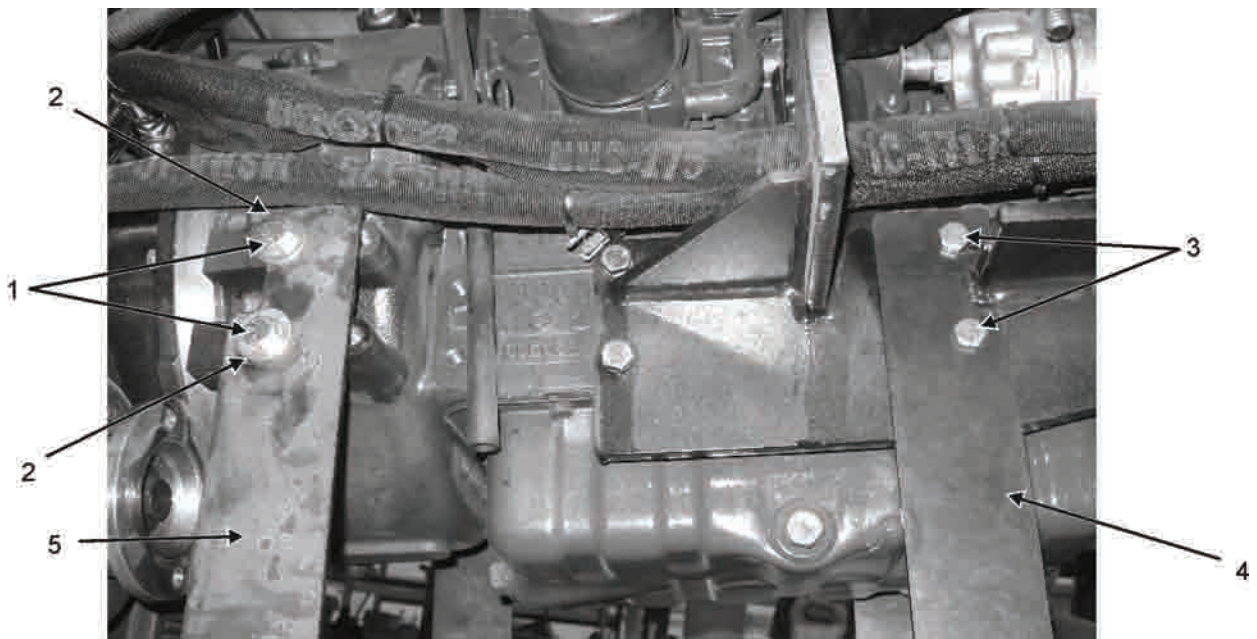


Figure 3. Engine Power Pack Maintenance Mounts RH, (Removal and Installation)

9. Position left side front (Figure 2, Item 5) maintenance mount.
10. Install bolts (Figure 2, Item 1).
11. Position left side rear (Figure 2, Item 4) maintenance mount.
12. Install bolts and washers (Figure 2, Item 2 and 3).
13. Position right side front (Figure 3, Item 4) maintenance mount.
14. Install bolts (Figure 3, Item 3).
15. Position right side rear (Figure 3, Item 5) maintenance mount.
16. Install bolts and washers (Figure 3, Item 1 and 2).

### **WARNING**

If positioning Engine Power Pack on a workbench, clamp or bolt all maintenance mounts to prevent injury to personnel or damage to equipment.

Engine Power Pack weighs in excess of 1800 pounds. Ensure workbench is capable of holding the Power Pack.

### **NOTE**

Power Pack may be lowered to the floor.

17. Lower engine power pack to a level surface.
18. Separate the transmission from the engine assembly (WP 0035).

### **NOTE**

If replacing engine remove all applicable Line Replaceable Unit's.

## **END OF TASK**

## **INSTALLATION**

1. Install the transmission assembly on the engine (WP 0035).
2. Attach lifting device to lifting points on engine power pack (Figure 1).

### **WARNING**

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under and engine, transmission being lifted or suspended. Use suitable lifting equipment for heavy components. Power pack weight is 1800 lbs.

3. Lift engine power pack.
4. Remove all engine power pack maintenance mounts (Figure 2 and 3).
5. Reinstall bolts (Figure 3, Item 3 and Figure 2, Item 1) into engine mount brackets LH/RH.

### **NOTE**

Ensure right front bottom isolator is installed with flat portion facing the engine.

6. Lower and secure engine power pack to cradle (WP 0032).
7. Remove lifting device from engine.
8. Install hydraulic tank (WP 0111).
9. Install fuel/water separator assembly (WP 0056).
10. Install power pack assembly into vehicle (WP 0023).

## **END OF TASK**

## **END OF WORK PACKAGE**





**FIELD MAINTENANCE  
ENGINE SERVICE**

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0017

WP 0020

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

Oil Filter Wrench (WP 0125, Item 18)

Drain Pan (WP 0126, Item 2)

**Materials/Parts**

Lubricating Oil (WP 0127, Item 25)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Shut Down and Cool

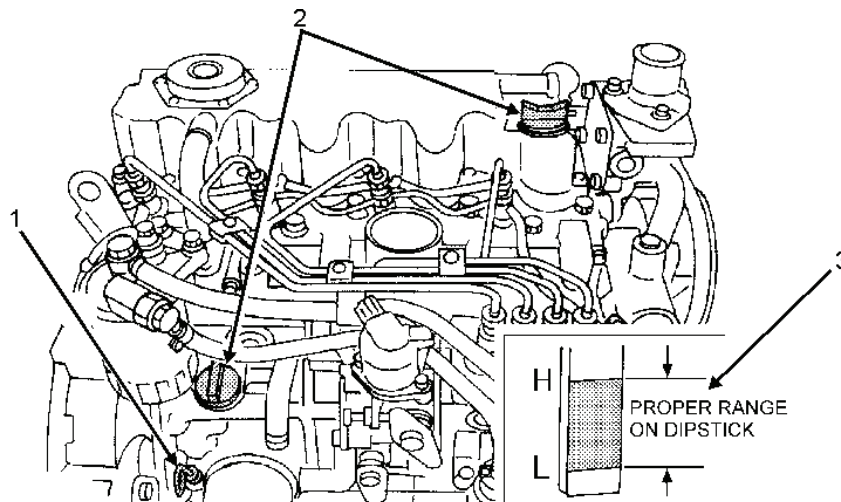


Figure 1. Oil Level Check

**WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**ENGINE OIL LEVEL CHECK**

1. Shutdown engine. (Wait 5 minutes)
2. Release engine cover rubber latches (WP 0020) and open engine cover.
3. Remove engine oil dipstick (Figure 1, Item 1) and wipe clean.
4. Reinsert engine oil dipstick, remove and verify the oil level is between the Low and High mark (Figure 1, Item 3).

**NOTE**

Add oil as necessary. DO NOT overfill engine crankcase.

5. Close engine cover (WP 0020).

**END OF TASK**

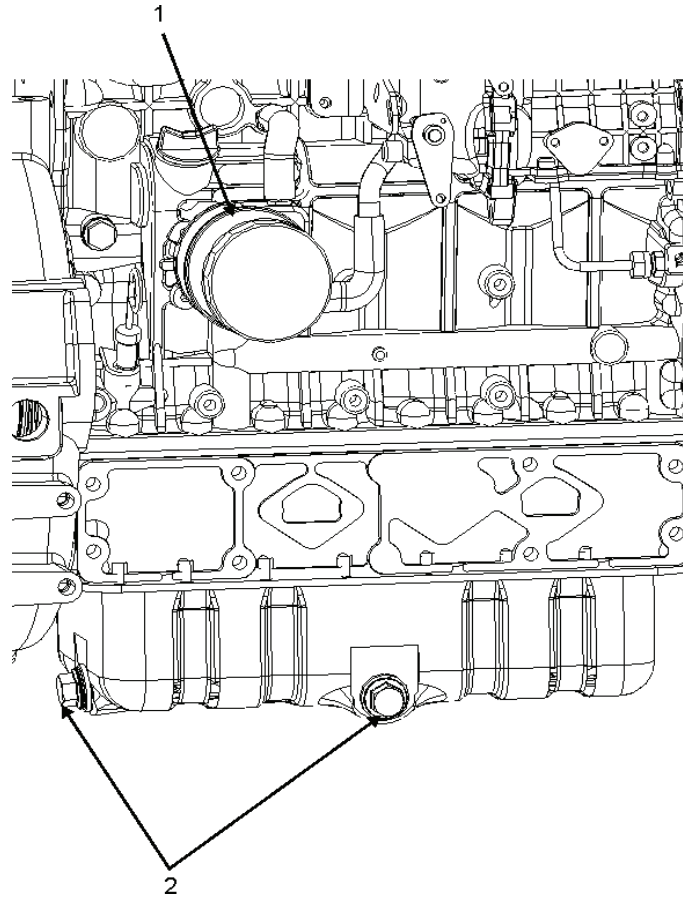


Figure 2. Oil and Filter Change

**ENGINE OIL/FILTER CHANGE****WARNING**

To avoid personal injury allow the engine to cool sufficiently prior to changing the engine oil and filter; hot oil can cause severe burns. Use appropriate PPE to prevent injury.

1. Place drain pan (5 gal capacity) under the engine oil pan drain plug. Either drain plug may be used.
2. Remove engine oil drain plug (Figure 2, Item 2) and allow oil to drain.
3. Clean and install drain plug.
4. Place drain pan under oil filter.
5. Using a filter wrench loosen the oil filter (Figure 2, Item 1) allowing oil in the filter cartridge to drain.
6. Remove and dispose of oil filter.
7. Wipe clean the oil filter engine-mating surface.
8. Lubricate the new oil filter seal with a small amount of clean lubricating oil.
9. Install new filter by turning the filter until the seal contacts the mating surface. Tighten filter an additional  $\frac{1}{2}$  to  $\frac{3}{4}$  turn.
10. Fill engine crankcase with lubricating oil.
11. Perform Maintenance Operation Check.
12. Shut down engine and recheck engine oil level. Add as required.
13. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**STARTER**

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**INITIAL SETUP:****Test Equipment**

Multi-meter (WP 0125, Item 6)

**References**

WP 0020

WP 0091

**Tools and Special Tools**

Torque Wrench, 100 inch pound (WP 0125, Item 1)

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**N/A

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**INSPECTION**

Visually inspect starter assembly mounting security, wiring for loose connections, breaks in insulation or any damage affecting serviceability.

**TEST****WARNING**

Remove all jewelry such as rings, ID tags, watches, and bracelets. If jewelry or tools contact a battery positive terminal, a direct short will result in instant heating or electric shock, damage to equipment, and injury to personnel.

**NOTE**

Perform voltage test at starter solenoid terminal (Figure 1, Item 6) ensuring 12 volts are present. Ensure starter mount is properly grounded.

**STARTER TEST**

1. Remove wire from starter solenoid (Figure 1, Item 7).
2. Using 12-gauge wire (approximately 6 inches long), briefly jump 12 volts from starter solenoid terminal (Figure 1, Item 6) to solenoid terminal (Figure 1, Item 7). Starter should engage.
3. Replace starter if test fails.

**END OF TASK**

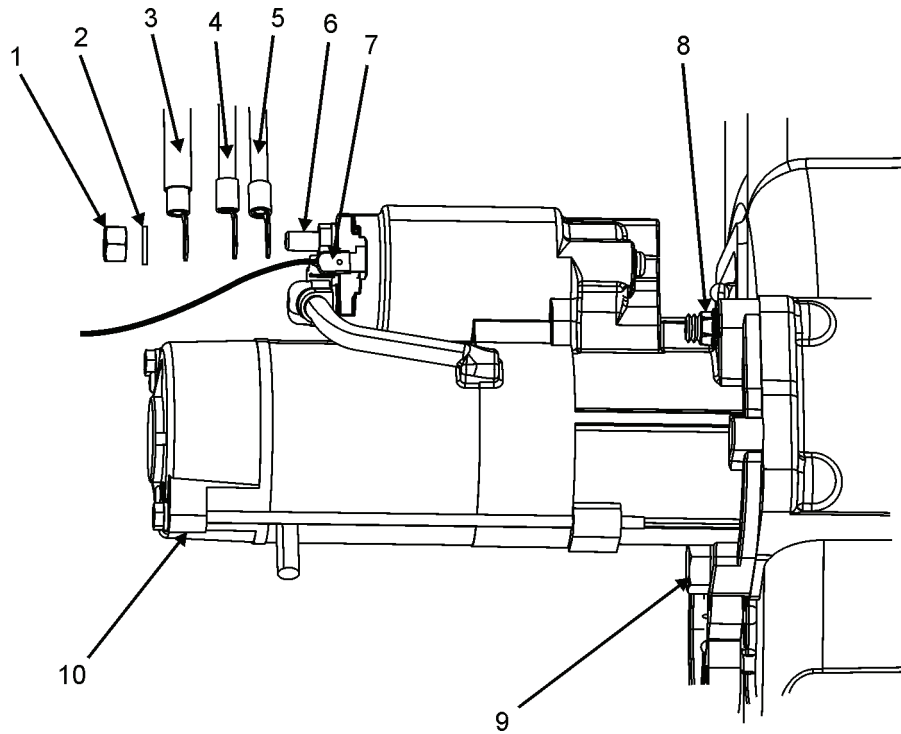


Figure 1 – Starter (Test, Removal and Installation)

## REMOVAL

### WARNING

Remove all jewelry such as rings, ID tags, watches, and bracelets. If jewelry or tools contact a battery positive terminal, a direct short will result in instant heating or electric shock, damage to equipment, and injury to personnel.

1. Disconnect battery negative cables, (WP 0091).
2. Open engine cover (WP 0020).
3. Remove nut (Figure 1, Item 1) and washer (Figure 1, Item 2) from starter solenoid terminal (Figure 1, Item 6).
4. Remove 3 wires; positive battery cable (Figure 1, Item 3), #1 red & white striped (Figure 1, item 4) and #1 solid red (Figure 1, item 5).
5. Remove wire from starter solenoid (Figure 1, Item 7).
6. Remove bottom starter mount bolt (Figure 1, Item 9).
7. Remove starter mount nut (Figure 1, Item 8).
8. Remove starter assembly (Figure 1, Item 10).

## END OF TASK

**INSTALLATION****WARNING**

Remove all jewelry such as rings, ID tags, watches, and bracelets. If jewelry or tools contact a battery positive terminal, a direct short will result in instant heating or electric shock, damage to equipment, and injury to personnel.

**NOTE**

Refer to torque charts (WP 0128) for mount bolt and nut torques.

1. Position starter assembly (Figure 1, Item 10).
2. Install starter mount nut (Figure 1, Item 8).
3. Install starter mount bolt (Figure 1, Item 9).
4. Install wire into starter solenoid (Figure 1, Item 7).
5. Install 3 wires; #1 solid red (Figure 1, item 5), #1 red & white striped (Figure 1, item 4) and positive battery cable (Figure 1, Item 3).
6. Secure wires to starter solenoid terminal (Figure 1, Item 6) with washer (Figure 1, Item 2) and nut (Figure 1, Item 1). Torque nut to 90 inch pounds.
7. Connect negative battery cables, (WP0091).
8. Perform Maintenance Operation Check.
9. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE  
ALTERNATOR**

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**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**References**

WP 0020

WP 0033

WP 0091

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

N/A

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**INSPECTION**

1. Inspect alternator wiring for corrosion, loose connections and breaks in insulation.
2. Inspect for proper mounting and for any damage affecting serviceability.
3. Verify engine/alternator belt tension is correct, (WP 0033).

**END OF TASK****TEST****WARNING**

Remove all jewelry such as rings, ID tags, watches, and bracelets. If jewelry or tools contact a battery positive terminal, a direct short will result in instant heating or electric shock, damage to equipment, and injury to personnel.

1. Ignition switch on.
2. Check for 12 volts at red wire, #1 (Figure 1, Item 2).
3. Disconnect electrical connector (Figure 1, Item 3).
4. Check for 12 volts at orange wire, #3 (Figure 1, Item 3).
5. Voltage reading of 12 volts.
6. Start engine, measure voltage at output terminal (Figure 1, Item 2).
7. Voltage reading should now be between 13.8 and 14.8 volts nominally.
8. Shut down engine.
9. Replace alternator if readings are low (no alternator output) or too high (overcharging batteries).

**END OF TASK****REMOVAL****WARNING**

Remove all jewelry such as rings, ID tags, watches, and bracelets. If jewelry or tools contact a battery positive terminal, a direct short will result in instant heating or electric shock, damage to equipment, and injury to personnel.

**NOTE**

Mark or tag wires to ease with reinstallation.

1. Disconnect battery negative cables, (WP 0091).
2. Remove nut and washer at output terminal (Figure 1, Item 2) and disconnect wire.
3. Release and disconnect electrical connector (Figure 1, Item 3).

4. Loosen the bottom alternator mounting bolt (Figure 1, Item 5).
5. Remove the top alternator mount bolt and washer (Figure 1, Item 1).
6. Slide alternator (Figure 1, Item 4) toward the engine.
7. Remove engine fan belt (Figure 1, Item 6) from the alternator pulley.
8. Loosen bracket mount bolt (Figure 1, Item 7) and move bracket up.
9. Remove bottom alternator mount bolt (Figure 1, Item 5).
10. Remove alternator (Figure 1, Item 4).

## END OF TASK

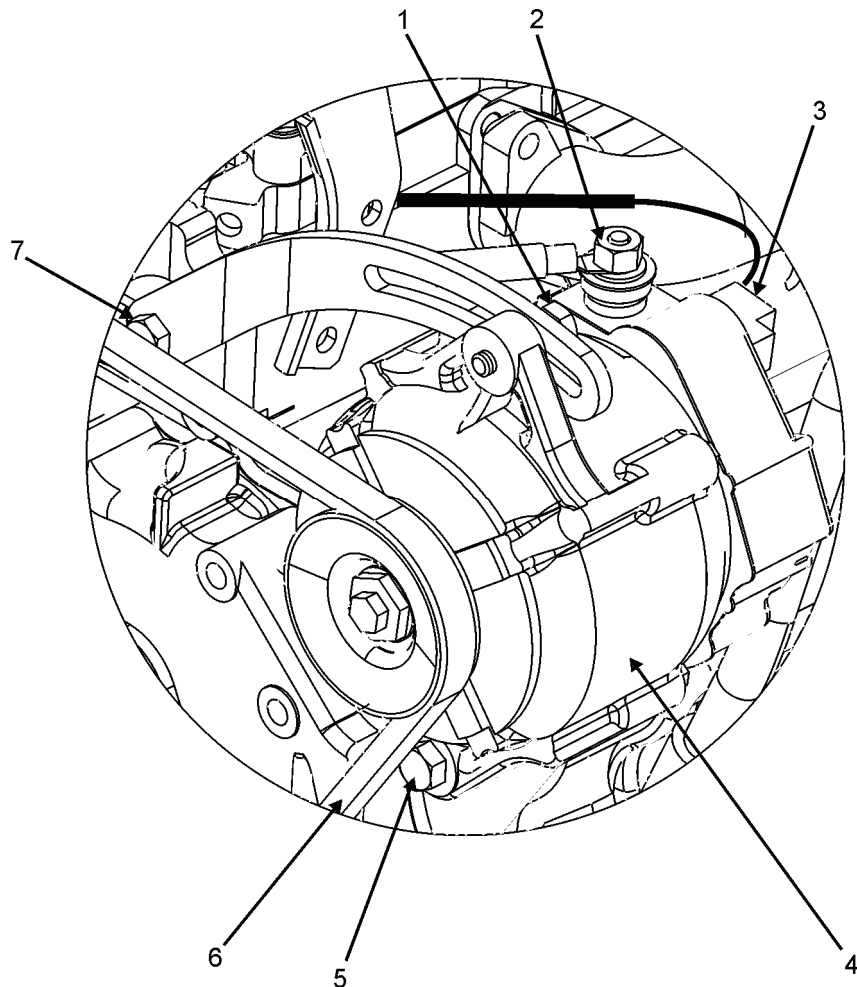


Figure 1. Alternator (Test, Removal and Installation)

## INSTALLATION

### WARNING

Remove all jewelry such as rings, ID tags, watches, and bracelets. If jewelry or tools contact a battery positive terminal, a direct short will result in instant heating or electric shock, damage to equipment, and injury to personnel.

1. Position alternator (Figure 1, Item 4) on the engine.
2. Install bottom alternator mount bolt and nut (Figure 1, Item 5). Do not tighten.
3. Position bracket and install upper alternator mount bolt and washer (Figure 1, Item 1). Do not tighten.



4. Tighten bracket mount bolt (Figure 1, Item 7).
5. Position fan belt (Figure 1, Item 6) over the alternator pulley.
6. Using pry bar, carefully pull the alternator (pressure on the alternator frame) until belt is tight.
7. Hold pressure and tighten top alternator mount bolt (Figure 1, Item 1).
8. Adjust belt tension, (WP 0033).
9. Tighten bottom alternator mounting bolt (Figure 1, Item 5).
10. Install wire, lock washer and nut at output terminal (Figure 2, Item 2).
11. Connect electrical connector (Figure 2, Item 3).
12. Reconnect batteries (WP 0091).
13. Perform Maintenance Operation Check.
14. Close engine cover (WP 0020).

**END OF TASK**

**END OF WORK PACKAGE**



## FIELD MAINTENANCE TURBOCHARGER

### INITIAL SETUP:

#### Test Equipment

N/A

#### References

WP 0020

WP 0091

#### Tools and Special Tools

General Mechanic Tool Box (WP 0125, Item 8)

#### Materials/Parts

N/A

#### Personnel Required

91B, Light Wheel Vehicle Mechanic

#### Equipment Condition

Engine Shut Down

### INSPECTION

1. Visually inspect turbocharger for any housing cracks, dents, or leaks.
2. Inspect hose clamps and hoses for damage affecting serviceability.
3. Remove turbo charger inlet hose (WP 0061) and inspect that turbine wheel moves freely and all blades are serviceable.

### END OF TASK

### REMOVAL

1. Disconnect negative battery cables (WP 0091).
2. Open engine cover (WP 0020).
3. Loosen clamp (Figure 1, Item 1).
4. Move hose (Figure 1, Item 11) and clamp.
5. Loosen clamp (Figure 1, Item 3).
6. Move hose (Figure 1, Item 6) and clamp.
7. Remove 4 turbo exhaust mount bolts (Figure 1, Item 8). (One bolt not shown)
8. Remove 2 lower oil drain tube mount bolts (Figure 1, Item 10).
9. Remove upper oil tube mount bolt (Figure 1, Item 4).
10. Remove sealing washer assembly (Figure 1, Item 2).
11. Remove 2 front turbocharger mount bolts (Figure 1, Item 9).
12. Remove 2 rear turbocharger mount nuts (Figure 1, Item 7).

### NOTE

If necessary release the coil clamp (not shown) holding the pressure and return oiling tubes together to facilitate removal of the Turbocharger.

13. Remove Turbocharger assembly (Figure 1, Item 5).

### END OF TASK

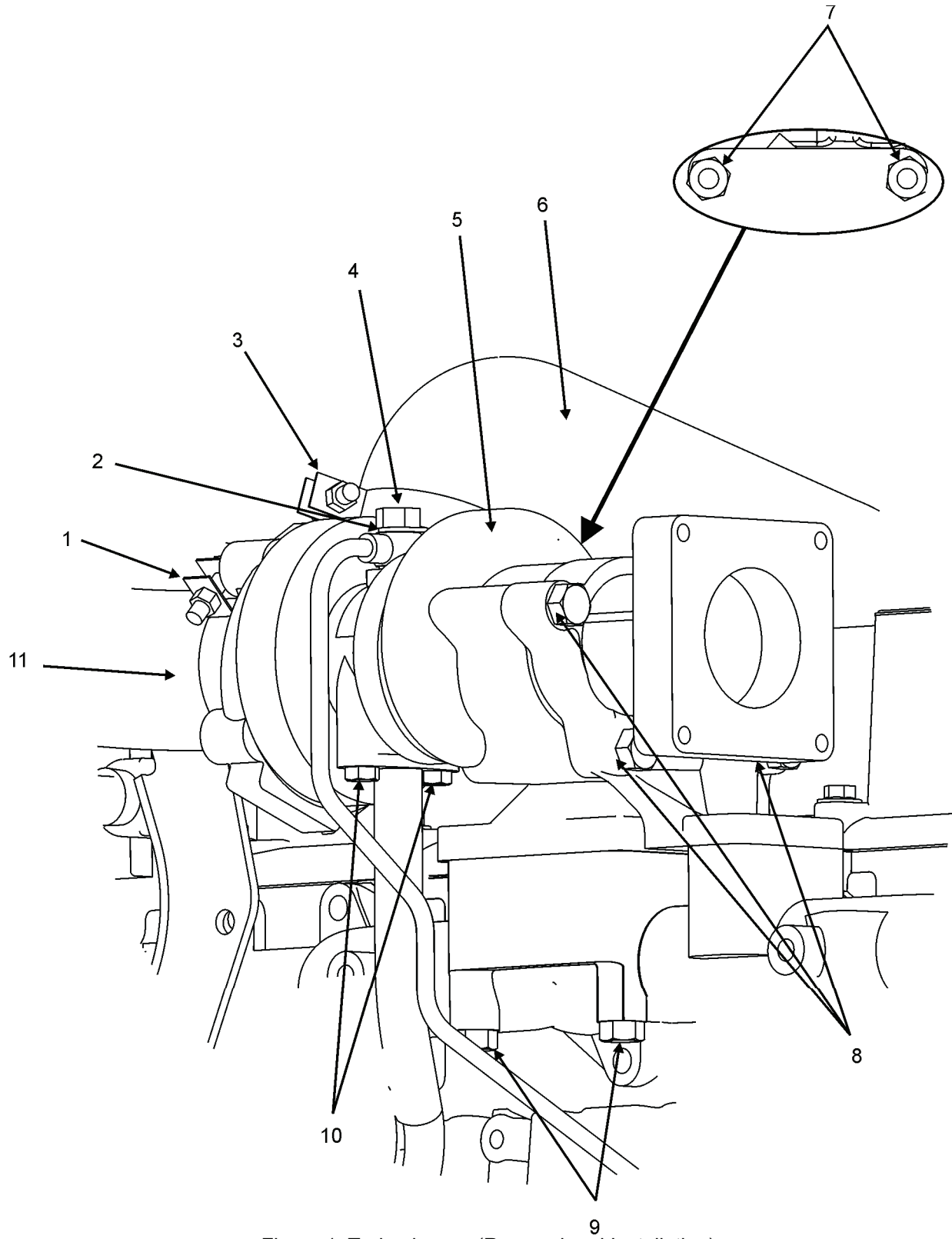


Figure 1. Turbocharger (Removal and Installation)

**INSTALLATION**

1. Position turbocharger assembly (Figure 1, Item 5) on exhaust manifold (new gasket).
2. Install 2 rear turbocharger mount nuts (Figure 1, Item 7).
3. Install 2 front turbocharger mount bolts (Figure 1, Item 9).
4. Install 2 lower oil drain tube mount bolts (Figure 1, Item 10).
5. Position sealing washer assembly (Figure 1, Item 2) on upper oiling tube.
6. Install upper oil tube mount bolt (Figure 1, Item 4).

**NOTE**

If coil clamp was released, reposition coil clamp and retighten.

7. Install 4 turbo exhaust mount bolts (Figure 1, Item 8). (One bolt not shown) (New gasket)
8. Position hose (Figure 1, Item 11)
9. Tighten clamp (Figure 1, Item 1).
10. Position hose (Figure 1, Item 6).
11. Tighten clamp (Figure 1, Item 3).
12. Close engine cover (WP 0020).
13. Connect negative battery cables (WP 0091).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE  
OIL PRESSURE SWITCHES**

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**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0020

WP 0091

**Materials/Parts**

Tape, Anti-Seize (WP 0127, Item 50)

**Equipment Condition**

Engine Shut Down and cool

---

**TEST/INSPECTION**

Inspect oil pressure switches for mounting security (no leaks) wiring for security, corrosion and any damage affecting serviceability.

**Pressure Switch Continuity Tests****WARNING**

Eye protection required when applying air pressure to switches.

**NOTE**

To properly test pressure switches, removal of switch assembly is required.

1. Oil Pressure Switch (Warning Light) – Remove switch (Figure 1, Item 1) and ohms check for continuity (normally closed) from the terminal connection to the switch case threads. Apply air pressure to the switch and ohms check for loss of continuity (switch open). If switch fails either test, replace defective switch.
2. Oil Pressure Switch (Hour Meter) – Remove switch (Figure 2, Item 1) and ohms check (no continuity, normally open) across the two electrical terminals. Apply air pressure and ohms check for continuity (pressure closes). If switch fails either test, replace defective switch.

**END OF TASK****REMOVAL****Oil Pressure Switch (Warning Light)**

1. Disconnect battery negative cables (WP 0091).
2. Open engine cover (WP 0020).

**NOTE**

Label or tag all wiring terminals after removal to aid with switch reinstallation.

3. Remove mount screw (Figure 1, Item 3).
4. Remove wire 30 (Figure 1, Item 2).

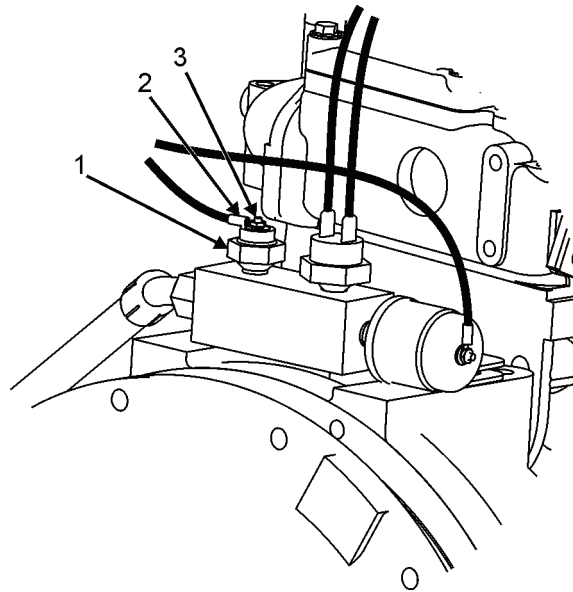


Figure 1 – Oil Pressure Switch (Warning Light) (Removal and Installation)

### WARNING

To avoid personal injury, ensure engine is stopped and has cooled prior to removing the oil pressure switch.

5. Remove oil pressure switch (warning light) (Figure 1, Item 1).

### END OF TASK

### INSTALLATION

1. Wrap threads of oil pressure switch (Figure 1, Item 1) with anti-seize tape.

### CAUTION

To avoid damage to oil pressure switch, do not over-tighten.

2. Install pressure switch (warning light) (Figure 1, Item 1).
3. Position wire 30 (Figure 1, Item 2) on pressure switch.
4. Install mount screw (Figure 1, Item 3) and secure.
5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.
7. Close engine cover (WP 0020).

### END OF TASK



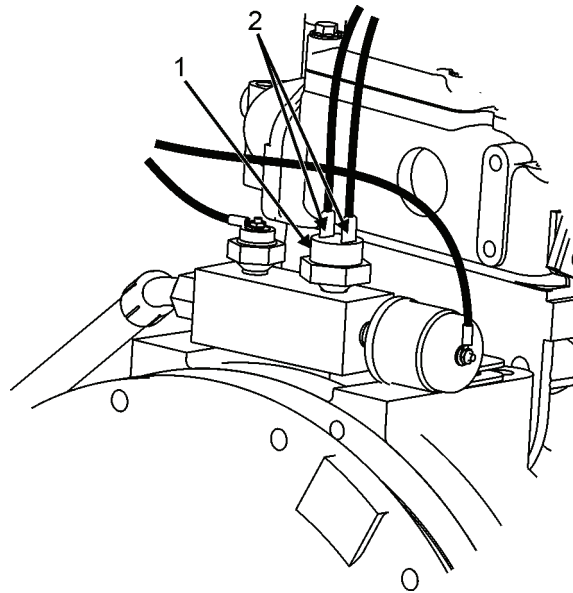


Figure 2. Oil Pressure Switch (Hour Meter) (Removal and Installation)

## REMOVAL

### Oil Pressure Switch (Hour Meter)

1. Disconnect battery negative cables (WP 0091).
2. Open engine cover (WP 0020).

### NOTE

Label or tag all wiring terminals after removal to aid with switch reinstallation.

3. Remove 2 wire leads (Figure 2, Item 2).

### WARNING

To avoid personal injury, ensure engine is stopped and has cooled prior to removing the oil pressure switch.

4. Remove oil pressure switch (hour meter) (Figure 2, Item 1).

## END OF TASK

## INSTALLATION

1. Wrap threads of oil pressure switch (hour meter) (Figure 2, Item 1) with anti-seize tape.

### CAUTION

To avoid damage to oil pressure switch, do not over-tighten.

2. Install pressure switch (hour meter) (Figure 2, Item 1).
3. Connect wire leads (Figure 2, Item 2).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.
6. Close engine cover (WP 0020).

**END OF TASK**

**END OF WORK PACKAGE**

**FIELD MAINTENANCE**  
**OIL PRESSURE SENDING UNIT (GAUGE)**

**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**References**

WP 0020

WP 0091

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

Tape, Anti-seize (WP 0127, Item 50)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine stopped and cool

**TEST/INSPECTION**

Inspect sender wiring and mounting for damage affecting serviceability.

**Oil Pressure Sending Unit Continuity Test**

1. Disconnect battery negative cables (WP 0091).
2. Remove nut (Figure 1, Item 4) and wire (Figure 1, Item 1) from sending unit stud (Figure 1, Item 3).
3. Ohms check from oil pressure sending unit stud (Figure 1, Item 3) to ground.
4. Resistance measured shall be 33 to 240 ohms.
5. Replace oil pressure sending unit if continuity test fails.

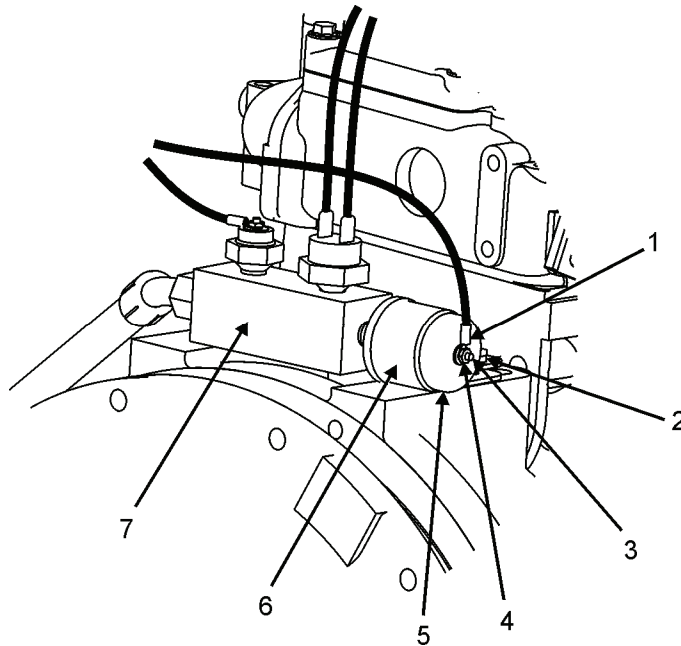
**END OF TASK**

Figure 1 – Oil Pressure (Gauge) Sending Unit (Removal and Installation)

**REMOVAL**

1. Disconnect negative battery cables (WP 0091).
2. Open engine cover (WP 0020).
3. Remove nut (Figure 1, Item 4) from sending unit stud (Figure 1, Item 3).
4. Remove wire (Figure 1, Item 1).
5. Loosen bolt (Figure 1, Item 2) securing loop clamp (Figure 1, Item 6) to flywheel housing.
6. Slide oil pressure sending unit from loop clamp.

**WARNING**

To avoid personal injury, ensure engine is stopped and has cooled prior to removing the oil pressure-sending unit.

7. Remove oil pressure sending unit (Figure 1, Item 5).

**END OF TASK****INSTALLATION**

1. Wrap threads of oil pressure sending unit (Figure 1, Item 5) with anti-seize tape.

**CAUTION**

To avoid damage to oil pressure sending unit, do not over-tighten.

2. Install oil pressure sending unit (Figure 1, Item 5).
3. Position oil pressure sending unit into loop clamp (Figure 1, Item 6)
4. Tighten bolt (Figure 1, Item 2).
5. Install wire (Figure 1, Item 1).
6. Secure wire to sending unit stud (Figure 1, Item 3) with nut (Figure 1, Item 4).
7. Connect battery negative cables (WP 0091).
8. Perform Maintenance Operation Check.
9. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**FLYWHEEL**

---

**INITIAL SETUP:****Test Equipment**  
N/A**Tools and Special Tools**Torque Wrench (0-100 ft-lb) (WP 0125, Item 3)  
General Mechanic Tool Box (WP 0125, Item 8)**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**WP 0023  
WP 0024  
WP 0035  
WP 0037**Materials/Parts**

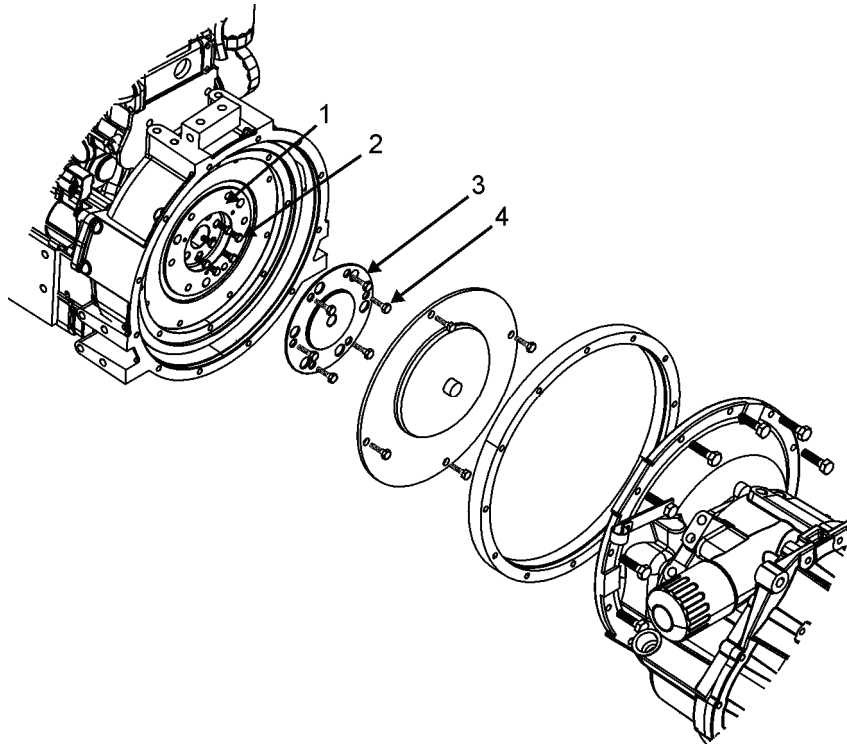
N/A

**Equipment Condition**Power Pack Assembly Removed  
Starter Removed

---

**INSPECTION**

Inspect flywheel (Figure 1, Item 1) for cracks, wear, damage, and missing gear teeth. Replace as necessary.

**END OF TASK**

WP0031F1

Figure 1. Flywheel (Removal and Installation)

**REMOVAL**

1. Remove Power Pack Assembly (WP 0023).
2. Remove engine power pack from cradle (WP 0024).
3. Install 4 engine power pack maintenance mounts (WP 0024).
4. Lower engine power pack to the floor or work table (WP 0024).
5. Remove Transmission (WP 0035).
6. Remove Torque Converter (WP 0037).
7. Remove 6 torque converter spacer bolts (Figure 1, Item 4) and remove torque converter spacer (Figure 1, Item 3).

**CAUTION**

Do not use an impact wrench when removing the flywheel mounting bolts as damage may occur to flywheel and/or crankshaft.

**NOTE**

When removing flywheel mount bolts, hold the engine harmonic balancer crank bolt or engine may spin.

8. Remove 6 flywheel mount bolts (Figure 1, Item 2).
9. Remove flywheel (Figure 1, Item 1) from engine.

**END OF TASK****INSTALLATION****NOTE**

Ensure flywheel and crankshaft mating surfaces are clean and free from oil and other foreign substances.

1. Position flywheel (Figure 1, Item 1) on engine.

**CAUTION**

Do not use an impact wrench when removing the flywheel mounting bolts as damage may occur to flywheel and/or crankshaft.

**NOTE**

When installing flywheel mount bolts, hold the engine harmonic balancer crank bolt or engine may spin.

2. Install 6 flywheel mount bolts (Figure 1, Item 2). Torque bolts to 72.4 – 79.5 ft-lb (98.1 – 107 N•m).
3. Carefully position torque converter spacer (Figure 1, Item 3) on flywheel.
4. Install 6 torque converter spacer mount bolts (Figure 1, Item 4).
5. Install Torque Converter (WP 0037).
6. Install Transmission (WP 0035).
7. Lift engine power pack (WP 0024).
8. Remove engine power pack maintenance mounts (WP 0024).
9. Install engine power pack in engine power pack cradle (WP 0024).
10. Install Power Pack Assembly in the vehicle (WP 0023).
11. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
ENGINE MOUNT ISOLATORS**

**INITIAL SETUP:**

**Test Equipment**

N/A

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0023

WP 0024

WP 0120

**Materials/Parts**

N/A

**Equipment Condition**

N/A

**INSPECTION**

Visually inspect engine mount rubber isolators for excessive wear, cracks, rubber degradation (impregnated) from oil or fuel and damage affecting serviceability

**END OF TASK**

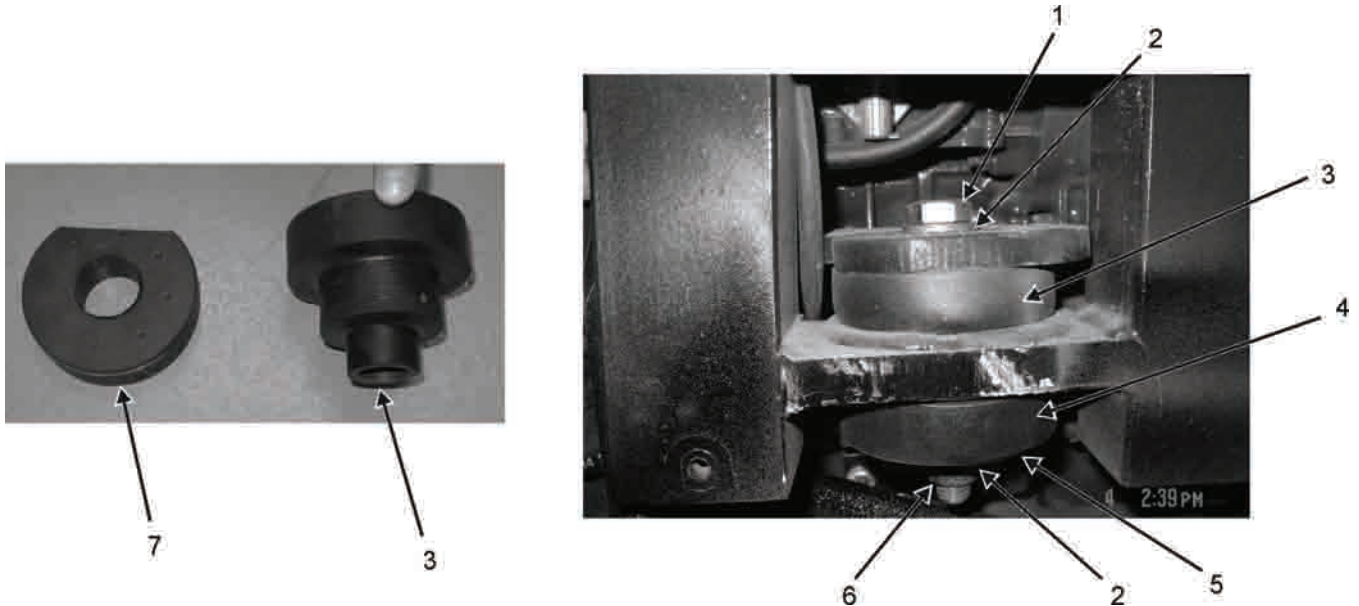


Figure 1. Engine Mount Isolators (Removal and Installation)

**REMOVAL****NOTE**

When replacing engine isolators, replace all four upper and lower as a set to prevent unnecessary maintenance later.

All four-engine power pack isolator mounts are removed using the same process.

1. Remove power pack assembly (WP 0023) and position in power pack cradle.
2. Remove 4-engine cradle mount nuts (Figure 1, Item 6), washers (Figure 1, Item 2) and snubber washers (Figure 1, Item 5).
3. Remove 4 lower engine cradle isolators (Figure 1, Item 4).
4. Remove 4-engine cradle mount bolts (Figure 1, Item 1) and washers (Figure 1, Item 2).
5. Lift engine power pack approximately 4 inches (WP 0024).
6. Remove 4 upper engine mount cradle isolators (Figure 1, Item 3).

**END OF TASK****INSTALLATION**

1. Install 4 upper engine mount cradle isolators (Figure 1, Item 3).
2. Place 4-engine cradle mount bolts (Figure 1, Item 1) and washers (Figure 1, Item 2) in engine and transmission mounts brackets to aid in realignment.
3. Carefully lower engine power pack into cradle while continuously observing that all harnesses, hoses, and pipes are not interfering with the installation process.

**NOTE**

Right front lower isolator must be modified (WP 0120) as illustrated in (Figure 1, Item 7). Flat portion of isolator must face the engine when installed to allow room to pass the gear pump.

4. Install 4 lower engine cradle isolators (Figure 1, Item 4).
5. Install 4-engine cradle mount snubber washers (Figure 1, Item 5), washers (Figure 1, Item 2) and nuts (Figure 1, Item 6).
6. Install Power Pack Assembly (WP 0023).
7. Lower Vehicle.
8. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**FAN BELT**

---

**INITIAL SETUP:****Test Equipment**  
N/A**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**WP 0020  
WP 0091**Materials/Parts**

N/A

**Equipment Condition**Engine Shut Down

---

**INSPECTION**

Inspect fan belt for cracks, cuts, tears and proper installation and pulley alignment. Apply thumb pressure on the center of the belt between the crankshaft and alternator. Acceptable deflection is between 0.39 to 0.47 inches (10 to 12 mm).

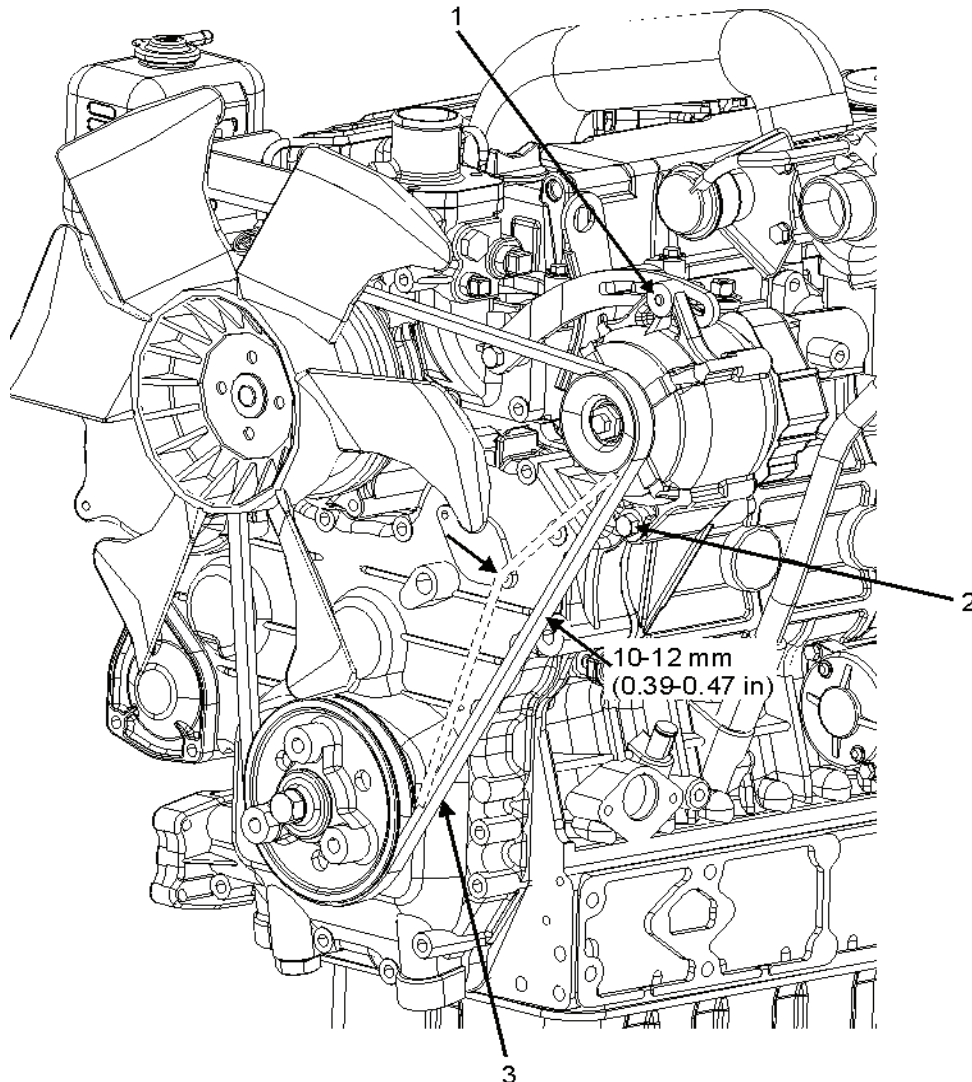


Figure 1. Fan Belt

**REMOVAL**

1. Disconnect battery negative cables (WP 0091).
2. Open engine cover (WP 0020).
3. Loosen alternator (fan belt tension) adjustment bolt (Figure 1, Item 1).
4. Loosen bottom alternator mount bolt (Figure 1, Item 2).
5. Push alternator toward engine to release belt tension.
6. Carefully remove fan belt by fishing belt (Figure 1, Item 3) over radiator cooling fan blades.

**INSTALLATION**

1. Carefully fish new belt (Figure 1, Item 3) over radiator cooling fan blades.
2. Place belt over all pulleys, using care not to twist the belt.
3. Use a pry bar and pull the alternator (pressure on the alternator frame) until belt is tight.
4. Hold pressure and tighten alternator adjustment bolt (Figure 1, Item 1).
5. Apply thumb pressure on the center of the belt between the crankshaft and alternator. Acceptable deflection is between 0.39 to 0.47 inches (10 to 12 mm).
7. Tighten bottom alternator mount bolt (Figure 1, Item 2).
6. Connect battery negative cables (WP0091).
7. Perform Maintenance Operation Check.
8. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

---

**FIELD MAINTENANCE**  
**GLOW PLUGS**

---

**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**Tools and Special Tools**Torque wrench, 0-25 ft-lb (WP 0125, Item 2)  
General Mechanic Tool Box (WP 0125, Item 8)**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References:**WP 0020  
WP 0091**Materials/Parts**

N/A

**Equipment Condition**Engine Cool

---

**INSPECTION/TEST**

Visually inspect glow plug wiring for broken insulation and terminal damage. Inspect glow plug for security of mounting. Glow plug may be tested while in the engine glow plug mount or removed.

1. If removed ohms check glow plug as illustrated in (Figure 1).

**NOTE**

If testing while installed, isolate by removing glow plug wire and rail, this Work Package.

2. If installed in engine, test from glow plug terminal to ground.
3. Resistance should read 1.0 ohm nominally.
4. Replace any glow plug(s) that are out of specification.

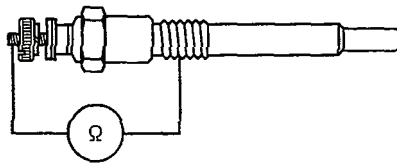


Figure 1. Glow Plug

**END OF TASK**

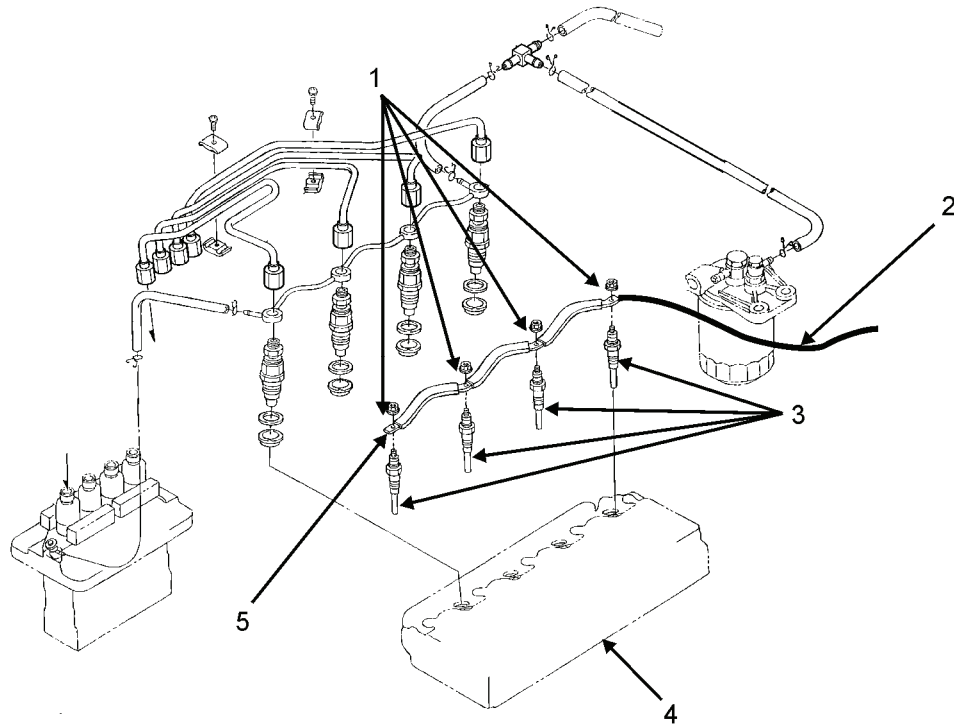


Figure 2. Glow Plug (Removal and Installation)

#### REMOVAL

1. Open engine cover (WP 0020).
2. Disconnect battery negative cables (WP 0091).
3. Remove four glow plug rail nuts (Figure 2, Item 1).
4. Remove glow plug wire (Figure 2, Item 2).
5. Remove glow plug rail (Figure 2, Item 5).
6. Ohms test glow plug(s), see test this Work Package.
7. Remove defective glow plug(s) (Figure 2, Item 3).

#### END OF TASK

#### INSTALLATION

1. Install glow plug(s) (Figure 2, Item 3) into engine,
2. Torque glow plug(s) to 15-18 ft lbs (20 to 24 N-m, 2.0 to 2.5 kgf-m).
3. Position glow plug rail (Figure 2, Item 5) on glow plugs (Figure 2, Item 3).
4. Install glow plug wire (Figure 2, Item 2) on rail.
5. Install four glow plug rail nuts (Figure 2, Item 1) and secure.
6. Connect battery negative cables (WP0091).
7. Perform Maintenance Operation Check.
8. Close engine cover (WP0020).

#### END OF TASK

#### END OF WORK PACKAGE

## FIELD MAINTENANCE TRANSMISSION

### INITIAL SETUP:

#### Test Equipment

N/A

#### Tools and Special Tools

Sling (WP 0125, Item 7)  
Trans Lift Weldment (WP 0125, Item 13)  
Torque Wrench, 0-250 ft-lb (WP 0125, Item 3)  
General Mechanic Tool Box (WP 0125, Item 8)

#### Personnel Required

91B, Light Wheel Vehicle Mechanic (2)

#### References

WP 0023  
WP 0024  
WP 0037  
WP 0076  
WP0078  
WP 0081

#### Materials/Parts

Sealant, Loctite (WP 0127, Item 38)

#### Equipment Condition

N/A

### INSPECTION

Inspect transmission for security of mounting, damage to the housing and for leaks at hoses, fittings and solenoid valves. Inspect solenoid wiring for cuts and breaks in the insulation. Inspect all wiring and connectors for security.

### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

### REMOVAL

#### NOTE

Note orientation of all LRU's, components, wiring and hoses, tag to aid in reinstallation.

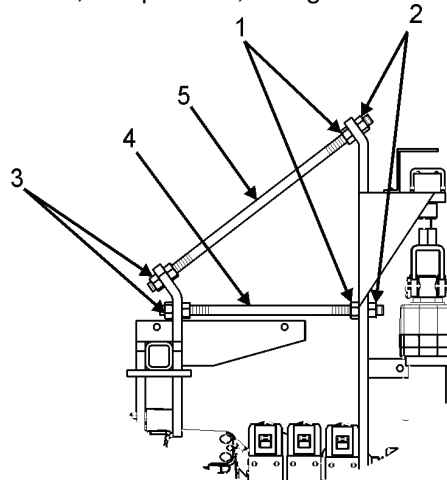


Figure 1. Threaded Rods – Park Position

1. Remove power pack assembly (WP 0023).
2. Position engine power pack on maintenance mounts (WP 0024).
3. Remove nuts (Figure 1, Item 2 and 3) from threaded rods (Figure 1, Item 4 and 5).

4. Loosen nut (Figure 1, Item 1) and remove threaded rods (Figure 1, Item 4 and 5).
5. Remove park position motor assembly (WP 0076).
6. Remove park position caliper (WP 0078).
7. Remove hand brake caliper/cable bracket assembly (WP 0081).

**NOTE**

Nut has a detent that must be straightened before you can loosen nut.

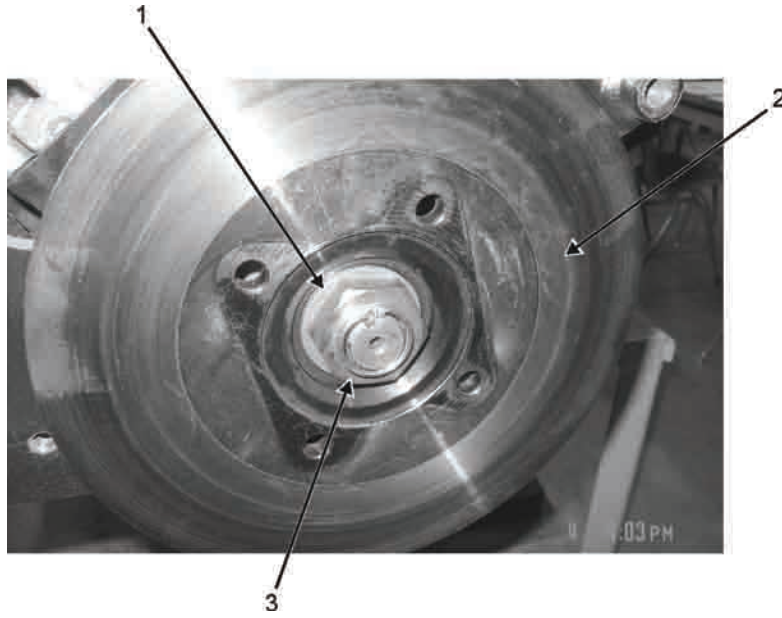


Figure 2. Brake Disk (Removal and Installation)

8. Removing stake nut (Figure 2, Item 3) and washer (Figure 2, Item 1).
9. Remove disc (Figure 2, Item 2).

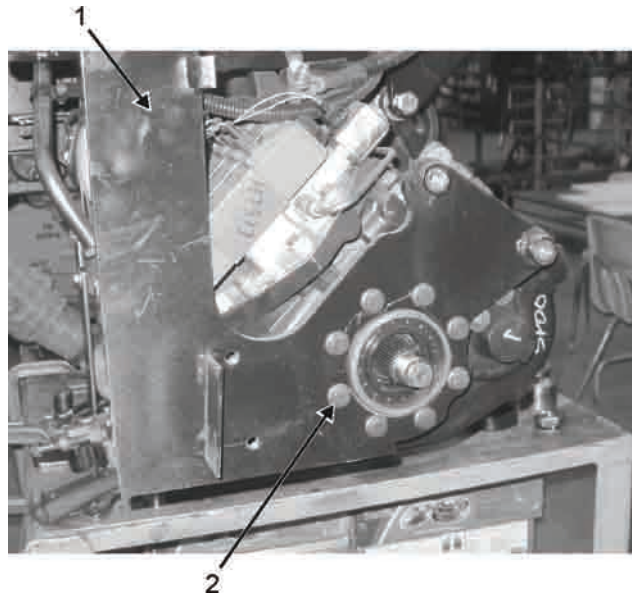


Figure 3. Park Position/Hand Brake Bracket (Removal and Installation)

10. Remove 8 bracket-mounting bolts (Figure 3, Item 2) while supporting park position/hand brake bracket.
11. Remove bracket (Figure 3, Item 1).

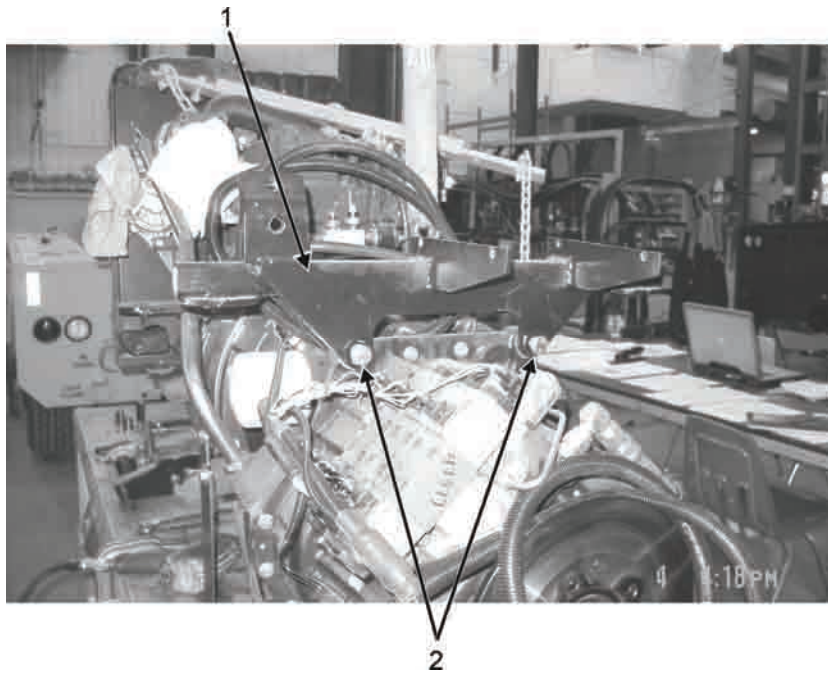


Figure 4. Transmission Mount Bracket (Removal and Installation)

12. Remove 2 bolts, 2 nuts, 2 washers and spacers (used as required) (Figure 4, Item 2) and remove transmission mount bracket (Figure 4, Item 1) from transmission.

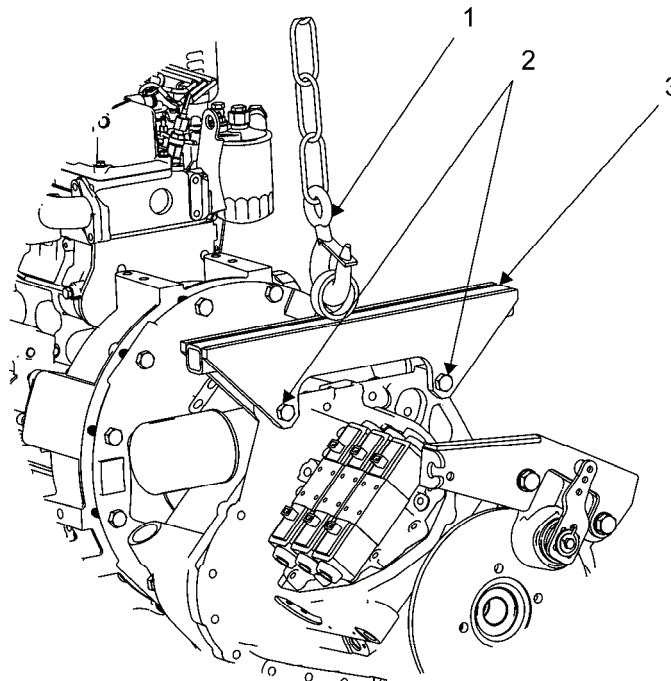


Figure 5. Transmission Sling Hookup

13. Install trans lift weldment (Figure 5, Item 3) with bolts and nuts from mount onto the eyelets of the transmission (Figure 5, Item 2).
14. Place sling hook (Figure 5, Item 1) onto lifting fixture and snug sling to support the transmission.  
Rewrite for LMI.
15. Disconnect oil cooler lines.

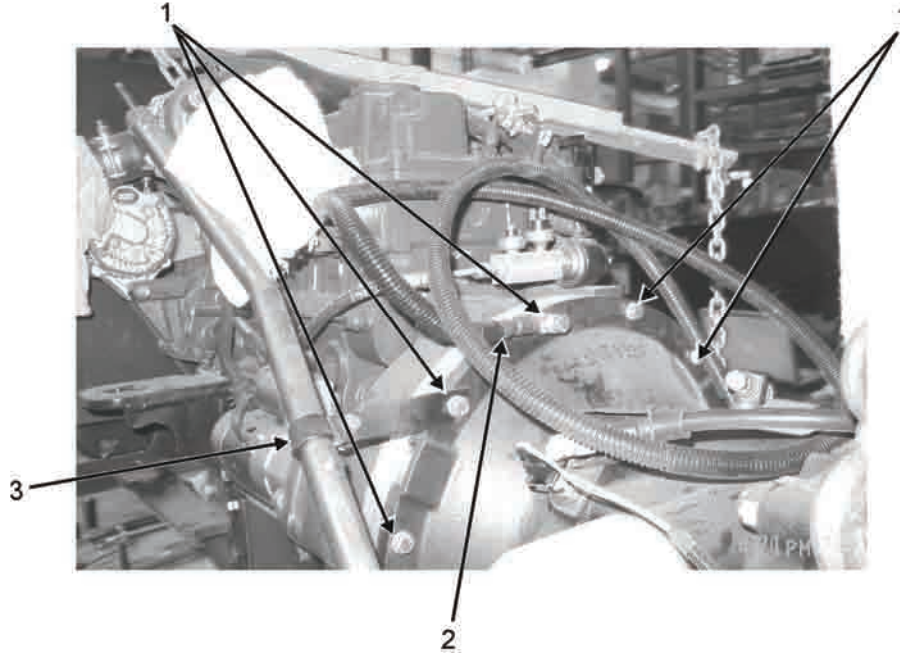


Figure 6. Transmission Bell Housing Bolts

16. Remove 3 transmission bell-housing mount bolts (Figure 6, Item 1) securing dipstick loop clamp (Figure 6, Item 3) and negative battery cable (Figure 6, Item 2).

**NOTE**

Place drip pan under transmission housing before separating transmission from engine.

17. Remove remaining 9 transmission bell housing bolts (some not shown) (Figure 6, Item 1).



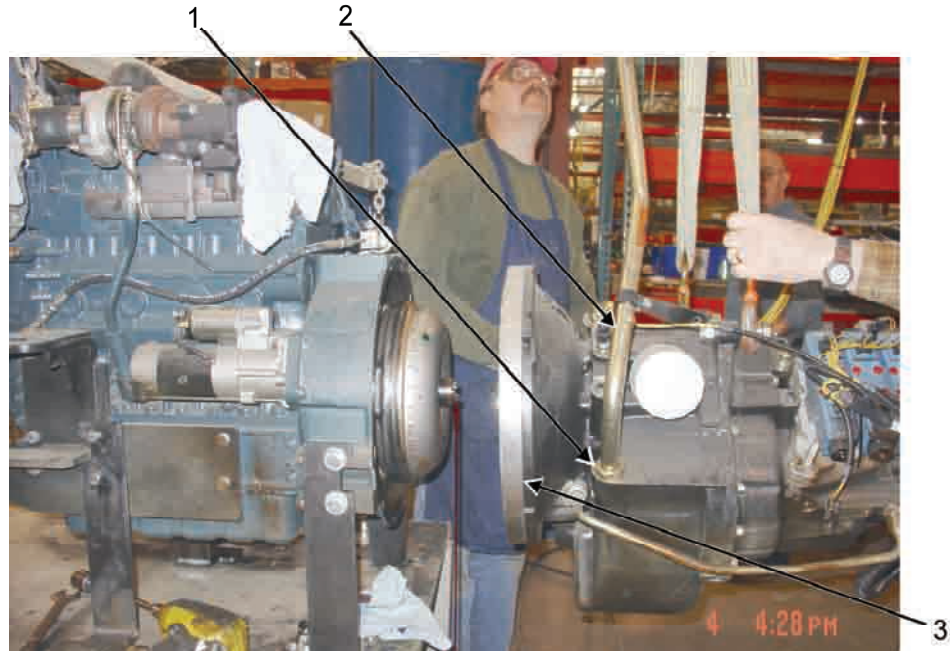


Figure 7. Transmission/Engine Separation

18. Loosen nut (Figure 7, Item 1) at base of dipstick tube (Figure 7, Item 2).
19. Remove dipstick (Figure 7, Item 2) and nut (Figure 7, Item 1), retain for reinstallation.
20. Lower transmission to the floor.

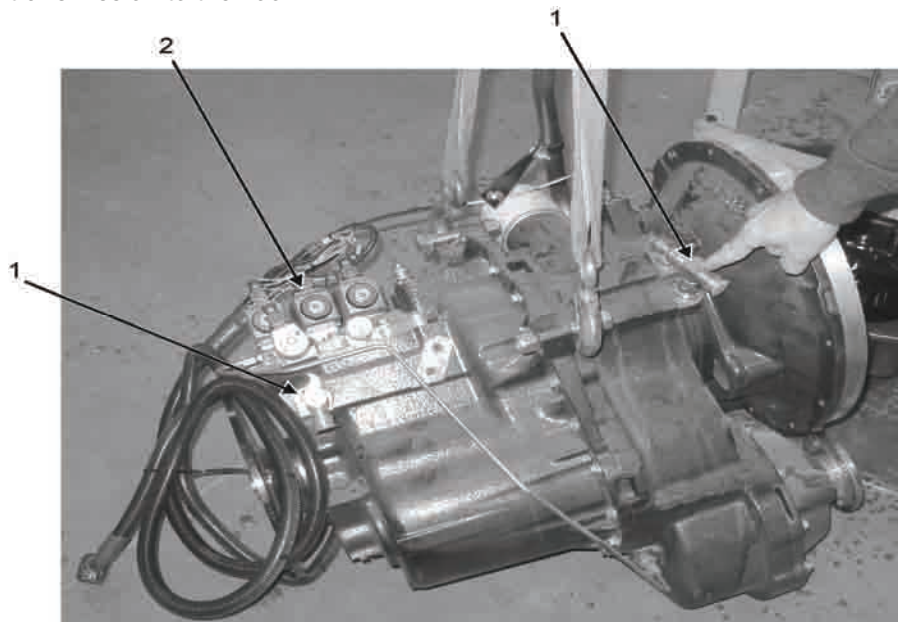


Figure 8. Fittings and Wiring

21. Remove all fittings (Figure 8, Item 1) (note orientation).
22. Tag and remove electrical wiring harness from solenoid connectors (Figure 8, Item 2). Save for reinstallation on new transmission.

**END OF TASK****INSTALLATION****NOTE**

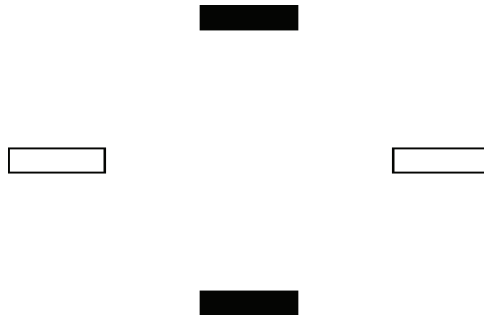
If transmission is being replaced it is recommended maintainers replace the torque converter (WP 0037) at the same time.

When installing a new transmission, use the old dipstick tube because it was modified during initial installation.

1. Install all fittings (Figure 8, Item 1) in correct position as previously noted.
2. Install electrical wiring harness (Figure 8, Item 2) in correct position as tagged.
3. Position trans lift weldment (Figure 5, Item 3) onto the eyelets of the transmission (Figure 5, Item 2).
4. Install 2 bolts, 2 nuts and 2 spacers into the eyelets of the transmission (Figure 5, Item 2).
5. Place sling hook (Figure 5, Item 1) on bolts and snug sling to support the transmission (Figure 7).
6. Position flywheel spacer ring on engine or transmission (Figure 7, Item 3).

**WARNING**

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under and engine, transmission being lifted or suspended. Use suitable lifting equipment for heavy components. Power pack weight is 1800 lbs.



**Figure 9. Tang Alignment**

**CAUTION**

Ensure the torque converter tangs are aligned properly with the transmission pump tangs or the transmission will not mate with the torque converter pump. Make sure that the transmission is perfectly square to the engine when the two are connected together. Do not use bolts to pull the components together, use only hand force or damage will occur (Figure 9).

7. Lift and align transmission with engine, push into place.
8. Install 9 transmission bell-housing bolts (Figure 6, Item 1). Leave out 2 bolts for installation of dipstick tube clamp bracket (Figure 6, Item 3) and negative battery cable (Figure 6, Item 2) at noted locations (Figure 6).

**NOTE**

Bolt hole closest to drive shaft connection does not receive a mount bolt. The design of transmission does not allow for bolt installation.

9. Attach dipstick tube clamp (Figure 6, Item 3) and negative battery cable (Figure 6, Item 2) to appropriate mounting holes (Figure 6).
10. Torque all transmission bell housing bolts (Figure 6, Item 1) to 30 ft-lbs using.
11. Remove sling, trans lifting weldment, 2 bolts, 2 nuts and 2 spacers from transmission.

**NOTE**

When installing transmission-mounting bracket, 5/8" washer may be used as spacers if required.

12. Install transmission mount bracket (Figure 4, Item 1) and secure with 2 bolts, 2 nuts (Figure 4, Item 2).
13. Connect oil cooler lines (Figure 5, Item 3).

**NOTE**

Nut has a detent that must be straightened before you can loosen it.

14. Remove stake nut (Figure 2, Item 3), and washer (Figure 2, Item 1) and remove pre-installed drive shaft disc (Figure 2, Item 2) from transmission.
15. Place the park position/hand brake caliper bracket in position and secure with 8 mounting bolts. Torque to 85 ft-lbs (Figure 3, Item 2).
16. Reinstall drive shaft disc (Figure 2, Item 2) and secure with existing washer (Figure 2, Item 1) and stake nut (Figure 2, Item 3). Torque nut to 221 ft-lbs.
17. Stake nut on shaft with hammer and punch at notch (Figure 2).
18. Install hand brake caliper assembly (WP 0081).
19. Install 2 threaded rods (Figure 1, Item 4 and 5) on park position bracket to transmission mounting bracket.
20. Tighten nuts (Figure 1, Items 2 and 3) to secure.
21. Install park position caliper (WP 0076, 0078).
22. Install engine power pack in engine cradle (WP 0024).
23. Install power pack assembly in vehicle (WP 0023).
24. Perform Maintenance Operation Check.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE  
TRANSMISSION SERVICE**

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**INITIAL SETUP:****Test Equipment**

N/A

**Tools and Special Tools**

Standard Automotive Tool Set (WP 0125, Item 9)

Oil Filter Wrench (WP 0125, Item 18)

Funnel (WP 0125, Item 21)

General Mechanic Tool Box (WP 0125, Item 8)

**References**

WP 005

WP 0017

WP 0020

**Materials/Parts**

Fluid, Transmission (WP 0127, Item 23)

Sealant, Loctite, 262 (WP 0127, Item 38)

Solvent (WP 0127, Item 14)

**Personnel Required**

91 B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

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**TRANSMISSION SERVICE**
**WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**CAUTION**

If transmission fluid is discolored or has a burnt smell, it may have been caused from high operating temperatures. Fluid and filter should be changed immediately.

If transmission fluid has a milky look, water has entered transmission. Fluid and filter should be changed immediately.

If transmission fluid has a concentration of air bubbles, this is an indication of an air leak in the suction lines. Do not operate the vehicle until these conditions have been corrected.

**NOTE**

Transmission fluid contains a red dye additive to distinguish this fluid from other fluids used on this vehicle. If leaks are noticed and are red in color, most likely a transmission leak is present.

Transmission fluid level check should be accomplished after vehicle engine is started and at idle speed for no more than 5 minutes.

Fluid level check should be accomplished with vehicle on a flat surface or as level as possible.

**TRANSMISSION FLUID LEVEL CHECK****CAUTION**

Perform these fluid check procedures as described or damage to the transmission may occur due to over servicing or under servicing the vehicle transmission.

1. Release engine cover rubber latches. Open engine cover (WP 0020).
2. **Cold Engine** - Start vehicle, (WP 0005) and allow engine to idle for a period not to exceed 5 minutes, proceed to step 5.
3. **Warm Engine** – Start vehicle, idle for 1 minute, proceed to step 5.
4. **Hot Engine** – Shut down, allow engine to cool (10 minutes), start vehicle, proceed to step 5.

**NOTE**

Any delay in checking the level will allow oil to drain back from the cooler and produce an incorrect reading.

5. Shut down vehicle and immediately remove transmission dipstick, (Figure 1, Item 1) and wipe.
6. Reinsert dipstick, remove and check fluid level is at the maximum mark on the dipstick.

**CAUTION**

Do not overfill, this will increase the transmission oil temperature.

7. If required add fluid (using funnel) through the dipstick (Figure 1, Item 1) filler tube to the maximum mark, with the engine stopped.
8. If over serviced (above the maximum mark) drain fluid from the drain plug (Figure 1, Item 6) until fluid level is correct.

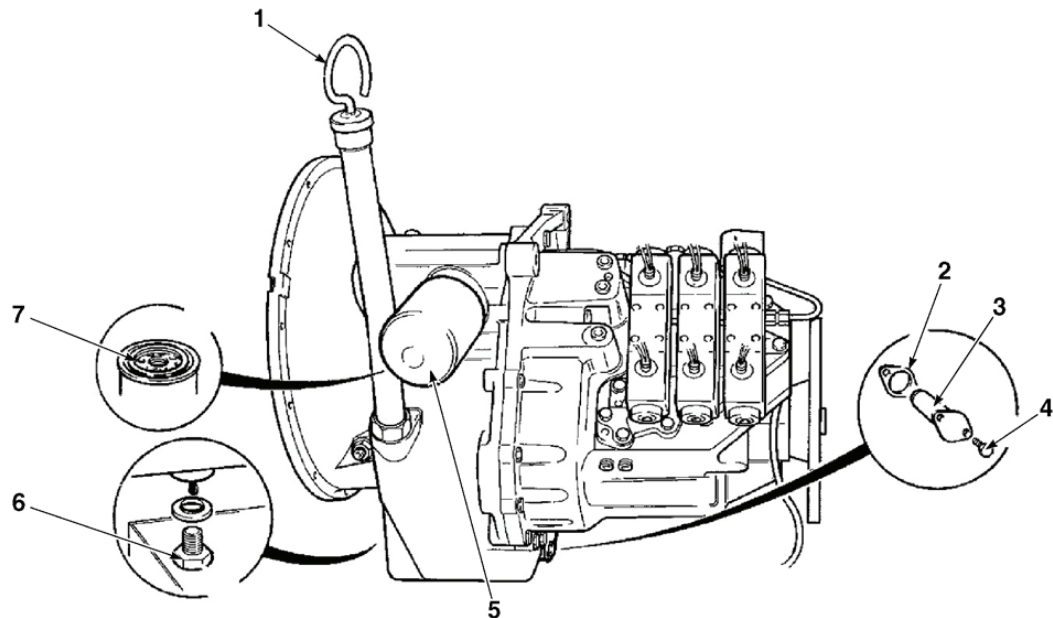
**END OF TASK**

Figure 1 - Transmission Service

## CHANGING TRANSMISSION FLUID

### WARNING

To avoid personal injury, stay clear of oil that may gush out when removing transmission drain plug, transmission strainer and transmission filter.

1. Open engine cover (WP 0020).
2. Remove dipstick (Figure 1, Item 1).
3. Place a 5-gallon drip pan under the transmission drain plug (Figure 1, Item 6).
4. Remove drain plug (Figure 1, Item 6) and allow all fluid to drain into pan. Clean plug.
5. Coat plug threads with thread sealant and install drain plug (Figure 1, Item 6) with washer seal.
6. Move drip pan under strainer assembly (Figure, Item 3)
7. Remove two mount bolts (Figure 1, Item 4) (one not shown) and carefully remove strainer and allow fluid to drain.
8. Clean strainer and bolts in solvent (PPE required).
9. Install strainer assembly (Figure 1, Item 3) with new gasket (Figure 1, Item 2).
10. Apply Loctite 262 or equivalent to mount bolt threads (Figure 1, Item 4) and torque bolts to 7.5 ft-lbs.

### END OF TASK

## CHANGING TRANSMISSION FILTER

1. Move drip pan under transmission filter cartridge.
2. Using filter wrench, remove filter (Figure 1, Item 5) from transmission housing.
3. Drain filter into drip pan and dispose of old cartridge.
4. Clean transmission filter (Figure 1, Item 5) seal mating surface on transmission housing.
5. Lubricate new filter seal with clean transmission fluid.
6. Install new filter on transmission until seal contacts mating surface and hand tighten and additional  $\frac{3}{4}$  of a turn.
7. Dispose of old transmission fluid and clean all work areas.

### END OF TASK

## SERVICING (FILLING) TRANSMISSION

### CAUTION

Do not over service transmission. Perform these fluid fill procedures as described or damage to the transmission may occur due to over servicing or under servicing the vehicle transmission

1. Place funnel in the transmission dipstick tube.

### NOTE

Insert dipstick into transmission filler tube; remove dipstick checking fill level at various intervals of filling transmission to prevent over servicing.

2. Fill transmission to the maximum mark on the dipstick (Figure 1, Item 1) (approximately 3 gallons).
3. Start engine and idle for 1 minute.
4. Shut down engine.
5. Again, fill transmission to the maximum mark on the dipstick (Figure 1, Item 1).
6. Restart engine and idle for 5 minutes. Shut down vehicle.
7. Recheck level and add fluid as necessary until fluid level is at the maximum mark on the dipstick.

END OF TASK

END OF WORK PACKAGE



---

**FIELD MAINTENANCE  
TORQUE CONVERTER**

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**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0017

WP 0023

WP 0024

WP 0035

**Tools and Special Tools**

Torque Wrench, 0-50 ft-lb (WP 0125, Item 2)

Dial Indicator (WP 0125, Item 22)

Drip Pan (WP 0126, Item 2)

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

Sealant, Loctite® (WP 0127, Item 37)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down and Cool

**INSPECTION**

Inspect torque converter output shaft for scouring and cracks. Inspect shaft tangs for wear, cracks and damage. Inspect transmission-mating teeth inside torque converter for damage. Inspect torque converter flex plate mounting bolts for security.

**WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**REMOVAL**

1. Remove power pack assembly (WP 0023).
2. Remove engine power pack and install maintenance mounts (WP 0024).
3. Remove transmission (WP 0035).
4. Place drip pan under the transmission torque converter.
5. Remove 4 torque converter flex plate mount bolts and washers (Figure 1, Item 9).
6. Pull torque converter assembly (Figure 1, Item 1) from engine.
7. Drain torque converter fluid into drip pan.
8. Remove 6 bolts (Figure 1, Item 15) holding flex plate and backing ring to torque converter (Figure 1, Item 12).

**END OF TASK****INSTALLATION**

1. Position flex plate (Figure 1, Item 13) and backing ring (Figure 1, Item 14) on torque converter.
2. Apply blue lock tight to the 6 flex plate/backing ring bolts.
3. Install 6 mount bolts (Figure 1, Item 15) holding flex plate/backing ring and snug (DO NOT TIGHTEN).
4. Position torque converter/flex plate assembly onto engine and perform alignment of all four mounting holes.
5. Carefully remove converter assembly not allowing any movement of flex plate.
6. Torque 6 mount bolts (Figure 1, Item 15) holding flex plate/backup ring to 35 ft lbs.

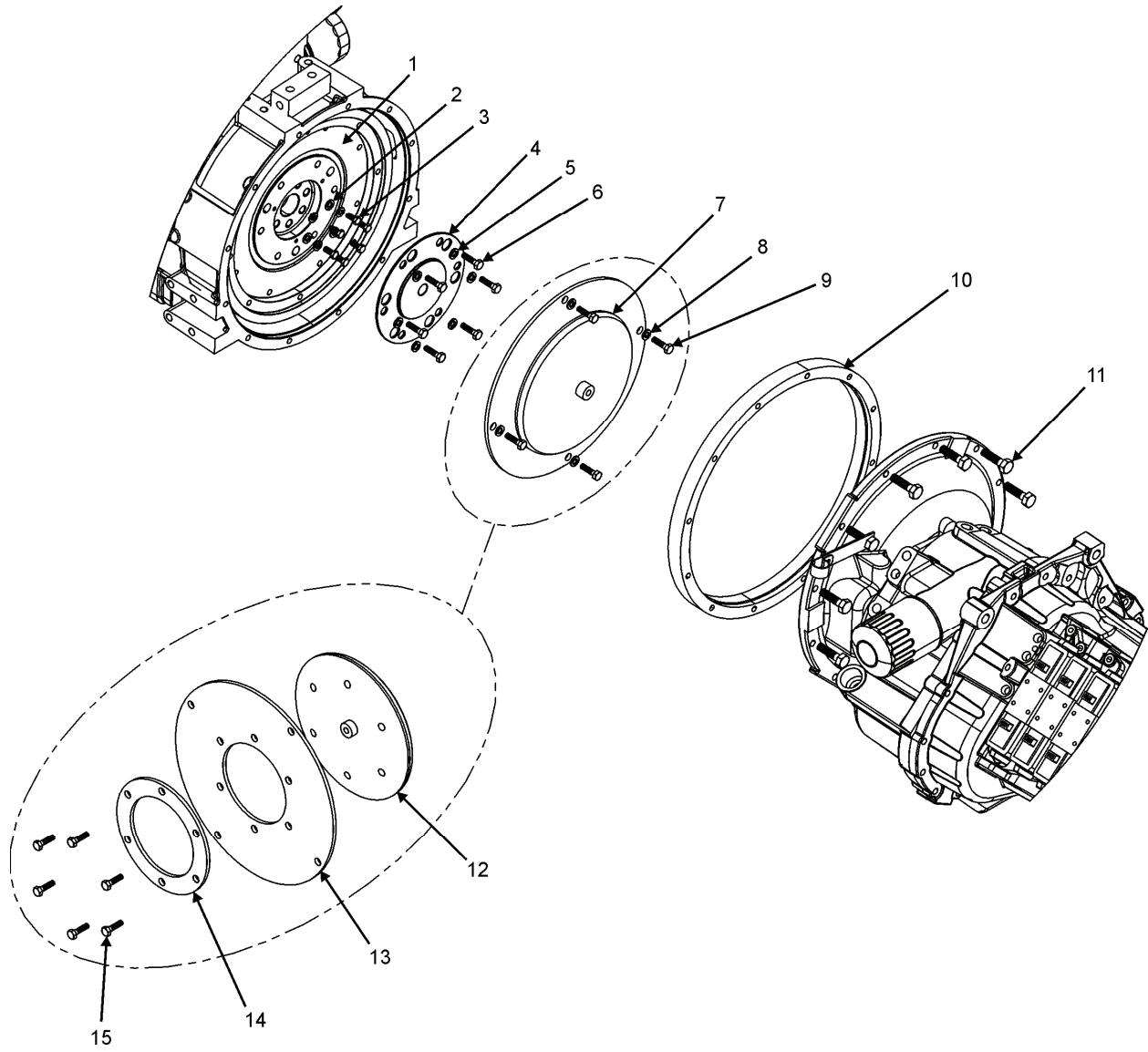


Figure 1. Transmission Torque Converter Assembly (Removal and Installation)

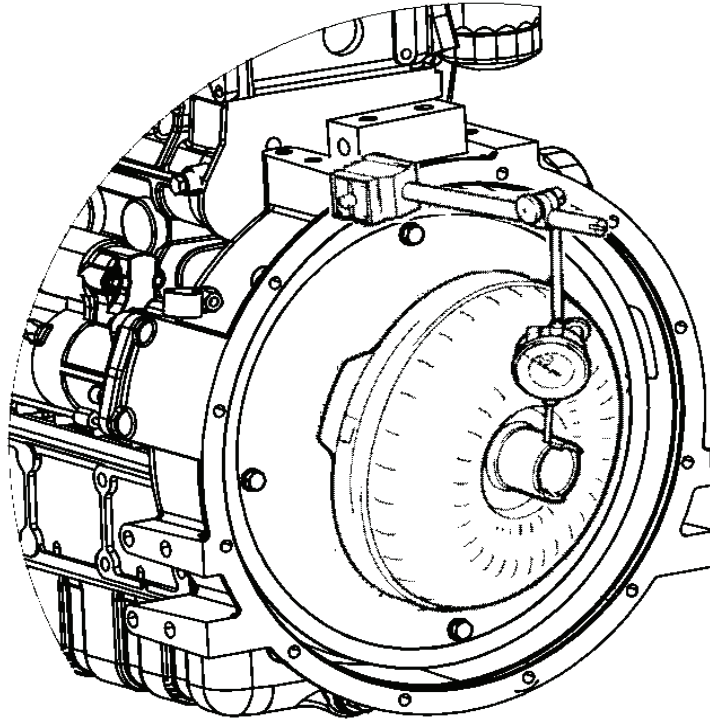


Figure 2. Torque Converter-Installation Measurement

**CAUTION**

When reinstalling the torque converter assembly, ensure the assembly mates to the engine perfectly or damage to the transmission pump will occur.

7. Reinstall torque converter on engine aligning the flex plate mounting holes to the flywheel.
8. Apply blue lock tight to the 4 torque converter assembly mount bolts.
9. Install 4 torque converter flex plate mount bolts and washers (Figure 1, Items 8 and 9) and torque to 30 ft lbs.
10. Attach dial indicator (Figure 2) and zero the gauge.
11. Spin engine (3 revolutions) at the harmonic balancer/crankshaft bolt.
12. Maximum torque converter out of round tolerance is .015 thousandths.
13. Prime torque converter with 1 quart of transmission fluid (WP 0017).
14. Mount transmission (WP 0035).
15. Install Engine Power Pack in cradle (WP 0024).
16. Install Power Pack Assembly (WP 0023).
17. Perform Maintenance Operation Check.

**END OF TASK**

**END OF WORK PACKAGE**



**FIELD MAINTENANCE  
TRANSMISSION SHIFT CONTROL**

---

**INITIAL SETUP:****Test Equipment**

Multimeter (WP 0125, Item 6)

**Tools and Special Tools**

Chocking Blocks (WP 0126, Item 1)

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0021

WP 0091

**Materials/Parts**

Wire Ties (WP 0127, Item 47)

**Equipment Condition**

Engine Shut Down

**INSPECTION**

Inspect transmission shift control for excessive wear or damage and mounting security. Inspect shifter-wiring harness for loose connections, broken wiring or corrosion. Inspect wire connectors for secure connections.

**END OF TASK****TEST**

1. Remove transmission shifter assembly this work package.

**NOTE**

Connector J11 is identified (Figure 1, Item 4) and connector J12 is identified (Figure 1, Item 3).

2. Place transmission gear selector in reverse (R).
3. Ohms test from J11 wire 65 (white) to J12 wire 66 (red) for continuity.
4. Place transmission gear selector in D1.
5. Ohms test from J11 wire 65 (white) to J12 wire 68 (green) for continuity.
6. Place transmission gear selector in D2.
7. Ohms test from J11 wire 65 (white) to J12 wire 70 (blue) for continuity.
8. Replace transmission shifter assembly if any continuity test fails.

**END OF TASK****REMOVAL**

1. Disconnect battery negative cables (WP 0091).
2. Chock rear wheels.
3. Lift front of vehicle (WP 0021).
4. Remove four mount screws and washers (Figure 1, Item 1).
5. Disconnect 2 shift control electrical connectors (Figure 1, Items 3 and 4) under front of vehicle.

**NOTE**

Remove wire ties from transmission shifter harness.

6. Carefully maneuver (rotate) transmission shift control assembly (Figure 1, Item 2).
7. Remove transmission shift control assembly (Figure 1, Item 2) from vehicle.

**END OF TASK**

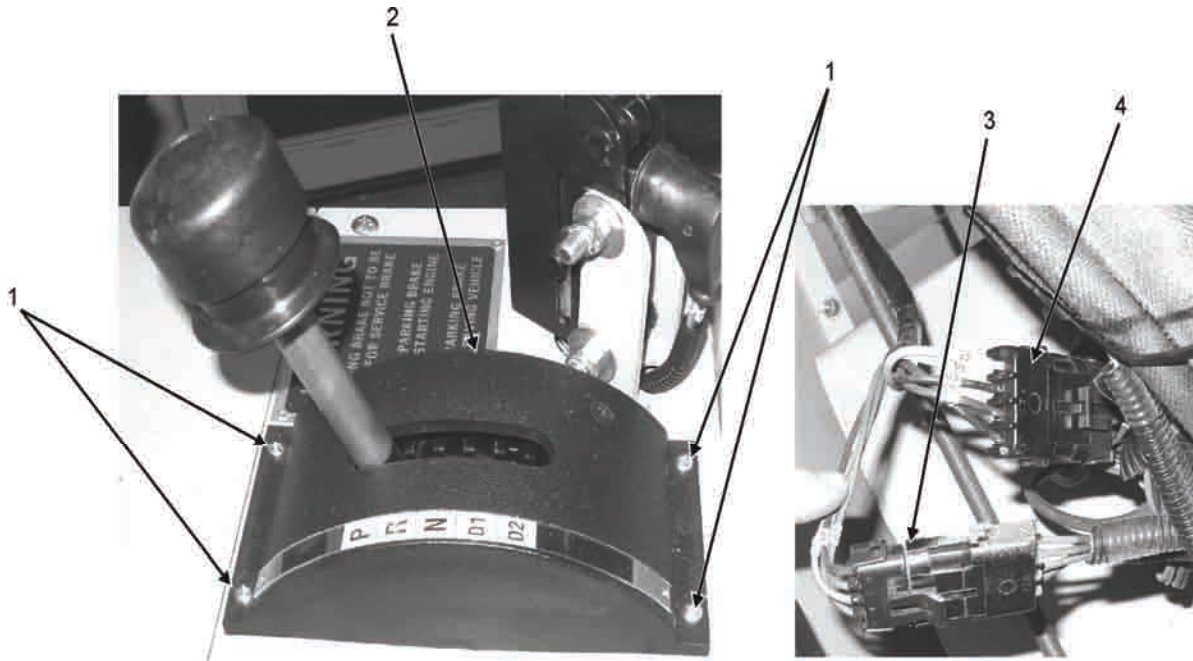


Figure 1. Transmission Shift Control (Removal and Installation)

## INSTALLATION

1. Carefully maneuver shift control assembly (Figure 1, Item 2) in the vehicle.
2. Connect the two transmission shift control electrical connectors (Figure 1, Items 3 and 4) under the vehicle.

## NOTE

Install wire ties on the wiring harness.

3. Center transmission shift control assembly (Figure 1, Item 2) in opening on console.
4. Secure shift control assembly with 4 mount washers and screws (Figure 1, Item 1).
5. Connect battery negative cables (WP 0091).
6. Lower vehicle (WP 0021).
7. Perform Maintenance Operation Check.

**END OF TASK**

**END OF WORK PACKAGE**

**FIELD MAINTENANCE  
TRANSMISSION SPEED SENSOR**

**INITIAL SETUP:**

**Test Equipment**

Multi-Meter (WP 0125, Item 6)

**References**

WP 0021

WP 0091

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Lift Vehicle

**INSPECTION**

Inspect speed sensor mounting for security (no leaks), wiring for breaks and connector for security and components for damage affecting serviceability.

**END OF TASK**

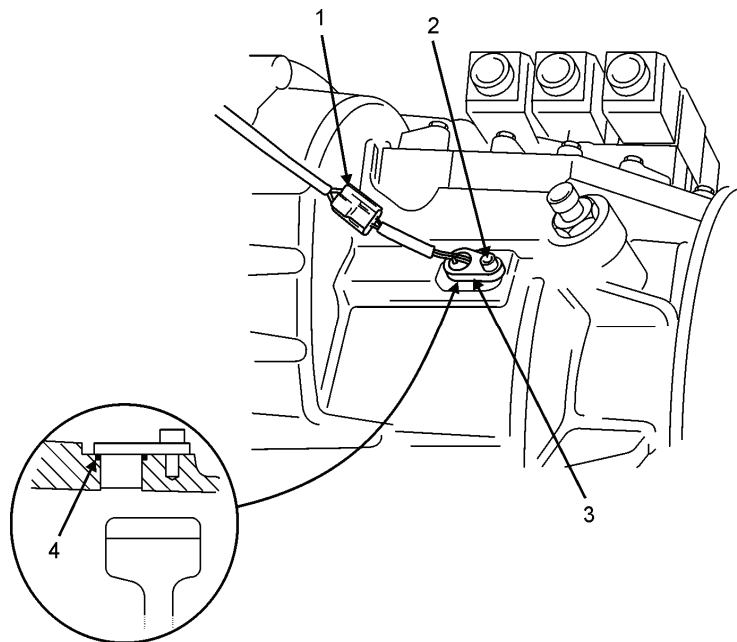


Figure 1. Speed Sensor (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Disconnect battery (WP0091).
2. Remove center deck plate (WP 0021).
3. Disconnect speed sensor wiring connector (Figure 1, Item 1).
4. Remove speed sensor mount bolt (Figure 1, Item 2).
5. Remove speed sensor (Figure 1, Item 3).
6. Remove and discard speed sensor o-ring (Figure 1, Item 4).

**END OF TASK****INSTALLATION**

1. Install new speed sensor o-ring (Figure 1, Item 4) on speed sensor.
2. Position speed sensor (Figure 1, Item 3) on transmission.
3. Install speed sensor mount bolt (Figure 1, Item 2).
4. Connect speed sensor wiring connector (Figure 1, Item 1).
5. Connect battery (WP0091).
6. Perform Maintenance Operation Check.
7. Install center deck plate (WP 0021).

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE**  
**TRANSMISSION ECU (ELECTRONIC CONTROL UNIT)**

**INITIAL SETUP:**

**Test Equipment**

N/A

**References**

WP 0021  
WP 0091

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

N/A

**INSPECTION**

Visually inspect ECU and connectors for mounting security, wiring for insulation breaks, corrosion or any damage affecting serviceability.

**END OF TASK**

**NOTE**

ECU is mounted underneath front of vehicle behind front pintle hitch area.

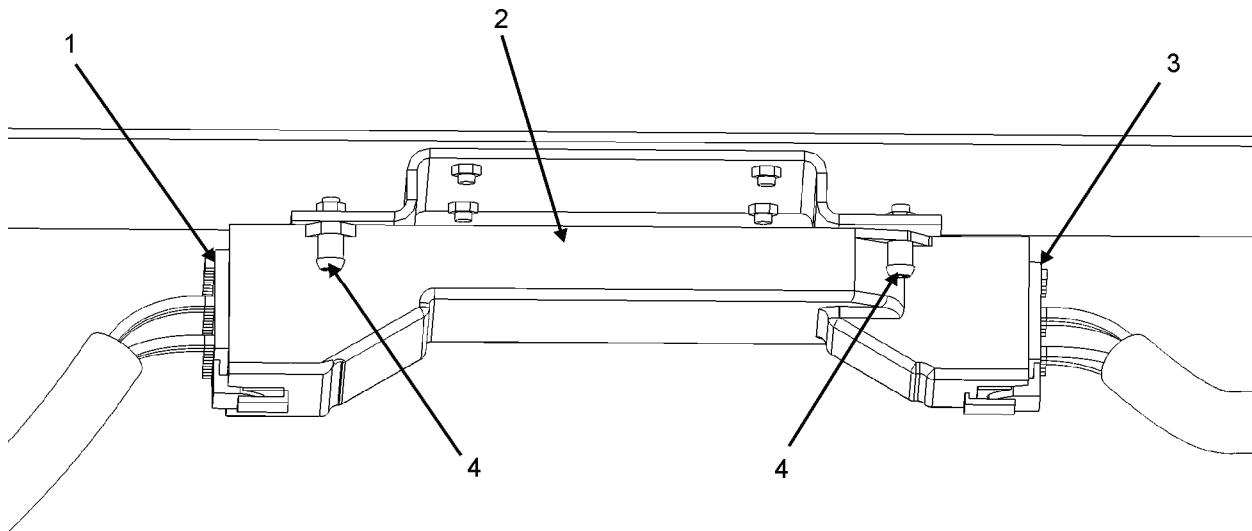


Figure 1. Transmission ECU

**REMOVAL**

1. Disconnect battery (WP0091).
2. Jack front of vehicle (WP 0021).
3. Disconnect ECU rear wiring connector (Figure 1, Item 1)
4. Disconnect ECU front wiring connector (Figure 1, Item 3).
5. Remove 4 mount screws (Figure 1, Item 4) (top mount screws not shown).
6. Remove ECU (Figure 1, Item 2).

**END OF TASK****INSTALLATION**

1. Position ECU (Figure 1, Item 2).
2. Install 4 mount screws (Figure 1, Item 4) (top mount screws not shown).
3. Connect ECU wiring connector (Figure 1, Item 1)
4. Connect ECU wiring connector (Figure 1, Item 3).
5. Lower Vehicle (WP 0021).
6. Connect battery (WP0091).
7. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**SOLENOID VALVE (3-POSITION/SINGLE SOLENOID)**

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**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**Tools and Special Tools**Torque Wrench, 10 ft-lb (WP 0125, Item 2)  
General Mechanic Tool Box (WP 0125, Item 8)**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**References**WP 0020  
WP 0091**Materials/Parts**Rag, Wiping P/N A-A-531 (WP 0127, Item 34)  
Fluid, Transmission (WP 0127, Item 23)  
Sealant, Loctite® 242 (WP 0127, Item 37)**Equipment Condition**

Engine Shut Down

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**INSPECTION**

Inspect all solenoid valve(s) for mounting security, leaks, damaged wiring or wiring connectors or for any damage affecting serviceability.

**END OF TASK****OHMS TEST****Forward and Reverse Solenoids****NOTE**

Removal of the center deck plate is required to access the solenoid valves (WP 0020).

All seven solenoid coils (Figure 1) are ohms tested using the same procedure.

Always tag the solenoid wiring connectors before removal to aid in reinstallation.

1. Remove all solenoid wiring connectors (Figure 2, Item 1).
2. Ohms test across solenoid connector pins (Figure 1, Item 2).
3. Resistance measured for all solenoids should be 5 ohms nominally.
4. Replace any solenoid coil, which fails the ohms test.

**4 Wheel Drive Solenoid (Figure 5)**

1. Remove 4-wheel drive solenoid wiring connector (same as) (Figure 2, Item 1).
2. Ohms test across solenoid connector pins (Figure 5, Item 6).
3. Resistance measured at the solenoid should be 7.5 ohms nominally.
4. Replace solenoid coil if ohms test fails.

**END OF TASK****VOLTAGE TEST****Reverse Solenoid Voltage Tests****NOTE**

A transmission solenoid voltage test reading between 0 and 9 volts is not acceptable.

1. Chock Wheels.

2. Remove wiring connectors from 2 solenoids (Figure 3, Items 4 and 5)
3. Turn ignition switch on; release hand brake, place transmission gear selector in reverse.
4. Measure the voltage across both reverse input connectors (Figure 1, Item 3).
5. Voltage measured should be 12 volts nominally.

#### D1 Forward Solenoid Voltage Tests

1. Chock Wheels.
2. Remove wiring connectors from 2 solenoids (Figure 3, Items 1 and 5).
3. Turn ignition switch on; release hand brake, place transmission gear selector in D1.
4. Measure the voltage across both D1 input connectors (Figure 1, Item 3).
5. Voltage measured should be 12 volts nominally.

#### D2 Forward Solenoid Voltage Tests

1. Lift vehicle all 4 wheels (WP 0020).
2. Remove wiring connectors from 2 solenoids (Figure 3, Items 2 and 6)
3. Start vehicle; release hand brake, place transmission gear selector in D2.
4. Allow wheels to spin fast enough to which would allow transmission to shift into 2<sup>nd</sup> gear.
5. Measure the voltage across both D2 input connectors (Figure 1, Item 3).
6. Voltage measured should be 12 volts nominally.

#### D3 Forward Solenoid Voltage Tests

1. Lift vehicle all 4 wheels (WP 0020).
2. Remove wiring connectors from 3 solenoids (Figure 3, Items 1 and 2)
3. Start vehicle; release hand brake, place transmission gear selector in D2.
4. Allow wheels to spin fast enough to which would allow transmission to shift into 3rd gear.
5. Measure the voltage across both D3 input connectors (Figure 1, Item 3).
6. Voltage measured should be 12 volts nominally.

#### END OF TASK

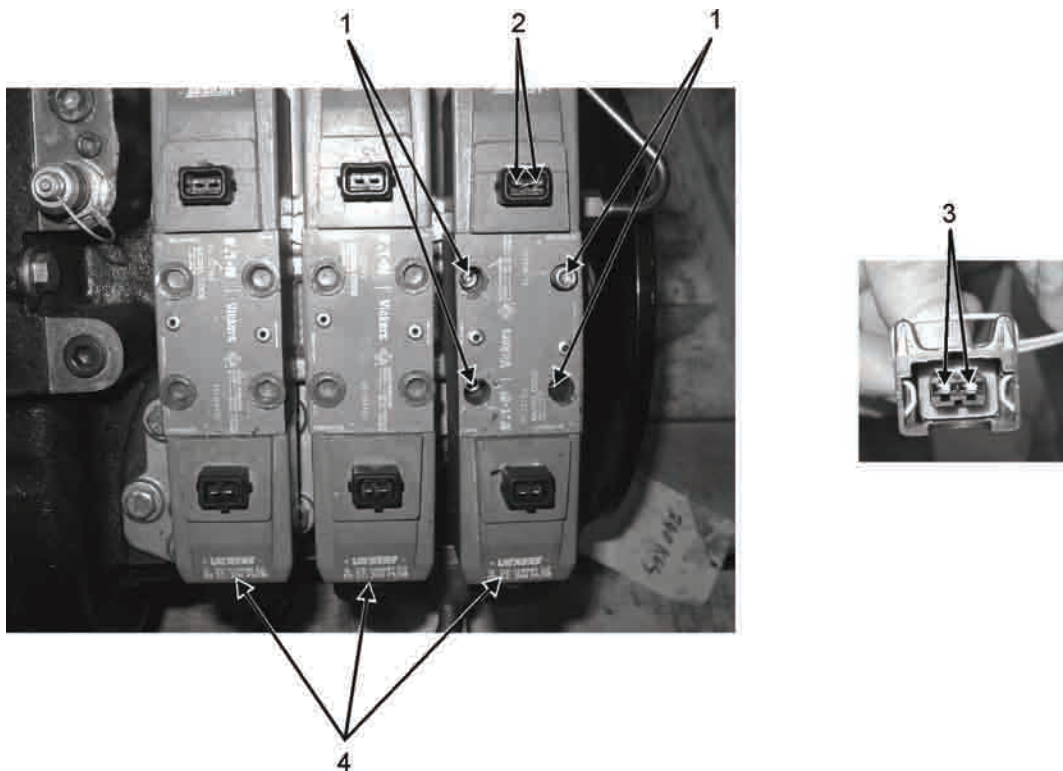


Figure 1. Solenoid Coil Ohms Test, Voltage Test (Removal and Installation)

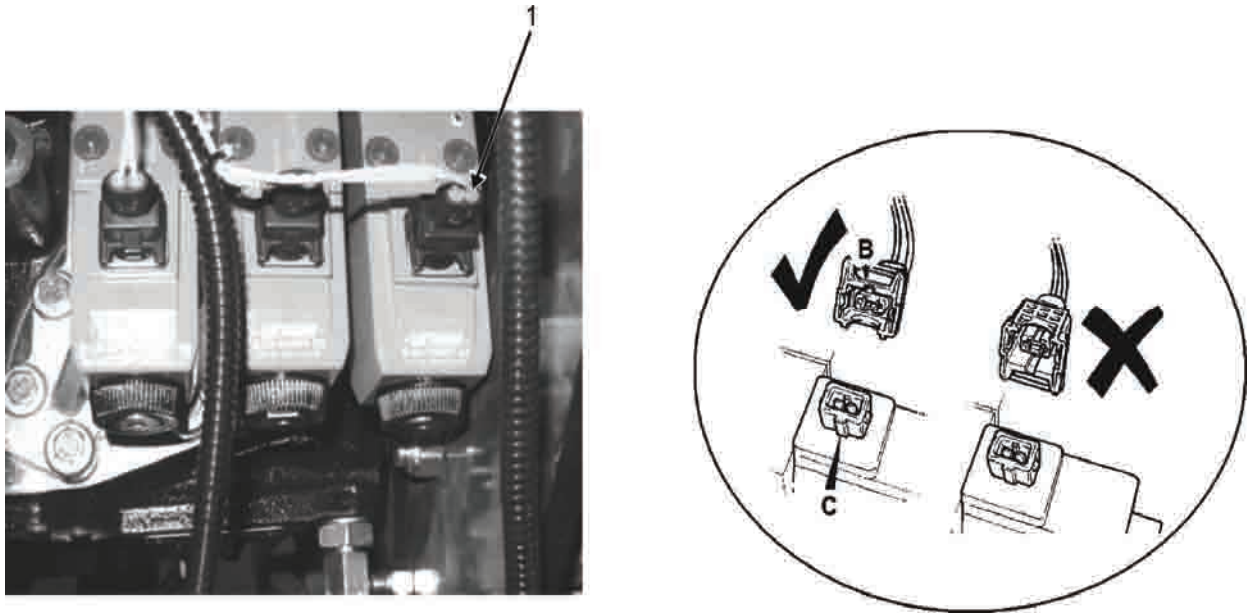


Figure 2. Solenoid Wiring Connector (Removal and Installation)

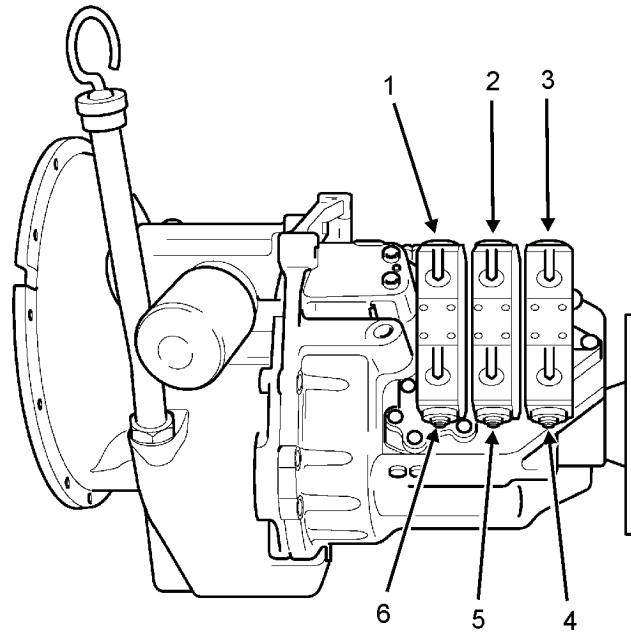


Figure 3. Solenoid Voltage/Ohms Test Callouts

**NOTE**

The MT3 SATS vehicle is equipped with an ITL 4-speeds forward power shift transmission. The SATS configuration only uses 3 forward gears. D1 uses forward 2<sup>nd</sup> gear; D2 uses forward 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> gears respectively.

Gear	Callout	Solenoids
D1 (2 <sup>nd</sup> Gear)	1 and 5	Forward Low and Lay Shaft
D2 (3 <sup>rd</sup> Gear)	2 and 6	Forward High and Lay Shaft
D3 (Automatic Shift) (4 <sup>th</sup> Gear)	1 and 2	Forward Low and Main Shaft
Reverse	4 and 5	Reverse High and Lay Shaft

Table 1. Solenoid Valve Input Voltage Test Points

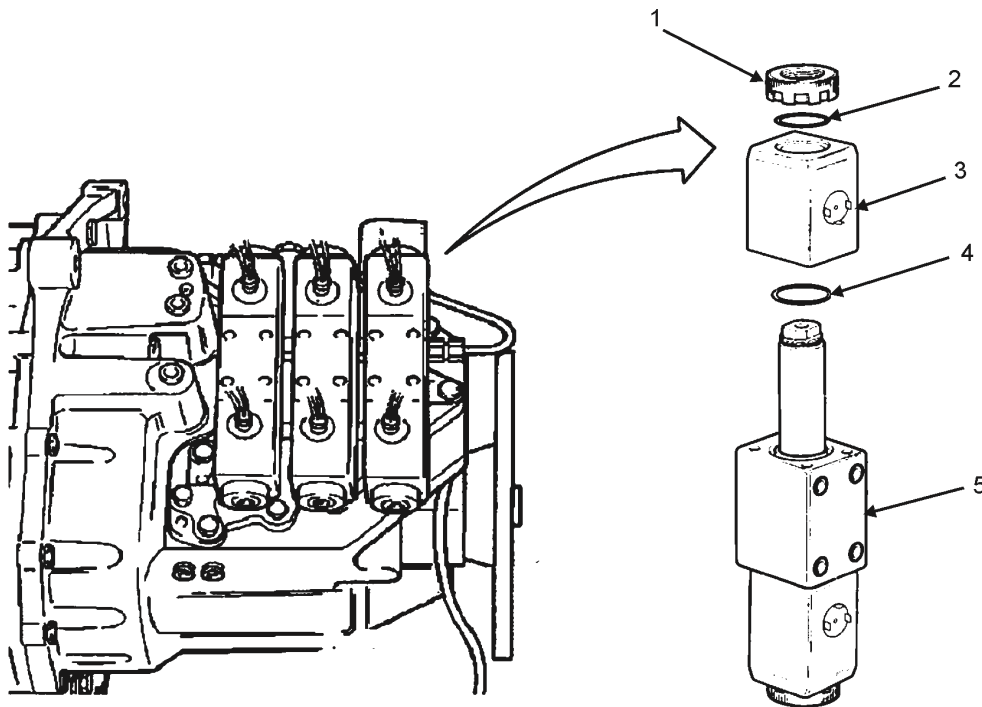
**REMOVAL****Solenoid Valve Coils**

Figure 4. Solenoid Valve Coil (Removal and Installation)

**WARNING**

Proper PPE is required when working around transmission fluid.

**NOTE**

It is not recommended to remove the spool from the valve body. None of the component parts of the solenoid valve are repairable. The extent of permissible servicing is cleaning and replacement of O-rings and solenoid coils. If damage to any other component is evident, the complete valve assembly must be replaced.

**NOTE**

This removal and installation procedure is the same on all 6 upper or lower solenoid coils.

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Disconnect appropriate solenoid wiring connector (Figure 2, Item 1).
4. Remove knurled nut (Figure 4, Item 1).
5. Remove O-ring (Figure 4, Item 2).
6. Remove solenoid coil (Figure 4, Item 3).
7. Remove O-ring (Figure 4, Item 4).

**END OF TASK****INSTALLATION****NOTE**

Apply a thin coat of transmission fluid on O-rings.

1. Install O-ring (Figure 4, Item 4) in valve body groove.
2. Position solenoid coil (Figure 4, Item 3).
3. Install O-ring (Figure 4, Item 2).
4. Apply Loctite® 242 to the knurled nut threads (Figure 4, Item 1).
5. Install knurled nut (Figure 4, Item 1) and snug tight (Do Not Over Tighten).
6. Connect appropriate solenoid wiring connector (Figure 2, Item 1).
7. Connect battery negative cables (WP 0091).
8. Perform Maintenance Operation Check.
9. Install center deck plate (WP 0020).

**END OF TASK**



Figure 5. Solenoid (Four Wheel Drive) Coil Test

## REMOVAL

### 4-Wheel Drive Solenoid Valve Coil and Spool

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Disconnect 4-wheel drive solenoid wiring connector (same as Figure 2, Item 1).
4. Remove coil mount nut (Figure 5, Item 1).
5. Remove solenoid plates with crush-ring (Figure 5, Item 2).
6. Remove solenoid coil (Figure 5, Item 3).

### NOTE

If necessary, perform step 7 to remove the 4-wheel drive spool assembly.

7. Turn spool assembly mount nut (Figure 5, Item 4) counterclockwise and remove spool assembly (Figure 5, Item 5).



## INSTALLATION

### 4-Wheel Drive Solenoid Valve Coil and Spool

#### NOTE

Removal of the coil from the spool may be necessary to allow for installation of the spool assembly.

1. Position spool assembly (Figure 5, Item 5) in transmission.
2. Turn spool mount nut (Figure 5, Item 4) clockwise and tighten.
3. Install solenoid coil (Figure 5, Item 3).
4. Install solenoid plates with crush-ring (Figure 5, Item 2).
5. Apply Loctite® 242 to the coil mount nut (Figure 5, Item 1) threads.
6. Install coil mount nut (Figure 5, Item 1) and torque to 4-6 ft. lbs.
7. Connect 4-wheel drive solenoid wiring connector (same as Figure 2, Item 1).
8. Connect battery negative cables (WP 0091).
9. Perform Maintenance Operation Check.
10. Install center deck plate (WP 0020).

#### END OF TASK

## REMOVAL

### Solenoid Valve Assembly

#### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

#### CAUTION

To prevent transmission malfunction, avoid contamination or damage to internal parts when replacing solenoid valve assembly.

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Disconnect appropriate solenoid wiring connector (Figure 2, Item 1).
4. Place a drip pan under the solenoid valve assembly.
5. Remove 4 mount bolts (Figure 1, Item 1).
6. Remove appropriate solenoid valve assembly (Figure 1, Item 4).

#### END OF TASK

## INSTALLATION

### Solenoid Valve Assembly

1. Install appropriate solenoid valve assembly (Figure 1, Item 4) on transmission.
2. Install 4 mount bolts (Figure 1, Item 1) and tighten.
3. Connect appropriate solenoid wiring connector (Figure 2, Item 1).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.
6. Install center deck plate (WP 0020).

#### END OF TASK

## END OF WORK PACKAGE



**FIELD MAINTENANCE  
OIL COOLER**

**INITIAL SETUP:**

**Test Equipment**

N/A

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**References**

WP 0021

WP 0036

WP 0091

**Materials/Parts**

Caps/ Plugs, Protective (WP 0127, Item 7)

Tape, Anti-Seize (WP 0127, Item 50)

**Equipment Condition**

Engine Shut Down

**INSPECTION**

Inspect oil cooler for leaks and fin damage, lines and fittings for damage or leaks and any damage affecting serviceability.

**END OF TASK**

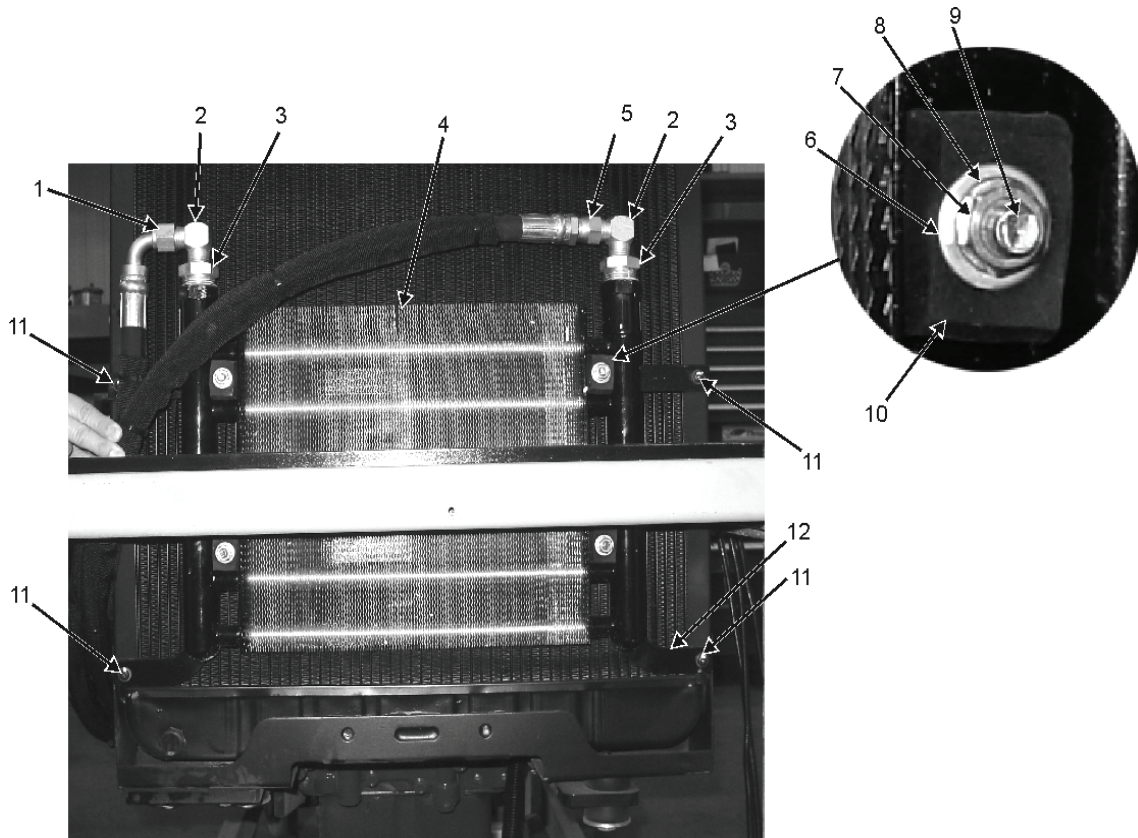


Figure 1. Oil Cooler (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**NOTE**

Cap and plug hoses and fitting during the removal process.

Note orientation of fittings during removal to aid in the reinstallation process.

Figure 1 illustrates the oil cooler mounted in the engine power pack cradle. Removal and installation is accomplished with power pack assembly in the vehicle.

1. Disconnect negative battery cables (WP 0091).
2. Raise front of vehicle (WP 0021).
3. Place a drip pan under the oil cooler hoses.
4. Remove hose (Figure 1, Item 1) from fitting (Figure 1, Item 2).
5. Remove hose (Figure 1, Item 5) from fitting (Figure 1, Item 2).
6. Store hoses out of the way.
7. Remove 2 lower cooler mounts (Figure 1, Item 11).

**NOTE**

Position a mechanic under the vehicle supporting the oil cooler assembly.

Keep oil cooler upright or in a drip pan during disassembly to prevent draining improperly.

8. Remove 2 upper cooler mounts (Figure 1, Item 11) and remove the oil cooler from the vehicle.
9. Remove 2 fittings (Figure 1, Item 3 and 2) as an assembly (for reinstallation).

**NOTE**

All four mount assemblies are removed using the same process

10. Remove 4 nuts (Figure 1, Item 7).
11. Remove 4 lock washers (Figure 1, Item 8).
12. Remove 4 flat washers (Figure 1, Item 6).
13. Remove 4 rubber vibration mounts (Figure 1, Item 10).
14. Remove 4 bolts (Figure 1, Item 9).
15. Remove cooler from bracket.
16. Drain old oil cooler and dispose of properly.

**END OF TASK**

**INSTALLATION****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Position oil cooler on bracket.
2. Install 4 bolts (Figure 1, Item 9).
3. Install 4 rubber vibration mounts (Figure 1, Item 10).
4. Install 4 flat washers (Figure 1, Item 6).
5. Install 4 lock washers (Figure 1, Item 8).
6. Install 4 nuts (Figure 1, Item 7) and tighten.
7. Wrap threads of 2 fitting (Figure 1, Item 3) with anti-seizing tape.
8. Stand cooler and fill with transmission fluid.
9. Install 2 fitting assemblies (Figure 1, Item 3 and 2) and cap.
10. Raise the cooler into position from underneath the vehicle.
11. Install 2 upper cooler mounts (Figure 1, Item 11)
12. Install 2 lower cooler mounts (Figure 1, Item 11).
13. Remove cooler fitting caps.
14. Install hose (Figure 1, Item 5) onto fitting (Figure 1, Item 2).
15. Install hose (Figure 1, Item 1) onto fitting (Figure 1, Item 2).
16. Lower front of vehicle (WP 0021).
17. Connect battery negative cables (WP 0091).
18. Perform Maintenance Operation Check.
19. Service Transmission (WP 0036).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**TEMPERATURE SENDING UNIT (TRANSMISSION)**

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**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0021

WP 0091

**Materials/Parts**

Tape, Anti-Seize (WP 0127, Item 50)

**Equipment Condition**Engine Shut Down

---

**INSPECTION**

Inspect temperature-sending unit for security (no leaks), wiring for breaks, connector for security and component for damage affecting serviceability.

**TEST****NOTE**

Transmission temperature sending unit is located on top and front of transmission housing.

1. Remove terminal nut (Figure 1, Item 1).
2. Remove wire (Figure 1, Item 2).
3. Ohms test sending unit from the stud (Figure 1, Item 2) to ground.
4. Resistance should measure, 2.5 K ohms nominally.
5. Replace temperature-sending unit if ohms test fails.

**END OF TASK****REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**NOTE**

Place a shop towel under temperature sending unit, fluid may leak.

1. Disconnect battery (WP0091).
2. Remove center deck plate (WP 0021).
3. Remove terminal nut (Figure 1, Item 1).
4. Remove wire (Figure 1, Item 2).
5. Remove temperature-sending unit (Figure 1, Item 3) from T-Fitting.

**END OF TASK**

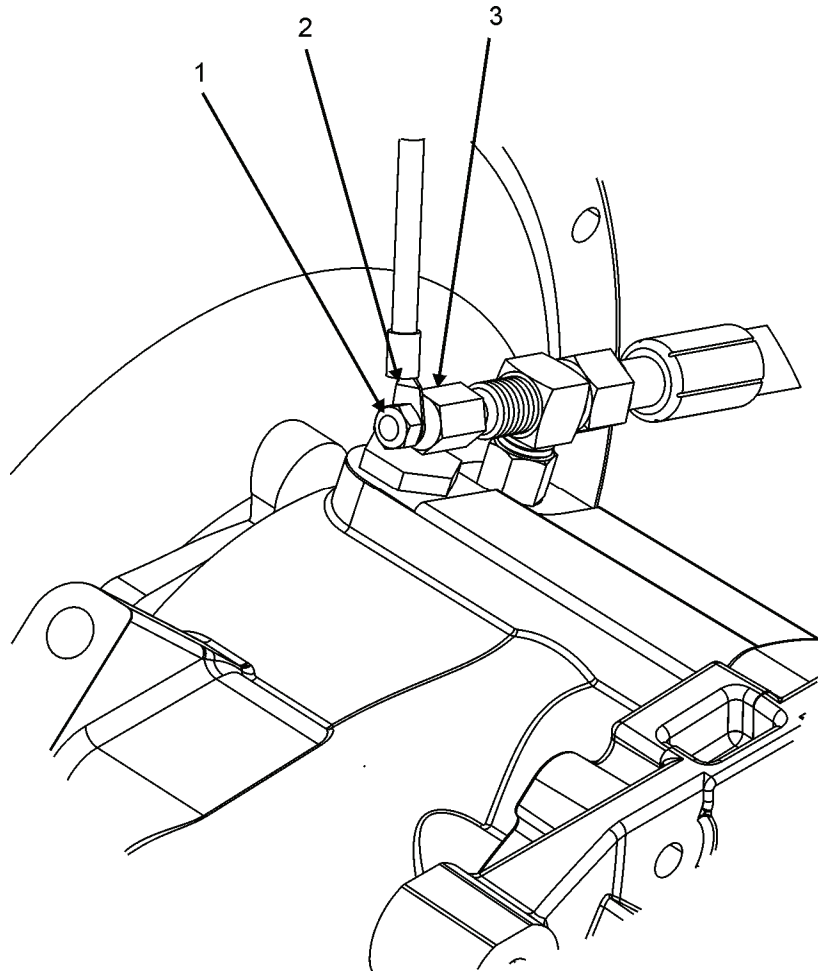


Figure 1 - Temperature Sending Unit (Test, Removal and Installation)

## INSTALLATION

### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Wrap threads of temperature-sending unit (Figure 1, Item 3) with anti-seize tape.
2. Install temperature-sending unit (Figure 1, Item 3) on T-Fitting.
3. Install wire (Figure 1, Item 2).
4. Install terminal nut (Figure 1, Item 1).
5. Install center deck plate (WP 0021).
6. Connect battery (WP0091).
7. Perform Maintenance Operation Check.

## END OF TASK

## END OF WORK PACKAGE



**FIELD MAINTENANCE**  
**RADIATOR**

**INITIAL SETUP:**

**Test Equipment**

N/A

WP 0042

WP 0045

WP 0048

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

WP 0049

WP 0053

WP 0074

**Personnel Required**

WP 00107

91B, Light Wheel Vehicle Mechanic (2)

**Materials/Parts**

Engine coolant (WP 0127, Item 5)

**References**

WP 0020

WP 0036

**Equipment Condition**

Engine Shut Down and Cool

**INSPECTION**

Inspect radiator, hoses and fittings for mounting security, leaks, clogs, or excessive dirt buildup and for any damage affecting serviceability

**END OF TASK**

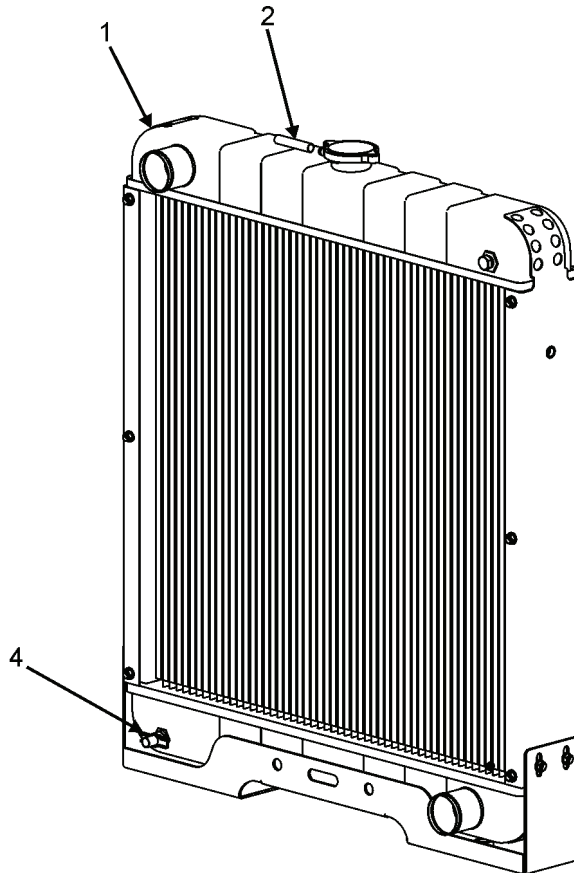


Figure 1. Radiator

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Open engine cover (WP 0020).
2. Remove brake reservoirs (WP 0074).
3. Remove throttle reservoir (WP 0107).
4. Remove transmission oil cooler (WP 0042).
5. Remove 3 radiator isolator mount bolts (WP 0049).
6. Drain radiator/engine coolant (WP 0045).
7. Disconnect overflow tube (Figure 1, Item 2).
8. Disconnect radiator hoses at the radiator (WP 0048).
9. Remove cooling fan (WP 0053).
10. Remove radiator.

**END OF TASK****CLEANING****Clean Radiator (Outside)****CAUTION**

Do not clean radiator with sharp or abrasive tools. Damage to fins or tubes may occur and cause coolant leaks or decrease cooling performance.

If dust and debris is between the fin and tube, wash it away with running water.

**END OF TASK****INSTALLATION**

1. Position radiator (Figure 1, Item 1) in engine cradle.
2. Install oil cooler (WP 0042).
3. Install cooling fan (WP 0053).
4. Install radiator isolator mount bolts (WP 0049).
5. Install radiator hoses (WP 0048) at the engine.
6. Connect overflow tube (Figure 1, Item 2) to radiator (Figure 1, Item 1).
7. Service radiator/engine with coolant (WP 0045).
8. Install throttle reservoir (WP 0107).
9. Install brake reservoirs (WP 0074).
10. Bleed brakes (WP 0075) if system was opened.
11. Bleed throttle system (WP 0104) if system was opened.
12. Perform Maintenance Operation Check.
13. Service radiator as necessary (WP 0045).
14. Service transmission as necessary (WP 0036).
15. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

---

**FIELD MAINTENANCE**  
**COOLING SYSTEM SERVICE**

---

**INITIAL SETUP:****Test Equipment**  
N/A**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)**Personnel Required**  
91B, Light Wheel Vehicle Mechanic**References**  
WP 0005  
WP 0017  
WP 0020**Materials/Parts**  
Ethylene Glycol, Long Life (WP 0127, Item 5)  
Tape, Anti-Seize (WP 0127, Item 50)**Equipment Condition**  
Engine Shut Down and Cool

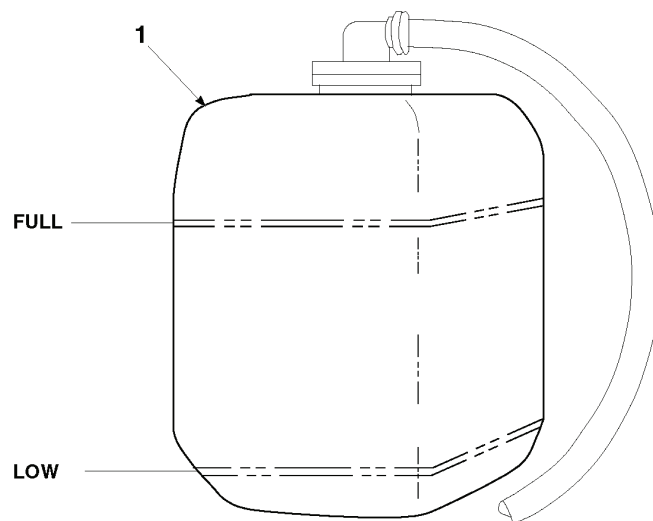
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**INSPECTION**

Inspect cooling system components (radiator, radiator cap, hoses, fittings, clamps, water pump, thermostat, fan, overflow bottle, temperature switch, temperature sending unit) for mounting security, leaks, corrosion, excessive dirt buildup or any damage affecting serviceability

**Coolant Level Check****NOTE**

If coolant level is low, service with a 50/50 mixture of ethylene glycol and water.



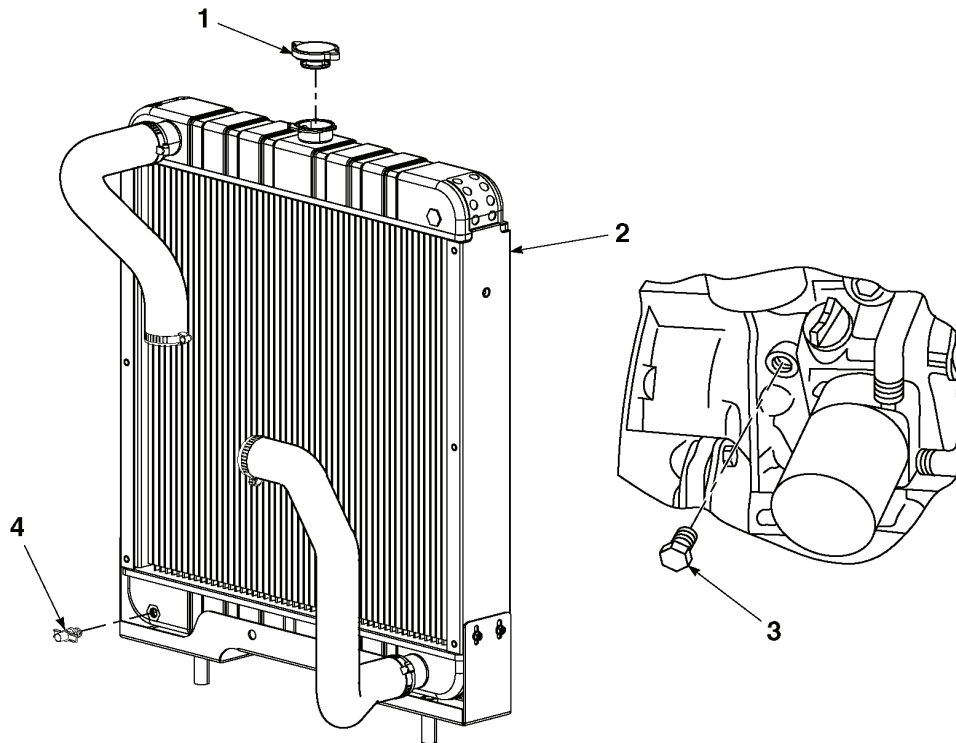
501348M-002

Figure 1. Coolant Recovery Tank.

1. Open engine cover (WP 0020).
2. Service overflow bottle to between the low and full marks (Figure 1). Do not overfill.
3. Close engine cover (WP 0020).

## END OF TASK

## COOLING SYSTEM SERVICE



501348M-003

Figure 2. Cooling System Service

**Drain Radiator/Engine Coolant****WARNING**

To avoid personal injury, do not remove the radiator cap when the engine is hot. Let the engine cool down and then loosen the cap slightly to relieve any excess pressure before removing cap completely.

**WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Open engine cover (WP 0020).
2. Remove radiator cap (Figure 2, Item 1).
3. Place a drip pan under the radiator.
4. Open radiator drain petcock (Figure 2, Item 4). Drain radiator coolant completely.
5. Place a drip pan under the engine drain plug.
6. Remove engine drain plug (Figure 2, Item 3). Drain engine coolant completely.
7. Apply anti-seize tape to drain plug (Figure 2, Item 3) threads.
8. Install engine drain plug (Figure 2, Item 3).
9. Flush radiator (Figure 2, Item 2) with water if necessary.
10. Close radiator drain petcock (Figure 2, Item 4).
11. Dispose of contaminated coolant and clean drip pan and area.

**END OF TASK****Refilling the Engine/Radiator****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**NOTE**

Refill radiator with a 50/50 mixture of coolant and water.

1. Slowly fill radiator (Figure 2, Item 2) until coolant just covers the core.
2. Start engine (WP 0005) and observe coolant level in radiator until it drops.
3. Shutdown engine (WP 0005).
4. Slowly fill radiator again (Figure 2, Item 2) until coolant just covers the core.
5. Repeat steps (2, 3 and 4) until radiator level is stable (covering the core).
6. Shutdown vehicle (WP 0005).
7. Install radiator cap (Figure 2, Item 1).
8. Check level of overflow bottle this work package and service as necessary.
9. Perform final Maintenance Operation Check.
10. Close engine Cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE  
WATER PUMP**

**INITIAL SETUP:**

**Test Equipment**  
N/A

WP 0033  
WP 0045  
WP 0053  
WP 0091

**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down and Cool

**References**  
WP 0020

**INSPECTION**

Visually inspect water pump for mounting security, housing and gasket for leaks or any for damage affecting serviceability.

**NOTE**

Check water pump (weep hole) located on the bottom of the water pump housing for presence of coolant. Replace water pump if coolant is leaking through weep hole.

**END OF TASK**

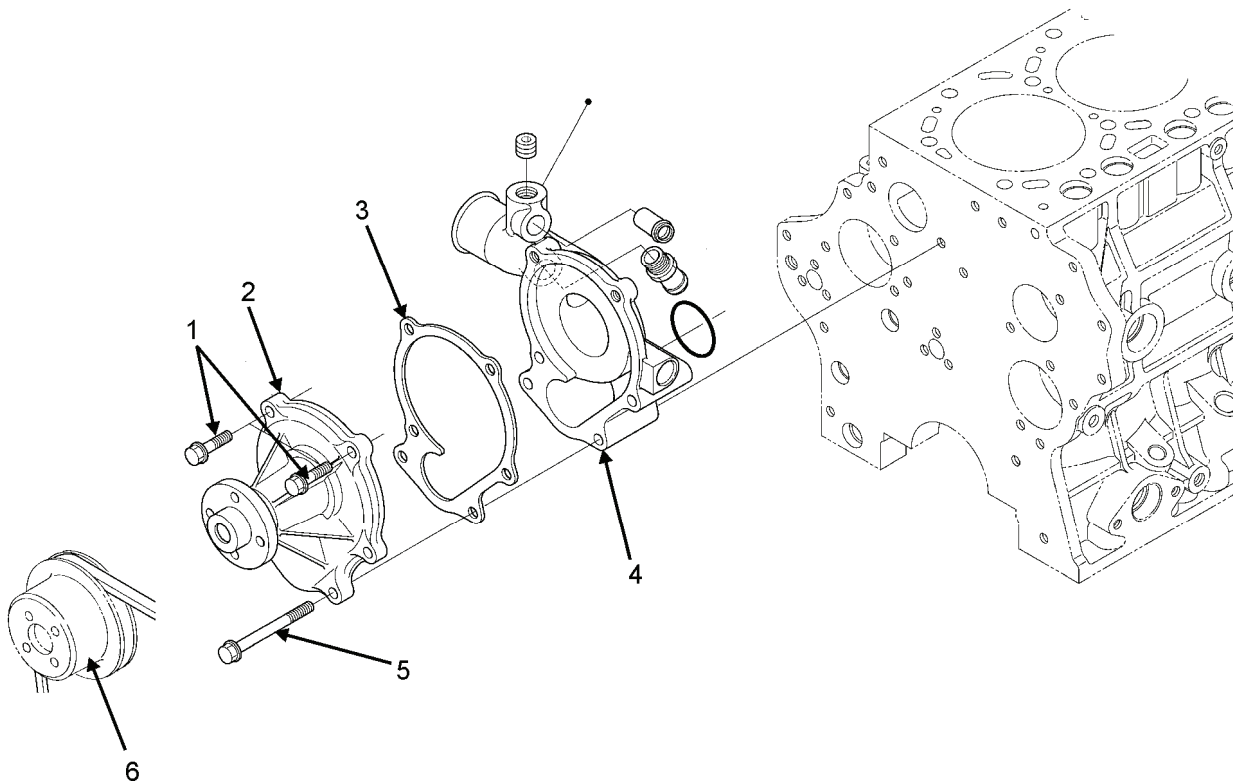


Figure 1. Water Pump (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Disconnect negative battery cables (WP0091).
2. Open engine cover (WP 0020).
3. Remove engine fan belt. (WP0033).
4. Remove cooling fan (WP 0053).
5. Remove engine pulley (Figure 1, Item 6).
6. Drain radiator (WP 0045).

**NOTE**

4 long and 2 short bolts secure the water pump, note orientation to aid in reinstallation.

7. Remove 2 short mount bolts (Figure 1, Item 1).
8. Remove 4 long mount bolts (Figure 1, Item 5) (3 bolts not shown).
9. Remove water pump (Figure 1, Item 2) and gasket (Figure 1, Item 3).
10. Clean water pump housing mating surface (Figure 1, Item 4).

**END OF TASK****INSTALLATION**

1. Position gasket (Figure 1, Item 3) on water pump housing (Figure 1, Item 2) and pre-install 2 short mount bolts (Figure 1, Item 1) to hold gasket in position.
2. Position water pump/gasket on housing (Figure 1, Item 4) and snug up the 2 pre-installed bolts.
3. Install 4 long mount bolts (Figure 1, Item 5) (3 bolts not shown) and snug.
4. Tighten 6 mount bolts (Figure 1, Items 1 and 5).
5. Install cooling fan (WP 0053).
6. Install engine fan belt and adjust tension (WP 0033).
7. Connect battery negative cables (WP 0091)
8. Service cooling system (WP 0045).
9. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE  
THERMOSTAT**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**References**  
WP 0020  
WP 0045  
WP 0091

**Materials/Parts**  
N/A

**Equipment Condition**  
Engine Shut Down and Cool

**INSPECTION**

Visually inspect thermostat housing for mount security and for leaks at thermostat gasket and housing or any damage affecting serviceability.

**END OF TASK**

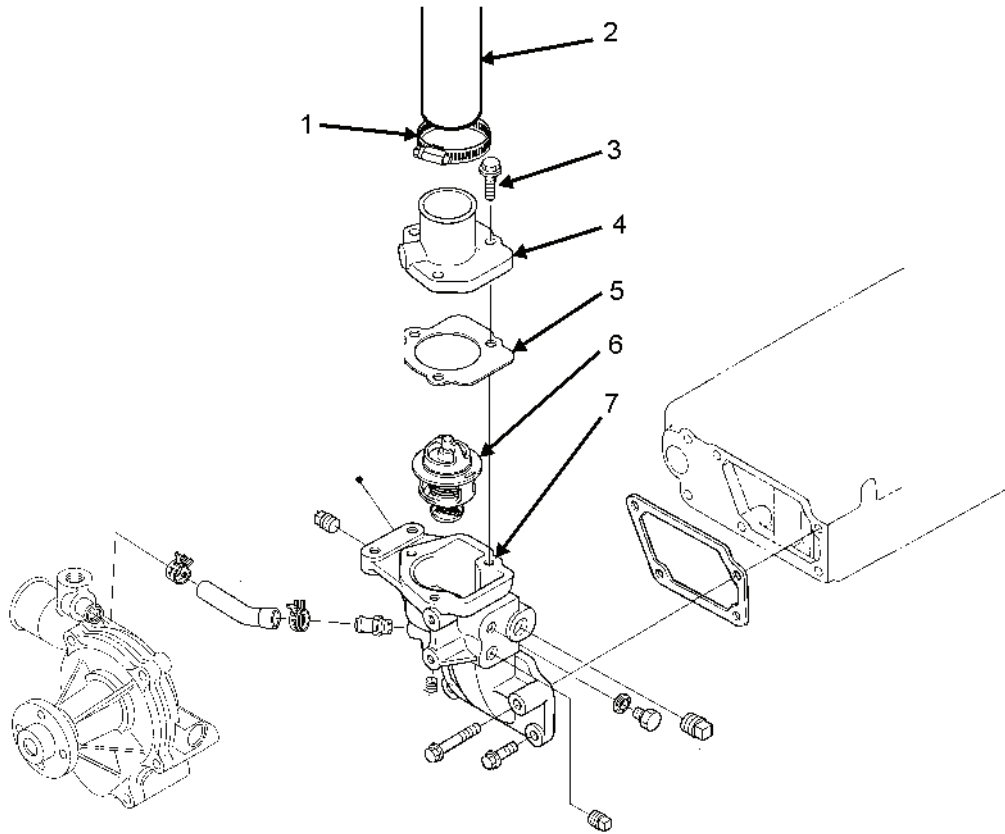


Figure 1. Thermostat (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Disconnect negative battery cables (WP0091).
2. Open engine cover (WP 0020).
3. Drain radiator coolant below the level of the thermostat (WP 0045).
4. Remove hose clamp (Figure 1, Item 1).
5. Remove hose (Figure 1, Item 2).
6. Remove 3 mount bolts (Figure 1, Item 3).
7. Remove top of thermostat housing (Figure 1, Item 4).
8. Remove gasket (Figure 1, Item 5).
9. Remove thermostat (Figure 1, Item 6).
10. Clean old gasket from thermostat housing mating surfaces (Figure 1, Items 4 and 7).

**END OF TASK****INSTALLATION**

1. Install thermostat (Figure 1, Item 6) into thermostat housing (Figure 1, Item 7).
2. Install gasket (Figure 1, Item 5) on thermostat housing (Figure 1, Item 7).
3. Position top of thermostat housing (Figure 1, Item 4) on bottom thermostat housing (Figure 1, Item 7).
4. Install 3 mount bolts (Figure 1, Item 3) and tighten.
5. Install hose (Figure 1, Item 2).
6. Install hose clamp (Figure 1, Item 1).
7. Service coolant system (WP 0045).
8. Connect battery negative cables (WP 0091).
9. Perform Maintenance Operation Check.
10. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

---

**FIELD MAINTENANCE**  
**UPPER AND LOWER RADIATOR HOSES**

---

**INITIAL SETUP:****Test Equipment**

N/A

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0020

WP 0021

WP 0045

WP 0083

**Materials/Parts**

N/A

**Equipment Condition**

Engine Shut Down and Cool

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**INSPECTION**

Inspect upper and lower radiator hoses for leaks, cracks, or deterioration and clamps for security.

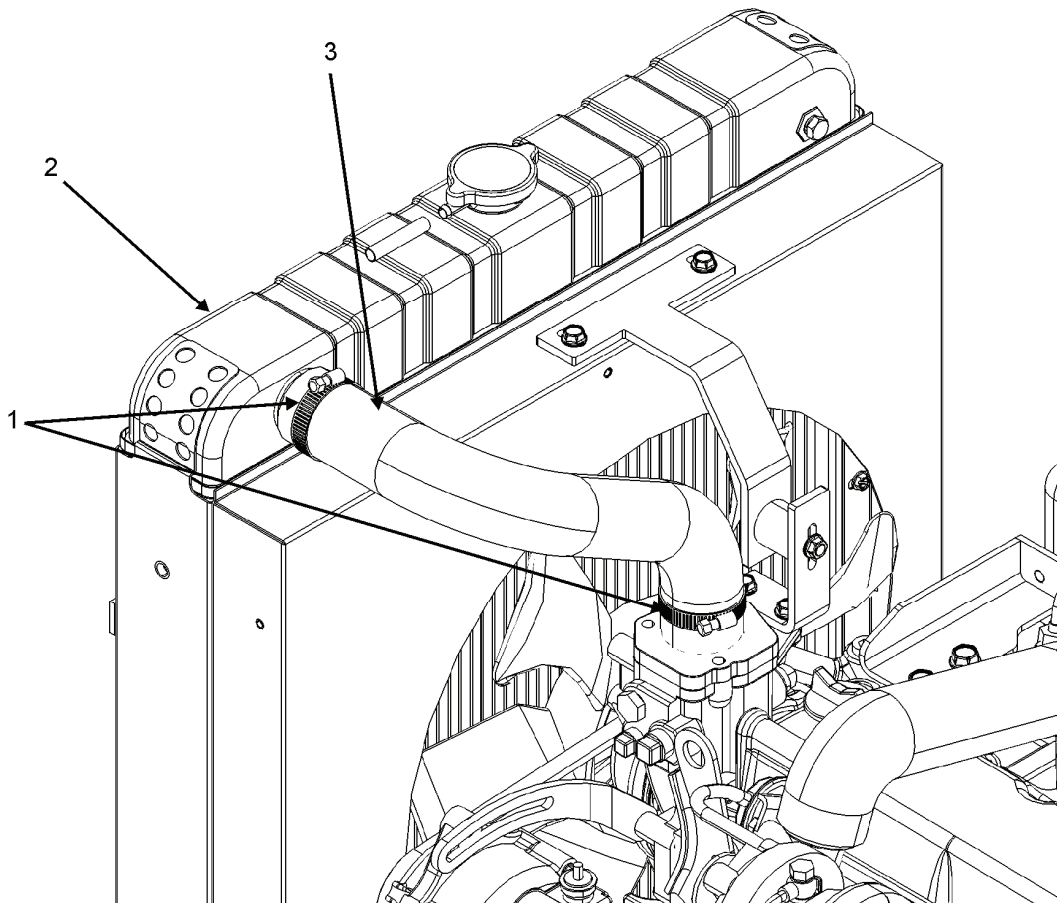
**END OF TASK**

Figure 1. Upper Radiator Hose (Removal and Installation)

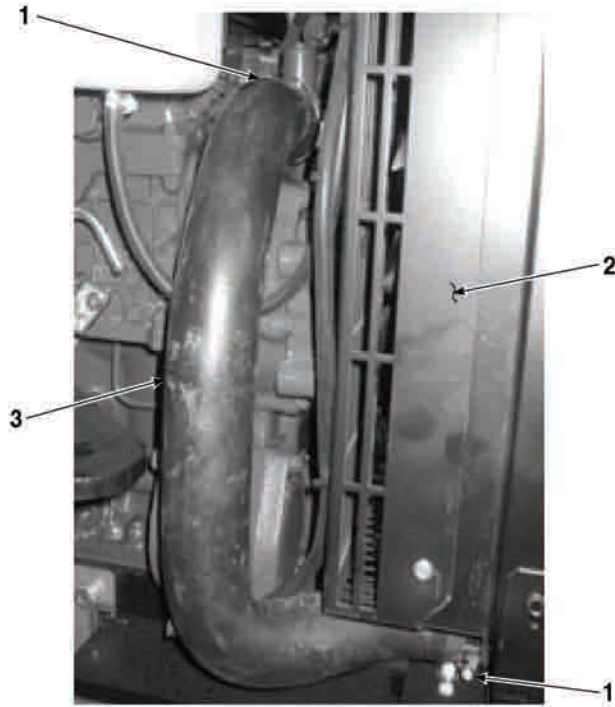


Figure 2. Lower Radiator Hose (Removal and Installation)

### NOTE

Drain radiator level below the thermostat for removal of upper hose and completely for removal of the lower hose.

Lower radiator hose clamp on lower hose is accessed through right front wheel housing.

### REMOVAL

### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Open engine cover (WP 0020).
2. Lift front of SATS vehicle (WP 0021).
3. Remove right front wheel assembly (WP 0083).
4. Drain radiator (WP 0045).
5. Loosen two hose clamps (Figure 1, Item 1) and remove upper radiator hose (Figure 1, Item 3).
6. Loosen two hose clamps (Figure 2, Item 1) and remove lower radiator hose (Figure 2, Item 3).

### END OF TASK

**INSTALLATION****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Loosely install 2 hose clamps (Figure 1, Item 1) on new hose.
2. Loosely install 2 hose clamps (Figure 2, Item 1) on new hose.
3. Position upper radiator hose (Figure 1, Item 3).
4. Tighten 2 hose clamps (Figure 1, Item 1).
5. Position lower radiator hose (Figure 2, Item 3).
6. Tighten 2 hose clamps (Figure 2, Item 1).
7. Service radiator (WP 0045).
8. Install right front wheel assembly (WP 0083).
9. Perform Maintenance Operation Check.
10. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE**  
**RADIATOR SUPPORT ISOLATORS**

**INITIAL SETUP:**

**Test Equipment**

N/A

**References**

N/A

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

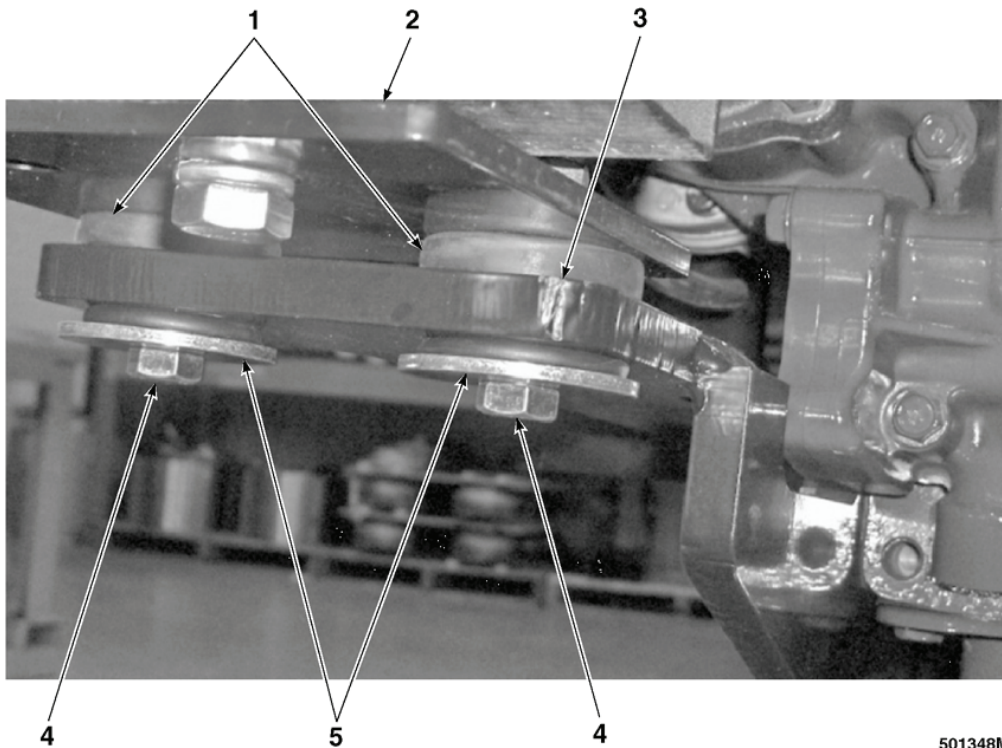
**Equipment Condition**

Engine Shut Down and Cool

**INSPECTION**

Visually inspect radiator support isolators for mount security, dry rot, or deterioration due to oil or coolant impregnation.

**END OF TASK**



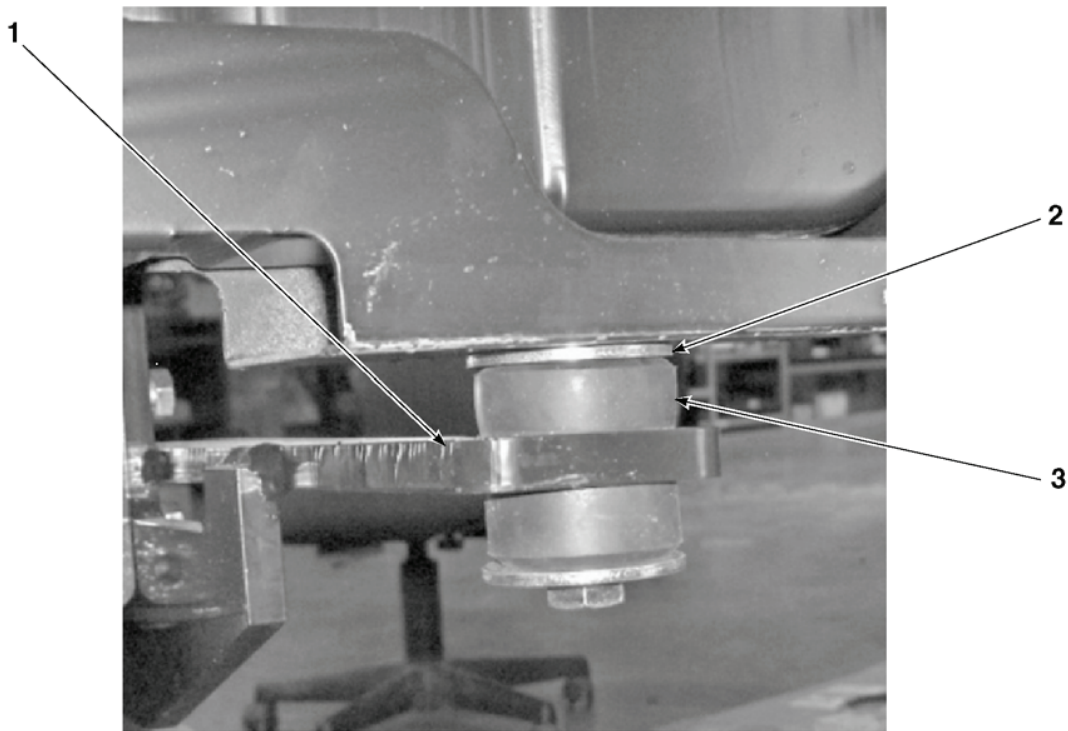
501348M-006

Figure 1. RH Radiator Support Isolators (Removal and Installation)

**REMOVAL****NOTE**

There are 3 radiator isolator mounts on the SATS located underneath the radiator.

1. Remove 2 lower bolts (Figure 1, Item 4) and 2 flat washers (Figure 1, Item 5).
2. Remove 2 upper nuts and flat washers (not shown).
3. Pry out 2 radiator support isolators (Figure 1, Item 1).
4. Remove lower mount bolt and washer (Figure 2).
5. Remove upper mount nut and washer (not shown).
6. Pry out radiator support isolator (Figure 2).

**END OF TASK**

501348M-133

Figure 2. LH Radiator Support Isolator (Removal and Installation)

**INSTALLATION**

1. Install 2 radiator support isolators (Figure 1, Item 1).
2. Install 2 lower bolts (Figure 1, Item 4) and 2 flat washers (Figure 1, Item 5) and secure with flat washers and nuts (not shown) and tighten.
3. Install radiator support isolator (Figure 2).
4. Install lower mount bolt and washer (Figure 2) and secure with flat washer and nut (not shown).
5. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE  
OVERFLOW BOTTLE**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0020  
WP 0045

**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down and Cool

**INSPECTION**

Visually inspect the overflow bottle for mount security, leaks, deterioration and proper hose connection.

**END OF TASK**

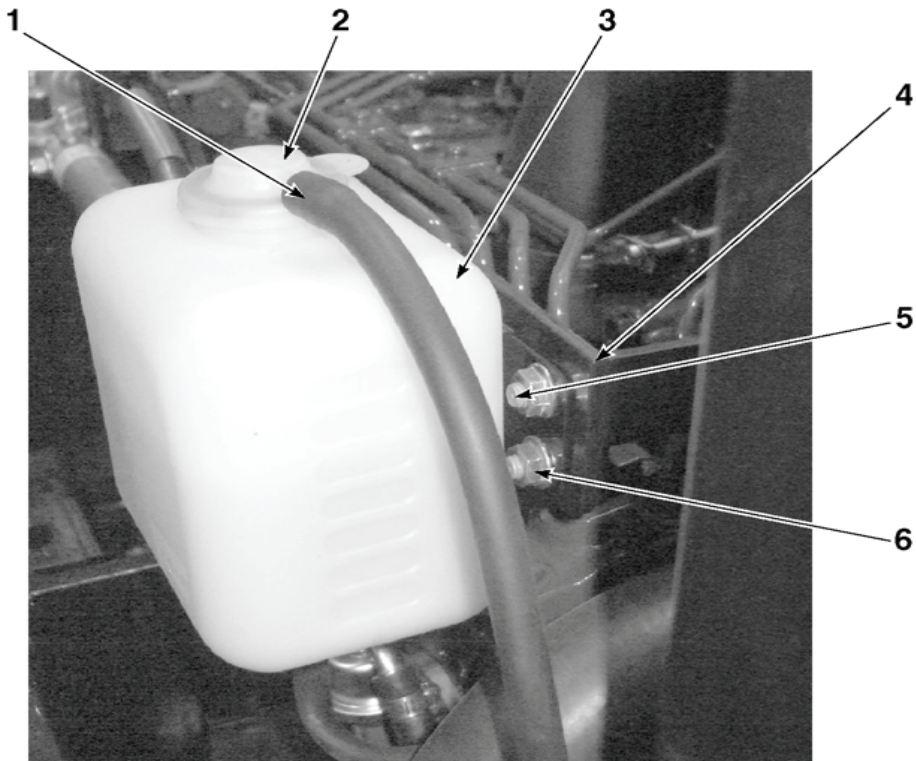


Figure 1. Overflow Bottle (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Open engine cover (WP 0020).
2. Disconnect overflow hose (Figure 1, Item 1).
3. Slide overflow bottle (Figure 1, Item 3) off of bracket (Figure 1, Item 4).

**NOTE**

Drain coolant from overflow bottle into a drip pan.

4. Disconnect bottom overflow bottle service hose (not shown).
5. Remove overflow bottle (Figure 1, Item 3).

**END OF TASK****INSTALLATION**

1. Slide overflow bottle on mount bracket (Figure 1, Item 4).
2. Connect overflow hose (Figure 1, Item 1).
3. Connect bottom overflow bottle service hose (not shown).
4. Service cooling system (WP 0045).
5. Perform Maintenance Operation Check.
6. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**TEMPERATURE SWITCH (COOLANT)**

---

**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0020

WP 0045

WP 0091

**Materials/Parts**

Tape, Anti-Seize (WP 0127, Item 50)

**Equipment Condition**

Engine stopped and cool

---

**INSPECTION**

Visually inspect temperature switch for mount security, leaks, wiring for security and corrosion or any damage affecting serviceability.

**END OF TASK****TEST****Temperature Switch Continuity Test**

1. Disconnect battery chassis negative cable (WP 0091).
2. Carefully pull wiring lead (Figure 1, Item 3) from switch terminal.
3. Ohms check from terminal stud to ground.
4. Resistance measured should be infinity (normally open switch).
5. Replace switch if continuity is measured.

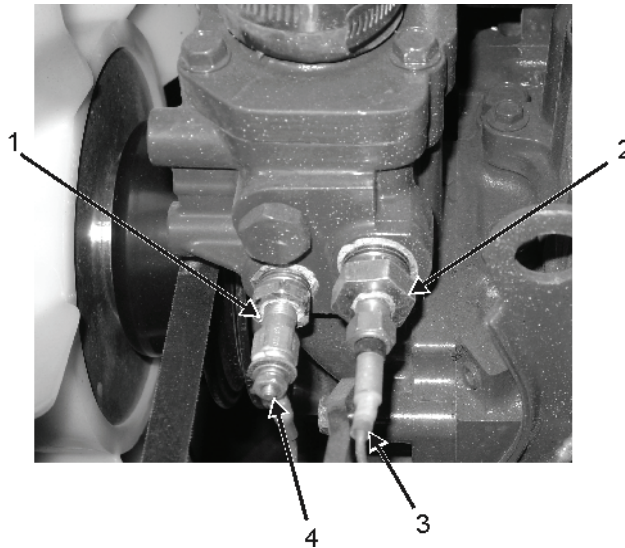
**END OF TASK**

Figure 1 – Temperature Switch (Item 2) (Removal and Installation)

**REMOVAL**

1. Disconnect battery negative cables (WP 0091).
2. Open engine cover (WP 0020).

**NOTE**

Label or tag all wiring terminals after removal to aid with reinstallation.

3. Remove wiring lead (Figure 1, Item 3).
4. Drain radiator (WP 0045) below the level of temp switch or excessive fluid will drain.

**WARNING**

To avoid personal injury, ensure engine is stopped and has cooled prior to removing coolant temp switch.

5. Remove coolant temperature switch (Figure 1, Item 2).

**END OF TASK****INSTALLATION****CAUTION**

To avoid damage to coolant temp switch, do not over-tighten.

1. Wrap threads of coolant temp switch (Figure 1, Item 2) with anti-seize tape.
2. Install coolant temp switch (Figure 1, Item 2).
3. Connect wiring lead (Figure 1, Item 3).
4. Service radiator (WP 0045).
5. Connect battery negative cable, (WP 0091).
6. Perform Maintenance Operation Check.
7. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

---

**FIELD MAINTENANCE**  
**COOLANT TEMPERATURE SENDING UNIT (GAUGE)**

---

**INITIAL SETUP:****Test Equipment**

Multimeter (WP 0125, Item 6)

**References**

WP 0020

WP 0091

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

Tape, Anti-Seize (WP 0127, Item 50)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down and Cool

---

**INSPECTION**

Visually inspect temperature switch for mount security, leaks, wiring for security and corrosion or any damage affecting serviceability.

**END OF TASK****TEST****Temperature Sender Continuity Test**

1. Disconnect battery chassis negative cable, (WP 0091).
2. Remove nut (Figure 1, Item 4).
3. Remove wire from temperature sending unit.
4. Ohms test from terminal nut (Figure 1, Item 4) to ground.

**NOTE**

Resistance measured is dependent on temperature.

5. Resistance measured reads 2k ohms nominally at 60° F.
6. Replace temperature sending unit if resistance reads infinity (no continuity is measured).

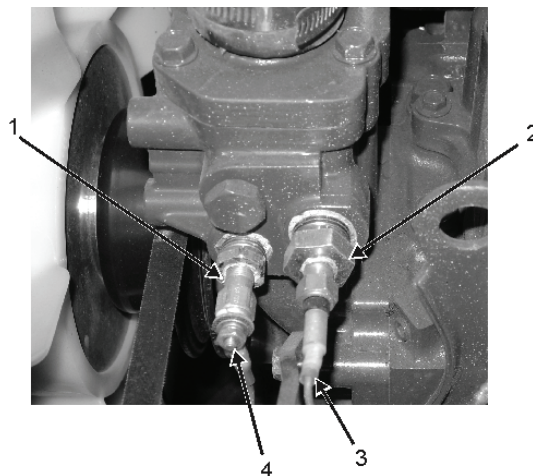
**END OF TASK**

Figure 1 – Temperature Sending Unit (Item 1) (Removal and Installation)

**REMOVAL**

1. Disconnect battery negative cables (WP 0091).
2. Open engine cover (WP 0020).

**NOTE**

Label or tag all wiring terminals after removal to aid with switch reinstallation.

3. Remove nut (Figure 1, Item 4) and wiring lead from temperature sending unit (Figure 1, Item 1) mount stud.

**WARNING**

To avoid personal injury, ensure engine is stopped and has cooled prior to removing coolant sender unit.

**NOTE**

It may be necessary to drain radiator below the level of temp sender or excessive fluid will drain.

4. Remove temperature sending unit (Figure 1, Item 1).

**END OF TASK****INSTALLATION****CAUTION**

To avoid damage to coolant sending unit, do not over-tighten.

1. Wrap threads of temperature sending unit (Figure 1, Item 1) with anti-seize tape.
2. Install temperature sending unit (Figure 1, Item 1).
3. Connect wiring lead (Figure 1, Item 4) and install nut onto temperature sending unit mount stud (Figure 1, Item 1).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.
6. Close engine cover and secure with rubber latches, (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
COOLING FAN**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0020  
WP0033  
WP0074  
WP0091

**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**  
N/A

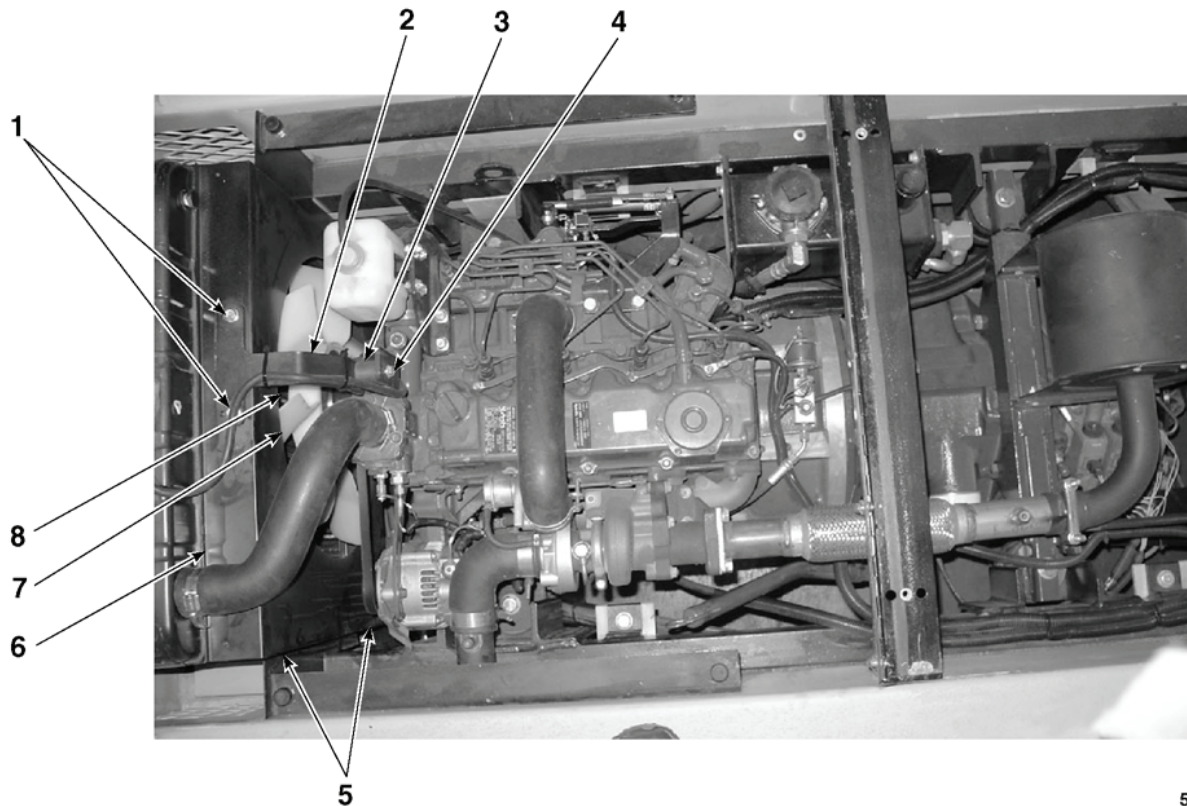
**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down and Cool

**INSPECTION**

1. Inspect cooling fan for cracks, missing blades, or warped blades.
2. Inspect fan shroud for any evidence of blade contact (shroud not installed properly).

**END OF TASK**



501348M-086

Figure 1. Cooling Fan (Removal and Installation)

**REMOVAL**

1. Open engine cover (WP 0020).
2. Disconnect battery negative cables (WP 0091).
3. Relieve fan belt tension (WP 0033).
4. Remove brake reservoirs only (WP 0074) and move out of the way.
5. Remove two bracket mount bolts (Figure 1, Item 1).
6. Remove one bracket mount bolt (Figure 1, Item 4).
7. Remove bracket (Figure 1, Item 2) and spacer (Figure 1, Item 3).

**NOTE**

It may be necessary to unbolt the radiator isolator mounts to allow better access to fan mount bolts.

8. Push radiator forward to allow access to cooling fan mount bolts.

**NOTE**

Spinning the fan will be necessary to allow easier access to the fan mount bolts.

9. Remove four fan mount bolts (Figure 1, Item 8) (Bolts not shown).
10. Remove cooling fan (Figure 1, Item 7) from water pump pulley.

**END OF TASK****INSTALLATION**

1. Position cooling fan (Figure 1, Item 7) on water pump pulley.

**NOTE**

Spinning the fan will be necessary to allow easier access to the fan mount bolts.

2. Install four fan mount bolts (Figure 1, Item 8) (Bolts not shown).
3. Push radiator rearward back into position.
4. Position bracket (Figure 1, Item 2) and spacer (Figure 1, Item 3).
5. Install one bracket mount bolt (Figure 1, Item 4).
6. Install two bracket mount bolts (Figure 1, Item 1).
7. Adjust fan belt tension (WP 0033).
8. Install brake reservoirs (WP 0074).
9. Connect battery negative cables (WP 0091).
10. Perform Maintenance Operation Check.
11. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**FUEL TANK**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0020

WP 0056

WP 0091

**Tools and Special Tools**

Torque Wrench, 0 to- 50 ft. lbs. (WP 0125, Item 2)

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

Tape, Anti-Seize (WP 0127, Item 50)

Cleaning Solution

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**N/A

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**INSPECTION**

Inspect fuel tank, fuel filler cap, fuel level sender wiring and mounting, tank protector strips/straps, tank fittings and hoses for leaks, rust, corrosion and security of mounting or any damage that affects serviceability.

**END OF TASK****REMOVAL****WARNING**

Fuel vapors create fire and explosion hazards. Do not allow any open flame, smoking materials, or other potential ignition sources near fuel or the fuel system.

If repairing, clean the tank thoroughly before sending to the welding shop. Fill tank with an inert gas, such as carbon dioxide or nitrogen or completely fill with water to minimize risk of serious injury or death from fire or explosion, before having fuel tank repaired.

1. Disconnect negative battery cables, (WP 0091).
2. Remove rear deck plate and middle deck plate (WP 0020).
3. Remove rear deck plate support (WP 0020).
4. Place a 20 gallon drain container under the fuel tank drain plug. Plug is accessible from the bottom of the vehicle.
5. Remove fuel tank cap (Figure 1, Item 5) and store for reinstallation.
6. Disconnect both fuel lines (Figure 1, Item 14) at fuel tank and plug.

**WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

7. Carefully remove fuel tank drain plug (Figure 1, Item 10) and allow tank to drain.
8. Remove fuel drain container and dispose of fuel at the waste collection site.
9. Disconnect fuel sending unit wiring (Figure 1, Item 2) and tag wiring leads. Tie wiring harness to side to avoid interference with the removal of fuel tank.

10. Remove two bolts and nuts (Figure 1, Items 11 and 12) securing one end of tank straps to the vehicle.
11. Remove 2 bolts, nuts and washers (Figure 1, Items 7, 8 and 9) securing the other end of tank straps to the vehicle and remove straps (Figure 1, Item 6).

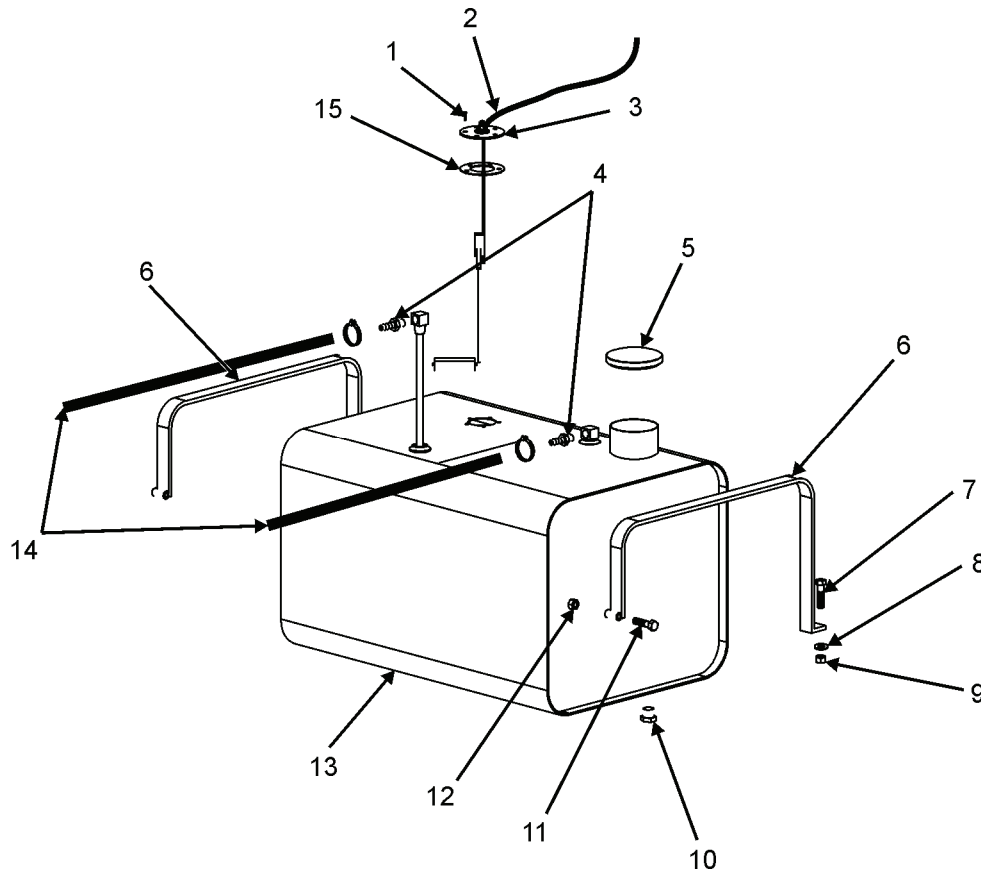


Figure 1 - Fuel Tank (Removal and Installation)

#### NOTE

If fuel tank will be repaired and reinstalled proceed to step 14. If fuel tank will be replaced steps 12 and 13 must be performed.

12. Remove five screws (Figure 1, Items 1) securing fuel tank sender to tank. Carefully extract sender and gasket (Figure 1, Items 3 and 15) from the tank.
13. Remove two fuel fittings (Figure 2, Item 4) (note orientation for reinstallation) from the fuel tank.
14. Carefully lift fuel tank (Figure 1, Item 13) and remove from tank compartment.

#### END OF TASK

#### CLEANING (FOR DISPOSAL OR REPAIR)

1. Install drain plug on bottom of fuel tank.
2. Pour a detergent and water solution into fuel tank.
3. Install filler cap.
4. Agitate mixture by rotating fuel tank. Ensure solution contacts all interior surfaces.
5. Remove drain plug and drain cleaning solution into a suitable container.

6. Flush fuel tank with clean water until all evidence of fuel is removed.
7. Repeat steps 2 if necessary and re-rinse with clean water.
8. Allow fuel tank to air dry. Dispose of tank or send for repair.

**END OF TASK****INSTALLATION**

1. Carefully position fuel tank (Figure 1, Item 13) in tank compartment.
2. Position straps over fuel tank (Figure 1, Items 6).
3. Secure one end of straps with two bolts and nuts (Figure 1, Items 11 and 12)
4. Secure other end of straps with two bolts, nuts and washers (Figure 1, Items 7, 8 and 9).

**NOTE**

If fuel tank is being replaced proceed to step 7, repaired proceed to step 5.

5. Carefully install sender (Figure 1, Item 3) and new gasket (Figure 1, Item 15) and secure with five screws (Figure 1, Item 1).
6. Apply Teflon tape to the two fuel fittings (Figure 1, Item 4) and install in tank assembly in the same position as removed.
7. Remove fuel line plugs and connect both fuel lines (Figure 1, Item 14) at fuel tank and secure with clamps.
8. Apply anti-seize tape to threads of fuel tank drain plug (Figure 1, Item 10) and install securely in tank.
9. Service tank (Figure 1, Item 13) with fuel and install cap (Figure 1, Item 5).
10. Connect tagged fuel sender wiring (Figure 2, Item 2) and secure with hardware.
11. Bleed air from fuel lines (WP 0056).
12. Install rear deck plate support (WP 0020).
13. Connect battery cables (WP 0091).
14. Perform Maintenance Operation Check.
15. Install rear deck plate and middle deck plate (WP 0020).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**FUEL TANK SENDING UNIT (FUEL GAUGE)**

---

**INITIAL SETUP:****Test Equipment**

Multimeter (WP 0125, Item 6)

**References**

WP 0020

WP 0091

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

N/A

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**INSPECTION**

Visually inspect fuel sending unit mounting security, gasket for leaks, wiring for breaks or corrosion and components for damage affecting serviceability.

**END OF TASK****TEST**

1. Remove fuel level sending unit, see removal this work package.
2. Ohms test the fuel level sending unit from (Figure 1, Item 2) to ground (Figure 1, Item 1) with float (Figure 1, Item 3) in the position illustrated (fuel tank empty).
3. Resistance measured should be 240 ohms nominally (Keep the meter in the test position).
4. Raise the float (Figure 1, Item 3) while observing the meter.
5. Resistance measured should consistently decrease (no dead spots) until the float is in the highest position.
6. With the float in the highest position (tank full) resistance measured should read 33.5 ohms nominally.
7. Replace fuel sending unit if ohms test fails.

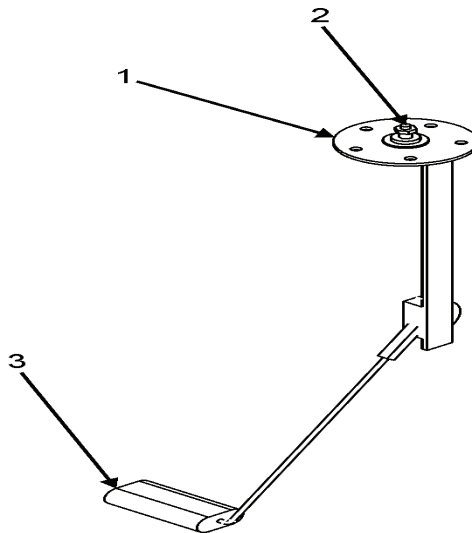


Figure 1. Fuel Sending Unit Test

**END OF TASK**

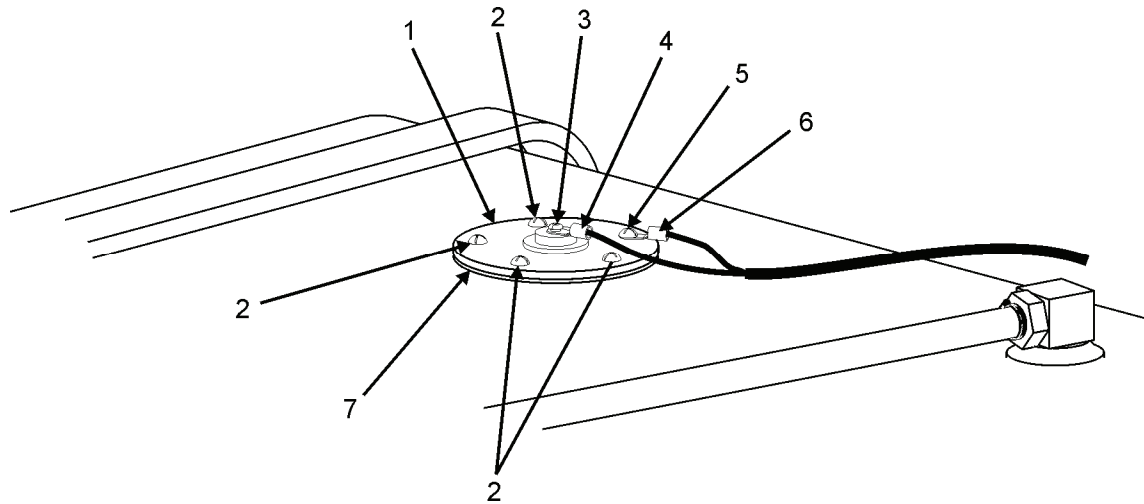


Figure 2. Fuel Sending Unit (Removal and Installation)

## REMOVAL

### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

### NOTE

Tag wiring to aid with the reinstallation process.

1. Remove rear deck plate (WP 0020).
2. Disconnect battery cables (WP 0091).
3. Remove terminal mount screw (Figure 2, Item 3) and wire (Figure 2, Item 4).
4. Remove fuel level sending unit mount screw (Figure 2, Item 5) and ground wire (Figure 1, Item 6).
5. Remove remaining four fuel level sending unit mount screws (Figure 2, Item 2).
6. Carefully remove fuel level sending unit (Figure 2, Item 1) and gasket (Figure 2, Item 7).
7. Clean fuel level sending unit mating surfaces.
8. Test fuel level sending unit this work package.

## END OF TASK

## INSTALLATION

### NOTE

Fuel sender mount holes will only line up in one way.

1. Position new gasket (Figure 2, Item 7) on fuel tank.
2. Position fuel level sending unit (Figure 1, Item 1).
3. Position ground wire #7 (Figure 2, Item 6).
4. Install five fuel level sending unit mount screws (Figure 2, Item 2 and 4).
5. Position terminal wire #33 (Figure 2, Item 4).
6. Install terminal mount screw (Figure 2, Item 3).
7. Connect battery cables (WP 0091).

8. Perform Maintenance Operation Check.
9. Install rear deck plate (WP 0020).

**END OF TASK**

**END OF WORK PACKAGE**





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**FIELD MAINTENANCE  
FUEL SYSTEM SERVICING**

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**Test Equipment**

N/A

**References**

WP 0020

WP 0091

**Tools and Special Tools**

Oil Filter Wrench (WP 0125, Item 18)

Drip Pan (WP 0126, Item 2)

General Mechanic Tool Kit (WP 0125, Item 8)

**Materials/Parts**

Tape, Anti Seizing (WP 0127, Item 50)

Rag (WP 0127, Item 34)

**Personnel Required**

91 B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shutdown

**INSPECTION**

Inspect fuel system hoses for cuts, abrasions and chaffing. Inspect clamps for tightness and security. Inspect lines, hoses and fittings for leaks (No leaks permitted). Inspect all fuel system components for leaks, security of mounting and any damage that may affect serviceability.

**FUEL SYSTEM SERVICING****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

Fuel vapors create fire and explosion hazards that will result in severe personal injury or death. Do not allow any open flame, smoking materials, or other potential igniter near fuel or the fuel system.

Do not mix gasoline or alcohol with diesel fuel. This mixture can cause an explosion. Try not to spill fuel during refueling; if fuel should spill, wipe it off at once or it may cause a fire. Always keep spilled fuel and lubricants away from engine.

When servicing any part of the fuel system, ensure the engine is shut down and the unit's batteries are disconnected.

Do not smoke when working around the battery or when refueling.

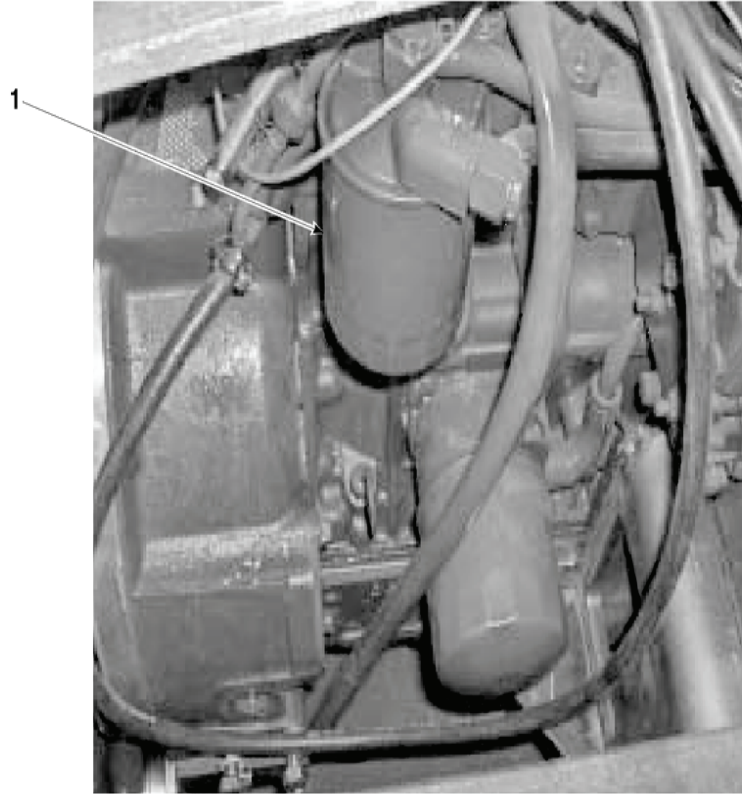
When servicing the fuel system ensure vehicle is in a well ventilated work space.

**CAUTION**

After removing fuel hoses or lines, plug them at both ends with protective caps to prevent contamination from entering. Contamination in fuel hoses may cause fuel injector pump malfunctions.

**NOTE**

Before reinstalling the fuel filter and fuel/water separator the maintainer should fill the fuel filter and fuel/water separator housing with fuel. This action will assist during fuel system bleeding operation.



501348M-029

Figure 1. Fuel Filter (Removal and Installation).

## REMOVAL

### FUEL FILTER

#### NOTE

Do not remove filter unless replacement filter is available.

1. Disconnect battery chassis negative cable (WP 0091).
2. Open engine cover (WP 0020).
3. Place a drip pan or suitable container under the filter cartridge.
4. Using the filter wrench, remove fuel filter (Figure 1, Item 1) drain and properly dispose of the filter.
5. Wipe clean filter mating surface.

## INSTALLATION

### FUEL FILTER

1. Fill new fuel filter with fuel to expel air.
2. Apply a thin film of fuel oil to fuel filter seal or gasket.
3. Install fuel filter (Figure 1, Item 1) on engine by hand.
4. After seal or gasket contacts sealing surface, tighten by hand an additional 3/4 turn. Avoid over-tightening fuel filter.
5. Perform air bleeding the fuel system this Work Package.

## END OF TASK

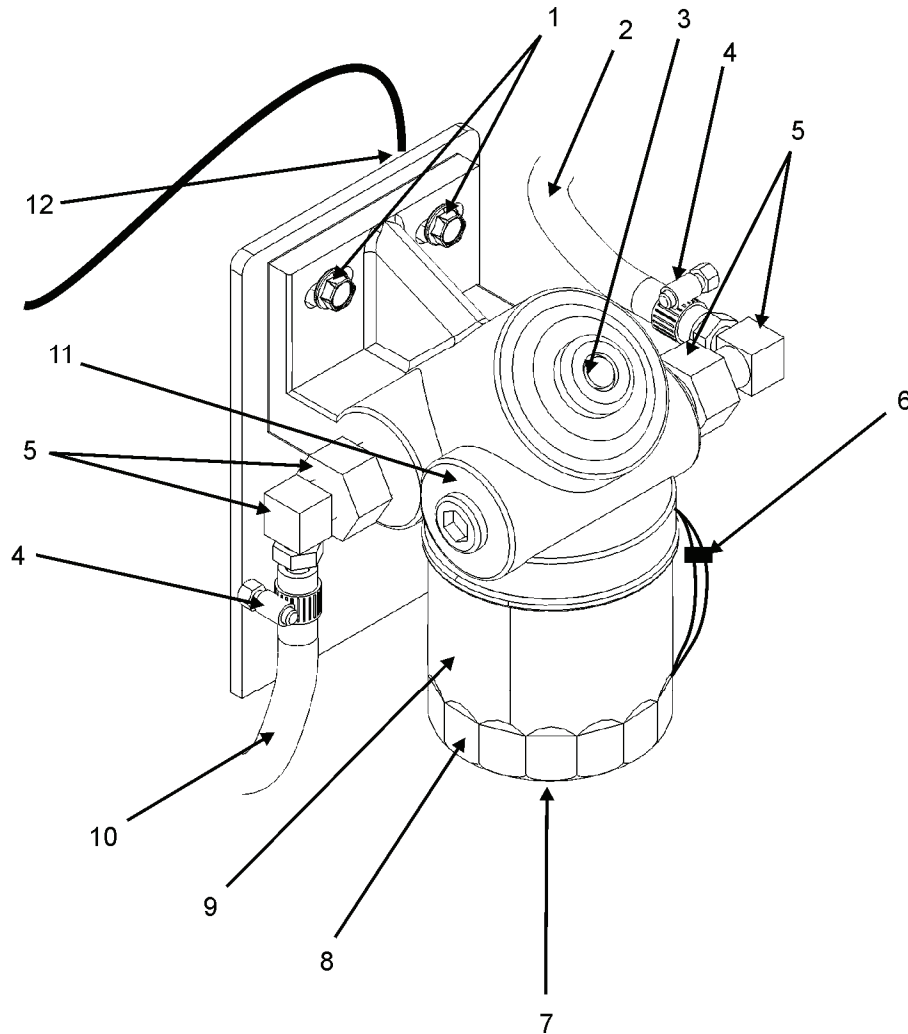


Figure 2. Fuel Filter/Water Separator Assembly

## REMOVAL

### FUEL/WATER SEPARATOR FILTER

#### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Disconnect battery chassis negative cable, (WP 0091).
2. Gain access to fuel filter/water separator by removing the middle deck plate, (WP 0020).
3. Place a drip pan or suitable container under the separator cartridge.
4. Remove fuel heater wiring connector (Figure 2, Item 6) from bowl.
5. Open separator petcock drain (Figure 2, Item 7) and allow fuel to drain completely.
6. Using the filter wrench, remove fuel/water filter assembly (Figure 2, Item 9).

7. Wipe clean the filter mating surface.
8. Remove bowl from fuel/water filter assembly (Figure 2, Item 9) . Dispose of old filter.
9. Clean bowl and close petcock (Figure 2, Item 7).

## INSTALLATION

### FUEL/WATER SEPARATOR FILTER

1. Install new filter (Figure 2, Item 9) onto bowl ensuring seal is in the bowl housing slot and hand tighten.
2. Fill fuel/water separator assembly with fuel and lubricate filter seal with clean fuel.
3. Install fuel filter/bowl assembly by hand onto filter housing (Figure 2, Item 11).
4. When separator assembly seal contacts the mating surface tighten by hand an additional  $\frac{3}{4}$  turn.
5. Install fuel heater wiring (Figure 2, Item 6) onto bowl receptacle connector.
6. Perform air bleeding the fuel system this Work Package.
7. Connect battery cable (WP 0091)

### END OF TASK

## REMOVAL

### FUEL WATER SEPARATOR HOUSING ASSEMBLY

#### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Disconnect battery chassis negative cable, (WP 0091).
2. Gain access to fuel filter/water separator by removing the center deck plate, (WP 0020).
3. Place a drip pan or suitable container under the separator cartridge.
4. Remove fuel heater wiring connector (Figure 2, Item 6) from bowl.
5. Open separator petcock drain (Figure 2, Item 7) and allow fuel to drain completely.
6. Loosen clamps (Figure 2, Item 4) and remove hoses (Figure 2, Items 2 and 10). Plug hoses to avoid contamination.
7. Remove two fittings (Figure 2, Item 5) as assemblies noting orientation or position.
8. Remove two bolts, washers, and nuts (Figure 2, Item 1) and ground wire (Figure 2, Item 12).
9. Remove fuel filter/water separator assembly (Figure 2).

### END OF TASK

## INSTALLATION

### FUEL WATER SEPARATOR HOUSING ASSEMBLY

1. Position fuel filter/water separator (Figure 2, Item 11).
2. Secure using two bolts, washers, and nuts (Figure 2, Item 1) with ground wire (Figure 2, Item 12).
3. Clean fittings (Figure 2, Item 5) and apply anti seizing tape to the threads.
4. Install two fittings (Figure 2, Item 5) in the same position as previously removed.
5. Remove hose plugs and connect hoses (Figure 2, Items 2 and 10) and secure with clamps (Figure 2, Item 4).
6. Install new filter (Figure 2, Item 9) onto bowl ensuring seal is in the bowl housing slot and hand tighten.

7. Fill fuel filter/bowl assembly with fuel and lubricate filter seal with clean fuel.
8. Spin fuel filter/bowl assembly onto housing (Figure 2).
9. When fuel filter/bowl assembly seal contacts the mating surface tighten by hand an additional  $\frac{3}{4}$  turn.
10. Install fuel heater wiring (Figure 2, Item 6) onto bowl receptacle connector.
11. Perform air bleeding the fuel system this Work Package.
12. Connect battery cable (WP 0091)

## END OF TASK

## SERVICING

### AIR BLEEDING THE FUEL SYSTEM

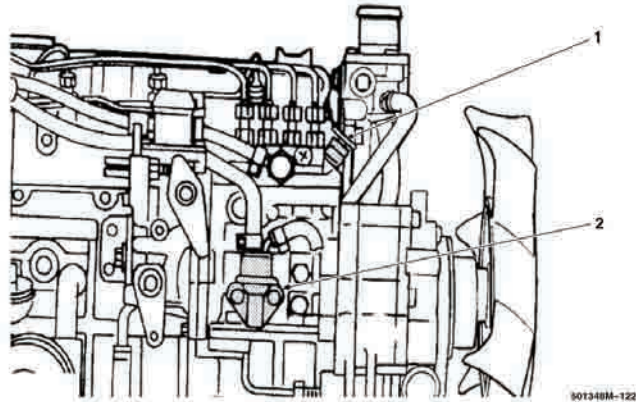


Figure 3. Injector Pump Air Bleed Valve

1. Ensure fuel tank has an adequate amount of fuel.
2. Open Injector Pump air bleed valve (Figure 3, Item 1).
3. Pump or push fuel/water separator plunger (Figure 2, Item 3) twenty times.
4. Close Injector Pump air bleed valve (Figure 3, Item 1).
5. Connect battery chassis negative cable, (WP 0091).
6. Remove and clean drip pan.
7. Perform Maintenance Operation Check (no leaks).
8. Install center deck plate, (WP 0020).
9. Close engine (WP 0020).

## END OF TASK

## END OF WORK PACKAGE



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**FIELD MAINTENANCE**  
**FUEL SOLENOID (START/SHUTDOWN)**

---

**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**References**

WP 0020

WP 0091

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down and Cool

---

**INSPECTION**

Visually inspect fuel shutdown solenoid mount security, wiring and wiring connector for corrosion and breaks in insulation.

**TEST****Fuel Solenoid Supply voltage**

1. Disconnect electrical connector (Figure 1, Item 1).
2. Place ignition switch to the run position.
3. Measure the voltage at the connector, wire 50 to ground.
4. Voltage measured should be 12 VDC. Troubleshoot circuit wiring if voltage is not present.
5. Crank engine and measure the voltage at the connector, wire 3 to ground.
6. Voltage measured should be 12 VDC. Troubleshoot circuit wiring if voltage is not present.
7. Turn ignition switch off.
8. Connect electrical connector (Figure 1, Item 1).

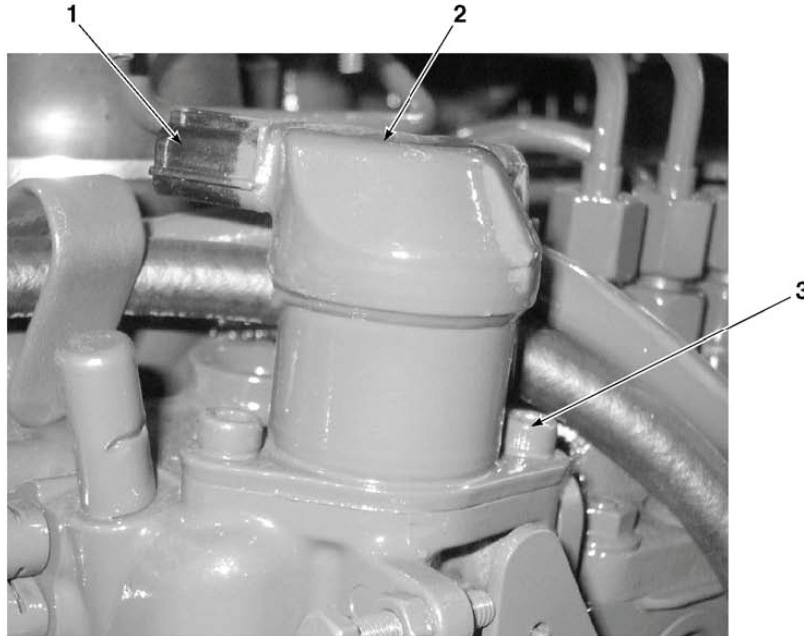
**Fuel Solenoid Ohms Check**

1. Disconnect electrical connector (Figure 1, Item 1) from shut-off solenoid (Figure 1, Item 2).
2. Ohms check the solenoid across the 2 input pins.
3. Resistance measured should be 16 ohms nominally.
4. Infinity reading across the solenoid coils indicates a faulty coil.
5. Replace fuel solenoid if ohms check fails

**Fuel Solenoid Rod Movement**

1. Remove fuel solenoid (Figure 1, Item 2) this work package.
2. Ground solenoid case to vehicle chassis.
3. Turn ignition switch "on" and "off" and observe solenoid rod movement.
4. Fuel solenoid rod should move in and out freely. If rod does not move freely, replace fuel solenoid (Figure 1, Item 2).
5. With solenoid grounded, crank engine for 2 seconds.
6. Observe rod movement. Fuel solenoid rod should move in and out freely. If rod does not move freely, replace fuel solenoid (Figure 1, Item 2).

**END OF TASK**



501348M-036

Figure 1. Shut-Off Solenoid (Removal and Installation)

## REMOVAL

### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Disconnect battery negative cables (WP 0091).
2. Remove engine cover (WP 0020).
3. Disconnect electrical connector (Figure 1, Item 1) from fuel solenoid (Figure 1, Item 2).
4. Remove two bolts (Figure 1, Item 3).
5. Pull straight up and remove fuel solenoid (Figure 1, Item 2).

## END OF TASK

## INSTALLATION

1. Carefully position fuel solenoid (Figure 1, Item 2) on fuel injection pump.
2. Install 2 bolts (Figure 1, Item 3) and tighten.
3. Connect electrical connector (Figure 1, Item 1).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.
6. Close engine cover (WP 0020).

## END OF TASK

## END OF WORK PACKAGE



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**FIELD MAINTENANCE**  
**FUEL PUMP (MECHANICAL)**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0005

WP 0020

WP 0056

WP 0057

WP 0091

**Tools and Special Tools**

Torque Wrench, 0-10 ft-lb (WP 0125, Item 2)

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**Materials/Parts**

Caps/Plugs, Protective (WP 0127, Item 7)

**Equipment Condition**

Engine Shut Down

---

**INSPECTION**

Visually inspect fuel pump and hose clamps for mount security, leaks or any damage affecting serviceability.

**END OF TASK****WARNING**

Test the fuel system in a well-ventilated and open place. Fuel vapors create fire and explosion hazards, which will result in severe personal injury or death. Do not allow any open flame, smoking materials, or other potential igniter near fuel or the fuel system. Always keep spilled fuel and lubricants away from engine.

**TEST**

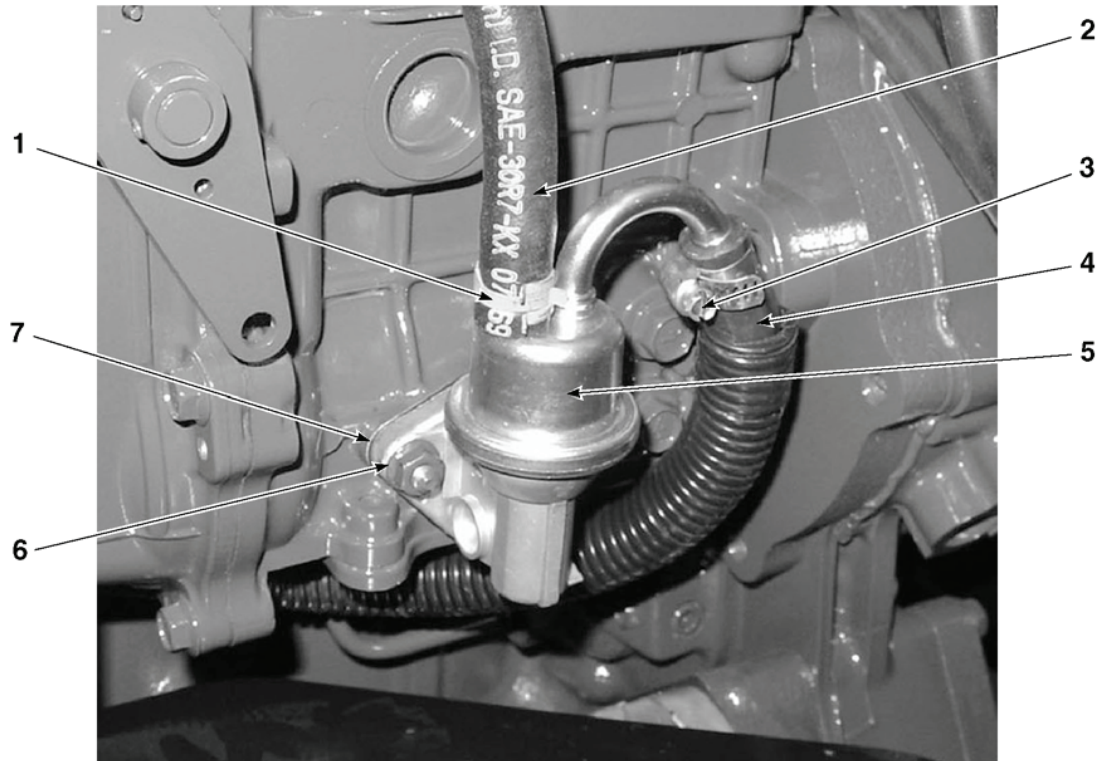
1. Open engine cover (WP 0020).
2. Remove electrical connector from the fuel solenoid (WP 0057).
3. Place a drip pan under the fuel pump.

**NOTE**

This test is performed with the fuel system serviced, no loose connections and no fuel system suction leaks.

4. Loosen fuel pump input line clamp (Figure 1, Item 3).
5. Remove fuel line (Figure 1, Item 4).
6. Push primer button on fuel water separator (WP 0056) until fuel output is steady (no air).
7. Connect fuel line (Figure 1, Item 4).
8. Tighten fuel pump input line clamp (Figure 1, Item 3).
9. Release tension and slide clamp (Figure 1, Item 1) up the fuel hose.
10. Remove fuel pump output fuel line (Figure 1, Item 2).
11. Crank engine (WP 0005) and observe that fuel is being discharged from the fuel pump.
12. Replace fuel pump this work package if test fails.
13. Install fuel pump output fuel line (Figure 1, Item 2).
14. Release tension and slide clamp (Figure 1, Item 1) over the fuel hose.
15. Test complete, perform shop cleanup.

**END OF TASK**



501348M-137

Figure 1. Fuel Pump (Test, Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**CAUTION**

When fuel hoses are disconnected, plug to prevent dirt from entering. Dirt in the fuel hoses can cause fuel injection pump malfunction.

1. Open engine cover (WP 0020).
2. Disconnect battery negative cables (WP 0091).
3. Place a drip pan under the fuel pump.
4. Loosen hose clamp (Figure 1, Item 1).
5. Loosen hose clamp (Figure 1, Item 3).
6. Remove output fuel line hose (Figure 1, Item 2).
7. Remove input fuel line hose (Figure 1, Item 4).
8. Remove two mount nuts (Figure 1, Item 6). (One nut not shown)
9. Remove fuel pump (Figure 1, Item 5).
10. Discard fuel pump gasket (Figure 1, Item 7).

**END OF TASK**

**INSTALLATION**

1. Clean fuel pump mating surface.
2. Position fuel pump gasket (Figure 1, Item 7).
3. Position fuel pump (Figure 1, Item 5).
4. Install two mount nuts (Figure 1, Item 6). (One nut not shown) Tighten nuts to 8 ft-lb (1.23 N•m).
5. Install input fuel line hose (Figure 1, Item 4).
6. Install output fuel line hose (Figure 1, Item 2).
7. Tighten hose clamp (Figure 1, Item 1).
8. Tighten hose clamp (Figure 1, Item 3).
9. Bleed air from fuel system (WP 0056).
10. Connect battery negative cables (WP 0091).
11. Perform Maintenance Operation Check.
12. Close engine access cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**FUEL INJECTION PUMP**

---

**INITIAL SETUP:****Test Equipment**

N/A

**Tools and Special Tools**

Gear Puller (WP 0125, Item 23)  
General Mechanic Tool Box (WP 0125, Item 8)  
Torque Wrench (WP 0125, Item 2)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**References**

WP 0020  
WP 0050  
WP 0091  
WP 0105

**Materials/Parts**

N/A

**Equipment Condition**

Engine Shut Down and Cool

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**INSPECTION**

Visually inspect fuel injection pump for mount security, fuel lines for leaks, cracks, or wear and for any damage affecting serviceability.

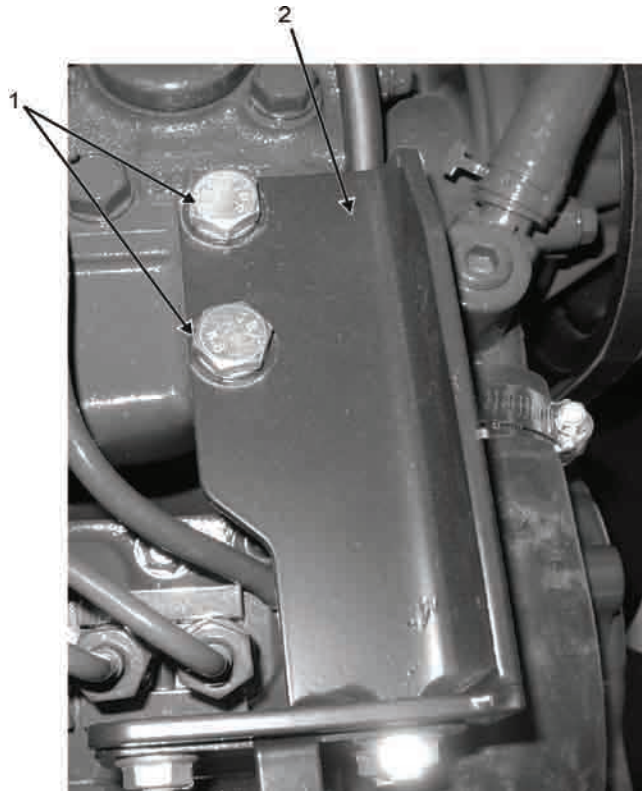
**END OF TASK**

Figure 1. Coolant Bottle Mount Bracket

**REMOVAL**

1. Disconnect negative battery cables (WP 0091).
2. Open engine cover (WP 0020).

3. Disconnect overflow hose from overflow bottle (WP 0050).
4. Remove bracket mount bolts (Figure 1, Item 1).
5. Remove bracket (Figure 1, Item 2).
6. Remove 4 fuel injection pump fuel lines (WP 0060).
7. Remove mechanical fuel pump output fuel line (WP 0058)..

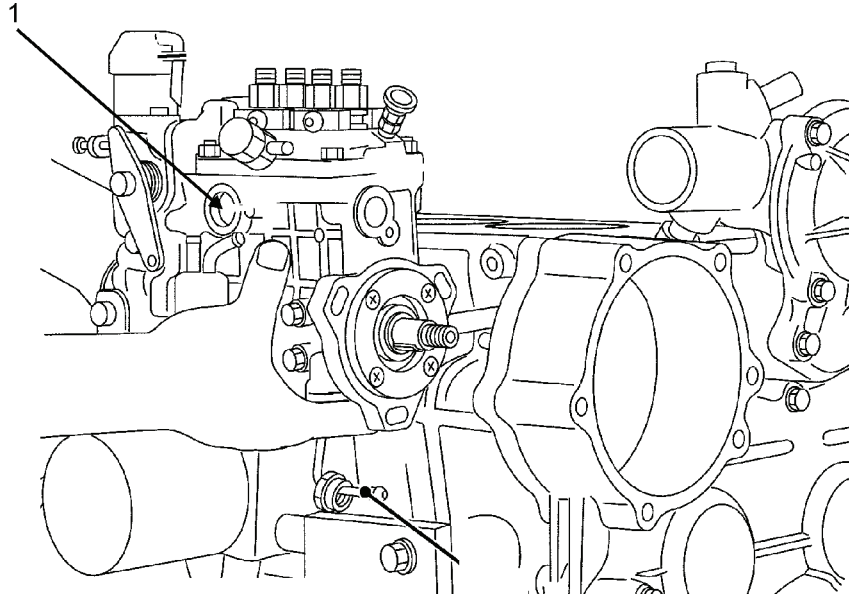


Figure 2. Access Cover

8. Remove access cover (Figure 2, Item 1).

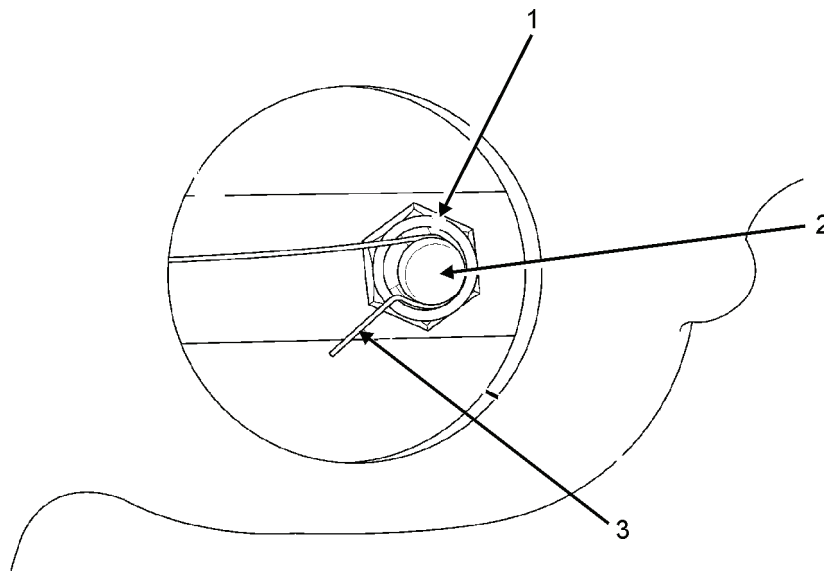


Figure 3. Start Spring

9. Unhook the start spring (Figure 3, Item 3) from the rack pin (Figure 3, Item 2) of the injection pump assembly.

**NOTE**

Be careful not to drop nut inside.

10. Remove the anti-rotation nut (Figure 3, Item 1)

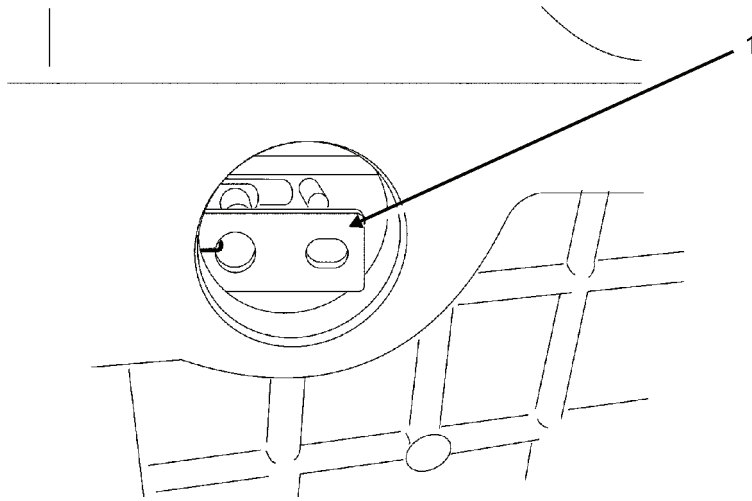


Figure 4. Governor Connecting Rod

11. Slide off the governor connecting rod (Figure 4, Item 1) completely from the rack pin of the injection pump assembly.

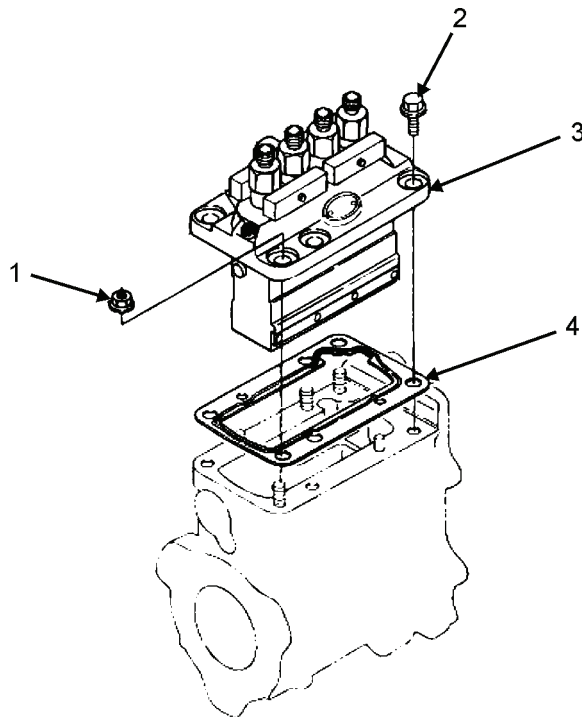


Figure 5. Injection Pump

**NOTE**

Remove fuel return hose and air bleed hose from pump assembly prior to removing mount bolts.

12. Remove 3 bolts (Figure 5, Item 2) (2 not shown) and 3 nuts (Figure 5, Item 1) (2 not shown).

13. Remove injection pump assembly (Figure 5, Item 3).
14. Remove injection pump gasket (Figure 5, Item 4).

**END OF TASK****INSTALLATION**

1. Install injection pump gasket (Figure 5, Item 4).
2. Install injection pump assembly (Figure 5, Item 3).
3. Install 3 bolts (Figure 5, Item 2) and 3 nuts (Figure 5, Item 1).

**NOTE**

Install fuel return hose and air bleed hose onto pump assembly at this point.

4. Slide governor connecting rod (Figure 4, Item 1) onto the rack pin of the injection pump assembly.

**CAUTION**

Be careful not to drop nut inside.

5. Install anti-rotation nut (Figure 3, Item 1). Torque nut 25-34 in lbs.
6. Hook the start spring (Figure 3, Item 3) onto the rack pin (Figure 3, Item 2) of the injection pump assembly.
7. Install 4 fuel injection pump fuel lines (WP 0060).
8. Position cooling mount bracket (Figure 1, Item 2) onto engine.
9. Install bracket mount bolts and lock washers (Figure 1, Item 1).
10. Install overflow hose onto overflow bottle (WP 0050).
11. Air bleed fuel system (WP 0056).
12. Close engine cover (WP 0020).
13. Perform operation maintenance operation check.

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE  
INJECTORS**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**Tools and Special Tools**  
Torque Wrench 0-100 ft-lbs (WP 0125, Item 3)  
General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**References**  
WP 0020  
WP 0056  
WP 0091

**Materials/Parts**  
Rag, Wiping (WP 0127, Item 34)

**Equipment Condition**  
Engine Shut Down and Cool

**INSPECTION**

Visually inspect injectors for mount security, loose or leaking injectors lines or any damage affecting serviceability.

**WARNING**

Extreme pressure is produced by the fuel injection pump. Do not place hands under fuel lines during fuel injection pump test.

**NOTE**

Injector nozzle factory cracking pressure setting 1992-2133 PSI

**END OF TASK**

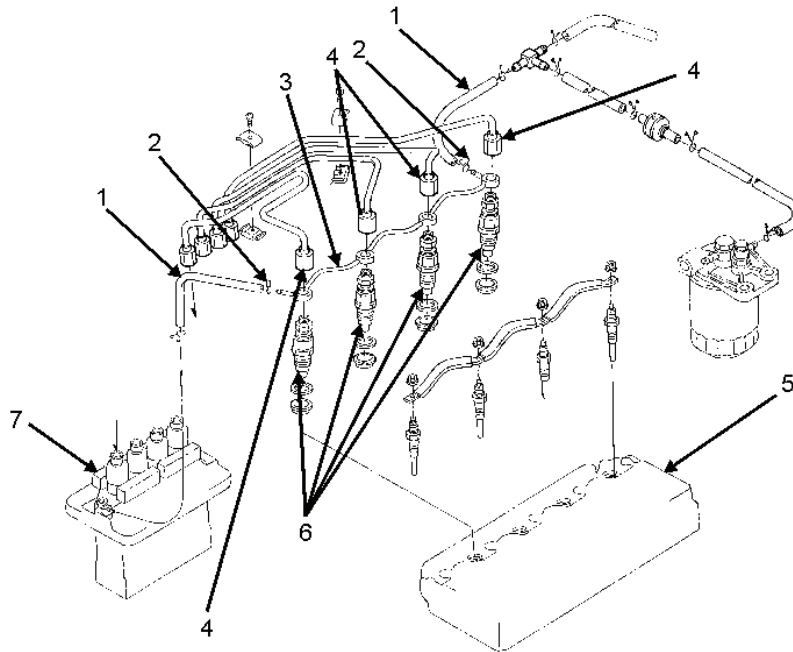


Figure 1. Injectors (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Disconnect battery negative cables (WP 0091).
2. Open engine cover (WP0020).

**WARNING**

Fuel vapors create fire and explosion hazards. Do not allow any open flame, smoking materials, or other potential ignition sources near fuel or the fuel system.

**NOTE**

A small amount of fuel will be present when removing fuel lines. Use rags appropriately.

3. Loosen 4 injector line fittings (Figure 1, Item 4) at injection pump and injectors.
4. Remove 4 fuel lines (Figure 1, Item 4).
5. Loosen 2 hose clamps (Figure 1, Item 2) from overflow hoses (Figure 1, Item 1).
6. Remove hoses (Figure 1, Item 1) from fuel flow pipe assembly (Figure 1, Item 3).
7. Remove fuel flow pipe assembly (Figure 1, Item 3) from injectors.
8. Remove defective injectors (Figure 1, Item 6).

**END OF TASK****INSTALLATION**

1. Install injector(s) (Figure 1, Item 6) with crush washer and seal.
2. Torque fuel injector(s) to 37 to 50 ft lbs.
3. Install fuel flow pipe assembly (Figure 1, Item 3) on injectors (Figure 1, Item 6).
4. Install 2 hoses (Figure 1, Item 1) to fuel flow pipe assembly (Figure 1, Item 3).
5. Tighten 2 hose clamps (Figure 1, Item 2).
6. Loosely install 4 injector lines (Figure 1, Item 4) at injector pump/injectors.
7. Torque injector pipes to 17 to 26 ft. lbs.
8. Air-bleed fuel system (WP 0056).
9. Connect battery negative cables (WP0091).
10. Perform Maintenance Operation Check.
11. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
AIR INTAKE TUBING**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0020

**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down

**INSPECTION**

Inspect air intake tubing, hoses and clamps for mount security, cuts, deterioration or any damage affecting serviceability.

**END OF TASK**

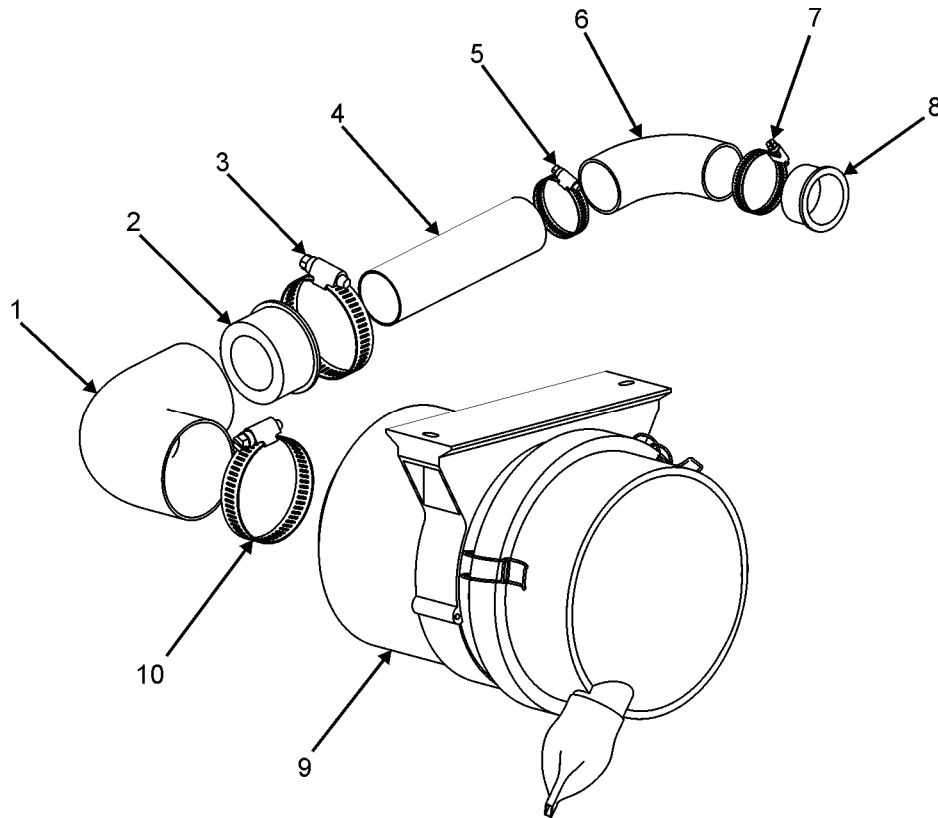


Figure 1. Air Intake Tubing (Removal and Installation)

**REMOVAL****NOTE**

Automotive style hose clamps or Mormon style hose clamps may be used to secure intake tubing.

1. Open engine cover (WP 0020).
2. Loosen air intake clamp (Figure 1, Item 5).
3. Loosen air cleaner assembly hose clamp (Figure 1, Item 10).
4. Remove air intake tubing (Figure 1, Items 1 and 4) as an assembly from the vehicle.

**NOTE**

To prevent FOD cover turbo air inlet on engine.

5. Loosen turbocharger clamp (Figure 1, Item 7).
6. Remove turbocharger intake tubing (Figure 1, Items 6 and 8) as an assembly from the turbocharger.
7. Disassemble air intake components as necessary for removal and installation.

**END OF TASK****INSTALLATION****NOTE**

Automotive style hose clamps or Mormon style hose clamps may be used to secure intake tubing.

1. Install turbocharger intake tubing (Figure 1, Items 6 and 8) as an assembly on the turbocharger.
2. Slide air intake tubing (Figure 1, Item 4) into turbo charger intake tubing (Figure 1, Item 6) elbow.
3. Slide air intake tubing (Figure 1, Item 1) on air cleaner assembly (Figure 1, Item 9).
4. Tighten turbocharger clamp (Figure 1, Item 7).
5. Tighten air intake clamp (Figure 1, Item 5).
6. Tighten air cleaner assembly hose clamp (Figure 1, Item 10).
7. Perform Maintenance Operation Check.
8. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AIR CLEANER ASSEMBLY**

---

**INITIAL SETUP:****Test Equipment**  
N/A**References**  
N/A**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)**Materials/Parts**  
N/A**Personnel Required**  
91B, Light Wheel Vehicle Mechanic**Equipment Condition**  
Engine Shut Down**INSPECTION**

Inspect air cleaner assembly for mounting security, damaged clamps/hoses, filter cap security or any damage affecting serviceability.

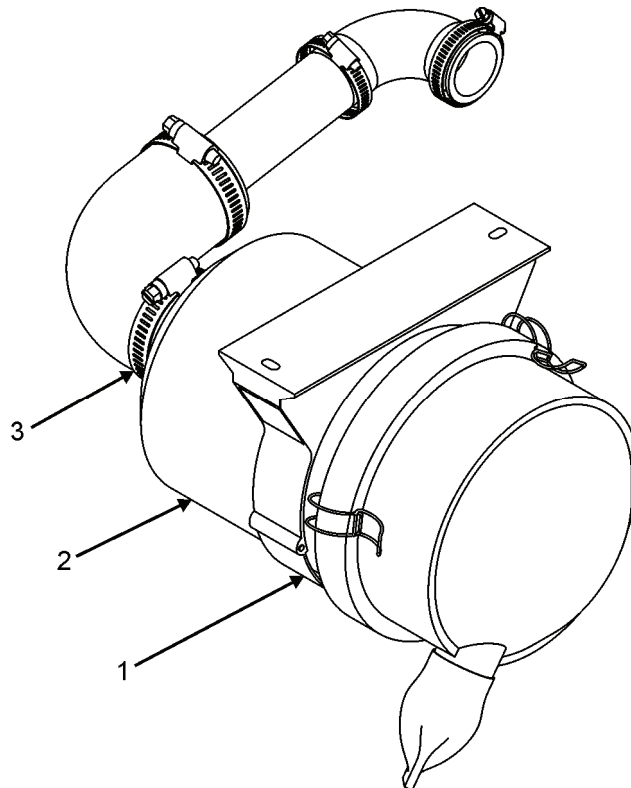
**END OF TASK**

Figure 1. Air Cleaner Assembly (Removal and Installation)

**REMOVAL**

1. Loosen hose clamp (Figure 1, Item 3).
2. Disconnect hose from air cleaner assembly (Figure 1, Item 2).
3. Release band clamp (Figure 1, Item 1).
4. Remove air cleaner assembly (Figure 1, Item 2).

**END OF TASK****INSTALLATION**

1. Position air cleaner assembly (Figure 1, Item 2).
2. Secure (latch) band clamp (Figure 1, Item 1).
3. Install hose on air cleaner assembly (Figure 1, Item 2).
4. Tighten hose clamp (Figure 1, Item 3).

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
AIR FILTERS**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
N/A

**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down

**INSPECTION**

Visually inspect air filters for mount security, filter damage, dirt impregnation or damage affecting serviceability.

**END OF TASK**

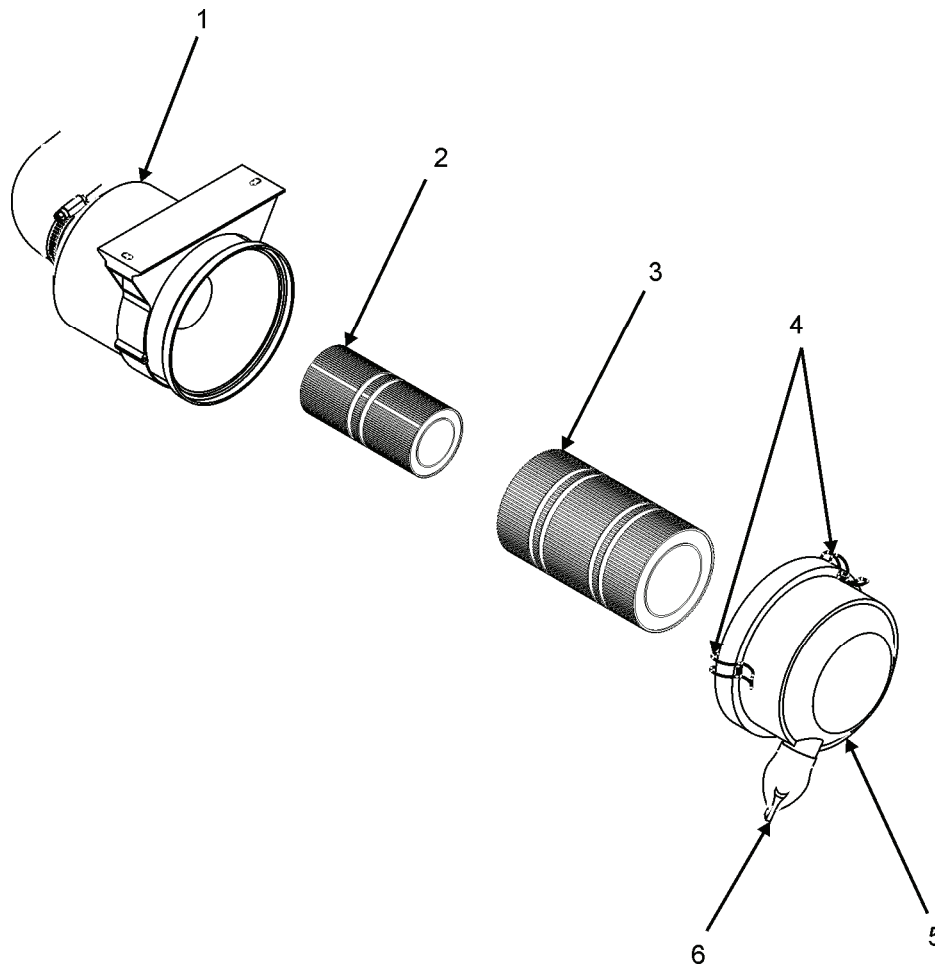


Figure 1. Air Filter (Removal and Installation)

**REMOVAL****NOTE**

Air cleaner assembly is located on the left side of the vehicle behind the lattice panel door

1. Release 3 three spring clamps (Figure 1, Item 4) (one not shown).

**NOTE**

Note position of filter cap evacuator (Figure 1, Item 6) seven o'clock for reinstallation.

2. Remove air cleaner assembly filter cap (Figure 1, Item 5).
3. Remove primary filter element (Figure 1, Item 3).
4. Remove secondary filter element (Figure 1, Item 2).
5. Clean inside of air cleaner assembly (Figure 1, Items 1 and 4).

**END OF TASK****INSTALLATION**

1. Install secondary filter element (Figure 1, Item 2).
2. Install primary filter element (Figure 1, Item 3) over secondary element.

**NOTE**

Install filter cap with evacuator (Figure 1, Item 6) at the seven o'clock position.

3. Position air cleaner assembly filter cap (Figure 1, Item 5).
4. Install 3 three spring clamps (Figure 1, Item 4) (one not shown).
5. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE**  
**MUFFLER**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0020  
WP 0091

**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down, Exhaust Cool

**INSPECTION**

Visually inspect muffler and muffler clamp mounting security, evidence of cracks or leaks or any damage affecting serviceability.

**END OF TASK**

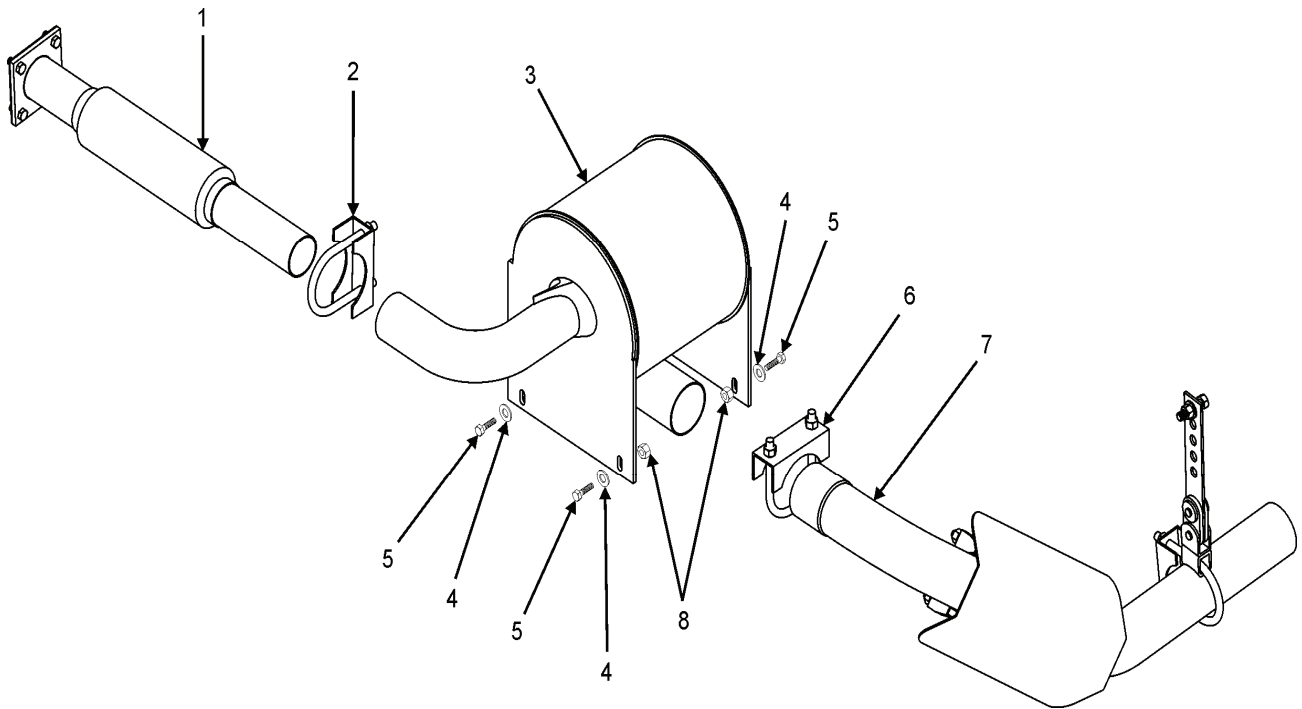


Figure 1 - Muffler (Removal and Installation)

**REMOVAL**

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Loosen muffler inlet exhaust pipe clamp (Figure 1, Item 2) and slide clamp towards engine.
4. Loosen muffler outlet exhaust pipe clamp (Figure 1, Item 6) and slide rearward.
5. Slide rear exhaust pipe (Figure 1, Item 7) away from muffler (Figure 1, Item 3).
6. Remove four bolts, washers, and nuts (Figure 1, Items 4, 5 and 8) (One mount not shown).
7. Slide muffler away from engine weldment exhaust pipe (Figure 1, Item 1).
8. Remove muffler (Figure 1, Item 3).

**END OF TASK****INSTALLATION**

1. Position muffler (Figure 1, Item 3) in mount bracket while aligning muffler inlet tube over engine weldment exhaust pipe (Figure 1, Item 1).
2. Install four bolts, washers, and nuts (Figure 1, Items 4, 5 and 8) (One mount not shown) and tighten.
3. Position rear exhaust pipe (Figure 1, Item 7) on muffler outlet port.
4. Secure exhaust pipe clamp (Figure 1, Item 6).
5. Position muffler inlet exhaust pipe clamp (Figure 1, Item 2).
6. Secure exhaust pipe clamp (Figure 1, Item 2).
7. Connect battery negative cables (WP 0091).
8. Perform Maintenance Operation Check.
9. Install center deck plate (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
EXHAUST PIPES**

**INITIAL SETUP:**

**Test Equipment**

N/A

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0020

WP 0064

WP 0091

**Materials/Parts**

N/A

**Equipment Condition**

Engine Shut Down and Cool

**INSPECTION**

Visually inspect exhaust pipes, pipe clamps and pipe hanger mounting security, evidence of cracks or leaks or any damage affecting serviceability.

**END OF TASK**

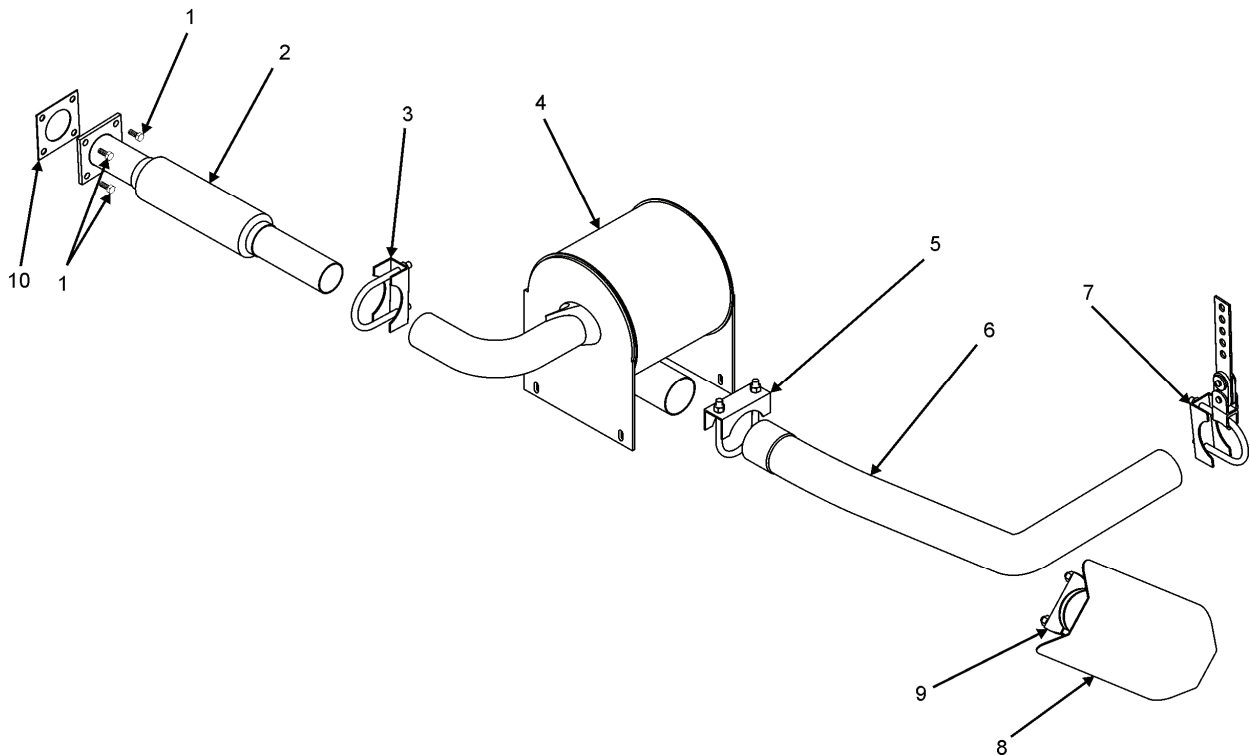


Figure 1. Exhaust Pipes (Removal and Installation)

**REAR EXHAUST PIPE****REMOVAL**

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Loosen muffler outlet exhaust pipe clamp (Figure 1, Item 5) and slide clamp up.
4. Remove 2 filter guard clamps (Figure 1, Item 9) (One not shown).
5. Remove filter guard (Figure 1, Item 8).
6. Loosen tail pipe hanger clamp (Figure 1, Item 7).
7. Pull rear exhaust pipe (Figure 1, Item 6) free from muffler outlet port and hanger clamp.
8. Remove rear exhaust pipe (Figure 1, Item 6)

**END OF TASK****INSTALLATION**

1. Position rear exhaust pipe (Figure 1, Item 6) over muffler outlet tube and in hanger clamp.
2. Position the muffler outlet exhaust pipe clamp (Figure 1, Item 5) and tighten.
3. Position the filter guard (Figure 1, Item 8).
4. Install 2 filter guard clamps (Figure 1, Item 9) (One not shown) and tighten.
5. Position the tail pipe hanger clamp (Figure 1, Item 7) and tighten.
6. Connect battery negative cables (WP 0091).
7. Perform Maintenance Operation Check.
8. Install center deck plate (WP 0020).

**END OF TASK****FORWARD EXHAUST PIPE****REMOVAL**

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Remove muffler (WP 0064).

**NOTE**

To prevent FOD cover turbo exhaust outlet on engine.

4. Remove 4 exhaust mount bolts (Figure 1, Item 1) (One not shown).
5. Remove engine exhaust weldment pipe (Figure 1, Item 2).
6. Discard old gasket (Figure 1, Item 10).
7. Clean exhaust weldment pipe flange mating surface.

**END OF TASK****INSTALLATION**

1. Position new gasket (Figure 1, Item 10) and engine exhaust weldment pipe (Figure 1, Item 2).
2. Install 4 exhaust mount bolts (Figure 1, Item 1) (One not shown). Torque to 35-38 ft lbs.
3. Install muffler (WP 0064).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.
6. Install center deck plate (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
AXLES (FRONT AND REAR)**

**INITIAL SETUP:**

<b>Test Equipment</b>	WP 0067
N/A	WP 0070
	WP 0075
<b>Tools and Special Tools</b>	WP 0083
Sling (WP 0125, Item 7)	WP 0084
Transmission/Differential Jack (WP 0125, Item 25)	WP 0091
	WP 0111
General Mechanic Tool Box (WP 0125, Item 8)	WP 0117
<b>Personnel Required</b>	<b>Materials/Parts</b>
91B, Light Wheel Vehicle Mechanic (2)	N/A
<b>References</b>	<b>Equipment Condition</b>
WP 0021	Engine Shut Down

**INSPECTION**

Visually inspect front and rear axle assemblies for mount security, leaks at the inner and outer hubs and seals and for any damage affecting serviceability.

**REMOVAL****Front Axle****WARNING**

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under these components being lifted or suspended. Use suitable lifting equipment for heavy components. Failure to follow these instructions can result in serious injury or death.

1. Disconnect battery negative cables (WP 0091).
2. Lift front of vehicle (WP 0021).
3. Remove front wheels (WP 0083).
4. Remove front drive shaft (front axle end only) (WP 0070) and lower to the ground.
5. Remove both front shock lower mount bolts (WP 0084).

**NOTE**

Place a drip pan under the brake lines and steering hoses during removal.

6. Disconnect brake lines (WP 0075) from axle brake manifold and remove any hardware securing brake lines to axle.
7. Plug lines to prevent brake system contamination.
8. Tie brake lines to the side to avoid any interference when removing axle.
9. Disconnect hydraulic hoses from steer cylinder (WP 0117) plug and cap.
10. Position an axle jack or other suitable mobile lifting device under each end of the axle (Figure 1, Item 1), and raise axle enough to relieve tension on axle assembly.
11. Remove 4 axle mounting nuts and washers (Figure 1, Items 3 and 4) (2 on each end).
12. Lower both front axle jacks until the axle clears the mounting bolts (Figure 1, Item 2).
13. Using axle jacks roll the front axle assembly out from the vehicle through the wheel housing.

**END OF TASK**

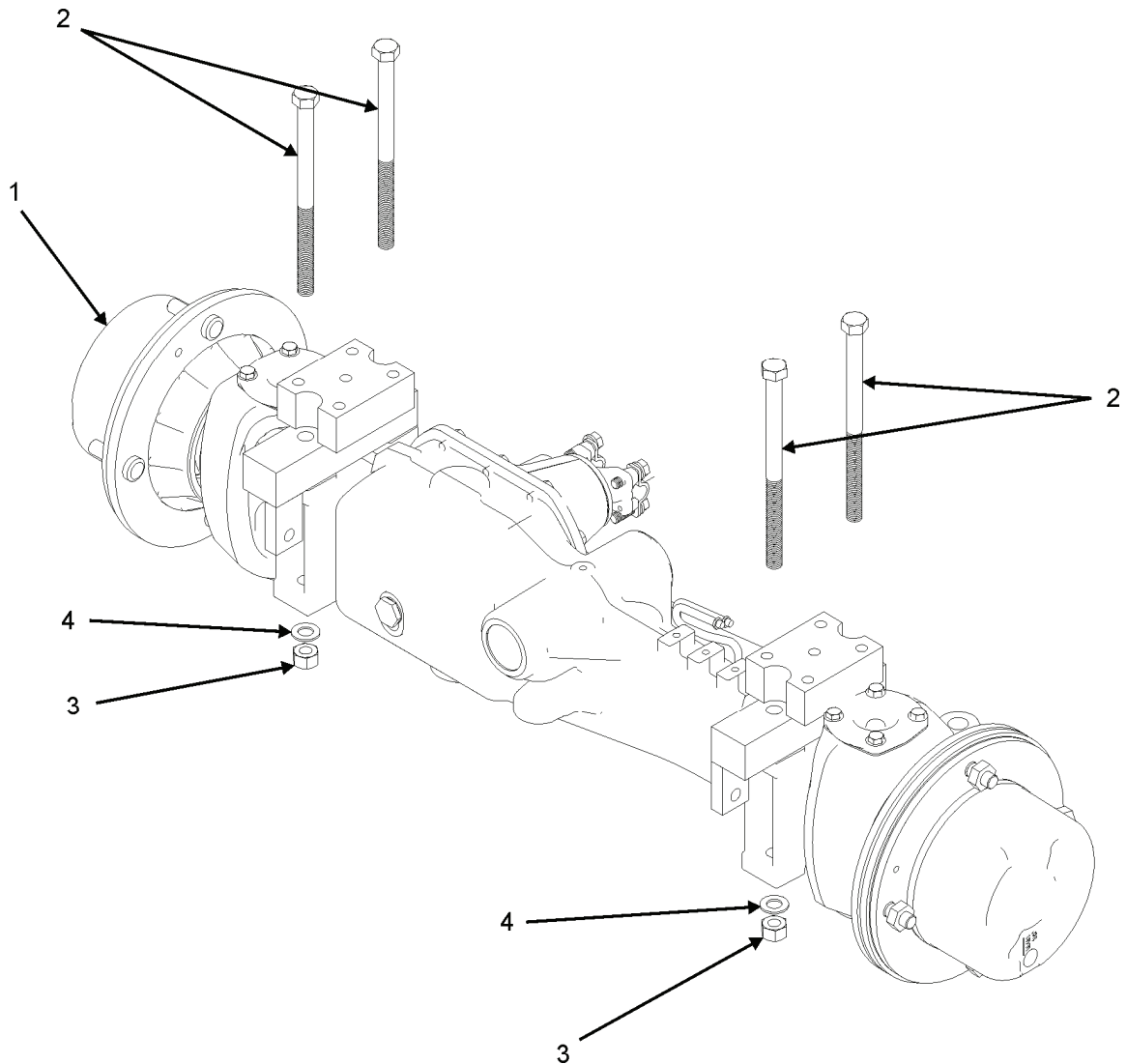


Figure 1. Front Axle (Removal and Installation)

## INSTALLATION

### Front Axle

#### WARNING

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under these components being lifted or suspended. Use suitable lifting equipment for heavy components. Failure to follow these instructions can result in serious injury or death.

1. Using a hoist and sling raise the replacement front axle assembly and place on the axle jacks.
2. Using axle jacks roll the front axle assembly under the vehicle through the wheel housing.
3. Position the front axle assembly under the 4 mounting bolts (Figure 1, Item 2).
4. Raise the front axle assembly allowing the mount bolts to align with the axle mount holes.
5. Install four axle-mounting washers and nuts (Figure 1, Items 3 and 4) 2 on each end of the front axle and tighten.
6. Install front shocks on lower mounts (WP 0084).

7. Remove axle jacks.
8. Connect hydraulic hoses to the steering cylinder (WP 0117).
9. Connect brake lines (WP 0075) to axle brake manifold and secure.
10. Install front drive shaft (front axle end only) (WP 0070).
11. Service front axle assembly (WP 0067).
12. Perform front brake system bleeding procedure (WP 0075).
13. Install front wheels (WP 0083).
14. Lower vehicle (WP 0021).
15. Connect battery negative cables (WP 0091).
16. Perform Maintenance Operation Check.
17. Service steering hydraulic tank (WP 0111).

## END OF TASK

## REMOVAL

### Rear Axle

#### WARNING

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under these components being lifted or suspended. Use suitable lifting equipment for heavy components. Failure to follow these instructions can result in serious injury or death.

1. Disconnect battery negative cables (WP 0091).
2. Lift rear of vehicle (WP 0021).
3. Remove rear wheels (WP 0083).
4. Remove rear drive shaft (rear axle end only) (WP 0070) and lower to the ground.
5. Remove both rear shock lower mount bolts (WP 0084).

#### NOTE

Place a drip pan under the brake lines and steering hoses during removal.

6. Disconnect brake lines (WP 0075) from rear axle brake manifold and remove any hardware securing brake lines to axle.
7. Plug lines to prevent system contamination.
8. Position an axle jack or other suitable mobile lifting device under each end of the axle (Figure 2, Item 1), and raise axle enough to relieve tension on axle assembly.
9. Remove 8 axle mounting nuts (Figure 2, Item 3) 4 each side and lower rear axle (Figure 2, Item 1) until axle clears bolts (Figure 2, Item 2).
10. Using axle jacks roll the rear axle assembly out from the vehicle through the wheel housing.

## END OF TASK

## INSTALLATION

### Rear Axle

#### WARNING

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under these components being lifted or suspended. Use suitable lifting equipment for heavy components. Failure to follow these instructions can result in serious injury or death.

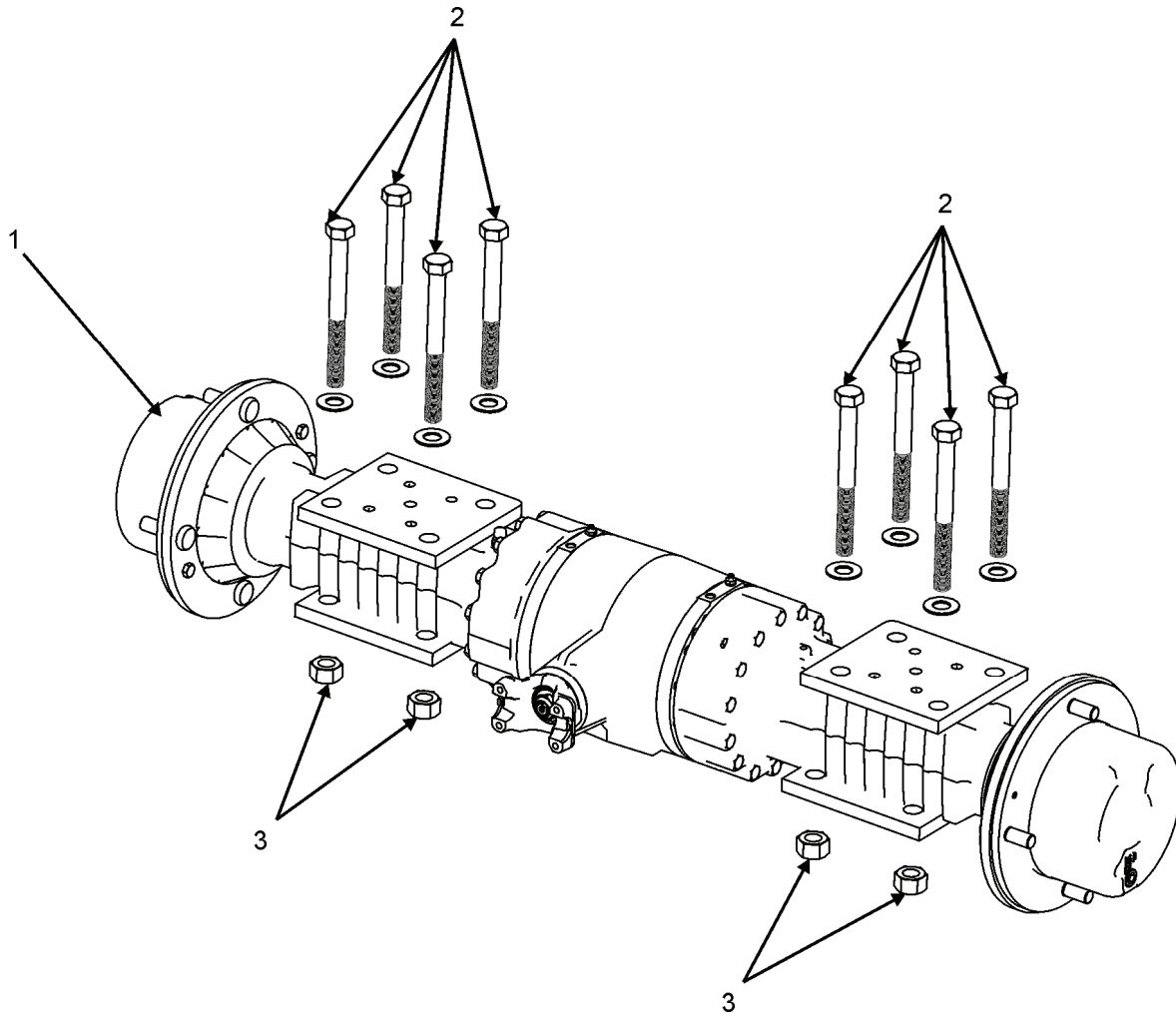


Figure 2. Rear Axle (Removal and Installation)

1. Using a hoist and sling raise the replacement rear axle assembly and place on the axle jacks.
2. Using axle jacks roll the rear axle assembly under the vehicle through the wheel housing.
3. Position the rear axle assembly under the 8 mounting bolts (Figure 2, Item 2).
4. Raise the rear axle assembly allowing the mount bolts to align with the axle mount holes.
5. Install 8 axle-mounting nuts (Figure 2, Item 3) 4 on each end of the rear axle. Torque nuts to 390-410 ft lbs.
6. Install rear shocks on lower mounts (WP 0084).
7. Remove axle jacks.
8. Connect brake lines (WP 0075) to axle brake manifold and secure.
9. Install rear drive shaft (rear axle end only) (WP 0070).
10. Service rear axle assembly (WP 0067).
11. Perform rear brake system bleeding procedure (WP 0075).
12. Install rear wheels (WP 0083).
13. Lower vehicle (WP 0021).
14. Connect battery negative cables (WP 0091).
15. Perform Maintenance Operation Check.

**END OF TASK**

**END OF WORK PACKAGE**



**FIELD MAINTENANCE  
AXLE SERVICE**

**INITIAL SETUP:**

**Test Equipment**

N/A

**Tools and Special Tools**

Hydraulic Floor Jack, 5 Ton (WP 0125, Item 15)  
 Jack Stands, 5 Ton (WP 0125, Item 16)  
 Torque Wrench, 60 ft-lb (WP 0125, Item 3)  
 General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0017  
 WP 0021

**Materials/Parts**

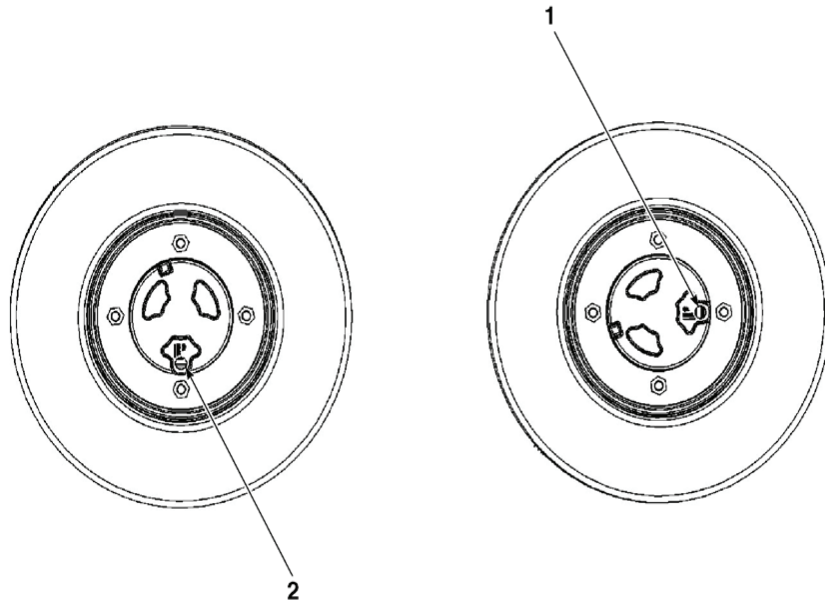
Mobile Fluid, 424 (WP 0127, Item 60)  
 Anti-Seize Tape (WP 0127, Item 50)

**Equipment Condition**

Engine Shut Down

**INSPECTION**

Visually inspect front and rear axles for mount security, leaks at the inner and outer seals and plugs and for any damage affecting serviceability.



501348M-042

Figure 1. Outer Hub Lubricant Level Check and Service

**WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**SERVICE****Lubricant Level Service (Outer Hubs) (Front and Rear Axles)**

1. Rotate or position the appropriate wheel hub drain/fill plug as illustrated (Figure 1, Item 1).
2. Remove drain/fill plug (Figure 1, Item 1) and check that lubricant is present at the plug opening. If not, service outer wheel hub (WP 0017) until level is visible at the bottom of the opening.
3. Wrap threads of fill/drain plug with anti-seize tape.
4. Install fill/drain plug and tighten.

**END OF TASK****Outer Hub Lubricant Service (Front and Rear Axles)**

1. Rotate or position the appropriate wheel hub drain/fill plug as illustrated in (Figure 1, Item 2).
2. Place a drain pan under the plug.
3. Remove drain/fill plug (Figure 1, Item 2) and drain lubricant.
4. Rotate or position the wheel hub drain/fill plug as illustrated (Figure 1, Item 1).
5. Service outer wheel hub (WP 0017) until level is visible at the bottom of the opening.
6. Wrap threads of fill/drain plug with anti-seize tape.
7. Install fill/drain plug and tighten.

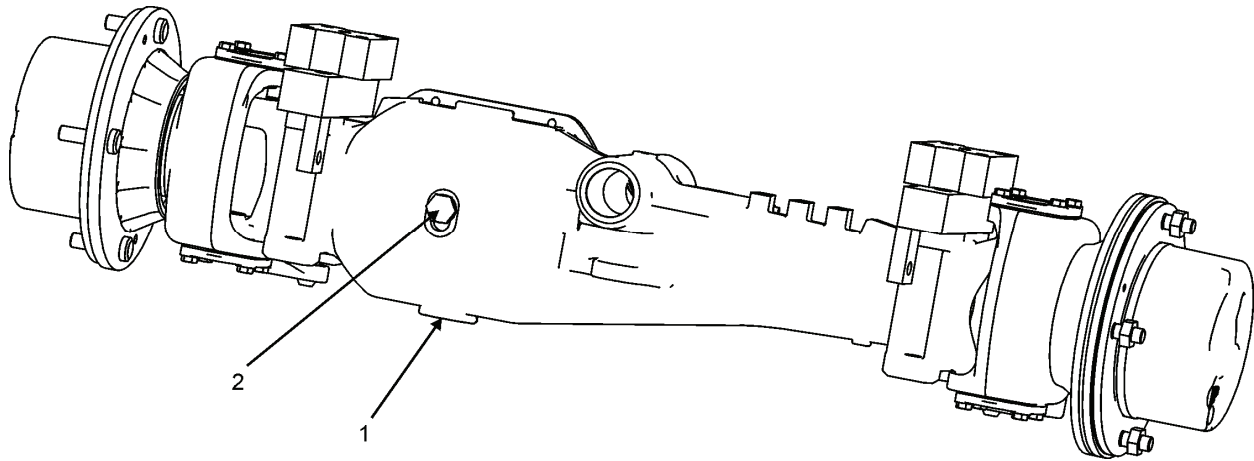
**END OF TASK**

Figure 2. Front Axle Lubricant Level Check and Service

**Lubricant Level Check (Front Axle)**

1. Remove front axle fill plug (Figure 2, Item 2) and check that lubricant is present at the bottom of the plug opening. If not, service front axle differential (WP 0017) until lubricant level is visible at the bottom of the fill plug (Figure 2, Item 2) opening.
2. Clean and install differential fill plug (Figure 2, Item 2) and snug.
3. Torque drain plug to 58 ft-lb (79 N•m).

**END OF TASK****Front Axle Lubricant Service**

1. Jack vehicle all 4 wheels (WP 0021).
2. Place a drain pan under the front axle drain plug.
3. Remove front axle fill plug (Figure 2, Item 2).
4. Remove front axle drain plug (Figure 2, Item 1) and drain lubricant.
5. Clean and install drain plug (Figure 2, Item 1) and snug.

6. Torque drain plug to 58 ft-lb (79 N•m).
7. Service front axle differential (WP 0017) until lubricant level is visible at the bottom of the fill plug (Figure 2, Item 2) opening.
8. Clean and install fill plug (Figure 2, Item 2) and snug.
9. Torque fill plug to 58 ft-lb (79 N•m).
10. Lower vehicle (WP 0021).
11. Perform Maintenance Operation Check.

## END OF TASK

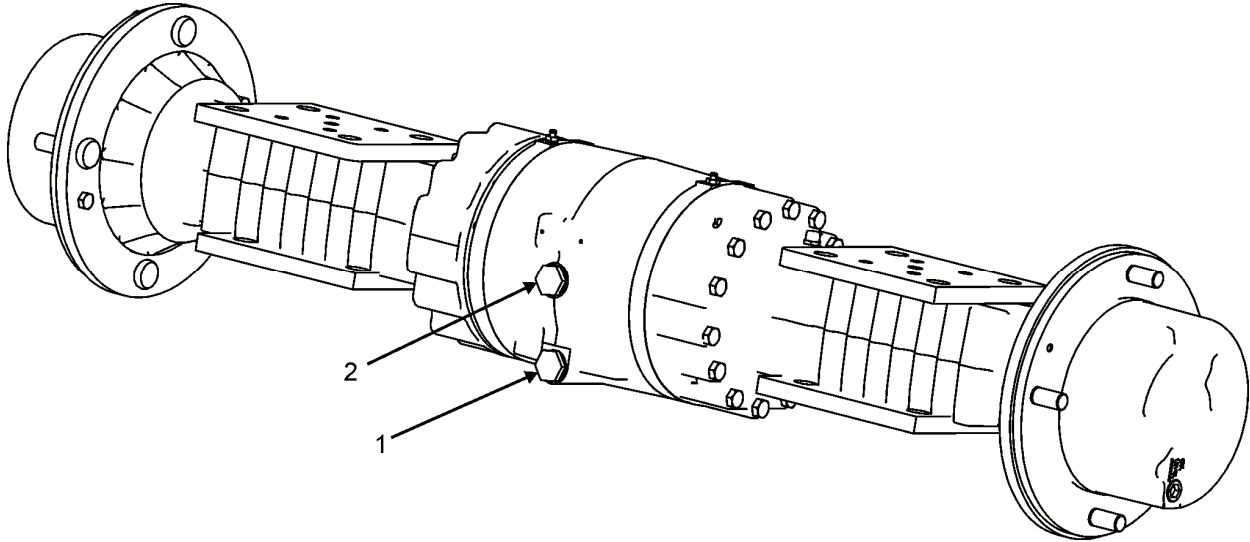


Figure 3. Rear Axle Lubricant Level Check and Service

### Lubricant Level Check (Rear Axle)

1. Remove rear axle fill plug (Figure 3, Item 2) and check that lubricant is present at the bottom of the plug opening. If not, service rear axle differential (WP 0017) until lubricant level is visible at the bottom of the fill plug (Figure 3, Item 2) opening.
2. Clean and install fill plug (Figure 3, Item 2) and snug.
3. Torque drain plug to 58 ft-lb (79 N•m).

## END OF TASK

### Rear Axle Lubricant Service

1. Jack vehicle all 4 wheels (WP 0021).
2. Place a drain pan under the rear axle drain plug.
3. Remove rear axle fill plug (Figure 3, Item 2).
4. Remove rear axle drain plug (Figure 3, Item 1) and drain lubricant.
5. Clean and install drain plug (Figure 3, Item 1) and snug.
6. Torque drain plug to 58 ft-lb (79 N•m).
7. Service rear axle differential (WP 0017) until lubricant level is visible at the bottom of the fill plug (Figure 3, Item 2) opening.
8. Clean and install differential fill plug (Figure 3, Item 2) and snug.
9. Torque fill plug to 58 ft-lb (79 N•m).
10. Lower vehicle (WP 0021).

11. Perform Maintenance Operation Check.

**END OF TASK**

**END OF WORK PACKAGE**

**FIELD MAINTENANCE  
BRAKE FRICTION PLATES (FRONT AXLE)**

**INITIAL SETUP:**

**Test Equipment**

N/A

**Tools and Special Tools**

Chock Blocks (WP 0126, Item 1)  
 Torque Wrench, 0-75 ft-lbs (WP 0125, Item 3)  
 Soft Faced Hammer (WP 0125, Item 24)  
 General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**References**

WP 0021  
 WP 0067  
 WP 0075  
 WP 0083  
 WP 0091

**Materials/Parts**

Sealant, Loctite 242 (WP 0127, Item 37)  
 Mobile Fluid 424 (WP 0127, Item 60)

**Equipment Condition**

N/A

**Inspection**

Inspect front axle friction plates for excessive wear, see Figure 2.

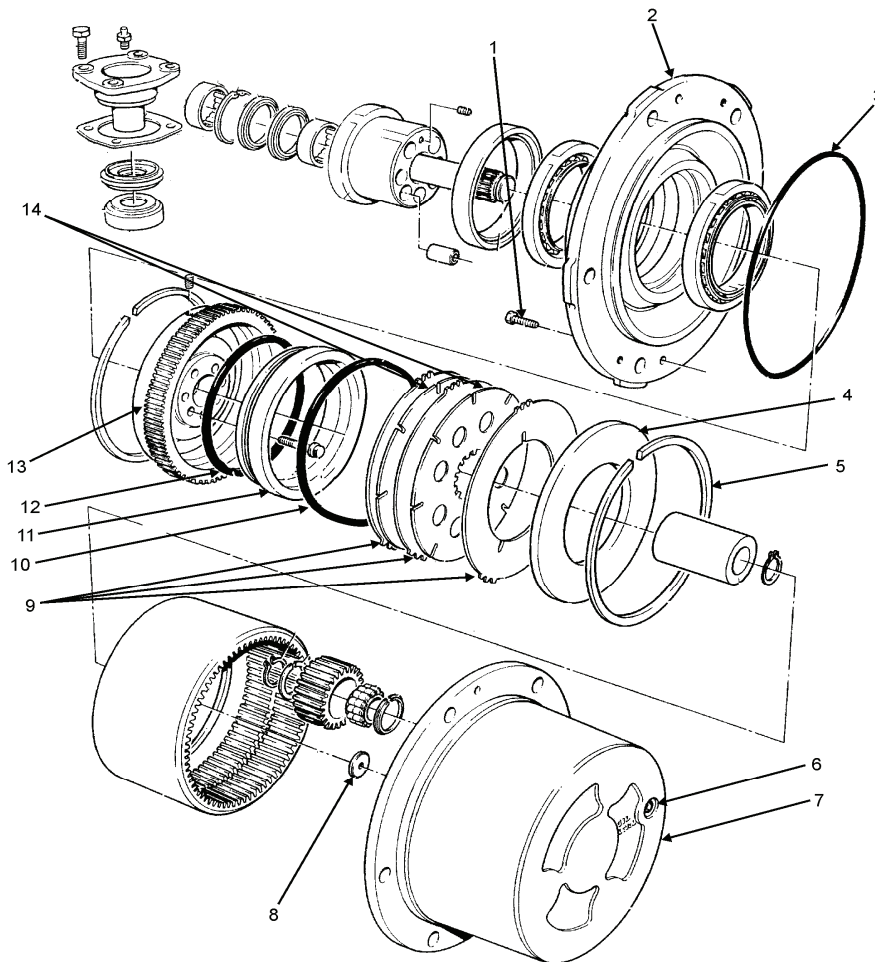


Figure 1. Front Axle Friction Plates (Removal and Installation)

## Front Axle Brake Friction Plates

### Removal

#### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

#### NOTE

When changing friction plates, change all plates, do not mix new and old plates on the axle. To ensure long brake plate life, ensure oil is changed at proper intervals to ensure worn friction material does not damage seals.

If old plates are reused, note orientation of brake friction plates during removal and reinstall in the same order.

1. Disconnect battery negative cables (WP 0091).
2. Jack vehicle front (WP 0021).
3. Remove front tires (WP 0083).
4. Drain front axle hubs (WP 0067).
5. Remove 2 hub housing mount bolts (Figure 1, Item 1) (only one shown).

#### NOTE

It may be necessary to tap the hub housing with a mallet to crack the seal.

6. Remove hub housing (Figure 1, Item 7).
7. Remove and discard o-ring (Figure 1, Item 3).
8. Remove snap ring (Figure 1, Item 5) and brake pressure plate (Figure 1, Item 4).
9. Remove counter plates (Figure 1, Items 9) and friction plates (Figure 1, Items 14).

#### NOTE

There are three counter plates and two friction plates. If plates are to be reused note position and reinstall in same order.

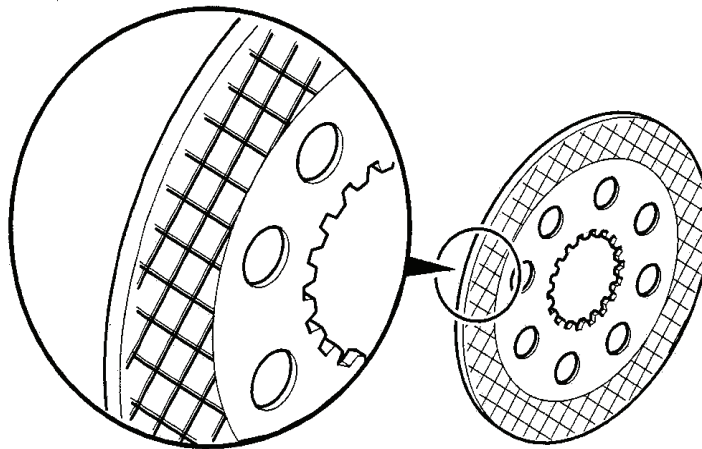


Figure 2. Friction Pad Wear

10. Inspect friction plates for wear (Figure 2). If the grid pattern is no longer visible they need to be replaced.

**Installation****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**NOTE**

Lubricate o-ring and brake friction plates with Mobil 424 before installation. Ensure o-ring seats squarely in the groove.

1. Install 3 counter plates (Figure 1, Item 9) and 2 friction plates (Figure 1, Item 14).
2. Install brake pressure plate (Figure 1, Item 4), insure that chamfer on pressure plate is installed toward brake pack.
3. Install snap ring (Figure 1, Item 5) into housing.
4. Apply slight brake pedal pressure and observe the piston activating and retracting.
5. Install new o-ring (Figure 1, Item 3) onto housing mount plate (Figure 1, Item 2).
6. Position hub housing (Figure 1, Item 7) onto housing mount plate (Figure 1, Item 2). Rotate as necessary to ensure gear teeth engage.
7. Ensure tapped holes between the hub housing and housing plate line up.
8. Apply Loctite 242 to the threads of housing mount bolts (Figure 1, Item 1).
9. Install housing mount bolts (Figure 1, Item 1) (one shown) and torque to 42 ft-lbs.
10. Service front axle hubs (WP 0067).

**NOTE**

Brakes must be bled (WP 0075) if brake caliper is removed from housing or leaks during the friction plate installation process.

11. Install front wheels (WP 0083).
12. Lower Vehicle and remove chock blocks (WP 0021).
13. Connect battery negative cables (WP 0091).
14. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**BRAKE FRICTION PLATES (REAR AXLE)**

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**INITIAL SETUP:****Test Equipment**

N/A

**Tools and Special Tools**

Chock Blocks (WP 0126, Item 1)  
 Hydraulic Floor Jack (WP 0125, Item 15)  
 Jack Stand (WP 0125, Item 16)  
 Torque Wrench, 0-178 ft-lb (WP 0125, Item 3)  
 General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**References**

WP 0021  
 WP 0075  
 WP 0083  
 WP 0091

**Materials/Parts**

Sealant, Loctite 574 (WP 0127, Item 53)  
 Sealant, Loctite 242 (WP 0127, Item 37)  
 Mobile Fluid, 424 (WP 0127, Item 60)  
 Grease, (WP 0127, Item 15)

**Equipment Condition**

N/A

**Inspection**

Inspect rear axle friction plates for excessive wear, see Figure 2.

**Rear Axle Friction Plates****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**CAUTION**

Axles are fitted with brake controlled back offs to maintain constant clearance of (0.02 in) within the brake pack. It is important that only one side at a time is dismantled to prevent damage to the bearings and to preserve the crown wheel and pinion backlash settings.

**NOTE**

When changing friction plates, change all plates, do not mix new and old plates on the axle. To ensure long brake plate life, ensure oil is changed at proper intervals to ensure worn friction material does not damage seals.

If old plates are reused, note orientation of brake friction plates during removal and reinstall in the same order.

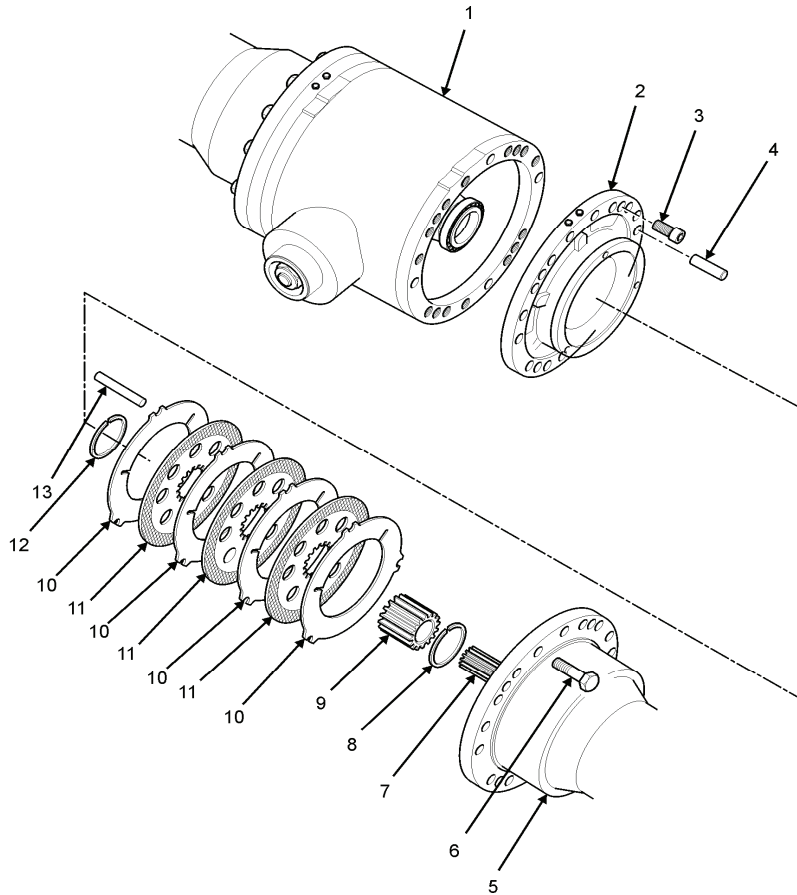


Figure 1. Rear Axle Friction Plates (Removal and Installation)

### Removal

1. Disconnect battery negative cables (WP 0091).
2. Jack vehicle rear (WP 0021).
3. Remove rear wheels (WH 0083).
4. Drain rear axles (WP 0067).
5. Remove rear axle (WP 0066).
6. Place the rear axle on a suitable workbench supported by wood blocks at the center of axle. Use hoist for support.
7. Mark or stake axle housing (Figure 1, Item 5) and differential (Figure 1, Item 1) to help with the reinstallation process.

### WARNING

Severe burns may result if personnel fail to observe safety precautions when using heating devices to remove mounting bolts.

### NOTE

Heating differential housing (Figure 1, Item 1) at bolt thread location will aid in the removal of mount bolts (Figure 1, Item 6). If a mount bolt does break during removal, extract the bolt after first removing the differential housing plate see steps 13 through 17.

8. Remove 14 mount bolts (Figure 1, Item 6) (only one shown).

9. Carefully separate the stub axle arm (Figure 1, Item 5) from the differential housing (Figure 1, Item 1) which have two position pins (Figure 1, Item 4) (only one shown). If necessary use a soft-faced mallet, tap the casing and separate from differential using pry bar. Clean all housing mating surfaces.
10. Remove spine axle rod assembly (Figure 1, Item 7) from the axle housing, which includes three friction plates (Figure 1, Item 11), four counter plates (Figure 1, Item 10), plate carrier gear (Figure 1, Item 9) and snap rings (Figure 1, Items 8 and 12).
11. Remove snap ring (Figure 1, Item 12).
12. Remove 3 friction plates (Figure 1, Item 11) and 4 counter plates (Figure 1, Item 10).

**NOTE**

The brake pack comprises three friction plates and four counter plates. There are two counter plates (Figure 1 Item 10) one at each end of the brake pack, which are not secured to the plate carrier (Figure 1 Item 9). If plates are to be reused note position, reinstall plates in same order.

Inspect friction plates for wear (Figure 2). If the grid pattern is no longer visible they need to be replaced. Replace all counter plates and friction plates as an assembly.

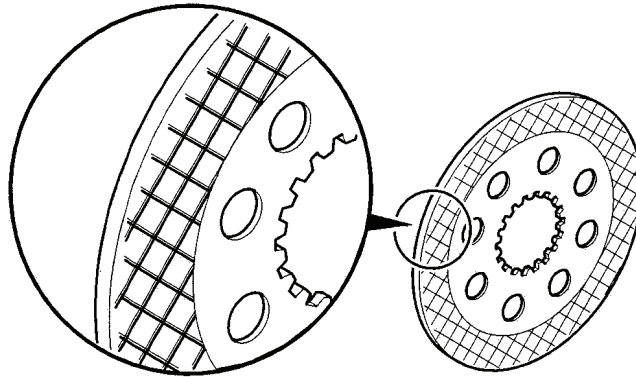


Figure 2. Friction Plate Wear

13. Remove four cap screws (Figure 1, Item 3).
14. Carefully remove differential housing plate (Figure 1, Item 2), 2 position pins (Figure 1, Item 4) (one not shown) from the differential housing (Figure 1, Item 1). Clean differential mating surfaces.

**NOTE**

Heating differential housing (Figure 1, Item 1) at bolt thread location will aid in the removal of mount bolts (Figure 1, Item 6).

15. Remove broken bolts.
16. Apply loctite 574 on mating surface of differential housing plate (Figure 1, Item 2).
17. Install differential housing plate (Figure 1, Item 2).

**END OF TASK**

**INSTALLATION****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**NOTE**

On assembly of the brake packs, the oil flow holes must be aligned with each other when being fitted to the brake pack carrier. If plates are to be reused position should have been noted in disassembly and reinstall in same order as original.

1. Ensure that the three alignment pins (Figure 1, Item 13) are placed in the grooves of the stub axle arm (Figure 1, Item 5) securing them with grease. Ensure the pins are fully pushed into their location holes in the housing.

**NOTE**

If plates are to be reused position should have been noted in disassembly and reinstall in same order as original. New friction plates are to be soaked in Mobile 424 prior to assembly.

2. Install the three friction plates (Figure 1, Item 11), four counter plates (Figure 1, Item 10), plate carrier gear (Figure 1, Item 9) and snap rings (Figure 1, Item 8 and 12) on the spine axle rod (Figure 1, Item 7) as one assembly.
3. Install the spline axle rod friction plate assembly (Figure 1, Item 7, 8, 9, 10, 11 and 12) into the stub axle arm (Figure 1, Item 5). Align and push the assembly forward onto the alignment pins (Figure 1, Item 13) (2 not shown) that are located in the drive stub axle arm (Figure 1, Item 5).
4. Ensure the spline axle rod is engaged within the stub axle arm's (Figure 1, Item 5) spline gear.
5. Ensure the oiling holes on the friction plates and counter plates match up.
6. Apply loctite 574 on the stub axle arm (Figure 1, Item 5) mating surface.
7. Carefully hoist the stub axle arm assembly (Figure 1, Item 5) onto the differential housing (Figure 1, Item 1). If necessary using a soft-faced mallet, tapping the case.
8. Apply loctite 242 to 14 mount bolt threads (Figure 1, Item 6) (one shown).
9. Snug all mount bolts (Figure 1, Item 6) then torque in a crisscross pattern to 178 ft-lbs.
10. Install rear axle assembly (WP 0066).
11. Service rear axle (WP 0067).

**NOTE**

Brakes must be bled (WP 0075) if brake caliper is removed from housing or leaks during the friction plate installation process.

12. Install wheels (WP 0083).
13. Lower vehicle (WP 0021).
14. Connect battery negative cables (WP 0091).
15. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**DRIVE SHAFTS**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0021

**Tools and Special Tools**

Hydraulic Floor Jack, 5 Ton (WP 0126, Item 15)

Jack Stand, 5 Ton (WP 0125, Item 16)

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

Sealant, Loctite 262 (WP 0127, Item 38)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**Engine Shut Down

---

**INSPECTION**

Visually inspect drive shafts (front and rear) for mount security, dry or worn u-joints or any damage affecting serviceability.

**END OF TASK****WARNING**

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under these components being lifted or suspended. Use suitable lifting equipment for heavy components. Failure to follow these instructions can result in serious injury or death.

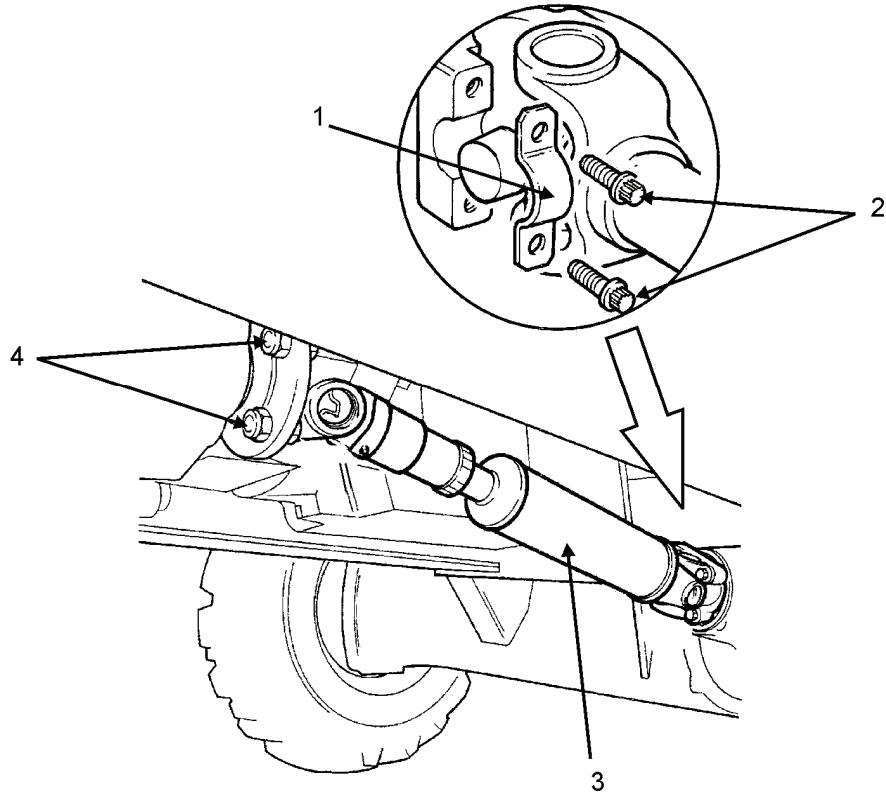


Figure 1. Front Drive Shaft (Removal and Installation)

## REMOVAL

### Front Drive Shaft

1. Lift vehicle front (WP 0021).
2. Remove 4 nuts and mount bolts (Figure 1, Item 4) (2 not shown) and lower drive shaft.
3. Remove 4 u-joint slip clamp bolts (Figure 1, Item 2) (2 not shown).
4. Remove 2 u-joint slip clamps (Figure 1, Item 1) (1 not shown).
5. Remove front drive shaft (Figure 1, Item 3).

## END OF TASK

## INSTALLATION

### Front Drive Shaft

1. Position front of drive shaft (Figure 1, Item 3) at the front differential.
2. Position 2 u-joint slip clamps (Figure 1, Item 1) (1 not shown).
3. Apply locktite 262 to the mount bolt threads.
4. Install 4 u-joint mount bolts (Figure 1, Item 2) (2 not shown) and tighten. Torque to 55-63 ft lbs.
5. Position rear of front drive shaft at the front transmission output yoke flange.
6. Install 4 bolts and nuts (Figure 1, Item 4) (2 not shown) and tighten. Torque to 33-38 ft lbs.
7. Lower vehicle (WP 0021).
8. Perform Maintenance Operation Check.

## END OF TASK

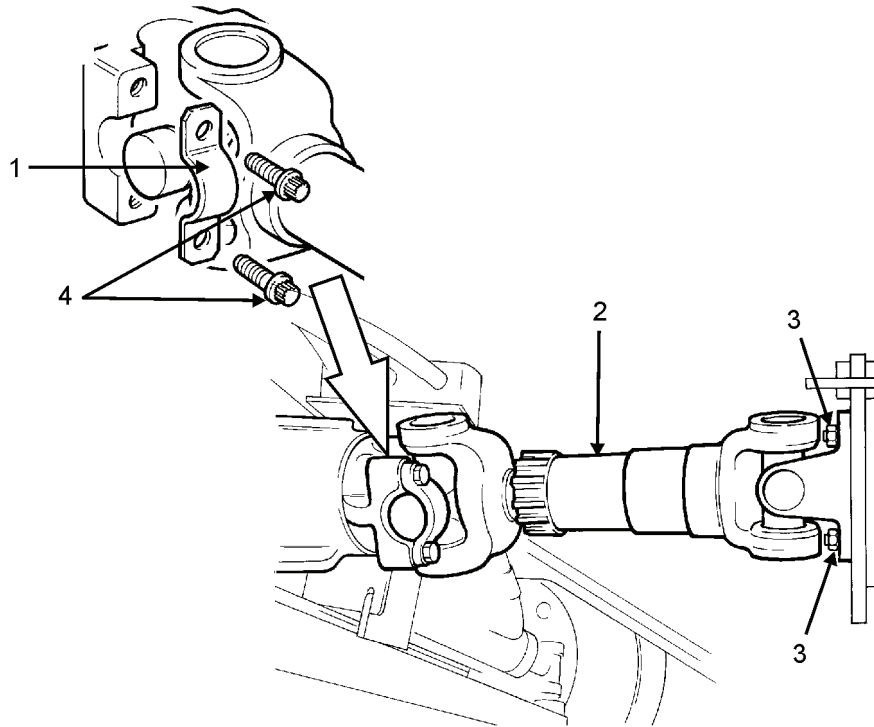


Figure 2. Rear Drive Shaft (Removal and Installation)

## REMOVAL

### Rear Drive Shaft

1. Lift rear of vehicle (WP 0021).
2. Remove 4 nuts and mount bolts (Figure 2, Item 3) (2 not shown) and lower drive shaft.
3. Remove 4 u-joint slip clamp bolts (Figure 2, Item 4) (2 not shown).
4. Remove 2 u-joint slip clamps (Figure 2, Item 1) (1 not shown).
5. Remove rear drive shaft (Figure 2, Item 2).

## END OF TASK

## INSTALLATION

### Rear Drive shaft

1. Position front of rear drive shaft (Figure 2, Item 2) at the transmission brake disc.
2. Install 4 bolts and nuts (Figure 2, Item 3) (2 not shown) and tighten. Torque to 33-38 ft lbs.
3. Position rear of rear drive shaft at the rear differential.
4. Position 2 u-joint slip clamps (Figure 2, Item 1) (1 not shown).
5. Apply locktite 262 to the mount bolt threads.
6. Install 4 u-joint slip clamp bolts (Figure 2, Item 4) (2 not shown) and tighten. Torque to 55-63 ft lbs.
7. Lower vehicle (WP 0021).
8. Perform Maintenance Operation Check.

## END OF TASK

## END OF WORK PACKAGE





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**FIELD MAINTENANCE**  
**HYDRAULIC MASTER CYLINDER (BRAKES)**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0020

WP 0087

WP 0091

**Tools and Special Tools**

Wheel Chocks (WP 0126, Item 1)

Floor Jack 5 Ton (WP 0125, Item 15)

Jack Stands 5 Ton (WP 0125, Item 16)

Floor Creeper (WP 0125, Item 19)

Drip Pan, 1 qt (WP 0126, Item 2)

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

Cloth, Lint-Free (WP 0127, Item 34)

Caps and Pugs (WP 0127, Item 7)

Brake Fluid, Hydraulic (WP 0127, Item 18)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**Equipment Condition**

Engine Shut Down

---

**INSPECTION**

Inspect master cylinder and brake pedal linkage for security. Inspect hose connections and master cylinder piston for leakage. Tighten hose connection if required. Replace master cylinder and pedal linkage as necessary.

**END OF TASK****REMOVAL****WARNING**

Before servicing brake system components, make sure that the machine is on level ground. Set the parking brake. Put chocks on each side of all four wheels. Disconnect the battery so that the engine cannot be started. If you do not take these precautions, the machine could run you over.

1. Release engine cover rubber tie-downs and open engine cover (WP 0020).
2. Remove both front seats by pressing release lever and sliding seat forward (WP 0087).
3. Remove seat cover to have access to brake master cylinder (WP 0020). Use floor creeper to have access to brake valve located under the front of vehicle.
4. Disconnect battery cables (WP 0091).

**WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**WARNING**

Hydraulic fluid is combustible. Do not use or store near flames, sparks, or hot surfaces. Use only in a well-ventilated area. If hydraulic fluid is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist can cause dermatitis and severe skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. Remove contaminated clothing and launder before reuse. If liquid contacts eyes, flush eyes with water immediately. If fluid is swallowed, do not try to vomit; fluid may enter the lungs and cause severe injury. Get immediate medical attention. When handling liquid, wear rubber gloves and impervious clothing to minimize contact. If prolonged contact with mist is likely, wear NIOSH/MSHA approved respirator.

**NOTE**

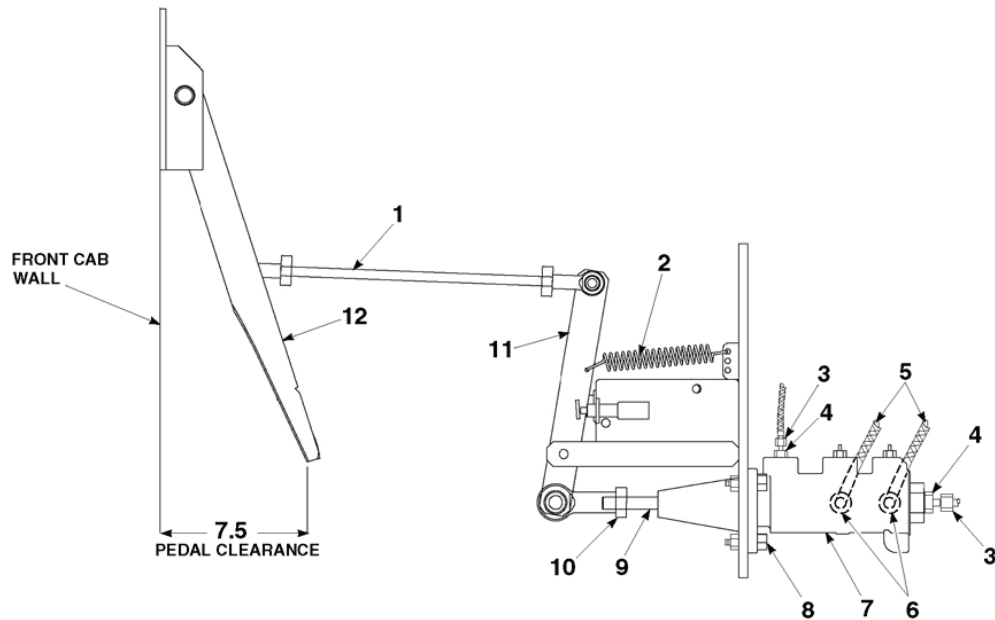
Plunger (Figure 1, Item 9) will drop as master cylinder is withdrawn from mounting hole.

5. Disconnect brake valve fluid tubing (Figure 1, Item 6) from the brake master cylinder and install caps and plugs to prevent spillage.
6. Disconnect brake hoses from brake master cylinder and install cap and plugs for reservoir hoses (Figure 1, Item 3).
7. Remove bolt and lock nut (not shown) from torque arm rod (Figure 1, Item 11) and discard lock nut.

### NOTE

Requires one person to secure bolt while other person removes lock nuts under the front of vehicle

8. Remove three bolts (two shown), flat washers and lock nuts (Figure 1, Item 8) and discard lock nut.
9. Remove master cylinder (Figure 1, Item 7).
10. Disconnect threaded rod (Figure 1, Item 9) and jam nut (Figure 1, Item 10) from brake master cylinder (Figure 1, Item 7).
11. Disconnect fittings (Figure 1, Item 4) from the brake master cylinder and store them for future installation (discard over-rings).



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Figure 1. Hydraulic Master Cylinder (Brakes) (Inspection, Removal and Installation)

### END OF TASK

### INSTALLATION

### WARNING

Before servicing brake system components, make sure that the machine is on level ground. Set the parking brake. Put chocks on each side of all four wheels. Disconnect the battery so that the engine cannot be started. If you do not take these precautions, the machine could run you over.

### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Install two fittings (Figure 4, Item 4) with over-rings to the brake master cylinder (Figure 1, Item 7).

#### **NOTE**

When inserting master cylinder in mounting hole, it is necessary to align plunger (Figure 1, Item 9) in rubber boot opening at the same time.

2. Align master cylinder (Figure 1, Item 7) with mounting holes and install three bolts (two shown), flat washers, and locknuts (Figure 1, Item 8).
3. Verify that return spring (Figure 1, Item 2) moves torque arm (Figure 1, Item 11) to start position.
4. With torque arm (Figure 1, Item 11) in start (brakes off) position, verify brake pedal (Figure 1, Item 12) clearance is 7-1/2 in. from front cab wall. If necessary, adjust rod (Figure 1, Item 1) to obtain clearance. Verify proper thread insertion of rod ends.
5. Loosen jam nut (Figure 1, Item 10) and threaded rod (Figure 1, Item 9) until it contacts the piston of master cylinder (Figure 1, Item 7). Now back off plunger 1-1/2 turns, tighten jam nut (Figure 1, Item 10). Verify proper thread insertion and brake pedal free play.
6. Remove protective caps. Connect two reservoir hoses (Figure 1, Item 3) and two brake valve tubes (Figure 1, Item 5).
7. Bleed and service brake system (WP 0075).
8. Connect battery negative cables (WP 0091).
9. Install seat cover (WP 0020).
10. Install both front seats. (WP 0087).
11. Close engine cover (WP 0020).

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**STOPLIGHT SWITCH**

---

**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**Tools and Special Tools**

Chock Blocks (WP 0126, Item 1)

Floor Jack 5 Ton (WP 0125, Item 15)

Jack Stands 5 Ton (WP 0125, Item 16)

General Mechanic Tool Box (WP 0125, Item 8)

**References**

WP 0021

WP 0091

**Materials/Parts**

N/A

**Equipment Condition**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

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**INSPECTION**

Visually inspect for security and integrity of stoplight switch (Figure 1, Item 3) and electrical connectors. Access to stoplight switch is under the front of the vehicle.

**END OF TASK****TEST****STOPLIGHT SWITCH**

1. Ohms test switch for continuity across switch terminals (Figure 1, Item 4). Switch should have no continuity without brake application.
2. Ohms test switch for continuity across switch terminals (Figure 1, Item 4) with brake applied. Continuity should be measured.

**END OF TASK****REMOVAL**

1. Lift vehicle front (WP 0021).
2. Disconnect battery negative cables (WP 0091).
3. Disconnect stoplight switch wires from switch terminals (Figure 1, Item 4).
4. Loosen jam nuts (Figure 1, Item 2). Remove forward jam nut (not shown).
5. Remove stoplight switch (Figure 1, Item 3).

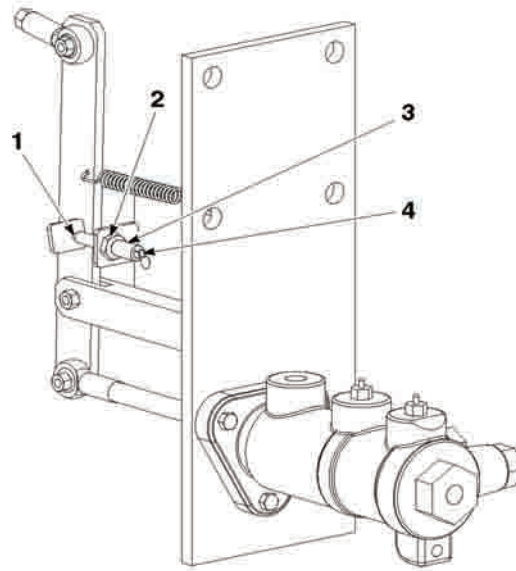


Figure 1. Stoplight Switch (Removal and Installation)

#### END OF TASK

#### INSTALLATION

1. Install rear jam nut (Figure 1, Item 2) on stoplight switch (Figure 1, Item 3).
2. Install stoplight switch (Figure 1, Item 3) in bracket and install front jam nut (Figure 1, Item 2) (not shown).
3. Do not tighten jam nuts (Figure 1, Item 2) at this time.

#### END OF TASK

#### ADJUSTMENT

1. With brake pedal in the off position, adjust jam nuts (Figure 1, Item 2) until plunger (Figure 1, Item 1) contacts brake pedal striker. Stoplight switch terminals (Figure 1, Item 4) should not have continuity when tested with a multi-meter.
2. Continue to adjust jam nuts (Figure 1, Item 2) so stoplight switch (Figure 1, Item 3) is one turn (thread) closer to striker.
3. Verify that when brake pedal is depressed, switch terminals (Figure 1, Item 4) should have continuity when tested with multi-meter.
4. Verify that when brake pedal is released, switch terminals (Figure 1, Item 4) should not have continuity when tested with multi-meter.
5. Install wires on switch terminals (Figure 1, Item 4).
6. Tighten jam nuts (Figure 1, Item 2) at this time.
7. Connect battery negative cables (WP 0091).
8. Perform Maintenance Operation Check.
9. Lower vehicle (WP 0021).

#### END OF TASK

#### END OF WORK PACKAGE

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**FIELD MAINTENANCE**  
**BRAKE VALVE**

---

**INITIAL SETUP:****Test Equipment**

Multi-meter (WP 0125, Item 6)

WP 0074

WP 0075

WP 0091

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

Plugs, Protective (WP 0127, Item 7)

Cloth, Lint-Free (WP 0127, Item 34)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**Equipment Condition**

Engine Shut Down

**References**

WP 0021

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**INSPECT**

Visually inspect for brake valve for mount security, fluid leaks at the valve, fittings, and brake lines/hoses and for any damage affecting serviceability.

**TEST**

Ohms test brake fails switch BFS (FO-1) for no continuity (Open). Brake fail switch BFS is a normally open switch therefore no continuity should exist. Replace BFS if continuity is measured.

**END OF TASK****REMOVAL****WARNING**

Before servicing brake system components, make sure that the machine is on level ground. Set the hand brake.

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Disconnect battery negative cables (WP 0091).
2. Lift front of vehicle (WP 0021).
3. Place a drip pan under the brake valve.
4. Disconnect 2 brake hoses (Figure 1, Items 5 and 8) and plug.
5. Disconnect 2 brake lines (Figure 1, Items 7 and 10) and plug.
6. Remove brake valve mount nuts and bolts (Figure 1, Items 6 and 12) (Nuts not shown).
7. Allow brake valve to drop (Figure 1, Item 11).
8. Remove brake switch screws (Figure 1, Item 1) and washers (Not shown).
9. Remove switch wires (Figure 1, Items 13 and 14).
10. Remove brake valve fittings (Figure 1, Item 5 and 3) as assemblies noting orientation.
11. Remove brake valve (Figure 1, Item 11).
12. Remove brake valve switch (Figure 1, Item 2).

**END OF TASK**

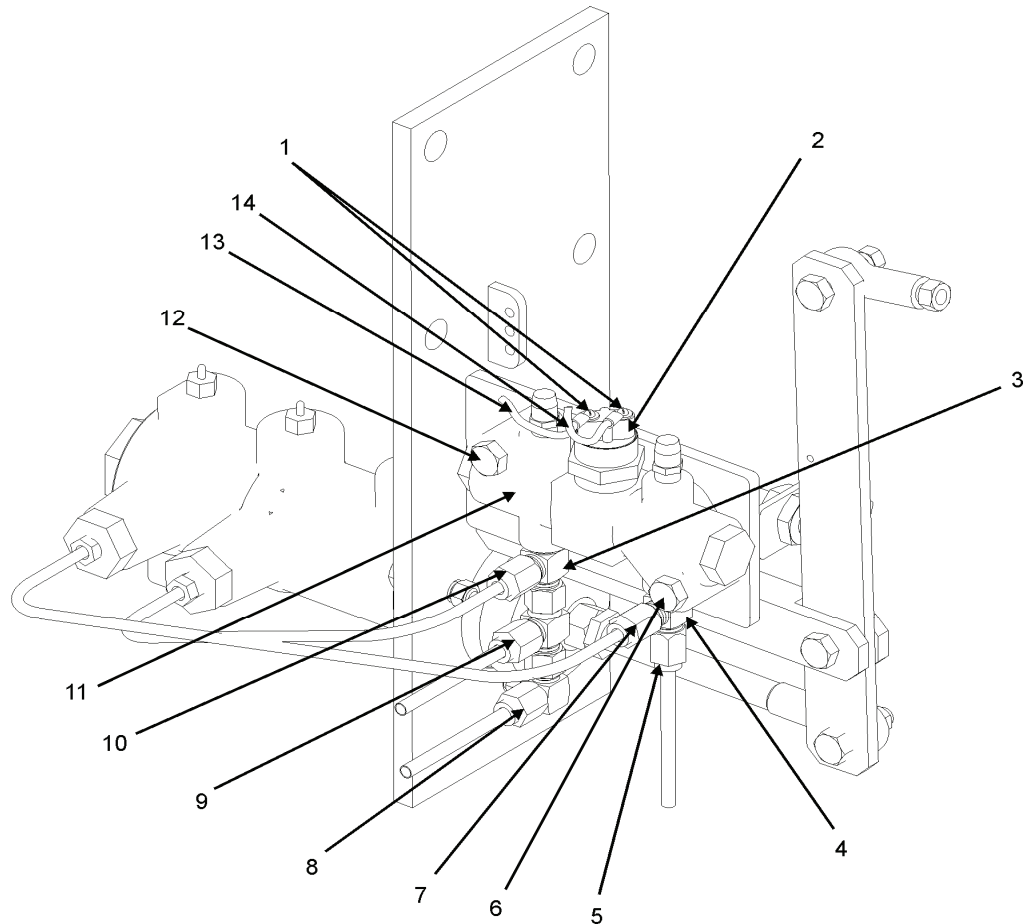


Figure 1. Brake Valve (Removal and Installation)

## INSTALLATION

### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Install brake valve switch (Figure 1, Item 2).
2. Install brake valve fittings (Figure 1, Items 5 and 3) same position as removed.
3. Position brake valve (Figure 1, Item 11).
4. Position switch wires (Figure 1, Items 13 and 14).
5. Install brake switch screws (Figure 1, Item 1) and washers (Not shown).
6. Install brake valve mount bolts and nuts (Figure 1, Items 6 and 12) (Nuts not shown).
7. Connect 2 brake lines (Figure 1, Items 7 and 10) and tighten.
8. Connect 2 brake hoses (Figure 1, Items 5 and 8) and tighten.
9. Service brake reservoirs (WP 0074).
10. Perform brake system bleeding procedures (WP 0075).
11. Lower front of vehicle (WP 0021).
12. Connect battery negative cables (WP 0091).
13. Perform Maintenance Operation Check.

**END OF TASK**  
**END OF WORK PACKAGE**



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**FIELD MAINTENANCE  
BRAKE RESERVOIRS**

---

**INITIAL SETUP:****Test Equipment**

N/A

WP 0020

WP 0075

WP 0091

**Tools and Special Tools**

Drip Pan (WP 0126, Item 2)

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

Hydraulic Brake Fluid (WP 0127, Item 18)

Caps and Plugs (WP 0127, Item 7)

Cloth, Lint Free (WP 0127, Item 34)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

**References**

WP 0017

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**INSPECTION**

1. Open engine cover (WP 0020).
2. Check brake reservoir for cracks, leaks, or deterioration. Replace as necessary.
3. Close engine cover (WP 0020).

**END OF TASK****SERVICE**

1. Open engine cover (WP 0020).
2. Check that the fluid level in brake reservoir is at the full mark.
3. If reservoir is low service to full mark with Hydraulic Fluid MIL-PRF-5606 (WP 0017).
4. Close engine cover (WP 0020).

**END OF TASK****REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**NOTE**

Removal is the same for both brake reservoirs.

1. Open engine cover (WP 0020).
2. Disconnect battery negative cables (WP 0091).
3. Remove 2 brake hoses (Figure 1, Item 5) and allow brake fluid to drain from brake reservoir (Figure 1, Item 1) into a suitable container. Cap hoses.
4. Remove two nuts, washers and bolts (Figure 1, Items 2, 3 and 4).
5. Remove brake reservoirs (Figure 1, Item 1).

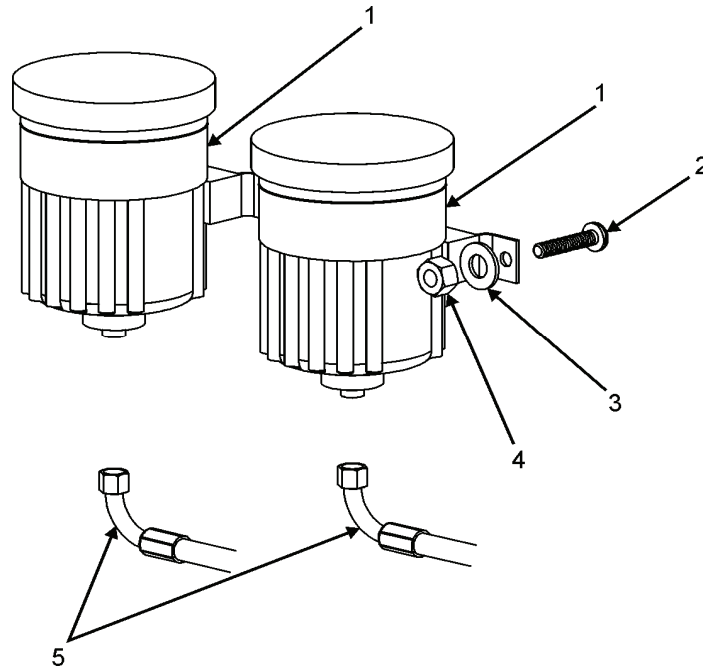


Figure 1. Brake Reservoir (Removal and Installation)

## END OF TASK

## INSTALLATION

### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

### NOTE

LH reservoir goes to rear brakes and RH reservoir goes to front brakes.  
Installation is the same for both brake reservoirs.

1. Position brake reservoirs (Figure 1, Item 1).
2. Install two bolts, washers and nuts (Figure 1, Items 2, 3 and 4) and tighten.
3. Connect 2 brake hoses (Figure 1, Item 5).

### CAUTION

Do not use automotive brake fluid to service the system. Use Hydraulic Fluid (WP 0127, Item 18)

4. Refill brake reservoirs (Figure 1, Item 1) with hydraulic brake fluid to the full mark.
5. Bleed brakes (WP 0075).
6. Close engine cover (WP 0020).
7. Connect battery negative cables (WP 0091).
8. Perform Maintenance Operation Check.

## END OF TASK

## END OF WORK PACKAGE

**FIELD MAINTENANCE  
BRAKE SYSTEM/BLEEDING**

**INITIAL SETUP:**

**Test Equipment**  
N/A

WP 0073  
WP 0083  
WP 0091

**Tools and Special Tools**  
General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**  
Caps, Protective (WP 0127, Item 7)  
Cloth, Lint-Free (WP 0127, Item 34)  
Hydraulic Fluid, Brake (WP 0127, Item 18)  
Clear Plastic Tubing

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic (2)

**Equipment Condition**  
Engine Shut Down

**References**  
WP 0020  
WP 0021

**INSPECT**

Visually inspect the brake system lines and hoses for mount security, leaks, chaffing, crimping and for any damage affecting serviceability.

**END OF TASK**

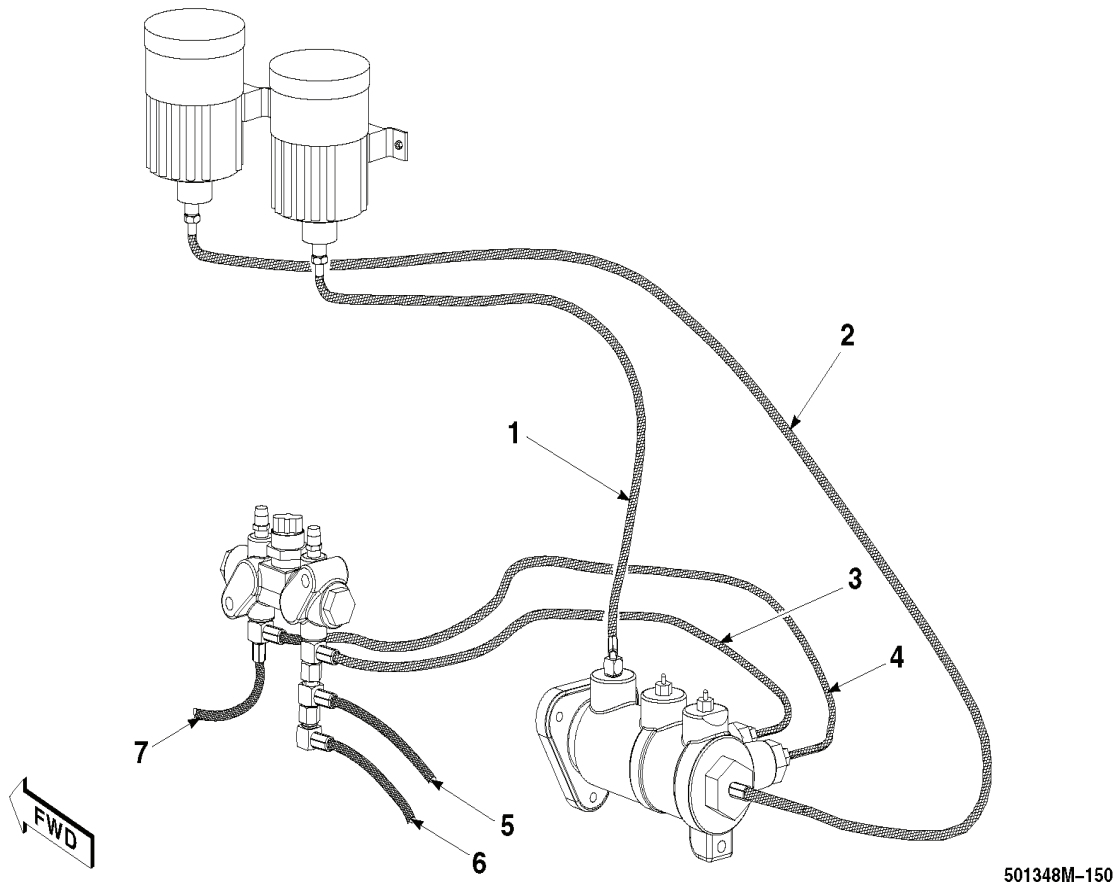
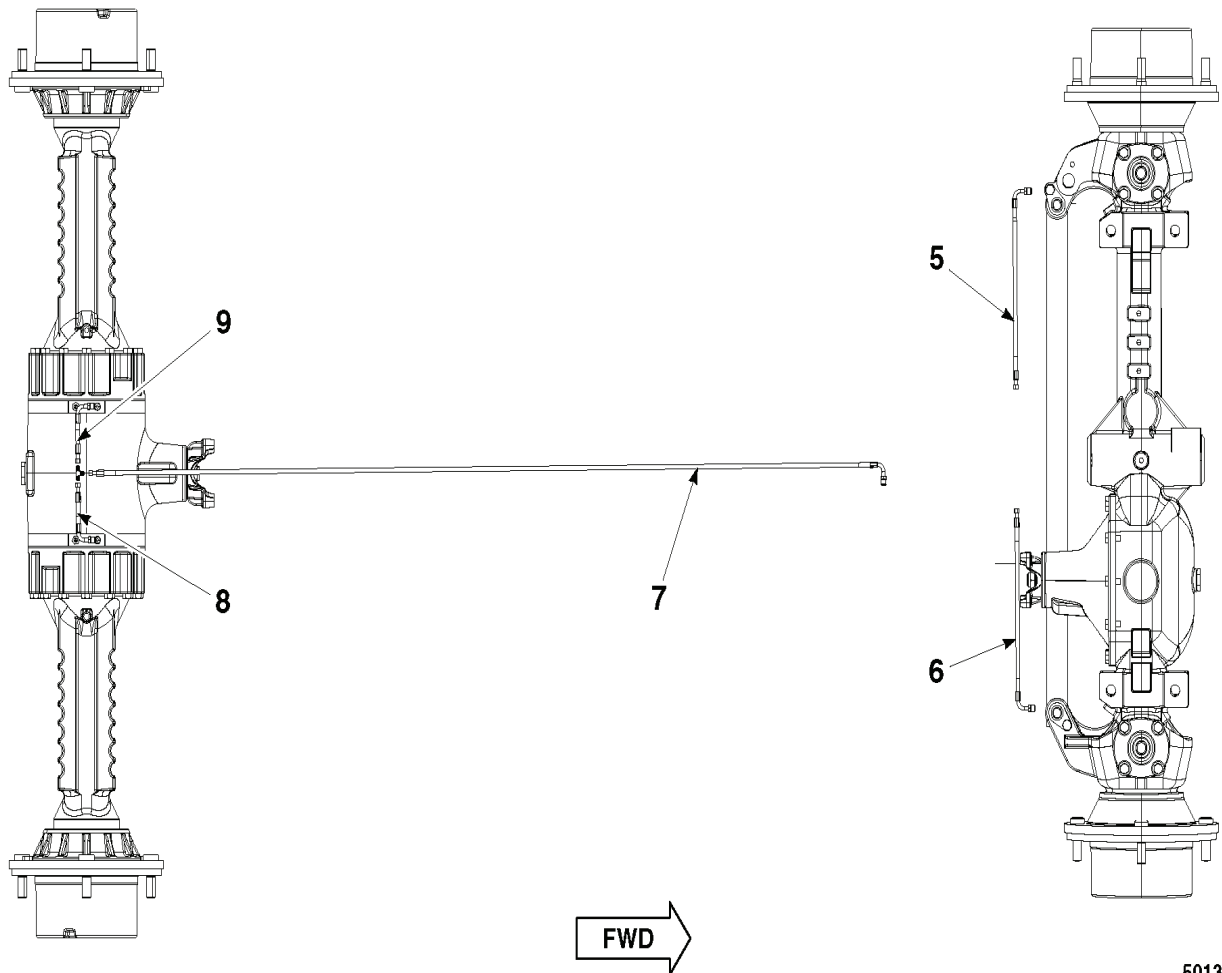


Figure 1. Brake System Components and Hoses



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Figure 2. Brake Lines, Hose/Tube Assemblies.

**WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**REMOVAL**

1. Disconnect appropriate brake hose/tube assembly at both ends and remove.
2. Cap and plug as necessary to facilitate maintenance.

**END OF TASK****INSTALLATION**

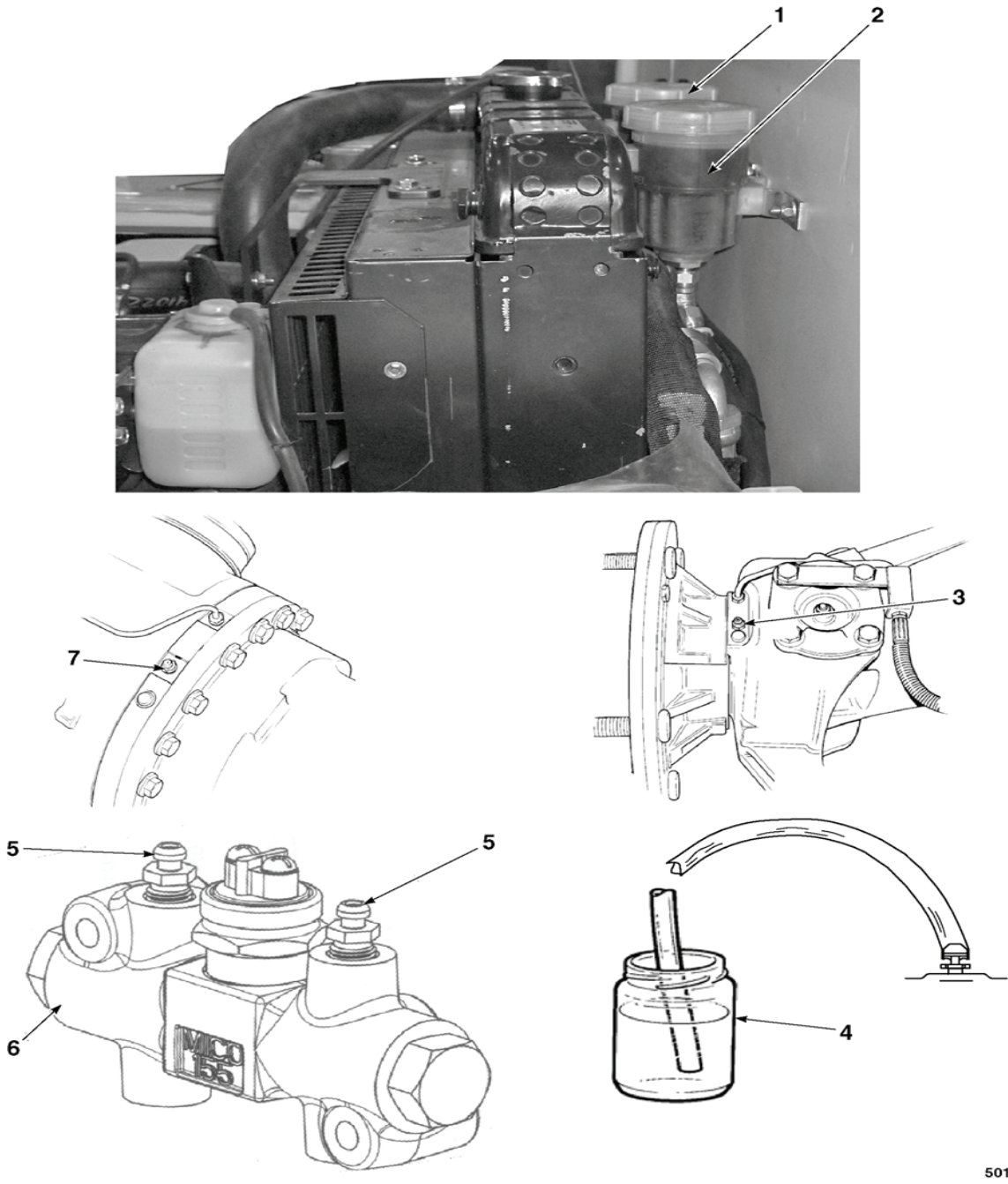
1. Install brake hose/tube assembly at both ends and tighten.
2. Bleed brake system this work package.

**END OF TASK**

**BLEED AND SERVICE BRAKES**

**WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.



501348M-118

Figure 3. Service Brake Bleeding

**CAUTION**

The use of incorrect brake fluid will cause serious damage to seals, which could cause brake failure.

**NOTE**

Location of brake valve is under center console panel.

Fill the brake reservoirs with the correct fluid and make sure the fluid levels are not allowed to fall below the MINIMUM mark during the bleeding process.

1. Disconnect battery negative cables (WP 0091).
2. Jack vehicle (all 4 wheels) (WP 0021).
3. Open engine cover (WP 0020).
4. Remove center console access panel (WP 0020).

**NOTE**

Clean all brake bleeder ports prior to clear hose connection then place the free end in the bleed container (Figure 3, Item 4).

**Brake Valve Bleeding**

5. Attach clear bleeder tube to the brake valve forward bleeder port (Figure 3, Item 5).
6. Pump brake pedal and hold pressure.
7. Open forward bleeder port (Figure 3, Item 5) allowing air to purge.
8. Close bleeder port before brake pedal reaches the floor.
9. Repeat procedure until all air is removed.
10. Repeat steps 7 through 11 for rear bleeder port (Figure 3, Item 5).

**Rear Axle Bleeding (2 Bleeder Ports)**

11. Attach clear bleeder tube to the rear axle right side bleeder port (Figure 3, Item 7).
12. Pump brake pedal and hold pressure.
13. Open bleeder port (Figure 3, Item 7) and allow air to purge.
14. Close bleeder port before brake pedal reaches the floor.
15. Repeat steps 14-16 until all air is removed.
16. Repeat steps 13 through 17 for rear axle left side bleeder port (not shown).

**Front Axle Bleeding (2 Bleeder Ports)**

17. Attach clear bleeder tube to front axle left side bleeder port (Figure 3, Item 3).
18. Pump brake pedal and hold pressure.
19. Open bleeder port (Figure 3, Item 3) and allow air to purge.
20. Close bleeder port before brake pedal reaches the floor.
21. Repeat steps 20-22 until all air is removed.
22. Repeat steps 19 through 23 for front axle right side bleeder port (not shown).
23. Refill brake reservoirs (Figure 3, Items 1 and 2) to FILL LEVEL marks.
24. Install center console access panel (WP 0020).
25. Close engine cover (WP 0020).
26. Lower vehicle (WP 0021).
27. Connect battery negative cables (WP 0091).
28. Perform Maintenance Operation Check.

**END OF TASK**

**END OF WORK PACKAGE**

**FIELD MAINTENANCE**  
**PARK POSITION MOTOR (LINEAR ACTUATOR)**

**INITIAL SETUP:**

**Test Equipment**

N/A

**References**

WP 0020

WP 0091

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

**INSPECTION**

Visually inspect park position motor for mount security (clamp and clevis), wiring connector for corrosion, loose pins, wiring for broken insulation or any damage affecting serviceability.

**END OF TASK**

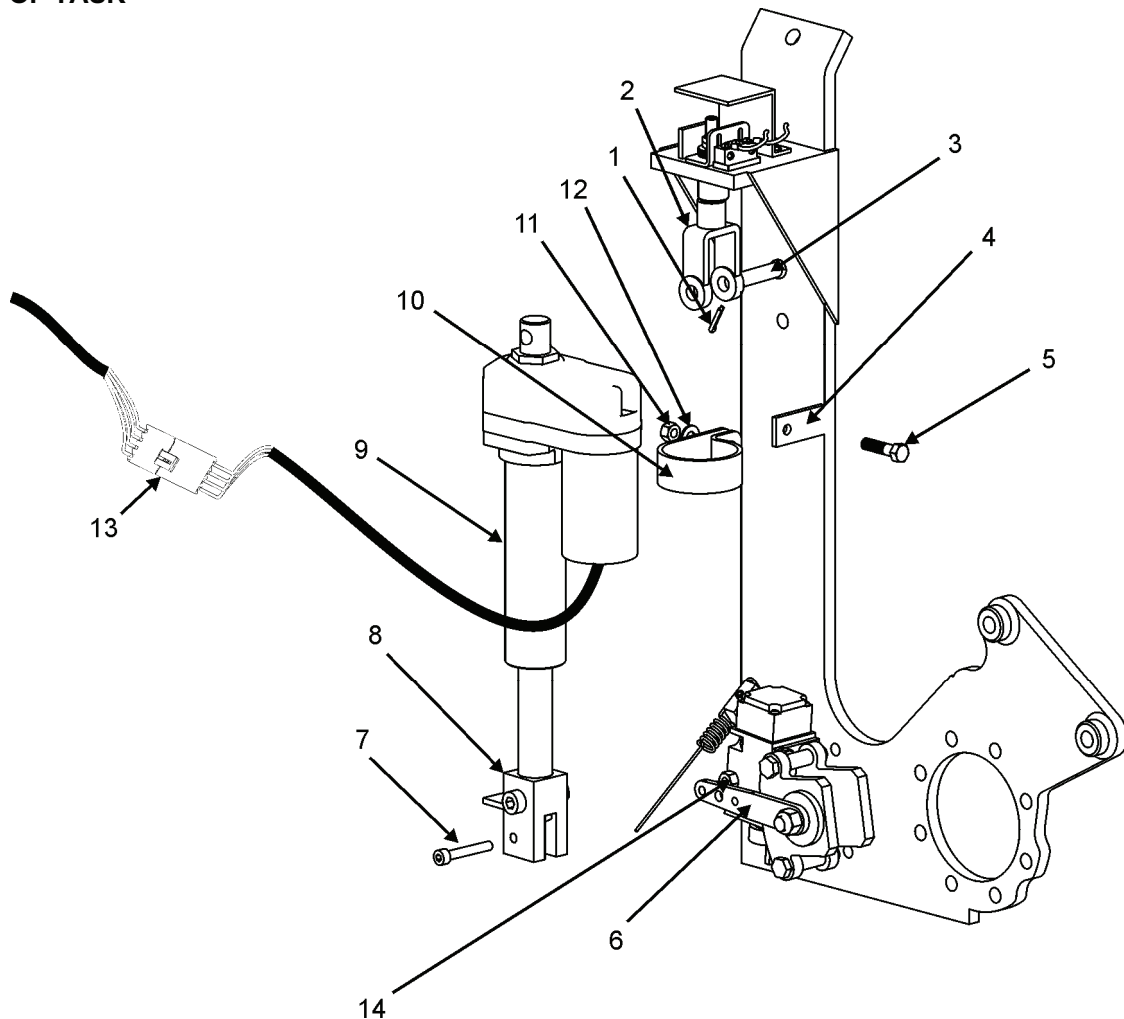


Figure 1. Park Position Brake Motor (Removal and Installation)

**REMOVAL**

1. Disconnect battery negative cables (WP 0091).
2. Remove center access panel (WP 0020).
3. Disconnect electrical connector (Figure 1, Item 13).
4. Remove shoulder bolt (Figure 1, Item 7) and nut (Figure 1, Item 14).

**NOTE**

Support park position motor actuator shaft from dropping when top clevis is removed.

5. Remove bolt, washer, and nut (Figure 1, Item 5, 11 and 12).
6. Remove clamp (Figure 1, Item 10).
7. Remove cotter pin (Figure 1, Item 1).
8. Support park position motor and remove clevis pin (Figure 1, Item 3).
9. Remove park position motor (linear actuator) (Figure 1, Item 9).

**END OF TASK****INSTALLATION****NOTE**

If replacing park position motor, remove bottom clevis from linear actuator and retain for reinstallation.

1. Attach bottom clevis (Figure 1, Item 8) to park position actuator rod (if necessary).
2. Align park position motor (Figure 1, Item 9) onto park position mount bracket (Figure 1, Item 14).
3. Install clevis pin (Figure 1, Item 3).
4. Install cotter pin (Figure 1, Item 1).
5. Install clamp onto motor (Figure 1, Item 10).
6. Install bolt, washer, and nut (Figure 1, Item 5, 12 and 11) and tighten.
7. Position clevis (Figure 1, Item 8) onto park position caliper lever (Figure 1, Item 6).
8. Install shoulder bolt (Figure 1, Item 7) and nut (Figure 1, Item 14).
9. Connect electrical connector (Figure 1, Item 13).
10. Connect battery negative cables (WP 0091).
11. Perform Maintenance Operation Check.
12. Install center access panel (WP 0020).

**END OF TASK**



### Park Position Motor/Switch Installation Test/Adjustment

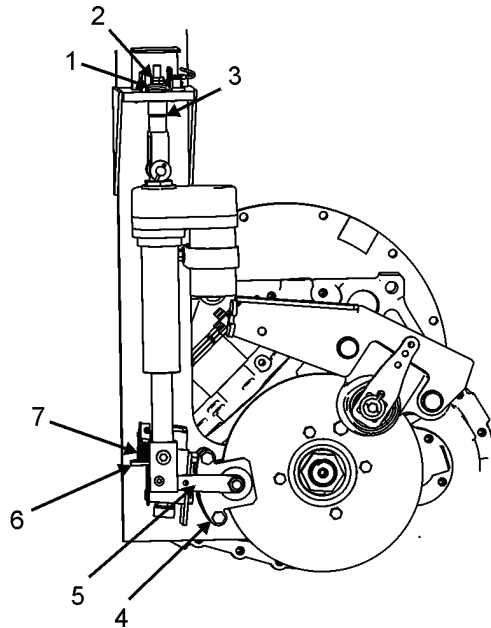


Figure 2. Park Position Motor Installation Test

1. Hand brake disengaged or off.
2. Turn ignition switch on with transmission shifter in park.
3. Move the transmission shifter to neutral (5 seconds) then back to park.
4. The actuator will retract, engaging the park position caliper (Figure 2, Item 5).
5. Bevel washers (Figure 2, Item 1) will compress actuating the upper limit switch.
6. Upper limit switch actuation opens the switch de-energizing the park position motor.
7. Adjust upper limit switch to open at point of washer compression.
8. Move gear shifter to any position other than park.
9. Actuator will extend and release park position caliper (Figure 2, Item 6).
10. Bottom clevis will actuate the lower limit switch and de-energize the park position motor.
11. Adjust lower limit switch as necessary by moving the limit switch actuator arm.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**PARK POSITION BRAKE LIMIT SWITCHES**

---

**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**Tools and Special Tools**

General Mechanic Tool Box (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0020

WP 0076

WP 0091

**Materials/Parts**

N/A

**Equipment Condition**

Engine Shut Down

---

**INSPECTION**

Inspect upper and lower switch assemblies for mount security, corrosion, loose wiring or broken terminals or any damage affecting serviceability.

**TEST**

Upper Limit Switch

**NOTE**

Disconnect battery negative cables prior to limit switch tests.

1. Remove upper limit switch this work package.
2. Ohms test at (Figure 2, Item 2) for continuity or from the normally closed to the common terminal.
3. Actuate switch (push button on bottom of switch) to open the contacts.
4. Ohms test at (Figure 2, Item 2) for open condition (no continuity).
5. Replace upper limit switch if ohms test fails.

Lower Limit Switch

1. Remove lower limit switch this work package.
2. Remove lower limit switch cover this work package.
3. Ohms test across limit switch pins (Figure 3, Item 5) for continuity.
4. Rotate actuator arm (Figure 3, Item 6) counter clockwise until switch clicks or opens.
5. Ohms test across limit switch pins (Figure 3, Item 5) for open condition (no continuity).
6. Replace lower limit switch if ohms test fails.

**END OF TASK**

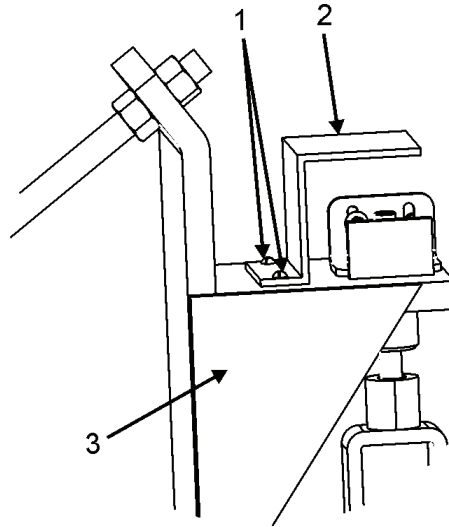


Figure 1. Upper Limit Switch Guard

## REMOVAL

### Upper Limit Switch

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Remove two screws (Figure 1, Item 1).
4. Remove limit switch guard (Figure 1, Item 2).

### NOTE

Tag limit switch wires to aid with reinstallation. Wire # 63 is connected to the normally closed contact and wire # 62 is connected to the common contact.

5. Remove two screws (Figure 2, Item 2).
6. Remove wiring lead # 62 (Figure 2, Item 5) and # 63 (Figure 2, Item 3) from limit switch.
7. Remove two screws, washers, and lock nuts (Figure 2, Items 4, 1 and 7).
8. Remove limit switch (Figure 2, Item 6).

## END OF TASK

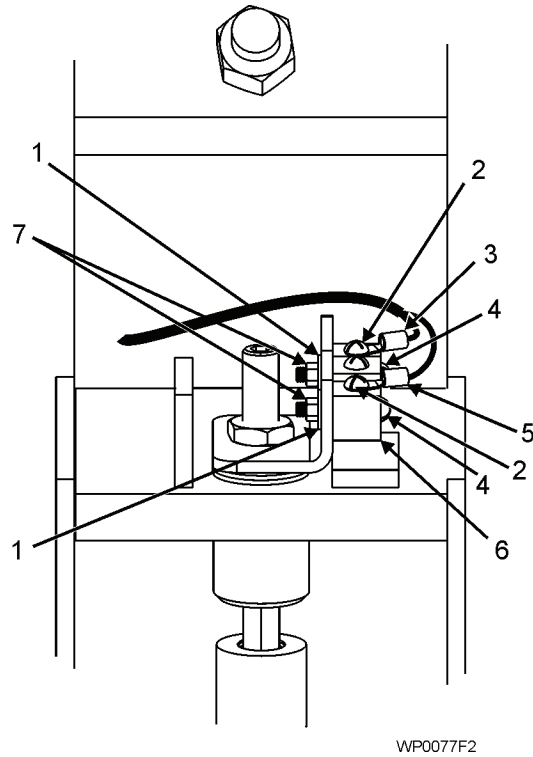


Figure 2. Upper Limit Switch (Removal and Installation)

## INSTALLATION

### Upper Limit Switch

1. Position limit switch (Figure 2, Item 6) on mounting bracket.
2. Secure using two screws, washers, and lock nuts (Figure 2, Items 4, 1 and 7).

## NOTE

Wire # 63 is connected to the normally closed contact and wire # 62 is connected to the common contact.

3. Position wiring leads # 62 (Figure 2, Item 5) and # 63 (Figure 2, Item 3) on the proper terminal.
4. Install 2 screws (Figure 2, Item 2) and tighten.
5. Position limit switch guard (Figure 1, Item 2) on bracket (Figure 1, Item 3).
6. Secure with two screws (Figure 1, Item 1).
7. Connect battery negative cables (WP 0091).
8. Perform Maintenance Operation Check.
9. If necessary adjust upper limit switch (WP 0076).
10. Install center deck plate.

## END OF TASK

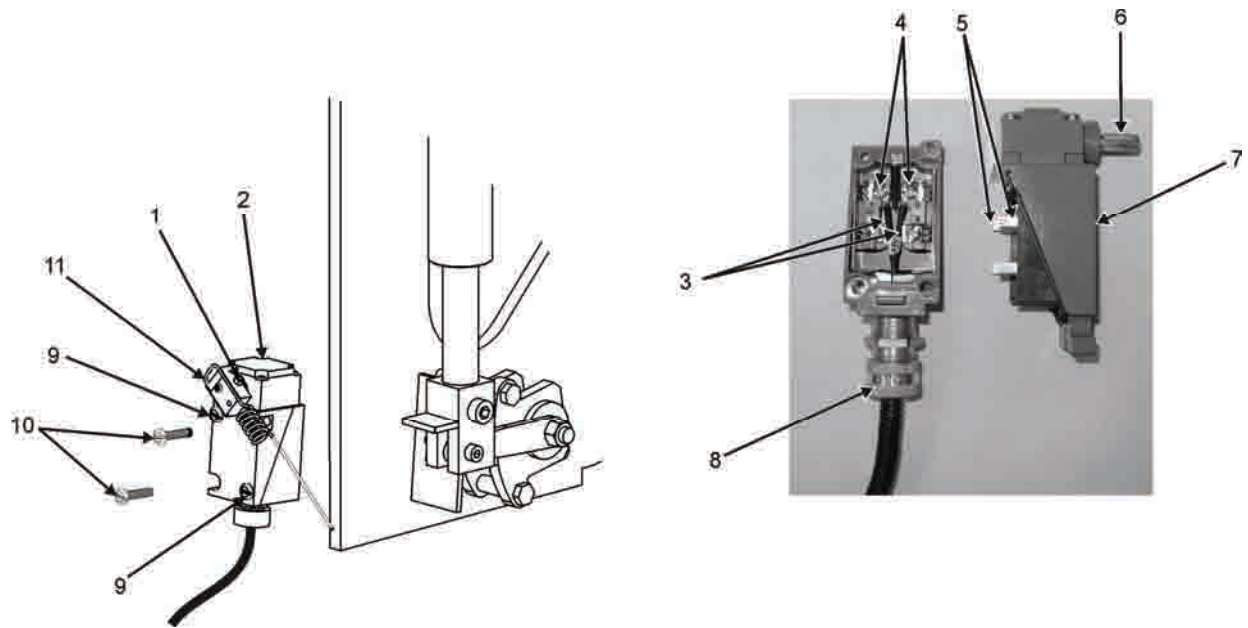


Figure 3. Lower Limit Switch (Removal and Installation)

## REMOVAL

### Lower Limit Switch

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Loosen spring arm mount bolt (Figure 3, Item 1).

### NOTE

Note position of spring arm assembly (9:00).

4. Remove spring arm assembly (Figure 3, Item 11) from switch shaft.
5. Remove 2 mount bolts (Figure 3, Item 10) and nuts.
6. Drop switch assembly (Figure 3, Item 2).
7. Remove 2 cover mount screws (Figure 3, Item 9).
8. Remove cover (Figure 3, Item 7) from switch assembly.
9. Loosen 2 wire mount screws (Figure 3, Item 4).
10. Pull 2 wires (Figure 3, Item 3) from switch assembly.
11. Remove wire stain relief plug (Figure 3, Item 8).

## END OF TASK

**INSTALLATION**

## Lower Limit Switch

**NOTE**

Remove cover from new switch assembly.

1. Install strain relief plug (Figure 3, Item 8).
2. Push 2 wires (Figure 3, Item 3) into switch assembly.
3. Loosen 2 wire mount screws (Figure 3, Item 4).
4. Install 2 wires (Figure 3, Item 3).
5. Tighten 2 wire mount screws (Figure 3, Item 4).
6. Install 2 cover mount screws (Figure 3, Item 9).
7. Position switch assembly (Figure 3, Item 2).
8. Install 2 mount bolts (Figure 3, Item 10) and nuts.

**NOTE**

Install spring arm assembly at the 9:00 o'clock position.

9. Install spring arm assembly (Figure 3, Item 11) on actuator shaft.
10. Tighten spring arm mount bolt (Figure 3, Item 1).
11. Connect battery negative cables (WP 0091).
12. Perform Maintenance Operation Check.
13. Install center deck plate (WP 0020).

**END OF TASK****END OF WORK PACKAGE**





**FIELD MAINTENANCE  
PARK POSITION CALIPER**

**INITIAL SETUP:**

**Test Equipment**

N/A

**Tools and Special Tools**

Torque Wrench, 12 ft-lb (WP 0125, Item 2)

Torque Wrench, 188 ft-lb (WP 0125, Item 3)

Wheel Chock Blocks (WP 0126, Item 1)

General Mechanic Tool Box (WP 0125, Item 8)

**References**

WP 0020

WP 0091

**Materials/Parts**

Cloth, Lint-Free (WP 0127, Item 34)

**Equipment Condition**

Engine Shut Down

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**INSPECTION**

Visually inspect the park position caliper for proper mounting, damaged components, brake disc pads (proper thickness) and all components for any damage affecting serviceability.

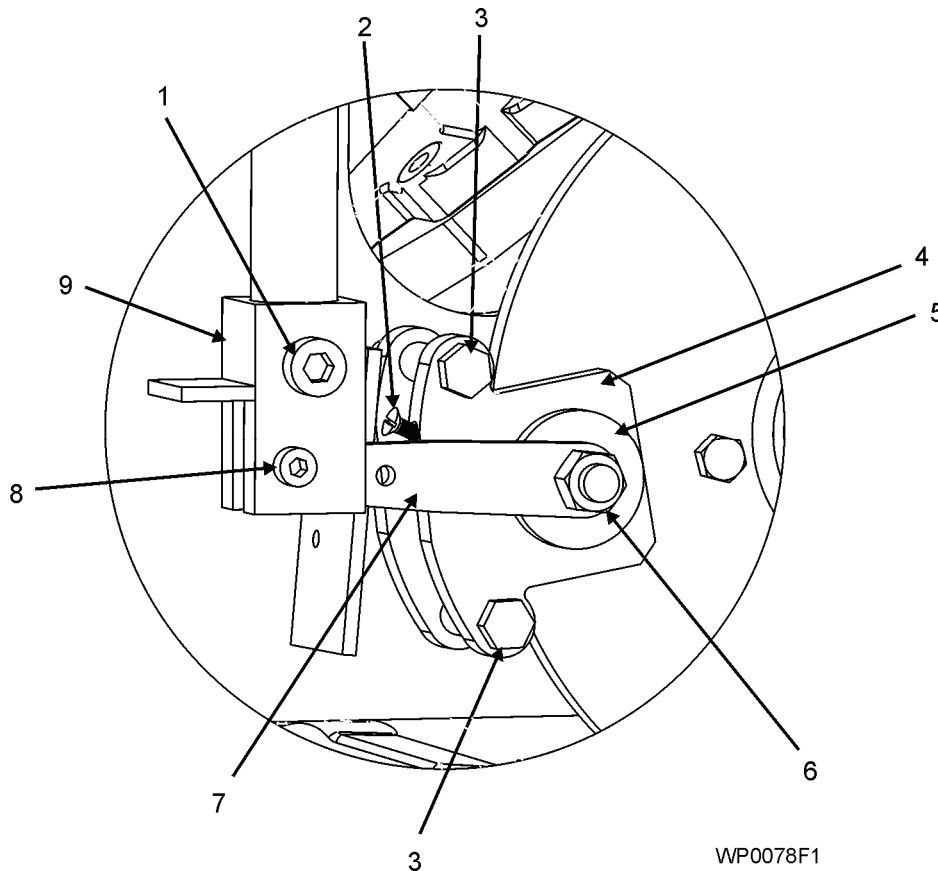


Figure 1. Park Position Caliper (Removal and Installation)

**REMOVAL****NOTE**

Proper PPE is required when performing maintenance on brake systems.

Turn ignition switch on, release the hand brake and place the transmission shifter in gear to release the park position caliper prior to performing caliper removal and replacement. Turn ignition switch off.

1. Chock front wheels.
2. Disconnect battery negative cables (WP 0091).
3. Remove center access panel (WP 0020).
4. Remove clevis mount bolt and nut (Figure 1, Item 1).
5. Remove caliper arm nut (Figure 1, Item 6).
6. Remove caliper actuator arm (Figure 1, Item 7) and bottom clevis (Figure 1, Item 9) as an assembly.
7. Loosen caliper adjustment lock bolt (Figure 1, Item 2).
8. Loosen caliper brake pad adjustment insert (Figure 1, Item 5).
9. Remove 2 caliper mount bolts and nuts (Figure 1, Item 3).
10. Remove caliper assembly (Figure 1, Item 4).

**END OF TASK****INSTALLATION****NOTE**

Loosen brake caliper pad adjustment lock bolt and open the pads prior to installation of the caliper assembly.

1. Position caliper assembly (Figure 1, Item 4).
2. Install 2 caliper mount bolts and nuts (Figure 1, Item 3).
3. Tighten caliper brake pad adjustment insert (Figure 1, Item 5) until the brake pads contact the disc then back out the insert 1/8 of a turn.
4. Tighten caliper insert adjustment lock bolt (Figure 1, Item 2).

**NOTE**

Install caliper actuator arm on the caliper spline shaft at the 9:00 o'clock position.

5. Install caliper actuator arm (Figure 1, Item 7) and bottom clevis (Figure 1, Item 9) as an assembly.
6. Install clevis mount bolt and nut (Figure 1, Item 1).
7. Install caliper arm lock nut (Figure 1, Item 6).
8. Connect battery negative cables (WP 0091).

**NOTE**

Turn ignition switch on, release the hand brake and place the gear shifter in park and check that the park position motor engages the disk. Place the gear shifter in any gear and observe the park position motor disengages the brakes. Turn ignition switch off.

9. Perform Maintenance Operation Check.
10. Install center access panel (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
HAND BRAKE LEVER**

**INITIAL SETUP:**

**Test Equipment**

N/A

**References**

WP 0005

**Tools and Special Tools**

Chock Blocks (WP 0126, Item 1)  
General Mechanic Tool Box (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

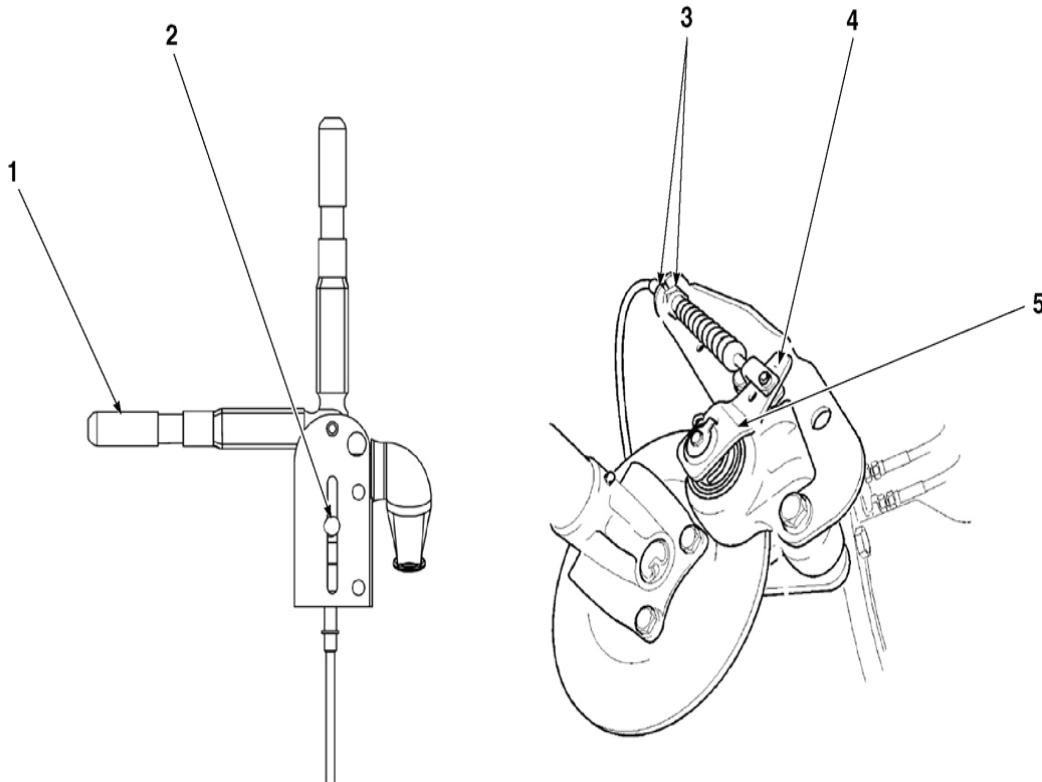
**Equipment Condition**

Engine Shut Down

**INSPECTION**

Visually inspect hand brake lever for corrosion, bent or broken parts and security of mounting. Ensure lever and adjustment knob is properly lubricated and operates smoothly.

**END OF TASK**



501348M-037

Figure 1. Hand Brake Cable – Adjustment

**Hand Brake Lever Adjustment**

1. Release hand brake lever.
2. Turn handle grip (Figure 1, Item 1) counterclockwise to center pin (Figure 1, Item 2) in slot.
3. Release the two locknuts at (Figure 1, Item 3) and adjust the cable length to give 0.40 - 0.60 in. (10 - 15 mm) of caliper lever movement at the outer cable hole (Figure 1, Item 4). The total clearance between the brake pad and brake disc should be 0.02 - 0.03 in. (0.50 - 0.75 mm).
4. Make sure there is adequate movement of caliper lever (Figure 1, Item 5) to ensure a positive brake application and that caliper lever returns to the rest position when hand brake is released.
5. Test hand brake. Make final adjustments as required at hand brake lever.

**END OF TASK****TEST****Hand Brake Holding Test**

1. Start SATS vehicle (WP 0005).
2. Hold pressure on the service brake pedal.
3. Place gear selector in D1.
4. Slowly release hand brake lever until hand brake light goes out and hold.
5. Transmission should engage at this point.
6. Release pressure on the service brake pedal and press accelerator pedal slightly.
7. The hand brake caliper should remain engaged on the brake disc (no movement).
8. Slowly release the hand brake lever allowing the vehicle to move.
9. Adjust hand brake lever or cable assembly if hand brake holding test fails.

**END OF TASK****REMOVAL****Hand Brake Lever**

1. Chock wheels.
2. Remove cotter pin (Figure 2, Item 4), washer (Figure 2, Item 3), and clevis pin (Figure 2, Item 9) securing hand brake cable (Figure 2, Item 6) to hand brake lever (Figure 2, Item 1).
3. Remove two bolts (Figure 2, Item 8) and two nuts (Figure 2, Items 2 and 5) securing hand brake lever (Figure 2, Item 1) to bracket.
4. Remove switch assembly (Figure 2, Item 7) from hand brake lever.
5. Remove hand brake lever (Figure 2, Item 1).

**END OF TASK**

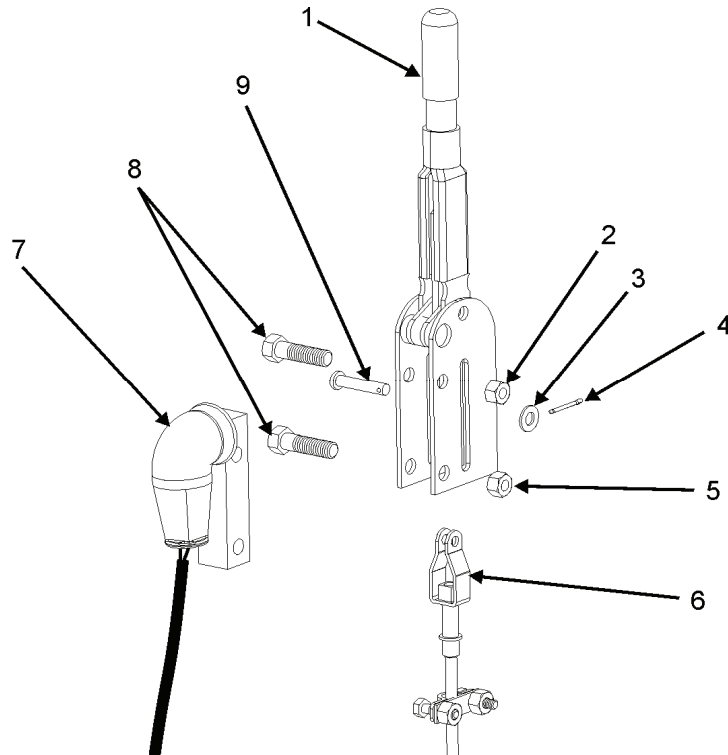


Figure 2. Hand Brake Lever (Removal and Installation)

## INSTALLATION

### Hand Brake Lever

1. Position switch assembly (Figure 2, Item 7) in hand brake lever.
2. Position hand brake lever on bracket.
3. Install two bolts (Figure 2, Item 8), two nuts (Figure 2, Items 2 and 5) securing hand brake lever to bracket.
4. Position hand brake cable (Figure 2, Item 6).
5. Install clevis pin (Figure 2, Item 9).
6. Install washer (Figure 2, Item 3) and secure with cotter pin (Figure 2, Item 4).
7. Perform hand brake adjustment this work package if necessary.
8. Remove wheel chocks.
9. Perform Maintenance Operation Check.

**END OF TASK**

**END OF WORK PACKAGE**



**FIELD MAINTENANCE  
HAND BRAKE CABLE**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0020  
WP0021  
WP 0091

**Tools and Special Tools**  
General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
N/A

**INSPECTION**

Visually inspect hand brake cable assembly for any damage affecting serviceability.

**END OF TASK**

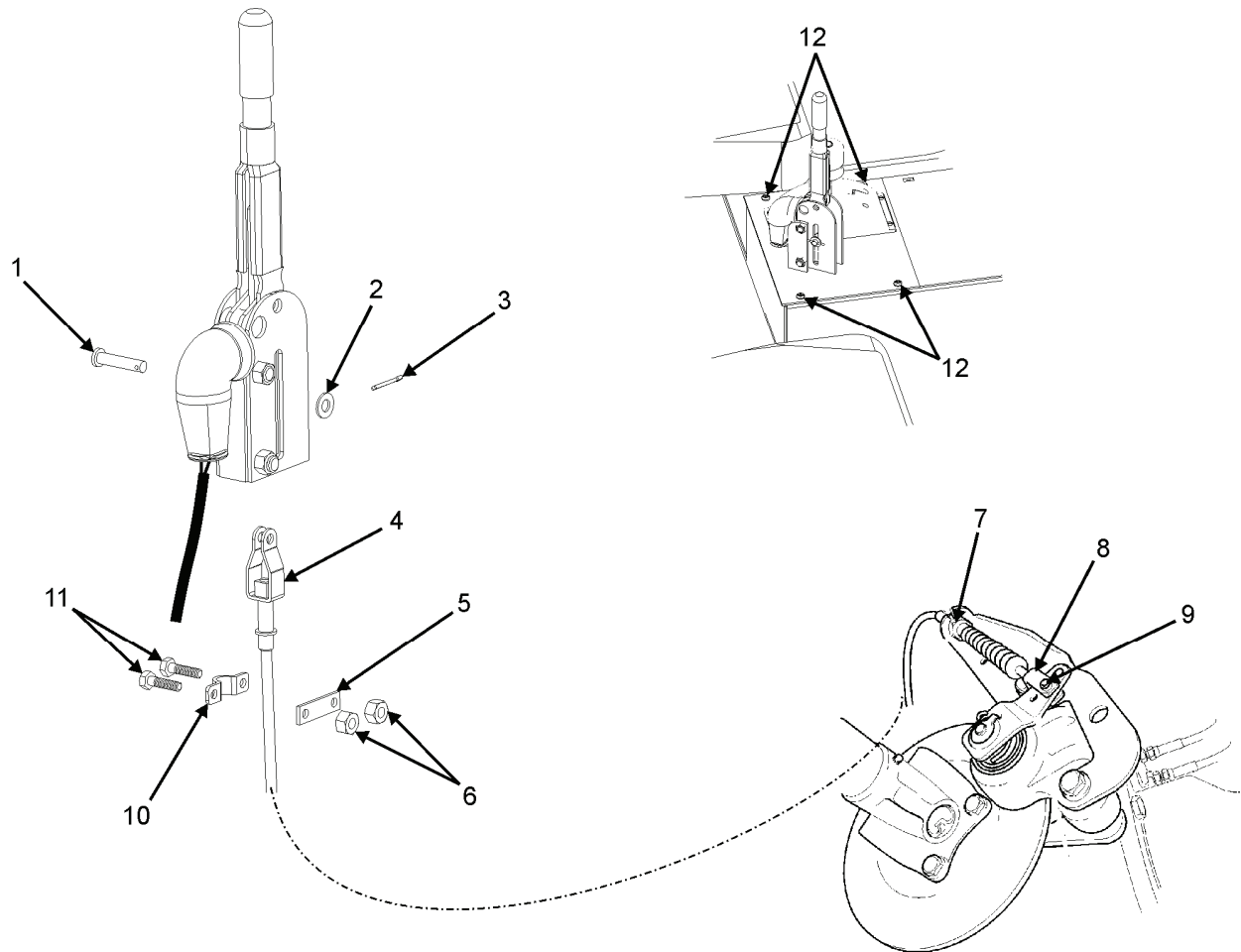


Figure 1. Hand Brake Cable Assembly

**REMOVAL****NOTE**

The hand brake cable may be removed and reinstalled without removing center plate or jacking vehicle.

Note the orientation of cable routing during removal to aid in the reinstallation process.

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Jack vehicle (WP 0021).
4. Remove 4 screws (Figure 1, Item 12).
5. Remove cotter pin (Figure 1, Item 3).
6. Remove washer (Figure 1, Item 2).
7. Remove clevis pin (Figure 1, Item 1).
8. Remove nuts (Figure 1, Item 6).
9. Remove bolts (Figure 1, Item 11).
10. Remove clamp assembly (Figure 1, Items 5 and 10).
11. Remove cotter pin and clevis pin (Figure 1, Item 9).
12. Remove clevis assembly (Figure 1, Item 8) from caliper.
13. Loosen jam nut (Figure 1, Item 7).
14. Remove hand brake cable assembly (Figure 1, Item 4).

**END OF TASK****INSTALLATION**

1. Position hand brake cable assembly (Figure 1, Item 4).
2. Install clevis pin (Figure 1, Item 1).
3. Install washer (Figure 1, Item 2).
4. Install cotter pin (Figure 1, Item 3).
5. Install clamp assembly (Figure 1, Items 5 and 10).
6. Install bolts (Figure 1, Item 11).
7. Install nuts (Figure 1, Item 6).
8. Install 4 screws (Figure 1, Item 12).
9. Route brake cable assembly (Figure 1, Item 4) to hand brake caliper.
10. Position clevis assembly (Figure 1, Item 8) on caliper lever.
11. Install clevis pin and cotter pin (Figure 1, Item 9).
12. Tighten jam nut (Figure 1, Item 7).
13. Install center plate (if removed) (WP 0020).
14. Lower vehicle (if raised) (WP 0021).
15. Connect battery negative cables (WP 0091).
16. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE  
HAND BRAKE CALIPER**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0020

WP0021

WP 0080

WP 0091

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Materials/Parts**

N/A

**Equipment Condition**

N/A

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**INSPECTION**

Visually inspect hand brake cable assembly for any damage affecting serviceability.

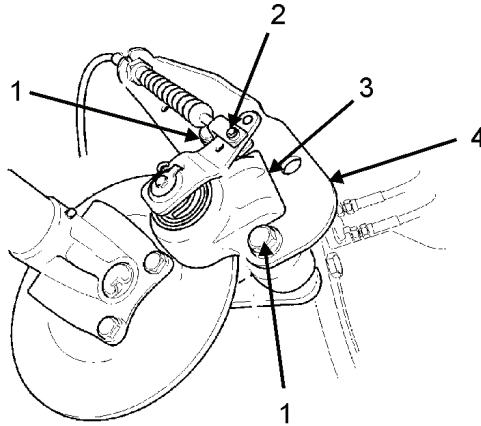
**END OF TASK**

Figure 1. Hand Brake Caliper (Removal and Installation)

**REMOVAL****NOTE**

The hand brake caliper may be removed and reinstalled without removing center plate or jacking vehicle.

Note the orientation of cable routing during removal to aid in the reinstallation process.

1. Disconnect battery negative cables (WP 0091).
2. Remove center deck plate (WP 0020).
3. Jack vehicle (WP 0021).
4. Remove hand brake cable from caliper assembly (WP 0080).
5. Remove caliper mount bolts (Figure 1, Items 1).
6. Remove caliper (Figure 1, Item 3).

#### **END OF TASK**

#### **INSTALLATION**

1. Position caliper (Figure 1, Item 3).
2. Install caliper mount bolts (Figure 1, Items 1).
3. Install hand brake cable on caliper assembly (WP 0080).
4. Install center plate (if removed) (WP 0020).
5. Lower vehicle (if raised) (WP 0021).
6. Connect battery negative cables (WP 0091).
7. Perform Maintenance Operation Check.

#### **END OF TASK**

#### **END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**HAND BRAKE LIMIT SWITCH**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0091

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**N/A

---

**INSPECTION**

Visually inspect protective boot, wiring and switch assembly for damage affecting serviceability.

**END OF TASK****TEST**

1. Ohms test across hand brake switch terminals (Figure 1, Item 3) for continuity (normally closed).
2. Replace switch if continuity test fails.

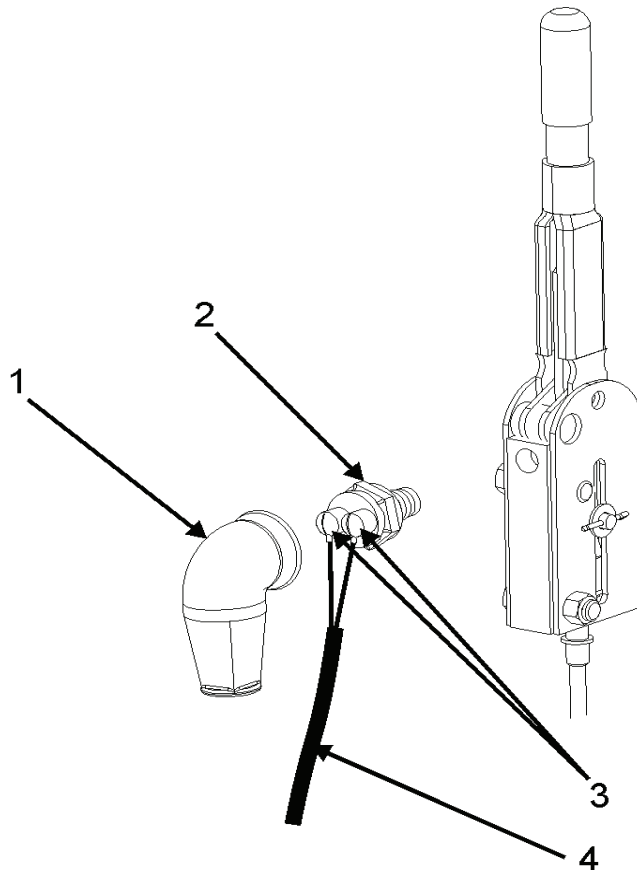


Figure 1. Hand Brake Limit Switch (Removal and Installation)

**REMOVAL**

1. Disconnect battery negative cables (WP 0091).
2. Remove protective boot (Figure 1, Item 1).
3. Remove screws and washers (Figure 1, Item 3).
4. Remove wires (Figure 1, Item 4).
5. Remove hand brake switch (Figure 1, Item 2).

**END OF TASK****INSTALLATION**

1. Install hand brake switch (Figure 1, Item 2).
2. Position wires (Figure 1, Item 4).
3. Install screws and washers (Figure 1, Item 3).
4. Install protective boot (Figure 1, Item 1).
5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**WHEELS AND TIRES**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0021

**Tools and Special Tools**

Hydraulic Floor Jack (WP 0125, Item 15)  
Torque Wrench, 400 ft-lb (WP 0125, Item 5)  
General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**Engine Shut Down

---

**INSPECTION****Tires**

Visually inspect tires for cuts, foreign objects stuck in the tread, proper inflation, rubber dry rot, and for any damage affecting serviceability. (Tire inflation pressure 80 PSI)

**Wheels**

Visually inspect wheel assembly mount security (loose lug nuts), bent rims and for any damage affecting serviceability. (Wheel lug nut torque is 400 ft-lb)

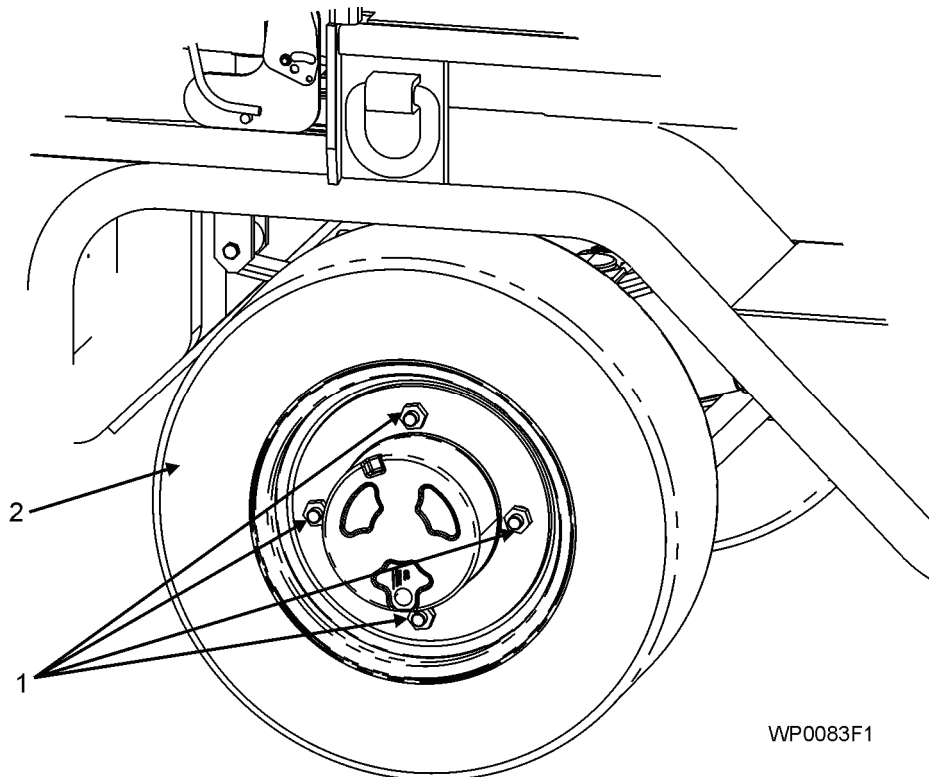
**END OF TASK**

Figure 1. Wheel Assembly (Removal and Installation)

**REMOVAL****WARNING**

Use extreme caution when lifting heavy components. Never permit any part of the body to be positioned under these components being lifted or suspended. Use suitable lifting equipment for heavy components. Failure to follow these instructions can result in serious injury or death.

**NOTE**

All 4 wheel removal and installation procedures are the same.

1. Lift vehicle (WP 0021).
2. Remove 4 wheel lug nuts (Figure 1, Item 1).
3. Remove wheel (Figure 1, Item 2).

**END OF TASK****INSTALLATION****WARNING**

Failure to follow proper wheel installation procedures could result in wheel mounting failure and or loss of vehicle control.

Do not apply lubricant to wheel studs, as it will result in inaccurate tightening torque.

1. Clean and dry wheel lug nuts, studs, and mating surfaces.
2. Position wheel assembly (Figure 1, Item 2) on studs.
3. Install 4 wheel lug nuts (Figure 1, Item 1) and snug.
4. Torque wheel lug nuts (Figure 1, Item 1) in a crisscross pattern to 400 ft lbs.
5. Lower the vehicle (WP 0021).
6. Perform Maintenance Operation Check.

**WARNING**

Perform an additional wheel lug nut re-torque after 1 and 8 hours of operation, then monthly or every 250 hours of operation.

7. Re-torque wheel lug nuts (Figure 1, Item 1) in a crisscross pattern to 400 ft-lb.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**SHOCK ABSORBER (FRONT AND REAR)**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0020

WP 0087

**Tools and Special Tools**

Hydraulic Floor Jack 5 Ton (WP 0125, Item 15)

Jack Stand 5 Ton (WP 0125, Item 16)

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

---

**INSPECTION**

Visually inspect shock absorbers for broken mounts, loose mount bolts, leaks or any damage affecting serviceability.

**END OF TASK****REMOVAL****Front Shock Absorbers**

1. Remove both seats (WP 0087).
2. Remove center console plate (WP 0020).
3. Remove mount bolt (Figure 1, Item 4), washer (Figure 1, Item 6) and nut (Figure 1, Item 7).
4. Remove mount bolt (Figure 1, Item 1) and washer (Figure 1, Item 2).
5. Remove shock absorber (Figure 1, Item 3) from vehicle.
6. Repeat steps 3, 4, and 5 and remove the other front shock absorber.

**END OF TASK****INSTALLATION****Front Shock Absorbers**

1. Position front shock absorber (Figure 1, Item 3) on top mount.
2. Install mount bolt (Figure 1, Item 1) and washer (Figure 1, Item 2) and tighten.

**NOTE**

Shock may have to be collapsed or expanded to line up with the bottom mount.

3. Install mount bolt (Figure 1, Item 4), washer (Figure 1, Item 6) and nut (Figure 1, Item 7) and tighten.
4. Repeat steps 1, 2 and 3 to install the other front shock absorber.
5. Install center console plate (WP 0020).
6. Install seats (WP 0087).
7. Perform Maintenance Operation Check.

**END OF TASK**

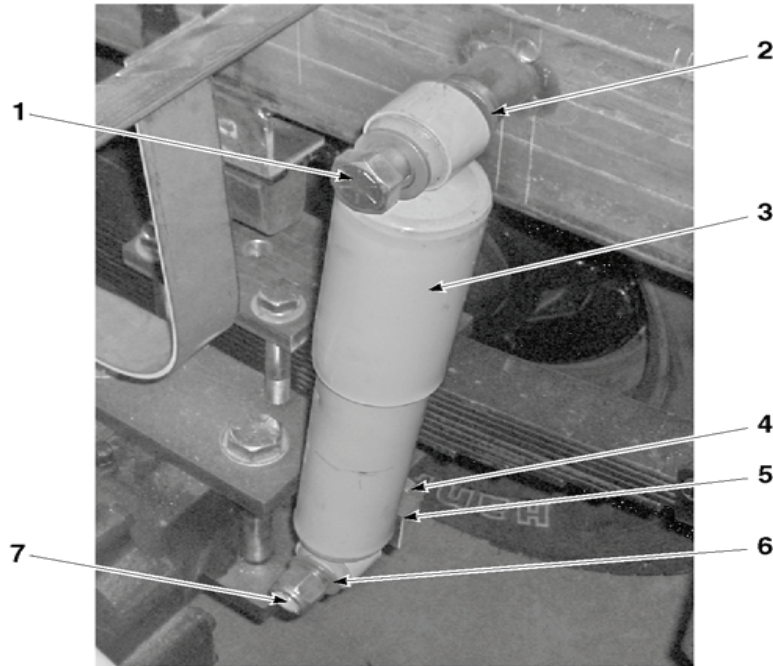


Figure 1. Front and Rear Shock Absorbers (Removal and Installation.)

### Removal

#### Rear Shock Absorbers

1. Remove rear deck plate (WP 0020).
2. Remove mount bolt (Figure 1, Item 4) washer (Figure 1, Item 6) and nut (Figure 1, Item 7).
3. Remove mount bolt (Figure 1, Item 1) and washer (Figure 1, Item 2).
4. Remove shock absorber (Figure 1, Item 3) from vehicle.
5. Repeat steps 3, 4, and 5 and remove the other rear shock absorber.

### END OF TASK

### INSTALLATION

#### Rear Shock Absorbers

1. Position rear shock absorber (Figure 1, Item 3) on top mount.
2. Install bolt (Figure 1, Item 1) and washer (Figure 1, Item 2) and tighten.

### NOTE

Shock may have to be collapsed or expanded to line up with the bottom mount.

3. Install mount bolt (Figure 1, Item 4), washer (Figure 1, Item 6) and nut (Figure 1, Item 7) and tighten.
4. Repeat steps 1, 2 and 3 to install the other front shock absorber.
5. Perform Maintenance Operation Check.
6. Install rear deck plate.

### END OF TASK

### END OF WORK PACKAGE



**FIELD MAINTENANCE**  
**SPRING ASSEMBLY (FRONT AND REAR)**

**INITIAL SETUP:**

**Test Equipment**

N/A

**References**

WP 0021

WP 0083

WP 0084

WP 0091

**Tools and Special Tools**

Chock Blocks (WP 0126, Item 1)

Hydraulic Floor Jack, 5 Ton (WP 0125, Item 15)

Jack Stands, 5 Ton (WP 0125, Item 16)

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

**INSPECTION**

Visually inspect all spring assemblies for mount security, leaf cracks, and breaks or for any damage affecting serviceability.

**END OF TASK**

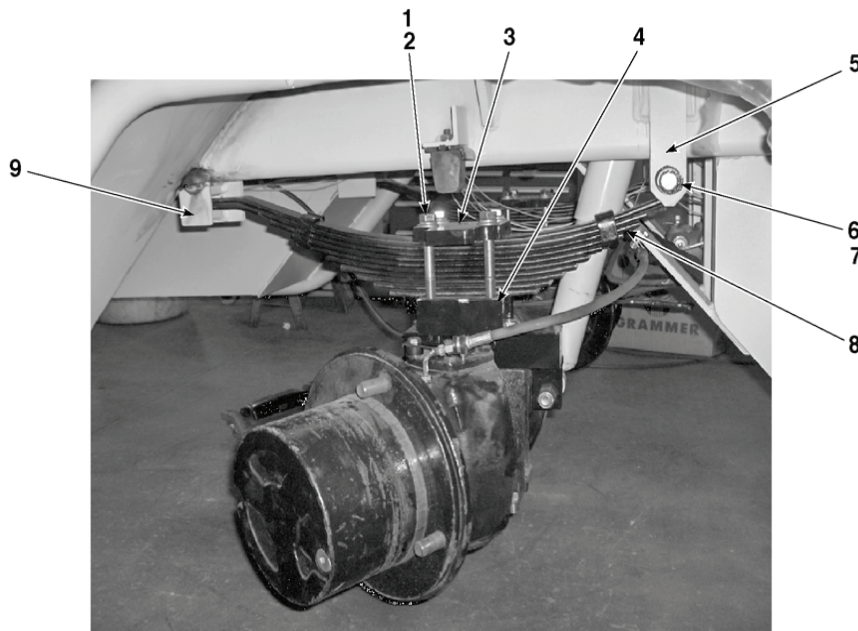


Figure 1. Front Springs (Removal and Installation)

**REMOVAL**

**Front Springs**

1. Chock rear wheels.
2. Disconnect battery negative cables (WP 0091).
3. Jack vehicle front (WP 0021).
4. Remove front wheels (WP 0083).
5. Position floor jack under the axle end assembly and apply pressure to the axle.
6. Remove lower shock mount bolt (WP 0084).
7. Remove leaf mount bolt and nut (Figure 1, Items 6 and 7) and remove bolt.
8. Remove 4 spring mount bolts and washers (Figure 1, Items 1 and 2) and remove bolts.
9. Remove spring plate (Figure 1, Item 3).
10. Remove 2 axle mount nuts and washers (WP 0066).
11. Lower axle jack 1 to 2 inches.
12. Remove spring assembly (Figure 1, Item 8).

## END OF TASK

## INSTALLATION

### Front Springs

1. Position spring assembly in the shackles (Figure 1, Item 9 and 5).
2. Install leaf mount bolt and nut (Figure 1, Items 6 and 7) and tighten.
3. Raise axle jack and apply pressure to the spring assembly.
4. Install spring plate (Figure 1, Item 3) on aligning pin.
5. Install 4 spring mount bolts and washers (Figure 1, Items 1 and 2) and tighten.
6. Install lower shock mount bolt (WP 0084).
7. Install 2 axle mount nuts and washers (WP 0066).
8. Install front wheels (WP 0083).
9. Lower vehicle (WP 0021).
10. Connect battery negative cables (WP 0091).
11. Perform Maintenance Operation Check.

## END OF TASK

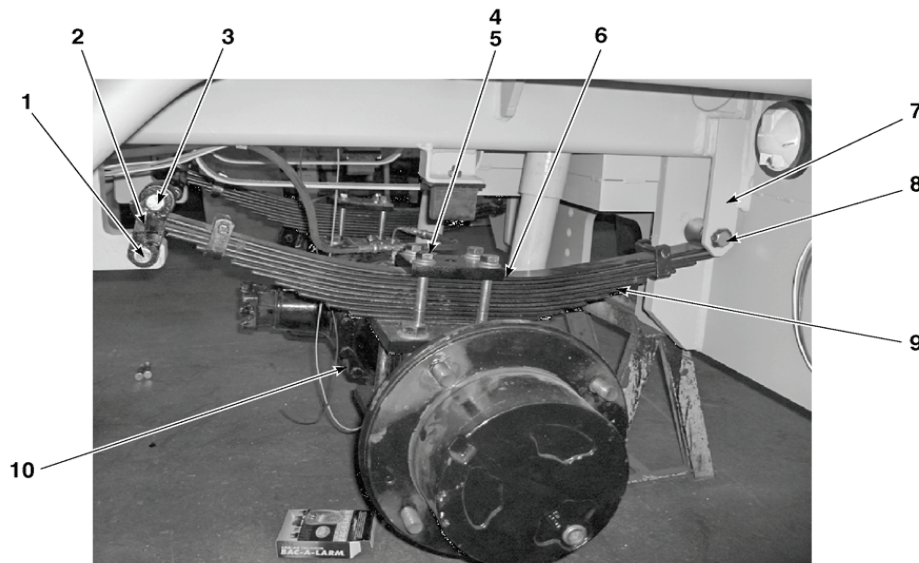


Figure 2. Rear Springs (Removal and Installation)

## REMOVAL

**Rear Springs**

1. Chock front wheels.
2. Disconnect battery negative cables (WP 0091).
3. Jack vehicle rear (WP 0021).
4. Remove rear wheels (WP 0083).
5. Position floor jack under the axle end assembly and apply pressure to the axle.
6. Remove lower rear shock mount bolt (WP 0084).
7. Remove 1 rear leaf mount bolt and nut (Figure 2, Item 8).
8. Remove 2 front leaf mount bolts and nuts (Figure 2, Items 1 and 3) and remove bolts.
9. Remove 4 spring mount bolts, washers and nuts (Figure 2, Items 4 and 5) and remove bolts.
10. Remove spring plate (Figure 2, Item 6).
11. Remove 4 rear axle mount nuts (WP 0066).
12. Lower axle jack 1 to 2 inches.
13. Remove spring assembly (Figure 2, Item 9).

**END OF TASK****INSTALLATION****Rear Springs**

1. Position spring assembly (Figure 2, Item 9) in the shackles.
2. Install rear leaf mount bolt and nut (Figure 1, Items 6 and 7) and tighten.
3. Install 2 front leaf mount bolts and nuts (Figure 2, Items 1 and 3) and tighten.
4. Raise axle jack and apply pressure to the spring assembly.
5. Install spring plate (Figure 2, Item 6) on aligning pin.
6. Install 4 spring mount bolts, washers and nuts (Figure 2, Items 4 and 5) and tighten.
7. Install rear lower shock mount bolt (WP 0084).
8. Install 4 rear axle mount nuts (WP 0066).
9. Install rear wheels (WP 0083).
10. Lower vehicle (WP 0021).
11. Connect battery negative cables (WP 0091).
12. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**PINTLE HITCH**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

N/A

**Tools and Special Tools**

Wheel Chocks (WP 0126, Item 1)  
Grease Gun (WP 0125, Item 26)  
Torque Wrench, 100 ft-lb (WP 0125, Item 3)  
General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

Grease (WP 00127, Item 15)

**Equipment Condition**

Engine Shut Down

**Personnel Required**91B, Light Wheel Vehicle Mechanic

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**WARNING**

Two person lift is required for adjustment of front and rear towing hitches. One person will use both hands to hold center bar while second person adjust pins. Hitch side weights 78 lbs, when adjusting height avoid all pinch areas.

**INSPECTION**

Inspect pintle hitch assembly for mount security, worn, damaged, or missing parts, and excessive movement of upper jaw. When closed, the maximum gap between the upper and lower jaw is 3/16 of an inch. Replace hook assembly if gap exceeds 3/16 of an inch. When closed, lift up on latch and measure the distance (slop) between the hook and the latch. Replace latch if gap exceeds 1/4 of an inch.

**END OF TASK****REMOVAL****NOTE**

Figure 1 illustrates a front (exterior) and rear (interior) view of the pintle hitch assembly.

The front and rear hitch assemblies are identical. Removal and replacement procedures are the same.

1. Chock wheels.
2. Remove cotter pin (Figure 1, Item 9).

**WARNING**

When removing the nut and washer keep constant pressure on spring. Wear protective gloves. Remove nut slowly and be careful not to let spring release quickly. Quick release of spring may cause injury.

3. Remove nut (Figure 1, Item 1) and washer (Figure 1, Item 8) together while holding spring.
4. Remove spring (Figure 1, Item 2).
5. Remove six mounting nuts (Figure 1, Item 7).
6. Remove six mounting bolts (Figure 1, Item 5).
7. Hold rear hitch portion (Figure 1, Item 3).
8. Slide front hitch portion (Figure 1, Item 4) from rear hitch portion (Figure 1, Item 4).
9. Remove hitch assembly.

**END OF TASK**

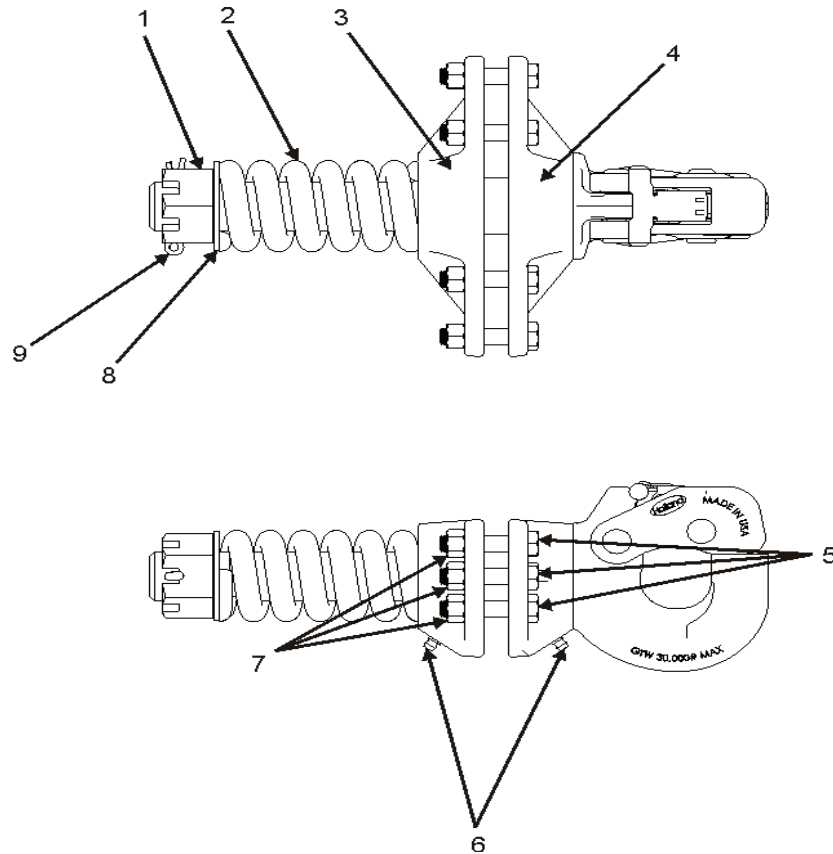


Figure 1. Pintle Hitch (Removal and Installation)

## INSTALLATION

### NOTE

Ensure the zerk fittings (Figure 1, Item 6) on front and rear hitch portions are mounted with the zerk facing the ground.

1. Position pintle and slide front hitch portion (Figure 1, Item 4) into rear hitch portion (Figure 1, Item 3)
2. Install six mounting bolts (Figure 1, Item 5).
3. Install six mounting nuts (Figure 1, Item 7) loosely.
4. Install spring (Figure 1, Item 2).
5. Install washer (Figure 1, Item 8) and nut (Figure 1, Item 1) loosely.
6. Ensure pintle is aligned and torque six mounting nuts (Figure 1, Item 7) to 60 ft-lbs minimum.
7. Tighten nut (Figure 1, Item 1) until it is snug against the spring.
8. Tighten nut (Figure, Item 1) an additional  $\frac{1}{2}$  turn minimum.
9. Align nut (Figure 1, Item 1) with cotter pin slot.
10. Install cotter pin (Figure 1, Item 9).
11. Lubricate pintle hitch at 2 zerk fittings (Figure 1, Item 6).
12. Remove wheel chocks.
13. Perform Maintenance Operation Check.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**SEAT**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

N/A

**Tools and Special Tools**

N/A

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**Engine Shut Down

---

**INSPECTION**

Inspect seat for tears, rips, deterioration or any damage affecting serviceability.

**END OF TASK****NOTE**

The removal process is the same for both the driver and passenger seats.

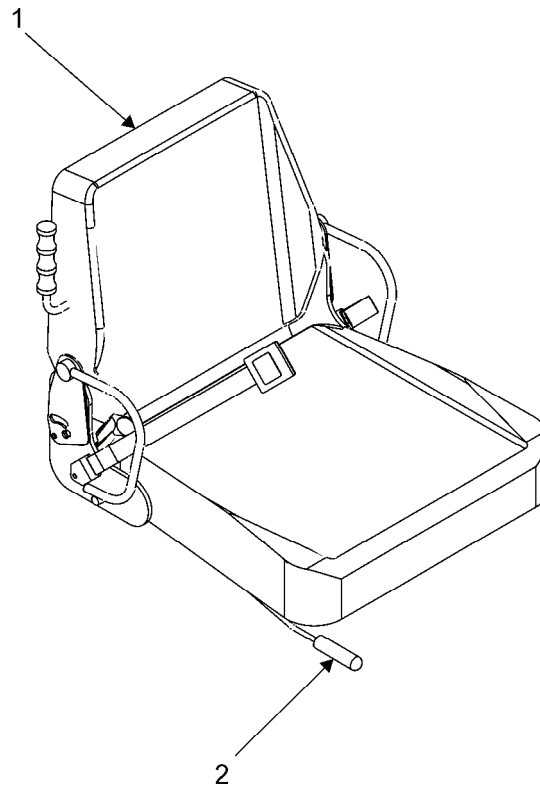


Figure 1. Seat (Removal and Installation)

**REMOVAL**

1. Lift and hold fore/aft knob (Figure 1, Item 2).
2. Slide seat (Figure 1, Item 1) forward.
3. Remove seat (Figure 1, Item 1) once it clears slide rails.

**END OF TASK****INSTALLATION**

1. Lift and hold fore/aft knob (Figure 1, Item 2).
2. Slide seat (Figure 1, Item 1) into position on slide rails.
3. Lift and hold fore/aft knob (Figure 1, Item 2) to adjust seat (Figure 1, Item 1).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**SEAT BELT**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

N/A

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**Engine Shut Down

---

**INSPECTION**

Inspect seat belts for mount security, tears, rips, or any damage affecting serviceability.

**END OF TASK****NOTE**

The removal/installation process is the same for all seat belt assemblies.

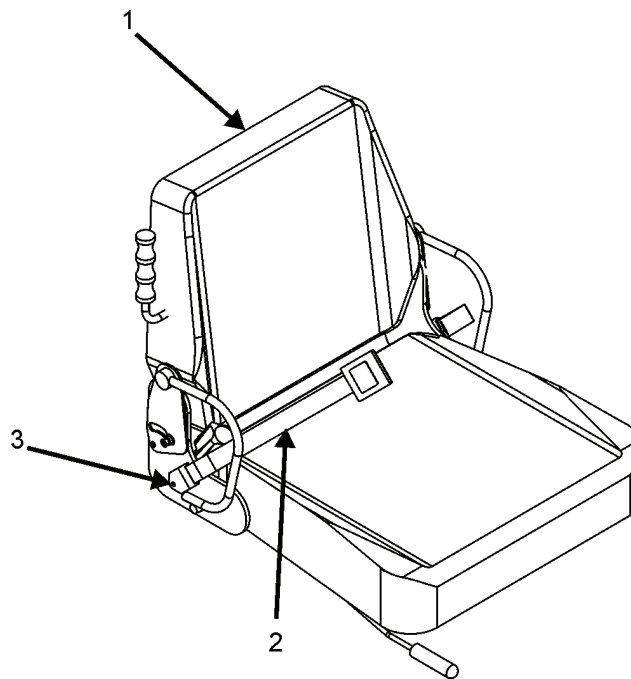


Figure 1. Seat Belt (Removal and Installation)

**REMOVAL**

1. Remove bolt and washer (Figure 1, Item 3) securing seat belt (Figure 1, Item 2) to seat (Figure 1, Item 1).
2. Remove belt.

**END OF TASK****INSTALLATION**

1. Position seat belt.
2. Install seat belt (Figure 1, Item 2) on seat (Figure 1, Item 1) and secure using bolt and washer (Figure 1, Item 3).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**FIRE EXTINGUISHER**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

N/A

**Tools and Special Tools**

N/A

**Materials/Parts**

N/A

**Personnel Required**

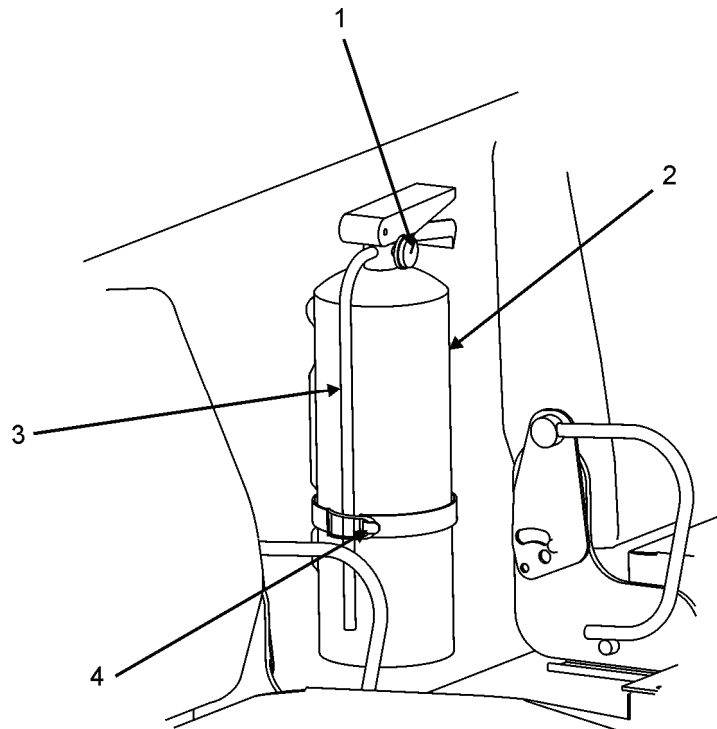
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**N/A

---

**INSPECTION**

1. Check gauge (Figure 1, Item 1) to ensure arrow is in the green area (195 psi).
2. Visually check fire bottle (Figure 1, Item 2) and hose (Figure 1, Item 3) for dents, cracks, or leakage.
3. Ensure safety pin and seal are installed.

**END OF TASK**

WP0089F1

Figure 1. Fire Extinguisher (Removal and Installation)

**REMOVAL**

1. Open fire extinguisher (Figure 1, Item 2) support bracket clamp (Figure 1, Item 4).
2. Remove fire extinguisher (Figure 1, Item 2).

**END OF TASK****INSTALLATION**

1. Install fire extinguisher (Figure 1, Item 2) into the fire extinguisher support bracket.
2. Close fire extinguisher support bracket clamp (Figure 1, Item 4).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**BATTERY**

---

**INITIAL SETUP:****Test Equipment**

Load Tester (WP 0125, Item 17)

**References**WP 0020  
TM 9-6140-200-14**Tools and Special Tools**Battery Post Brush (WP 0125, Item 27)  
General Mechanics Tool Kit (WP 0125, Item 8)**Materials/Parts**Sodium Bicarbonate (WP 0127, Item 46)  
Petrolatum Technical (WP 0127 Item 32)**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

---

**INSPECTION/TEST**

1. Open battery access cover.
2. Inspect battery posts for corrosion and damage affecting serviceability.
3. Inspect batteries for cracks, which allow acid leaks from the batteries.
4. Replace as necessary.
5. Inspect battery hold down strips, j-bolts and battery compartment for corrosion or any damage affecting serviceability.
6. Load Test batteries with a battery load tester TM 9-6140-200-14.

**END OF TASK****WARNING****BATTERIES**

• To avoid injury, eye protection and acid-resistant gloves must be worn when working around batteries. Do not smoke, use open flame, make sparks or create other ignition sources around batteries. If a battery is giving off gases, it can explode and cause injury to personnel. Remove all jewelry such as rings, ID tags, watches, and bracelets. If jewelry or a tool contacts a battery terminal, a direct short will result in instant heating or electric shock, damage to equipment, and injury to personnel.

• Sulfuric acid contained in batteries can cause serious burns. If battery corrosion or electrolyte makes contact with skin, eyes or clothing, take immediate action to stop the corrosive burning effects. Failure to follow these procedures may result in injury or death.

1. Eyes. Flush with cold water for no less than 15 minutes and seek medical attention immediately.
2. Skin. Flush with large amounts of cold water until all acid is removed. Seek medical attention as required.
3. Internal. If corrosion or electrolyte is ingested, drink large amounts of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Seek medical attention immediately.
4. Clothing/Equipment. Wash the affected area with large amounts of cold water. Neutralize acid with baking soda or household ammonia.

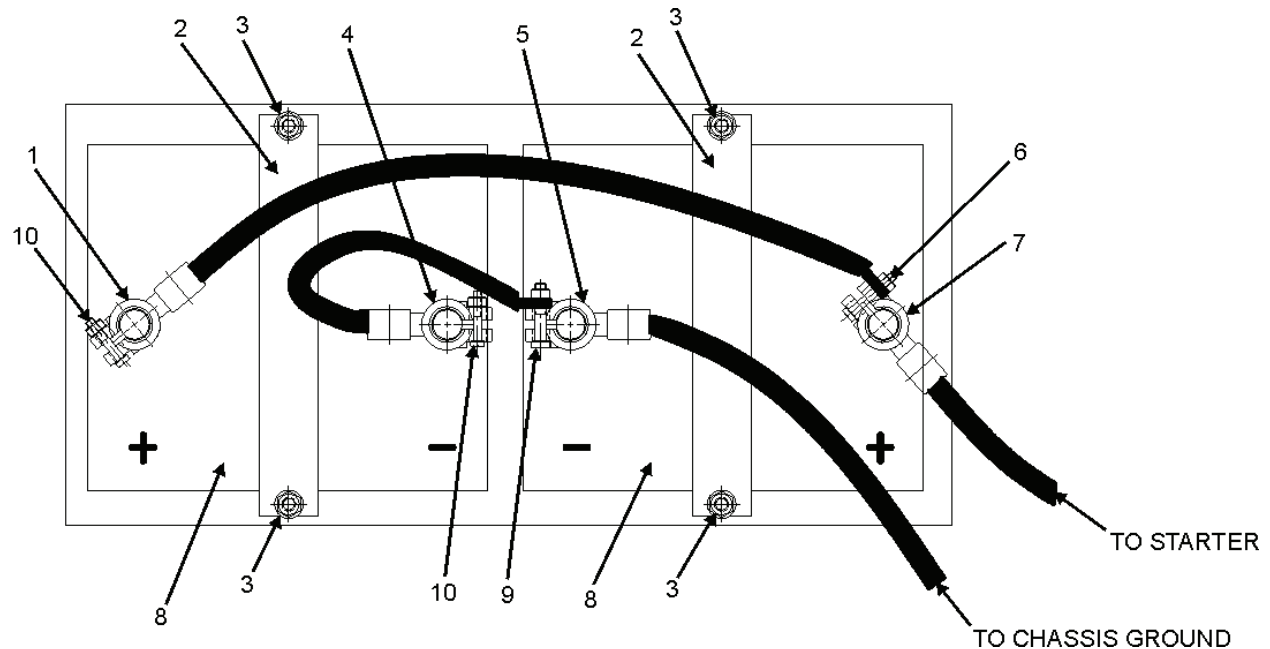


Figure 1. Battery (Removal and Installation)

## REMOVAL

1. Remove rear deck panel (WP 0020).

## WARNING

To avoid electrical shock or damage to equipment, disconnect negative battery cables first, then positive battery cables.

## NOTE

Battery terminal covers removed from illustration for clarity.

## NOTE

Replace batteries in pairs.

2. Remove battery terminal covers.
3. Loosen negative terminal nuts (Figure 1, Items 9 and 10).
4. Remove negative battery cables (Figure 1, Items 4 and 5) from batteries (Figure 1, Items 8).
5. Loosen positive terminal nuts (Figure 1, Items 6 and 10).
6. Remove positive battery cables (Figure 1, Items 1 and 7) from batteries (Figure 1, Items 8).
7. Remove 4 nuts (Figure 1, Item 3) from J-Bolts.
8. Remove 2 hold down straps (Figure 1, Item 2).
9. Remove batteries (Figure 1, Items 8).

## END OF TASK

**INSTALLATION****CAUTION**

Always connect positive battery cables first to avoid equipment damage.

1. Install batteries (Figure 1, Items 8) as illustrated in Figure 1.
2. Position hold down straps (Figure 1, Item 2) over J-Bolts.
3. Install 4 nuts (Figure 1, Item 3) and tighten.
4. Apply a thin coat of Petrolatum Technical, a corrosion preventive compound, to all battery posts.
5. Position positive battery cables (Figure 1, Items 1 and 7).
6. Tighten positive terminal nuts (Figure 1, Items 6 and 10).
7. Position negative battery cables (Figure 1, Items 4 and 5).
8. Tighten negative terminal nuts (Figure 1, Items 9 and 10).
9. Perform Maintenance Operation Check.
10. Apply a thin coat of Petrolatum Technical, a corrosion preventive compound, to all battery terminal connectors.

**NOTE**

Battery terminal covers are not shown in illustration for clarity.

11. Install battery terminal covers.
12. Install rear deck panel (WP 0020).

**END OF TASK****END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**BATTERY CABLES**

---

**INITIAL SETUP:****Test Equipment**

N/A

**Tools and Special Tools**

Wire Brush (WP 0125, Item 28)

General Mechanics Tool Kit (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0020

WP 0026

WP 0035

**Materials/Parts**

Sodium Bicarbonate (WP 0127, Item 46)

Wire Ties (WP 0127, Item 47)

Petrolatum Technical (WP 0127, Item 32)

**Equipment Condition**

N/A

---

**INSPECTION**

Inspect cables at the batteries, starter and at the transmission bell housing. Inspect all connections for security, corrosion, breaks in cable insulation, chaffing and damage affecting serviceability. Replace as necessary.

**END OF TASK****WARNING****BATTERIES**

- To avoid injury, eye protection and acid-resistant gloves must be worn when working around batteries. Do not smoke, use open flame, make sparks or create other ignition sources around batteries. If a battery is giving off gases, it can explode and cause injury to personnel. Remove all jewelry such as rings, ID tags, watches, and bracelets. If jewelry or a tool contacts a battery terminal, a direct short will result in instant heating or electric shock, damage to equipment, and injury to personnel.

- Sulfuric acid contained in batteries can cause serious burns. If battery corrosion or electrolyte makes contact with skin, eyes or clothing, take immediate action to stop the corrosive burning effects. Failure to follow these procedures may result in injury or death.

1. Eyes. Flush with cold water for no less than 15 minutes and seek medical attention immediately.
2. Skin. Flush with large amounts of cold water until all acid is removed. Seek medical attention as required.
3. Internal. If corrosion or electrolyte is ingested, drink large amounts of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Seek medical attention immediately.
4. Clothing/Equipment. Wash affected area with large amounts of cold water. Neutralize acid with baking soda or household ammonia.

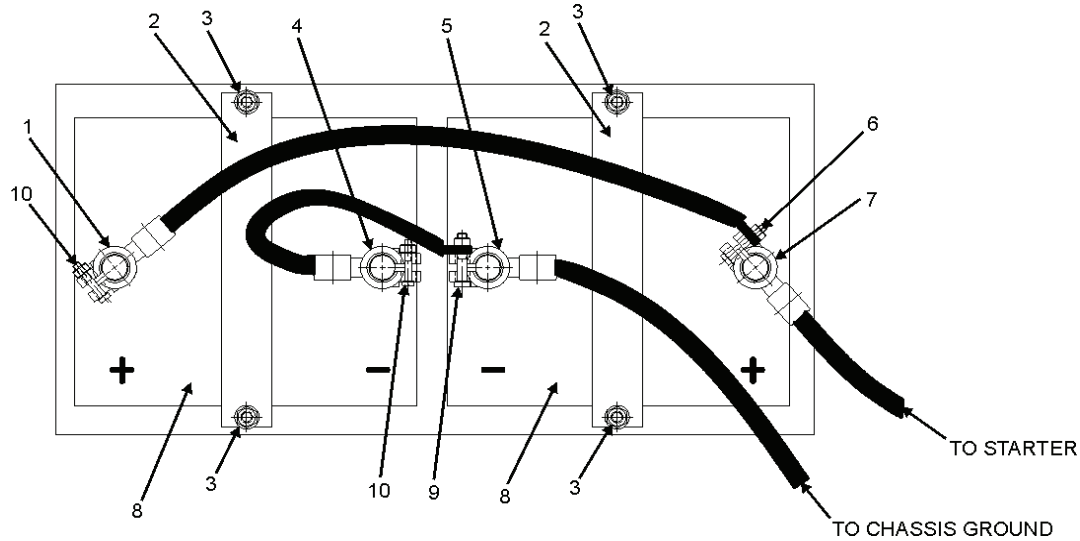


Figure 1. Battery Cable (Removal and Installation)

## REMOVAL

### NOTE

Tag all cable connections if reinstalling to ease with the reinstallation process.

Note routing of cable assemblies during removal to aid in the reinstallation process.

1. Open battery cover.
2. Loosen negative terminal mount nuts (Figure 1, Items 9 and 10).
3. Remove negative cables from batteries.
4. Loosen positive terminal mount bolts (Figure 1, Items 1 and 6).
5. Remove cables from batteries.
6. Remove other end of positive battery cable from starter (WP 0026).
7. Remove positive cable assembly.
8. Remove other end of negative battery cable from transmission bell housing (WP 0035).
9. Remove negative cable assembly.

## INSTALLATION

1. Secure positive battery cable terminal end to starter (WP 0026).
2. Route positive battery cable connectors.
3. Position on batteries as illustrated in (Figure 1, Items 1 and 7).
4. Tighten nuts (Figure 1, Items 6 and 10).
5. Secure negative battery cable terminal end to the transmission bell housing (WP 0035).
6. Route negative battery cable connectors.
7. Position on batteries as illustrated in (Figure 1, Items 4 and 5).
8. Tighten nuts (Figure 1, Items 9 and 10).
9. Perform Maintenance Operation Check.
10. Apply a thin coat of Petrolatum Technical, a corrosion preventive compound, to the battery posts.
11. Close battery cover.

## END OF TASK

## END OF WORK PACKAGE

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**FIELD MAINTENANCE  
HARNESS**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

N/A

**Tools and Special Tools**

Standard Automotive Tool Set (WP 0125, Item 9)

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Remove all Access Panels (WP 0020)

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**INSPECTION**

Visually inspect harness for loose or damaged connectors, wiring for breaks in insulation, corrosion at terminal ends and connectors. Replace as necessary.

**END OF TASK****REPAIR****Connector Replacement****NOTE**

Harness repair is limited to replacement of connectors. Perform the following steps for each wire of connector.

1. Tag wires to aid in installation.
2. Using pin removal tool, position tool over pin (Figure 1, Item 1) and push inward to retract two barbs of pin.
3. Remove wire (Figure 1, Item 2) with pin (Figure 1, Item 1) attached from rear of connector (Figure 1, Item 3).
4. Remove pin (Figure 1, Item 1) from wire (Figure 1, Item 2) by cutting through wire just behind pin.
5. Using wire stripping tool, strip insulation of wire (Figure 2, Item 1) to expose proper length of metal strands (Figure 2, Item 4).
6. Using crimping tool, securely crimp tabs (Figure 2, Item 3) of pin (Figure 2, Item 5) over metal strands (Figure 2, Item 4) of wire (Figure 2, Item 1).

**NOTE**

The other two tabs of pin may need to be crimped slightly in order to enter connector.

7. Using crimping tool, crimp tabs (Figure 2, Item 2) at rear of pin (Figure 2, Item 5) over insulation of wire (Figure 2, Item 1).
8. Push pin (Figure 2, Item 5) into rear of connector (Figure 1, Item 3) until fully seated.

**END OF TASK**

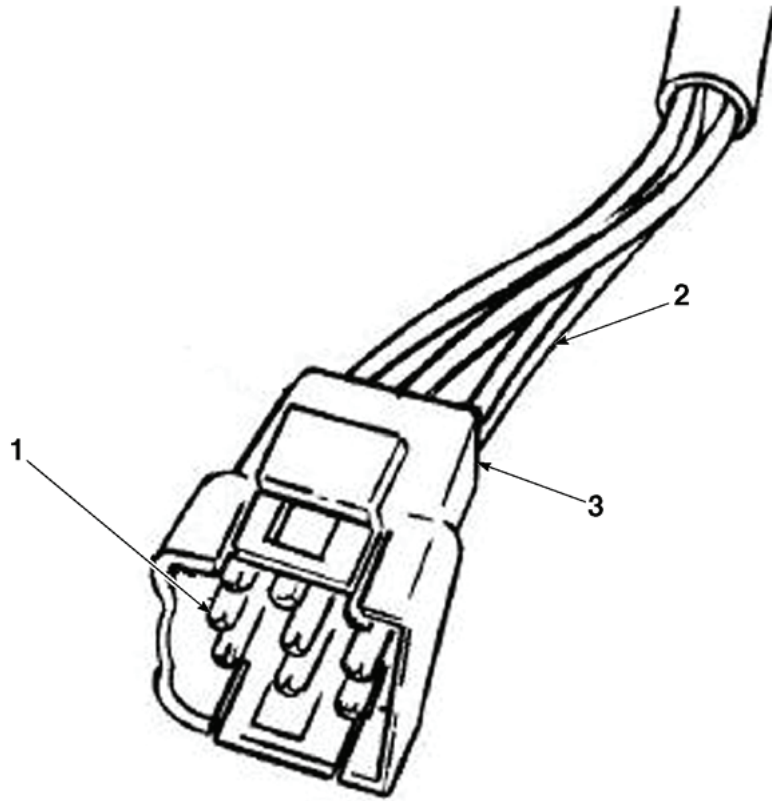


Figure 1. Connector – Removal.

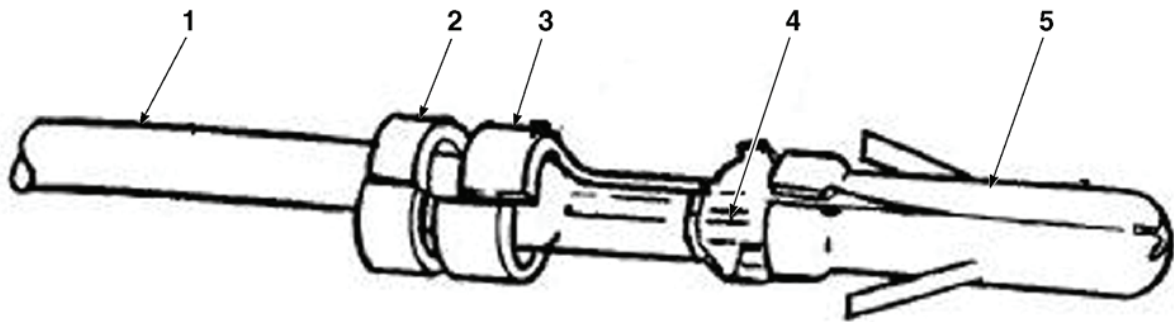


Figure 2. Connector – Installation.

### Sealed Connector Replacement

1. Open hinged cover (Figure 3, Item 8) of connector (Figure 3, Item 7) for access to rear of connector.

#### NOTE

Perform the following steps for each wire of connector.

2. Tag wires to aid in installation.
3. Using pin removal tool, position tool over pin (Figure 3, Item 6) and push inward to retract two barbs of pin.
4. Remove wire (Figure 3, Item 1), with pin (Figure 3, Item 6) and seal (Figure 3, Item 3) attached, from rear of connector (Figure 3, Item 7).
5. If defective, remove pin (Figure 3, Item 6) and seal (Figure 3, Item 3) from wire (Figure 3, Item 1) by cutting through wire just behind seal.
6. Position new seal (Figure 3, Item 3) on wire (Figure 3, Item 1).
7. Using wire stripping tool, strip insulation of wire (Figure 3, Item 1) to expose 1/8 in. (3 mm) length of metal strands (Figure 3, Item 2).
8. Using crimping tool, securely crimp tabs (Figure 3, Item 5) of pin (Figure 3, Item 6) over metal strands (Figure 3, Item 2) of wire (Figure 3, Item 1).
9. Slide seal (Figure 3, Item 3) next to pin (Figure 3, Item 6) and crimp tabs (Figure 3, Item 4) of pin over end of seal.
10. Push pin (Figure 3, Item 6) into rear of connector (Figure 3, Item 7) until fully seated. Remove tags.
11. Close hinged cover (Figure 3, Item 8) of connector (Figure 3, Item 7).

### END OF TASK

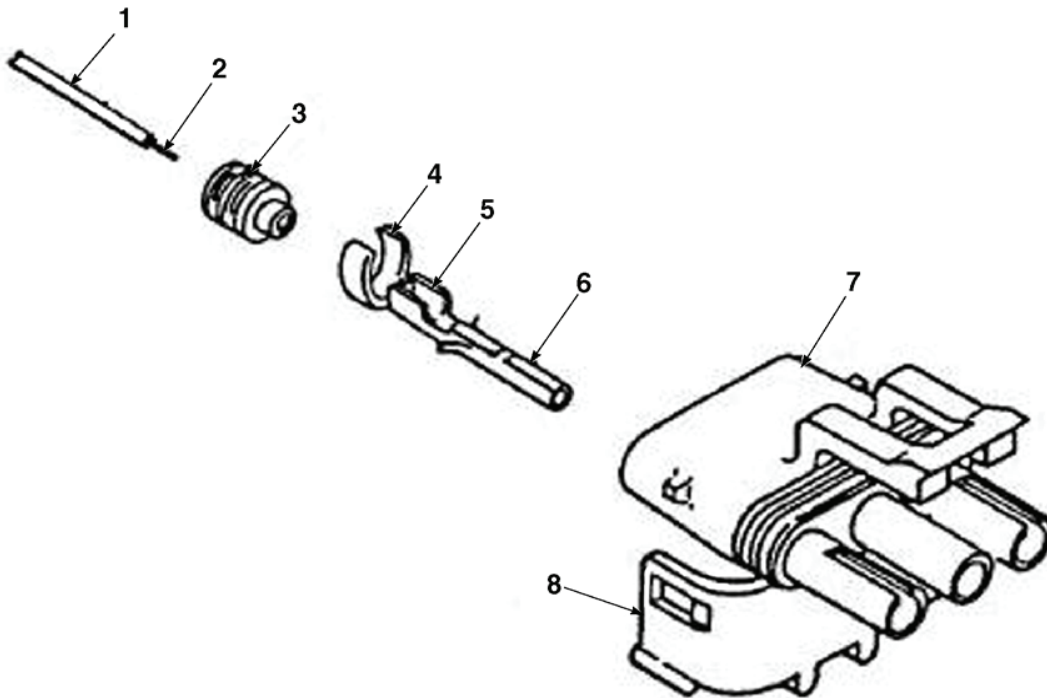


Figure 3. Sealed Connector – Replacement.

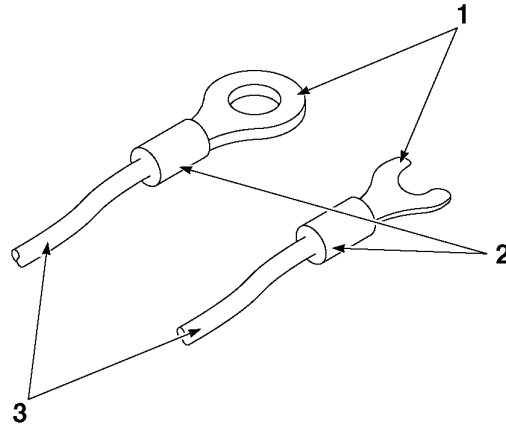


Figure 4. Wire Terminal Lug – Replacement.

### Wire Terminal Lug Replacement

#### NOTE

Replace is the same for both types of wire terminal lugs.

1. Cut off damaged terminal lug (Figure 4, Item 1).
2. If necessary, slide heat shrinks tubing over wires (Figure 4, Item 3).
3. Using wire stripper, strip enough insulation (Figure 4, Item 2) from wire (Figure 4, Item 3) to allow bare wire to go all the way into hole in terminal lug.
4. Select proper terminal lug (Figure 4, Item 1) for wire size and terminal.
5. Insert bare end of wire (Figure 4, Item 3) all the way into terminal lug (Figure 4, Item 1).
6. Crimp terminal lug (Figure 4, Item 1) to wire (Figure 4, Item 3). Ensure that connection is tight.
7. If heat shrink tubing is used, slide tubing over connection and shrink in place.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**HEADLIGHT**

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**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**References**

N/A

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

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**INSPECTION****NOTE**

Headlight protective cover must be removed to perform proper inspection.

Visually inspect sealed headlight for cracks, loose connections, or condensation buildup in light. Replace as necessary.

**END OF TASK****REMOVAL****Bulb Replacement**

1. Remove four bolts (Figure 1, Item 1) and four nuts (Figure 1, Item 2) securing protective cover (Figure 1, Item 3) to tow vehicle.
2. Disconnect connector (Figure 2, Item 4) from headlight (Figure 2, Item 2).
3. Remove defective light bulb (twist and pull) from headlight.

**INSTALLATION****Bulb Replacement**

1. Install new light bulb (push and twist) into headlight.
2. Install connector (Figure 2, Item 4) to headlight (Figure 2, Item 2).
3. Install protective cover (Figure 1, Item 3) on tow vehicle and secure with four bolts (Figure 1, Item 1) and four nuts (Figure 1, Item 2).

**END OF TASK****REMOVAL****Headlight Assembly**

1. Remove four bolts (Figure 1, Item 1) and four nuts (Figure 1, Item 2) protective cover (Figure 1, Item 3) to tow vehicle.
2. Disconnect connector (Figure 2, Item 4) from headlight (Figure 2, Item 2).
3. Remove headlight assembly (Figure 2, Item 2) from front of vehicle.

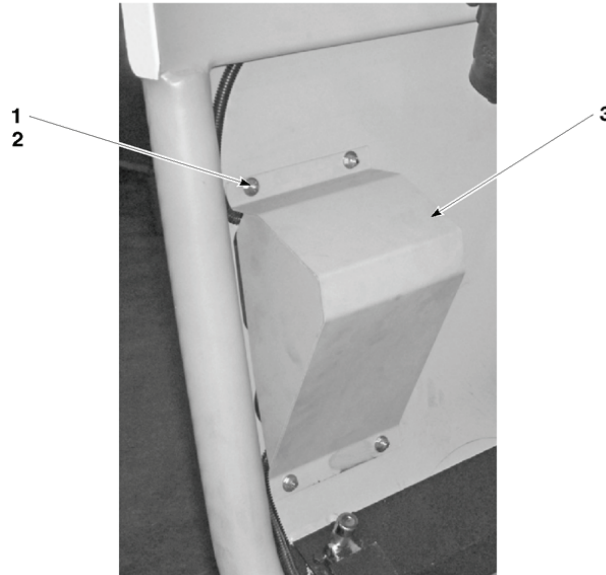
**END OF TASK**

Figure 1. Sealed Headlight – Guard.

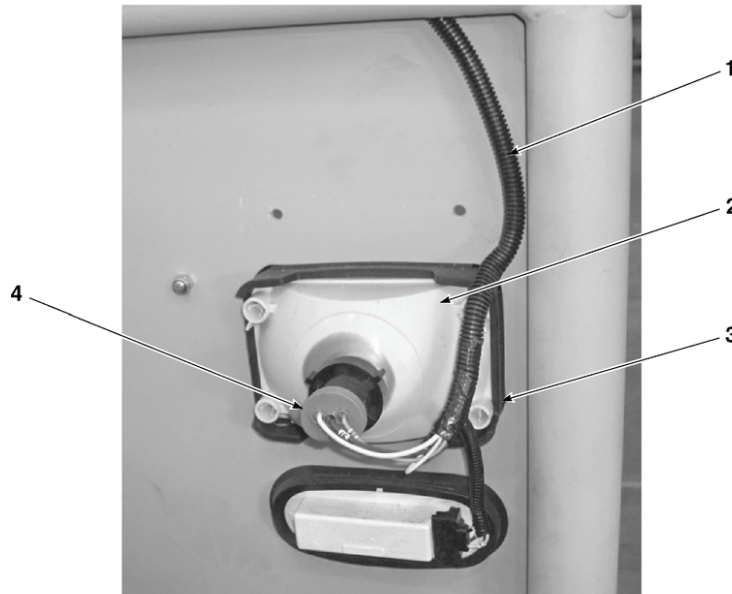


Figure 2. Sealed Headlight.

**INSTALLATION**

1. From the outside of tow vehicle, push headlight assembly (Figure 2, Item 2) into tow vehicle.
2. Install connector (Figure 2, Item 4) to headlight (Figure 2, Item 2).
3. Install protective cover (Figure 1, Item 3) on tow vehicle and secure with four bolts (Figure 1, Item 1) and four nuts (Figure 1, Item 2).

**END OF TASK****END OF WORK PACKAGE**



---

**FIELD MAINTENANCE**  
**DIMMER SWITCH**

---

**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**References**

N/A

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**Engine Shut Down

---

**INSPECTION**

1. Visually inspect dimmer switch for cracks, loose connections, or corrosion. Replace as necessary.
2. Using multi-meter set to ohms, test switch for continuity.

**END OF TASK****REMOVAL**

1. Remove two bolts (Figure 1, Item 1) and two nuts (Figure 1, Item 2) securing dimmer switch (Figure 1, Item 3) to tow vehicle.
2. Slide dimmer switch (Figure 1, Item 3) from bracket (Figure 1, Item 4).
3. Tag and disconnect harness (Figure 2, Item 2) from dimmer switch (Figure 2, Item 1).

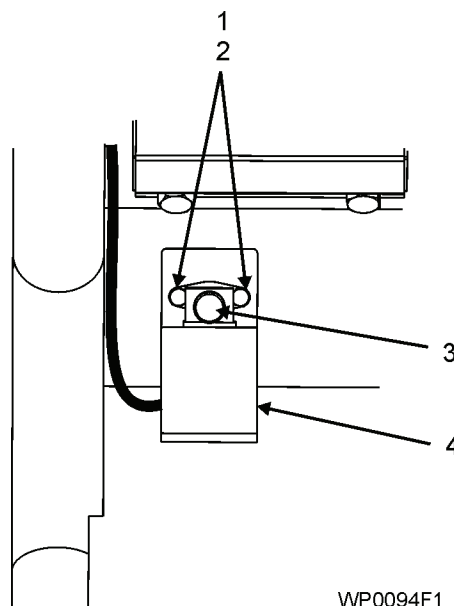
**END OF TASK**

Figure 1. Dimmer Switch

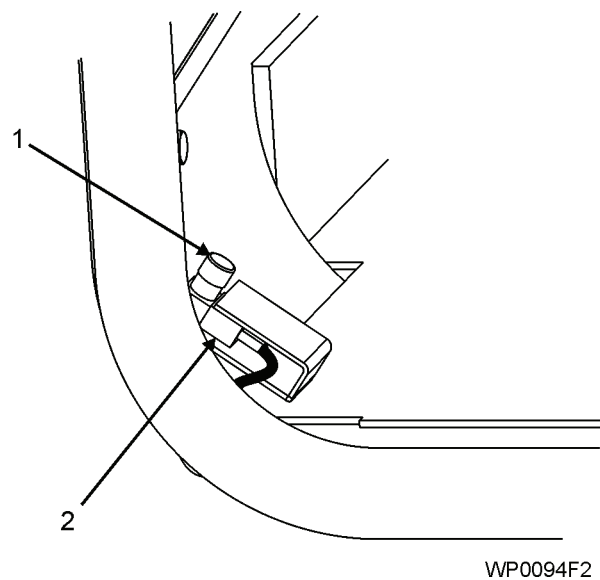


Figure 2. Dimmer Switch - Connector

## INSTALLATION

1. Remove tags and connect harness (Figure 2, Item 2) to dimmer switch (Figure 2, Item 1).
2. Slide dimmer switch (Figure 1, Item 3) under bracket (Figure 1, Item 4).
3. Install dimmer switch (Figure 1, Item 3) on tow vehicle and secure with two bolts (Figure 1, Item 1) and two nuts (Figure 1, Item 2).

## END OF TASK

## END OF WORK PACKAGE

**FIELD MAINTENANCE  
DIRECTIONAL SIGNAL ARM**

**INITIAL SETUP:**

**Test Equipment**

N/A

**References**

WP 0091

WP 0116

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

Wire Ties (WP 0127, Item 47)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**Equipment Condition**

N/A

**INSPECTION**

Inspect directional signal arm assembly for mounting security, excessive wear, proper electrical connections and damage affecting serviceability.

**END OF TASK**



Figure 1. Horn Wire and Wire Harness

**REMOVAL****NOTE**

Note orientation of wire harness connectors and wire ties to aid in reinstallation.

1. Disconnect battery negative cables (WP 0091).
2. Remove orbital valve cover panel (WP 0110).
3. Disconnect horn wire (Figure 1, Item 1).
4. Disconnect 6 wiring harness (Figure 1, Item 2) connectors (Figure 2) from under the center console area under the vehicle.
5. Carefully pull wiring harness (Figure 1, Item 2) from center console area.
6. Remove mount clamp (Figure 3, Item 1).
7. Remove directional signal arm assembly.

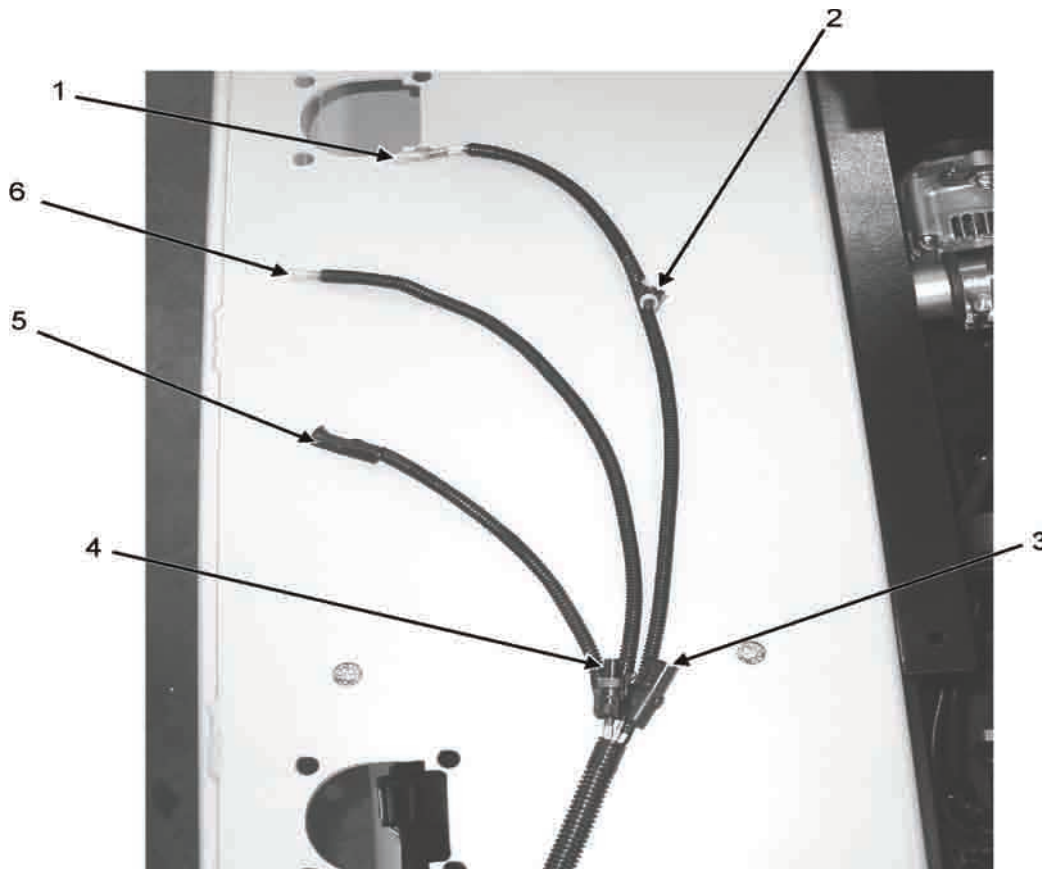
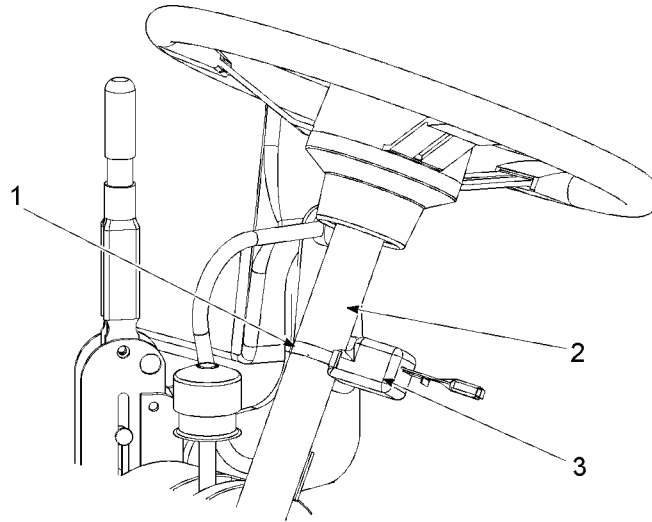
**END OF TASK**

Figure 2. Directional Signal Arm Wire Harness Connectors



WP0095F3

Figure 3. Directional Signal Arm

**INSTALLATION**

1. Position directional signal arm assembly.
2. Install mount clamp (Figure 3, Item 1).
3. Carefully route wiring harness (Figure 1, Item 2) to center console area.
4. Connect 6 wiring harness (Figure 1, Item 2) connectors (Figure 2) under the center console area under the vehicle.

**NOTE**

Wire tie the harness as previously noted to prevent excessive chaffing or damage.

5. Connect horn wire (Figure 1, Item 1).
6. Install orbital valve cover panel (WP 0116).
7. Connect battery negative cables (WP 0091).
8. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



---

**FIELD MAINTENANCE**  
**TURN SIGNAL LIGHT**

---

**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**References**

N/A

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

---

**INSPECTION**

1. Visually inspect sealed headlight for cracks, loose connections, or condensation buildup in light. Replace as necessary.
2. Check for 12 VDC at appropriate harness with ignition switch on and turn signal light lever actuated. If voltage is present, replace turn signal light.

**END OF TASK****REMOVAL****NOTE**

Turn signal light is a sealed assembly, when required replace entire assembly.

1. Remove four bolts (Figure 1, Item 1) and four nuts (Figure 1, Item 2) securing guard (Figure 1, Item 3) to tow vehicle.
2. Tag and disconnect harness (Figure 2, Item 2) from turn signal light (Figure 2, Item 1).
3. Push turn signal light (Figure 2, Item 1) and grommet (Figure 2, Item 3) from tow vehicle.

**END OF TASK**

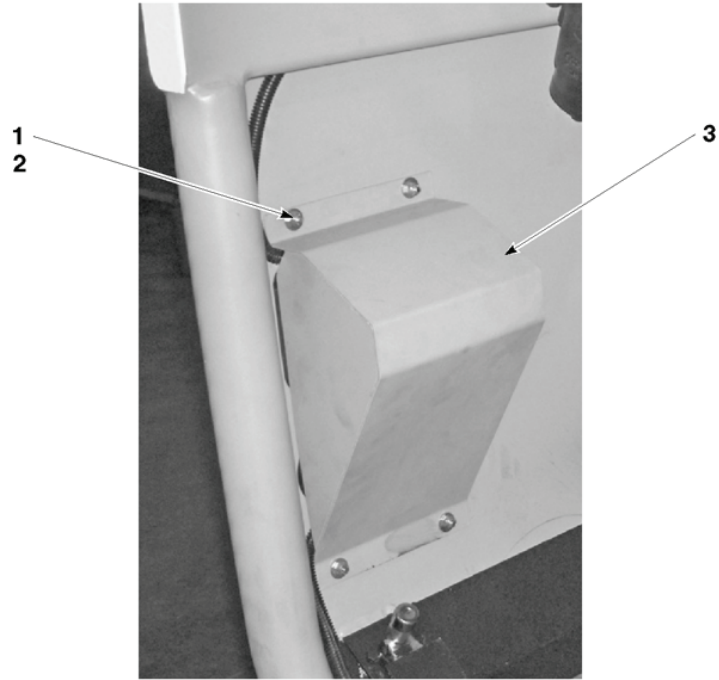


Figure 1. Turn Signal Light – Guard.

501348M-124

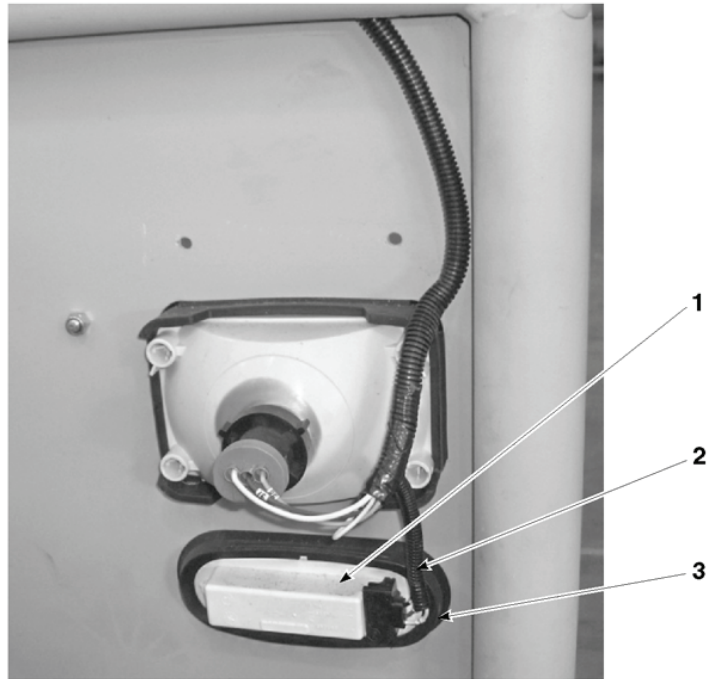


Figure 2. Turn Signal Light.

501348M-126



**INSTALLATION**

1. From the outside of tow vehicle, push turn signal light (Figure 2, Item 1) and grommet (Figure 2, Item 3) into tow vehicle.
2. Remove tags and connect harness (Figure 2, Item 2) to turn signal light (Figure 2, Item 1).
3. Install guard (Figure 1, Item 3) on tow vehicle and secure with four bolts (Figure 1, Item 1) and four nuts (Figure 1, Item 2).
4. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



---

**FIELD MAINTENANCE**  
**STOPLIGHT**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

N/A

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**Engine Shut Down

---

**INSPECTION**

Visually inspect stoplight for cracks, loose connections, or condensation buildup in light. Repair or replace as necessary.

**END OF TASK****REMOVAL**

1. Disconnect battery cables (WP 0091).
2. Tag and disconnect electrical wires (Figure 1, Item 2) from stoplight (Figure 1, Item 1).
3. Push stoplight (Figure 2, Item 1) and external gasket (Figure 2, Item 2) from tow tractor (Figure 2, Item 3).

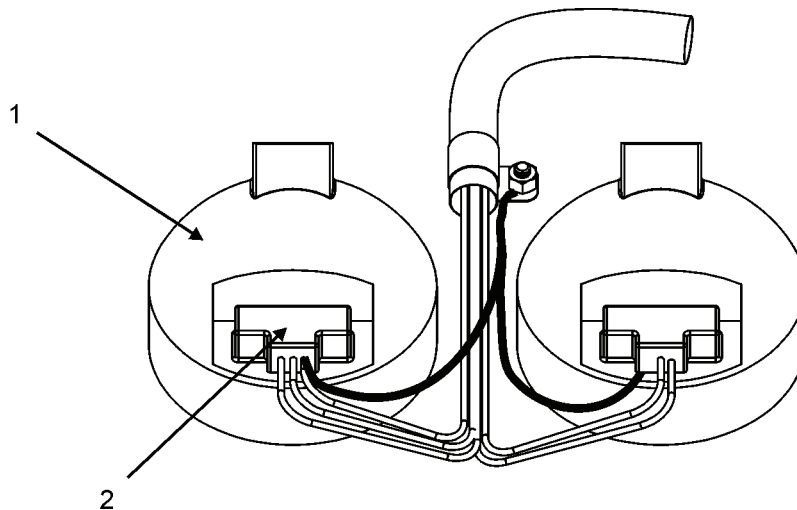
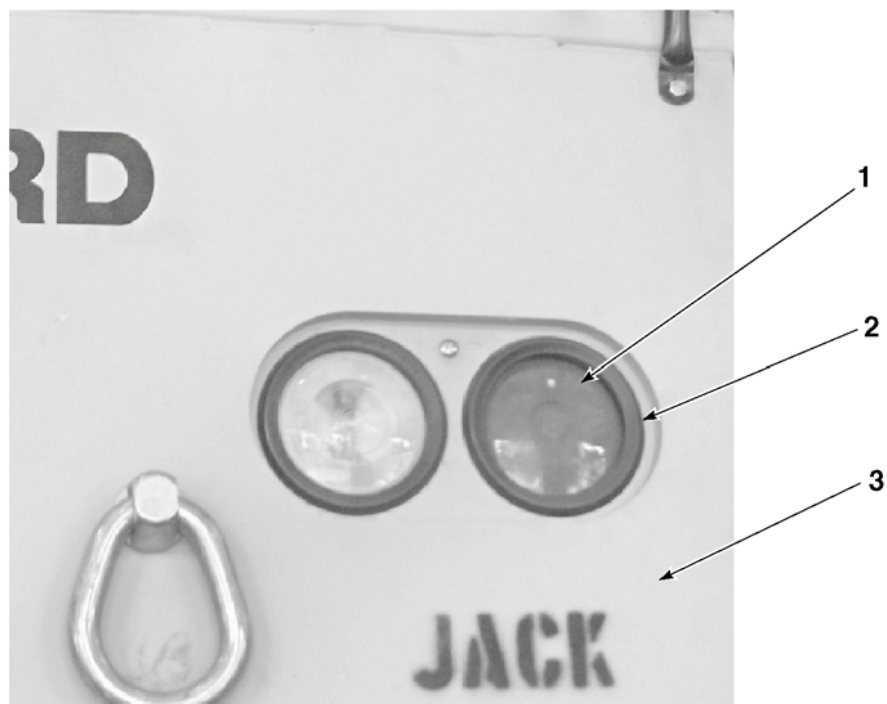


Figure 1. Stoplight – Interior.



501348M-060

Figure 2. Stoplight – Exterior.

**END OF TASK****INSTALLATION**

1. From the outside of tow tractor (Figure 2, Item 3), push stoplight (Figure 2, Item 1) and external gasket (Figure 2, Item 2) into tow tractor.
2. Remove tags and connect electrical wires (Figure 1, Item 2) to stoplight (Figure 1, Item 1).
3. Connect battery cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**BACK-UP (REVERSE/WORK) LIGHT**

---

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0091

**Tools and Special Tools**  
General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
N/A

---

**INSPECTION**

Visually (access under the vehicle) inspect stoplight for cracks, loose connections, or condensation buildup in light. Repair or replace as necessary.

**END OF TASK****REMOVAL**

1. Disconnect battery cables (WP 0091).
2. Tag and disconnect electrical wires (Figure 1, Item 2) from back-up light (Figure 1, Item 1).
3. Remove back-up light (Figure 2, Item 1) and external gasket (Figure 2, Item 2) from tow tractor (Figure 2, Item 3).

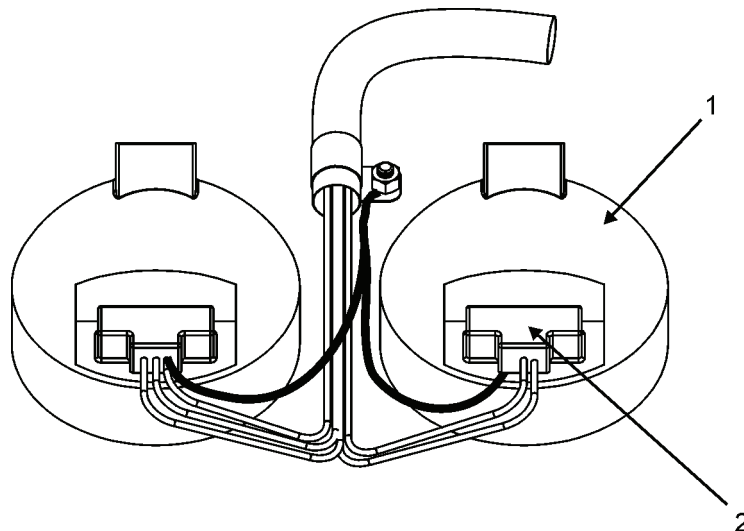
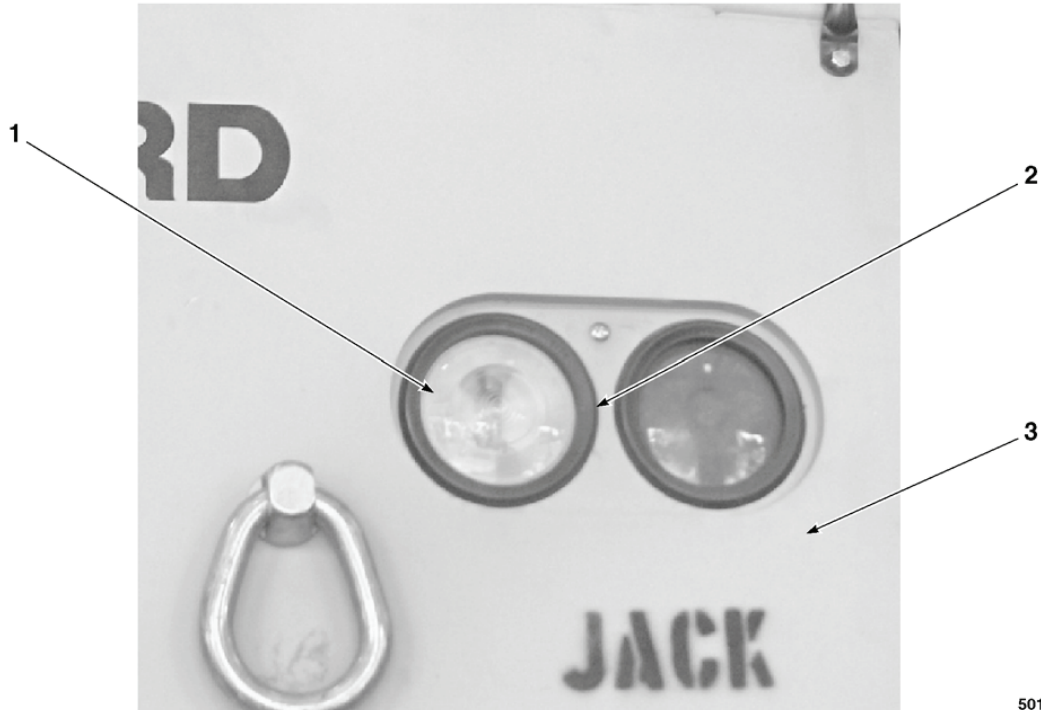


Figure 1. Backup Light – Interior.



501348M-062

Figure 2. Backup Light – Exterior.

**END OF TASK****INSTALLATION**

1. From the outside of tow tractor (Figure 2, Item 3), install back-up light (Figure 2, Item 1) and external gasket (Figure 2, Item 2) to tow tractor.
2. Remove tags and connect electrical wires (Figure 1, Item 2) to back-up light (Figure 1, Item 1).
3. Connect battery cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**

---

**FIELD MAINTENANCE**  
**BACK-UP ALARM**

---

**INITIAL SETUP:****Test Equipment**

Multimeter (WP 0125, Item 6)

**References**

WP 0020

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**Engine Shut Down

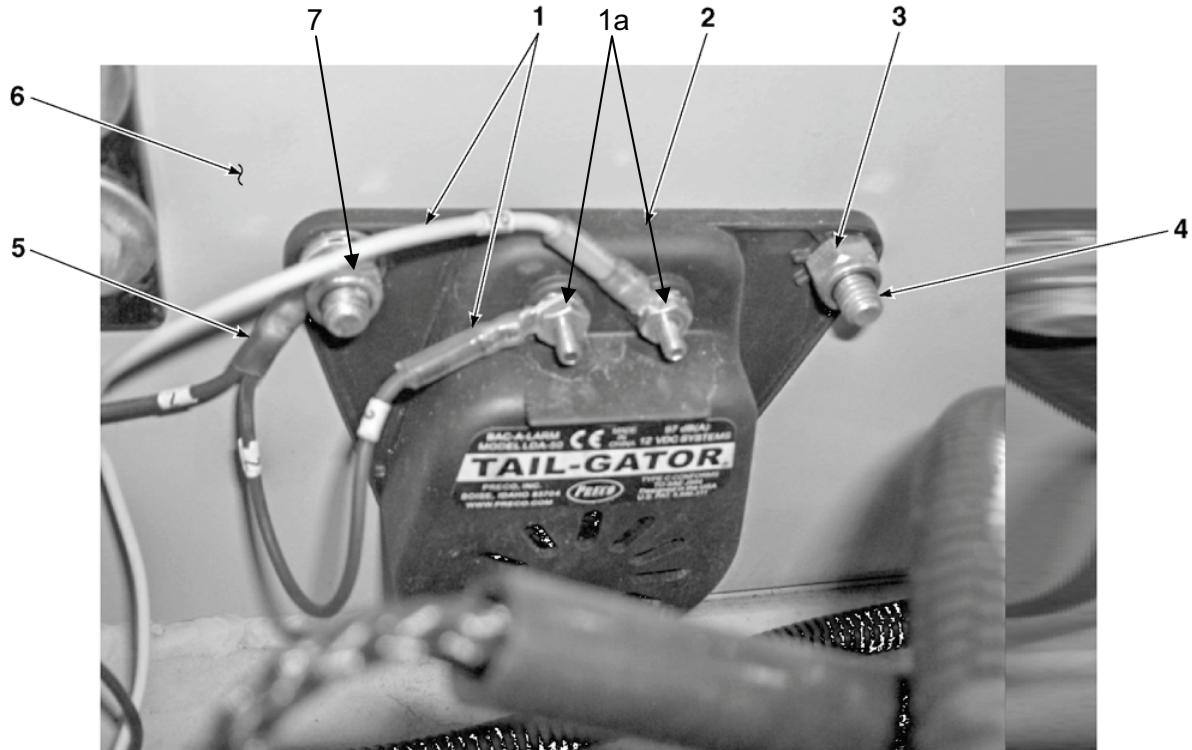
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**INSPECTION**

1. Visually inspect backup alarm terminals for corrosion or loose connections. Repair or replace as necessary.

**END OF TASK****REMOVAL**

1. Remove rear deck plate (WP 0020).
2. Remove LH toolbox (WP 0020).
3. Tag and disconnect electrical wires (Figure 1, Item 1) from backup alarm (Figure 1, Item 3).
4. Remove bolt/star washer/nut (Figure 1, Item 8).
5. Tag and disconnect ground wire (Figure 1, Item 6).
6. Remove remaining bolt/star washer (Figure 1, Item 5), nut (Figure 2, Item 4) securing backup alarm (Figure 1, Item 3) to tow tractor (Figure 1, Item 7).
7. Remove backup alarm (Figure 1, Item 3) from tow tractor (Figure 1, Item 7).



501348M-011

Figure 1. Backup Alarm

**END OF TASK****INSTALLATION**

1. Position backup alarm (Figure 1, Item 3) on tow tractor (Figure 1, Item 7).
2. Secure with bolt/star washer (Figure 1, Item 5), nut (Figure 1, Item 4).
3. Install bolt/star washer/nut (Figure 1, Item 8) with ground wire (Figure 1, Item 6). Remove tag.
4. Remove tags and connect electrical wires (Figure 1, Item 1) with nuts (Figure 1 Item 2) to backup alarm (Figure 1, Item 3).
5. Install toolbox (WP 0020).
6. Install rear deck plate (WP 0020).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE  
OPERATOR DASH PANEL**

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**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**References**

WP 0091

FO-1

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

Soldering Iron (WP 0125, Item 31)

**Materials/Parts**

Solder, Lead Allow (WP 0127, Item 55)

Flux (WP 0127, Item 54)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

**INSPECTION**

Visually inspect Operator Gauges, switches and indicator lights for damage affecting serviceability. Open cover and inspect components and wiring for corrosion, damaged connectors and sockets, exposed wiring, and faulty mounting.

**TEST****NOTE**

Flasher relay and Diodes REC1 and REC2 are located behind the SATS operator panel.

**Diodes REC1 and REC2**

1. Remove appropriate diode this work package.
2. Ohms test across the diode terminals in both directions.
3. Resistance measured should be continuity in one direction.
4. Resistance measured should be open or no continuity in the other direction.
5. Replace diode if either ohms test fails.

**Flasher Relay**

1. Remove flasher relay this work package.
2. Ohms test from relay pins X to L.
3. Resistance measured should be 50 ohms nominally.
4. Ohms test from relay pins P to L in both directions.
5. Resistance should be measured in one direction.
6. Resistance measured should be open or no continuity in the other direction.
7. Ohms test from relay pins P to X.
8. Resistance should be measured in one direction.
9. Resistance measured should be open or no continuity in the other direction.
10. Replace flasher relay if any ohms test fails.

## Ignition Switch

### Off Position

1. Ohms test ignition switch for continuity between all terminals.
2. All switch terminals should read open (no continuity).

### Run Position

1. Ohms test ignition switch for continuity.
2. ACC-IGN, continuity should exist.
3. IGN-BATT, continuity should exist.
4. ACC-BATT, continuity should exist.

### Start Position

1. BATT-ACC, continuity should exist.
2. BATT-START, continuity should exist.
3. BATT-IGN, continuity should exist.

Replace ignition switch if any test fails.

## END OF TASK

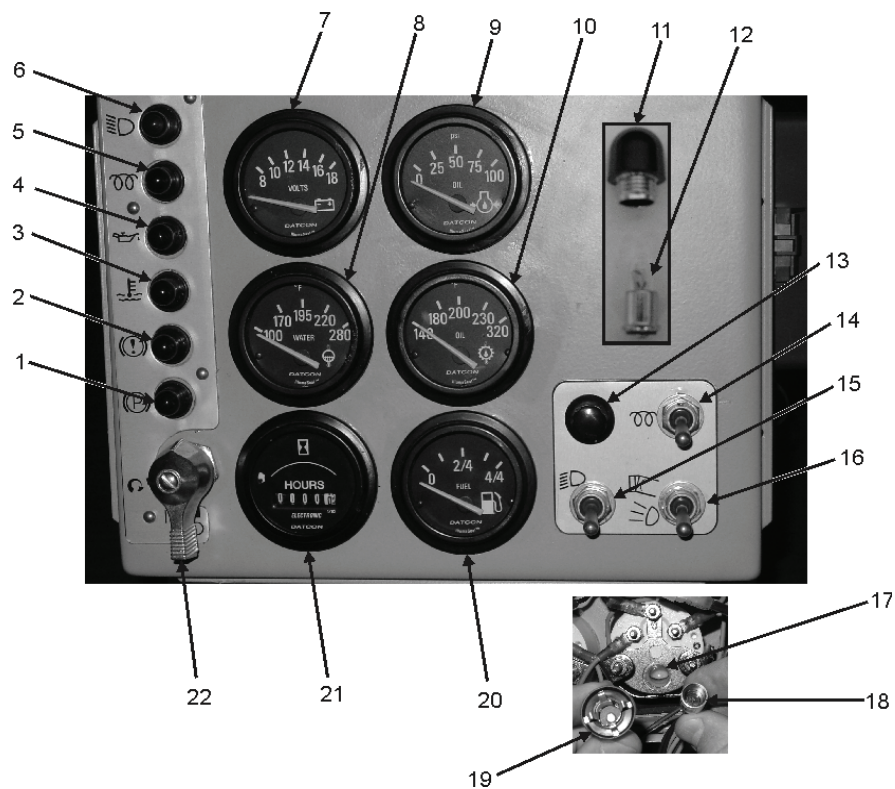


Figure 1. Operator Dash Panel (Front)

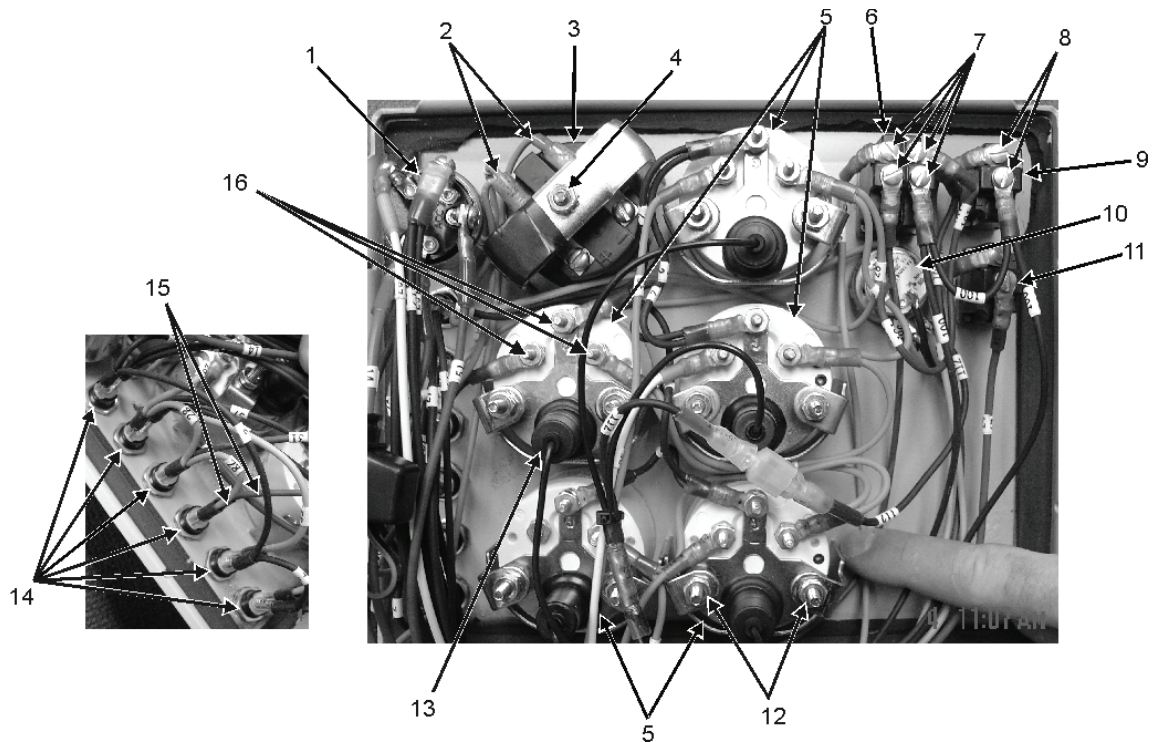


Figure 2. Operator Dash Panel (Rear)

#### NOTE

Components and wiring should be tested for serviceability prior to replacement of components or wiring, see (FO-1).

Components on the Operator's Dash Panel are grouped together to ease operator maintenance.

#### REMOVAL

##### INDICATOR LENS AND BULB

1. Disconnect battery negative cables (WP 0091).
2. Locate defective indicating light lens (Figure 1, Items 1 – 6) and or bulb.
3. Remove lens (Figure 1, Items 1 - 6) by un-screwing lens. Bulb is positioned inside of lens cover.
4. Remove bulb (Figure 1, Item 12) by pulling from lens (Figure 1, Item 11).

#### INSTALLATION

##### INDICATOR LENS AND BULB

1. Install bulb (Figure 1, Item 12) in appropriate lens cover (Figure 1, Item 11).
2. Install appropriate lens/bulb assembly (Figure 1, Items 1 – 6) by screwing lens into appropriate position.
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

#### END OF TASK

**REMOVAL****NOTE**

Tag all wiring during all removal processes to aid in reinstallation.

**LIGHT (INDICATOR) HOLDER**

1. Disconnect battery negative cables (WP 0091).
2. Open Operator dash panel.
3. Locate faulty light holder (socket) (Figure 2, Item 14).
4. Remove wires from light holder by pulling from terminal and tag, to ease reinstallation.
5. Remove lock nut and star washer on light holder (socket) (Figure 2, Item 14).
6. Remove defective light holder.

**END OF TASK****INSTALLATION****LIGHT (INDICATOR) HOLDER**

1. Install appropriate light holder (socket) (Figure 2, Item 14) in appropriate position on panel.
2. Install lock nut and star washer on light holder (socket) (Figure 2, Item 14) and tighten.
3. Install tagged wires to correct position by pushing solderless terminal onto light holder.
4. Install lens assembly (Figure 1, Item 1 – 6) on light holder.
5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****IGNITION SWITCH (START/STOP)**

1. Disconnect battery negative cables (WP 0091).
2. Locate ignition switch and remove ignition switch (Figure 1, Item 22) actuator knob by removing retaining screw.
3. Remove ignition switch (Figure 1, Item 22) by removing assembly lock nut and star washer and then push stem through the cover.
4. Open Operator dash panel.
5. Remove 4 screws and disconnect wiring from four switch terminals (Figure 2, Item 1).
6. Remove faulty switch.

**END OF TASK****INSTALLATION****IGNITION SWITCH (START/STOP)**

1. Position ignition switch (Figure 2, Item 1) in operator panel.
2. Secure ignition switch (Figure 1, Item 22) assembly by installing lock nut and star washer.
3. Install ignition switch (Figure 1, Item 22) actuator knob and tighten with retaining screw.
4. Position 4 wires on switch terminals (Figure 2, Item 1).
5. Install wire mount screws (Figure 1, Item 7).
6. Close Operator panel.
7. Connect battery negative cables (WP 0091).
8. Perform Maintenance Operation Check.

**END OF TASK**

**REMOVAL****VOLT METER, OIL PRESSURE GAUGE, WATER TEMP GAUGE, OIL TEMP GAUGE, FUEL GAUGE****NOTE**

All five gauges are removed and reinstalled using the same instructions. Just ensure the correct gauge is identified during the removal process.

1. Disconnect battery negative cables (WP 0091).
2. Locate the defective meter or gauge on the operator panel.
3. Open operator dash panel.
4. Remove gauge light assembly (Figure 2, Item 13) by pulling socket plug out of gauge.
5. Remove three nuts and washers securing the wires to the gauge, (Figure 2, Item 16) and tag for reinstallation.
6. Remove gauge hardware (two nuts and washers) (Figure 2 Item 12) securing gauge to the operator dash cover.
7. Remove defective gauge from operator dash panel.

**END OF TASK****INSTALLATION****VOLT METER, OIL PRESSURE GAUGE, WATER TEMP GAUGE, OIL TEMP GAUGE, FUEL GAUGE****NOTE**

All five gauges are installed using the same procedure.

1. Position appropriate operator gauge in panel.
2. Install appropriate gauge bracket and secure with two nuts and washers (Figure 2 Item 12) securing gauge to the operator cover.
3. Install three wires to gauge (Figure 2, Item 16) and secure with three nuts and washers .
4. Close Operator dash panel.
5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****HOUR METER (ENGINE)**

1. Disconnect battery negative cables (WP 0091).
2. Locate the defective meter (Figure 1, Item 21) on the operator panel.
3. Open operator dash panel.
4. Pull two wires from hour meter terminals (Figure 2, Item 2).
5. Remove one nut and star washer (Figure 2 Item 4) from retaining bracket holding gauge to the operator cover.
6. Remove defective hour meter from operator dash panel.

**END OF TASK**

**INSTALLATION****HOUR METER (ENGINE)**

1. Position hour meter in operator dash panel.
2. Install bracket and secure with one nut and star washer (Figure 2 Item 4) securing gauge to the operator cover.
3. Push two wires on hour meter terminals (Figure 2, Item 2).
4. Close Operator dash panel.
5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****HEAD LIGHT SWITCH (SW3)**

1. Disconnect battery negative cables (WP 0091).
2. Remove nut and star washer (Figure 1, Item 15) from defective head light switch.
3. Open Operator dash panel.
4. Remove four screws (Figure 2, Item 7) securing wires and tag wires for reinstallation.
5. Remove defective head light switch from operator dash panel.

**END OF TASK****INSTALLATION****HEAD LIGHT SWITCH (SW3)**

1. Position head light switch in operator dash panel.
2. Secure head light switch with star washer and nut (Figure 1, Item 15).
3. Position four wires and secure with four screws (Figure 2, Item 7).
4. Close Operator dash panel.
5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****WORK (RUN) LIGHT SWITCH (SW6) GLOW PLUG SWITCH (SW7)**

1. Disconnect battery negative cables (WP 0091).
2. Remove nut and star washer securing the run light or glow plug switch (Figure 1, Item 14 or 16) to the operator dash panel.
3. Open Operator dash panel.
4. Remove two screws (Figure 2, Item 8 or 11) securing wires.
5. Remove defective run light or glow plug switch.

**END OF TASK****INSTALLATION****WORK (RUN) LIGHT SWITCH (SW6) GLOW PLUG SWITCH (SW7)**

1. Position run light/glow plug switch in operator panel.
2. Secure appropriate switch (Figure 1, Item 14 or 16) with star washer and nut.
3. Position 2 wires and secure with two screws (Figure 2, Items 8 or 11).
4. Close Operator dash panel.

5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****GAUGE LIGHT DIMMER REHOSTAT**

1. Disconnect battery negative cables (WP 0091).
2. Open Operator dash panel.
3. De-solder four wires (Figure 2, Item 10). Note orientation of rheostat secured to panel.
4. Close cover. Remove rheostat switch knob (Figure 1, Item 13) by loosening set-screw and removing knob.
5. Remove locknut and star washer from rheostat and remove rheostat from operator dash panel.

**END OF TASK****INSTALLATION****GAUGE LIGHT DIMMER REHOSTAT**

1. Position rheostat (Figure 2, Item 10) in operator dash panel.
2. Secure rheostat switch (knob removed) (Figure 1, Item 13) with star washer and nut.
3. Solder wires to rheostat (Figure 2, Item 10) terminals.
4. Close operator cover and install rheostat switch knob (Figure 1, Item 13) and tighten set screw in knob.
5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****GAUGE LIGHT**

1. Disconnect battery negative cables (WP 0091).
2. Open Operator dash panel.
3. Pull appropriate gauge light assembly (Figure 2, Item 13) from the appropriate gauge.
4. Push in on LED (Figure 1, Item 18) and twist to release from holder (Figure 1, Item 19).
5. Remove defective LED.

**END OF TASK****INSTALLATION****GAUGE LIGHT**

1. Place LED (Figure 1, Item 18) in holder (Figure 1, Item 19) push LED in then twist to lock in place.
2. Push appropriate gauge light assembly (Figure 2, Item 13) into the appropriate gauge and secure.
3. Close Operator dash panel.
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK**

**REMOVAL****TURN SIGNAL FLASHER RELAY**

1. Disconnect battery negative cables (WP 0091).
2. Open Operator dash panel.
3. Carefully pull turn signal flasher relay (Figure 3, Item 7) from the relay socket.
4. Remove defective flasher relay.

**END OF TASK****INSTALLATION****TURN SIGNAL FLASHER RELAY**

1. Carefully push signal flasher relay (Figure 3, Item 7) into relay socket.
2. Close Operator dash panel.
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

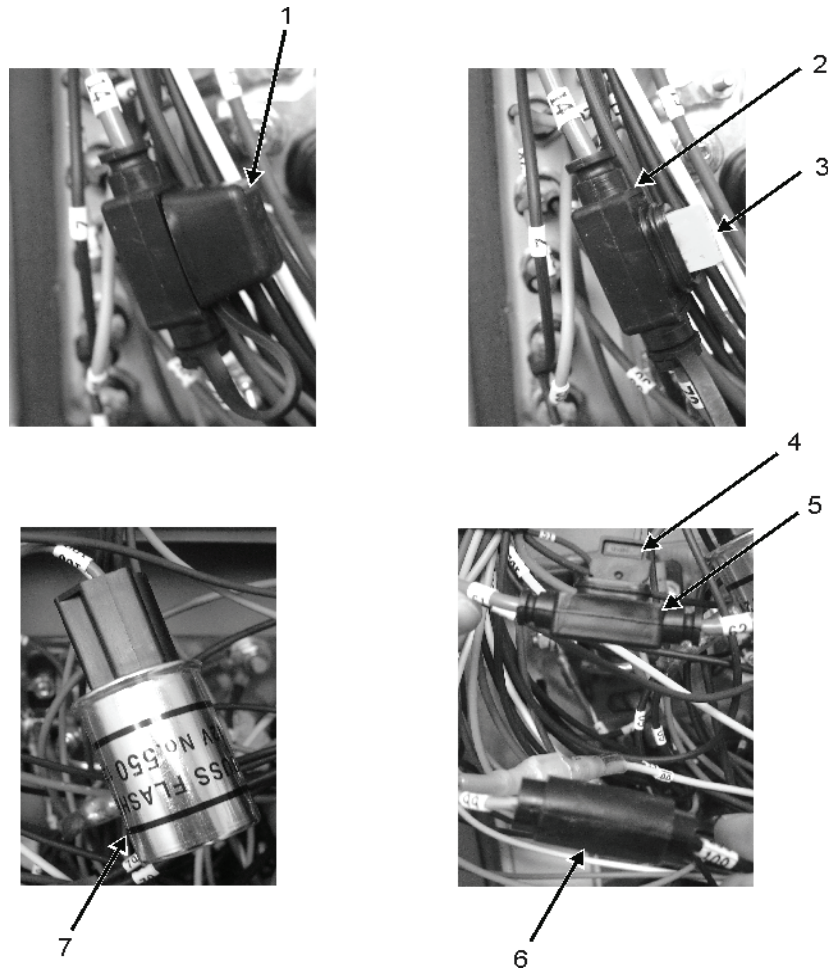
**END OF TASK**

Figure 3. Accessory Components (Located Behind Operator Dash Panel)



**REMOVAL****TRANSMISSION CIRCUIT FUSE (20 AMP)**

1. Disconnect battery negative cables (WP 0091).
2. Open Operator dash panel.
3. Remove fuse boot cover (Figure 3, Item 1).
4. Remove defective fuse (Figure 3, Item 3) from fuse holder (Figure 3, Item 2).

**END OF TASK****INSTALLATION****TRANSMISSION CIRCUIT FUSE (20 AMP)**

1. Install 20-amp fuse (Figure 3, Item 3) in fuse holder (Figure 3, Item 2).
2. Install fuse boot cover (Figure 3, Item 1).
3. Close Operator panel.
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****RECTIFIER DIODE, PARK BRAKE ENGAGE (REC2)**

1. Disconnect battery negative cables (WP 0091).
2. Open Operator dash panel.
3. Pull diode REC2 (Figure 3, Item 4) from diode holder ( Figure 3, Item 5).
4. Remove defective diode.

**END OF TASK****INSTALLATION****RECTIFIER DIODE, PARK BRAKE ENGAGE (REC2)**

1. Install diode REC2 (Figure 3, Item 4) in diode holder (Figure 3, Item 5).
2. Close Operator dash panel.
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****RECTIFIER DIODE, REVERSE (BACKUP) LIGHT (REC1)**

1. Disconnect battery negative cables (WP 0091).
2. Open Operator dash panel.
3. Remove diode REC1 (Figure 3, Item 6) from wiring harness quick disconnects.

**END OF TASK**

**INSTALLATION****RECTIFIER DIODE, REVERSE (BACKUP) LIGHT (REC1)**

1. Connect diode REC1 (Figure 3, Item 6) to wiring harness by connecting solder less quick disconnects.
2. Close Operator dash panel.
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE  
ELECTRIC PANEL (DASH)**

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**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**Tools and Special Tools**

Fuse Puller Tool (WP 0125, Item 32)

General Mechanics Tool Kit (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0091

WP 0100

FO-1

**Materials/Parts**

N/A

**Equipment Condition**

Engine Shut Down

**INSPECTION**

Visually inspect components and wiring for corrosion, damaged connectors and sockets, exposed wiring, and faulty mounting.

**END OF TASK****TEST****Relay's CRR and CRS (Figure 1, Item 10 and 13)****NOTE**

Relay test pins are identified on the bottom of the relay.

1. Remove appropriate relay this work package.
2. Ohms test relay coil from pins 85 to 86.
3. Resistance measured should be 85 ohms nominally.
4. Ohms test relay switch from pins 30 to 87A for continuity.
5. Replace relay if either ohms test fails.

**Accessory Relay (CRA)**

1. Remove wiring from accessory relay this work package.
2. Ohms test across relay coil terminals (Figure 1, Item 16).
3. Resistance measured should be 15 ohms nominally.
4. Ohms test across relay terminals (Figure 1, Item 1 and 6).
5. Open circuit or no continuity should exist.
6. Replace relay if either ohms test fails.

**END OF TASK**

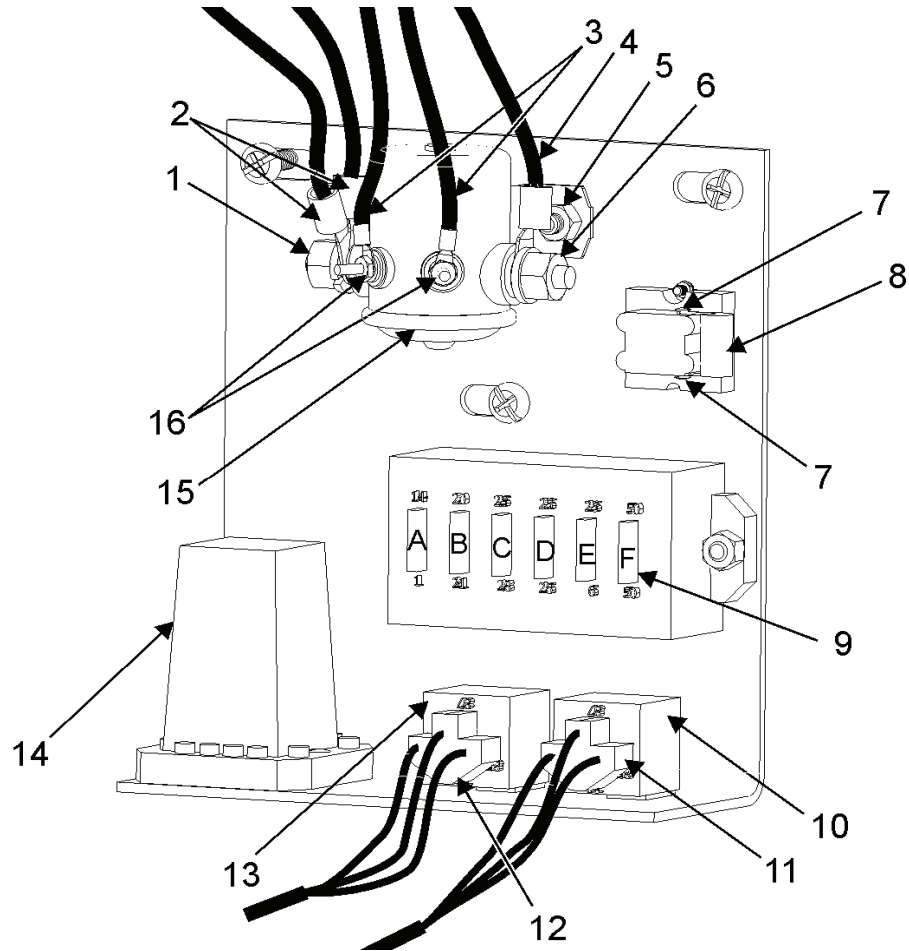


Figure 1 – Electric Panel (Dash)

**NOTE**

Components in the electric panel are grouped together to ease operator maintenance.

Tag all wires during the removal process to aid in reinstallation.

**REMOVAL****ACCESSORY RELAY (CRA) (Figure 1, Item 15)**

1. Disconnect battery negative cables (WP 0091).
2. Open operator dash panel (WP 0100).
3. Locate accessory (Figure 1, Item 15) relay referencing panel decal.
4. Remove nut and washer (Figure 1, Item 1) and remove 2 wires (Figure 1, Item 2).
5. Remove 2 nuts (Figure 1, Items 16) and remove 2 wires (Figure 1, Item 3).
6. Remove nut and washer (Figure 1, Item 6) and remove wire (Figure 1, Item 4).
7. Remove 2 relay mounting nuts and washers (Figure 1, Item 5) (One not shown).
8. Remove accessory relay (Figure 1, Item 15).

**END OF TASK**

**INSTALLATION****ACCESSORY RELAY (CRA)**

1. Position accessory relay (Figure 1, Item 15).
2. Install 2 washers and nuts (Figure 1, Item 5) (One not shown) and tighten.
3. Install wire (Figure 1, Item 4) on relay.
4. Install washer and nut (Figure 1, Item 6) and tighten.
5. Install 2 wires (Figure 1, Item 3) on relay.
6. Install 2 nuts on the relay terminal (Figure 1, Item 16) and tighten.
7. Install 2 wires (Figure 1, Item 2).
8. Install washer and nut (Figure 1, Item 1) and tighten.
9. Close operator dash panel (WP 0100).
10. Connect battery negative cables (WP 0091).
11. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****TIME DELAY RELAY (TRD)**

1. Disconnect battery negative cables (WP 0091).
2. Open operator dash panel (WP 00100).
3. Locate accessory relay referencing panel schematic decal or (Figure 1, Item 14).
4. Remove Time Delay Relay by pulling straight up while gently wiggling relay side to side.

**END OF TASK****INSTALLATION****TIME DELAY RELAY (TRD)**

1. Position Time Delay Relay (Figure 1, Item 14) and plug into socket by pushing on top of relay.
2. Adjust time range selector to the D position, MIN/MAX rheostat to the second position from MIN.
3. Close operator dash panel (WP 0100).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****PARK POSITION BRAKE ENGAGE RELAY (CRP)**

1. Disconnect battery negative cables (WP 0091).
2. Open operator dash panel, (WP 0100).
3. Locate CRP relay (Figure 1, Item 13) referencing panel schematic decal.
4. Remove wiring connector (Figure 1, Item 12) from CRP Relay.
5. Slide CRP relay (Figure 1, Item 13) from its mount tang by pulling forward while gently wiggling relay side to side.

**END OF TASK**

**INSTALLATION****PARK POSITION BRAKE ENGAGE RELAY (CRP)**

1. Slide CRP relay (Figure 1, Item 13) on its tang mount by pushing forward while gently wiggling relay side to side.
2. Install wiring connector (Figure 1, Item 12) on CRP Relay.
3. Close operator dash panel (WP 0100).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****PARK POSITION BRAKE DISENGAGE RELAY (CRR)**

1. Disconnect battery negative cables (WP 0091).
2. Open operator dash panel, (WP 0100).
3. Locate CRR relay (Figure 1, Item 10) referencing panel schematic decal.
4. Remove wiring connector (Figure 1, Item 11) from CRR Relay.
5. Slide CRR relay (Figure 1, Item 10) from its mount tang by pulling forward while gently wiggling relay side to side.

**END OF TASK****INSTALLATION****PARK POSITION BRAKE DISENGAGE RELAY (CRR)**

1. Slide CRR relay (Figure 1, Item 10) on its tang mount by pushing forward while gently wiggling relay side to side.
2. Install wiring connector (Figure 1, Item 11) on CRR Relay.
3. Close operator dash panel (WP 0100).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****CAPACITOR (SERVICE BRAKE SYSTEM FAIL) (CAP-1)**

1. Disconnect battery negative cables (WP 0091).
2. Open operator dash panel, (WP 0100).
3. Locate service brake system fail capacitor referencing schematic decal or (Figure 1, Item 8).
4. Loosen 2 set screws (Figure 1, Items 7).
5. Remove capacitor (Figure 1, Item 8) noting positive lead is in the top position.

**END OF TASK****INSTALLATION****CAPACITOR (SERVICE BRAKE SYSTEM FAIL) (CAP-1)**

1. Install capacitor (Figure 1, Item 8) with positive lead in the top position.
2. Tighten 2 set screws (Figure 1, Items 7).
3. Close operator dash panel (WP 0100).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK**

**REMOVAL****ACCESSORY FUSES****Electric Panel Fuse Identification (Figure 1, Items 9A, B, C, D, E, F)**

9A – Fuse 3FU – 30 Amp – Run Circuit  
9B – Fuse 4FU – 5 Amp – Engine Start  
9C – Fuse 7FU – 5 Amp – Gauges and Senders  
9D – Fuse 6FU – 5 Amp – Hand Brake Relay  
9E – Fuse 5FU – 10Amp – Transmission ECU  
9F – Fuse 8FU – 5 Amp – Fuel Solenoid, Glow Plugs

1. Disconnect battery negative cables (WP 0091).
2. Open operator dash panel, (WP 0100).
3. Locate fuse to be replaced referencing (Figure 1, Item 9A, B, C, D, E, or F) or electric panel schematic label.
4. Remove defective fuse.

**END OF TASK****INSTALLATION****ACCESSORY FUSES**

1. Push appropriate fuse (Figure 1, Item 9A, B, C, D, E, or F) into fuse holder.
2. Close operator dash panel (WP 0100).
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKGAE**





**FIELD MAINTENANCE**  
**POWER DISTRIBUTION BLOCK (FUSE/RELAY HOLDER)**

**INITIAL SETUP:****Test Equipment**

Multi-Meter (WP 0125, Item 6)

**References**WP 0091  
FO-1**Tools and Special Tools**Fuse Puller Tool (WP 0125, Item 32)  
General Mechanics Tool Kit (WP 0125, Item 8)**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

**INSPECTION**

1. Visually inspect fuses, circuit breakers, and single pole double throw relays for damage affecting serviceability. Inspect all sockets for corrosion.
2. Inspect wiring inside operator dash panel for corrosion, damaged connectors and sockets, exposed wiring, and faulty wiring mounting.

**TEST****NOTE**

Relays 2A through 2E (Figure 2) are all tested using the same procedures and are interchangeable. Connector pin numbers are stamped on the bottom of the relay next to the relay plug pins.

Circuit Breaker and fuses (Figure 2, Items 3 – 8) are simply tested for continuity.

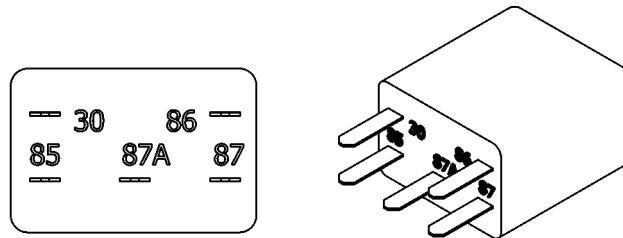
**Relays**

Figure 1. Relay Test Pin Identification

1. Disconnect battery negative cables (WP 0091).
2. Remove appropriate relay from socket holder.
3. Ohms test from pins 30 to 87A (Figure 1) for continuity.
4. Resistance measured should be less than 1 ohm.
5. Ohms test from pins 85 to 86 (Figure 1) for continuity.
6. Resistance should measure 85 ohms nominally.
7. Replace relay if either ohms test fails.

**END OF TASK**

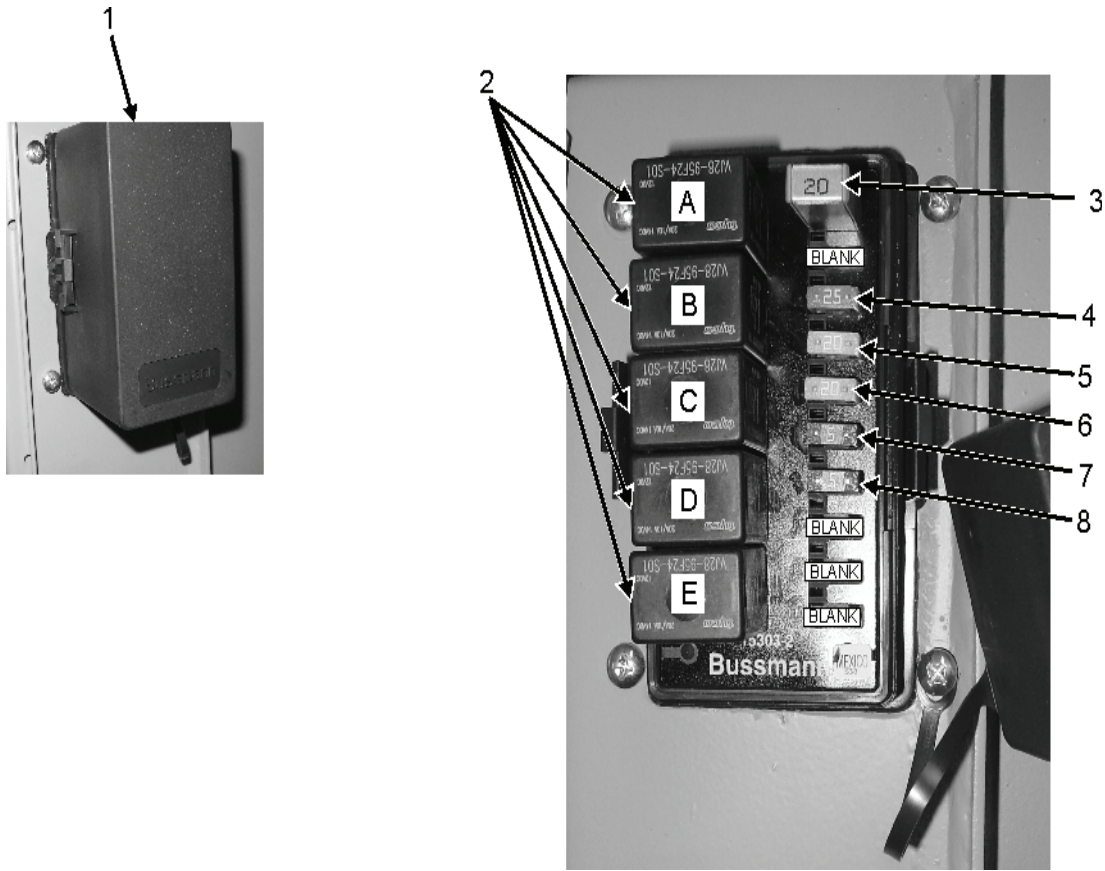


Figure 2 – Power Distribution Block (Dash)

### NOTE

Identification of all relays is accomplished by removing cover (Figure 1, Item 1), see decal inside cover.

Always replace fuses with same amperage rating fuses.

Distribution Block relays are all exactly alike (interchangeable) which could help when troubleshooting circuit malfunctions.

Components in the distribution block are grouped together to ease with operator maintenance.

### REMOVAL

#### PARK RELAY (SHIFTER) (CRS)

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate Park Relay (CRS), (Figure 2, Item 2A) or reference the decal inside distribution box cover.
4. Carefully pull relay from socket.

### END OF TASK

**INSTALLATION****PARK RELAY (SHIFTER) (CRS)**

1. Line up Park Brake Relay pins with distribution socket.
2. Carefully push relay CRS (Figure 2, Item 2A) into distribution box socket.
3. Install distribution box cover (Figure 2, Item 1).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****STARTER INTERLOCK RELAY (CRSI)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate Starter Interlock Relay (CRSI), (Figure 2, Item 2B) or reference decal inside distribution box cover.
4. Carefully pull relay from socket.

**END OF TASK****INSTALLATION****STARTER INTERLOCK RELAY (CRSI)**

1. Line up Starter Interlock Relay pins with distribution socket.
2. Carefully push relay CRSI, (Figure 2, Item 2B) into distribution box socket.
3. Install distribution box cover (Figure 2, Item 1).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****INTERLOCK RELAY (CRI)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate Interlock Relay (CRI), (Figure 2, Item 2C) or reference decal inside distribution box cover.
4. Carefully pull relay from socket.

**END OF TASK**

**INSTALLATION****INTERLOCK RELAY (CRI)**

1. Line up Interlock Relay pins with distribution socket.
2. Carefully push relay CRI, (Figure 2, Item 2C) into distribution box socket.
3. Install distribution box cover (Figure 2, Item 1).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****HANDBRAKE RELAY (CRHB)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate Handbrake Relay (CRHB), (Figure 2, Item 2D) or reference decal inside distribution box cover.
4. Carefully pull relay from socket.

**END OF TASK****INSTALLATION****HANDBRAKE RELAY (CRHB)**

1. Line up Handbrake Relay pins with distribution socket.
2. Carefully push relay CRHB, (Figure 2, Item 2D) into distribution box socket.
3. Install distribution box cover (Figure 2, Item 1).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****TRANSMISSION CIRCUIT RELAY (CRT)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate Transmission Circuit Relay (CRT), (Figure 2, Item 2E) or reference decal inside distribution box cover.
4. Carefully pull relay from socket.

**END OF TASK****INSTALLATION****TRANSMISSION CIRCUIT RELAY (CRT)**

1. Line up Transmission Circuit Relay pins with distribution socket.
2. Carefully push relay CRT, (Figure 2, Item 2E) into distribution box socket.
3. Install distribution box cover (Figure 2, Item 1).
4. Connect battery negative cables (WP 0091).
5. Perform Maintenance Operation Check.

**END OF TASK**

**REMOVAL****PARK POSITION MOTOR CIRCUIT BREAKER (CB2)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate CB2, (Figure 2, Item 3) or reference decal inside distribution box cover.
4. Carefully pull circuit breaker from socket.

**END OF TASK  
INSTALLATION****PARK POSITION MOTOR CIRCUIT BREAKER (CB2)**

1. Carefully push circuit breaker CB2, (Figure 2, Item 3) into the distribution box socket.
2. Install distribution box cover (Figure 2, Item 1).
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****FUEL HEATER FUSE (10FU)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate heater fuse (Figure 2, Item 4) 10FU 25 Amp, or reference decal inside distribution box cover.
4. Carefully pull fuse from socket.

**END OF TASK****INSTALLATION****FUEL HEATER FUSE (10FU)**

1. Carefully push heater fuse, (Figure 2, Item 4) into the distribution box socket.
2. Install distribution box cover (Figure 2, Item 1).
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****HEADLIGHT FUSE (12FU)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate headlight fuse (Figure 2, Item 5) 12FU 20 Amp, or reference decal inside distribution box cover.
4. Carefully pull fuse from socket.

**END OF TASK****INSTALLATION**

**HEADLIGHT FUSE (12FU)**

1. Carefully push headlight fuse, (Figure 2, Item 5) into the distribution box socket.
2. Install distribution box cover (Figure 2, Item 1).
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****TAIL LIGHT FUSE (13FU)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate tail light fuse (Figure 2, Item 6) 13FU 20 Amp, or reference decal inside distribution box cover.
4. Carefully pull fuse from socket.

**END OF TASK****INSTALLATION****TAIL LIGHT FUSE (13FU)**

1. Carefully push taillight fuse, (Figure 2, Item 6) into the distribution box socket.
2. Install distribution box cover (Figure 2, Item 1).
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****REMOVAL****HORN FUSE (11FU)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate horn fuse (Figure 2, Item 7) 11FU 5 Amp, or reference decal inside distribution box cover.
4. Carefully pull fuse from socket.

**END OF TASK****INSTALLATION****HORN FUSE (11FU)**

1. Carefully push horn fuse, (Figure 2, Item 7) into the distribution box socket.
2. Install distribution box cover (Figure 2, Item 1).
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK**

**REMOVAL****PREHEAT FUSE (14FU)**

1. Disconnect battery negative cables (WP 0091).
2. Remove distribution box cover (Figure 2, Item 1).
3. Locate preheat fuse (Figure 2, Item 8) 14FU 5 Amp, or reference decal inside distribution box cover.
4. Carefully pull fuse from socket.

**END OF TASK****INSTALLATION****PRE-HEAT FUSE (14FU)**

1. Carefully push preheat fuse, (Figure 2, Item 8) into the distribution box socket.
2. Install distribution box cover (Figure 2, Item 1).
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKGAE**





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**FIELD MAINTENANCE  
ELECTRIC PANEL (CENTER CONSOLE)**

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**INITIAL SETUP:****Test Equipment**

MultiMeter (WP 0125, Item 6)

**Tools and Special Tools**

Fuse Puller Tool (WP 0125, Item 32)

General Mechanics Tool Kit (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**References**

WP 0020

WP0091

FO-1

**Materials/Parts**

N/A

**Equipment Condition**

Engine Shut Down

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**INSPECTION****NOTE**

Access to the electric panel is located under the center console panel between the seats.

1. Inspect fuses, circuit breakers, and relays for damage affecting serviceability.
2. Inspect wiring inside center console electric panel for corrosion, damaged connectors and sockets, exposed wiring, and faulty mounting.

**END OF TASK****TEST****NOTE**

Disconnect battery negative cables prior to performing all test procedures.

**Glow Plug Relay (CRGP)**

1. Disconnect either wire (Figure 1, Item 16).
2. Ohms test across both terminals (Figure 1, Item 16).
3. Resistance measured should be 15 ohms nominally.
4. Disconnect wire from terminal (Figure 1, Item 15).
5. Ohms test across both terminals (Figure 1, Item 15).
6. Resistance measured should be infinity/open (no continuity).

**Starter Relay**

1. Remove wiring from starter relay this work package.
2. Ohms test across relay coil terminals (Figure 1, Item 12).
3. Resistance measured should be 15 ohms nominally.
4. Ohms test across relay terminals (Figure 1, Items 10).
5. Open circuit or no continuity should exist.
6. Replace relay if either ohms test fails.

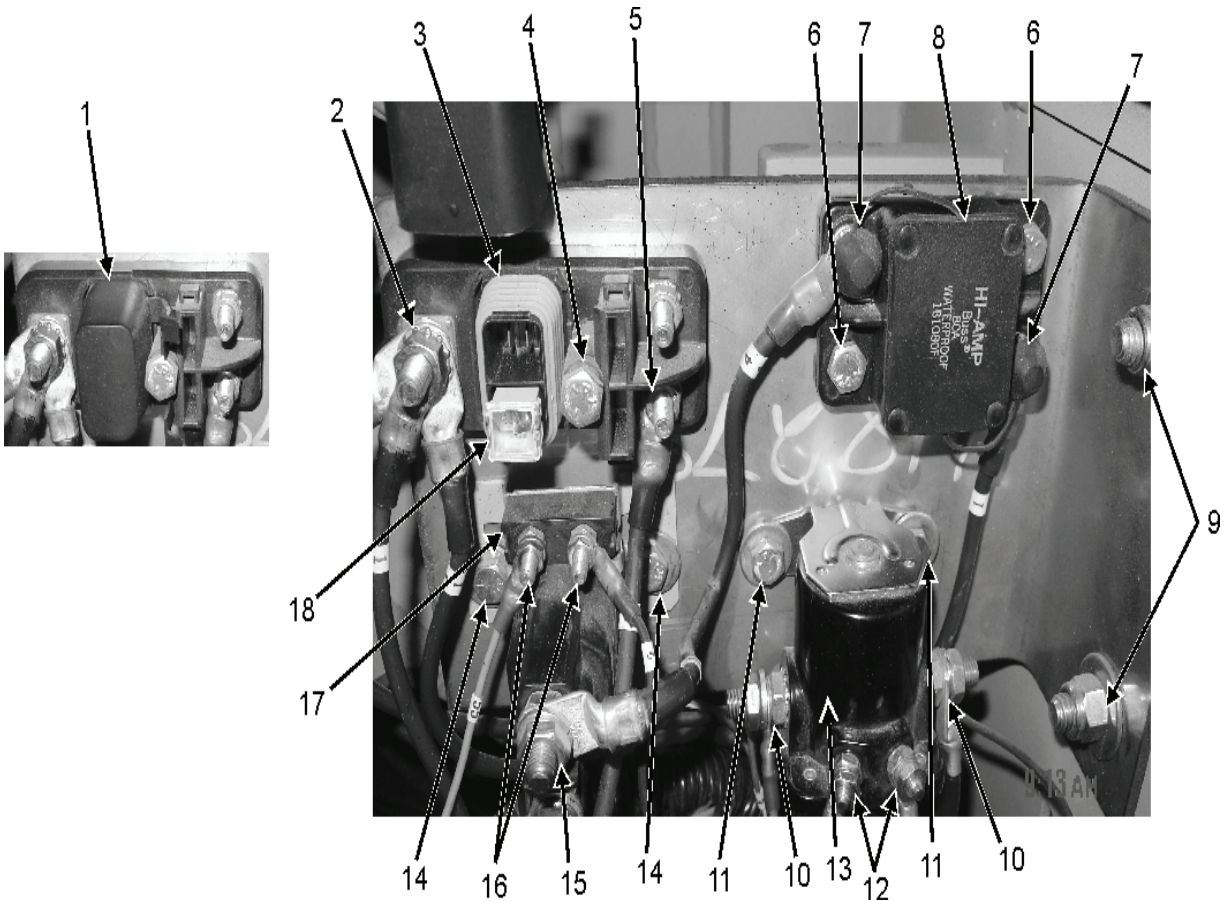


Figure 1 – Electric Panel (Center Console)

**NOTE**

Components in the Electric Panel (Center Console) are grouped together to ease with operator maintenance.

Tag wires during the removal process to aid with reinstallation.

**REMOVAL**

**POWER FUSE (2FU)**

1. Disconnect battery negative cables (WP 0091).
2. Remove driver and passenger seats (WP 0087).
3. Remove center console panel (WP 0020).
4. Removing fuse cover (Figure 1, Item 1).
5. Remove fuse (2FU) (Figure 1, Item 18).

**END OF TASK**

**INSTALLATION**

**POWER FUSE (2FU)**

1. Install fuse (2FU) (Figure 1, Item 18).
2. Install fuse cover (Figure 1, Item 1).
3. Connect battery negative cables (WP 0091).
4. Perform Maintenance Operation Check.
5. Install center console panel (WP 0020).

**END OF TASK****REMOVAL****NOTE**

Removal and installation of terminal protective boots is necessary to perform removal of glow plug circuit breaker.

**GLOW PLUG CIRCUIT BREAKER (CB1)**

1. Disconnect battery negative cables (WP 0091).
2. Remove center console panel (WP 0020).
3. Remove nuts and washers from terminal posts (Figure 1, Item 7) and remove wires.
4. Remove two mount bolts (Figure 1, Item 6) and attaching nuts.
5. Remove CB1 (Figure 1, Item 8) from center console.

**END OF TASK****INSTALLATION****GLOW PLUG CIRCUIT BREAKER (CB1)**

1. Position CB1 (Figure 1, Item 8) on mount panel.
2. Install two mount bolts (Figure 1, Item 6) and attaching nuts and tighten.
3. Install 2 wires on the terminal posts (Figure 1, Item 7).
4. Install washers and nuts on terminal posts (Figure 1, Item 7) and tighten.
5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.
7. Install center console panel (WP 0020).

**END OF TASK****REMOVAL****GLOW PLUG RELAY (CRGP)**

1. Disconnect battery negative cables (WP 0091).
2. Remove center console panel (WP 0020).
3. Remove nuts and washers (Figure 1, Items 10 and 12).
4. Remove wires (Figure 1, Items 10 and 12) from glow plug relay (Figure 1, Item 13).
5. Remove 2 relay mount bolts (Figure 1, Item 11) and attaching hardware.
6. Remove glow plug relay (Figure 1, Item 13).

**END OF TASK****INSTALLATION****GLOW PLUG RELAY (CRGP)**

1. Position glow plugs relay (Figure 1, Item 13).
2. Install 2 relay mount bolts (Figure 1, Item 11) and attaching hardware.
3. Install wires (Figure 1, Items 10 and 12) on glow plug relay (Figure 1, Item 13).
4. Install washers and nuts (Figure 1, Items 10 and 12) and tighten.
5. Connect battery negative cables (WP 0091).
6. Perform Maintenance Operation Check.
7. Install center console panel (WP 0020).

**END OF TASK**

**REMOVAL****STARTER (ENGINE) RELAY (SR)**

1. Disconnect battery negative cables (WP 0091).
2. Remove center console panel (WP 0020).
3. Remove nuts and washers (Figure 1, Items 15 and 16) from electrical terminals.
4. Remove wires from starter relay.
5. Remove 2 starter relay mount bolts (Figure 1, Item 14) and attaching hardware.
6. Remove starter relay (Figure 1, Item 13).

**END OF TASK****INSTALLATION****STARTER (ENGINE) RELAY (SR)**

1. Position starter relay (Figure 1, Item 13).
2. Install 2-starter relay mount bolts (Figure 1, Item 14) and attaching hardware.
3. Install wires on starter relay terminals.
4. Install washers and nuts (Figure 1, Items 15 and 16) and tighten.
7. Connect battery negative cables (WP 0091).
8. Perform Maintenance Operation Check.
8. Install center console panel (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE  
THROTTLE SYSTEM**

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**INITIAL SETUP:****Test Equipment**

N/A

WP 0091

WP 0105

WP 0106

WP 0107

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

Hydraulic Fluid (WP 0127, Item 18)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**Equipment Condition**

Engine Shut Down

**References**

WP 0020

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**INSPECTION**

1. Open engine cover, (WP 0020).
2. Inspect throttle reservoir (Figure 1, Item 1) for mount security. Inspect reservoir, hose connection, and fitting for leaks.
3. Inspect throttle master cylinder (Figure 1, Item 5) for mount security. Inspect hose and cylinder for clearance and chaffing during operation. Inspect hose connections and fittings for leaks.
4. Inspect throttle pedal assembly (Figure 1, Item 4) for mount security. Look for wear and or cracks.
5. Inspect throttle slave cylinder (Figure 1, Item 3) and spring for security. Inspect hose and cylinder for clearance and chaffing during operation. Inspect hose connection and fitting for leaks.

**END OF TASK****SERVICE****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

Remove reservoir cap (WP 0017) and inspect reservoir fluid level. Add hydraulic fluid as required. After throttle system component replacement, bleeding is required. Make sure that reservoir fluid level is properly maintained during and after bleeding process.

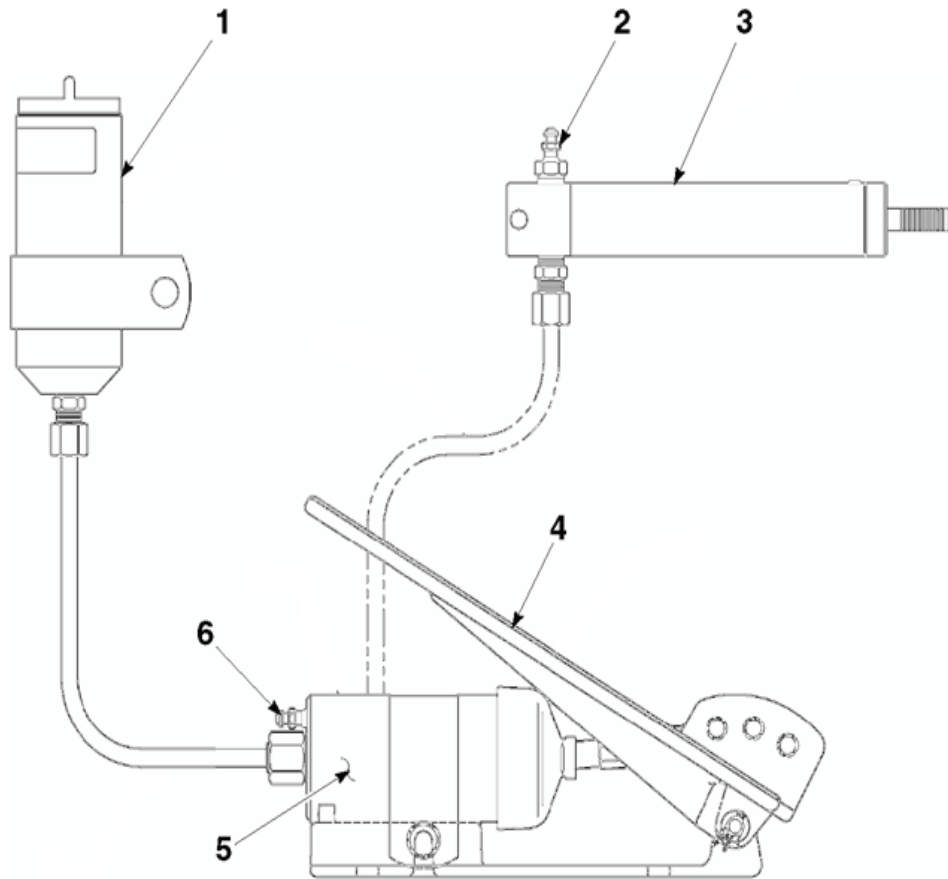


Figure 1. Throttle System – Bleeding.

## BLEEDING THE THROTTLE SYSTEM

### WARNING

Before servicing throttle system components, make sure that the machine is on level ground. Set the parking brake. Put chocks on each side of all four wheels. Disconnect the battery so that the engine cannot be started. If you do not take these precautions, the machine could run you over.

### NOTE

Throttle system bleeding starts at the throttle master cylinder and ends at the slave cylinder.

1. Verify throttle reservoir (Figure 1, Item 1) is full (WP 0017).
2. At master cylinder (Figure 1, Item 5), connect bleed hose to bleeder valve (Figure 1, Item 6) and put other end in container.

**CAUTION**

When bleeder valve is opened, pedal will move and push air/fluid out of bleeder valve. Do not release foot pressure on pedal until the bleeder valve is closed.

3. Apply foot pressure on pedal (Figure 1, Item 4) and open master cylinder bleeder valve (Figure 1, Item 6) vent air. Close bleeder valve and release foot pressure. Repeat procedure until no air is present.
4. Add hydraulic fluid to reservoir (Figure 1, Item 1) as required.
5. At slave cylinder (Figure 1, Item 3), connect bleed hose to bleeder valve (Figure 1, Item 2) and put other end in container.
6. Apply foot pressure on pedal (Figure 1, Item 4) and open slave cylinder bleeder valve (Figure 1, Item 2) to vent any air. Close bleeder valve and release foot pressure. Repeat procedure until all air is removed.
7. Add hydraulic fluid to reservoir (Figure 1, Item 1) as required.
8. Connect battery, (WP 0091).
9. Perform Maintenance Operation Check
10. Close engine access cover (WP 0020).

**END OF TASK**

**END OF WORK PACKAGE**





**FIELD MAINTENANCE**  
**THROTTLE SLAVE CYLINDER ASSEMBLY AND VALIDATION SWITCH**

**INITIAL SETUP:****Test Equipment**

N/A

**Tools and Special Tools**

Wheel Chocks (WP 0126, Item 1)

Drip Pan (WP 0126, Item 2)

General Mechanics Tool Kit (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**References**

WP 0020

WP 0091

WP 0104

**Materials/Parts**

Towel Paper (WP 0127, Item 31)

Fluid, Hydraulic (WP 0127, Item 18)

Anti-Seize Tape (WP 0127, Item 49)

**Equipment Condition**

Engine Shut Down

**INSPECTION**

Visually inspect slave cylinder for proper mount security, hose connection and cylinder rod end for leakage and for any damage affecting serviceability.

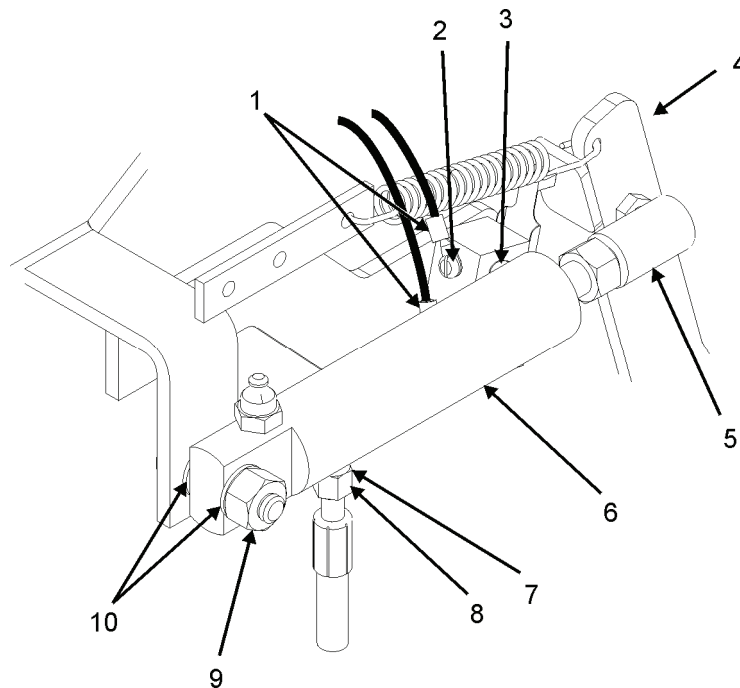
**END OF TASK**

Figure 1. Throttle Slave Cylinder (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Chock wheels.
2. Disconnect negative battery cables (WP 0091).
3. Open engine access cover (WP 0020).
4. Place a drip pan under slave cylinder.
5. Remove slave cylinder supply hose (Figure 1, Item 8) and plug.
6. Remove hose fitting (Figure 1, Item 7) and save for reinstallation.
7. Remove nut and washer (Figure 1, Item 4 - back of bracket)
8. Remove slave cylinder mount nut and flat washer (Figure 1, Item 9 and 10).
9. Remove slave cylinder (Figure 1, Item 6).

**NOTE**

If removing the ball joint (Figure 1, Item 5) note the number of threads inside of cylinder rod mount during removal to aid in reinstallation.

**END OF TASK****INSTALLATION**

1. Place inside washer (Figure 1, Item 10) over rear mount stud.
2. Slide slave cylinder (Figure 1, Item 6) over rear mount stud and place ball joint (Figure 1, Item 5) into mount bracket.
3. Install nut and washer (Figure 1, Item 4 - back of bracket) to secure ball joint to mount bracket.
4. Install slave cylinder mount washer and nut (Figure 1, Item 9 and 10) and tighten.
5. Wrap hose fitting (Figure 1, Item 7) with anti-seize tape and install.
6. Install slave cylinder supply hose (Figure 1, Item 8) and tighten.
7. Perform throttle system bleeding (WP 0104).
8. Connect battery negative cables (WP 0091).
9. Perform Maintenance Operation Check.
10. Close engine access cover (WP 0020).

**END OF TASK**

**REMOVAL****Throttle Validation Switch****NOTE**

Tag validation switch wires and note their position to aid in the reinstallation process.

1. Disconnect battery negative cables (WP 0091).
2. Open engine cover (WP 0020).
3. Remove 2 wire mount screws (Figure 1, Item 2) (1 not shown).
4. Remove 2 switch wires (Figure 1, Item 1).
5. Remove 2 switch mount screws and nuts (Figure 1, Item 3) (1 not shown).
6. Remove validation switch assembly.

**INSTALLATION****Throttle Validation Switch**

1. Position the validation switch assembly.
2. Install 2 switch mount screws and nuts (Figure 1, Item 3) (1 not shown) and tighten.
3. Position 2 switch wires (Figure 1, Item 1).
4. Install 2 wire mount screws (Figure 1, Item 2) (1 not shown) and tighten.
5. Close engine cover (WP 0020).
6. Connect battery negative cables (WP 0091).
7. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE**  
**THROTTLE MASTER CYLINDER/PEDAL ASSEMBLY**

**INITIAL SETUP:**

**Test Equipment**

N/A

**Tools and Special Tools**

Wheel Chocks (WP 0126, Item 1)  
Drip Pan (WP 0126, Item 2)  
General Mechanics Tool Kit (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**References**

WP 0020  
WP 0091  
WP 0104

**Materials/Parts**

Cloth, Lint-Free (WP 0127, Item 31)  
Fluid, Hydraulic (WP 0127, Item 18)  
Anti-Seize Tape (WP 0127, Item 49)

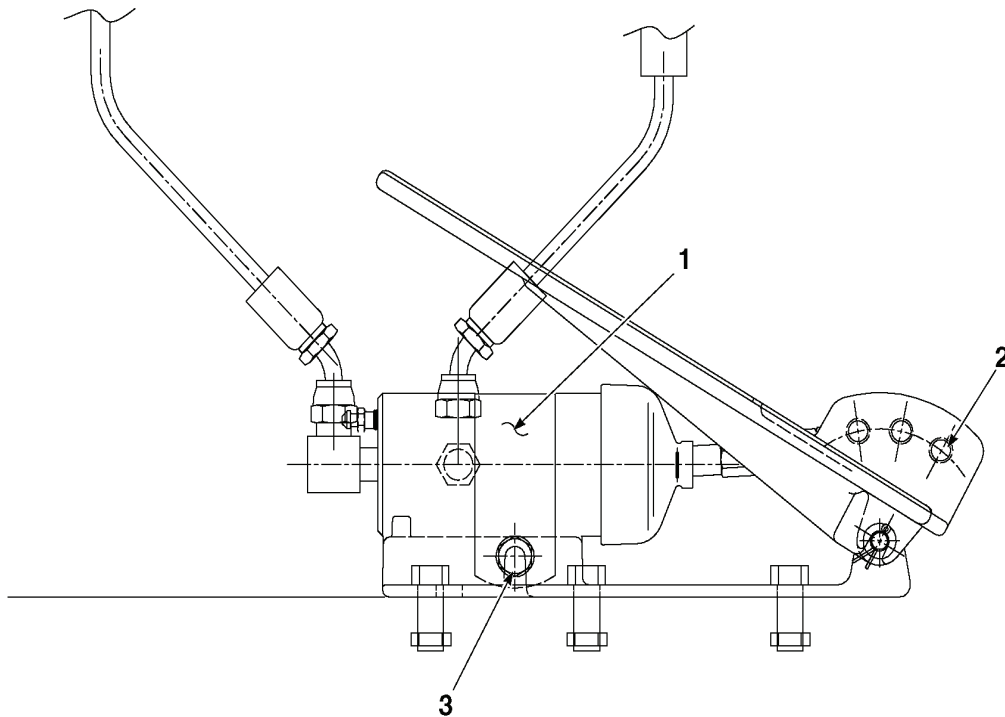
**Equipment Condition**

Engine Shut Down

**INSPECTION**

Inspect throttle master cylinder and pedal assembly for mount security, hose connection and rod end for leakage or any damage affecting serviceability.

**END OF TASK**



501348M-097

Figure 1. Throttle Master Cylinder/Pedal Assembly (Removal and Installation)

## THROTTLE MASTER CYLINDER

### REMOVAL

#### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Chock wheels.
2. Disconnect battery negative cables (WP 0091).
3. Place a drip pan under throttle master cylinder.
4. Remove pressure hose (Figure 1, Item 1) and plug.
5. Remove supply hose (Figure 1, Item 2) and plug.
6. Note orientation and remove 2 cylinder hose fittings (Figure 1, Item 13) and save for reinstallation.
7. Loosen cylinder rod jam nut (Figure 1, Item 5).

#### NOTE

Note the number of threads inside of cylinder rod clevis mount during removal to aid in reinstallation.

8. Turn cylinder rod counterclockwise and remove rod from clevis (not shown).
9. Remove nut, lock washer and bolt (Figure 1, Items 9, 10 and 11).
10. Remove clamp (Figure 1, Item 3) and save for reinstallation.
11. Remove throttle master cylinder (Figure 1, Item 12).
12. Remove cylinder rod jam nut (Figure 1, Item 5).

### END OF TASK

### INSTALLATION

1. Install cylinder rod jam nut (Figure 1, Item 5).
2. Position throttle master cylinder (Figure 1, Item 12) rod at the clevis.

#### NOTE

Screw the cylinder rod into the clevis the same number of threads as noted during removal.

3. Turn throttle master cylinder (Figure 1, Item 12) rod clockwise into the rod clevis.
4. Position clamp (Figure 1, Item 3) on master cylinder.
5. Install bolt, lock washer and nut (Figure 1, Items 9, 10 and 11) and tighten.
6. Tighten cylinder rod jam nut (Figure 1, Item 5).
7. Wrap threads of hose fittings (Figure 1, Item 13) with anti-seize tape.
8. Install 2 cylinder hose fitting (Figure 1, Item 13) in same position as noted during removal.
9. Install supply hose (Figure 1, Item 2).
10. Install pressure hose (Figure 1, Item 1).
11. Bleed throttle system (WP 0104).
12. Connect battery negative cables (WP 0091).
13. Remove chocks.
14. Perform Maintenance Operation Check.

### END OF TASK

**THROTTLE PEDAL ASSEMBLY****REMOVAL****NOTE**

It may be necessary to remove the pedal floor mount bolts in order to remove the master cylinder clamp mount bolt.

1. Chock wheels.
2. Disconnect battery negative cables (WP 0091).
3. Remove nut, lock washer and bolt (Figure 1, Items 9, 10 and 11).
4. Remove clamp (Figure 1, Item 3) and save for reinstallation.
5. Remove clevis mount bolt (Figure 1, Item 6).

**NOTE**

Pedal assembly mount nuts are accessed from under the vehicle.

6. Remove 3 pedal mount bolts and nuts (Figure 1, Items 7 and 8).
7. Remove pedal assembly (Figure 1, Item 4).

**END OF TASK****INSTALLATION**

1. Position pedal assembly (Figure 1, Item 4).
2. Position clamp (Figure 1, Item 3) over cylinder.
3. Install bolt, lock washer and nut (Figure 1, Items 9, 10 and 11) and tighten.
4. Install clevis mount bolt (Figure 1, Item 6).

**NOTE**

Pedal assembly mount nuts are accessed from under the vehicle.

5. Install 3 pedal mount bolts and nuts (Figure 1, Items 7 and 8).
6. Connect battery negative cables (WP 0091).
7. Remove wheel chocks.
8. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**





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**FIELD MAINTENANCE  
THROTTLE RESERVIOR**

---

**INITIAL SETUP:****Test Equipment**

N/A

**Tools and Special Tools**

Wheel Chocks (WP 0126, Item 1)

Drip Pan (WP 0126, Item 2)

General Mechanics Tool Kit (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic (2)

**References**

WP 0017

WP 0020

WP 0091

WP 0104

**Materials/Parts**

Cloth, Lint-Free (WP 0127, Item 31)

Fluid, Hydraulic (WP 0127, Item 18)

Anti-Seize Tape (WP 0127, Item 49)

**Equipment Condition**

Engine Shut Down

**INSPECTION**

Inspect throttle reservoir for security. Inspect cap, hose connection, and fitting for leaks. Tighten hose connection if required. Replace throttle reservoir as necessary.

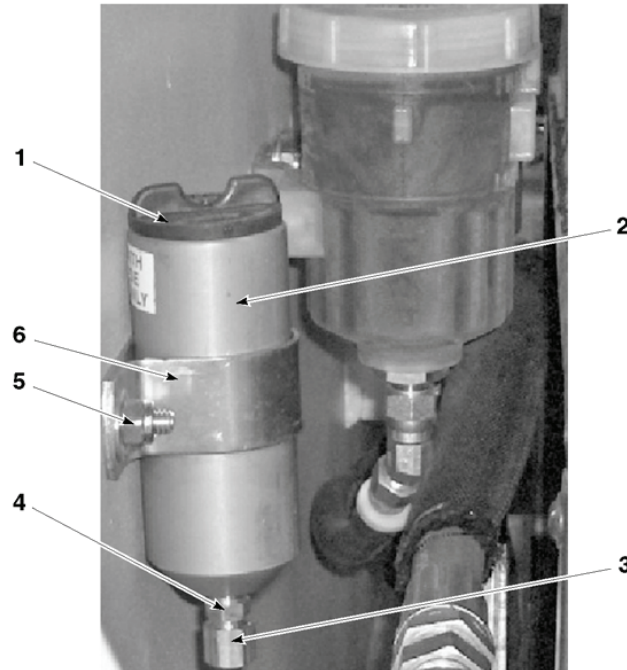
Visually check for contamination, milky color or debris in reservoir.

**SERVICE****CAUTION**

Throttle reservoir cap is plastic, use caution when removing and installing cap.

Ensure throttle reservoir is  $\frac{3}{4}$  full (WP 0017).

**END OF TASK**



501348M-098

Figure 1. Throttle Reservoir (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Chock wheels.
2. Disconnect battery negative cables (WP 0091).
3. Remove driver seat (WP 0020).
4. Open engine access cover (WP 0020).
5. Place a drip pan under throttle reservoir.
6. Remove throttle reservoir hose (Figure 1, Item 3) and plug.
7. Cap reservoir fitting (Figure 1, Item 4) or allow reservoir to drain.
8. Remove reservoir fitting (Figure 1, Item 4) and save for reinstallation.
9. Remove nut, washer and screw (Figure 1, Item 5).
10. Remove throttle reservoir (Figure 1, Item 2).
11. Remove reservoir clamp (Figure 1, Item 6) from reservoir and save for reinstallation.

**END OF TASK****INSTALLATION**

1. Position reservoir clamp (Figure 1, Item 6) on the reservoir.
2. Position the throttle reservoir (Figure 1, Item 2).
3. Install screw, washer and nut (Figure 1, Item 5) and tighten.
4. Wrap reservoir fitting (Figure 1, Item 4) with anti-seize tape.
5. Install reservoir fitting (Figure 1, Item 4).

6. Install the throttle reservoir hose (Figure 1, Item 3) and tighten.
7. Service reservoir and perform throttle system bleed (WP 0104).
8. Install driver seat (WP 0020).
9. Connect battery negative cables (WP 0091).
10. Remove wheel chocks.
11. Perform Maintenance Operation Check.
12. Close engine access cover (WP 0020).

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**HORN BUTTON AND HORN**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0091

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

---

**INSPECTION**

Visually inspect horn button and horn for mounting security, wiring for cracks and security and any damage affecting component serviceability.

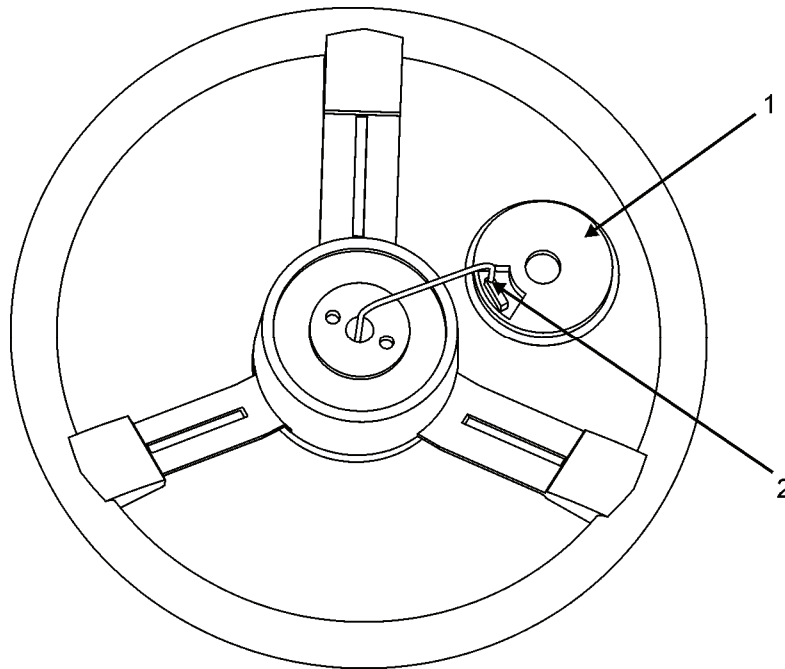
**END OF TASK**

Figure 1. Horn Button (Removal and Installation)

**REMOVAL****Horn Button**

1. Disconnect negative battery cables (WP 0091).
2. Pry horn button (Figure 1, Item 1) from steering wheel.
3. Disconnect wire (Figure 1, Item 2).
4. Remove horn button (Figure 1, Item 1).

**END OF TASK****INSTALLATION**

1. Connect wire (Figure 1, Item 2).
2. Install horn button (Figure 1, Item 1) on steering wheel.
3. Connect negative battery cables (WP 0091).
4. Perform Maintenance Operation Check.

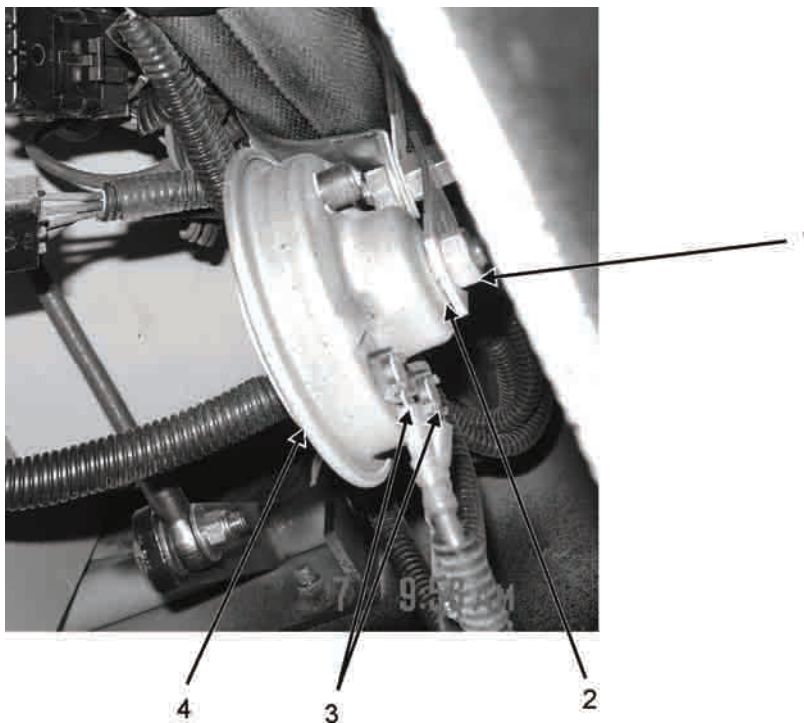
**END OF TASK**

Figure 2. Horn (Removal and Installation)

**REMOVAL****Horn****NOTE**

Tag wires on horn assembly to aid in reinstallation

1. Disconnect negative battery cables (WP 0091).
2. Remove mount nut (Figure 1, Item 1).
3. Disconnect wires (Figure 1, Item 3).
4. Remove horn (Figure 1, Item 4).
5. Remove star washer (Figure 1, Item 2).

**END OF TASK****INSTALLATION****Horn**

1. Install star washer (Figure 1, Item 2).
2. Install horn (Figure 1, Item 4).
3. Install mount nut (Figure 1, Item 1).
5. Connect wires (Figure 1, Item 3).
6. Connect negative battery cables (WP 0091).
7. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**





**FIELD MAINTENANCE**  
**STEERING WHEEL**

**INITIAL SETUP:**

**Test Equipment**

N/A

**References**

WP 0091

WP 0108

**Tools and Special Tools**

Standard Automotive Tool Set (WP 0125, Item 9)

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

N/A

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

N/A

**INSPECTION**

Visually inspect steering wheel for mounting security and any damage affecting component serviceability.

**END OF TASK**

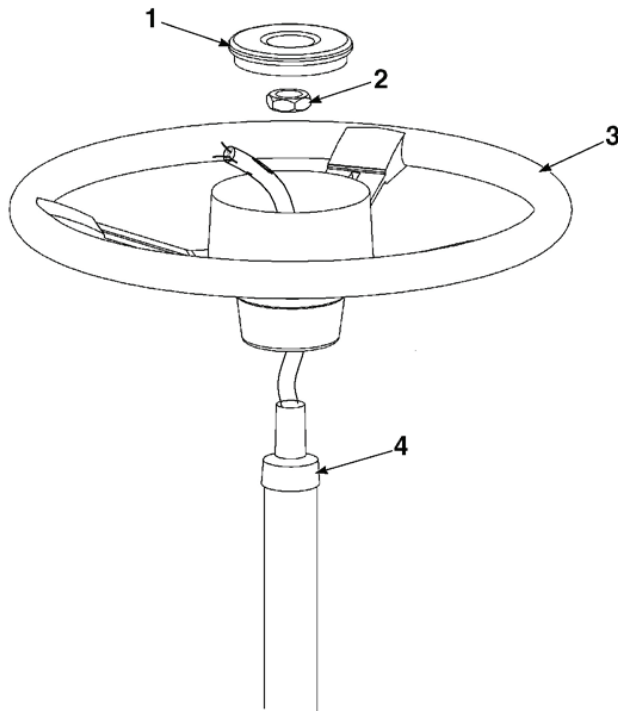


Figure 1. Steering Wheel (Removal and Installation)

**REMOVAL****NOTE**

Wheel puller may be used to aid in steering wheel removal.

1. Disconnect negative battery cables (WP 0091).
2. Remove horn button (WP 0108).
3. Remove nut (Figure 1, Item 2).
4. Remove steering wheel (Figure 1, Item 3).

**END OF TASK****INSTALLATION**

1. Install steering wheel (Figure 1, Item 3).
2. Seat steering wheel in position with a mallet or soft-faced hammer.
3. Install nut (Figure 1, Item 2).
4. Install horn button (WP 0108).
5. Connect negative battery cables (WP 0091).
6. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE  
STEERING COLUMN**

**INITIAL SETUP:**

**Test Equipment**

N/A

**References**

WP 0095

WP 0108

WP 0109

WP 0116

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Materials/Parts**

N/A

**Equipment Condition**

N/A

**INSPECTION**

Inspect steering column for damage affecting serviceability.

**END OF TASK**

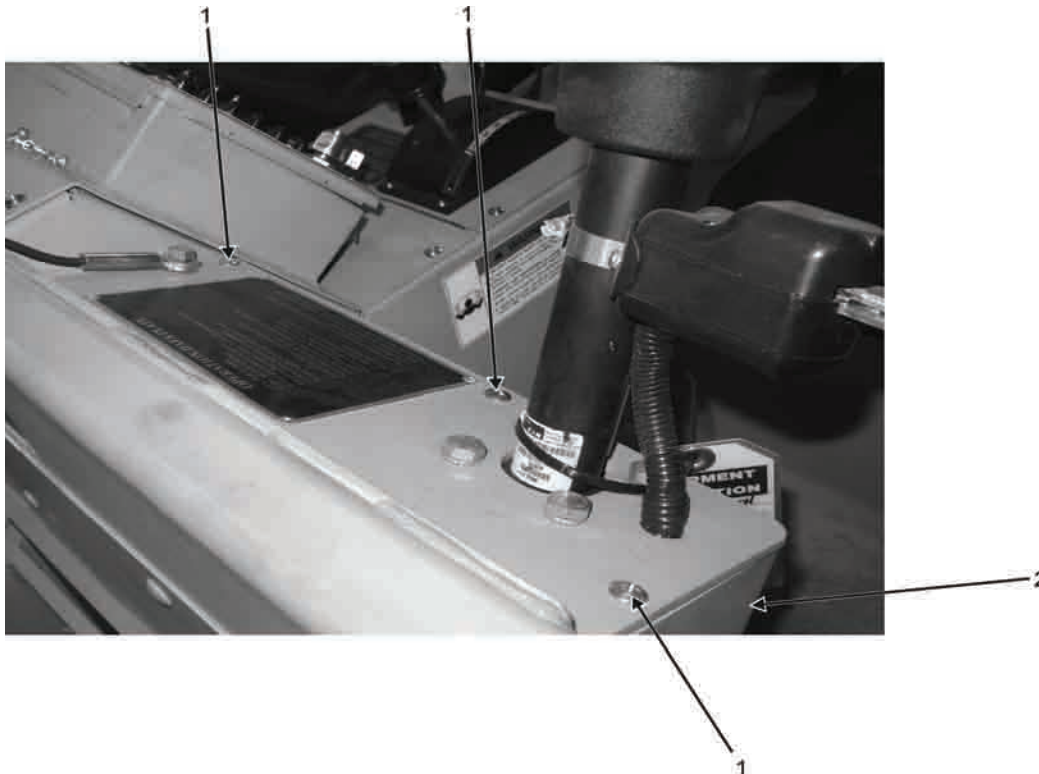


Figure 1. Orbital Valve Panel (Removal and Installation)

**REMOVAL**

1. Remove 3 steering panel mount screws (Figure 1, Item 1).
2. Remove steering panel (Figure 1, Item 2).
3. Disconnect horn wire (Figure 2, Item 3).
4. Remove steering horn button (WP 0108).
5. Remove steering wheel (WP 0109).
6. Remove directional signal arm (WP 0095).
7. Remove 4 orbital valve retaining bolts and washers (Figure 2, Items 2 and 4).
8. Drop orbital valve (WP 0116) and move away from steering column.
9. Remove steering column (Figure 2, Item 1).

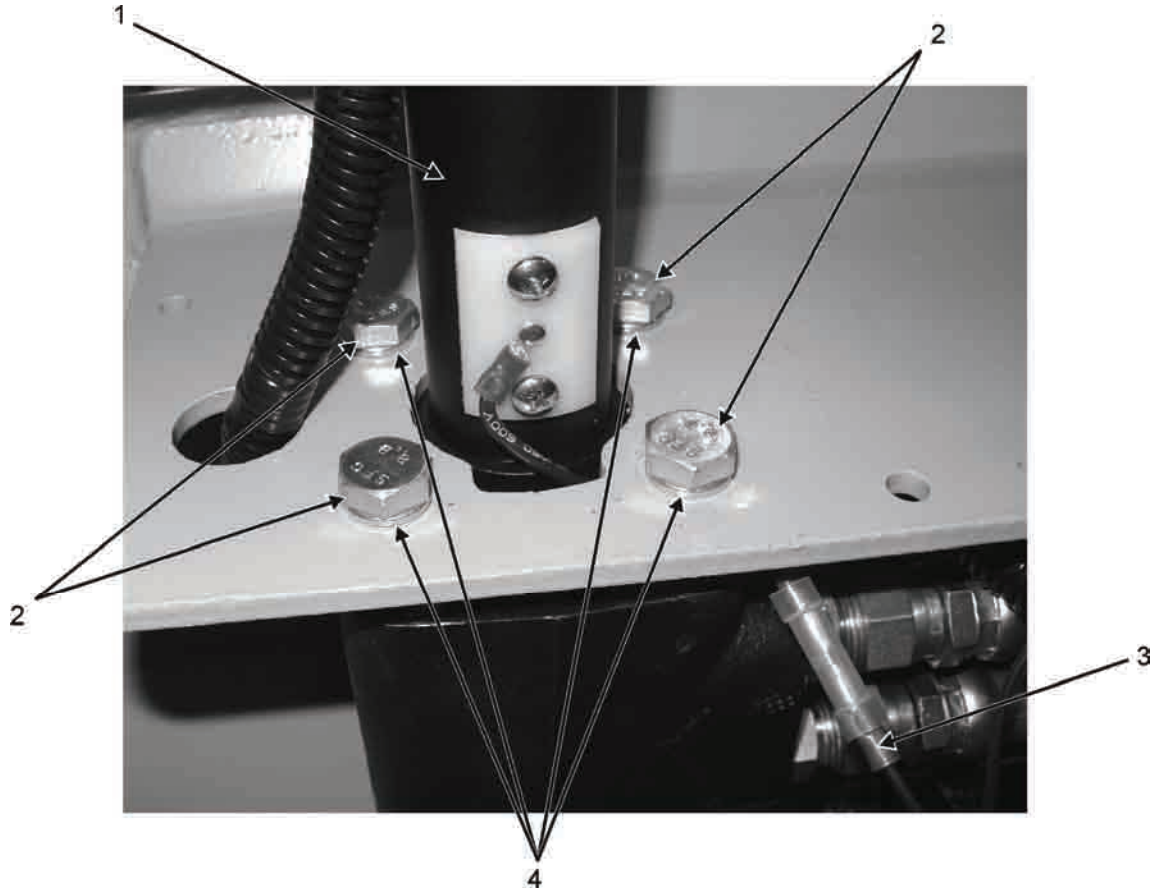
**END OF TASK**

Figure 2. Steering Column (Removal and Installation)

**INSTALLATION**

1. Position steering column (Figure 2, Item 1).
2. Position orbital valve (WP 0116) on steering column.
3. Install 4 orbital valve retaining bolts and washers (Figure 2, Item 2 and 4).
4. Install directional signal arm (WP 0095).
5. Install steering wheel (WP 0109).
6. Install steering horn button (WP 0108).
7. Connect horn wire (Figure 2, Item 3).
8. Position steering panel (Figure 1, Item 2).
9. Install 3 steering panel mount screws (Figure 1, Item 1).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**HYDRAULIC TANK ASSEMBLY (STEERING)**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0017

WP 0020

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

Fluid, Hydraulic (WP 0127, Item 23)

Cap and Plug (WP 0127, Item 7)

Cleaning Solvent (WP 0127, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

---

**INSPECTION**

Inspect hydraulic tank mounting security, lines and fittings for leaks and fluid level.

**END OF TASK****SERVICE**

1. Remove dipstick (Figure 1, Item 4) and wipe clean.
2. Reinsert dipstick, remove and check level.
3. Level should be between the low and high marks on the dipstick. Service as required.
4. Reinstall dipstick (Figure 1, Item 4).

**END OF TASK****WARNING**

Hydraulic fluid is combustible. Do not use or store near flames, sparks, or hot surfaces. Use only in a well-ventilated area. If hydraulic fluid is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist can cause dermatitis and severe skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. Remove contaminated clothing and launder before reuse. If liquid contacts eyes, flush eyes with water immediately. If fluid is swallowed, do not try to vomit; fluid may enter the lungs and cause severe injury. Get immediate medical attention. When handling liquid, wear rubber gloves and impervious clothing to minimize contact. If prolonged contact with mist is likely, wear NIOSH/MSHA approved respirator.

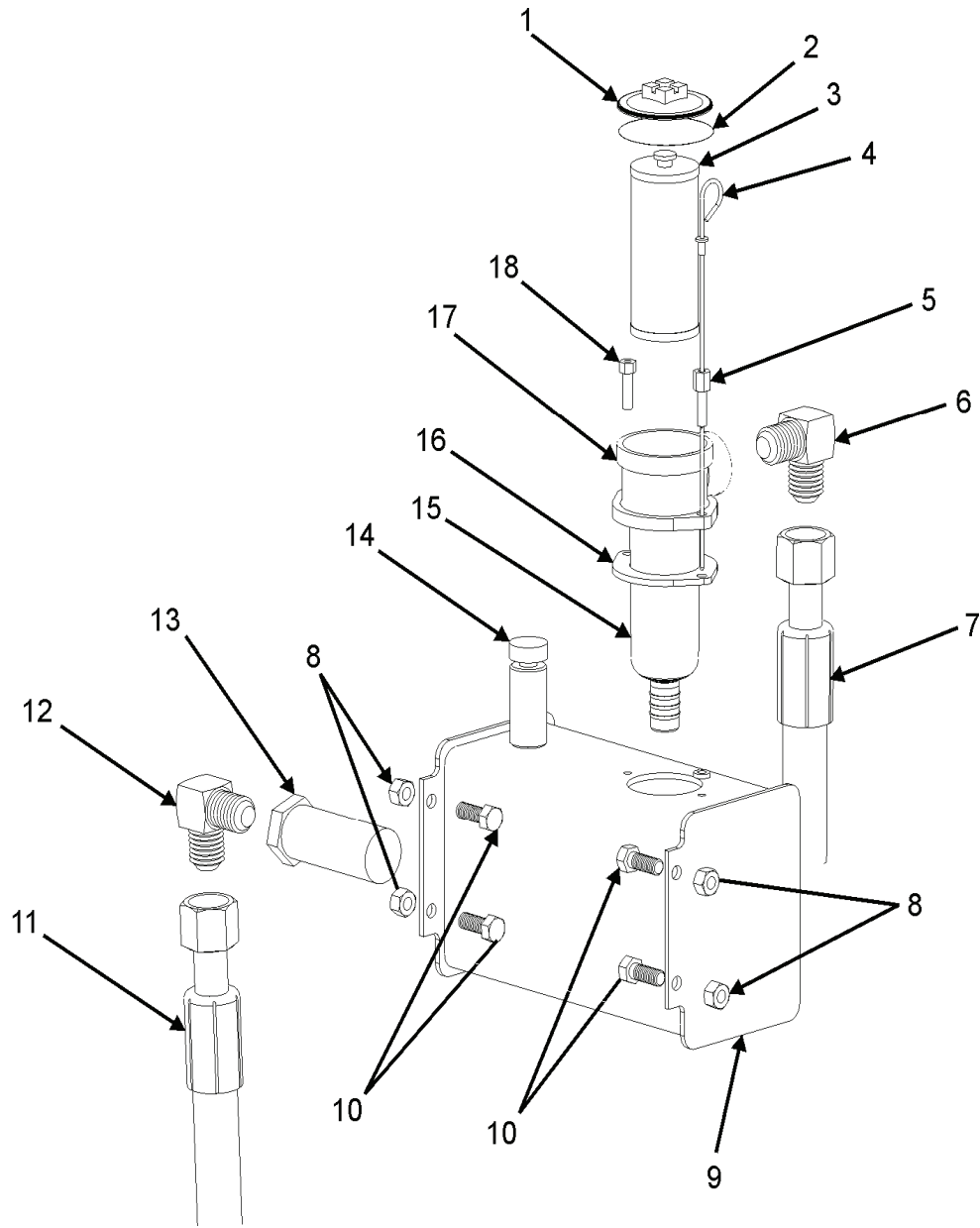


Figure 1. Hydraulic Tank Assembly (Removal and Installation)



## REMOVAL

### WARNING

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

### NOTE

Cap, plug and tag all lines and fitting during removal to aid with the reinstallation process.

Note the orientation of all fitting and hoses during removal to aid with the reinstallation process.

1. Remove engine cover (WP 0020).
2. Remove center deck plate (WP 0020).
3. Remove center support bar (WP 0020).
4. Remove suction hose (Figure 1, Item 11).
5. Allow all hydraulic fluid to drain.
6. Remove hydraulic return hose (Figure 1, Item 7).
7. Remove 4 mount nuts (Figure 1, Item 8) and mount bolts (Figure 1, Item 10).
8. Remove hydraulic tank (Figure 1, Item 9) and drain remaining fluid.
9. Remove fitting strainer assembly (Figure 1, Items 12 and 13) as an assembly.
10. Remove breather cap (Figure 1, Item 14).
11. Remove dipstick (Figure 1, Item 4) from mount (Figure 1, Item 5).
12. Remove tank cap (Figure 1, Item 1) and gasket (Figure 1, Item 2).
13. Remove filter assembly mount bolts (Figure 1, Item 5 and 18).
14. Remove filter assembly (Figure 1, Item 17) from tank. (Keep associated parts together).
15. Dispose of filter element (Figure 1, Item 3) if contaminated.

## END OF TASK

### Cleaning

1. Clean strainers (Items 13 and 15) and associated parts.
2. Clean tank for disposal or for reinstallation.
3. Wipe tank seat area clean.

## INSTALLATION

1. Install strainer assembly (Figure 1, Items 12 and 13) as an assembly.
2. Install filter assembly (with new filter if required) (Figure 1, Item 17) as an assembly.
3. Install filter assembly mount bolts (Figure 1, Items 5 and 18).
4. Install dipstick (Figure 1, Item 4) into mount (Figure 1, Item 5).
5. Install breather cap (Figure 1, Item 14).
6. Position hydraulic tank (Figure 1, Item 9).
7. Install 4 mount bolts (Figure 1, Item 10) and nuts (Figure 1, Item 8) and tighten.
8. Connect hydraulic suction hose (Figure 1, Item 11) and remove tag.
9. Connect hydraulic return hose (Figure 1, Item 7) to fitting (Figure 1, Item 6) and remove tag.
10. Remove filter (Figure 1, Item 3) from tank.
11. Fill tank with hydraulic fluid and perform fluid check this work package. Check for leaks.
12. Reinstall filter (Figure 1, Item 3) into tank.
13. Install tank cap (Figure 1, Item 1) and gasket (Figure 1, Item 2).

**NOTE**

Remove any air that may have entered the hydraulic system by starting engine and turning steering wheel full right, then full left. Repeat several times.

14. Perform Maintenance Operation Check.
15. Recheck fluid level this work package. Add as required.
16. Install center support bar (WP 0020).
17. Install center deck plate (WP 0020).
18. Install engine cover (WP 0020).

**END OF TASK**

**END OF WORK PACKAGE**

**FIELD MAINTENANCE**  
**FILTER (HYDRAULIC TANK)**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0020

**Tools and Special Tools**  
General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down

**INSPECTION**

Inspect hydraulic tank filter for contamination or clogged condition.

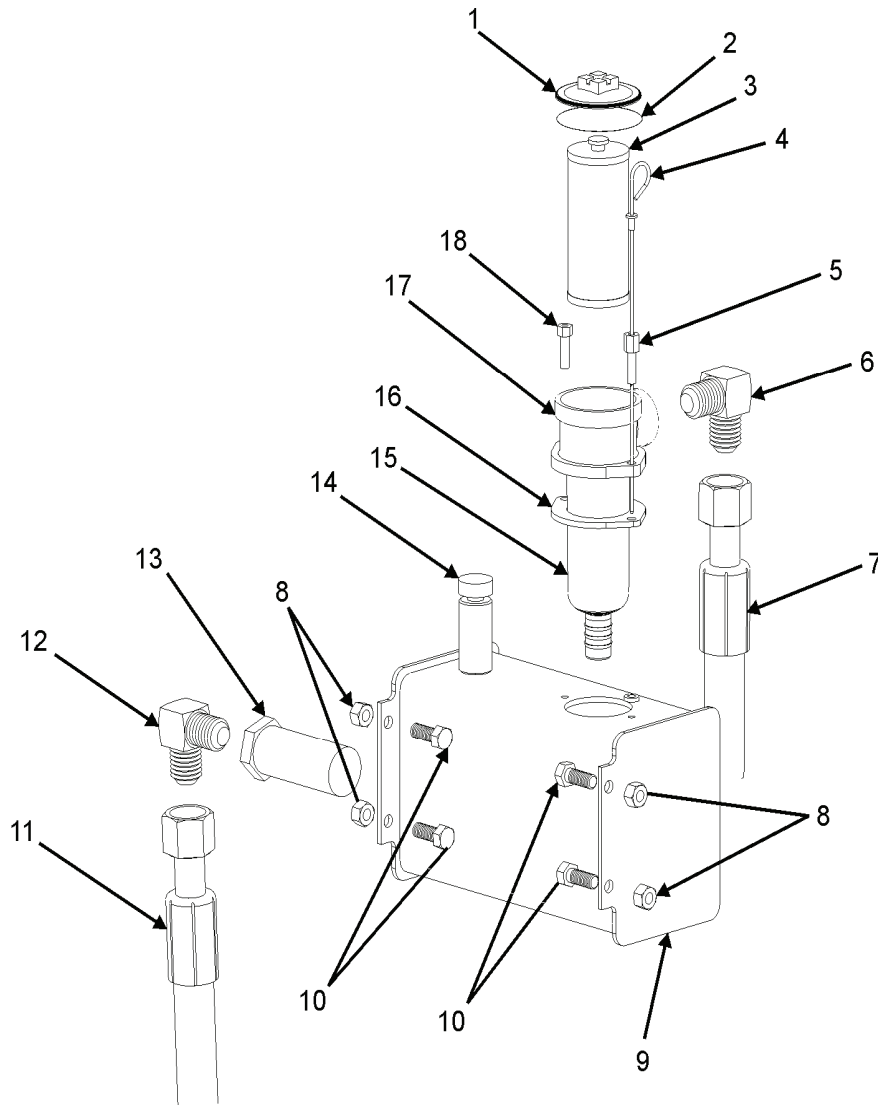


Figure 1. Filter (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Open engine cover (WP 0020).
2. Remove tank cap (Figure 1, Item 1) and gasket (Figure 1, Item 2).
3. Remove filter (Figure 1, Item 3) from strainer (Item 15).
4. Properly dispose of old filter.

**END OF TASK****INSTALLATION**

1. Install filter (Figure 1, Item 3) into strainer (Item 15).
5. Install gasket (Figure 1, Item 2) and tank cap (Figure 1, Item 1).
6. Perform Maintenance Operation Check.
7. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**STRAINER (HYDRAULIC TANK)**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0020

WP 0111

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

Cleaning Solvent (WP 0127, Item 8)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**

Engine Shut Down

---

**INSPECTION**

Inspect upper tank strainer and lower tank strainer for damage affecting serviceability.

**END OF TASK****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**REMOVAL**

1. Open engine cover (WP 0020).
2. Remove upper and lower tank strainers (WP 0111).
3. Clean and or replace as necessary.

**INSTALLATION**

1. Install clean or new upper and lower tank strainers (WP 0111).
4. Close engine cover (WP 0020).
2. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE**  
**HYDRAULIC TANK BREATHER**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0020

**Tools and Special Tools**  
General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**  
N/A

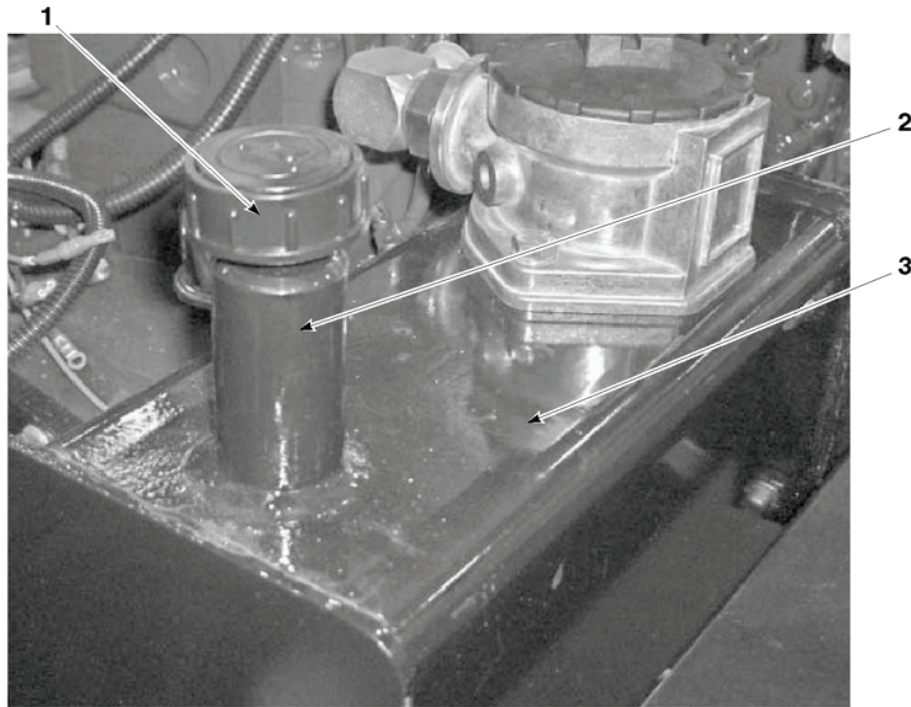
**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down

**INSPECTION**

Inspect breather cap for security, worn threads or any damage affecting serviceability.

**END OF TASK**



501348M-142

Figure 1. Hydraulic Tank Breather (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

1. Remove engine cover (WP 0020).
2. Remove center deck plate (WP 0020).
3. Remove breather cap (Figure 1, Item 1).

**END OF TASK****INSTALLATION**

1. Install breather cap (Figure 1, Item 1).
2. Install center deck plate (WP 0020).
3. Install engine cover (WP 0020).
4. Perform Maintenance Operation Check.

**END OF TASK****END OF WORK PACKAGE**



**FIELD MAINTENANCE**  
**GEAR PUMP (STEERING)**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0020  
WP 0021

**Tools and Special Tools**  
General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down

**INSPECTION**

Inspect gear pump for mount security, hoses and fittings for leaks and any damage affecting serviceability.

**END OF TASK**

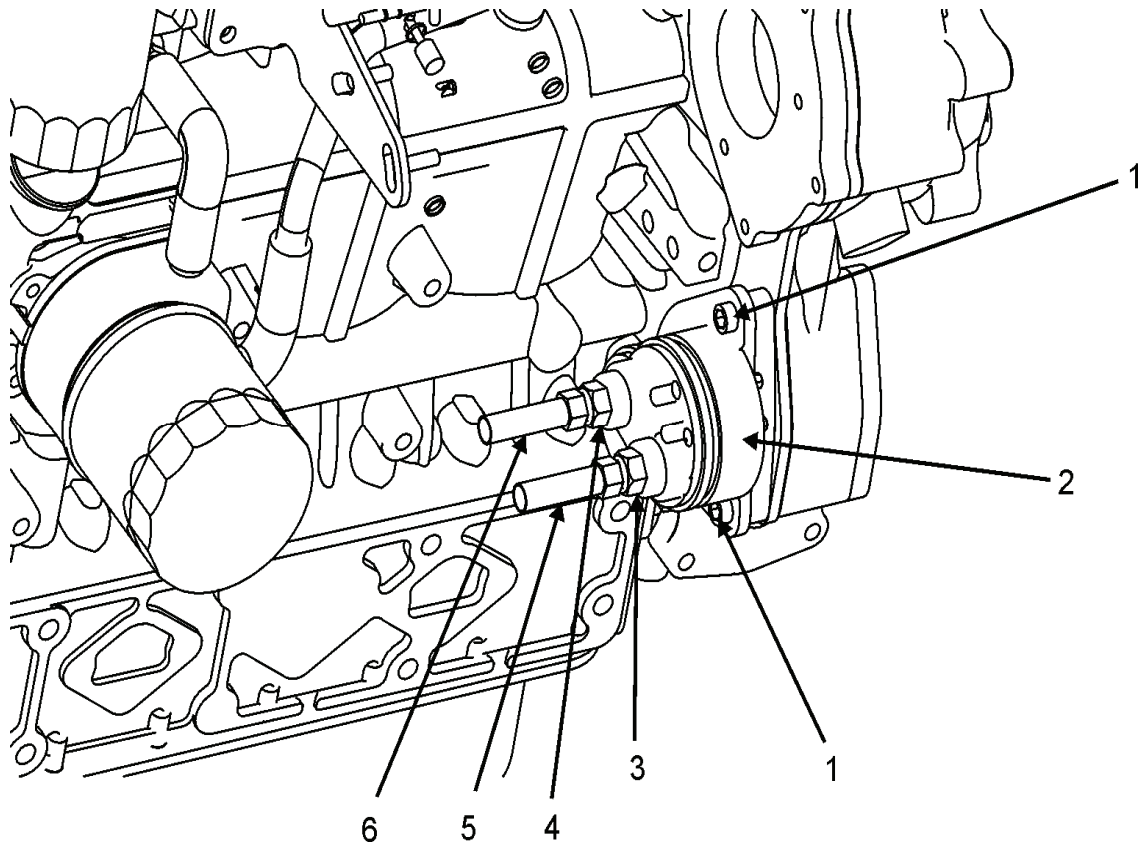


Figure 1. Gear Pump (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**NOTE**

Cap/plug and label hydraulic hoses and note orientation of connections during the removal process.

1. Disconnect battery negative cables (WP 0091).
2. Open engine cover (WP 0020).
3. Lift front of vehicle (WP 0021).
4. Place a drip pan under the gear pump.
5. Disconnect suction hydraulic hose (Figure 1, Item 5) from fitting (Figure 1, Item 3).
6. Disconnect pressure hydraulic hose (Figure 1, Item 6) from fitting (Figure 1, Item 4).
7. Remove 2 gear pump mount bolts and washers (Figure 1 Item 1).
8. Remove gear pump (Figure 1, Item 2) from engine.
9. Remove fitting (Figure 1, Item 3) from gear pump, discard o-ring.
10. Remove fitting (Figure 1, Item 4) from gear pump, discard o-ring.

**END OF TASK****INSTALLATION****NOTE**

Clean gear pump engine mating surfaces.

11. Install fitting (Figure 1, Item 3) on gear pump with new o-ring.
12. Install fitting (Figure 1, Item 4) on gear pump with new o-ring.
13. Install o-ring on gear pump (Figure 1, Item 2).
14. Position gear pump on engine.
15. Install 2 gear pump mount bolts and washers (Figure 1 Item 1).
16. Connect pressure hydraulic hose (Figure 1, Item 6) to fitting (Figure 1, Item 4).
17. Connect suction hydraulic hose (Figure 1, Item 5) to fitting (Figure 1, Item 3).
18. Lower vehicle (WP 0020).
19. Connect battery negative cables (WP 0091).

**NOTE**

Remove any air that may have entered the hydraulic system by starting engine and turning steering wheel full right, then full left. Repeat several times.

20. Perform Maintenance Operation Check.
21. Lower front of vehicle (WP 0021).
22. Close engine cover (WP 0020).

**END OF TASK****END OF WORK PACKAGE**

**FIELD MAINTENANCE**  
**ORBITAL VALVE (STEERING)**

**INITIAL SETUP:**

**Test Equipment**  
N/A

**References**  
WP 0110

**Tools and Special Tools**  
General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**  
N/A

**Personnel Required**  
91B, Light Wheel Vehicle Mechanic

**Equipment Condition**  
Engine Shut Down

**INSPECTION**

Inspect orbital valve for mount security, damaged or leaking lines and fittings or any damage affecting serviceability.

**END OF TASK**

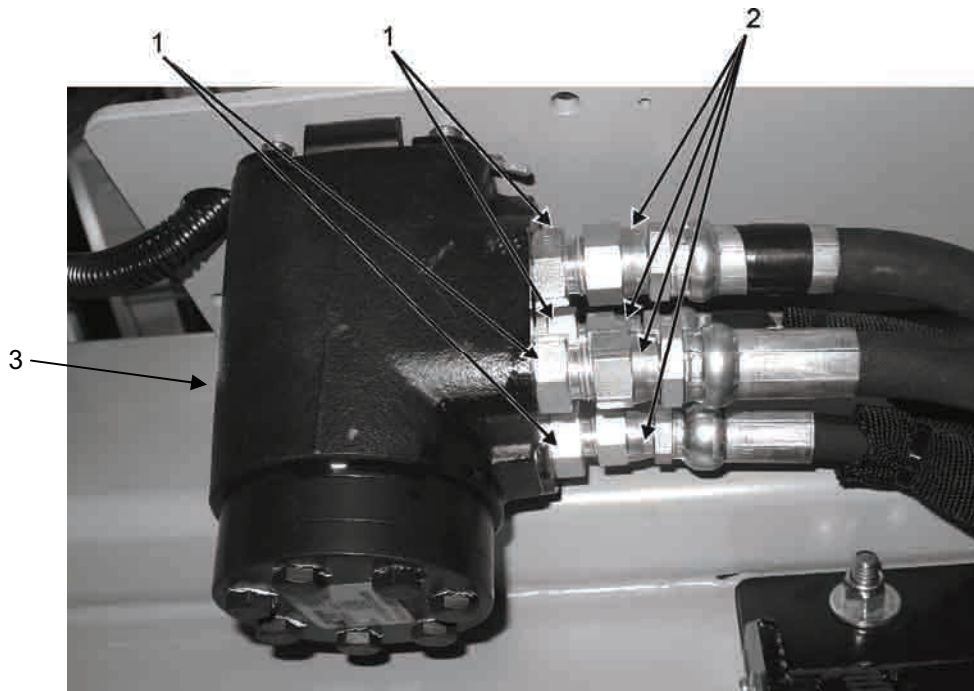


Figure 1. Orbital Valve (Steering) (Removal and Installation)

**REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death.

**NOTE**

Tag hoses and fittings during the removal process to aid in reinstallation.

1. Remove orbital valve panel cover (WP 0110).
2. Disconnect hydraulic hoses (Figure 1, Item 2) from fittings (Figure 1, Item 1).
3. Remove orbital valve mount bolts (WP 0110).
4. Remove orbital valve (Figure 1, Item 3) from steering column.
5. Remove fittings (Figure 1, Item 1).

**END OF TASK****INSTALLATION**

1. Install fittings (Figure 1, Item 1) on orbital valve (Figure 1, Item 3).
2. Position orbital valve (Figure 1, Item 3).
3. Install orbital valve mount bolts (WP 0110).
4. Connect hydraulic hoses (Figure 1, Item 2) to fittings (Figure 1, Item 1).

**NOTE**

Remove any air that may have entered the hydraulic system by starting engine and turning steering wheel full right, then full left. Repeat several times.

5. Perform Maintenance Operation Check.
6. Install orbital valve panel cover (WP 0110).

**END OF TASK****END OF WORK PACKAGE**

---

**FIELD MAINTENANCE**  
**STEERING CYLINDER**

---

**INITIAL SETUP:****Test Equipment**

N/A

**References**

WP 0021

WP 0111

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Materials/Parts**

Anti-Seize Compound (WP 0127, Item 10)

Plugs and Caps (WP 0127, Item 7)

**Personnel Required**

91B, Light Wheel Vehicle Mechanic

**Equipment Condition**Engine Shut Down

---

**INSPECTION**

Inspect steering cylinder for mount security, hoses and fittings for leaks and any damage affecting serviceability.

**END OF TASK****REMOVAL****WARNING**

The use of Personal Protective Equipment (PPE) is required when using or handling hazardous materials associated with operating and maintaining equipment (jet fuel, hydraulic fluid, brake fluid, ethylene glycol, cleaning solvents, compressed air, and engine/axle oil). Failure to use PPE when handling these materials could result in injury or death. If there is any prolonged contact with skin, wash contacted area with soap and water. Remove contaminated clothing and launder before reuse. If liquid contacts eyes, flush eyes with water immediately.

**NOTE**

Tag hoses and fittings during removal process to aid in reinstallation.

It may be necessary to reuse steering cylinder grease fitting and hose pipe fittings during reinstallation.

1. Raise front of vehicle (WP 0021).
2. Place a drip pan under the steering cylinder hoses.
3. Disconnect steering cylinder hoses (Figure 1, Items 3 and 4) noting orientation.
4. Remove fittings (Figure 1, Item 5) from steering cylinder pipes.
5. Remove mount plate/pin assembly (Figure 1, Item 2).
6. Remove steering pin mount bolt (Figure 1, Item 7).
7. Remove pin (Figure 1, Item 6) from the bottom.
8. Remove steer cylinder assembly (Figure 1, Item 8).

**END OF TASK**

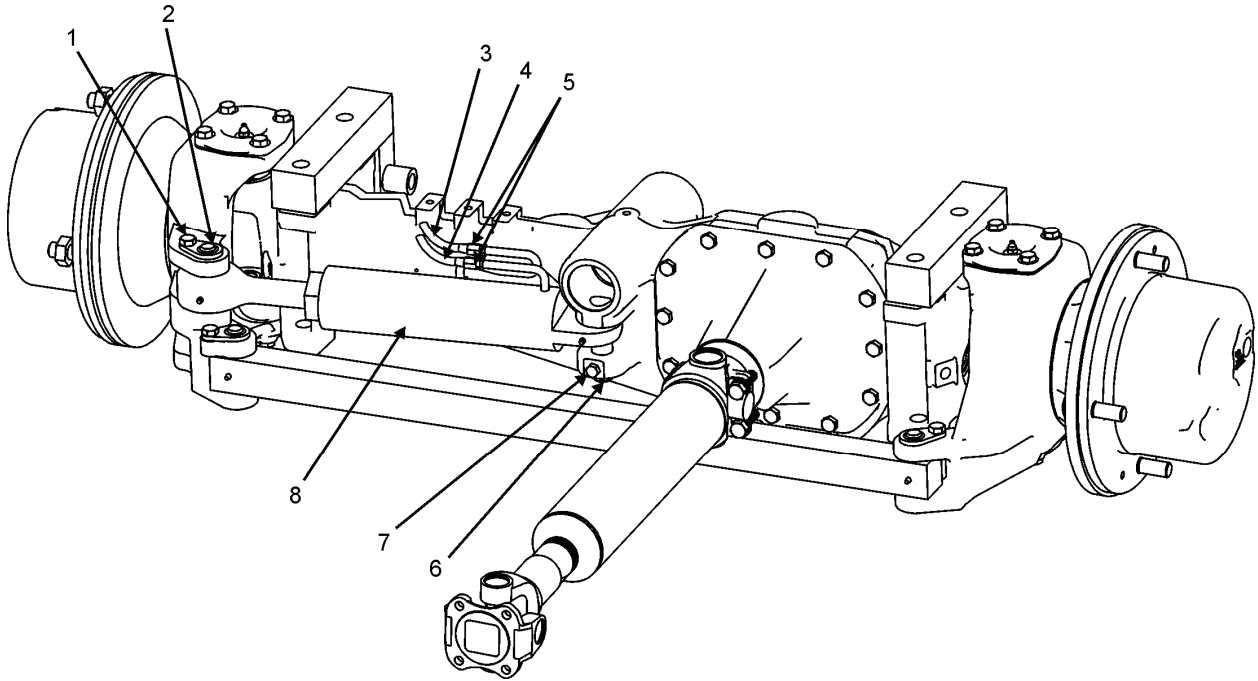


Figure 1. Steer Cylinder (Removal and Installation)

## INSTALLATION

1. Position steer cylinder assembly (Figure 1, Item 8) inside cylinder mounts.
2. Apply anti-seize compound to steering cylinder mount pins.
3. Install pin (Figure 1, Item 6) so pin hole lines up with mount bolthole.
4. Install steering pin mount bolt (Figure 1, Item 7).
5. Install mount plate/pin assembly (Figure 1, Item 2).
6. Install mount bolt (Figure 1, Item 5).
7. Connect steering cylinder hoses (Figure 1, Items 3 and 4) same as removal.

## NOTE

Remove any air that may have entered the hydraulic system by starting engine and turning steering wheel full right, then full left. Repeat several times.

8. Perform Maintenance Operation Check.
9. Lower front of vehicle (WP 0021).
10. Service steering hydraulic tank (WP 0111).

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE  
STORAGE**

---

**INITIAL SETUP:****Test Equipment**

N/A

**Tools and Special Tools**

General Mechanics Tool Kit (WP 0125, Item 8)

**Personnel Required****References**

WP 0005  
 WP 0009  
 WP 0016  
 WP 0090  
 WP 0091

**Materials/Parts**

Towel Paper (WP 0127, Item 31)  
 Cap and Plug Set (WP 0127, Item 7)  
 Antifreeze (WP 0127, Item 5)  
 Engine Oil (WP 0127, Items 21, 22, 24 and 25)  
 Grease (WP 0127, Item 15)  
 Petroleum Technical (WP 0127, Item 33)  
 Tape, Duct (WP 0127, Item 59)  
 Internal Engine Preservative (WP 0127, Item 26)  
 Corrosion Preventive Compound (WP 0127, Item 56)

**Equipment Condition**

Vehicle placed on lift  
 Engine not running, ignition switch in OFF position  
 N/A

---

If you need to keep your machine idle for more than 30 days, or you are putting it into indefinite storage, first prepare it according to the following procedures:

**NOTE**

The following steps will help minimize corrosion and deterioration while your machine is in storage.

**PREPARATION FOR STORAGE****Storage 30-90 Days**

1. Perform any necessary repairs.
2. Clean machine carefully. Wash off mud and dirt. Wipe off excess oil and grease. Remove debris from radiator cooling fins.
3. Select a dry and protected storage location. Position machine so as to permit access to all components.
4. Start engine and run it until it reaches operating temperature. Shut off engine. Drain crankcase, change oil filter, and refill crankcase with recommended oil.
5. Disconnect battery (WP 0091). Put battery into safe storage (WP 0090) in a fully charged condition. Protect battery terminals against corrosion using a spray of external engine preservative or petroleum jelly.
6. Seal all engine openings.
7. Apply a thin coat of grease to exposed machined but unpainted metal surfaces.
8. Refinish any scratched or scuffed paint surfaces.
9. If the machine must be stored outdoors, cover with a heavy canvas or waterproof material. Secure cover with a strong waterproof tape so it will not blow away.

**Storage 90 Days or Longer**

The recommendations below are designed to prevent damage to the engine when it is withdrawn from service for a prolonged period. Perform in addition to 30-90 day procedure.

1. Clean engine breather pipe and seal end of pipe.

2. Drain fuel system and fill with clean fuel. The fuel must be drained and filters discarded at end of storage period. If you add a fuel preservative to the fuel, the fuel and filters may not need to be discarded at the end of the storage period.
3. Operate engine until it is warm. Stop engine and fix any fuel, oil, or air leaks.
4. Drain the cooling system. In order to protect the cooling system against corrosion, fill with a coolant that has a corrosion inhibitor. If protection against frost is necessary, use an antifreeze mixture.
5. Operate engine for a short period in order to circulate lubricating oil and coolant in engine.
6. Remove injectors and spray an internal engine preservative into each cylinder bore. If this is not available, clean engine oil will offer some protection. Two to three ounces of oil should be placed in each cylinder.
7. Slowly turn crankshaft one revolution and then fit injectors with new seat washers and new dust seals.
8. Remove pipes installed between air filter and intake manifold. Spray preservative into intake manifold. Seal manifold with waterproof tape.
9. Remove exhaust pipe. Spray internal engine preservative into exhaust manifold. Seal manifold with waterproof tape.
10. Remove oil filler cap. Spray internal engine preservative into oil filler hole to protect rocker shaft assembly. Install filler cap.
11. Seal vent pipe of fuel tank or filler cap with waterproof tape.
12. Remove drive belts and put into storage.
13. Spray engine with external engine preservative to prevent corrosion. Do not spray area inside alternator cooling fan.
14. Follow instructions in your engine manual.

### **Removing Machine from Storage**

1. Remove protective cover and unseal engine openings.
2. Install battery and connect cables (WP 009 and WP 0091).
3. Wipe excess grease from machined, unpainted surfaces.
4. Inspect hydraulic seals at cylinders for leaks.

### **NOTE**

If the unit has been stored for more than 120 days, you can expect some deterioration of the hydraulic seals. Replace defective seals before operating machine.

1. Install all parts that were removed when vehicle was being prepared for storage.
2. Perform "Daily" checks as described in WP 0016.
3. After the hydraulic system has warmed up to operating temperature, remove hydraulic tank fill cap and check appearance of hydraulic fluid. A milky appearance indicates that there is water in the system and that the system should be drained and re-filled with fresh oil.

**END OF TASK**

**END OF WORK PACKAGE**



**FIELD MAINTENANCE  
SHIPPING**

**PREPARATION FOR SHIPMENT**

1. Review transportation data plate (Figure 1) for pertinent shipping data.
2. Fold operator and hitch mirrors "in" so they do not protrude outward.
3. Move the front and rear pintle hitch to the uppermost position (WP 0005).
4. Remove fire extinguisher from its operating location between seats and store in one of the side storage compartments.

**END OF TASK**

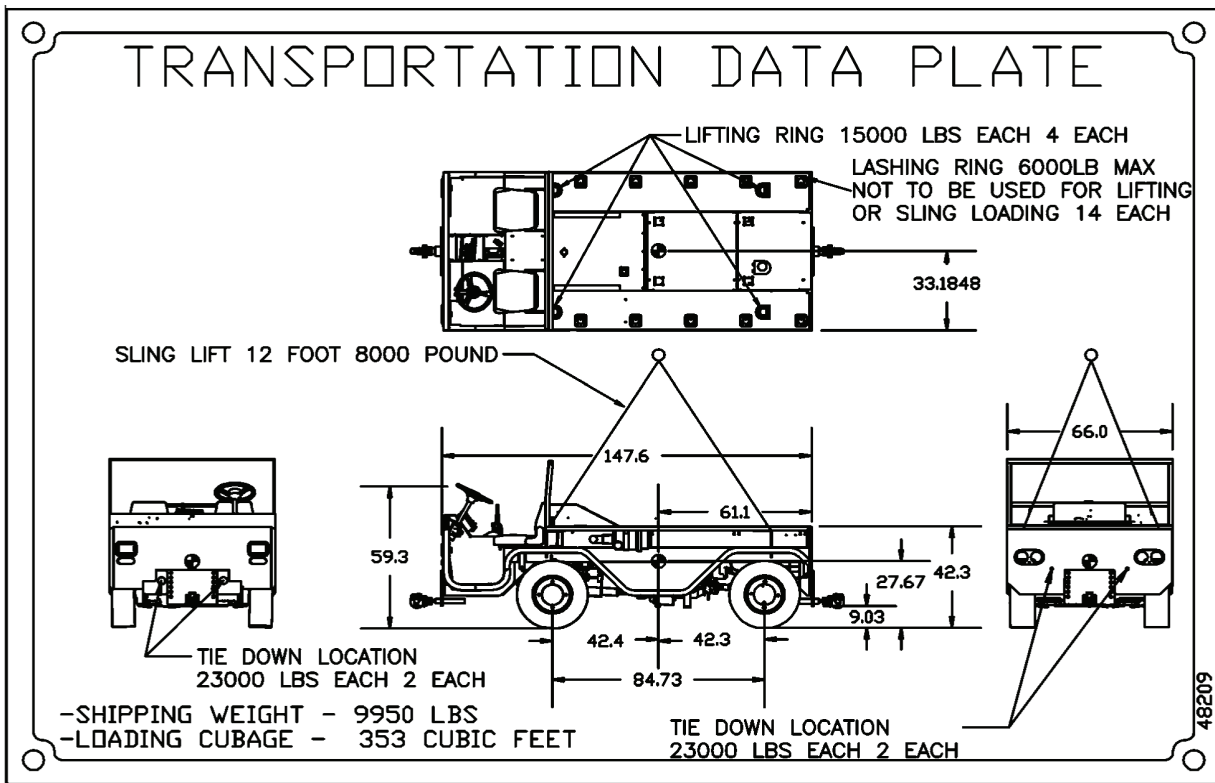


Figure 1. Transportation Data Plate.

**HIGHWAY, RAIL, MARINE, FIXED-WING, INTERNAL/EXTERNAL HELICOPTOR TRANSPORT**

1. Prepare the vehicle for shipment per applicable mode of transport.
2. Refer to instructions in applicable transportation pamphlets.
3. Follow the guidelines as outlined in (Table 1, Figure 1 and 2 and Appendix A).

**END OF TASK**

**END OF WORK PACKAGE**

TABLE 1. HSL CH-47D FLIGHT TEST RIGGING REQUIREMENTS

PARAMETER	PROCEDURES
Configuration	Single point
Required rigging	Army sling set, 25,000-lb Reach Pendant, 25,000-lb capacity
Materials	Tape, adhesive, pressure-sensitive, 2-in. wide roll
	Cord, nylon, type-III, 550-lb breaking strength
	Web, cotton, 1/4-in., 80-lb breaking strength
	Felt sheet, cattle hair, type-IV, 1/2-in. or suitable padding
	Cargo strap, general purpose (NSN 3990-01-204-3009), two each, or suitable tie-down lashings.
	Webbing, tubular, nylon, 1/2-in., 1,000-lb breaking strength
Preparation	Ensure the fuel tank is not over three-quarters full. Inspect the fuel tank cap, oil filler cap, and battery caps, for proper installation.
	Engage the vehicle parking brake and put the transmission in neutral.
	Ensure the front wheels are pointed straight ahead. Tie the steering wheel using the securing device provided under the dashboard.
	Secure all loose items (air intake cap, seat cushions, etc.) with tape or type-III nylon cord.
	Remove mirror and secure to seat with tape or type-III nylon cord.
	Cover all lights, markers, and reflectors with tape.
Personnel	2 persons, 15 min
Rigging process	Position apex fitting on the bed of the vehicle and rigging to each side of the load: outer sling legs 1 and 2 to the front, inner sling legs 3 and 4 to the rear.
	Loop the chain end of sling leg 1 through the front left slinging provision that protrudes through the bed. Place the corresponding link in the grab hook. Repeat with sling leg 2 through front right provision.
	Secure excess chain with 2-in. tape or type-III nylon cord.
	Loop the chain end of sling leg 3 through the rear left slinging provision that protrudes through the bed. Place the corresponding link in the grab hook. Repeat with sling leg 4 through rear right provision.
	Secure excess chain with 2-in. tape or type-III nylon cord.
	Cluster and tape or tie (breakaway technique) all sling legs above the load to prevent entanglement during hookup, with apex fitting located where they can be easily accessed by hookup team personnel standing at side of vehicle.
Hookup	Hookup team stands beside load as signalman guides aircraft to load and assumes guidance.
	Apex fitting handler attaches pendant to aircraft center cargo hook.
	Hookup team stands by and guides sling legs to prevent entanglement as aircraft maneuvered to remove slack in rigging.
	When satisfactory hookup is assured, signalman indicates affirmative signal to aircrew and hookup team exits vicinity of aircraft to designated rendezvous point.
De-rigging	Reverse of rigging.



Figure 2. SATS Prepped for HSL Air Transport

## Appendix A



**Date:** 14 December 2009

**Subject:** Transportability Approval for the Standard Aircraft Towing System (SATS)

**File Number:** DP 21-09

**Requestor:** Mr. Steven G. Hensley, Test Director, Bridging and Watercraft Team

**Reference Documents:**

- a. DoD Instruction 4540.07, "Operation of the DoD Engineering for Transportability and Deployability Program," 11 Sept 07
- b. Product Description for the Standard Aircraft Towing System (SATS), 8 Oct 08
- c. Transportability Testing of the Standard Aircraft Towing System (SATS), 19 Sept 09
- d. Transportability Test of the Standard Aircraft Towing System (Rail Impact Test), 24 Mar 09
- e. Air Transport Certification of Standard Aircraft Towing System (SATS), 12 Nov 09
- f. Helicopter Sling Load (HSL) and CH-47 Internal Air Transport Certification of the Standard Aircraft Towing System (SATS)

**General:** In accordance with reference a, and based on the listed reference documents above, SDDCTEA grants transportability approval to the SATS, subject to the restrictions provided herein. SDDCTEA also concurs with full materiel release and type classification standard.

**Item Description:** The Standard Aircraft Towing System (SATS) is a diesel-engine powered airfield support asset designed to push, tow, or position the U.S. Army rotary-wing or fixed-wing aircraft weighing up to 55,000 lb and all aviation ground support equipment (AGSE). The SATS is shown in figures 1 through 6 and the physical characteristics are listed in Table 1.



**Figure 1. Standard Aircraft Towing System (SATS)**

## Appendix A

**Subject:** Transportability Approval for the Standard Aircraft Towing System (SATS)

**VEHICLE DATA:**

**Table 1. Physical Characteristics of the SATS**

	SATS
Length (inch) (front mirrors to tow-bar)	192.3"
Width (inch) (Front fender)	66.6"
Height (inch) (Rollbar)	70.1"
Center of Gravity (Longitudinal x Lateral x Vertical) (inch)	42.4" x 0.1" (left) x 26.5"
Gross Vehicle Weight (GVW)	10,840 lbs
Front Axle	5,530 lbs
Rear Axle	5,310 lbs

**Requirements:** The SATS must be capable of unrestricted transport as a secondary load during highway, rail, and marine transport. Also, air transport inside a C-130 or larger aircraft, internal CH-47 helicopter transport, and external CH-47 helicopter transport is required. All requirements shall be in accordance with MIL-STD-1366, MIL-STD-913, and as described in MIL-HDBK-1791. The SATS lifting and tiedown provisions shall meet the requirements of MIL-STD-209K.

**Conditions of Certification:** Our analysis shows that the SATS meets all of its transportability requirements. A summary of our analysis follows:

- a. **Highway.** The SATS can meet the dimensional and weight limits in the United States and NATO countries for unrestricted highway transport while mounted on a trailer. The trailer must have appropriate payload capacity and cargo tiedowns that conform to MIL-STD-209. Tiedown procedures suitable for highway truck/trailer transport can be found in TEA Pamphlet 55-20, *Tiedown Handbook for Truck Movements, Fourth Edition*. An electronic copy of this pamphlet can be downloaded from our website at [www.tea.army.mil](http://www.tea.army.mil), or hard copies of any of our pamphlets can be ordered from the following location:

[www.tea.army.mil/pubs/pubs\\_order.htm](http://www.tea.army.mil/pubs/pubs_order.htm).

- b. **Rail.** The SATS is capable of unrestricted rail transport in the United States and NATO countries. It successfully passed a MIL-STD-810 rail impact test conducted by Aberdeen Test Center on 24 March 2009. Figures 2 thru 3 shows how the equipment was restrained during rail testing. Tiedown procedures suitable for rail transport are included in TEA Pamphlet 55-19, *Tiedown Handbook For Rail Movements, Sixth Edition*.

## Appendix A

**Subject:** Transportability Approval for the Standard Aircraft Towing System (SATS)



**Figure 2.** SATS secured to railcar (front view)



**Figure 3.** SATS secured to railcar (rear view)

- c. **Marine.** The SATS meets dimensional and weight limits for transport on breakbulk, roll-on/roll-off, SEABEE, LASH and all USA, USMC and USN lighterage. Tiedown procedures for marine transport can be found in TEA Pamphlet 55-22, *Marine Lifting and Lashing Handbook*, Third Edition.
- d. **Fixed-Wing Air.** The Aeronautical System Center Air Transportability Test Loading Activity (ATTLA) certified the SATS for air transport aboard C-130, C-17, and C-5 aircraft (Enclosure 1). The maximum vehicle weight for air transport is 11,200 lbs with maximum axle weight of 6,400 lbs for both front and rear axles. Refer to Enclosure 1 for further guidance on how to prepare the vehicle for air transport.
- e. **Internal Helicopter Transport.** The SATS successfully completed a test loading on board the CH-47 and is certified for internal transport via CH-47 (Enclosure 2). Additional, supplemental air tiedowns were added to the front and sides of the vehicle to accommodate restraint in the CH-47 helicopter. Figure 5 shows the locations of these added provisions.

Appendix A

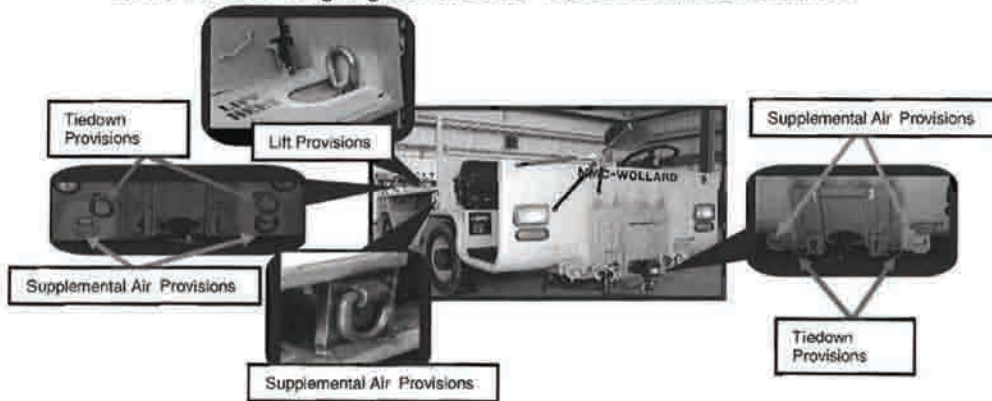
**Subject:** Transportability Approval for the Standard Aircraft Towing System (SATS)

- f. **External Helicopter Transport.** The SATS met all external helicopter transport requirements and is approved for helicopter sling load using any helicopter with a suitable lift capacity (Enclosure 2). Figure 4 below, shows a successful single-point helicopter sling load test of the SATS.



**Figure 4.** SATS during single point helicopter sling load testing with CH-47

- g. **Low-Velocity Air Drop (LVAD).** The SATS has not been tested nor is it certified for LVAD.
- h. **Containerization.** The SATS does not have a containerization requirement.
- i. **Lifting and Tiedown Provisions.** The SATS successfully passed MIL-STD-209K lifting and tiedown provision testing at the Aberdeen Proving Grounds on 13 January through 28 August 2009. The center most provisions on the front and rear are the vehicle tiedowns. The outer most provisions are supplemental air provisions. The lift provisions are located on top of the payload area aft of the seating area. The tiedown and lifting provisions were tested to restrain a vehicle weight of no more than 10,840 lbs. For air transport, when supplemental and vehicle tiedowns are used, a vehicle weighing no more than 11,200 lbs can be restrained.



**Figure 5.** SATS tiedown, lift and supplemental air provisions.

**Appendix A**

**Subject:** Transportability Approval for the Standard Aircraft Towing System (SATS)



**Figure 6.** SATS undergoing static lift testing

**Point of Contact:** This concludes the requirements for transportability approval for the SATS. Please consult us to discuss the need for a new transportability approval should changes occur that increase the size and/or weight of the SATS. Point of contact for the SATS is Mr. Kevin Rucker, (618) 220-5210, DSN 770-5210, or kevin.rucker@us.army.mil.

Reviewed by: JOHN D. NEWMAN  
Chief, Deployability Engineering Branch

Approved by: DAVID A. CANNELLA  
Chief, Deployability Division

**2 Enclosures:**

1. Air Transport Certification of the Standard Aircraft Towing System (SATS)
2. Helicopter Sling Load (HSL) and CH-47 Internal Air Transport Certification of the Standard Aircraft Towing System (SATS)



**Appendix A**

**Subject:** Transportability Approval for the Standard Aircraft Towing System (SATS)

**Required Distribution:**

Deputy Chief of Staff G-3, ATTN: DAMO-FDZ/FDL, 400 Army Pentagon, Washington, DC  
20310-0400

Deputy Chief of Staff G-4, ATTN: DALO-SM, 500 Army Pentagon, Washington, DC 20310-  
0500

Deputy Chief of Staff G-8, ATTN: DAPR-FD/FDL, 700 Army Pentagon, Washington, DC  
20310-0700

Assistant Secretary of the Army, Acquisition, Logistics and Technology, ATTN: COL Johnson,  
Director, Combat Support Systems, Suite 11300, 2511 Jefferson Davis Highway, Arlington, VA  
22202

Steven G. Hensley, Test Director Bridging and Watercraft Team, Aberdeen Test Center 400  
Colleran Rd. Aberdeen Proving Ground, MD 21005

## Appendix A

	<h3>Internal Air Transport Certification</h3> <p>ASC/ENFC (ATTLA)          2530 Loop Road West          WPAFB, OH 45433-7101  <a href="https://afkm.wpafb.af.mil/ATTLA">https://afkm.wpafb.af.mil/ATTLA</a> (direct)  <a href="https://wwwd.my.af.mil/afknprod/ATTLA">https://wwwd.my.af.mil/afknprod/ATTLA</a> (AF Portal)</p>	
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**Date:** 12 November 2009

**Item Nomenclature:** Standard Aircraft Towing System (SATS)

**File Number:** 2009.10.02

**Requestor:** SDDCTEA (Kevin Rucker)

**Item Description:** The subject item is identified to be a Standard Aircraft Towing System (SATS) vehicle. Vehicle dimensions are approximately 180" L x 67" W x 70" H. The vehicle has a gross weight of 10,000 lbs and a gross vehicle weight rating (GVWR) of 14,000 lbs. The front axle is reported to weigh 5,102 lbs with a rating of 8,000 lbs. The rear axle is reported to weigh 4,898 lbs with a rating of 8,000 lbs.



**Figure 1: SATS**

**Certified Aircraft:** USAF C-130, C-17, and C-5

**Conditions of Certification:**

**1. Maximum Weight for Air Transport:**

- a. Gross Vehicle Weight: 11,200 lbs. (80% of GVWR)
- b. Axle Limits:
  - (1) Front Axle: 6,400 lbs. (80% of front axle weight rating)
  - (2) Rear Axle: 6,400 lbs. (80% of rear axle weight rating)

Appendix A

File Number 2009.10.02

**2. Item Preparation:**

- a. The pintle hook at vehicle's front end shall be adjusted to a position other than the lowest setting to prevent ramp and or ground contact during load/off-load.
- b. All equipment shall be prepared, packaged, or mounted such that there is no adverse effect on the functioning of the equipment after being subjected to the aircraft environmental extremes. MIL-STD-810 provides guidance on approved test methods and data gathering techniques.
- c. All hazardous materials (to include fuel level, batteries, etc.) must be prepared and certified for airlift in accordance with TM 38-250/AFMAN 24-204(I). Do not consider this air transport certification as approval for hazardous materials. Authorization for airlifting hazardous material is the responsibility of 401 SCMS/GUMAA (DSN 787-4503 or COM (937) 257-4503).

**3. Loading Instructions:**

- a. Load vehicle in accordance with TO 1C-XXX-9/-1 normal procedures.
- b. C-5: Vehicle may be loaded over forward or aft ramp when respective aircraft end used for loading is configured in the kneeled position, otherwise approach shoring will be required.

**4. Restraint Requirements:** The SATS and all accompanying cargo must be restrained to meet MIL-HDBK-1791 requirements of 3G forward, 1.5G aft and lateral, and 2G up. In addition, stored or installed equipment must meet these requirements and be capable of withstanding a 4.5G down load. Tiedown provision locations and rated capacities are provided in Table 1 & 2.

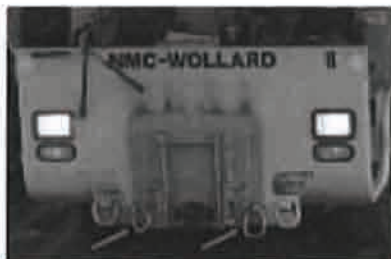
**Table 1: Primary Provision Locations & Rated Capacities**

Provision Location	Longitudinal	Lateral	Vertical
Forward Left	22,630 lbs	7,335 lbs	4,675 lbs
Forward Right	22,630 lbs	7,335 lbs	4,675 lbs
Aft Left	22,845 lbs	9,790 lbs	6,380 lbs
Aft Right	22,845 lbs	9,790 lbs	6,380 lbs

**Table 2: Supplemental Provision Locations & Rated Capacities**

Provision Location	Rated Capacity
All Supplemental	10,000 lbs

**Note:** Supplemental provision loading based on MIL STD 209K.



**Figure 2: Front Primary Provisions**



**Figure 3: Front Supplemental Provisions**

## Appendix A

File Number 2009.10.02

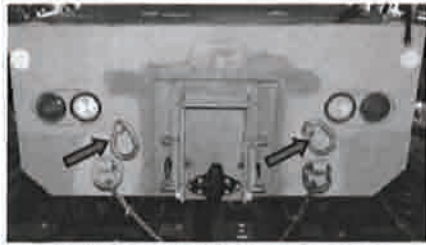


Figure 4: Aft Primary Provisions



Figure 5: Aft Supplemental Provisions



Figure 5: Left Side Supplemental Provisions



Figure 6: Right Side Supplemental Provisions

**Required Distribution:**

1. Shipper shall give a copy of this certification to the ATOC representative when the item is presented for airlift. This memo shall be part of the official cargo manifest documentation package and shall be briefed to the aircraft loadmaster prior to loading this item.

2. AMC/A3V.

3. SDDC TEA.

**Point of Contact:** David Daniels, at david.daniels@wpafb.af.mil, DSN 785-9639 or Commercial (937) 255-9639. Refer to file number 2009.10.02 to reference this item.

Reviewed by: *Melvin C. J. Santiago*  
MELVIN C. J. SANTIAGO  
Aerial Delivery Technical Expert  
Crew Systems Branch

Approved by: *John C. Hill*  
JOHN C. HILL  
Technical Advisor  
Crew Systems Branch

Appendix A



DEPARTMENT OF THE ARMY  
 US ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND  
 NATICK SOLDIER CENTER  
 KANSAS STREET  
 NATICK MA 01760-5017

RDNS-WPA-D

MEMORANDUM FOR

Program Executive Office, Aviation, Aviation Ground Support Equipment, ATTN: SFAE-AV-AS-AG, James M. Pruitt, Redstone Arsenal, AL 35898-5000  
 Headquarters, Aerial Delivery and Field Services Department, U.S. Army Quartermaster Center and School, ATTN: ATSM-ADFSD, 710 Adams Avenue, Fort Lee, VA 23801-1502

SUBJECT: Helicopter Sling Load (HSL) and CH-47 Internal Air Transport (IAT) certification of the Standard Aircraft Towing System (SATS)

1. Reference Draft Report, Transportability Testing of the Standard Aircraft Towing System (SATS) ATEC PROJECT NO. 2008-DT-ATC-SATSX-D6962, REPORT NO. 09-WF-E-53.
2. The U.S. Army Natick Soldier, Research, Development, and Engineering Center (NSRDEC) has reviewed the referenced test report, and concludes that the SATS when prepared and rigged in accordance with the procedures enclosed conforms with the requirements for certification for HSL and IAT. Based on our evaluation of the reference, NSRDEC hereby certifies the SATS for HSL and CH-47 IAT.
3. Table of configurations and rigging requirements for HSL:

Nomenclature	Maximum Weight	Sling Set	Link Count Front/Rear	Single or Dual Point	Aircraft	Recommended Maximum Airspeed (Knots)
SATS	10840 lbs	25 K	3/15	Single	AHWSLC <sup>1</sup>	110 <sup>2</sup>

<sup>1</sup> AHWSLC-Any Helicopter With Suitable Lift Capacity

<sup>2</sup> Limiting factor: Aircraft Limitations

4. The SATS is rigged for HSL in accordance with the Single Point configuration enclosed procedures.
5. Certification for HSL is contingent upon the following:
  - a. Item weights, Center of Gravity (CG), dimensions, configuration and other pertinent data remain identical to those used in the tests and analysis.
  - b. The item is rigged in accordance with the specified, verified rigging procedures.

Enclosure 2

**Appendix A**

AMSRD-NSR-WP-AD

SUBJECT: Helicopter Sling load Certification and CH 47 Internal Air Transport of the Standard Aircraft Towing System (SATS)

6. Certification for HSL is based upon the following:

a. Engineering evaluation of the load characteristics (weight to projected frontal area ratio and weight distribution) and engineering analysis of the lifting provisions for a helicopter flight environment.

b. Static lift is evaluated by testing as published in the reference.

c. Successful proof load as documented in the referenced test report.

d. Flight evaluation testing as documented in the referenced test report.

7. NSRDEC recommends the validated rigging procedures for the HSL of the SATS be included in the Field Manual/Technical Order (FM/TO) FM 4-20/FM 10-450 series manuals by U.S. Army Quartermaster Center and School (QMC&S).

8. Verified draft rigging procedures are enclosed for inclusion in the appropriate HSL rigging manuals.

9. Certification for IAT is contingent upon the following:

a. Item weights, Center of Gravity (CG), dimensions, configuration and other pertinent data remain identical to those used in the tests and analysis.

b. The item is prepared in accordance with the validated SATS CH-47 IAT enclosed procedures.

c. The validated SATS CH-47 IAT procedures are to be incorporated in the appropriate operator crew technical manual.

10. Certification is based upon the following:

a. Successful proof load testing of the Supplemental Air Transport Provisions per the reference.

b. Successful completion and validation of the SATS compatibility with the aircraft in the back in configuration and forward configuration.

c. Validated compatibility of the SATS with the aircraft cargo compartment area and aircraft tie down provisions.

d. Validation of the SATS to be restrained in accordance with the requirements of FM 55-450 and TM 1-1520-240-10

**Appendix A**

AMSRD-NSR-WP-AD

SUBJECT: Helicopter Sling load Certification and CH 47 Internal Air Transport of the Standard Aircraft Towing System (SATS)


e. Flight characteristics are accepted based on the aircraft weight and balance computations completed by the operational aircrew members present during the certification process.

11. NSRDEC requires the validated SATS CH-47 IAT procedures be included in the SATS operator crew technical manual.

12. The validated draft SATS CH-47 IAT procedures have been provided to Program Executive Office, Aviation, Aviation Ground Support Equipment for inclusion in the SATS operator crew technical manual.

13. Point of contact for this effort is Dale Tabor at DSN 256-5509 or email Dale.Tabor@US.army.mil.

Encl

  
EDWARD J. DOUCETTE  
Director, Warfighter Protection  
and Aerial Delivery Directorate

CF:

Military Surface Deployment and Distribution Command-Transportation Engineering Agency,  
ATTN: SDTE-DPE, 709 Ward Drive, Building 1990, Workspace 2E287-73, Scott AFB, IL  
62225





**STANDARD AVIATION TOWING SYSTEM  
ILLUSTRATED LIST OF MANUFACTURED ITEMS**

## INTRODUCTION

### Scope

This work package includes complete instructions for making items authorized to be manufactured.

### How to Use the Index of Manufactured Items

A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the page that covers fabrication criteria.

### Explanation of the Illustrations of Manufactured Items

All instructions needed by maintenance personnel to manufacture the item are included on the illustrations. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

## REFERENCE INDEX

PART NUMBER	NOMENCLATURE	FIGURE NO
47389	Transmission Hanger Tab	3
49129	Isolator Modified	17
49364	Trans Lift Bar	2
49365	Trans Lift Ring	4
49366	Trans Lift Weldment	1
49504	Maintenance Mount	15
49505	Maintenance Mount	12
49506	Mount Maintenance	16
49507	Mount Maintenance	13
49555	Stand Weldment, Engine Pack	5
49557	Tube, Long, Engine Cart, MT3	6
49558	Tube, Short, Engine Cart, MT3	7
49559	Tube, Upright, Engine Cart, MT3	8
49560	Plate, Caster, Engine Cart, MT3	9
49614	Tube, Top, Engine Cart, MT3	10
49615	Cap, Tube, Engine Cart, MT3	11
49631	Gusset, Maintenance Mount	14

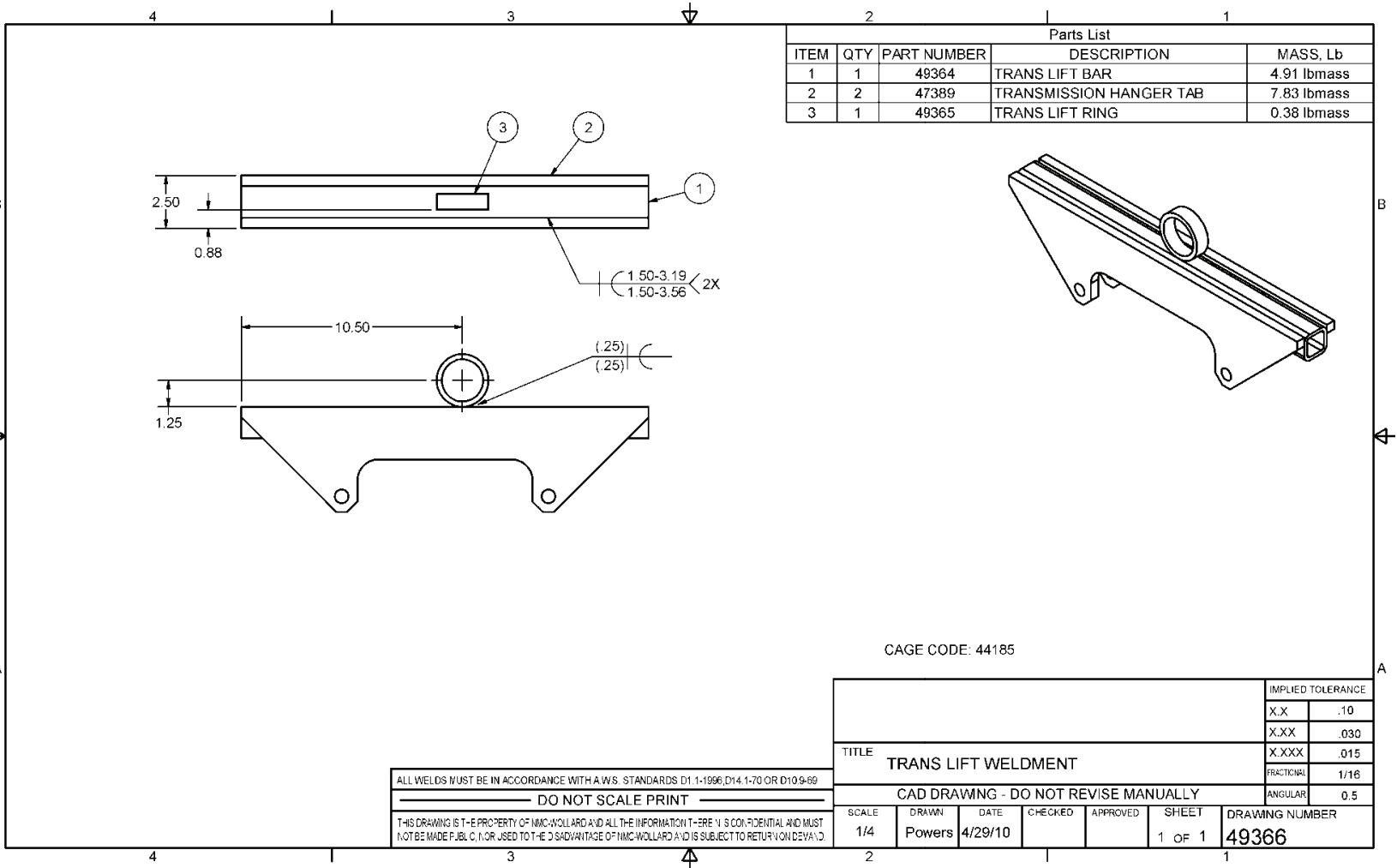


Figure 1. Trans Lift Weldment

0120-2

CAGE CODE: 44185

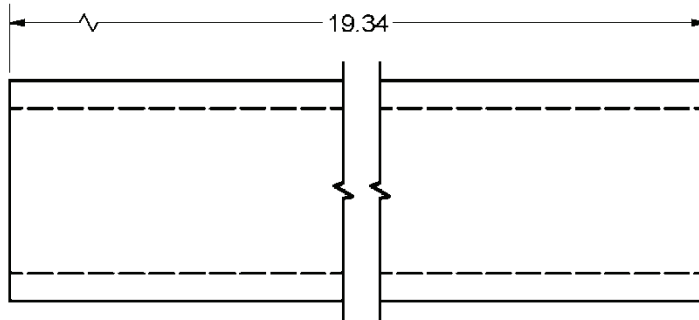
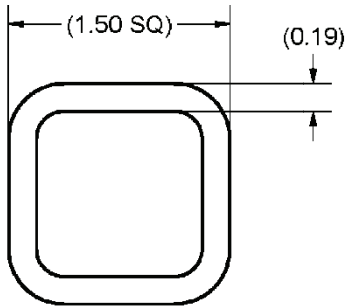
ALL WELDS MUST BE IN ACCORDANCE WITH AWS STANDARDS D1.1-1996/D14.1-70 OR D10.9-69

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TITLE		TRANS LIFT WELDMENT		IMPLIED TOLERANCE	
		X.X	.10		
		X.XX	.030		
		X.XXX	.015		
		FRACTIONAL	1/16		
		ANGULAR	0.5		
CAD DRAWING - DO NOT REVISE MANUALLY					
SCALE	DRAWN	DATE	CHECKED	APPROVED	SHEET
1/4	Powers	4/29/10			1 OF 1
					DRAWING NUMBER
					49366

ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	19.34	LB	416800	TBG, SQ	Steel, Mild	A500B	1.5 X 1.5 X .19	4.91



CAGE CODE: 44185

ALL WELDS MUST BE IN ACCORDANCE WITH A.W.S. STANDARDS D1.1-1996, D14.1-70 OR D10.9-69							IMPLIED TOLERANCE	
							X.X	± .10
DO NOT SCALE PRINT							X.XX	± .030
							X.XXX	± .015
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							ANGULAR	± 0.5°
TITLE							CAD DRAWING - DO NOT REVISE MANUALLY	
TRANS LIFT BAR							SCALE	DRAWN
							DATE	CHECKED
							APPROVED	SHEET
							1 OF 1	DRAWING NUMBER
								49364

Figure 2. Trans Lift Bar

0120-3

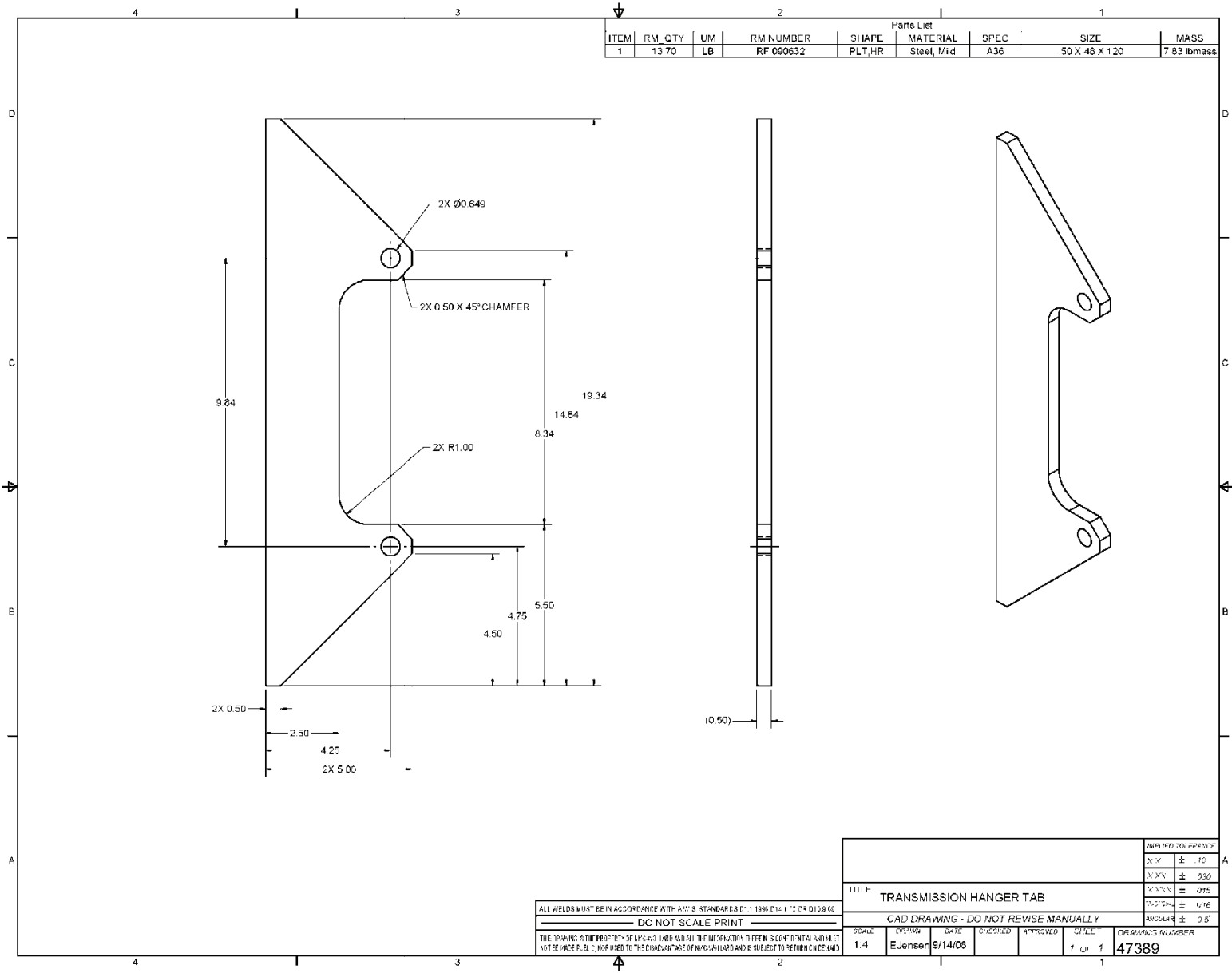


Figure 3. Transmission Hanger Tab

ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	0.75	IN	434000	TBG	Steel, Mild	DOM	2.50 OD X 0.25W	0.38

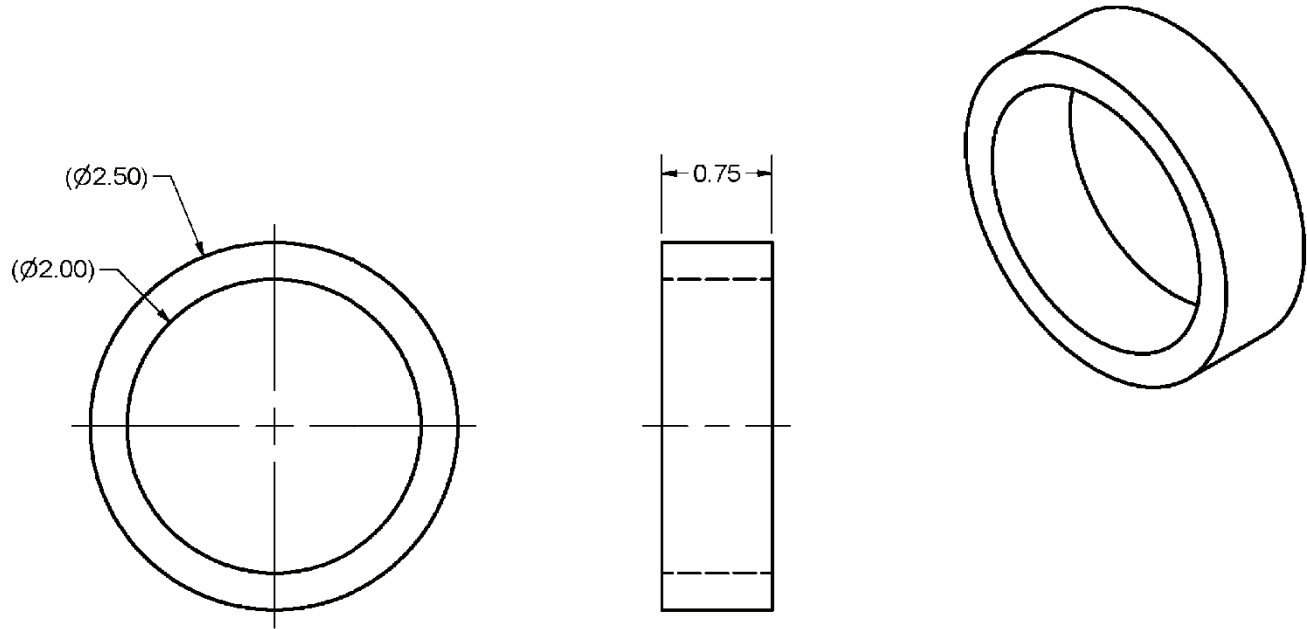


Figure 4. Trans Lift Ring

0120-5

ALL WELDS MUST BE IN ACCORDANCE WITH A.W.S. STANDARDS D1.1-1966, D14.1-70 OR D10.9-69							IMPLIED TOLERANCE	
							X.X	± .10
DO NOT SCALE PRINT							X.XX	± .030
							X.XXX	± .015
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							ANGULAR	± 0.5°
TITLE							CAD DRAWING - DO NOT REVISE MANUALLY	
TRANS LIFT RING							SCALE	DRAWN
							1/1	Powers
							DATE	CHECKED
							4/29/10	
							APPROVED	SHEET
								1 OF 1
							DRAWING NUMBER	
								49365

TM 1-1740-221-138P

0120 00

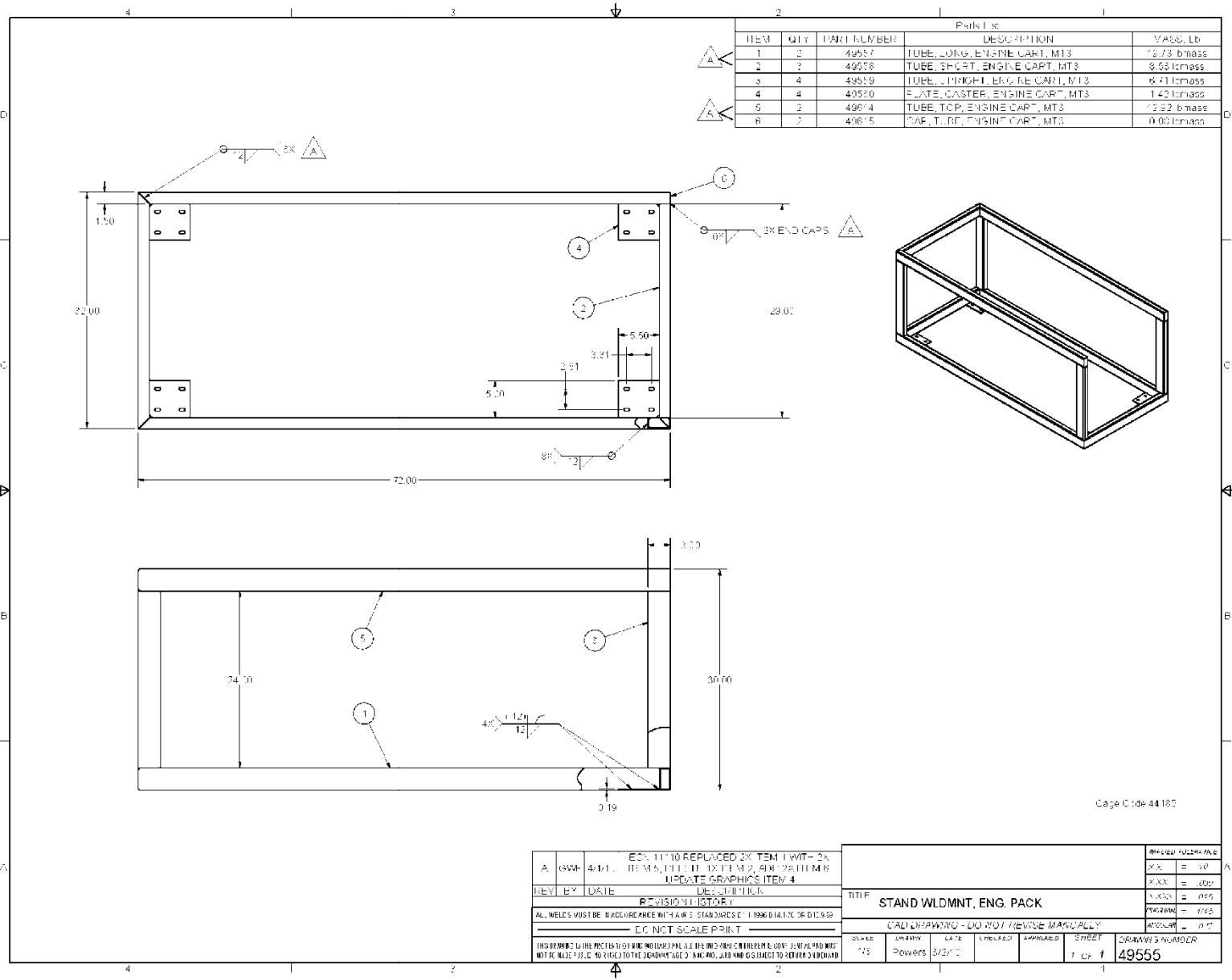


Figure 5. Stand Weldment, Engine Pack

ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	72.00	IN	408500	TBG, RCT	Steel, Mild	A500	3.00 X 1.50 X 11GA	19.73

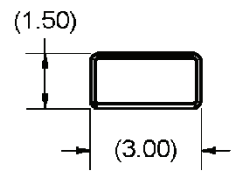
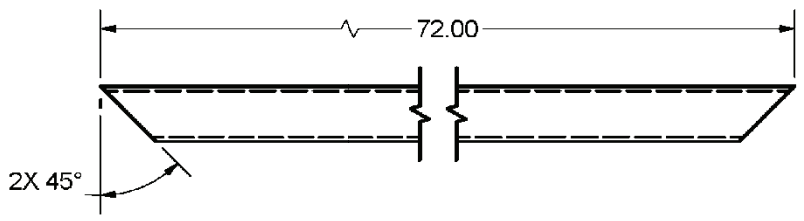
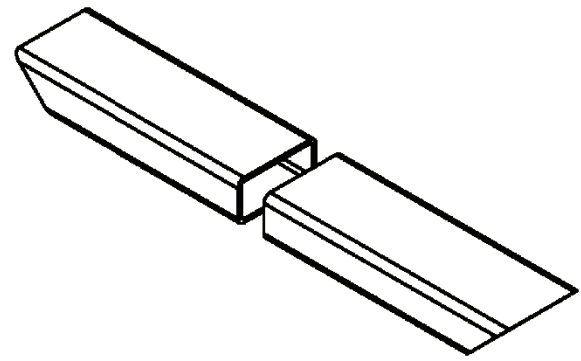


Figure 6. Tube, Long, Engine Cart, MT3

0120-7

ALL WELDS MUST BE IN ACCORDANCE WITH A.W.S. STANDARDS D1.1-1996, D14.1-70 OR D10.9-69		TITLE		IMPLIED TOLERANCE		
DO NOT SCALE PRINT		TUBE, LONG, ENGINE CART, MT3		X.X	± .10	
				X.XX	± .030	
THIS DRAWING IS THE PROPERTY OF NMC WOLARD AND ALL THE INFORMATION THEREIN IS CONFIDENTIAL AND MUST NOT BE MADE PUBLIC OR USED TO THE DISADVANTAGE OF NMC WOLARD AND IS SUBJECT TO RETURN ON DEMAND.		CAD DRAWING - DO NOT REVISE MANUALLY		X.XXX	± .015	
				FRACTIONAL	± 1/16	
				ANGULAR	± 0.5°	
SCALE	DRAWN	DATE	CHECKED	APPROVED	SHEET	DRAWING NUMBER
1/4	Powers	3/1/10			1 OF 1	49557

ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	32.00	IN	408500	TBG, RECT	Steel, Mild	A500	3.00 X 1.50 X 11GA	8.53

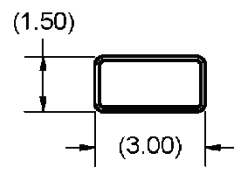
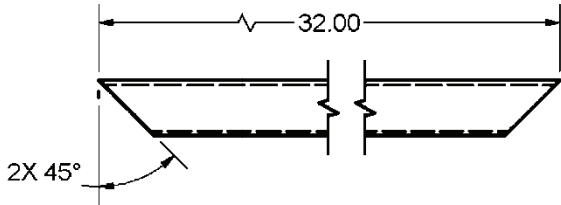
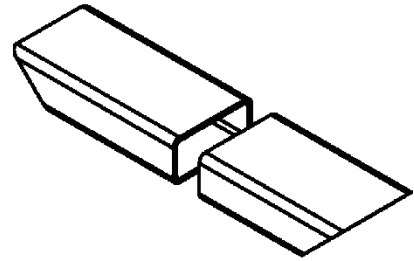


Figure 7. Tube, Short, Engine Cart, MT3

0120-8

ALL WELDS MUST BE IN ACCORDANCE WITH A.W.S. STANDARDS D1.1-1996, D14.1-70 OR D10.9-69 <b>DO NOT SCALE PRINT</b>							IMPLIED TOLERANCE X.X ± .10 X.XX ± .030 X.XXX ± .015 FRACTIONAL ± 1/16 ANGULAR ± 0.5°	
							TITLE <b>TUBE, SHORT, ENGINE CART, MT3</b>	
CAD DRAWING - DO NOT REVISE MANUALLY							SCALE 1/4	
DRAWN Powers		DATE 3/2/10		CHECKED [ ]		APPROVED [ ]		
SHEET 1 OF 1						DRAWING NUMBER 49558		
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ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	24.00	IN	408500	TBG, RCT	Steel, Mild	A500	3.00 X 1.50 X 11GA	6.71

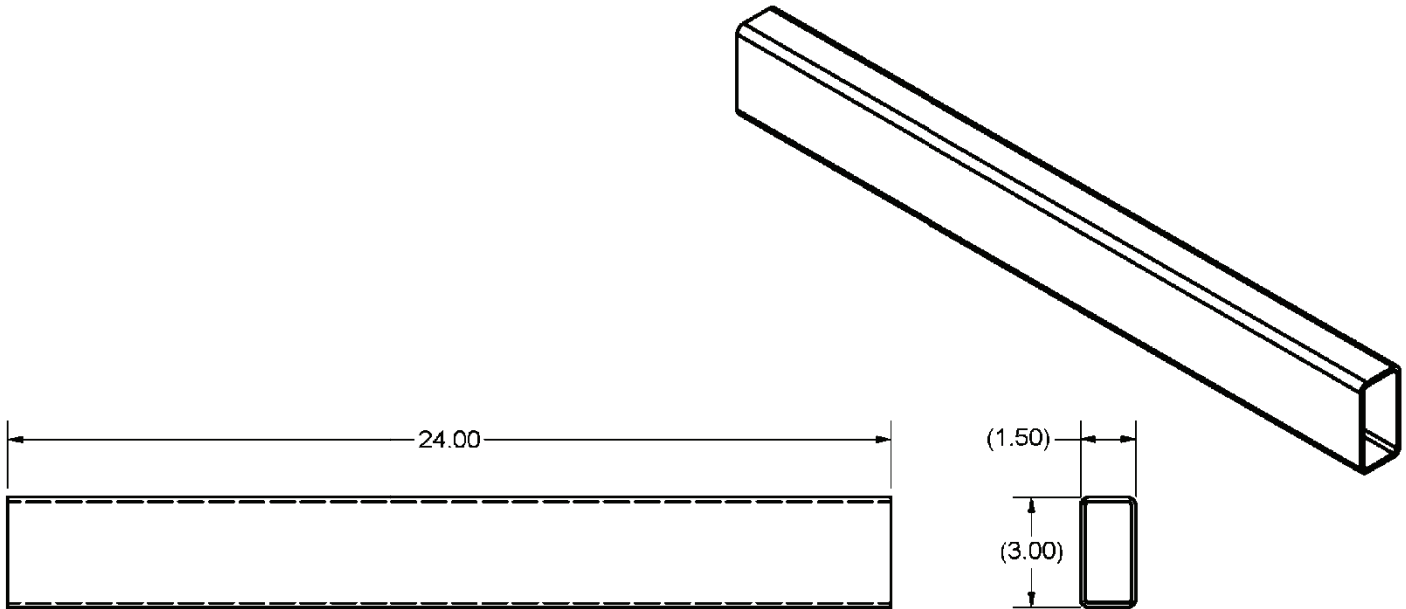
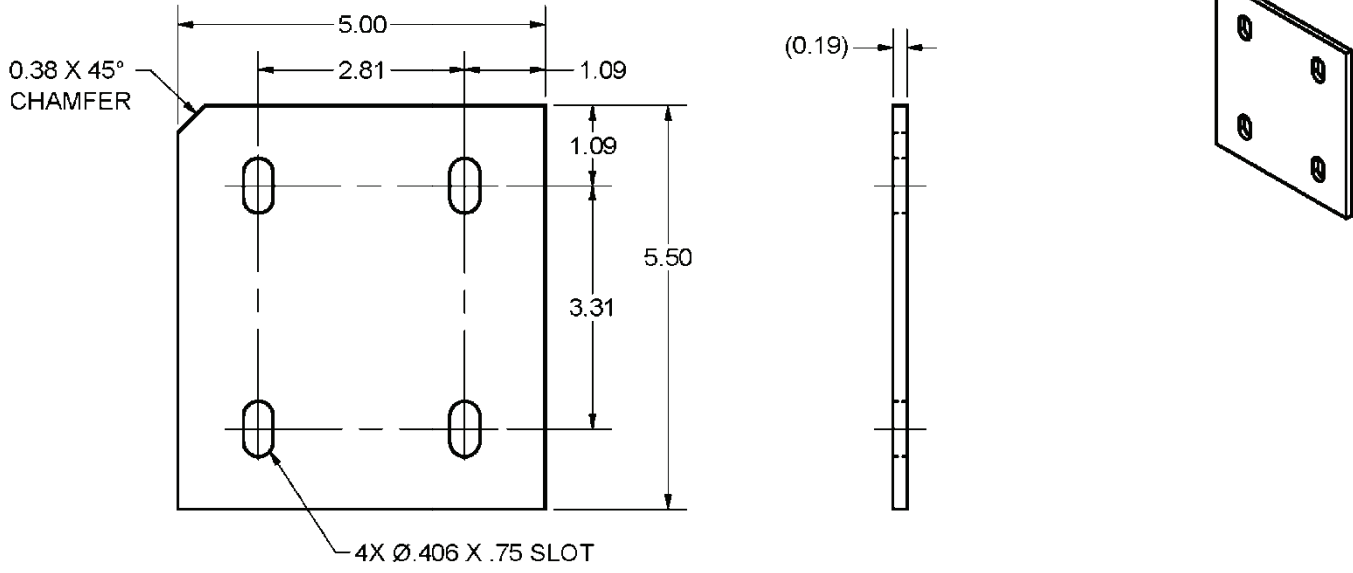


Figure 8. Tube, Upright, Engine Cart, MT3

0120-9

ALL WELDS MUST BE IN ACCORDANCE WITH A.W.S. STANDARDS D1.1-1966, D14.1-70 OR D10.9-69		TITLE		IMPLIED TOLERANCE		
DO NOT SCALE PRINT		TUBE, UPRIGHT, ENGINE CART, MT3		X.X	± .10	
				X.XX	± .030	
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				FRACTIONAL	± 1/16	
				ANGULAR	± 0.5°	
SCALE	DRAWN	DATE	CHECKED	APPROVED	SHEET	DRAWING NUMBER
1/4	Powers	3/2/10			1 OF 1	49559

ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	1.46	LB	421900	PLT	Steel, Mild	A36	.19	1.42



REVISION HISTORY				TITLE				IMPLIED TOLERANCE					
A	GWP	4/1/10	ECN 11110 REVISED OVERALL SIZE AND SLOTS	PLATE, CASTER, ENGINE CART, MT3				X.X	± .10				
REV	BY	DATE	DESCRIPTION					X.XX	± .030				
ALL WELDS MUST BE IN ACCORDANCE WITH A.W.S. STANDARDS D1.1-1966, D14.1-70 OR D10.9-69				CAD DRAWING - DO NOT REVISE MANUALLY				X.XXX	± .015				
DO NOT SCALE PRINT				SCALE				DRAWN	DATE	CHECKED	APPROVED	SHEET	DRAWING NUMBER
THIS DRAWING IS THE PROPERTY OF NMC WOLAR AND ALL THE INFORMATION THEREIN IS CONFIDENTIAL AND MUST NOT BE MADE PUBLIC OR USED TO THE DISADVANTAGE OF NMC WOLAR AND IS SUBJECT TO RETURN ON DEMAND.				1/2	Powers	3/2/10					1 OF 1	49560	

Figure 9. Plate, Caster, Engine Cart, MT3

ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	71.93	IN	408500	TBG, RCT	Steel, Mild	A500	3.00 X 1.50 X 11GA	19.92

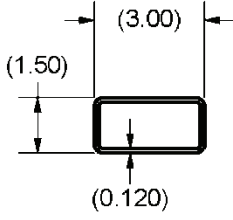
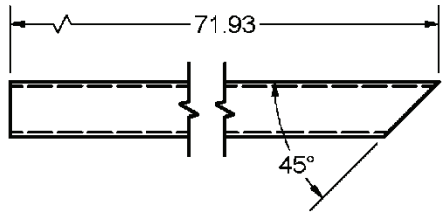
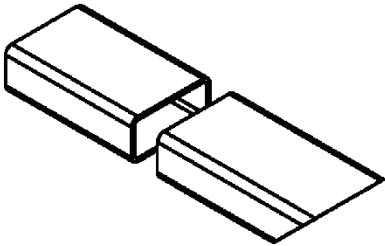


Figure 10. Tube, Top, Engine Cart, MT3

0120-11

ALL WELDS MUST BE IN ACCORDANCE WITH A.W.S. STANDARDS D1.1-1996, D14.1-70 OR D10.9-69							IMPLIED TOLERANCE	
							X.X	± .10
DO NOT SCALE PRINT							X.XX	± .030
							X.XXX	± .015
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							ANGULAR	± 0.5°
TITLE							TUBE, TOP, ENGINE CART, MT3	
CAD DRAWING - DO NOT REVISE MANUALLY								
SCALE	DRAWN	DATE	CHECKED	APPROVED	SHEET	DRAWING NUMBER		
1/4	Powers	4/1/10			1 OF 1	49614		

TM 1-1740-221-138P

0120 00

ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	0.08	LB	RF 048009	SHEET	Steel, Mild	A36	14GA (.0747)	0.08

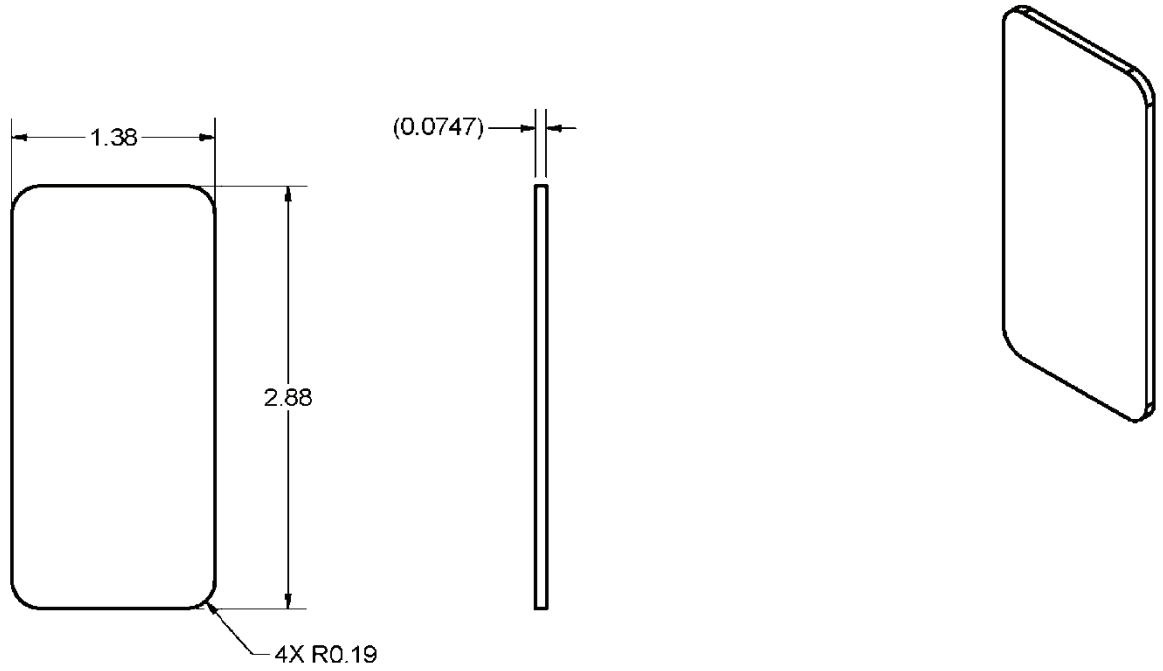


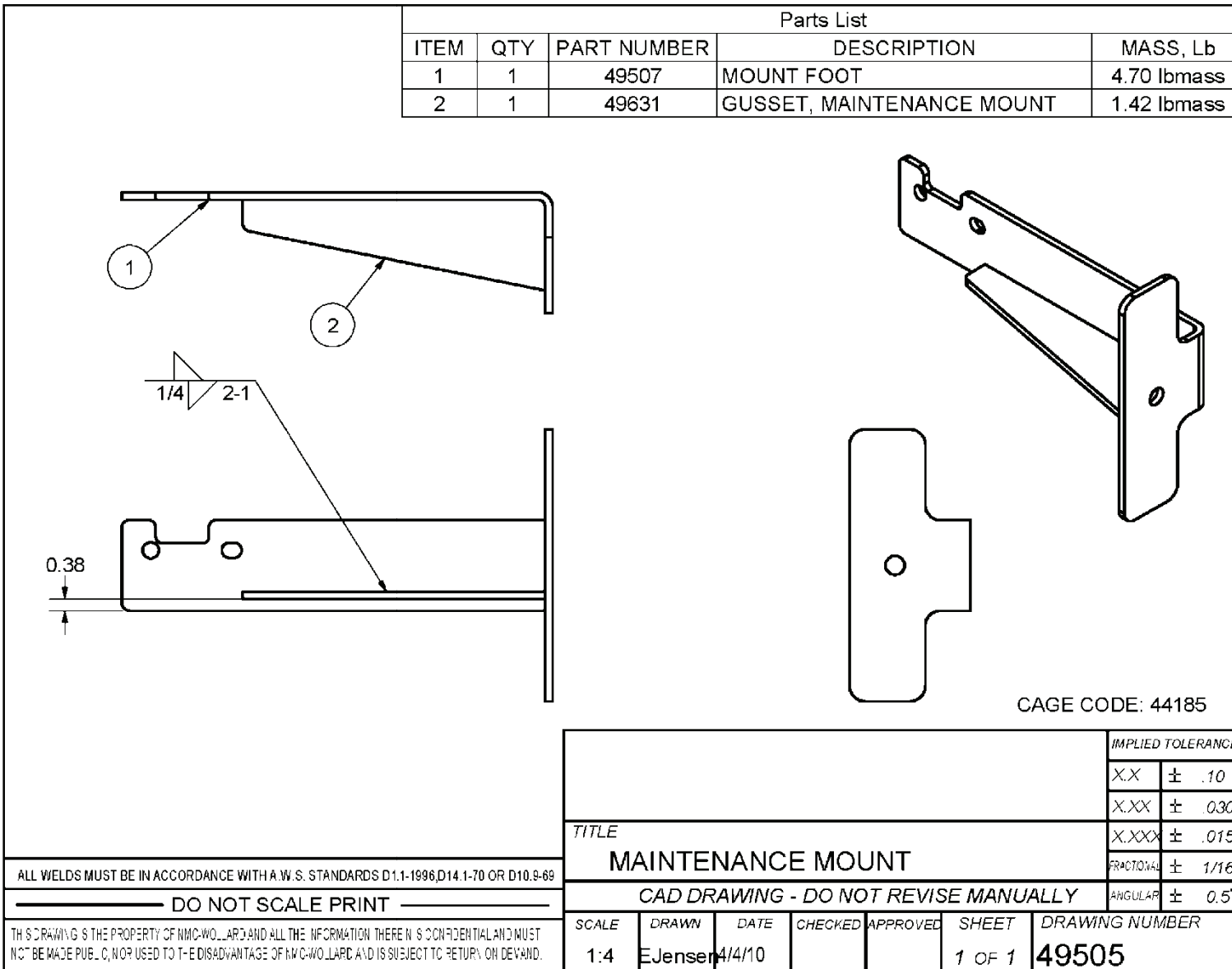
Figure 11. Cap, Tube, Engine Cart, MT3

0120-12

ALL WELDS MUST BE IN ACCORDANCE WITH A.W.S. STANDARDS D1.1-1996, D14.1-70 OR D10.9-69							IMPLIED TOLERANCE	
							X.X	± .10
DO NOT SCALE PRINT							X.XX	± .030
							X.XXX	± .015
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							ANGULAR	± 0.5°
TITLE							CAP, TUBE, ENGINE CART, MT3	
CAD DRAWING - DO NOT REVISE MANUALLY								
SCALE	DRAWN	DATE	CHECKED	APPROVED	SHEET	DRAWING NUMBER		
1/1	Powers	4/1/10			1 OF 1	49615		

0120-13

Figure 12. Maintenance Mount



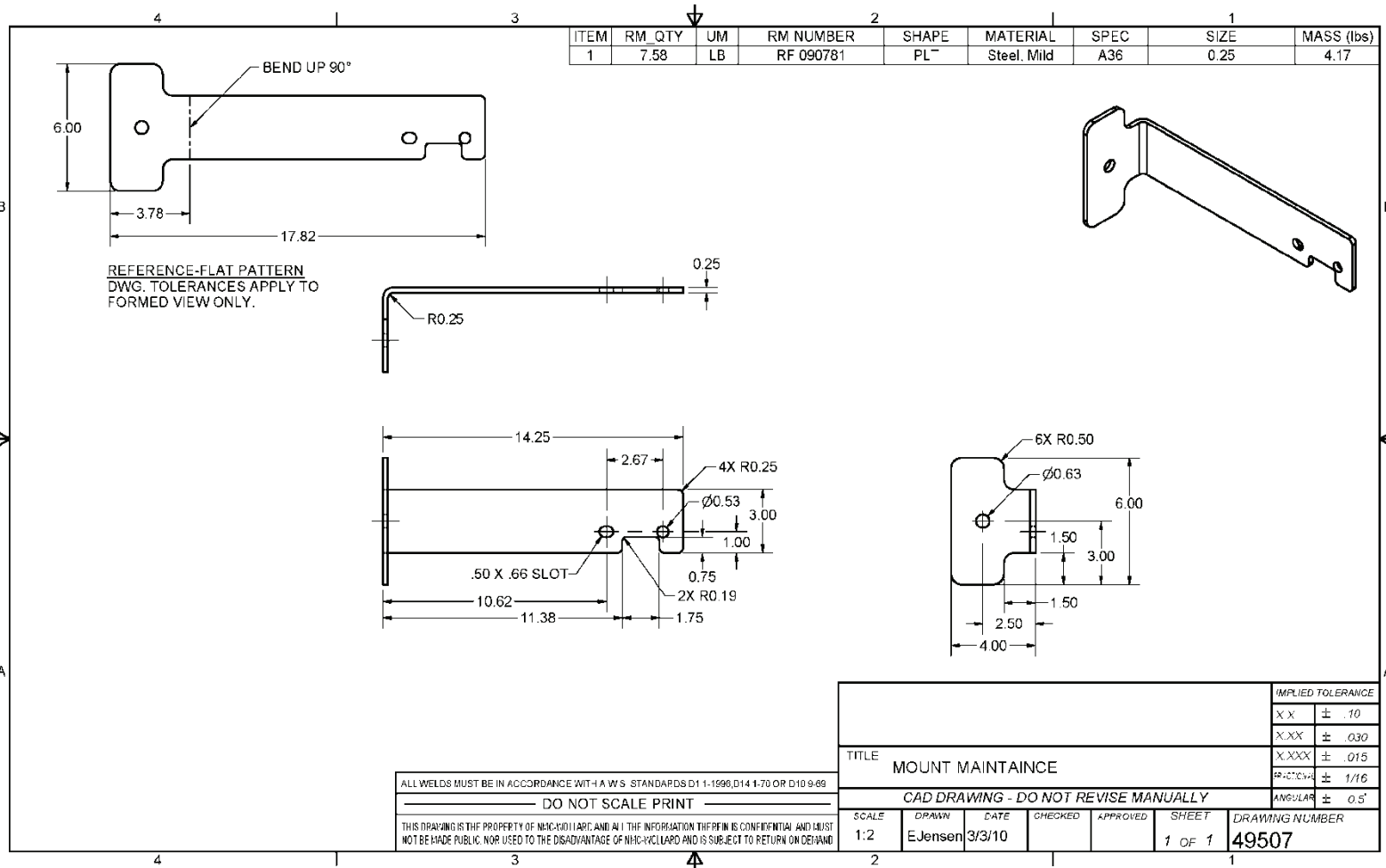
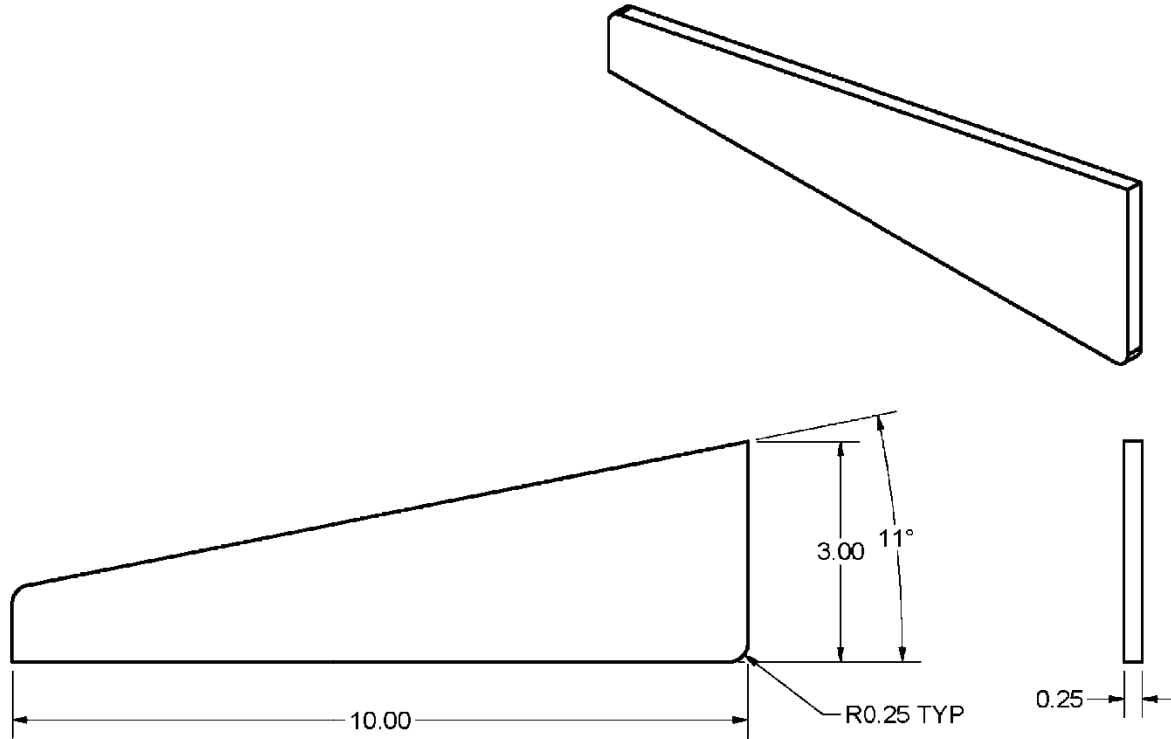


Figure 13. Mount Maintenance

ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	1.50	LB	RF 090880	PLT	Steel, Mild	GR50	0.25 X 48 X 120,A572/50	1.42



ALL WELDS MUST BE IN ACCORDANCE WITH A.W.S. STANDARDS D1.1-1996, D14.1-70 OR D10.9-69							IMPLIED TOLERANCE	
							X.X	± .10
DO NOT SCALE PRINT							X.XX	± .030
							X.XXX	± .015
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							ANGULAR	± 0.5°
TITLE							CAD DRAWING - DO NOT REVISE MANUALLY	
GUSSET, MAINTENANCE MOUNT								
SCALE	DRAWN	DATE	CHECKED	APPROVED	SHEET	DRAWING NUMBER		
1:2	EJensen	4/4/10			1 OF 1	49631		

Figure 14. Gusset, Maintenance Mount

0120-15

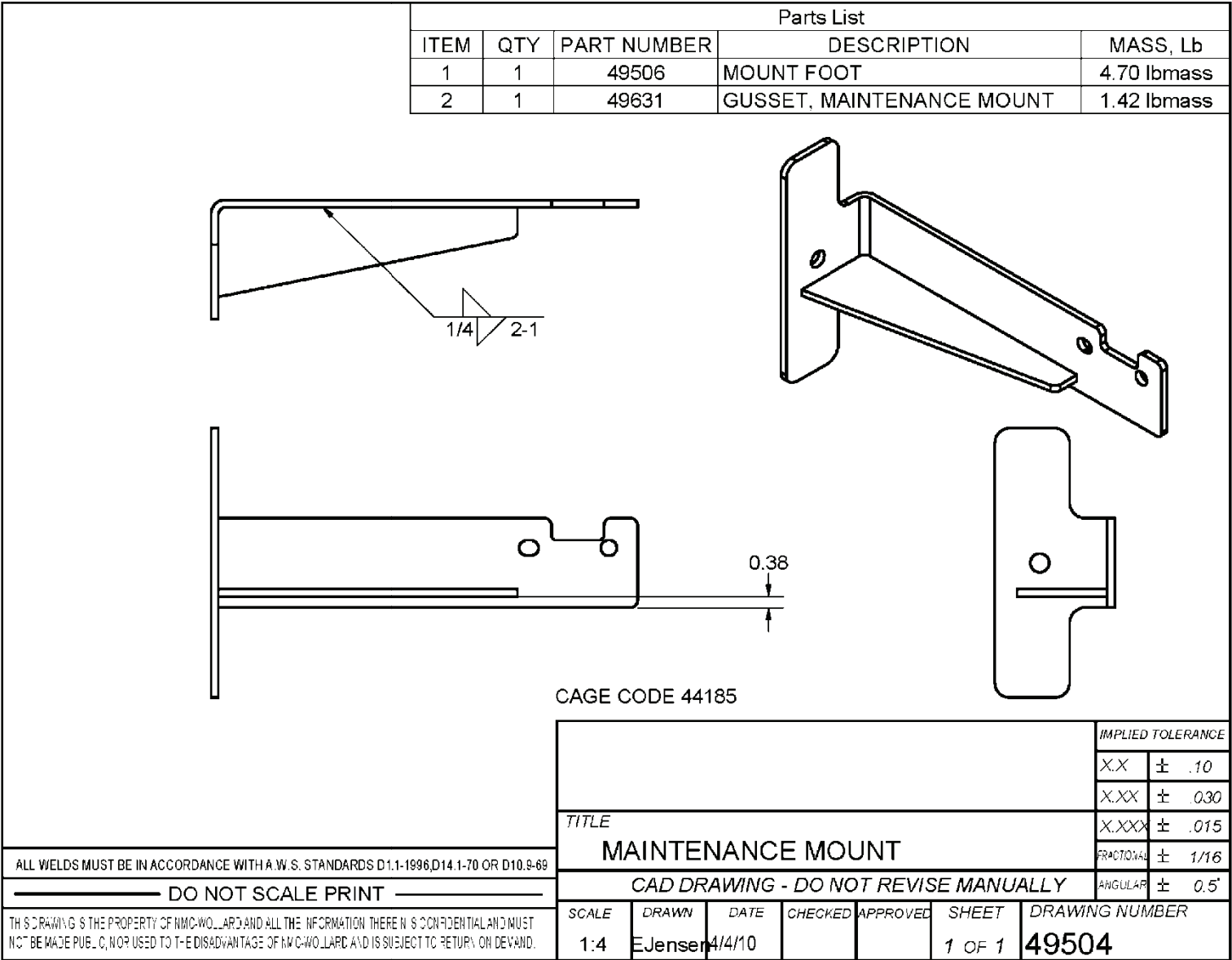
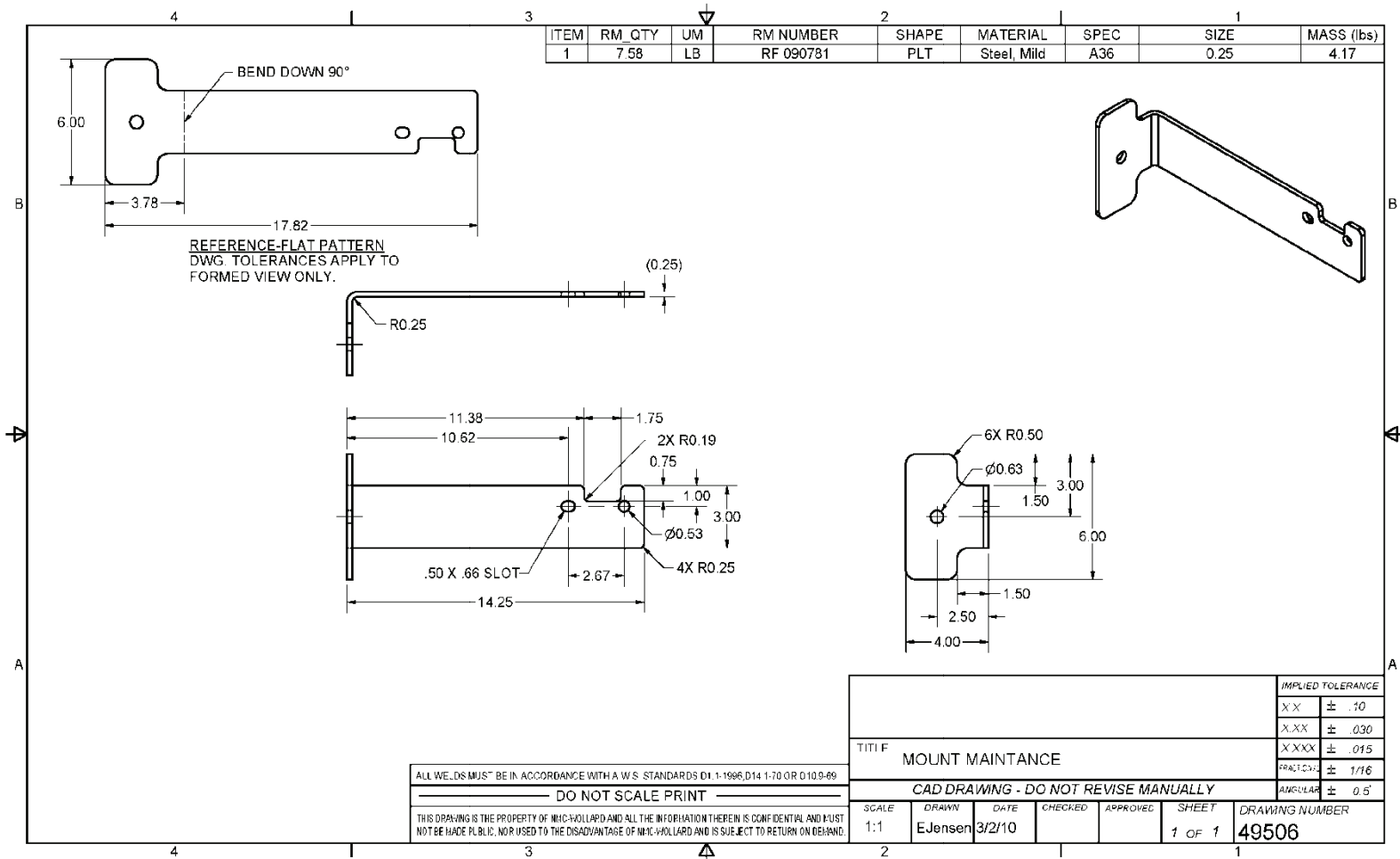


Figure 15. Maintenance Mount



0120-17

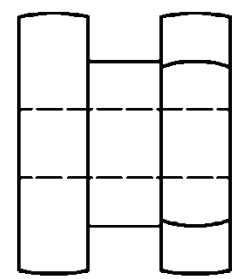
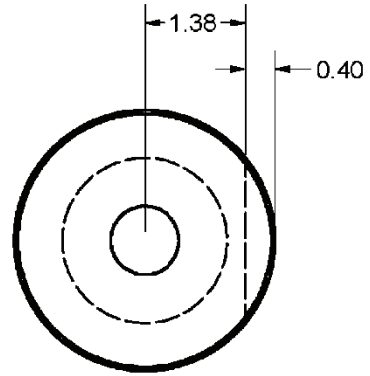
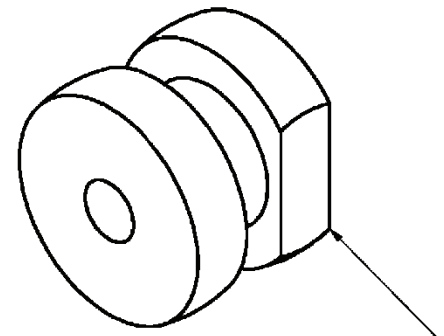
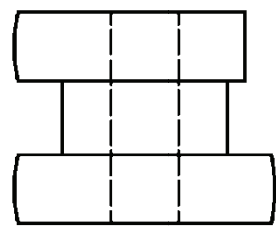
Figure 16. Mount Maintenance



TM 1-1740-221-138P

0120 00

ITEM	RM_QTY	UM	RM NUMBER	SHAPE	MATERIAL	SPEC	SIZE	MASS (lbs)
1	0.00	LB	207057				ISOLATOR	5.59



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						IMPLIED TOLERANCE	
						X.X	± .10
						X.XX	± .030
TITLE						X.XXX	± .015
ISOLATOR MODIFIED						FRACTIONAL	± 1/16
						ANGULAR	± 0.5°
CAD DRAWING - DO NOT REVISE MANUALLY							
SCALE	DRAWN	DATE	CHECKED	APPROVED	SHEET	DRAWING NUMBER	
1:2	DRIVER	9/22/09			1 OF 1	49129	

Figure 17. Isolator Modified

**CHAPTER 6**  
**PARTS INFORMATION**



**FIELD MAINTENANCE  
MT3 REPAIR PARTS SPECIAL TOOLS LIST (RPSTL) INTRODUCTION**

INTRODUCTION

SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of field maintenance of the MT3 SATS Tow Tractor. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

**GENERAL**

In addition to the Introduction work package, this RPSTL is divided into the following work packages.

- 1 Repair Parts List Work Packages. Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Repair parts kits are listed separately in their own functional group and work package. Repair parts for repairable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.
- 2 Special Tools List Work Packages. Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.
- 3 Cross-Reference Indexes Work Packages. There are two cross-reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The National Stock Number Index work package refers you to the figure and item number. The Part Number Index work package refers you to the figure and item number.

**EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGES**

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout. This entry may be subdivided into 4 subentries, one for each service.

<b>Table 1. SMR Code Explanation</b>			
<b>Source Code <u>XX</u></b>	<b>Maintenance Code <u>XX</u></b>	<b>Recoverability Code <u>X</u></b>	
1 <sup>st</sup> two positions: How to get an Item.	3 <sup>rd</sup> position: Who can install, Replace, or use the Item.	4 <sup>th</sup> position: Who can do complete repair* on the item.	5 <sup>th</sup> position: Who determines Disposition action on Unserviceable items.

\*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

<u>Source Code</u>	<u>Application/Explanation</u>	<u>NOTE</u>
PA		
PB		
PC	Items coded PC are subject to deterioration	
PD		
PE	Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code.	
PF		
PG		
PH		
PR		
PZ		
KD	Items with these codes are not to be requested/requisitioned individually.	
KF	They are part of a kit which is authorized to the maintenance level indicated in the third position of the SMR code. The complete kit must be requisitioned and applied. Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance. Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the third position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.	
KB		
MF-Made at field		
MH-Made at below depot/sustainment level		
ML-Made at SRA		
MD-Made at depot		
MG-Navy only		
AF-Assembled by field		
AH-Assembled by below depot sustainment level		
AL-Assembled by SRA		
AD-Assembled by depot		
AG-Navy only		
XA	Do not requisition an "XA" coded item. Order the next higher assembly. (Refer to NOTE below.)	
XB	If an item is not available from salvage, order it using the CAGEC and part number. Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's part number.	
XC		
XD	Item is not stocked. Order an XD-coded item through local purchase or normal supply channels using the CAGEC and part number given, if no NSN available.	

**NOTE**

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

Maintenance Code	Application/Explanation
F -	Field maintenance can remove, replace, and use the item.
H -	Below Depot Sustainment maintenance can remove, replace, and use the item.
L -	Specialized repair activity can remove, replace and use the item.
G -	Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only)
K -	Contractor facility can remove, replace, and use the item.
Z -	Item is not authorized to be removed, replaced, or used at any maintenance level
D -	Depot can remove, replace, and use the item.

\*NOTE – Army may use C in the third position. However, for joint service publications, Army will use O.

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

**NOTE**

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance Code	Application/Explanation
F -	Field is the lowest level that can do complete repair of the item.
H -	Below Depot Sustainment is the lowest level that can do complete repair of the item.
L -	Specialized repair activity is the lowest level that can do complete repair of the item.
D -	Depot is the lowest level that can do complete repair of the item.
G -	Both afloat and ashore intermediate levels are capable of complete repair of item. (Navy only)
K -	Complete repair is done at contractor facility.
Z -	Nonrepairable. No repair is authorized.
B -	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows.

---

### Recoverability

Code	<u>Application/Explanation</u>
Z -	Nonrepairable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
F -	Repairable item. When uneconomically repairable, condemn and dispose of the item at the field level.
H -	Repairable item. When uneconomically repairable, condemn and dispose of the item at the below depot sustainment level.
D -	Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L -	Repairable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A -	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G -	Field level repairable item. Condemn and dispose at either afloat or ashore intermediate levels. (Navy only)
K -	Repairable item. Condemnation and disposal to be performed at contractor facility.

---

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

#### NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the number listed.

DESCRIPTION AND USABLE ON CODE (UOC) (Column (6)). This column includes the following information:

1. The federal item name, and when required, a minimum description to identify the item.
2. Part numbers of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
4. The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.

QTY (Column (7)). The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.



**EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES FORMAT AND COLUMNS**

1. National Stock Number (NSN) Index Work Package. NSN's in this index are listed in National Item Identification Number (NIIN) sequence.

STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

For example, if the NSN is 5385-01-574-1476, the NIIN is 01-574-1476.

FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index Work Package. Part numbers in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. Indicates the part number assigned to the item.

FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

**SPECIAL INFORMATION**

UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC...." in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the UOCs used in the RPSTL are:

---

<u>Code</u>	<u>Used On</u>
Not applicable.	

---

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in (enter applicable TM number).

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / Part Number (P/N) Index work packages and the bulk material list in the repair parts list work package.

Illustrations List. The illustrations in this RPSTL contain field authorized items. Illustrations published in (enter applicable TM number for the higher maintenance level RPSTL, e.g., for field, below depot sustainment, etc.) that contain field authorized items also appear in this RPSTL. The tabular list in the repair parts list work package contains only those parts coded "F" in the third position of the SMR code, therefore, there may be a break in the item number sequence.

### 1. When NSNs or Part Numbers Are Not Known.

First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers

### 2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN. Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

### 3. When Part Number Is Known.

First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number index work package. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.

## ABBREVIATIONS

<u>Abbreviation</u>	<u>Explanation</u>
A/R	As Required
COMM	Commercial Item Readily Available From Local Sources
DP	Double-Polesingle-Throw
HHCS	Hexhead Capscrew
ID	Inside Diameter
LH	Left-Hand
NS	Not Shown

**END OF WORK PACKAGE**

FIELD MAINTENANCE

MT3 REPAIR PARTS SPECIAL TOOLS LIST (RPSTL)

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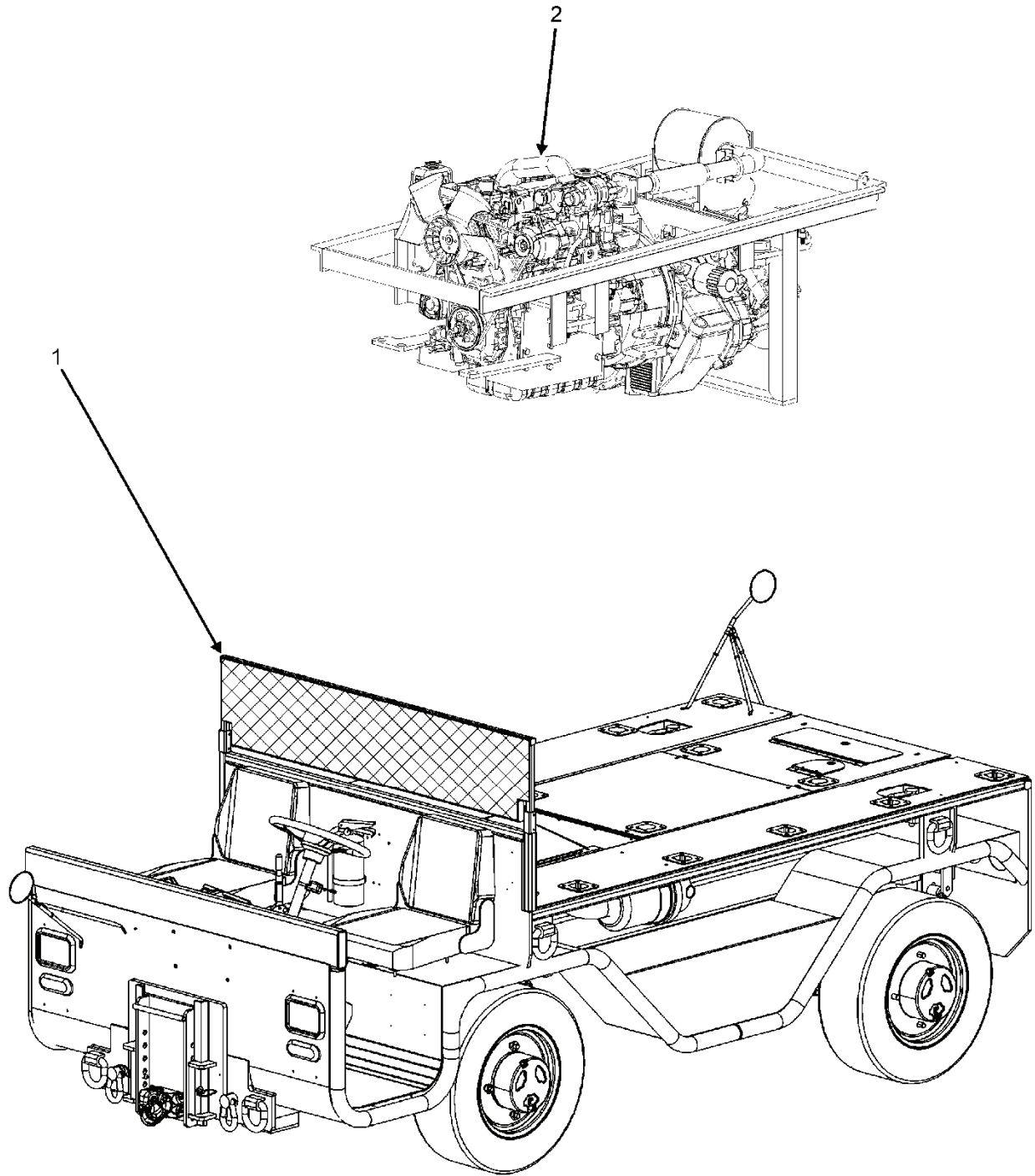


FIGURE 1. STANDARD ARMY TOWING SYSTEM (SATS)

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 00 MT3 SATS	
					FIGURE 1. STANDARD ARMY TOWING SYSTEM (SATS)	
1	PAODD	1740-01-575-5662	44185	47930	STANDARD ARMY TOWING SYSTEM (SATS)	1
2	AOKKK		44185	47380	POWER PACK ASSEMBLY	1

END OF FIGURE

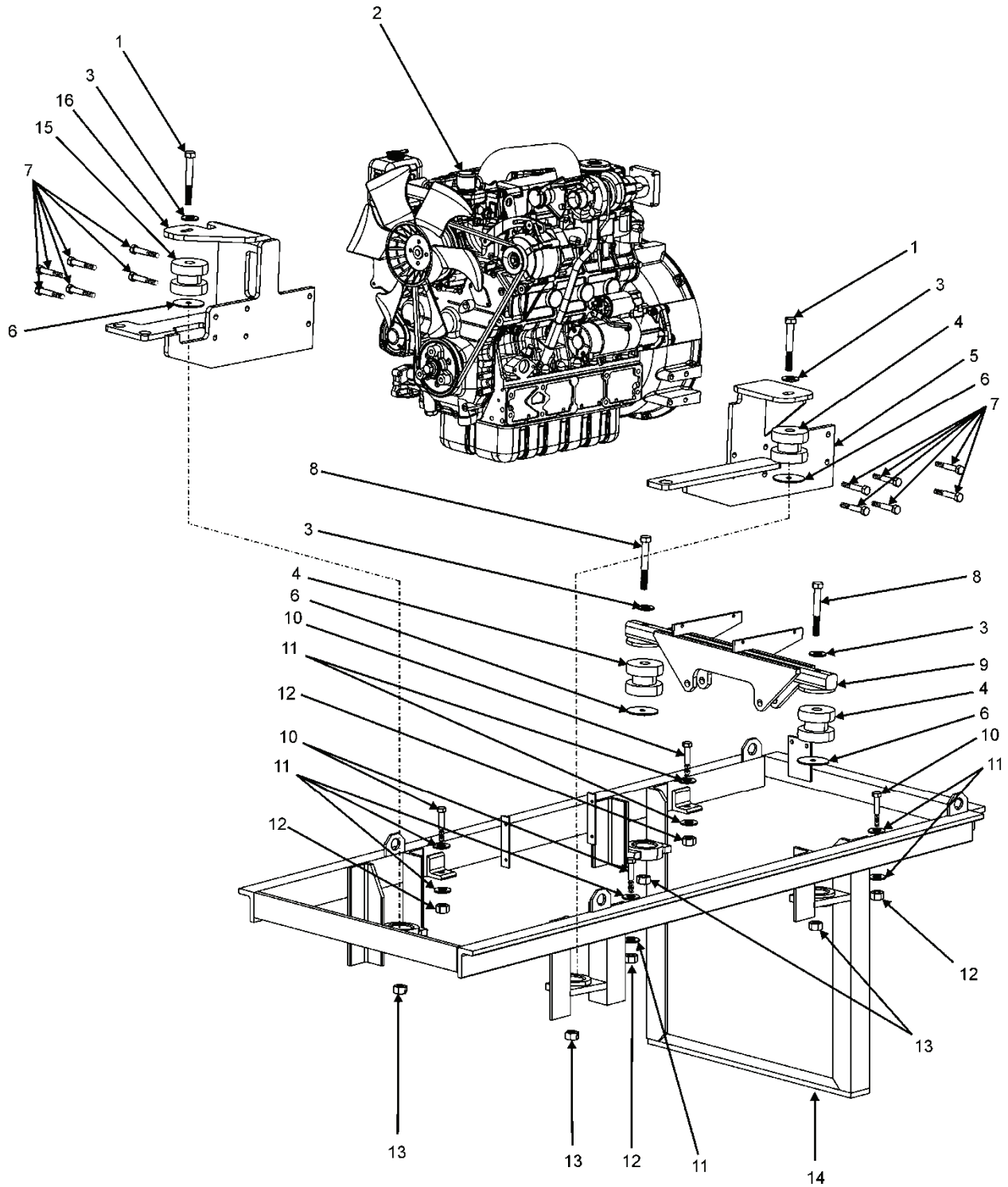


FIGURE 2. ENGINE, ENGINE MOUNTS, ISOLATORS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 2. ENGINE, ENGINE MOUNTS, ISOLATORS	
1	PAOZZ	5305-01-309-7053	80204	B1821H075C500N	SCREW, CAP, HEXAGON HEAD	2
2	PAFLL		44185	47378	ENGINE COMPONENTS	1
3	PAOZZ	5310-00-809-8533	96906	MS27183-23	WASHER, FLAT	4
4	PAFZZ		5P059	60043	ISOLATOR, RUBBER	3
5	XBFZZ		44185	47392	MOTOR MOUNT, LH	1
6	PAOZZ		44185	49130	WASHER,.66ID, 3.12 OD	4
7	PAOZZ		2V507	91180A711	SCREW,CAP,HEX HD M12 X 125 X 20MM	12
8	PAOZZ		1SE17	E571	SCREW, CAP, HEX HD 3/4-10 X 7 IN	2
9	PAFZZ		44185	47388	MOUNT WELDMENT	1
10	PAOZZ	5305-00-071-2073	80204	B1821BH050C250N	SCREW, CAP , HEXAGON HEAD	4
11	PAOZZ	5310-00-809-5998	96906	MS27183-18	WASHER, FLAT	8
12	PAOZZ	5310-00-225-6993	96906	MS51922-33	NUT, SELF-LOCKING, HEXAGON	4
13	PAOZZ	5310-00-176-6519	96906	MS35690-1204	NUT,PLAIN,HEXAGON	4
14	XBFZZ		44185	47495	CRADLE WELDMENT, ENG	1
15	PAFZZ		44185	49129	ISOLATOR	1
16	XBFZZ		44185	47393	MOTOR MOUNT, RH	1

END OF FIGURE

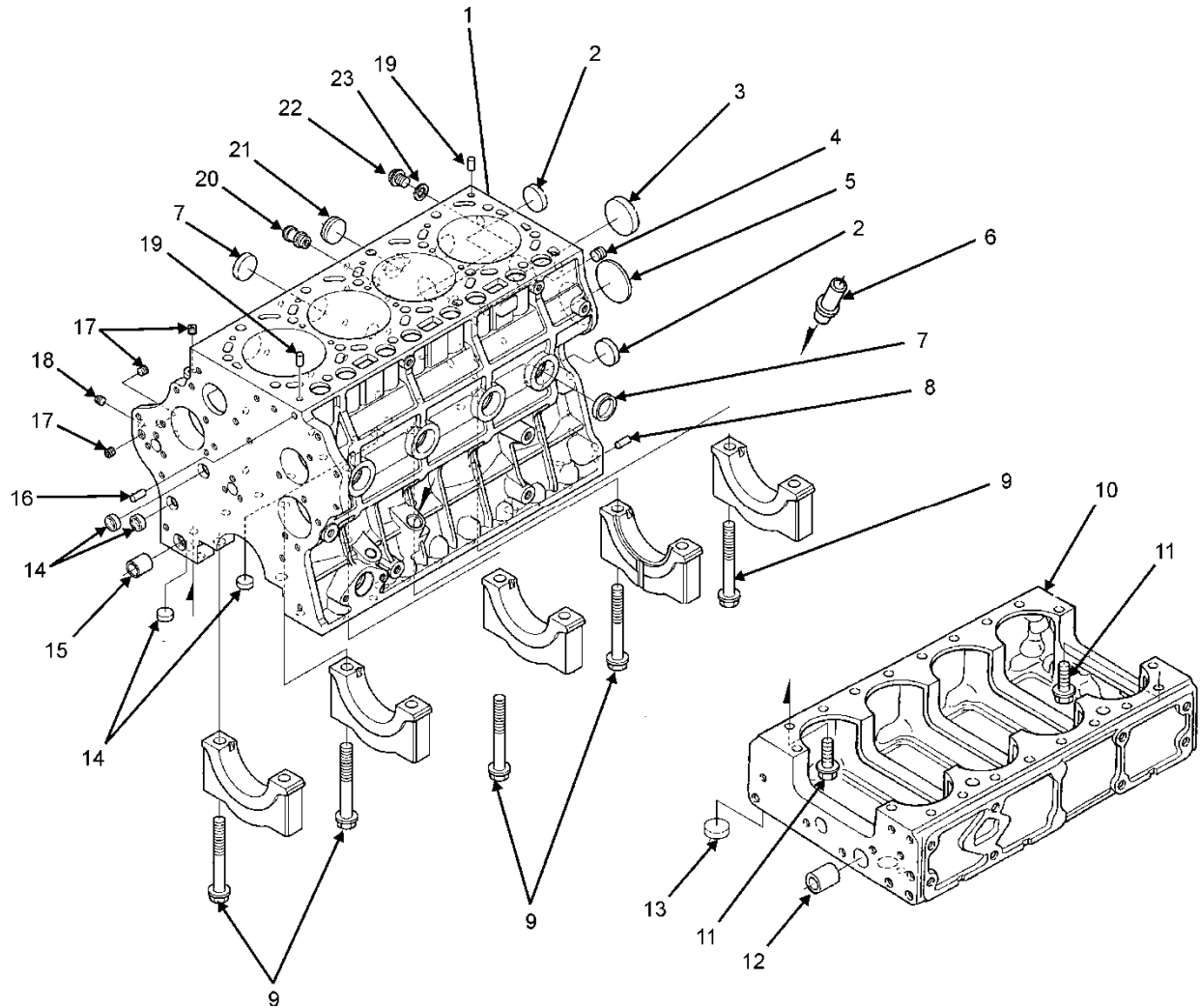


FIGURE 3. ENGINE CRANKCASE



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 3. ENGINE CRANKCASE	
1	XAFZZ			1C010-0104-8	COMP.CRANKCASE (INC 2-5,7-9,14-19)	1
2	PAFZZ	4730-01-533-3297	1Q0C4	15221-0338-0	CAP,HOSE	2
3	PAFZZ	4730-01-533-4123	1Q0C4	15221-0339-0	CAP,LUBRICATION FITTING,PROTECTI	1
4	PAFZZ	4730-01-533-6209	1Q0C4	1C010-9601-0	PLUG,TUBE FITTING,THREADED	1
5	XDFZZ		1Q0C4	1C010-9616-0	PLUG,EXPANSION	1
6	XDFZZ		1Q0C4	1C040-3321-2	PIPE,OIL	1
7	PAOZZ	4730-01-533-3297	1Q0C4	15221-0338-0	CAP,HOSE	7
8	XDFZZ		1Q0C4	05012-01016	PIN,STRAIGHT	4
9	PAFZZ	5306-01-533-5237	1Q0C4	1C010-0456-0	BOLT,MACHINE	10
10	XDFZZ		1Q0C4	1C010-0112-6	CRANKCASE	1
11	XDFZZ		1Q0C4	01774-51030	BOLT,FLANGE	16
12	PAFZZ	5315-01-533-2077	1Q0C4	1C010-3365-0	PIN,STRAIGHT,HEADLESS	1
13	PAFZZ	4730-01-533-3297	1Q0C4	15221-0338-0	CAP,HOSE	1
14	PAFZZ	4730-01-533-3731	1Q0C4	15261-0337-0	CAP,LUBRICATION FITTING,PROTECTI	4
15	PAFZZ	5315-01-533-2975	1Q0C4	1C010-3364-0	PIN,STRAIGHT,HEADLESS	1
16	XDFZZ		1Q0C4	05012-00820	PIN,STRAIGHT	1
17	PAFZZ	4730-01-533-4181	1Q0C4	15521-9602-0	PLUG,TUBE FITTING,THREADED	3
18	PAFZZ	3431-01-506-8134	5X475	15841-9602-0	PLUG	1
19	XDFZZ		1Q0C4	15221-3365-0	PIN,PIPE	2
20	XDFZZ		1Q0C4	1C010-3711-4	JOINT,WATER PIPE	1
21	PAFZZ	4730-01-533-5249	1Q0C4	16683-9602-0	PLUG,TUBE FITTING,THREADED	1
22	PAFZZ	5365-01-533-4422	1Q0C4	06311-55030	PLUG,MACHINE THREAD	1
23	PAFZZ		1Q0C4	04724-00170	GASKET	1

END OF FIGURE

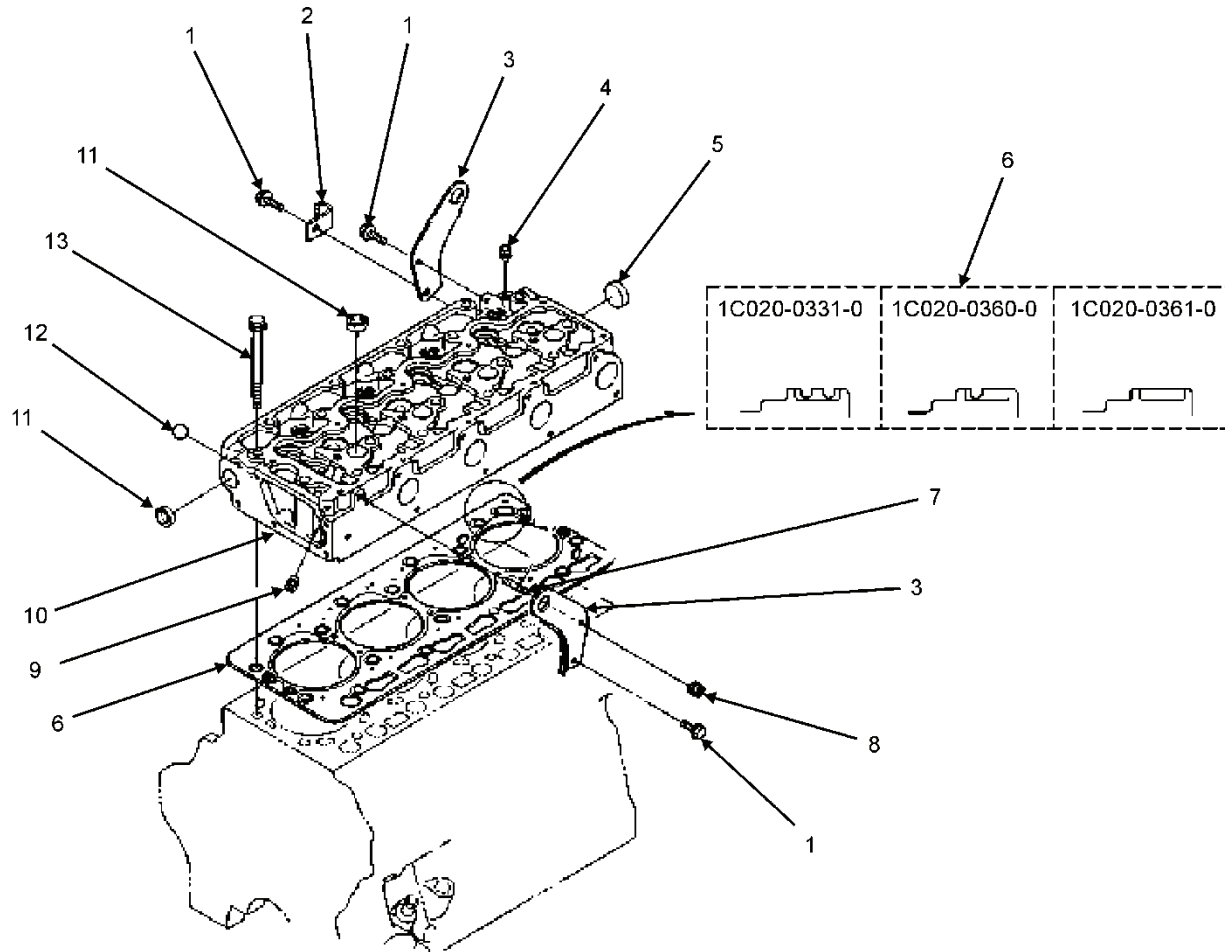


FIGURE 4. ENGINE CYLINDER HEAD

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 4. ENGINE CYLINDER HEAD	
1	PAFZZ		1Q0C4	01754-50814	BOLT,FLANGE	3
2	PAFZZ	5340-01-533-3726	1Q0C4	12234-6758-0	BRACKET, ANGLE	1
3	PAFZZ	2815-01-536-0830	1Q0C4	15471-0174-0	ENGINE HOOK	2
4	PAFZZ	4730-01-533-4181	1Q0C4	15521-9602-0	PLUG,TUBE FITTING,THREADED	1
5	PAFZZ	3431-01-506-4648	5X475	15221-0349-0	CAP,SEALING	1
6	XDLZZ		1Q0C4	1C020-0331-0	GASKET,CYLINDER HEAD	1
			1Q0C4	1C020-0360-0	GASKET,CYLINDER HEAD	1
			1Q0C4	1C020-0361-0	GASKET,CYLINDER HEAD	1
7	PAFZZ	5307-01-533-2948	1Q0C4	15221-9153-0	STUD, PLAIN	1
8	PAFZZ	5310-01-533-9486	1Q0C4	02751-50080	NUT,PLAIN,PLATE	1
9	PAFZZ	3431-01-506-8134	1Q0C4	15841-9602-0	PLUG	1
10	XAFFF		1Q0C4	1J530-0302-0	ASSY CYLINDER HEAD (INC 4,5,11,12)	1
11	PAFZZ	5340-01-533-4423	1Q0C4	15221-0337-0	PLUG, EXPANSION	5
12	PAFZZ		1Q0C4	07715-03209	BALL	4
13	PAFZZ	5306-01-533-9220	1Q0C4	1C010-0345-0	BOLT, MACHINE	18

END OF FIGURE

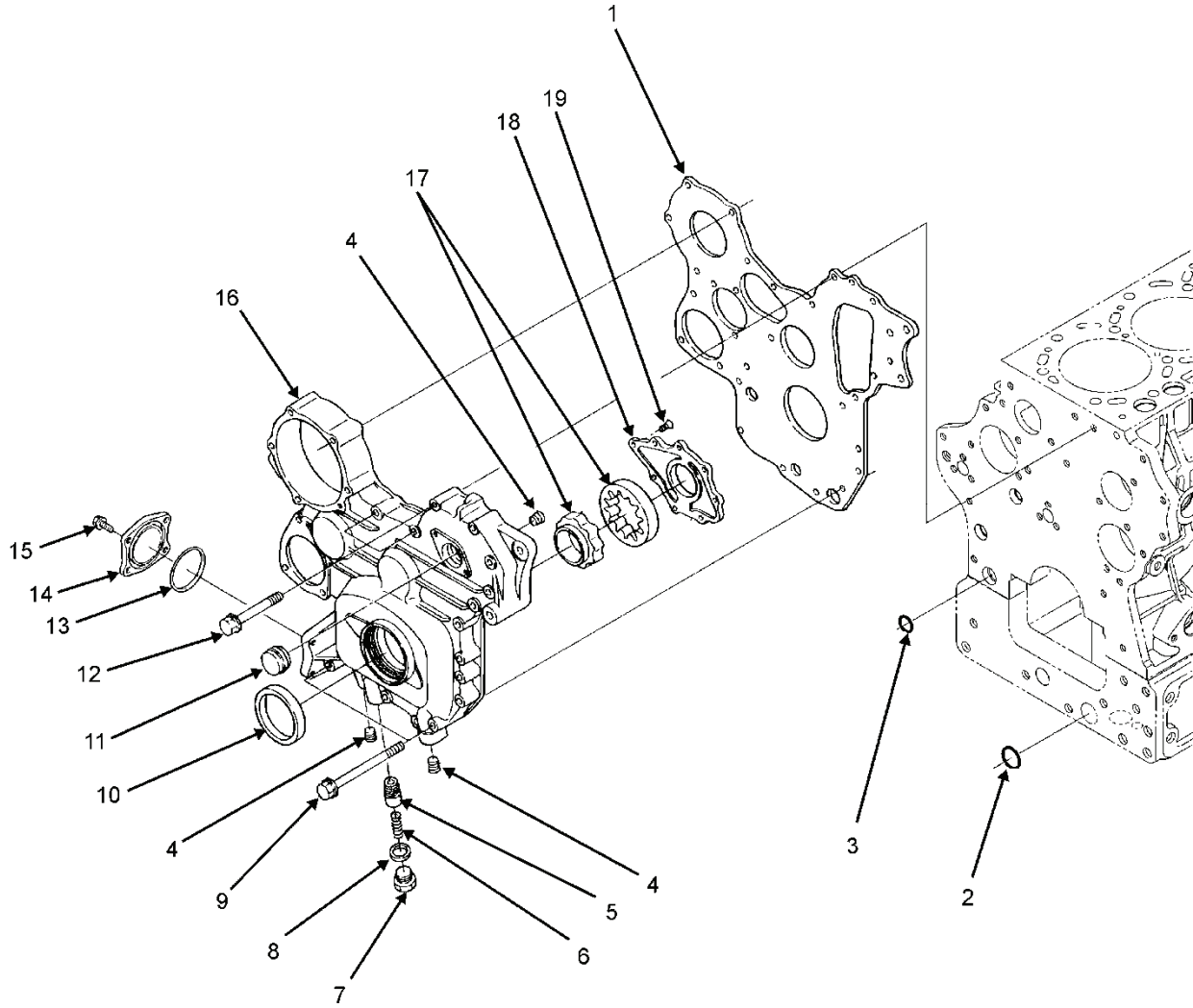


FIGURE 5. ENGINE GEARCASE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 5. ENGINE GEARCASE	
1	PALZZ	5340-01-533-3311	1Q0C4	1C010-0416-2	PLATE,RETAINING,SEAL	1
2	PALZZ	5331-01-533-3408	1Q0C4	04814-00240	O RING	1
3	PALZZ		1Q0C4	04814-00200	O RING	1
4	PALZZ	4730-01-533-3413	1Q0C4	1C010-9602-0	PLUG,TUBE FITTING,THREADED	3
5	PALZZ		1Q0C4	1C010-3692-2	VALVE,RELIEF	1
6	PALZZ	5360-01-533-4688	1Q0C4	1C010-3695-0	SPRING,HELICAL,COMPRESSION	1
7	PALZZ	4730-01-533-2846	1Q0C4	1C010-3696-0	PLUG,TUBE FITTING,THREADED	1
8	PALZZ	5330-01-506-5021	5X475	15451-9667-0	GASKET	1
9	PALZZ		1Q0C4	1C010-9104-0	BOLT,FLANGE	2
10	PALZZ		1Q0C4	1C020-0414-0	SEAL,OIL	1
11	PALZZ	5340-01-542-6339	5X475	16264-8334-2	COVER,ACCESS	1
12	PALZZ		1Q0C4	1C010-9103-0	BOLT,FLANGE	13
13	PALZZ	5331-01-533-7418	1Q0C4	19202-9683-0	O RING	1
14	PALZZ	4730-01-533-2896	1Q0C4	1C010-3288-0	CAP,LUBRICATION FITTING,PROTECTI	1
15	PALZZ	5306-01-358-9526	0MR83	01754-50820	BOLT,FLANGE	4
16	PALZZ		1Q0C4	1C020-0401-0	ASSY CASE,GEAR (INC 4-8,14-15,17-19)	1
17	PALZZ	2990-01-573-5484	1Q0C4	1C010-3507-0	OIL PUMP	1
18	PALZZ		1Q0C4	1C010-3513-0	COVER,OIL PUMP	1
19	PALZZ	5305-01-533-3409	1Q0C4	03016-50616	SCREW,TAPPING	8

END OF FIGURE

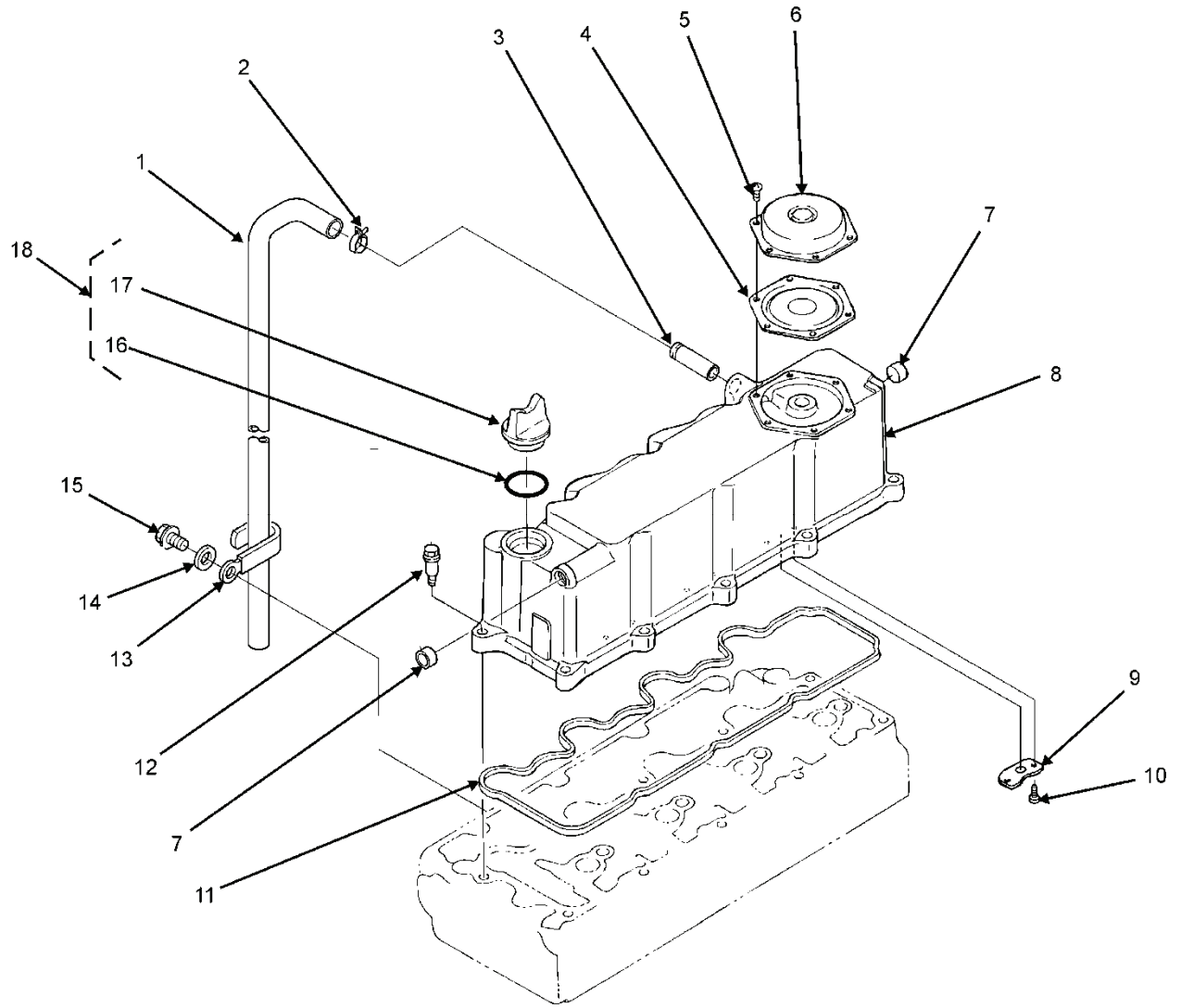


FIGURE 6. ENGINE HEAD COVER

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 6. ENGINE HEAD COVER	
1	XDLZZ		1Q0C4	1C040-0551-0	PIPE,BREATHER	1
2	XDLZZ		1Q0C4	16241-3351-0	BAND,PIPE	1
3	PALZZ	4730-01-533-2536	1Q0C4	16241-0555-0	COUPLING,PIPE,SLIP JOINT	1
4	PALZZ	4820-01-536-0898	1Q0C4	1C010-0520-0	VALVE,PRESSURE EQUALIZING,GASEOU	1
5	PALZZ	5305-01-533-2472	1Q0C4	03054-50508	SCREW,TAPPING	6
6	PALZZ	4820-01-533-3294	1Q0C4	1C010-0512-0	CAP,VALVE	1
7	PALZZ	4730-01-533-2129	1Q0C4	06311-85016	PLUG,TUBE FITTING,THREADED	2
8	XDLZZ		1Q0C4	1C010-1450-6	ASSY COVER,CYL.HEAD(INC 3-7,9-12,16-18)	1
9	XDLZZ		1Q0C4	1J510-0537-0	SHIELD,OIL BREATHER	3
10	XDLZZ	5305-01-533-2067	1Q0C4	03054-50408	SCREW,TAPPING	6
11	PALZZ	5330-01-524-7680	1Q0C4	1C010-1452-0	GASKET	1
12	PALZZ	5306-01-533-2940	1Q0C4	1C010-9102-0	BOLT,MACHINE	10
13	PALZZ		1Q0C4	68011-5116-0	CLAMP,CORD	1
14	PALZZ	5310-01-500-2382	0XWR1	04013-60100	WASHER,FLAT	1
15	PALZZ		1Q0C4	01774-51014	BOLT,FLANGE	1
16	PALZZ		1Q0C4	04817-50300	O RING	1
17	PALZZ	5365-01-542-6383	5X475	E9151-3314-0	PLUG,MACHINE THREAD	1
18	PALZZ		1Q0C4	1C010-3308-0	ASSY PLUG,O/FILLER	1

END OF FIGURE

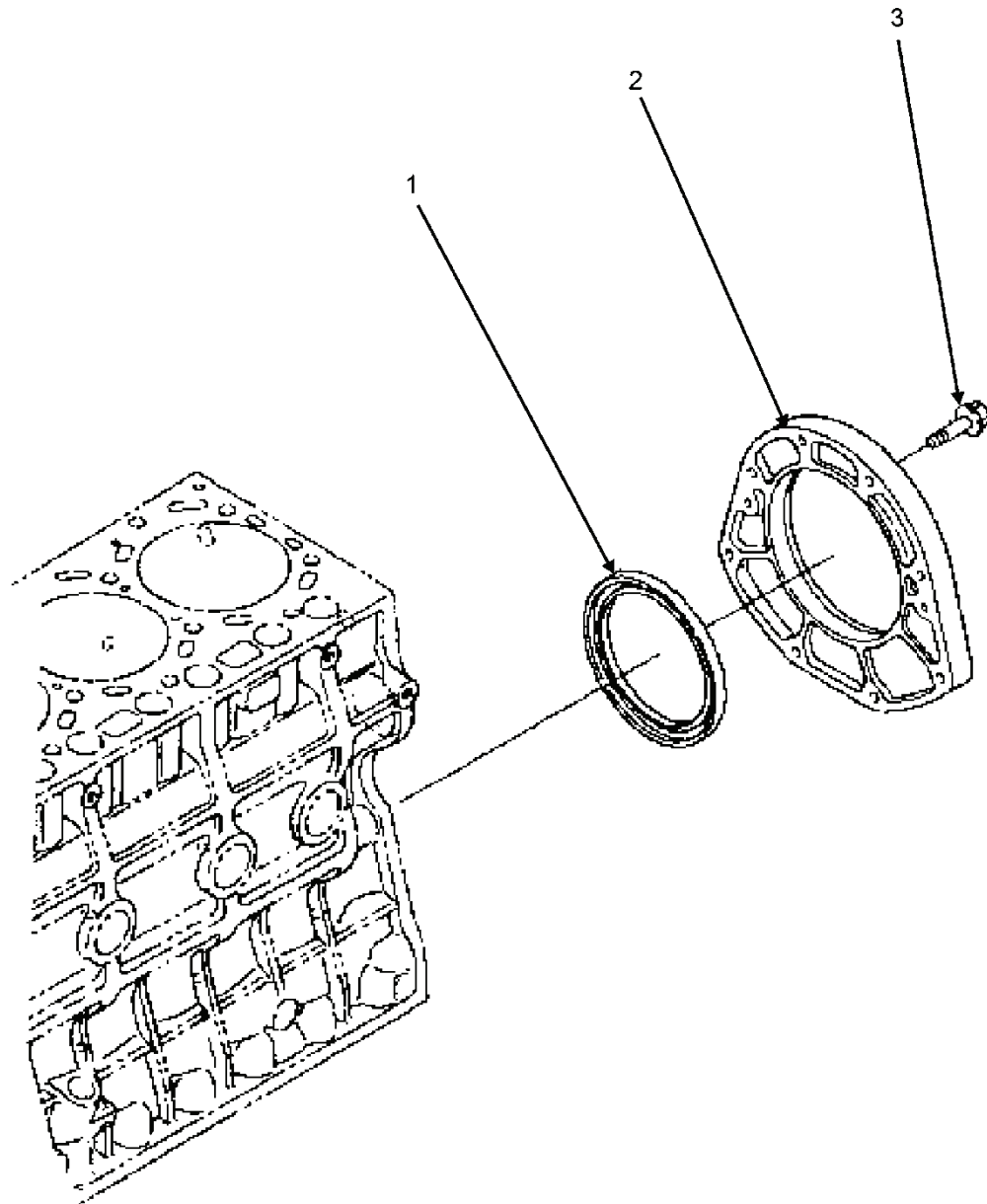


FIGURE 7. ENGINE MAIN BEARING CASE



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 7. ENGINE MAIN BEARING CASE	
1	PALZZ	5330-01-524-8043	1Q0C4	1C010-0446-0	SEAL,PLAIN	1
2	PALZZ	3130-01-533-2489	1Q0C4	1C010-0430-0	CAP,PILLOW BLOCK	1
3	XDLZZ		1Q0C4	01754-50830	BOLT,FLANGE	8

END OF FIGURE

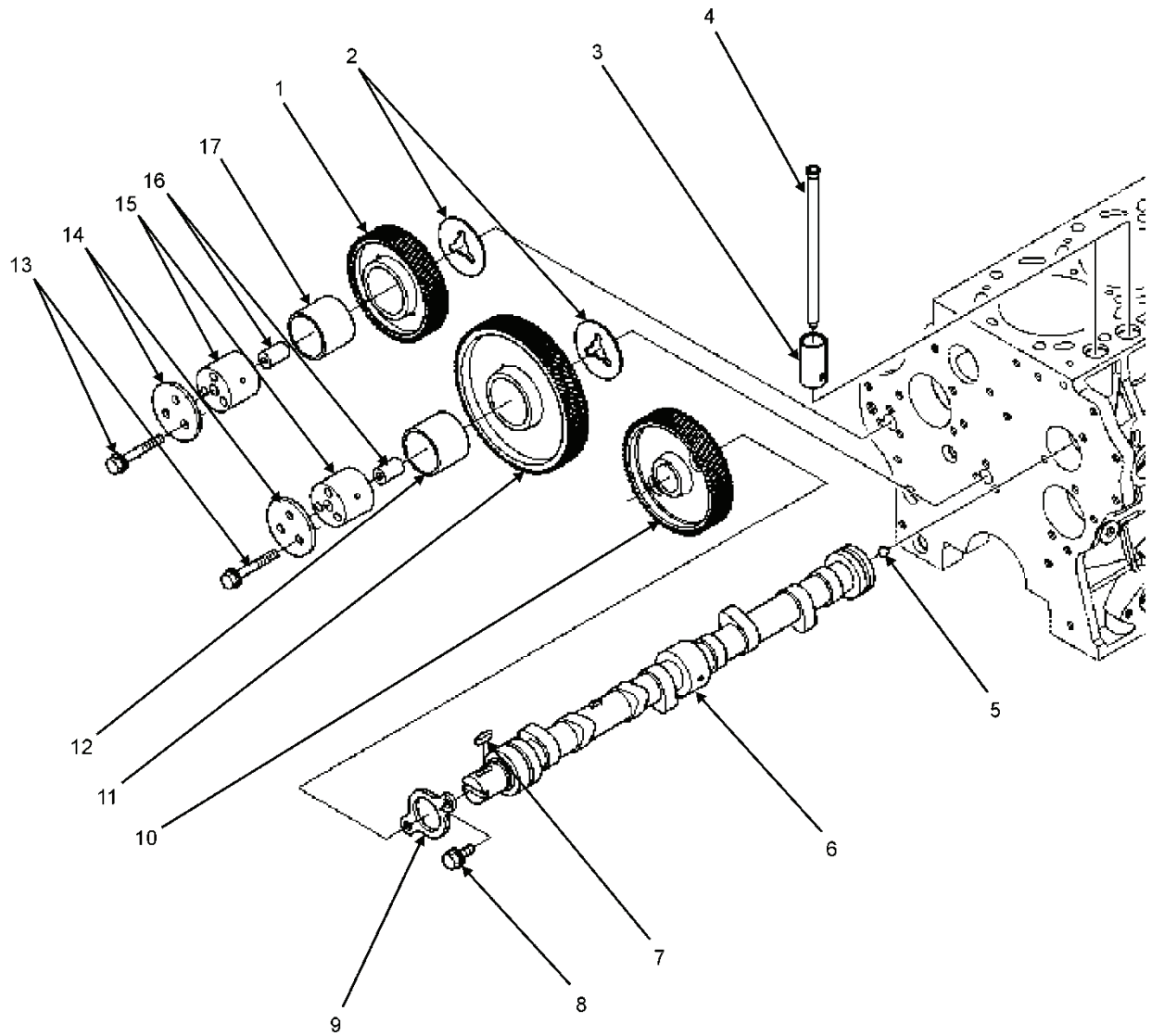


FIGURE 8. ENGINE CAMSHAFT AND IDLE GEAR SHAFT

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 8. ENGINE CAMSHAFT AND IDLE GEAR SHAFT	
1	XCLZZ		1Q0C4	1C010-2402-2	COMP.GEAR,IDLE (INC 17)	1
2	PALZZ	3040-01-536-0861	1Q0C4	1C010-2436-0	COLLAR,SHAFT	2
3	PALZZ	2815-01-536-0901	1Q0C4	15601-1555-0	GUIDE,ENGINE POPPET VALVE TAPPET	8
4	PALZZ	2815-01-536-0899	1Q0C4	1C010-1511-0	PUSH ROD,ENGINE POPPET VALVE	8
5	PALZZ	2815-01-536-0900	1Q0C4	07715-01605	BALL	1
6	XCLZZ		1Q0C4	1J530-1601-0	ASSY CAMSHAFT (INC 5, 7-9)	1
7	PALZZ	5315-01-393-1316	31013	05712-00520	KEY,MACHINE	1
8	XCLZZ		1Q0C4	01754-50814	BOLT,FLANGE	2
9	PALZZ	2815-01-536-0904	1Q0C4	1C010-1627-0	CAMSHAFT STOPPER	1
10	XCLZZ		1Q0C4	1C010-1651-2	GEAR,CAM	1
11	XCLZZ		1Q0C4	1C010-2401-2	COMP.GEAR,IDLE (INC 12)	1
12	XCLZZ		1Q0C4	1C010-2498-2	BUSH,IDLE GEAR	1
13	PALZZ	5306-01-393-4864	31013	01754-50855	BOLT,MACHINE	6
14	PALZZ	3040-01-536-0862	1Q0C4	1C010-2437-0	COLLAR,SHAFT	2
15	PALZZ	3040-01-536-0859	1Q0C4	1C010-2425-0	SHAFT,STRAIGHT	2
16	XCLZZ		1Q0C4	1C010-2452-0	PIN,GEAR IDLE	2
17	PALZZ	5365-01-533-1824	1Q0C4	1C010-2498-0	BUSHING BLANK	1

END OF FIGURE

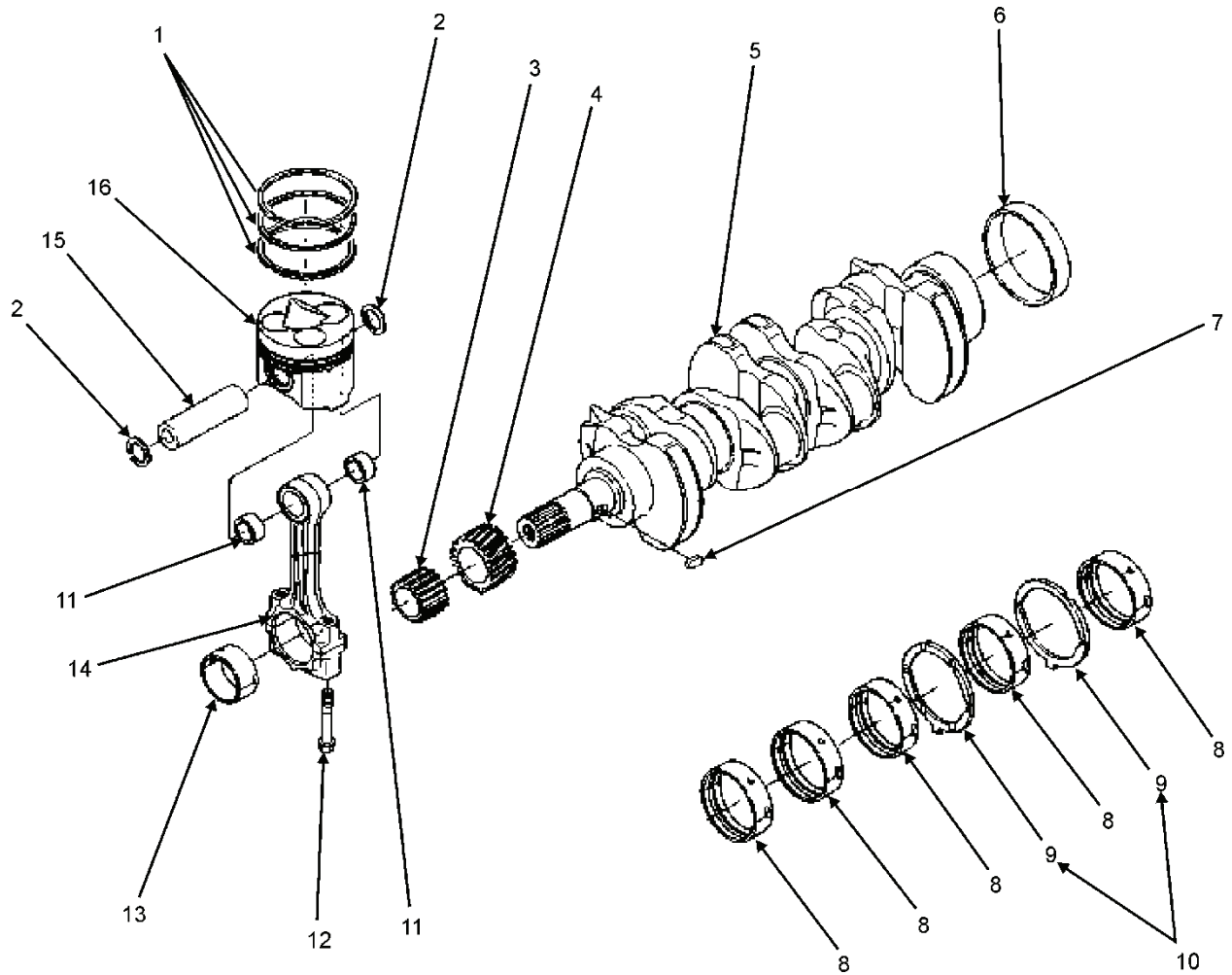


FIGURE 9. ENGINE PISTON AND CRANKSHAFT

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 9. ENGINE PISTON AND CRANKSHAFT	
1	XCLZZ		1Q0C4	1C011-2105-0	ASSY PISTON RING	4
2	PALZZ	5325-01-533-3933	1Q0C4	04611-00300	RING,RETAINING	8
3	XCLZZ		1Q0C4	1C010-3563-0	GEAR,OIL PUMP DRIVE	1
4	XCLZZ		1Q0C4	1C010-2411-2	GEAR,CRANKSHAFT	1
5	XCLZZ		1Q0C4	1G520-2301-0	COMP.CRANKSHAFT (INC 3,4,6,7)	1
6	PALZZ	3120-01-533-2593	1Q0C4	1C010-2330-0	BEARING,SLEEVE	1
7	PALZZ	5315-01-533-3553	1Q0C4	05712-00515	KEY,WOODRUFF	1
8	XCLZZ		1Q0C4	1C020-2347-0	METAL,CRANKSHAFT	5
9	PALZZ	3040-01-536-0907	1Q0C4	1C010-2354-0	COLLAR,SHAFT	2
10	PALZZ	3040-01-536-0909	1Q0C4	1C010-2353-0	COLLAR,SHAFT	2
11	PALZZ	3120-01-533-2983	1Q0C4	1C010-2198-0	BUSHING,SLEEVE	8
12	PALZZ	5306-01-533-2613	1Q0C4	1C010-2214-0	BOLT,MACHINE	8
13	XCLZZ		1Q0C4	1C020-2231-2	METAL,CRANKPIN	4
	XCLZZ		1Q0C4	1C020-2233-2	METAL,CRANKPIN	4
14	XCLZZ		1Q0C4	1J574-2201-0	ASSY ROD,CONNECTING (INC 11-13)	4
15	PALZZ	2815-01-536-0902	1Q0C4	1C010-2131-0	PIN,PISTON	4
16	XCLZZ		1Q0C4	1J530-2111-0	PISTON	4

END OF FIGURE

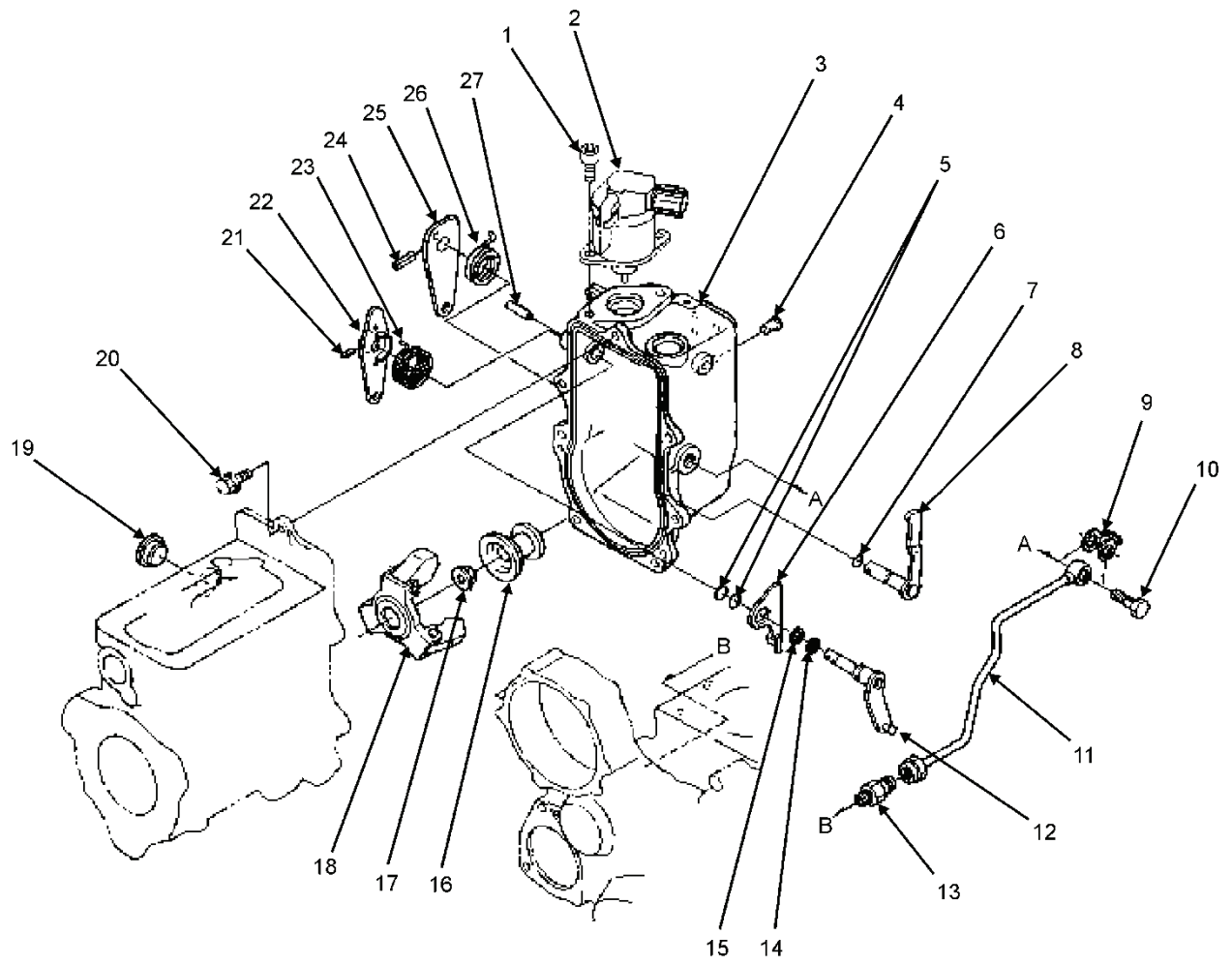


FIGURE 10. ENGINE STOP SOLENIOD

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 10. ENGINE STOP SOLENIOD	
1	PAFZZ	5306-01-533-7420	1Q0C4	01311-10616	BOLT,MACHINE	2
2	PAFZZ		1Q0C4	1C010-6001-5	SOLENOID,STOP	1
3	XCLZZ		1Q0C4	1C011-5510-4	HOUSING,GOVERNOR	1
4	XCLZZ		1Q0C4	15221-5628-0	PIN,START SPRING	1
5	PALZZ	5331-01-537-0007	0XWR1	04814-10070	O RING	2
6	PALZZ		1Q0C4	1C010-6015-3	LEVER,STOP	1
7	PALZZ	5331-01-537-0007	0XWR1	04814-10070	O RING	1
8	PALZZ	3040-01-536-0914	1Q0C4	1C010-5770-0	CONNECTING LINK,RIGID	1
9	XCLZZ		1Q0C4	1C020-9665-0	GASKET	1
10	PALZZ	5305-01-533-8759	1Q0C4	17371-9580-0	SCREW,CAP,HEXAGON HEAD	1
11	PALZZ	4710-01-533-6258	1Q0C4	1C010-3332-0	PIPE ASSEMBLY,METAL	1
12	PALZZ	2990-01-536-0912	1Q0C4	1C010-5602-3	LEVER ASSEMBLY,POWER-SPEED CONTR	1
13	PALZZ	4730-01-533-9333	1Q0C4	15707-3336-0	COUPLING,PIPE,SLIP JOINT	1
14	PALZZ	5340-01-533-4990	1Q0C4	04613-50120	CLIP,RETAINING	1
15	PALZZ	5310-01-533-2924	1Q0C4	15221-1443-0	WASHER,FLAT	1
16	XCLZZ		1Q0C4	1C020-5545-3	SLEEVE,GOVERNOR	1
17	PALZZ	5310-01-533-6199	1Q0C4	02771-50120	NUT,PLAIN,HEXAGON	1
18	XCLZZ		1Q0C4	1C020-5505-0	ASSY WEIGHT,GOVERNOR	1
19	PALZZ	2815-01-536-0881	1Q0C4	1C010-5675-0	GOVERNOR ROD COVER	1
20	PALZZ	5305-01-564-6807	2V507	92820A325	SCREW, CAP, HEXAGON HEAD	6
21	PALZZ	5315-01-533-2652	1Q0C4	05411-00416	PIN,SPRING	1
22	XCLZZ		1Q0C4	1K012-5715-0	LEVER,SPEED CONTROL	1
23	XCLZZ		1Q0C4	1C010-5751-2	SPRING	1
24	PALZZ	5315-01-533-2652	1Q0C4	05411-00416	PIN,SPRING	1
25	PALZZ	3040-01-536-0916	1Q0C4	1C010-5762-0	CONNECTING LINK,RIGID	1
26	PALZZ	5360-01-533-2800	1Q0C4	15471-5792-0	SPRING,HELICAL,COMPRESSION	1
27	XCLZZ		1Q0C4	1C010-9451-0	PIN,STRAIGHT	1

END OF FIGURE

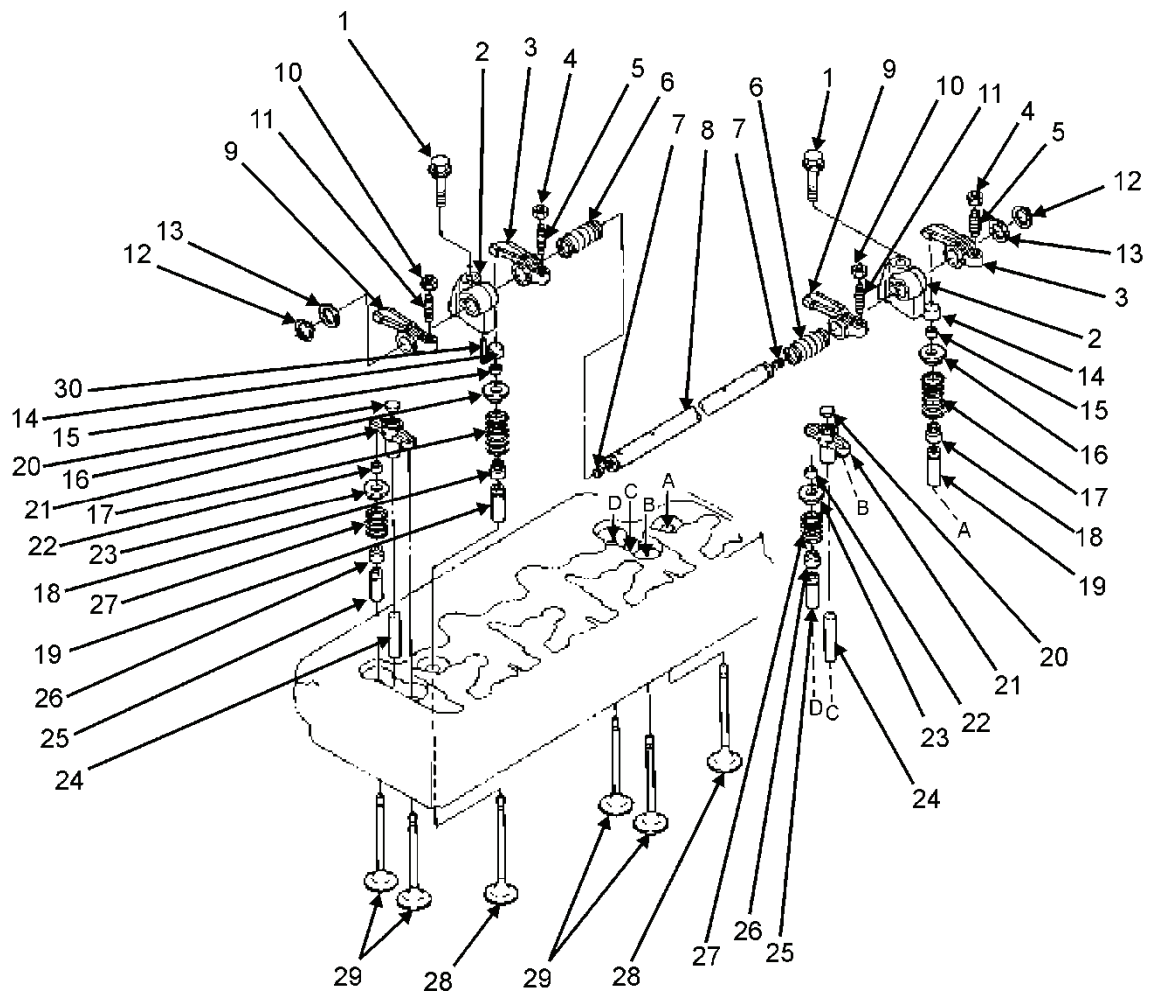


FIGURE 11. VALVE AND ROCKER ARM



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 11. VALVE AND ROCKER ARM	
1	PALZZ	5305-01-533-6244	1Q0C4	01774-51060	SCREW,CAP,HEXAGON HEAD	4
2	PALZZ	2815-01-536-0835	1Q0C4	1C010-1435-0	ROCKER ARM BRACKET	4
3	XDLZZ		1Q0C4	1C010-1415-0	ASSY ROCKER ARM,EXH. (INC 3-4)	2
4	PALZZ	5310-01-533-3834	1Q0C4	15021-1424-0	NUT,PLAIN,HEXAGON	4
5	PALZZ	5307-01-533-9241	1Q0C4	15521-1423-0	STUD,RECESSED	4
6	XDLZZ		1Q0C4	1C020-1431-0	SPRING,ROCKER ARM	3
7	XDLZZ		1Q0C4	03410-50808	SCREW,SET	2
8	XDLZZ		1Q0C4	1C010-1405-0	ASSY SHAFT,R-ARM (INC 7)	1
9	XDLZZ		1Q0C4	1C010-1402-0	ASSY ROCKER ARM,IN. (INC 10-11)	2
10	PALZZ	5310-01-533-3834	1Q0C4	15021-1424-0	NUT,PLAIN,HEXAGON	4
11	PALZZ	5307-01-533-9241	1Q0C4	15521-1423-0	STUD,RECESSED	4
12	PALZZ	5325-01-321-3443	S4532	04612-00160	RING,RETAINING	2
13	PALZZ	5310-01-533-6230	1Q0C4	1C010-1443-0	WASHER,FLAT	2
14	PALZZ	4810-01-533-6238	1Q0C4	15221-1328-0	CAP,VALVE	4
15	XDLZZ		1Q0C4	15221-1398-0	COLLET,VALVE SPRING	4
16	PALZZ	4820-01-536-0868	1Q0C4	15221-1333-0	RETAINER,SPRING VAL	4
17	PALZZ	5360-01-533-3207	1Q0C4	15221-1324-0	SPRING,HELICAL,COMPRESSION	4
18	PALZZ	5330-01-534-0030	1Q0C4	1C010-1316-0	SEAL,PLAIN	4
19	XDLZZ		1Q0C4	1C010-1356-0	GUIDE,VALVE,EXHAUST	4
20	PALZZ	5340-01-533-3205	1Q0C4	1C010-1349-0	MOUNT,RESILIENT,GENERAL PURPOSE	4
21	XDLZZ		1Q0C4	1C020-1346-3	ARM,VALVE BRIGE	4
22	PALZZ	4820-01-536-0870	1Q0C4	15261-1336-0	VALVE SPRING COLLET	8
23	PALZZ	5340-01-543-6042	5X475	16261-1333-0	RETAINER,HELICAL COMPRESSION SPR	8
24	XDLZZ		1Q0C4	1C010-1348-2	SHAFT,VALVE	4
25	PALZZ	2815-01-542-6055	5X475	16261-1354-0	GUIDE,VALVE STEM	8
26	PALZZ	3431-01-507-0847	5X475	1C010-1315-0	SEAL VALVE S	8
27	PALZZ	5360-01-533-2517	1Q0C4	1C010-1324-0	SPRING,HELICAL,COMPRESSION	8
28	XDLZZ		1Q0C4	1C010-1312-2	VALVE,EXHAUST	4
29	XDLZZ		1Q0C4	1C010-1311-3	VALVE,INLET	8
30	XDLZZ		1Q0C4	05411-00528	PIN,SPRING	1

END OF FIGURE

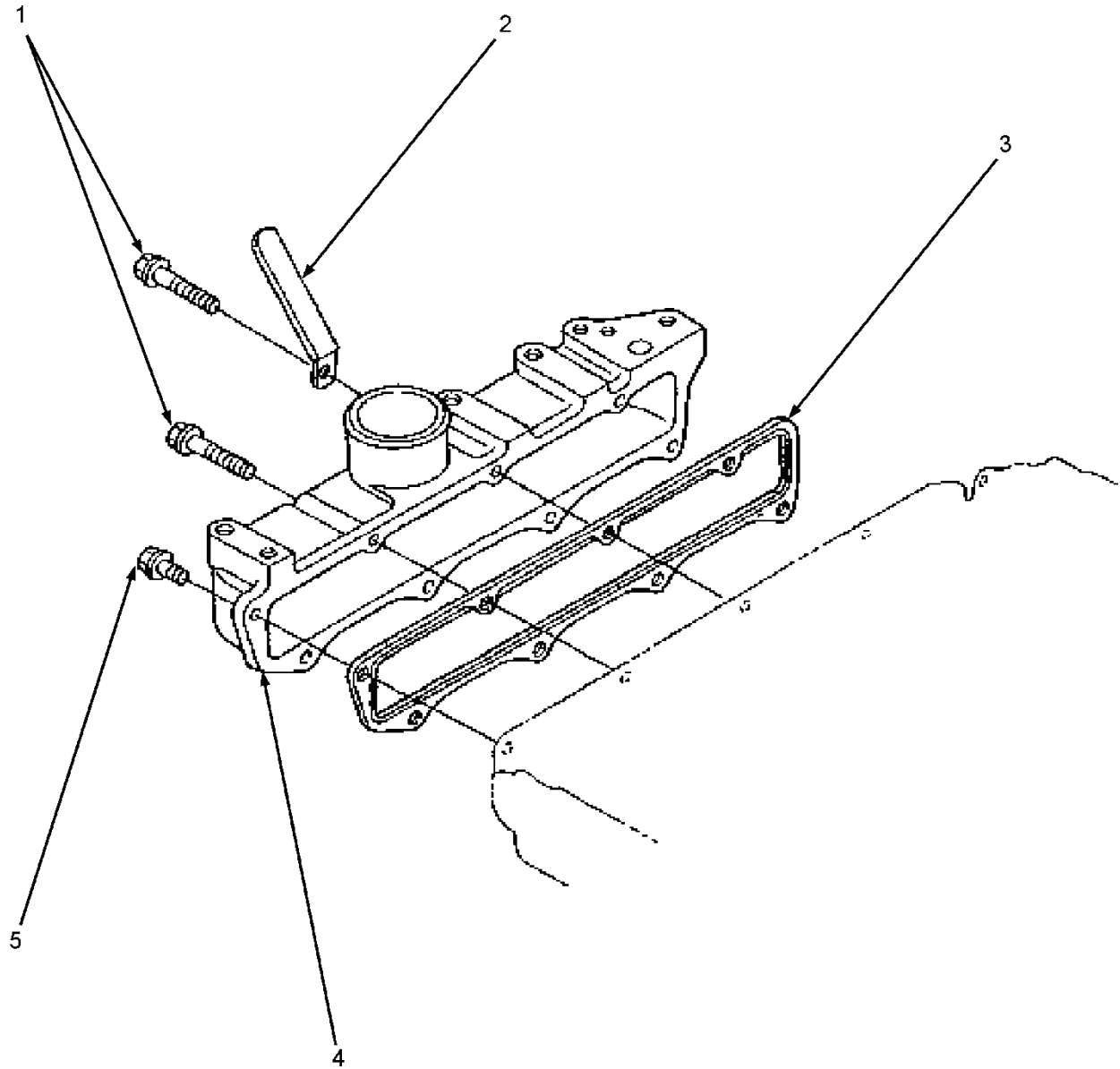


FIGURE 12. INLET MANIFOLD

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 12. INLET MANIFOLD	
1	PALZZ	5306-01-533-3807	1Q0C4	01754-50865	BOLT, MACHINE	3
2	PALZZ	5340-01-533-3726	1Q0C4	12234-6758-0	BRACKET,ANGLE	1
3	PALZZ	5330-01-533-9117	1Q0C4	1C010-1182-0	GASKET	1
4	XCFZZ		1Q0C4	1J530-1176-0	MANIFOLD,INLET	1
5	PALZZ	5306-01-358-9526	0MR83	01754-50820	BOLT,MACHINE	5

END OF FIGURE

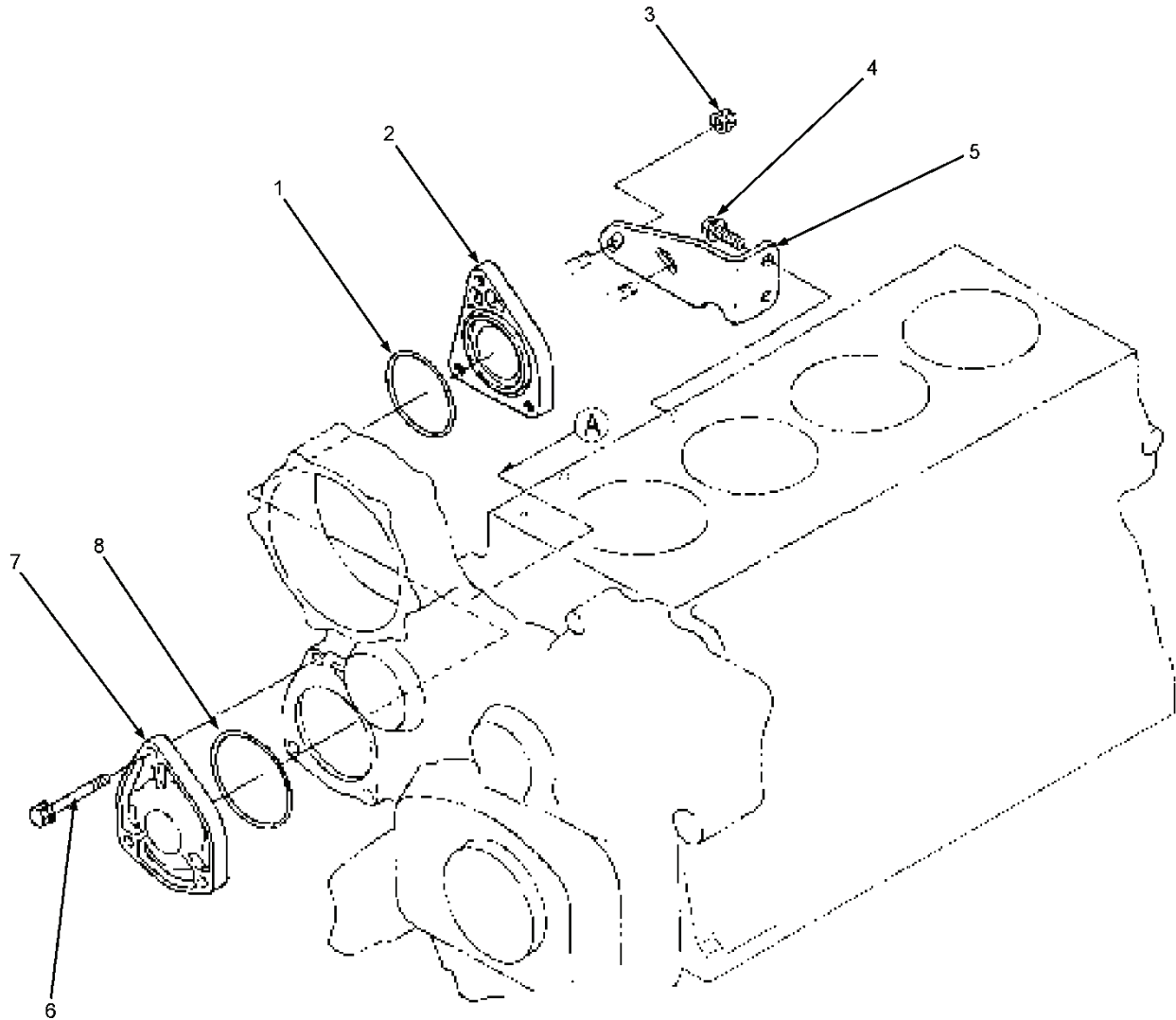


FIGURE 13. HYDRAULIC PUMP CONNECTION

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 13. HYDRAULIC PUMP	
					CONNECTIONERROR! REFERENCE	
					<b>SOURCE NOT FOUND.</b>	
1	XCLZZ		1Q0C4	1C010-9696-0	O RING	1
2	PALZZ	4320-01-536-0876	1Q0C4	1C010-8315-0	COVER, HYDRAULIC, PUMP-MOTOR	1
3	PALZZ	5310-01-533-9486	1Q0C4	02751-50080	NUT, PLAIN, PLATE	2
4	XCLZZ		1Q0C4	01755-50814	BOLT, FLANGE	2
5	PALZZ	5340-01-533-6253	1Q0C4	1C010-5162-0	BRACKET, MOUNTING	1
6	PALZZ	5306-01-533-5742	1Q0C4	01754-50870	BOLT, MACHINE	3
7	PALZZ	4320-01-536-0878	1Q0C4	1C010-8335-0	COVER, HYDRAULIC, PUMP-MOTOR	1
8	XCLZZ		1Q0C4	1C010-9696-0	O RING	1

END OF FIGURE

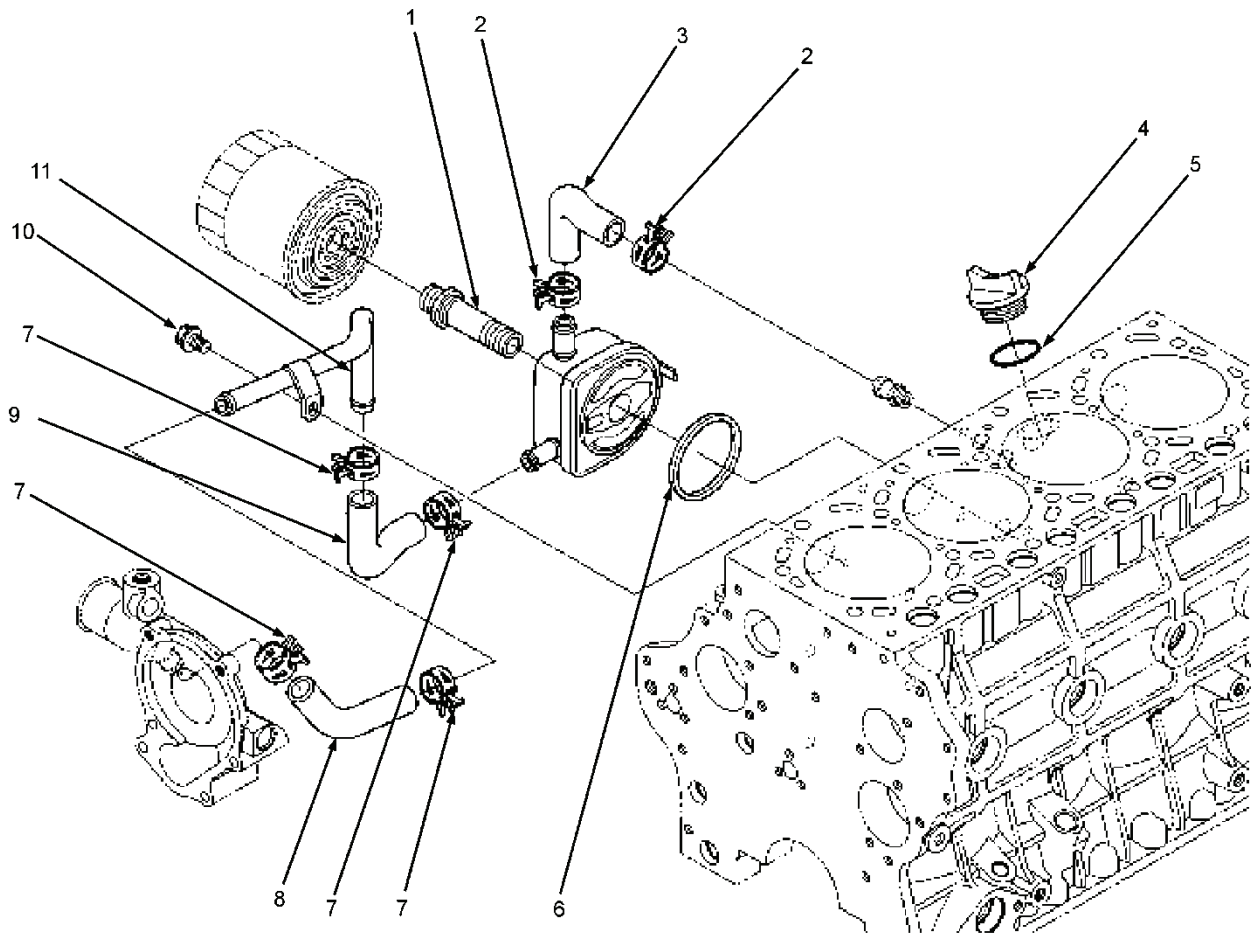


FIGURE 14. OIL COOLER

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 14. OIL COOLER	
1	XCFZZ		1Q0C4	1C010-3229-2	JOINT	1
2	PAOZZ	4730-01-478-7123	0XWR1	09318-88200	CLAMP,HOSE	2
3	PAOZZ	4720-01-524-7615	1Q0C4	1C010-3715-0	HOSE,NONMETALLIC	1
4	PAOZZ	5365-01-542-6383	5X475	E9151-3314-0	PLUG,MACHINE THREAD	1
5	XCFZZ		1Q0C4	04817-50300	O RING	1
6	XCFZZ		1Q0C4	15484-3707-0	GASKET,OIL COOLER	1
7	XCFZZ		1Q0C4	1C010-3717-2	PIPE,OIL COLLER	1
8	PAOZZ	4720-01-524-7591	1Q0C4	1C010-3718-2	HOSE,NONMETALLIC	1
9	XCFZZ		1Q0C4	01754-50814	BOLT,FLANGE	1
10	PAOZZ	4710-01-533-6260	1Q0C4	1C010-3716-0	TUBE,METALLIC	1

END OF FIGURE

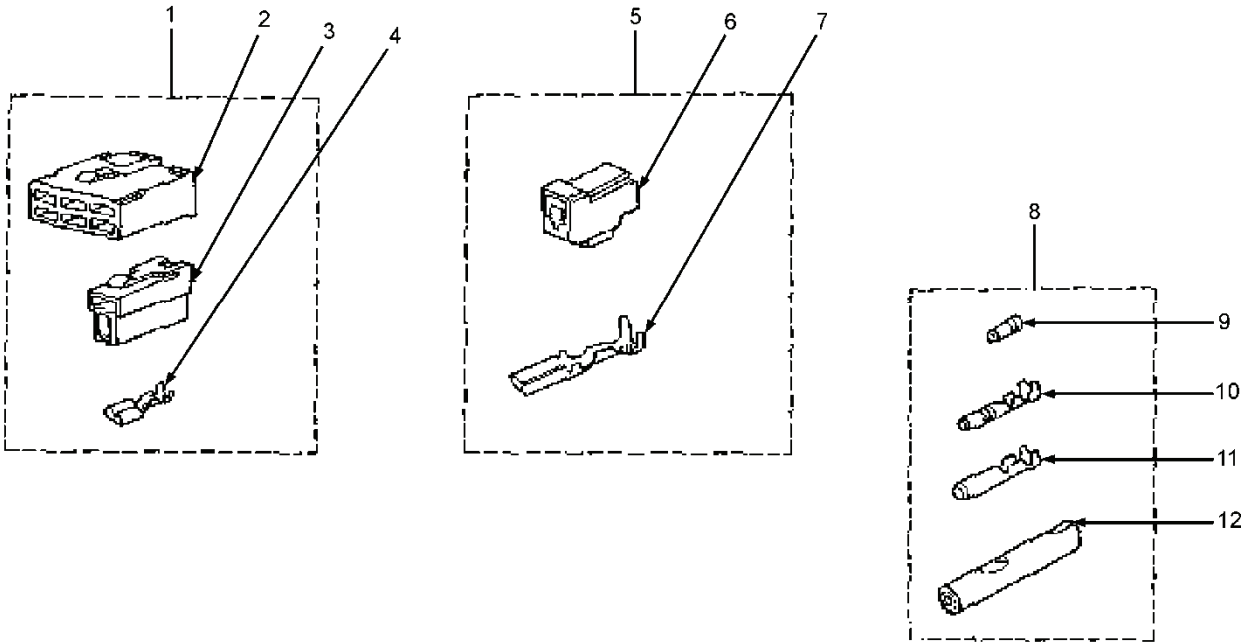


FIGURE 15. ACCESSORIES AND SERVICE PARTS



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 15. ACCESSORIES AND SERVICE	
					PARTS	
1	PAOZZ	5330-01-542-7037	5X475	19883-65830	SLEEVE,SEAL,COUPLER	1
2	PAOZZ	5935-01-543-5970	5X475	19872-6584-0	CONNECTOR,RECEPTACLE,ELECTRICAL	1
3	PAOZZ	5935-01-543-5972	1Q0C4	19872-6588-0	CONNECTOR,RECEPTACLE,ELECTRICAL	1
4	PAOZZ	5940-01-537-2058	0XWR1	19237-6591-0	TERMINAL,LUG	7
5	PAOZZ	4730-01-542-7049	5X475	1C010-6583-0	COUPLING ASSEMBLY,SELF-SEALING	1
6	PAOZZ	5935-01-543-5982	5X475	1C010-6588-0	CONNECTOR,RECEPTACLE,ELECTRICAL	1
7	PAOZZ	5940-01-542-7053	5X475	1C010-6591-0	TERMINAL,LUG	2
8	PAOZZ	5330-01-542-7039	5X475	19268-6578-0	SLEEVE,SEAL,COUPLER	1
9	PAOZZ	5940-01-542-7043	5X475	68271-6591-0	TERMINAL,LUG	1
10	PAOZZ	5970-01-543-5975	5X475	68271-6592-0	INSULATION SLEEVING,ELECTRICAL	1
11	PAOZZ	5940-01-542-7047	5X475	19268-6593-0	TERMINAL,LUG	1
12	PAOZZ	5970-01-543-5976	5X475	19268-6587-0	INSULATION SLEEVING,ELECTRICAL	1

END OF FIGURE

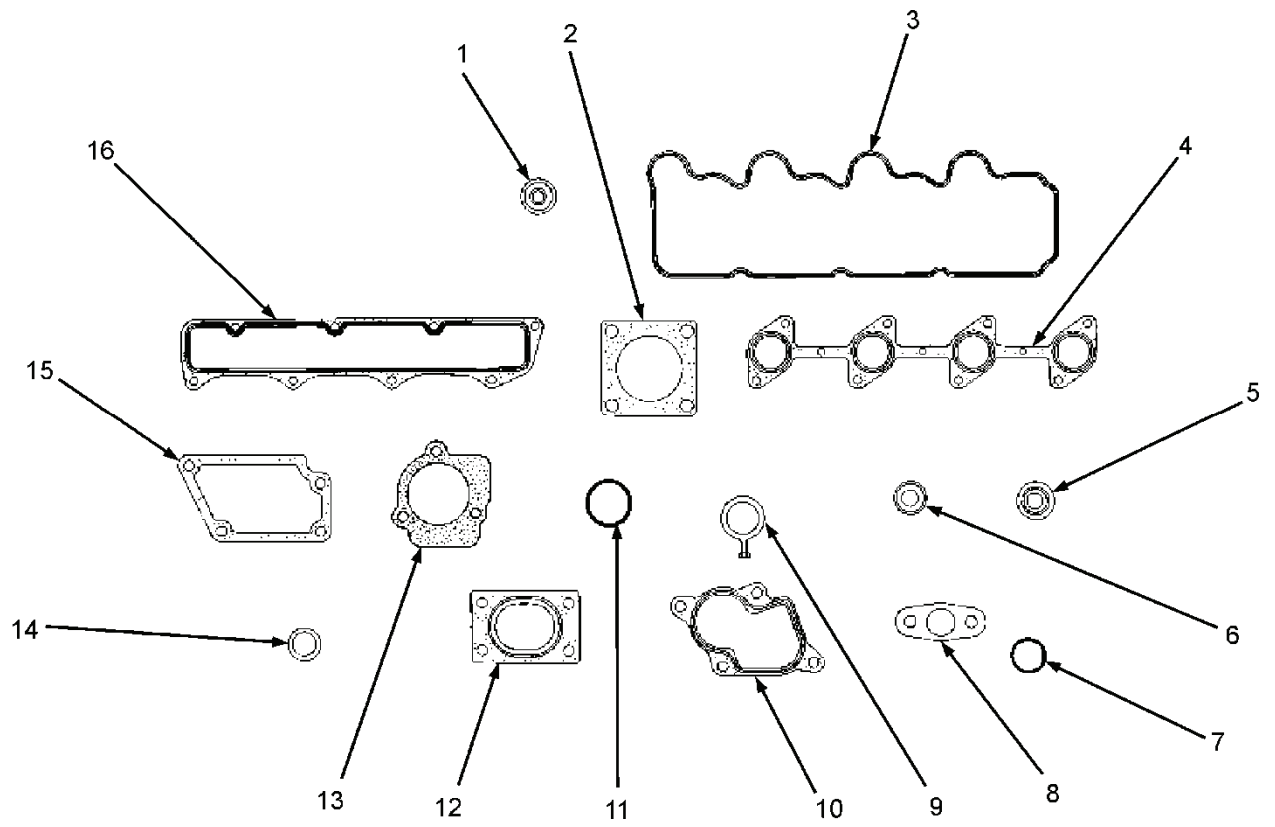


FIGURE 16. GASKET KIT, UPPER

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 16. GASKET KIT, UPPER	
	XDLZZ		1Q0C4	1G563-9935-2	KIT GASKET UPPER	1
1	PALZZ	5330-01-431-3620	31013	19077-53650	SEAL,PLAIN ENCASED	4
2	PALZZ	5330-01-533-7589	3H244	19258-1223-0	GASKET	1
3	PALZZ	5330-01-524-7680	1Q0C4	1C010-1452-0	GASKET	1
4	PALZZ	5330-01-533-5751	1Q0C4	1C010-1235-2	GASKET	1
5	PALZZ	5330-01-534-0030	1Q0C4	1C010-1316-0	SEAL,PLAIN	4
6	PALZZ	3431-01-507-0847	5X475	1C010-1315-0	SEAL VALVE S	8
7	XCLZZ		1Q0C4	04817-00160	O RING	1
8	PALZZ	5330-01-478-5144	0XWR1	1C040-33670	GASKET	1
9	XCLZZ		1Q0C4	1C020-9665-0	GASKET	1
	XCLZZ		1Q0C4	1C020-9665-0	GASKET	1
	XCLZZ		1Q0C4	1G557-9665-0	GASKET	1
10	XCLZZ		1Q0C4	1C040-1711-0	GASKET	1
11	XCLZZ		1Q0C4	04817-50300	O RING	1
12	XCLZZ		1Q0C4	1C040-1710-0	GASKET	1
13	XCLZZ		1Q0C4	1C020-7327-2	GASKET	1
14	PALZZ	5330-01-524-7447	1Q0C4	17105-3368-0	GASKET	4
15	PALZZ	5330-01-533-6252	1Q0C4	1C010-7282-0	GASKET	1
16	PALZZ	5330-01-533-9117	1Q0C4	1C010-1182-0	GASKET	1

END OF FIGURE

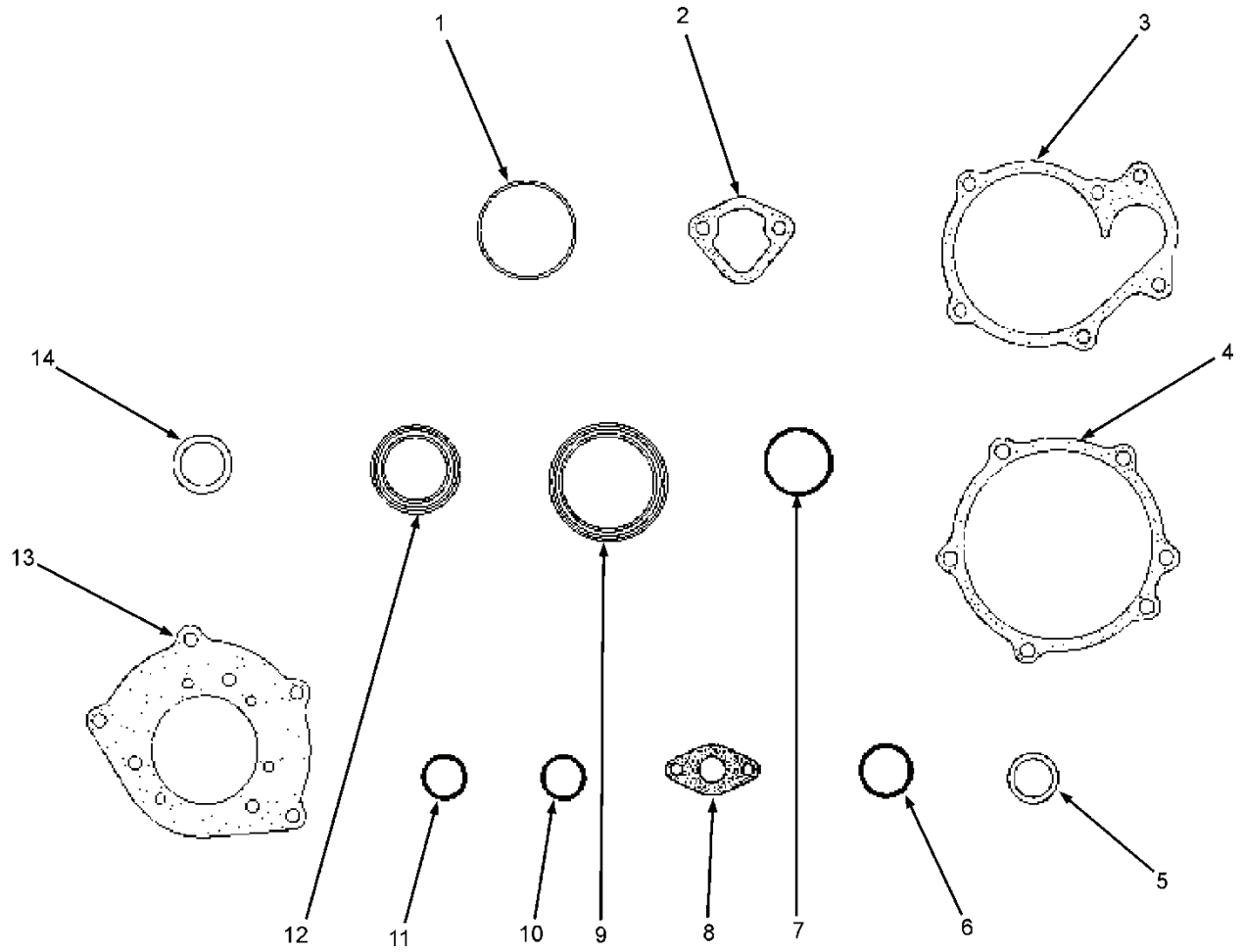


FIGURE 17. GASKET KIT, LOWER

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 17. GASKET KIT, LOWER	
	XDLZZ		1Q0C4	1G533-9936-2	KIT GASKET LOWER	1
1	XDLZZ	5330-01-533-2522	1Q0C4	1C010-1622-0	GASKET	1
2	XCZZ	5330-01-478-6366	0XWR1	16264-52140	GASKET	1
3	PAFZZ	5330-01-524-7431	1Q0C4	1C010-7343-0	GASKET	1
4	PAFZZ	5330-01-533-4948	1Q0C4	1C010-5166-0	GASKET	1
5	XCZZ		1Q0C4	16265-9667-0	GASKET	2
6	XCZZ	5331-01-533-6875	1Q0C4	04814-00420	O-RING	2
7	XCZZ		1Q0C4	1C010-9696-0	O RING	2
8	XCZZ	5340-01-533-3336	1Q0C4	15521-0479-0	COVER STRIP	1
9	XCZZ	5330-01-524-8043	1Q0C4	1C010-0446-0	SEAL,PLAIN	1
10	XCZZ		1Q0C4	04814-00200	O RING	1
	XCZZ	5331-01-533-3408	1Q0C4	04814-00240	O-RING	1
11	XCZZ	5331-01-533-7418	1Q0C4	19202-9683-0	O-RING	1
12	XCZZ		1Q0C4	1C020-0414-0	SEAL,OIL	1
13	XCZZ	5330-01-533-2071	1Q0C4	1C010-5118-0	GASKET	1
14	XCZZ	5330-01-506-5021	5X475	15451-9667-0	GASKET	2

END OF FIGURE

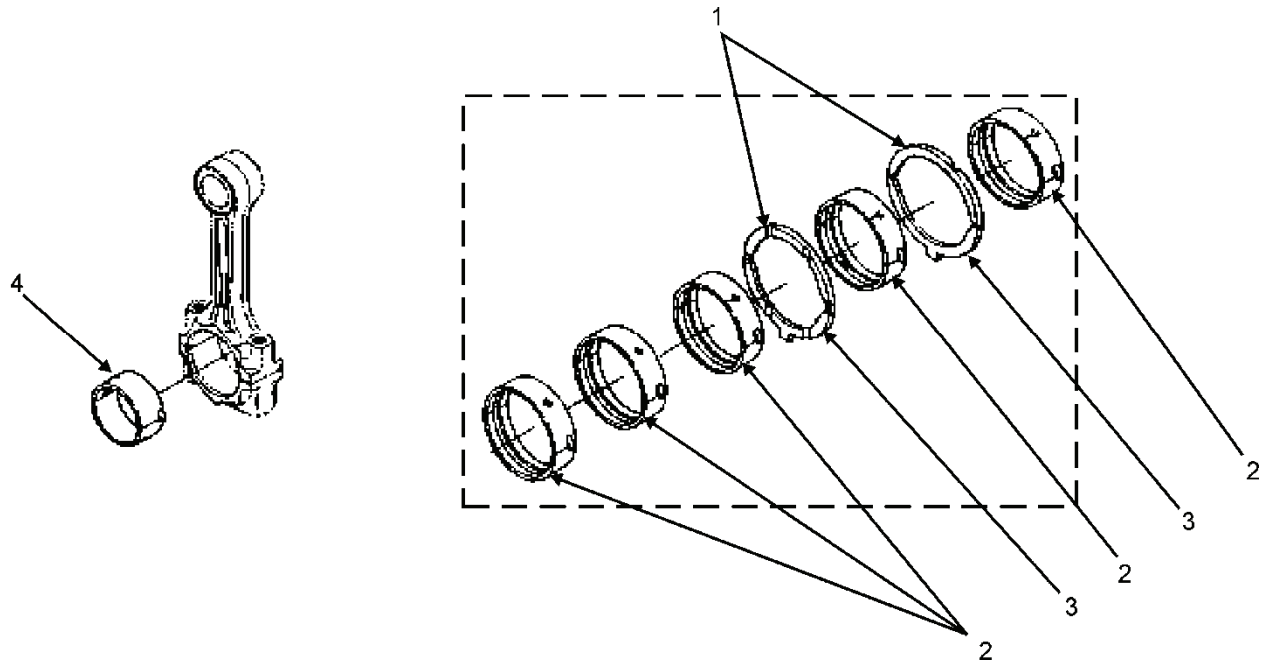


FIGURE 18. METAL KIT, MOTOR

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 18. METAL KIT, MOTOR	
1	PBLZZ	3040-01-536-0909	1Q0C4	1C010-2353-0	COLLAR,SHAFT	2
	PBLZZ	3040-01-536-0905	1Q0C4	1C010-2395-0	COLLAR,SHAFT	2
	PBLZZ	3040-01-536-0906	1Q0C4	1C010-2396-0	COLLAR,SHAFT	2
2	XCLZZ		1Q0C4	1C020-2347-0	METAL,CRANKSHAFT	5
	XCLZZ		1Q0C4	1C020-2391-0	METAL,CRANKSHAFT	5
	XCLZZ		1Q0C4	1C020-2392-0	METAL,CRANKSHAFT	5
3	PBLZZ	3040-01-536-0907	1Q0C4	1C010-2354-0	COLLAR,SHAFT	2
	PBLZZ	3040-01-536-0908	1Q0C4	1C010-2397-0	COLLAR,SHAFT	2
	PBLZZ	3040-01-536-0911	1Q0C4	1C010-2398-0	COLLAR,SHAFT	2
4	XCLZZ		1Q0C4	1C020-2233-2	METAL,CRANKPIN	4
	XCLZZ		1Q0C4	1C020-2296-2	METAL,CRANKPIN	4
	XCLZZ		1Q0C4	1C020-2297-2	METAL,CRANKPIN	4

END OF FIGURE

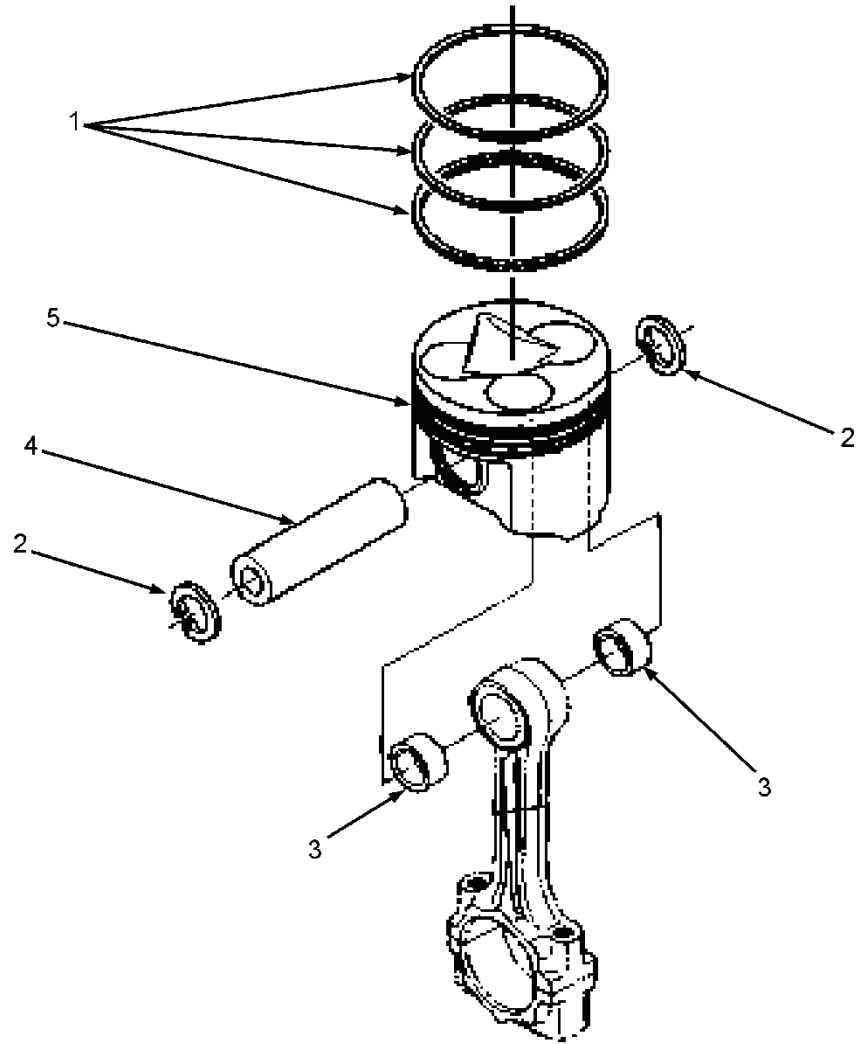


FIGURE 19. PISTON KIT



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					FIGURE 19. PISTON KIT	
1	XCLZZ		1Q0C4	1C011-2105-0	ASSY PISTON RING	4
1	XCLZZ		1Q0C4	1C011-2109-0	ASSY PISTON RING	4
2	PALZZ	5325-01-533-3933	1Q0C4	04611-00300	RING,RETAINING	8
3	PALZZ	3120-01-533-2983	1Q0C4	1C010-2198-0	BUSHING,SLEEVE	8
4	PBLZZ	2815-01-536-0902	1Q0C4	1C010-2131-0	PIN,PISTON	4
5	XCLZZ		1Q0C4	1J530-2111-0	PISTON	4
	XCLZZ		1Q0C4	1J530-2191-0	PISTON	4

END OF FIGURE

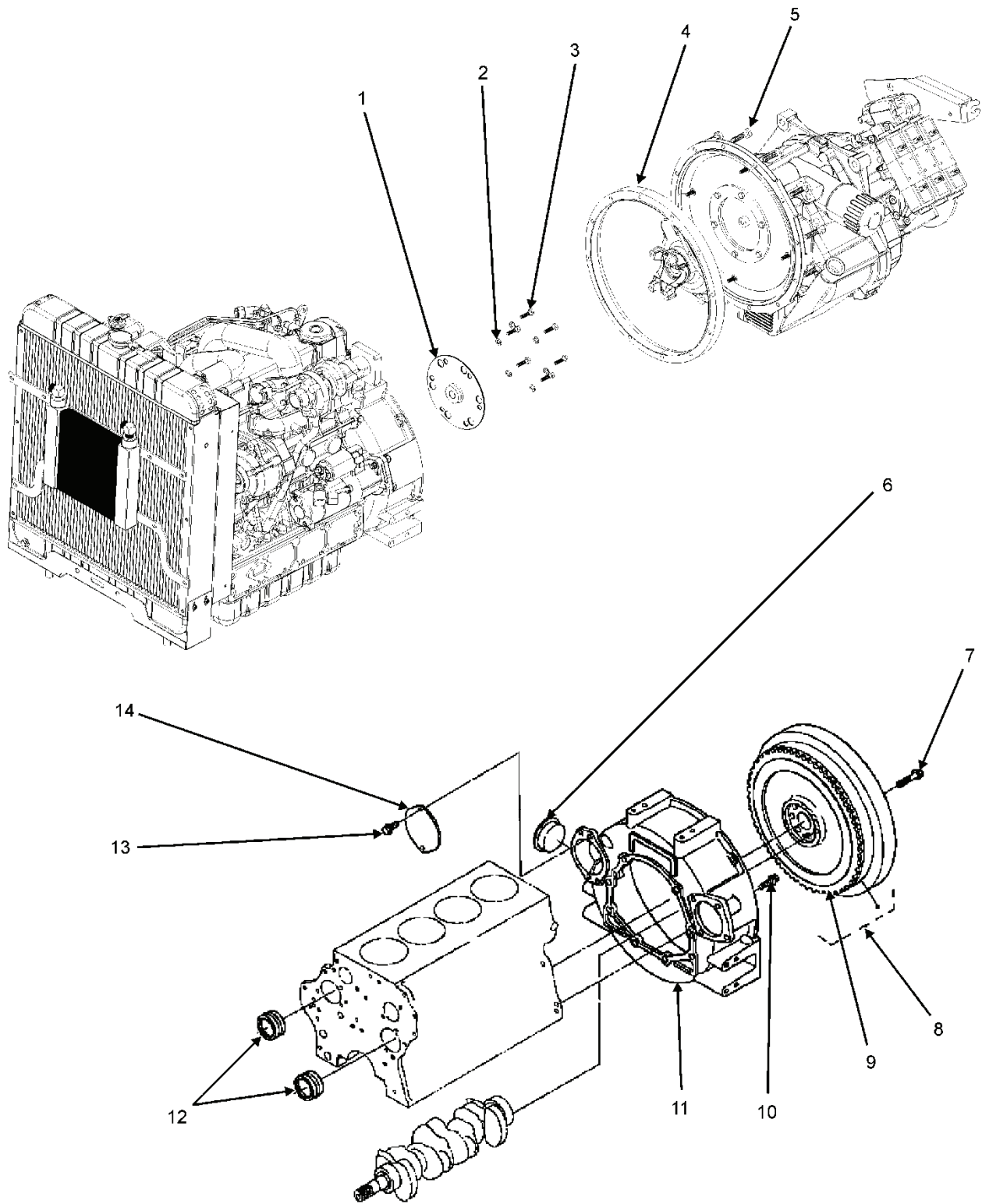


FIGURE 20. FLYWHEEL

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					GROUP 0103 FLYWHEEL	
					FIGURE 20. FLYWHEEL	
1	PAFZZ		44185	47371	SPACER, TORQUE CONV	1
2	PAFZZ	5310-01-533-5753	39428	91202A246	WASHER, LOCK	6
3	PAFZZ	5305-01-538-1473	1SE17	TKC6	SCREW,MACHINE	6
4	PAFZZ		44185	47370	SPACER, FLYWHEEL	1
5	PAFZZ		1SE17	0EHU	SCREW, CAP, HEX HD M12 X 125 X 30MM	12
6	PAFZZ		1Q0C4	1C010-0468-0	COVER	1
7	XBFZZ		1Q0C4	15424-2516-2	BOLT,FLYWHEEL	7
8	XBFZZ		1Q0C4	1G517-2501-0	COMP.FLYWHEEL	1
9	XBFZZ		1Q0C4	15602-63841	GEAR,RING	1
10	XBFZZ		1Q0C4	1G772-9103-0	BOLT,FLANGE	8
11	XALZZ		1Q0C4	1G517-0461-0	HOUSING,FLYWHEEL	1
12	XBFZZ		1Q0C4	1C020-2634-0	COVER,BLANCER	2
13	PAFZZ	5306-01-533-2070	1Q0C4	01774-51018	BOLT,MACHINE	2
14	XBFZZ		1Q0C4	1C010-0445-0	COVER,F/W HOUSING	1

END OF FIGURE

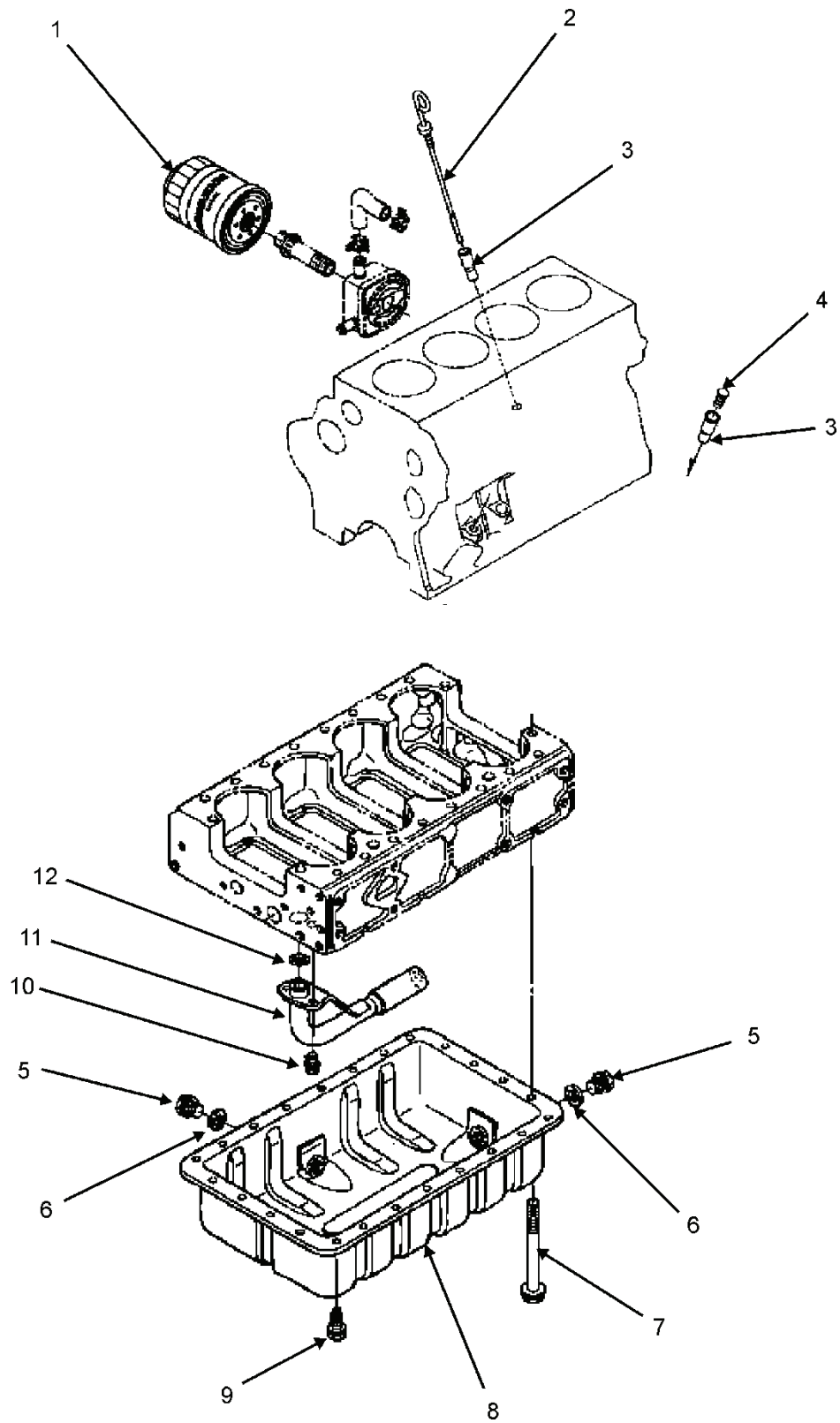


FIGURE 21. OIL FILTER CARTRIDGE, OIL PAN, DIPSTICK

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 ENGINE	
					GROUP 0103 OIL FILTER CARTRIDGE AND OIL PAN	
					FIGURE 21. OIL FILTER CARTRIDGE, OIL PAN, DIPSTICK	
1	PAOZZ	2910-01-524-7660	1Q0C4	HH1C0-3243-0	FILTER,FLUID	1
3	PAOZZ	4730-01-533-1441	1Q0C4	1C010-3642-2	PLUG,QUICK DISCONNECT	2
2	PAOZZ	6680-01-534-1062	1Q0C4	1C010-3641-2	GAGE ROD,LIQUID LEVEL	1
4	PAOZZ		1Q0C4	1G513-3655-0	PLUG,OIL GAUGE	1
5	PBOZZ	5365-01-506-5046	1Q0C4	15707-3375-0	PLUG,MACHINE THREAD	2
6	PAOZZ		1Q0C4	16265-9667-0	GASKET	2
7	PAOZZ	5306-01-533-4120	1Q0C4	01774-51004	BOLT,FLANGE	4
8	XDFZZ		1Q0C4	1C010-0150-3	COMP.OIL PAN	1
9	PAOZZ		1Q0C4	1C010-9110-0	BOLT,OIL PAN	20
10	XDFZZ		1Q0C4	01754-50814	BOLT,FLANGE	2
11	XDFZZ		1Q0C4	1C010-3211-0	FILTER,OIL	1
12	PAFZZ	5331-01-533-2921	1Q0C4	04814-00220	O-RING	1

END OF FIGURE

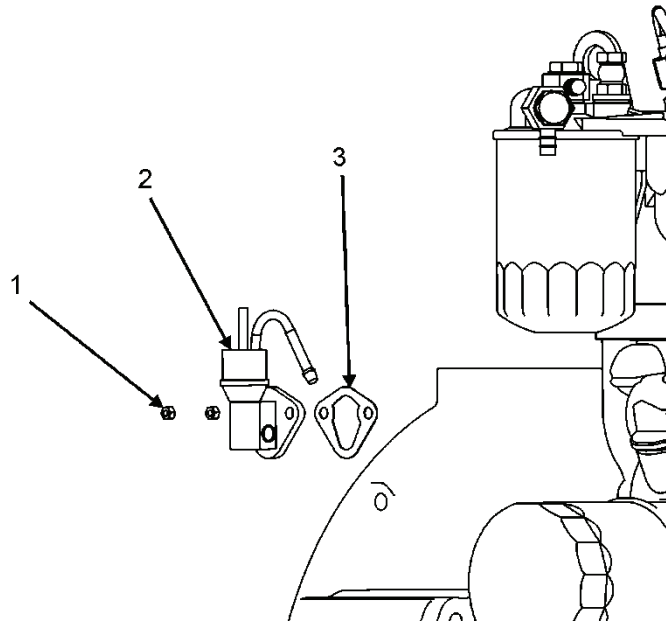


FIGURE 22. FUEL PUMP

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0302 FUEL PUMPS	
					FIGURE 22. FUEL PUMP	
1	PAOZZ	5310-01-496-6020	S4532	02751-50060	NUT,PLAIN,PLATE	2
2	PAOZZ	2910-01-524-7918	1Q0C4	1C010-52032	PUMP, FUEL, CAM ACTUATED	1
3	PAOZZ	5330-01-478-6366	0XWR1	16264-52140	GASKET	1

END OF FIGURE

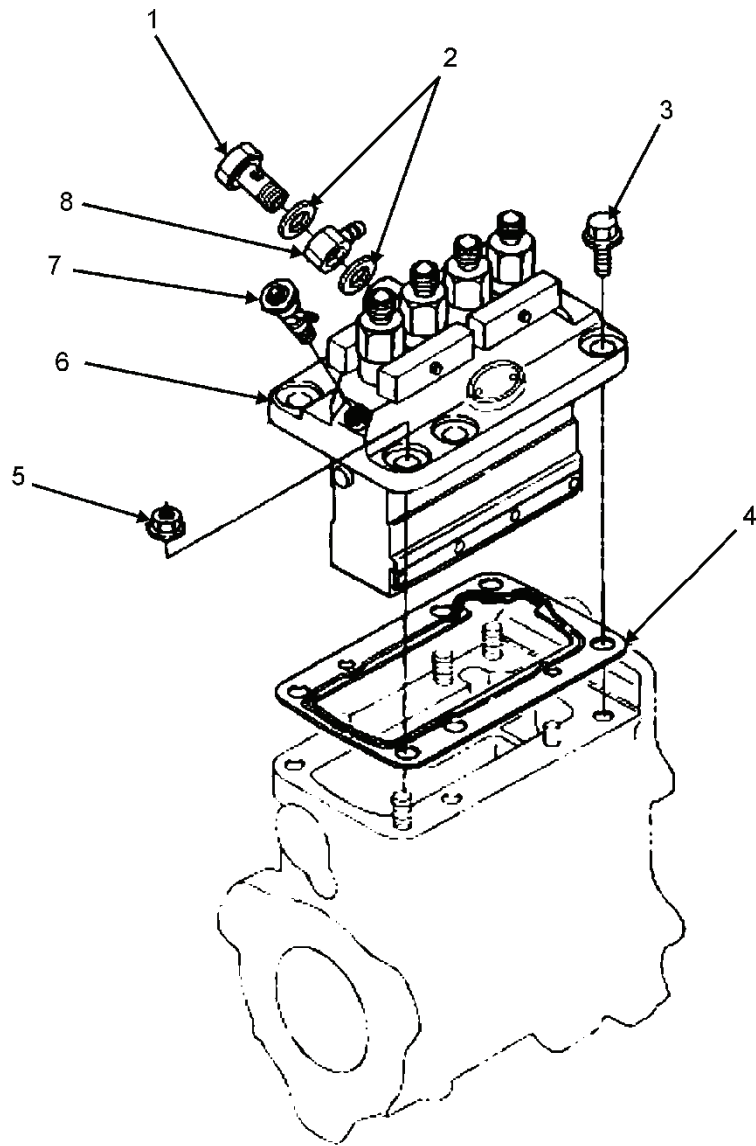


FIGURE 23. INJECTOR PUMP



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0302 FUEL PUMPS	
					FIGURE 23. INJECTOR PUMP	
1	PAFZZ		1Q0C4	1C010-5132-0	SCREW,HOLLOW	1
2	PAFZZ		1Q0C4	15401-9665-0	GASKET	2
3	PAFZZ		1Q0C4	01754-50825	BOLT,FLANGE	3
4	PBFZZ	5365-01-533-2987	1Q0C4	1C010-5211-0	SHIM	1
5	PAFZZ	5310-01-533-9486	1Q0C4	02751-50080	NUT,PLAIN,PLATE	3
6	PAFZZ		1Q0C4	1K012-5101-2	ASSY PUMP,INJECTION	1
7	PBFZZ	2815-01-536-0879	1Q0C4	14311-6050-4	JET START COCK	1
8	PBFZZ	5310-01-533-2080	1Q0C4	15401-9569-0	NUT,EYE	1

END OF FIGURE

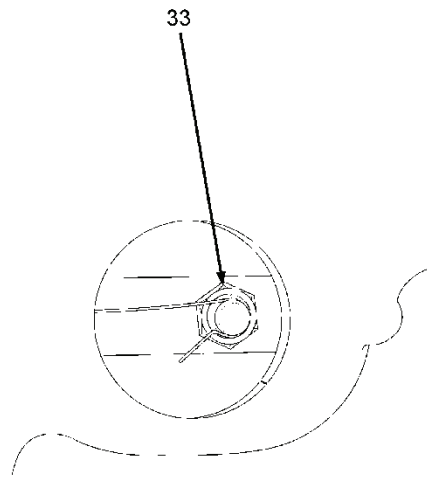
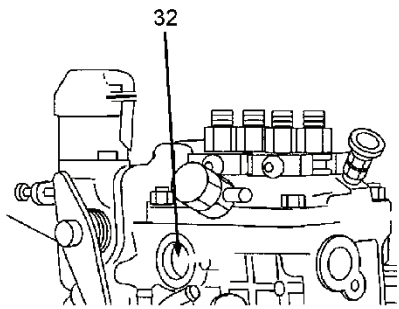
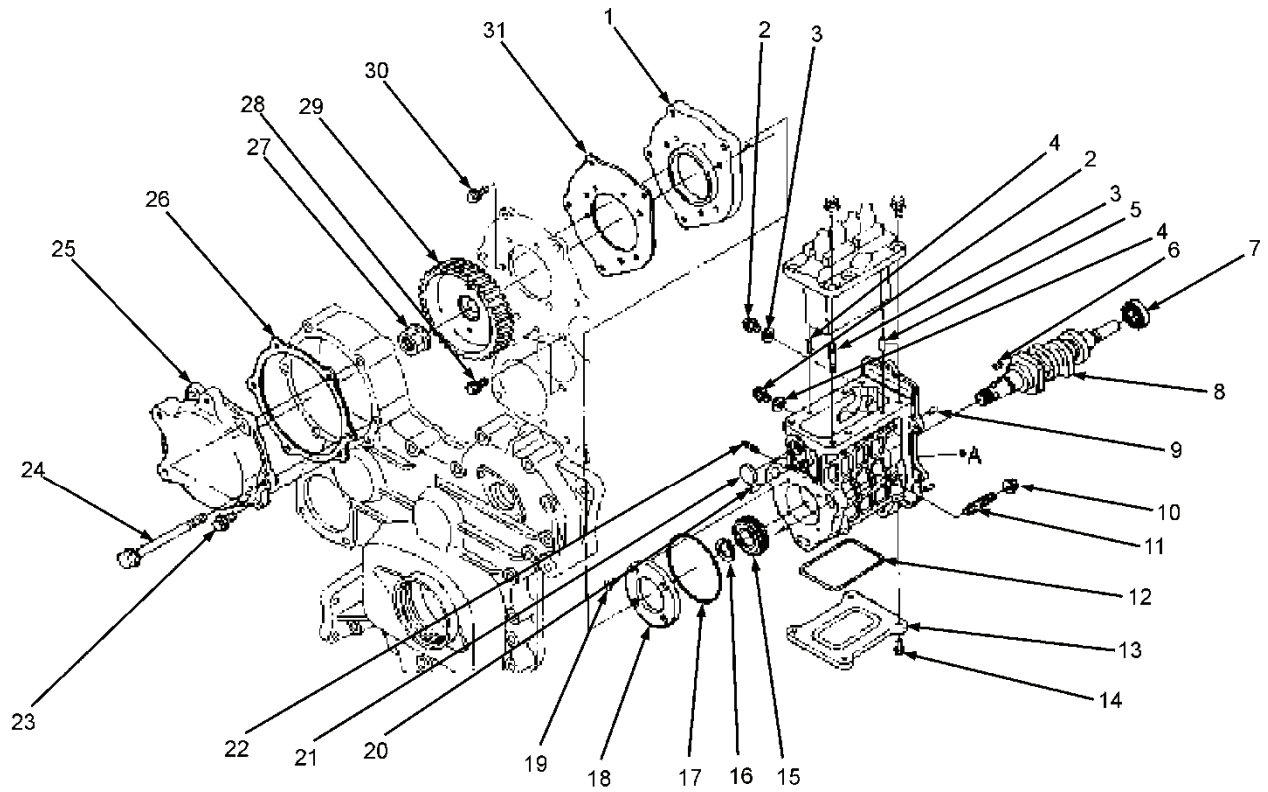


FIGURE 24. FUEL INJECTION PUMP HOUSING

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0302 FUEL PUMPS	
					FIGURE 24. FUEL INJECTION PUMP	
					HOUSING	
1	XDLZZ		1Q0C4	1C010-5117-4	BASE,INJECTION PUMP	1
2	XDLZZ		1Q0C4	01754-50814	BOLT,FLANGE	2
3	PBLZZ	5330-01-445-9423	0XWR1	15021-3366-0	GASKET	2
4	PALZZ	5315-01-533-2912	1Q0C4	05012-00609	PIN,STRAIGHT,HEADLESS	2
5	XDLZZ		1Q0C4	15471-9153-0	STUD	3
6	PALZZ	5315-01-533-4182	1Q0C4	12331-9523-0	WOODRUFF KEY ASSORTMENT	1
7	PALZZ	3110-01-533-2916	1Q0C4	08101-06203	BEARING,BALL	1
8	XDLZZ		1Q0C4	1C010-1617-5	CAMSHAFT,FUEL	1
9	PALZZ	5315-01-533-4174	1Q0C4	05012-00512	PIN,STRAIGHT,HEADLESS	2
10	PALZZ	5310-01-533-9486	1Q0C4	02751-50080	NUT,PLAIN,PLATE	3
11	XDLZZ		1Q0C4	1C020-9149-0	STUD	3
12	PALZZ	5330-01-533-2522	1Q0C4	1C010-1622-0	GASKET	1
13	PALZZ	4730-01-533-2804	1Q0C4	1C010-1621-0	COVER,FLUID STRAINER	1
14	PALZZ	5306-01-533-3366	1Q0C4	13901-9102-0	BOLT,MACHINE	4
15	XDLZZ		1Q0C4	1G527-1657-0	BEARING,BALL	1
16	PALZZ	5325-01-348-4873	1Q0C4	04612-00200	RING,RETAINING	1
17	PALZZ	5330-01-533-3215	1Q0C4	1C010-5213-0	GASKET	1
18	XDLZZ		1Q0C4	1C020-1632-2	STOPPER,FUEL C/SHAFT	1
19	PALZZ	5305-01-533-3409	1Q0C4	03016-50616	SCREW,TAPPING	4
20	XDLZZ		1Q0C4	05012-00614	PIN,STRAIGHT	1
21	PALZZ	4730-01-533-4178	1Q0C4	1C010-5514-0	PLUG,TUBE FITTING,THREADED	1
22	PBLZZ	5307-01-506-8297	5X475	16245-9154-0	STUD,PLAIN	2
23	XDLZZ		1Q0C4	01754-50825	BOLT,FLANGE	1
24	PALZZ	5306-01-533-8062	1Q0C4	01754-50875	BOLT,MACHINE	5
25	PALZZ	4730-01-533-2907	1Q0C4	1C010-5165-0	CAP,TUBE	1
26	XDLZZ		1Q0C4	1C010-5166-3	GASKET,I/P COVER	1
27	PALZZ	5310- 01-533-6423	1Q0C4	02776-50140	NUT,PLAIN,HEXAGON	1
28	XDLZZ		1Q0C4	01754-50814	BOLT,FLANGE	3
29	XDLZZ		1Q0C4	1J530-5115-0	GEAR,INJECTION PUMP	1
30	PALZZ	5307-01-320-7105	S4532	01754-50614	STUD,SHOULDERED	3
31	PALZZ	5330-01-533-2071	1Q0C4	1C010-5118-0	GASKET	1
32	PBLZZ	2815-01-536-0881	1Q0C4	1C010-56750	GOVERNOR ROD COVER	1
33	XDLZZ		1Q0C4	1C010-92020	NUT	1

END OF FIGURE

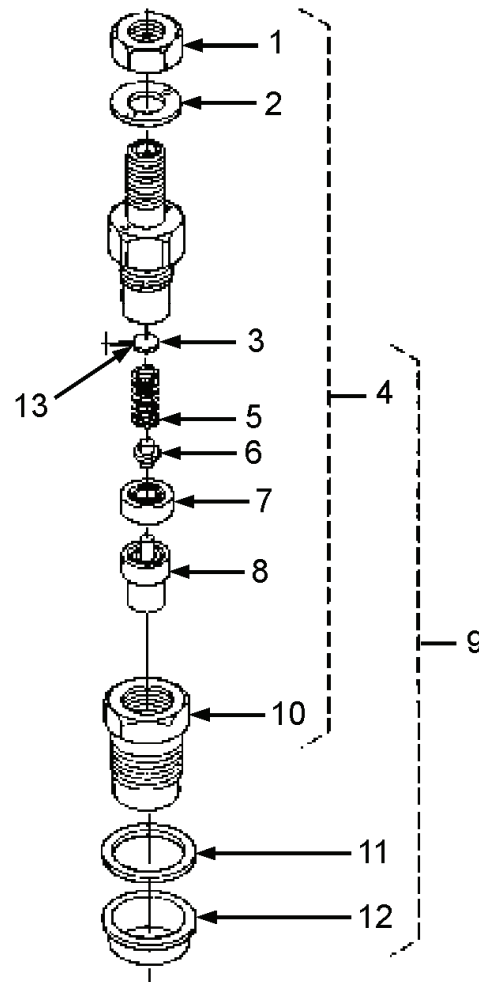


FIGURE 25. NOZZLE HOLDER

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM GROUP 0302 FUEL PUMPS FIGURE 25. NOZZLE HOLDER	
1	PAFZZ	5310-01-537-0000	0XWR1	15841-9203-0	NUT,PLAIN,HEXAGON	1
2	PAFZZ	5310-01-537-0006	0XWR1	15841-9404-0	WASHER,FLAT	4
3	XAFZZ		1Q0C4	15841-5323-0	WASHER,ADJUSTING	4
4	PAFZZ	4820-01-524-7610	1Q0C4	1C010-5300-0	NOZZLE,VALVE	4
5	XAFZZ		1Q0C4	1C010-5317-0	SPRING,NOZZLE	4
6	XAFZZ		1Q0C4	15841-5316-0	PUSH ROD	4
7	XAFZZ		1Q0C4	15841-5335-0	PIECE,DISTANCE	4

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
8	XAFZZ		1Q0C4	1C010-5361-0	PIECE,NOZZLE	4
9	PAFZZ	4820-01-524-7610	1Q0C4	1C010-5390-0	NOZZLE,VALVE	4
10	PAFZZ	5310-01-537-1199	0XWR1	16475-5328-0	NUT,NOZZLE	4
11	PAFZZ	5331-01-431-3621	0XWR1	15841-5362-2	O-RING	4
12	PAFZZ	5330-01-431-3620	31013	19077-5365-0	SEAL,PLAIN ENCASED	4
13	XCFZZ		1Q0C4	15841-9810-0	ASSY WASHER, ADJUST	13
	XCFZZ		1Q0C4	15841-5323-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9851-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9852-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9853-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9854-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9855-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9856-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9857-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9858-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9859-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9860-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9861-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9862-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9863-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9864-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9865-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9866-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9867-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9868-0	WASHER,ADJUSTING	44
	XCFZZ		1Q0C4	15841-9869-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9870-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9871-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9872-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9873-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9874-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9875-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9876-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9877-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9878-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9879-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9880-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9881-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9882-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9883-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9884-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9885-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9886-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9887-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9888-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9889-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9890-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9891-0	WASHER,ADJUSTING	4
	XCFZZ		1Q0C4	15841-9892-0	WASHER,ADJUSTING	4

END OF FIGURE

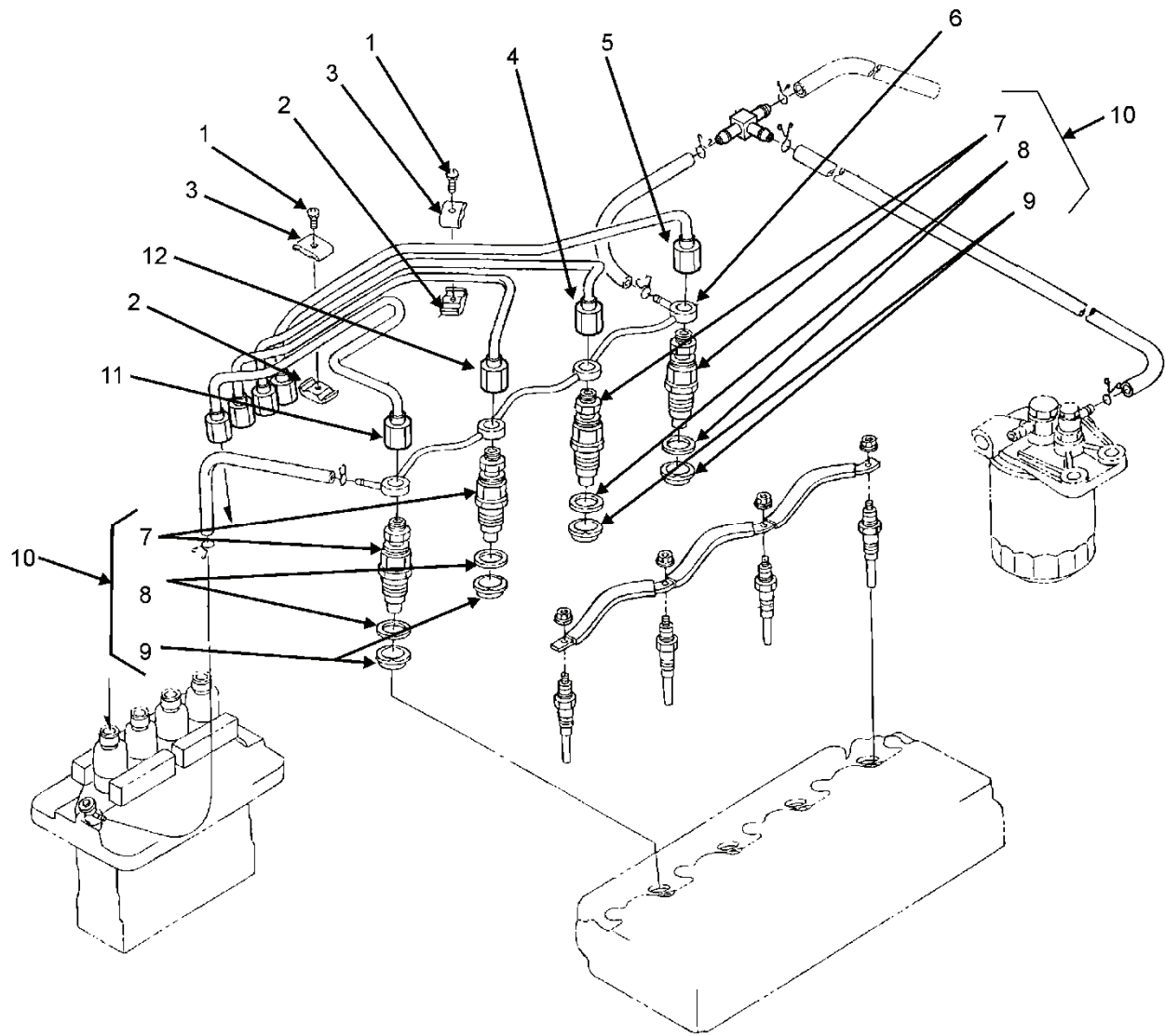


FIGURE 26. INJECTORS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0302 FUEL PUMPS	
					FIGURE 26. INJECTORS	
1	PAFZZ	5305-01-533-3695	1Q0C4	03024-50520	SCREW,ASSEMBLED WASHER	3
2	PBFZZ	4730-01-434-3360	67271	322135	CLAMP,HOSE,SPECIAL-SHAPED	3
3	PBFZZ	4730-01-434-3361	67271	322136	CLAMP,HOSE,SPECIAL-SHAPED	3
4	PAFZZ	4710-01-533-6287	1Q0C4	1C010-5373-0	TUBE ASSEMBLY,METAL	1
5	PAFZZ	4710-01-533-5407	1Q0C4	1C010-5374-0	TUBE ASSEMBLY,METAL	1
6	PAFZZ	4710-01-533-9215	1Q0C4	1C010-4250-0	PIPE ASSEMBLY,METAL	1
7	PAFZZ	4820-01-524-7610	1Q0C4	1C010-5300-0	NOZZLE,VALVE	4
8	PAFZZ	5331-01-431-3621	1Q0C4	15841-5362-2	O-RING	4
9	PAFZZ	5330-01-431-3620	1Q0C4	19077-5365-0	SEAL,PLAIN ENCASED	4
10	PAFZZ	4820-01-524-7610	1Q0C4	1C010-5390-0	NOZZLE,VALVE	4
11	PAFZZ	4710-01-533-3318	1Q0C4	1C010-5371-0	TUBE ASSEMBLY,METAL	1
12	PAFZZ	4710-01-533-2057	1Q0C4	1C010-5372-0	TUBE ASSEMBLY,METAL	1

END OF FIGURE

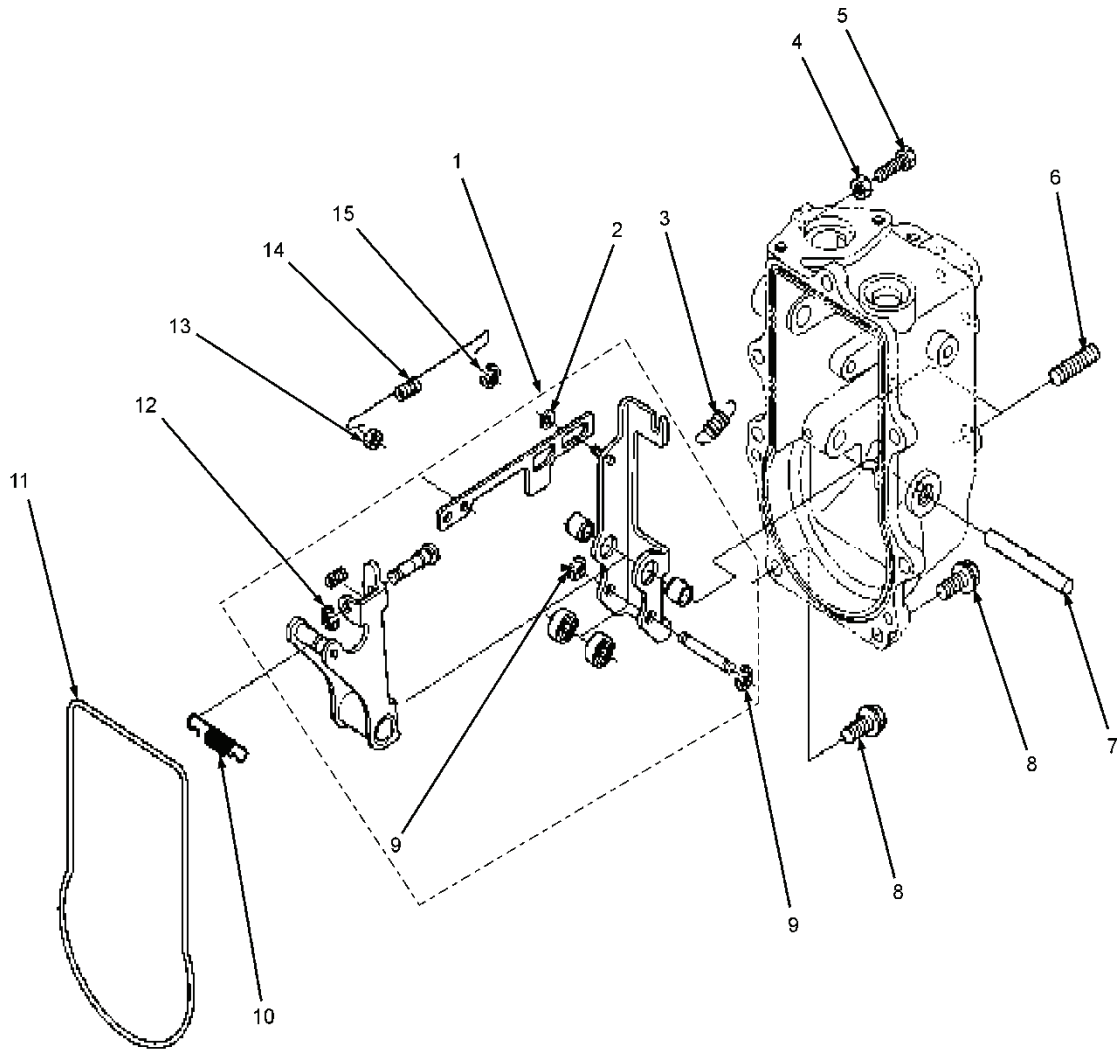


FIGURE 27. FORK LEVER (GOVERNOR)



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0302 FUEL PUMPS	
					FIGURE 27. FORK LEVER (GOVERNOR)	
1	XDLZZ		1Q0C4	1J530-5603-2	ASSY LEVER,FORK	1
2	XDLZZ		S4532	04013-60050	WASHER,PLAIN	1
3	XDLZZ		S4532	1C010-5792-0	SPRING,STOP LEVER	1
4	PBLZZ	5310-01-320-7038	S4532	02056-50060	NUT,PLAIN,HEXAGON	1
5	PBLZZ	5306-01-479-0365	0XWR1	15108-5728-0	BOLT,MACHINE	1
6	PALZZ	5307-01-533-8058	1Q0C4	01518-50820	STUD,RECESSED	2
7	XDLZZ		S4532	1G517-5615-0	SHAFT,FORK LEVER	1
8	PALZZ	5306-01-321-3374	S4532	01754-50618	BOLT,MACHINE	7
9	PALZZ	5325-01-321-3446	S4532	04613-50050	RING,RETAINING	2
10	XDLZZ		S4532	1C010-5641-3	SPRING,GOVERNOR	1
11	XDLZZ		S4532	1C010-5577-0	GASKET,GOV.HOUSING	1
12	XDLZZ		S4532	04613-50030	CIR CLIP,EXTERNAL	1
13	XDLZZ		S4532	1C010-9202-0	NUT,LOCK	1
14	PALZZ	5360-01-533-3160	1Q0C4	1C010-5648-0	SPRING,HELICAL,EXTENSION	1
15	XDLZZ		S4532	04613-50040	CIR CLIP,EXTERNAL	1

END OF FIGURE

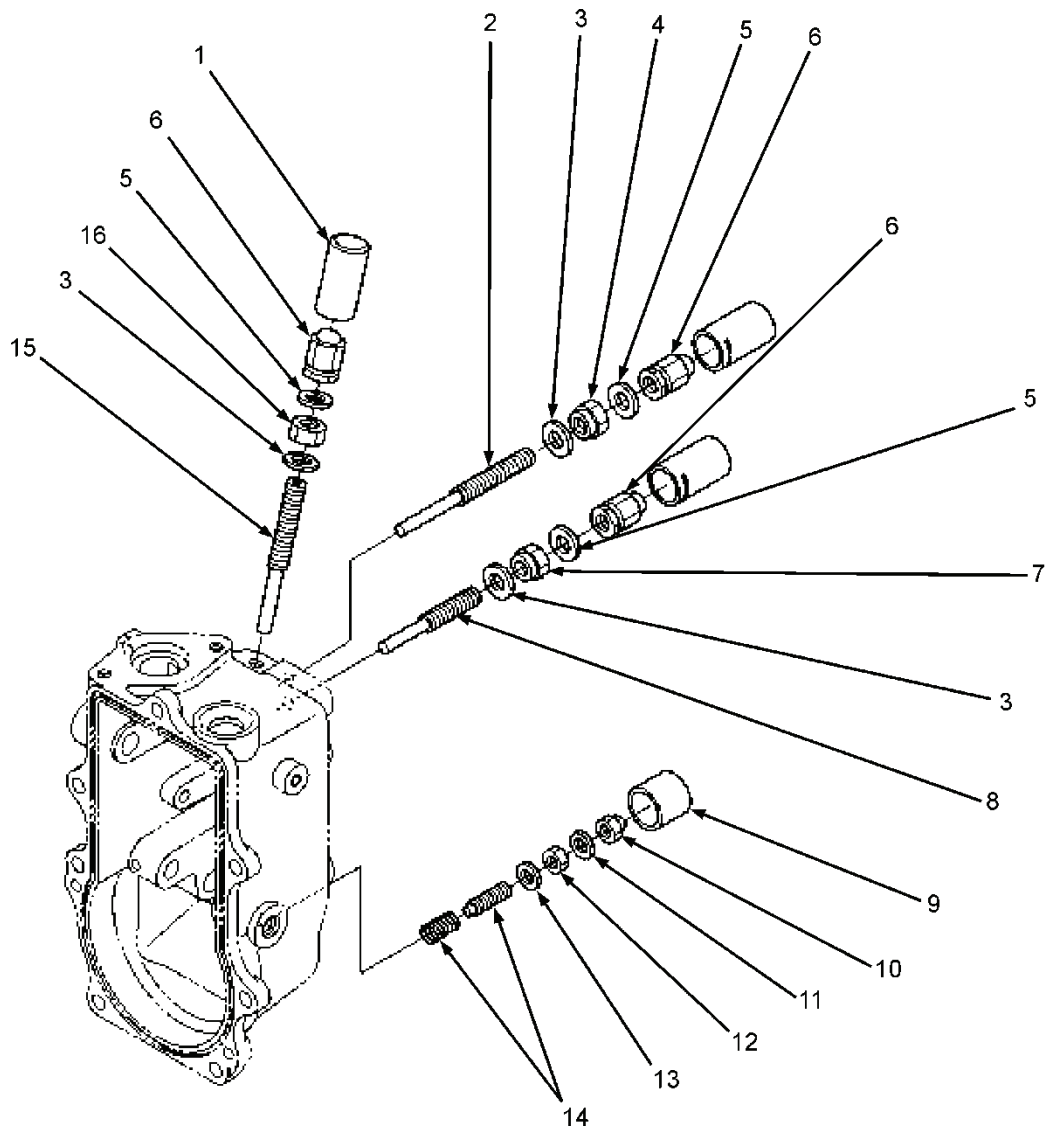


FIGURE 28. GOVERNOR ADJUSTING BOLT

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0302 FUEL PUMPS	
					FIGURE 28. GOVERNOR ADJUSTING BOLT	
1	PALZZ	3431-01-507-1185	5X475	16221-5442-0	CAP	1
2	XCLZZ		1Q0C4	1G545-5412-0	BOLT,ADJUSTING	1
3	PALZZ	5330-01-478-4911	0XWR1	15601-9665-0	GASKET	3
4	PALZZ	5340-01-507-1192	5X475	1G031-5421-0	NUT,LOCK	1
5	PALZZ	5330-01-478-4911	0XWR1	15601-9665-0	GASKET	3
6	XCLZZ		1Q0C4	15852-9233-0	NUT	3
7	PALZZ	5340-01-507-1192	5X475	1G031-5421-0	NUT,LOCK	1
8	XCLZZ		1Q0C4	1C010-5415-3	BOLT,ADJUSTING	1
9	PALZZ	5340-01-533-6757	1Q0C4	15841-5427-0	CAP	1
10	PALZZ	5310-01-533-3554	1Q0C4	15841-5422-0	NUT	1
11	PALZZ	5330-01-445-9423	0XWR1	15021-3366-0	GASKET	1
12	PALZZ	5310-01-496-6041	S4532	15261-9202-0	NUT	1
13	PALZZ	5330-01-445-9423	0XWR1	15021-3366-0	GASKET	1
14	XCLZZ		1Q0C4	1C010-5410-2	ASSY BOLT,ADJUSTMENT	1
15	PALZZ	5315-01-533-2927	1Q0C4	1C010-5412-0	BOLT,ADJUSTING	1
16	PALZZ	5310-01-478-5181	0XWR1	15841-9202-0	NUT	1

END OF FIGURE

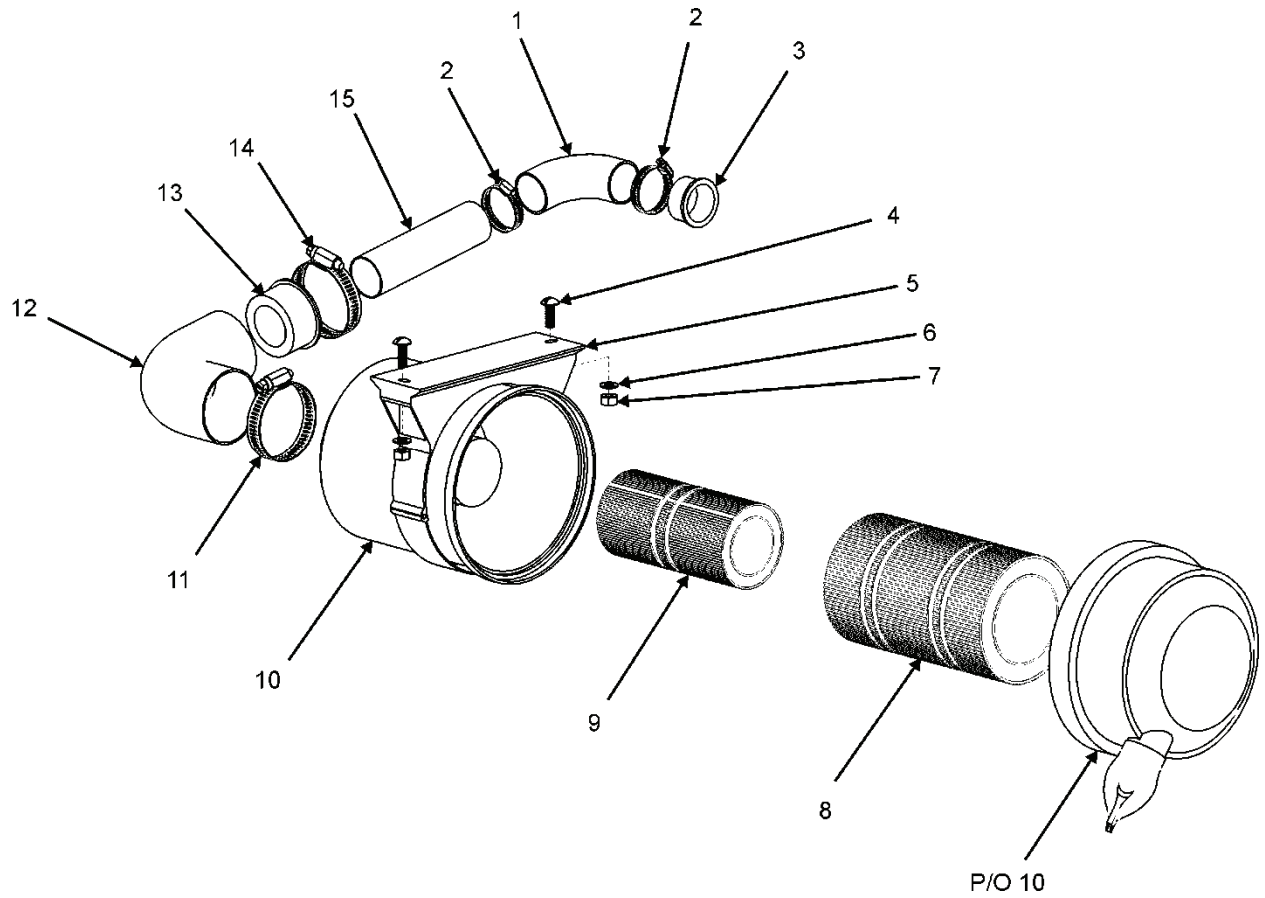


FIGURE 29. AIR CLEANER ASSEMBLY

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0304 AIR CLEANER ASSEMBLY	
					FIGURE 29. AIR CLEANER ASSEMBLY	
1	PAOZZ	4720-01-179-3129	24161	20882	HOSE,PREFORMED	1
2	PAOZZ	4730-00-834-8331	96906	MS21920-20	CLAMP,HOSE	2
3	PAOZZ		24161	26392	REDUCER, INSERT	1
4	PAOZZ	5305-00-051-0841	96906	MS51957-100	SCREW, MACHINE	2
5	XAOZZ		D8086	39 400 40 999	BRACKET, AIR FILTER	1
6	PAOZZ	5310-00-081-4219	96906	MS27183-12	WASHER, FLAT	2
7	PBOZZ	5310-01-538-1528	1SE17	NAN2	NUT,PLAIN,HEXAGON	2
8	PAOZZ	2940-00-871-7053	01637	FA-126	FILTER ELEMENT, INTAKE AIR CLEANER	1
9	PAOZZ		18265	P78-0012	FILTER ELEMENT	1
10	XDOZZ		D8086	45 400 92 941	AIR CLEANER ASSY	1
11	PAOZZ		2V507	8946K33	CLAMP, T-BOLT	2
12	PAOZZ	4720-01-097-9228	18265	P10-5532	HOSE,PREFORMED	1
13	PAOZZ		3PFR7	30R20	REDUCER, HOSE	1
14	PAOZZ	4730-00-013-2978	96906	MS21920-28	CLAMP, HOSE	1
15	XDOZZ		44185	47928	TUBE, EXHAUST	1

END OF FIGURE

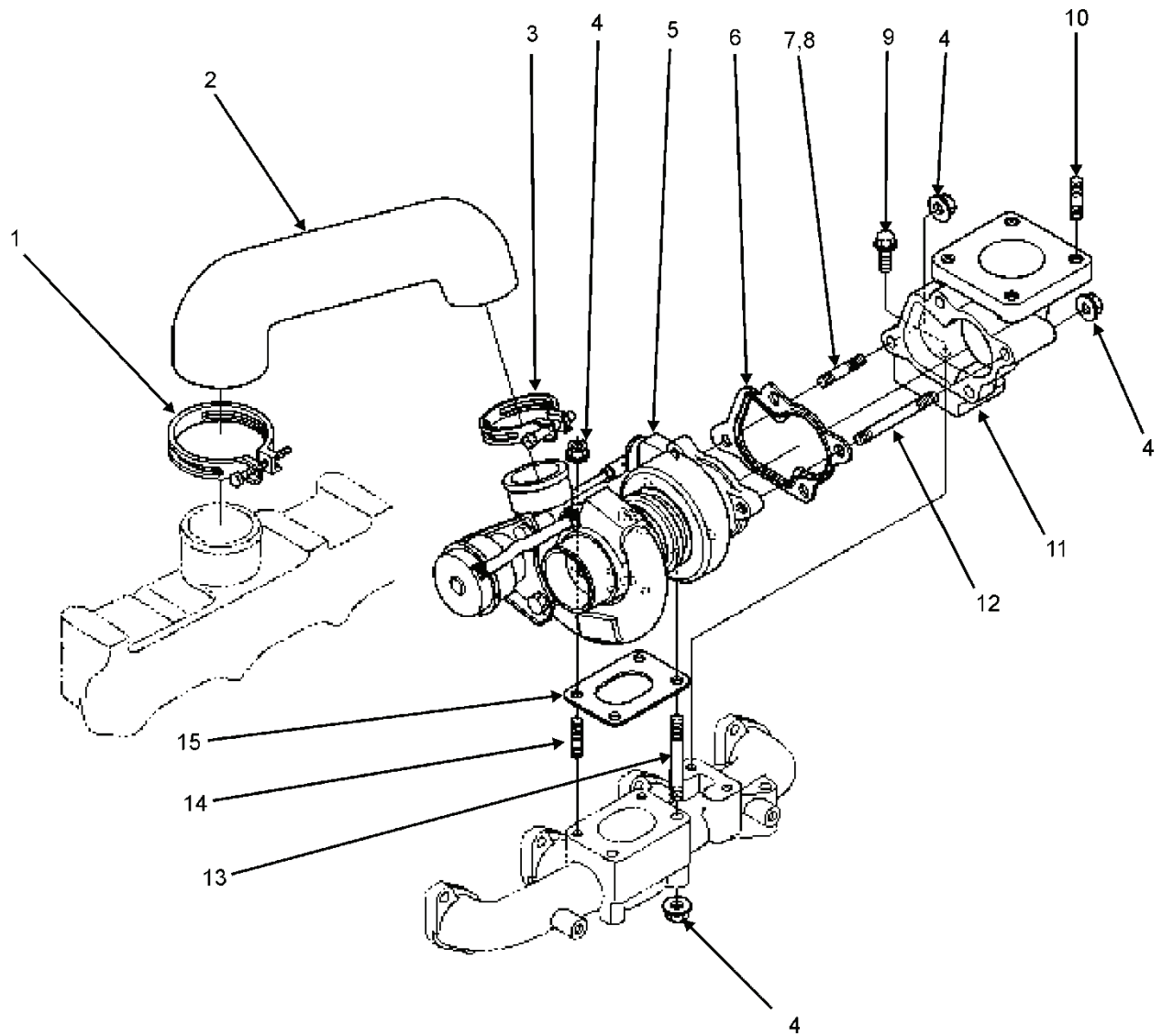


FIGURE 30. TURBOCHARGER

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0305 TURBOCHARGER	
					FIGURE 30. TURBOCHARGER	
1	PAFZZ		1Q0C4	35466-7446-0	BAND,PIPE	1
2	PAFZZ		1Q0C4	1C040-1163-0	HOSE,INLET	1
3	PBFZZ	5340-01-542-8229	5X475	15401-1172-0	BAND,RETAINING	1
4	PAFZZ		1Q0C4	02756-50080	NUT,UBS	8
5	PAFZZ		1Q0C4	1J530-1701-0	ASSY TURBO CHARGER	1
6	PAFZZ		1Q0C4	1C040-1711-0	GASKET	1
7	PAFZZ		1Q0C4	1J530-9151-0	STUD	1
8	PAFZZ		1Q0C4	01517-61030	STUD	1
9	PAFZZ	5306-01-533-2070	1Q0C4	01774-51018	BOLT,MACHINE	2
10	PAFZZ		1Q0C4	1J530-9154-0	STUD	4
11	PAFZZ		1Q0C4	1G551-12320	FLANGE,MUFFLER	1
12	PAFZZ		1Q0C4	1J530-9152-0	STUD	2
13	PAFZZ		1Q0C4	1J530-9153-0	STUD	2
14	PAFZZ		1Q0C4	1J530-9150-0	STUD	2
15	PAFZZ		1Q0C4	1C040-1710-0	GASKET	1

END OF FIGURE

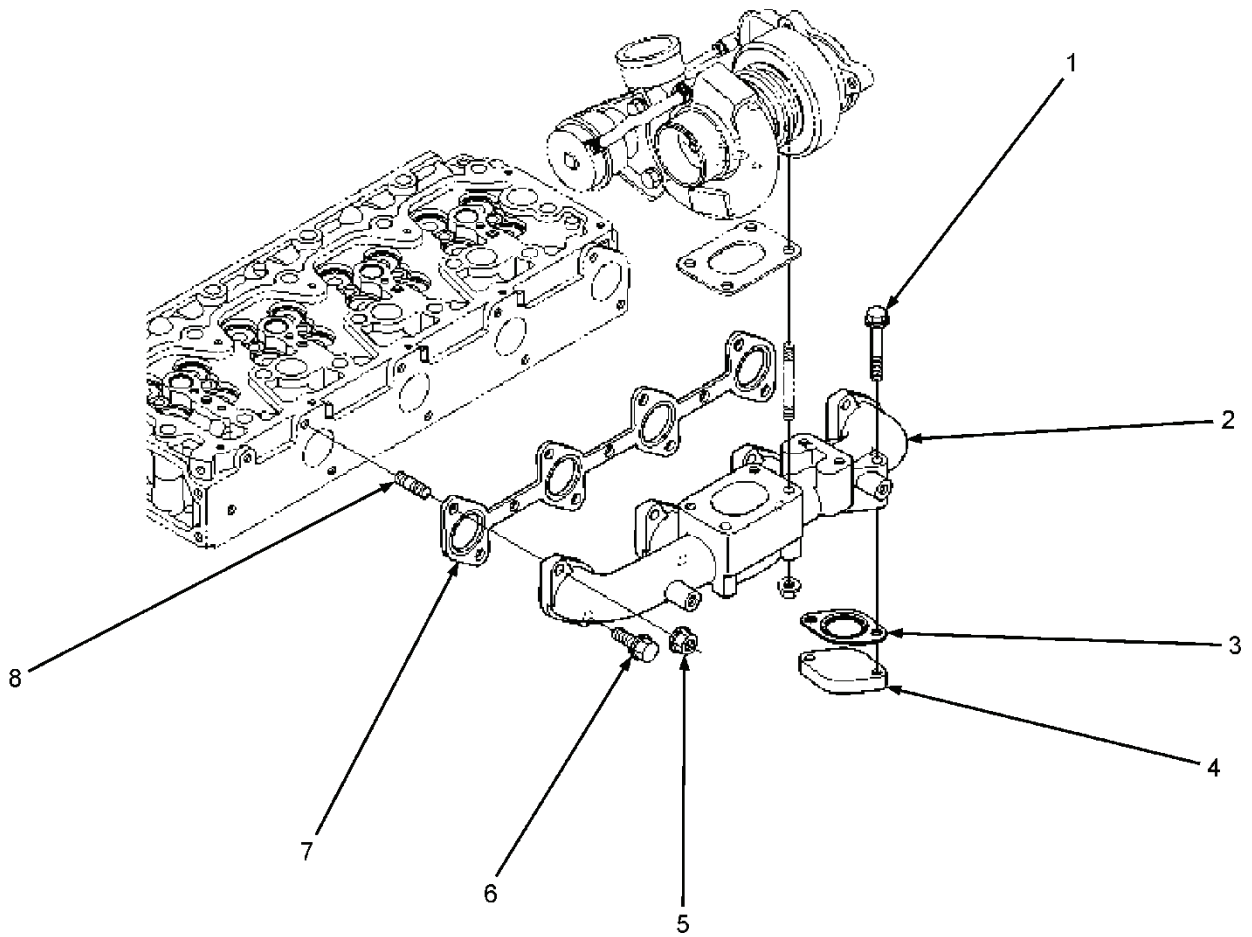


FIGURE 31. EXHAUST MANIFOLD



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0305 TURBOCHARGER	
					FIGURE 31. EXHAUST MANIFOLD	
1	PAFZZ		1Q0C4	1C010-9103-0	BOLT,FLANGE	2
2	XBFZZ		1Q0C4	1J550-1231-2	MANIFOLD,EXHAUST	1
3	PAFZZ		1Q0C4	1J574-1744-0	GASKET,EGR FLANGE	1
4	XBFZZ		1Q0C4	1J530-1287-0	COVER,EXHAUST	1
5	PAFZZ	5310-01-533-9486	1Q0C4	02751-50080	NUT,PLAIN,PLATE	4
6	PAFZZ	5306-01-358-9526	0MR83	01754-50820	BOLT,MACHINE	4
7	PAFZZ	5330-01-533-5751	1Q0C4	1C010-1235-2	GASKET	1
8	PAFZZ	5307-01-533-2948	1Q0C4	15221-9153-0	STUD,PLAIN	4

END OF FIGURE

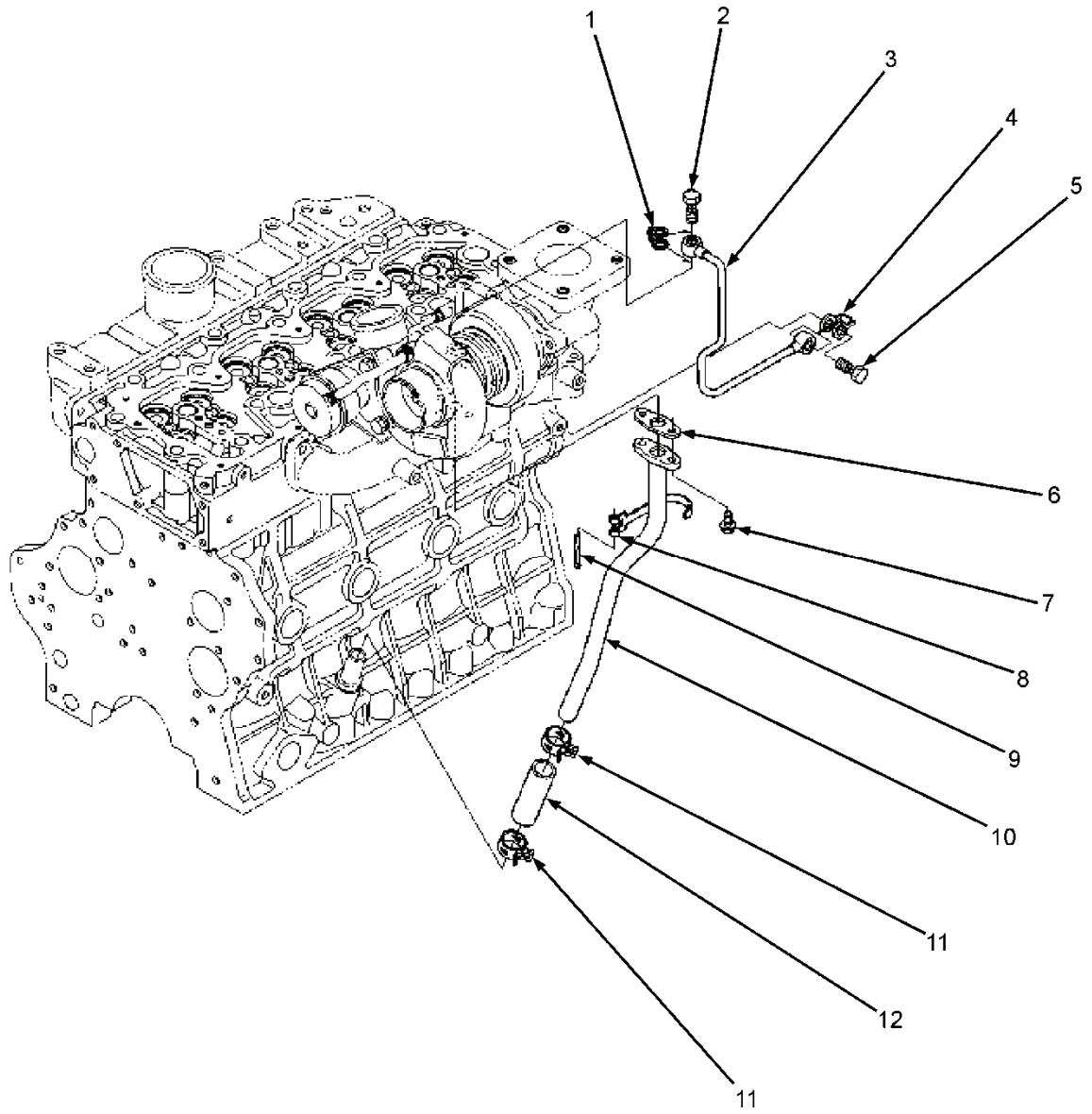


FIGURE 32. OIL PIPE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0305 TURBOCHARGER	
					FIGURE 32. OIL PIPE	
1	PAFZZ		1Q0C4	1C020-9665-0	GASKET	1
2	PAFZZ	5305-01-533-8759	1Q0C4	17371-9580-0	SCREW,CAP,HEXAGON HEAD	1
3	XDFZZ		1Q0C4	1C040-3304-0	COMP.PIPE,OIL	1
4	PAFZZ		1Q0C4	1G557-9665-0	GASKET	1
5	PAFZZ		1Q0C4	15471-9579-0	BOLT,EYE JOINT	1
6	PAFZZ	5330-01-478-5144	0XWR1	16299-33670	GASKET	1
7	PAFZZ	5306-01-393-4857	S4532	01754-50612	BOLT,MACHINE	2
8	PAFZZ		1Q0C4	1A024-3352-0	CLAMP,PIPE	1
9	PAFZZ	5315-01-500-4981	0XWR1	33430-8276-0	PIN,COTTER	1
10	XDFZZ		1Q0C4	1C040-3306-3	COMP.PIPE,OIL	1
11	PAFZZ		1Q0C4	09318-88230	CLAMP,HOSE	2
12	XDFZZ		1Q0C4	15471-3324-0	PIPE,OIL	1

END OF FIGURE

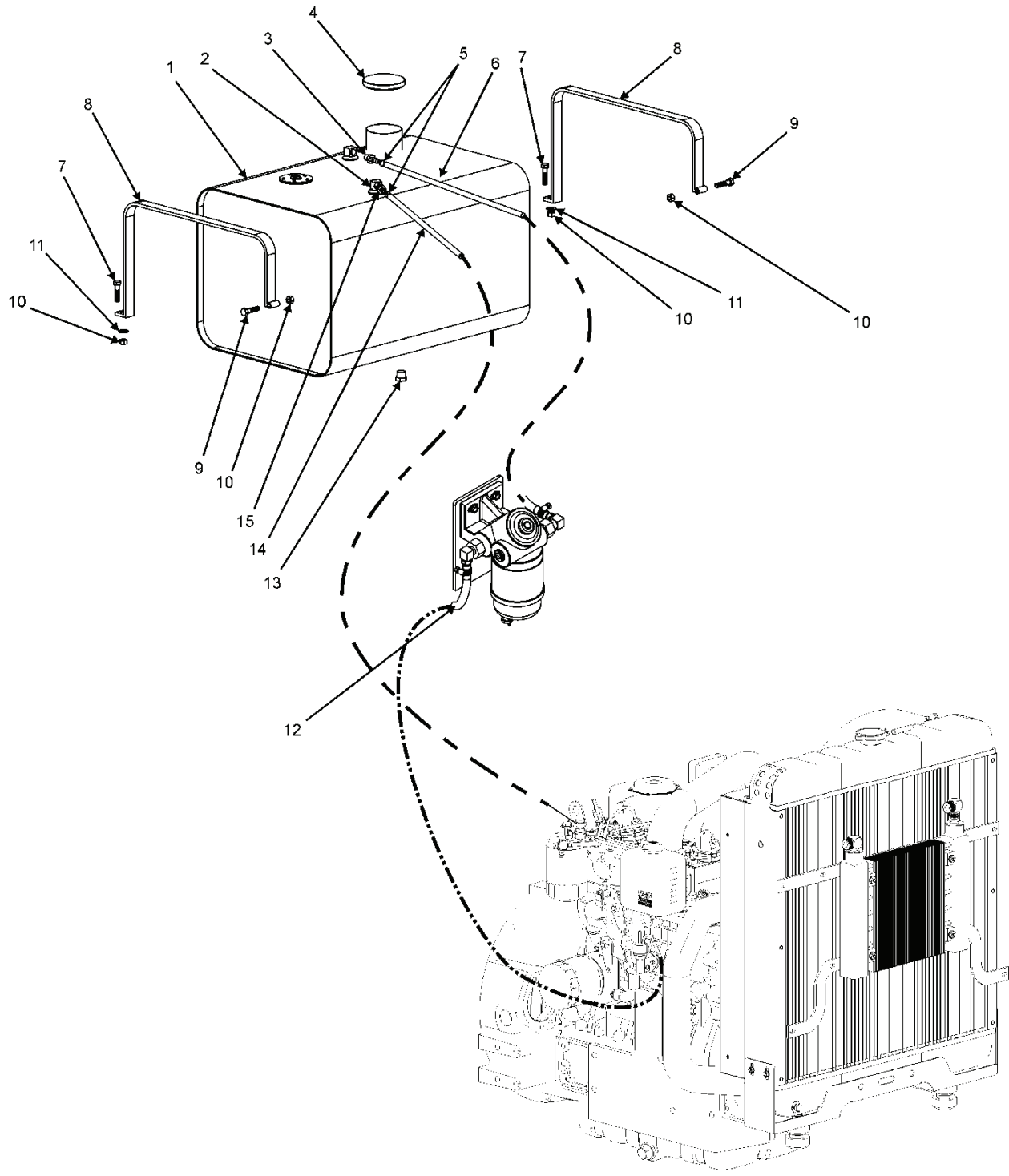


FIGURE 33. FUEL TANK, LINES AND FITTINGS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0306 FUEL TANK, LINES AND FITTINGS	
					FIGURE 33. FUEL TANK, LINES AND FITTINGS	
1	XBOZZ		44185	49040	TANK, FUEL	1
2	PAOZZ		44185	NW036196	TUBE, FUEL RETURN	1
3	PAOZZ	4730-01-317-5264	79470	05705B-104	ADAPTER, STRAIGHT, PIPE TO HOSE	2
4	PAOZZ		4NU98	450445	CAP	1
5	PAOZZ	4730-01-524-7708	39428	5388K14	CLAMP, HOSE	5
6	PAOZZ		44185	48879	HOSE ASSY	1
7	PAOZZ	5306-00-226-4834	80204	B1821BH031C225N	BOLT, MACHINE	2
8	XBOZZ		44185	48880	STRAP WELDMENT	2
9	PAOZZ	5306-00-226-4835	80204	B1821BH031C250N	BOLT, MACHINE	2
10	PAOZZ	5310-01-538-1528	1SE17	NAN2	NUT, PLAIN, HEXAGON	4
11	PAOZZ	5310-01-522-6093	96906	MS27183-13	WASHER, FLAT	2
12	PAOZZ		24161	SAE 30R6-7	HOSE ASSY	1
13	XDOZZ		39428	9171K252	PLUG	1
14	PAOZZ		44185	48877	HOSE ASSY	1
15	PAOZZ	4730-01-328-2272	39428	5346K12	ADAPTER, STRAIGHT	1

END OF FIGURE

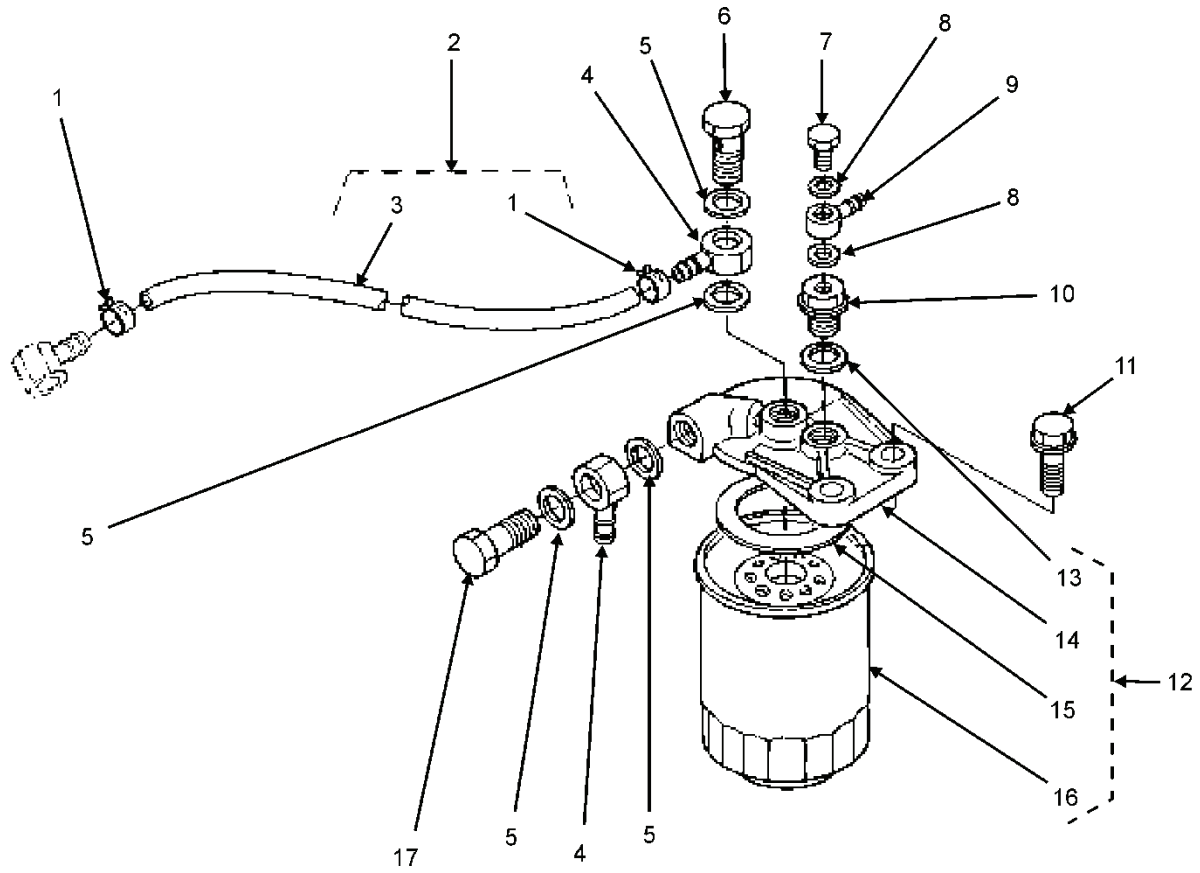


FIGURE 34. FUEL FILTER

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0309 FUEL FILTERS	
					FIGURE 34. FUEL FILTER	
1	PAOZZ	4730-01-359-4772	98255	14911-4275-0	CLAMP,HOSE	2
2	PAOZZ		1Q0C4	1C010-4201-2	ASSY TUBE,FUEL	1
3	PAOZZ		1Q0C4	09661-70360	TUBE,FUEL	1
4	PBOZZ	5310-01-533-2080	1Q0C4	15401-9569-0	NUT,EYE	2
5	PAOZZ	5330-01-524-7447	1Q0C4	17105-3368-0	GASKET	4
6	PAOZZ		1Q0C4	16541-9579-0	BOLT,JOINT	1
7	PAOZZ		1Q0C4	16541-9581-0	CONNECTOR	1
8	PBOZZ	5330-01-445-9423	0XWR1	15021-3366-0	GASKET	2
9	PAOZZ		1Q0C4	14117-4256-0	JOINT,PIPE	1
10	PAOZZ		1Q0C4	16551-9580-0	CONNECTOR	1
11	PAOZZ		1Q0C4	01774-51030	BOLT,FLANGE	2
12	PAOZZ		1Q0C4	1C010-4301-0	ASSY FILTER,FUEL	1
13	PAOZZ	5330-01-524-7447	1Q0C4	17105-3368-0	GASKET	1
14	PAOZZ		1Q0C4	16541-4321-0	COVER	1
15	PAOZZ		1Q0C4	16541-4333-0	GASKET	1
16	PAOZZ	2910-01-179-2597	12658	BF-954	ELEMENT,FUEL FILTER	1
17	PAOZZ		1Q0C4	16541-9579-0	BOLT,JOINT	1

END OF FIGURE

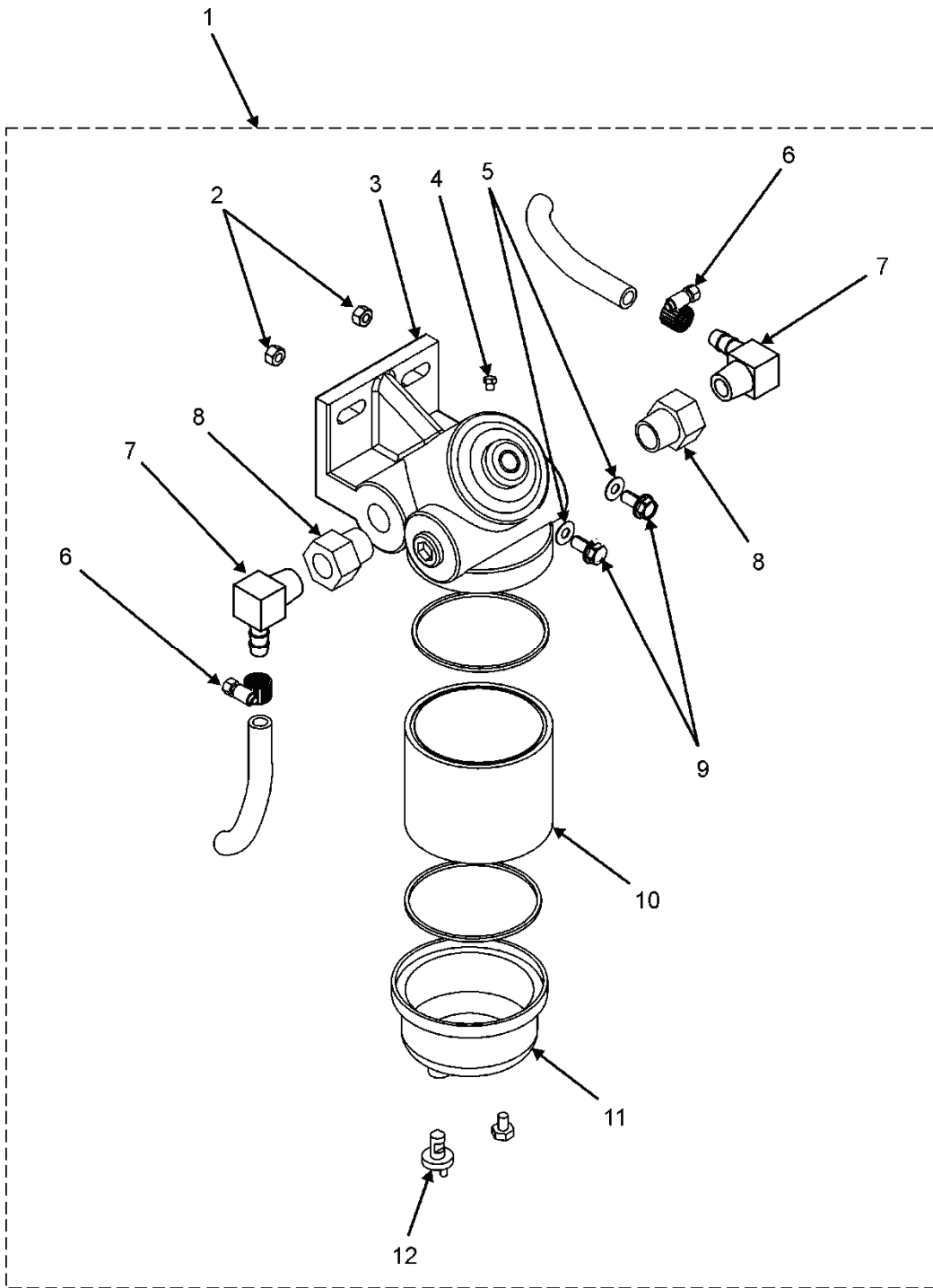


FIGURE 35. FUEL WATER SEPARATOR



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0309 FUEL FILTERS	
					FIGURE 35. FUEL WATER SEPARATOR	
1	PAOOO		55752	460R1230	FUEL/WATER SEPARATOR	1
2	PAOZZ	5310-01-538-1646	1SE17	NAN3	NUT,PLAIN,HEXAGON	2
3	PAOZZ	4930-00-454-8099	23972	460	FILTER BODY,FLUID	1
4	PAOZZ	5305-01-428-6791	55752	RK 10110	SCREW,MACHINE	1
5	PAOZZ	5310-00-080-6004	96906	MS27183-14	WASHER,FLAT	2
6	PAOZZ	4730-01-524-7708	39428	5388K14	CLAMP,HOSE	5
7	PAOZZ	4730-01-244-8414	79470	05705B-C04	ELBOW,PIPE TO HOSE	2
8	PAOZZ	4730-01-539-1059	0SUA9	5406-06-04	ADAPTER,STRAIGHT,HOSE TO BOSS	2
9	PAOZZ	5305-00-725-2317	0158B	MS90725-64	SCREW,CAP,HEXAGON HEAD	2
10	PAOZZ	2940-01-367-7515	55752	R60P	FILTER ELEMENT, FLUID	1
11	PAOZZ	2910-01-529-7662	55752	22003-03	HEATER, DIESEL OIL, DIESEL ENGINE	1
12	PAOZZ	4820-01-474-6910	55752	RK30476	DISK,VALVE	1

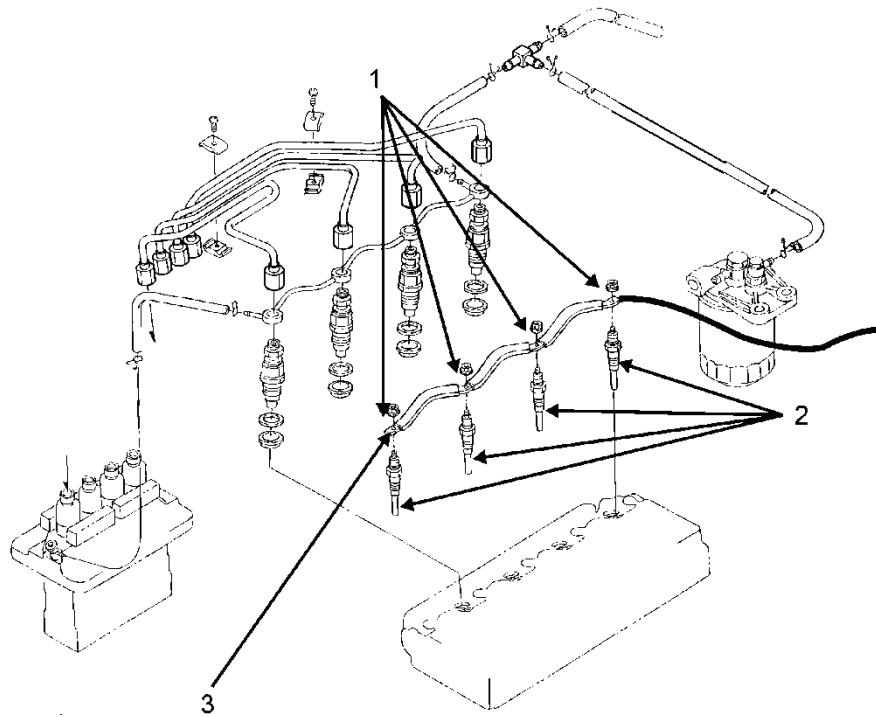


FIGURE 36. GLOW PLUGS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC ODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0311 GLOW PLUGS	
					FIGURE 36. GLOW PLUGS	
1	PBOZZ	5310-01-440-6749	S4532	02761-5004-0	NUT,SLEEVE	4
2	PAOZZ		1Q0C4	16415-6551-2	GLOW PLUG	4
3	PBOZZ	2920-01-536-0883	1Q0C4	1C010-6556-0	COVER,GLOW PLUG	1

END OF FIGURE

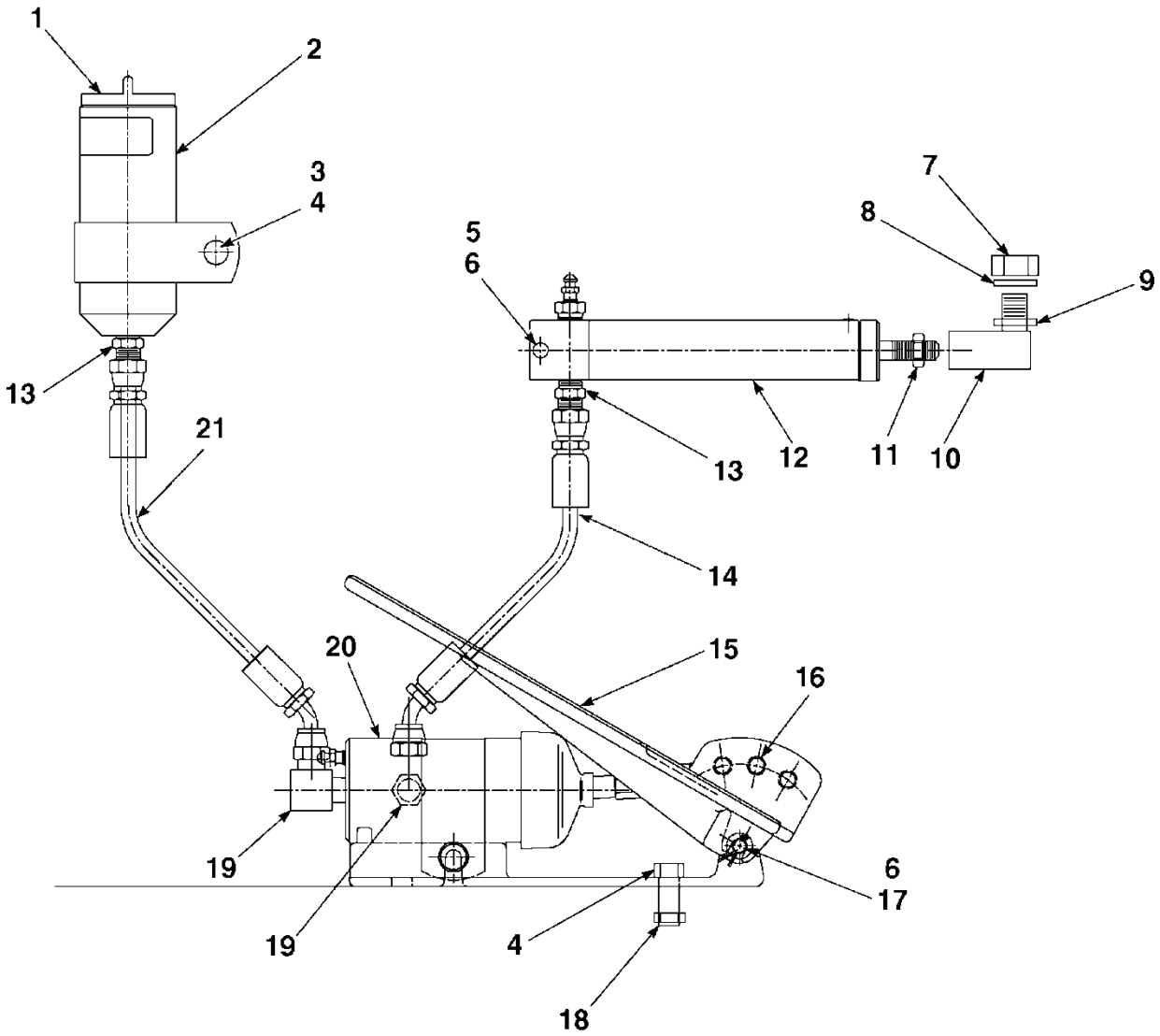


FIGURE 37. THROTTLE ASSEMBLY

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 FUEL SYSTEM	
					GROUP 0312 THROTTLE ASSEMBLY	
					FIGURE 37. THROTTLE ASSEMBLY	
1	PAOZZ		92865	40-030-004	CAP	1
2	PAOZZ		92865	20-920-009	RESERVOIR	1
3	PAOZZ	5305-00-988-1727	96906	MS35206-283	SCREW, MACHINE	1
4	PAOZZ	5310-01-538-1880	1SE17	NAN1	NUT, PLAIN, HEXAGON	4
5	PAOZZ	5315-00-839-2325	96906	MS24665-132	PIN, COTTER	1
6	PAOZZ	5310-01-274-3255	96906	MS27183-10	WASHER, FLAT	1
7	PAOZZ	5310-00-880-7746	96906	MS51968-4	NUT, PLAIN, HEXAGON	1
8	PAOZZ	5310-00-407-9566	80205	MS35338-45	WASHER, LOCK	1
9	PAOZZ	5310-01-522-6093	96906	MS27183-13	WASHER, FLAT	1
10	PAOZZ	3040-00-484-3561	62809	A038491	BALL JOINT	1
11	PBOZZ	5310-01-290-2196	39428	90631A011	NUT, SELF-LOCKING, HEXAGON	1
12	PAOZZ		92865	12-120-010	CYLINDER, SLAVE	1
13	PAOZZ	4730-01-554-6236	5E240	2404-04-02	ADAPTER, STRAIGHT, TUBE TO BOSS	2
14	PAOZZ		44185	47656-2	HOSE ASSY	1
15	XDOZZ		92865	12-460-186	PEDAL ASSY	1
16	PAOZZ	5306-00-225-8499	80205	MS90725-34	BOLT, MACHINE	1
17	PAOZZ		2V507	97245A272	PIN 1/4X3-1/2IN	1
18	PAOZZ	5305-00-225-3843	80204	B1821BH025C100N	SCREW, CAP, HEXAGON HEAD	1
19	PAOZZ	4730-00-647-3207	5E240	2501-04-02	ELBOW, PIPE TO TUBE	2
20	PAOZZ		92865	12-460-188	MASTER CYLINDER	1
21	PAOZZ		44185	47656-3	HOSE ASSY	1

END OF FIGURE

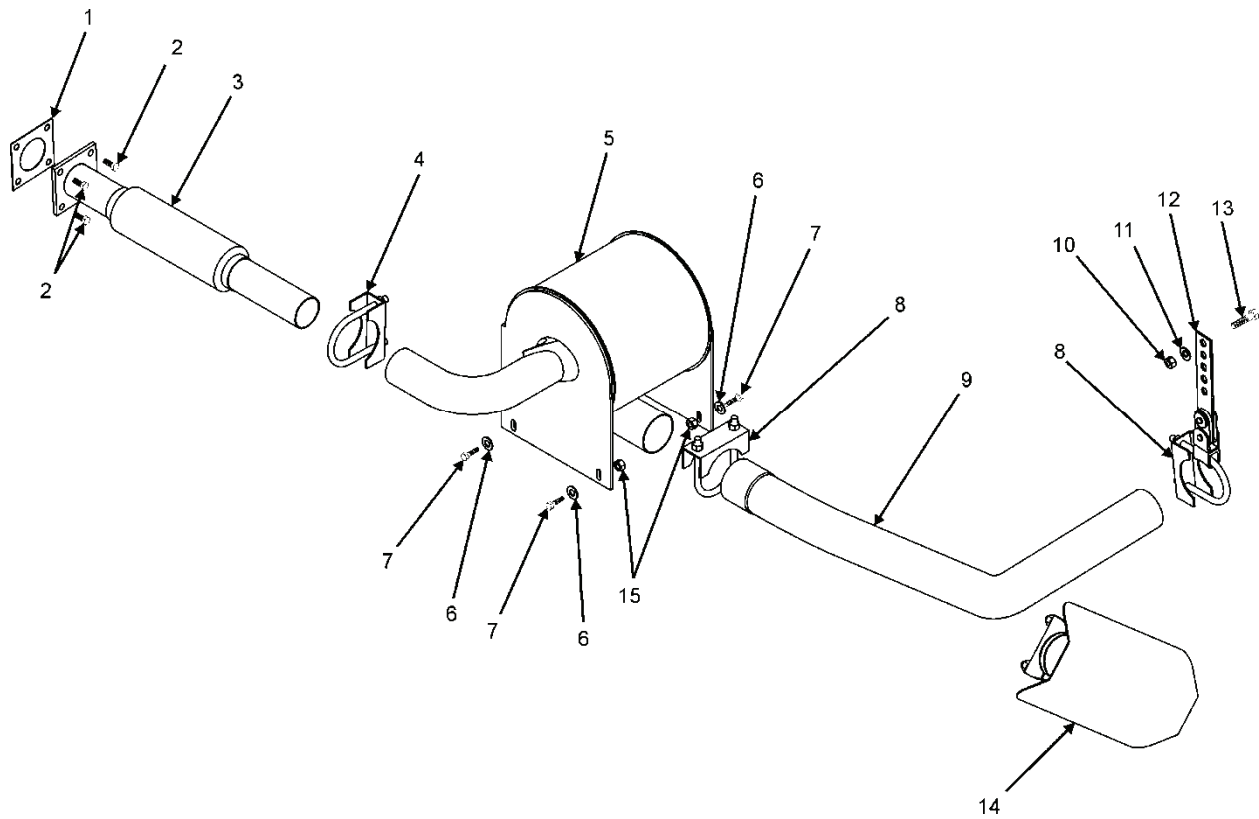


FIGURE 38. EXHAUST SYSTEM

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 04 EXHAUST SYSTEM	
					FIGURE 38. EXHAUST SYSTEM	
1	PAOZZ	5330-01-533-7589	3H244	19258-12230	GASKET	1
2	PBOZZ	5305-01-538-1423	1SE17	525F	SCREW, MACHINE	4
3	XDOZZ		44185	47929	WELDMENT, EXHAUST	1
4	PAOZZ		L0838	517200	CLAMP, MUFFLER	1
5	XDOZZ		1DG36	TS25PL4914050	MUFFLER	1
6	PAOZZ	5310-00-081-4219	96906	MS27183-12	WASHER, FLAT	4
7	PAOZZ	5306-00-225-8499	80205	MS90725-34	BOLT, MACHINE	4
8	PAOZZ		2V507	3042T79	CLAMP, MUFFLER	2
9	XDOZZ		44185	47895	PIPE, EXHAUST	1
10	PAOZZ	5310-01-538-1646	1SE17	NAN3	NUT, PLAIN, HEXAGON	1
11	PAOZZ	5310-00-809-4061	96906	MS27183-15	WASHER, FLAT	1
12	PAOZZ		44185	302273	HANGER, TAILPIPE	1
13	PAOZZ	5305-00-942-2196	80204	B1821BH038C100D	SCREW, CAP, HEXAGON HEAD	1
14	XDOZZ		44185	48932	GUARD WELDMENT	1
15	PBOZZ	5310-01-538-1528	1SE17	NAN2	NUT, LOCK 5/16-18	4

END OF FIGURE

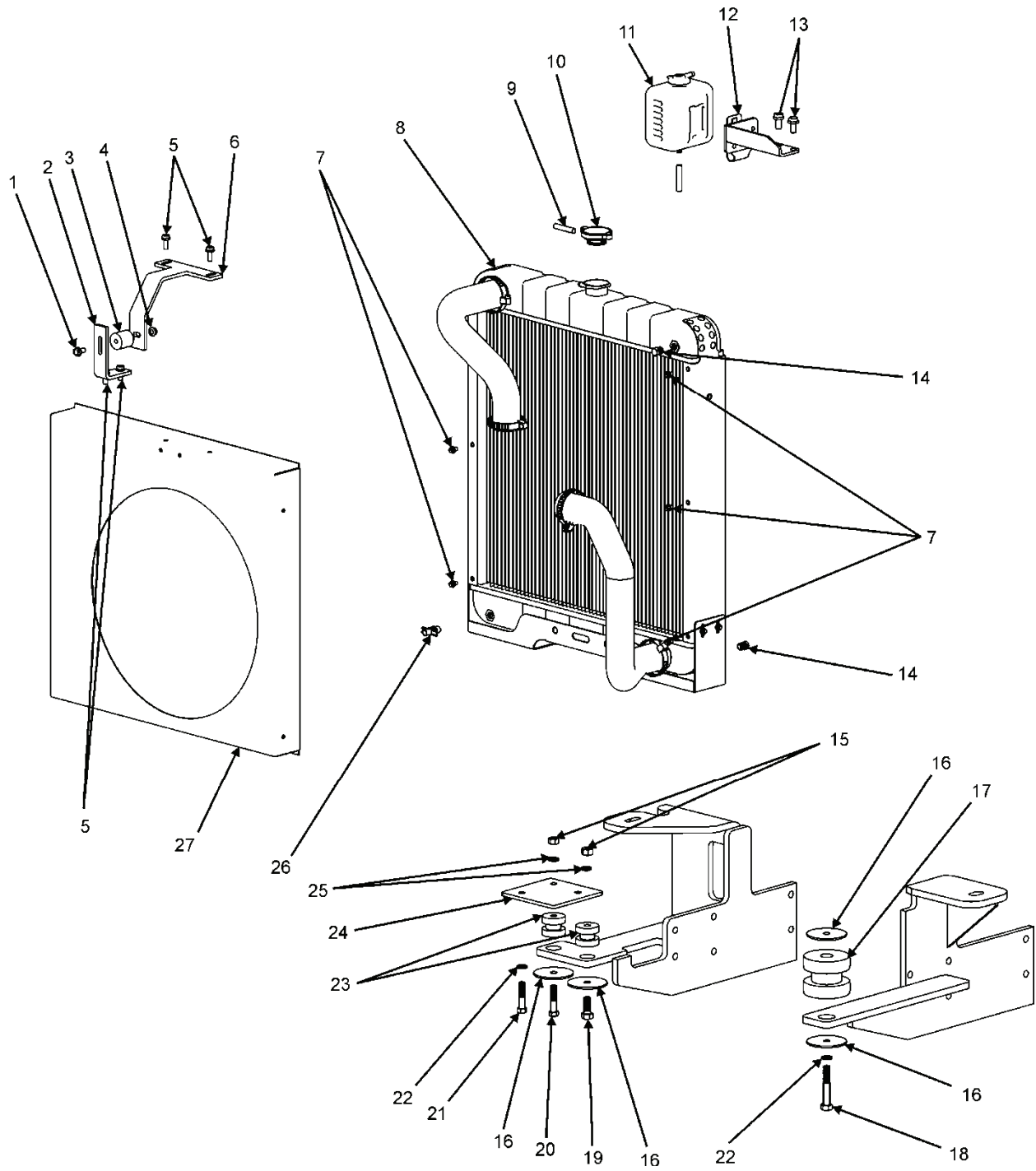


FIGURE 39. RADIATOR, RADIATOR MOUNTS AND OVERFLOW



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 05 COOLING SYSTEM	
					GROUP 0501 RADIATOR	
					FIGURE 39. RADIATOR, RADIATOR MOUNTS AND OVERFLOW	
1	PAOZZ	5305-01-359-8002	19207	12346514-32	SCREW,CAP,HEXAGON HEAD	1
2	XBOZZ		44185	47378-39	BRACKET	1
3	XDOZZ		44185	47378-40	SPACER	1
4	PAOZZ		1SE17	F5P2	5/16-18 HEX FLANGE NUT ZINC (NO SERR)	5
5	PAOZZ		1SE17	F516	SCREW, CAP, HEX HDM10 X 1.5 X 16MM	2
6	XBOZZ		44185	47378-41	BRACKET	1
7	PAOZZ	5305-01-575-1984	39428	91306A376	SCREW,CAP,HEXAGON HEAD	6
8	PAOZZ		3BEF4	79000625	RADIATOR	1
9	PAOZZ		44185	47378-46	HOSE, OVERFLOW	1
10	PAOZZ		3BEF4	69300001	CAP,RADIATOR	1
11	PAOZZ		3BEF4	81500001	BOTTLE, OVERFLOW	1
12	XBOZZ		1QQC4	21000240	BRACKET, MOUNT	1
13	PAOZZ		39428	92820A530	FHCS, M10 X 1.5 X 20	2
14	PAOZZ	4730-00-089-2515	22031	5406-P-4	PLUG,PIPE	2
15	PAOZZ	5310-00-575-5329	2V507	MS51922-25	NUT,SELF-LOCKING,HEXAGON	1
16	PAOZZ		44185	49130	WASHER, FLAT 094 ID X 019 IN THK	4
17	PAOZZ		5P059	60270-5	ISOLATOR, RUBBER	1
18	PAOZZ		1SE17	512K	BOLT, CARRIAGE 1/2-13 X 3 IN	1
19	PAOZZ	5305-00-225-3841	80204	B1821BH025C138N	SCREW,CAP,HEXAGON HEAD	1
20	PAOZZ	5305-00-071-2058	80204	B1821BH044C225N	SCREW,CAP,HEXAGON HEAD	1
21	PAOZZ	5305-00-071-2069	80204	B1821BH050C150N	SCREW,CAP,HEXAGON HEAD	1
22	PAOZZ	5310-00-013-1101	96906	MS35339-29	WASHER,LOCK	1
23	PAOZZ		5P059	60230	ISOLATOR	2
24	XDOZZ		44185	48856	MOUNT, RADIATOR	1
25	PAOZZ	5310-00-194-0743	1SE17	MS35338-28	WASHER,LOCK	1
26	PAOZZ	4820- 00-845-1096	72853	308400	COCK,DRAIN	1
27	XDOZZ		44185	47378-38	SHROUD,FAN	1

END OF FIGURE

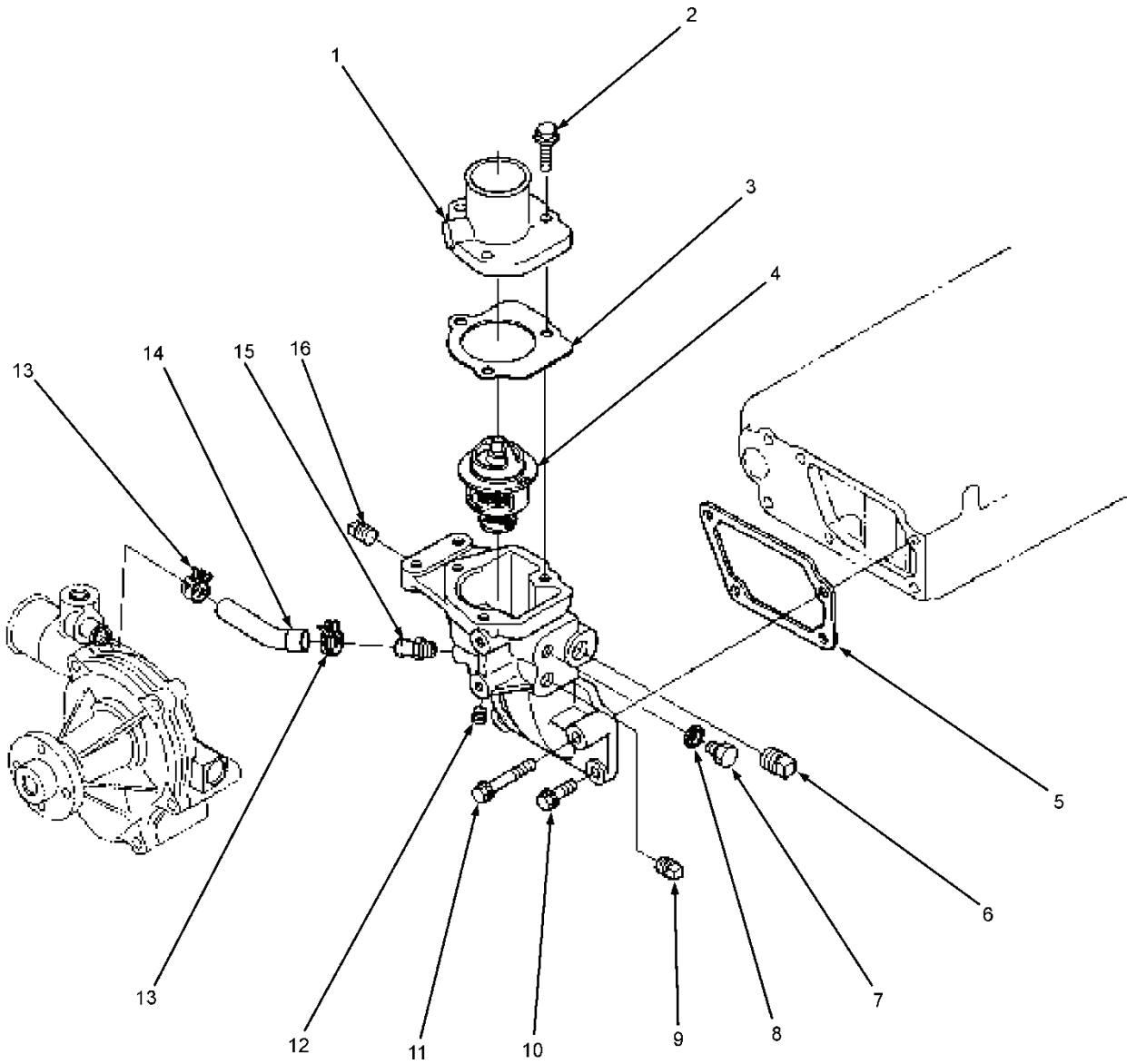


FIGURE 40. THERMOSTAT ASSEMBLY

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 05 COOLING SYSTEM	
					GROUP 0501 RADIATOR	
					FIGURE 40. THERMOSTAT ASSEMBLY	
1	PAOZZ		1Q0C4	1C020-7326-0	COVER,THERMOSTAT	1
2	PAOZZ		1Q0C4	01754-50825	BOLT,FLANGE	3
3	PAOZZ		1Q0C4	1C020-7327-2	GASKET	1
4	PAOZZ		1Q0C4	1C011-7301-0	ASSY THERMOSTAT	1
5	PAOZZ	5330-01-533-6252	1Q0C4	1C010-7282-0	GASKET	1
6	PAOZZ	5365-01-533-9254	1Q0C4	1G521-9601-0	PLUG,MACHINE THREAD	1
7	PAOZZ	5365-01-533-6239	1Q0C4	15109-3363-0	PLUG,MACHINE THREAD	1
8	PBOZZ	5330-01-438-8809	67271	322539	GASKET	1
9	PAOZZ		1Q0C4	19071-9602-0	PLUG	1
10	PAOZZ		1Q0C4	01754-50825	BOLT,FLANGE	3
11	PAOZZ	5306-01-533-5746	1Q0C4	01754-50850	BOLT,MACHINE	1
12	PAOZZ		1Q0C4	1G521-9602-0	PLUG	1
13	PAOZZ	4730-01-478-7123	0XWR1	09318-88200	CLAMP,HOSE	2
14	PAOZZ		1Q0C4	1C010-7335-2	PIPE,WATER RETURN	1
15	PAOZZ		1Q0C4	1C010-3711-4	JOINT,WATER PIPE	1
16	PBOZZ	5365-01-506-8257	5X475	16241-9602-0	PLUG, MACHINE THREAD	1

END OF FIGURE

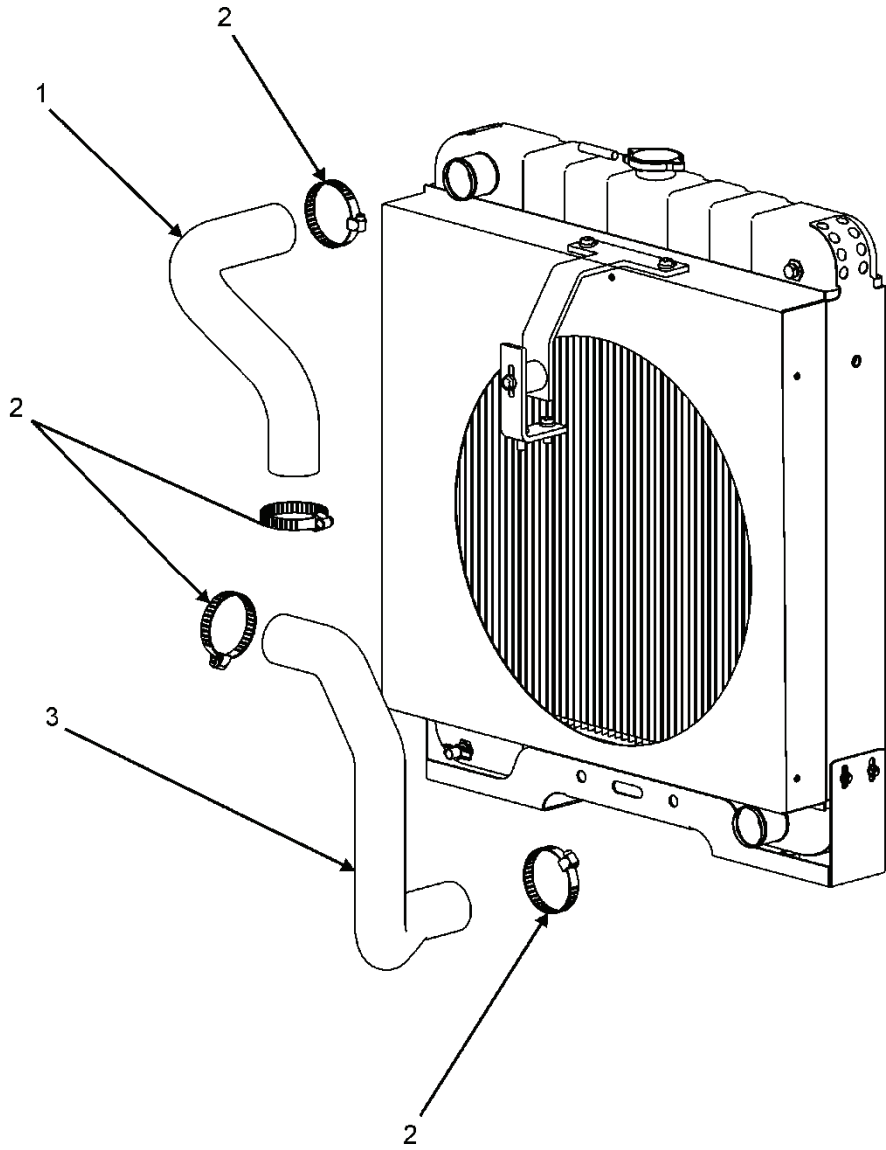


FIGURE 41. RADIATOR HOSES

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 05 COOLING SYSTEM GROUP 0503 RADIATOR HOSES FIGURE 41. RADIATOR HOSES	
1	PAOZZ		5X475	68900652	HOSE,UPPER	1
2	PAOZZ	4730-00-908-3193	96906	MS35842-12	CLAMP,HOSE	4
3	PAOZZ		5X475	68900653	HOSE,LOWER	1

END OF FIGURE

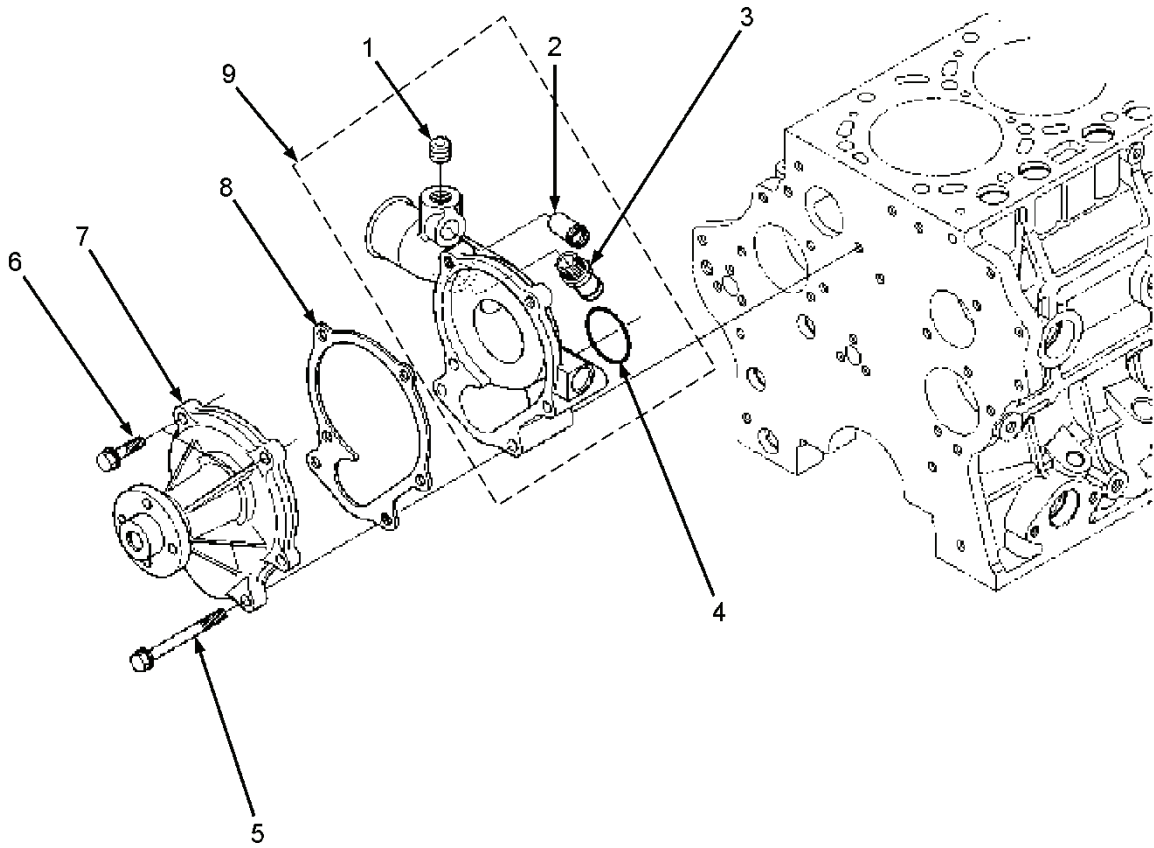


FIGURE 42. WATER PUMP

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 05 COOLING SYSTEM	
					GROUP 0503 RADIATOR HOSES	
					FIGURE 42. WATER PUMP	
1	PBOZZ	5365-01-506-8257	5X475	16241-9602-0	PLUG,MACHINE THREAD	1
2	PAOZZ	4730-01-533-2536	1Q0C4	16241-0555-0	COUPLING,PIPE,SLIP JOINT	1
3	PAOZZ	2930-01-533-7027	1Q0C4	1C010-3711-0	WATER OUTLET,ENGINE	1
4	PAOZZ	5331-01-533-6875	1Q0C4	04814-00420	O-RING	1
5	PAOZZ	5306-01-357-3765	S4532	01754-50880	BOLT,MACHINE	4
6	PAOZZ		1Q0C4	01754-50830	BOLT,FLANGE	2
7	PAOZZ		1Q0C4	1C010-7303-2	ASSY PUMP,WATER	1
8	PAOZZ	5330-01-524-7431	1Q0C4	1C010-7343-0	GASKET	1
9	XAOZZ		1Q0C4	1C010-7306-8	ASSY SUPPORT W/P	1

END OF FIGURE

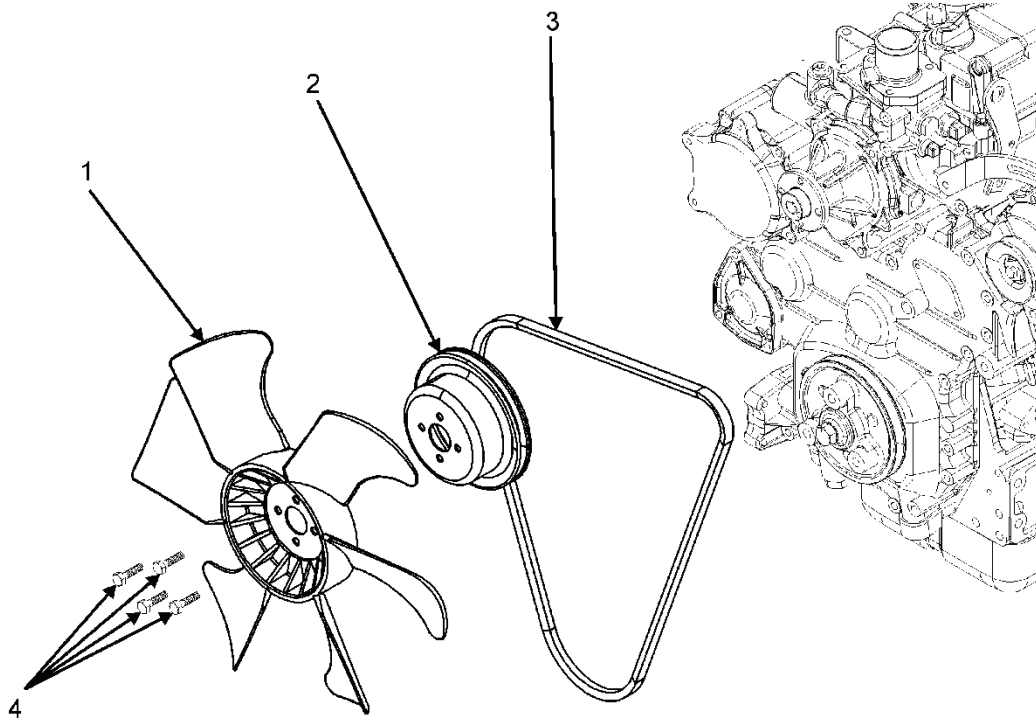


FIGURE 43. FAN ASSEMBLY



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 05 COOLING SYSTEM	
					GROUP 0505 FAN ASSEMBLY	
					FIGURE 43. FAN ASSEMBLY	
1	PAOZZ	4140-01-560-2099	1Q0C4	1C010-74110	FAN,TUBEAXIAL	1
2	PAOZZ		1Q0C4	1G541-7425-0	PULLEY,FAN	1
3	PAOZZ	3030-01-347-6575	24161	9525	BELT,V	1
4	PAOZZ		1Q0C4	01754-50814	BOLT,FLANGE	4

END OF FIGURE

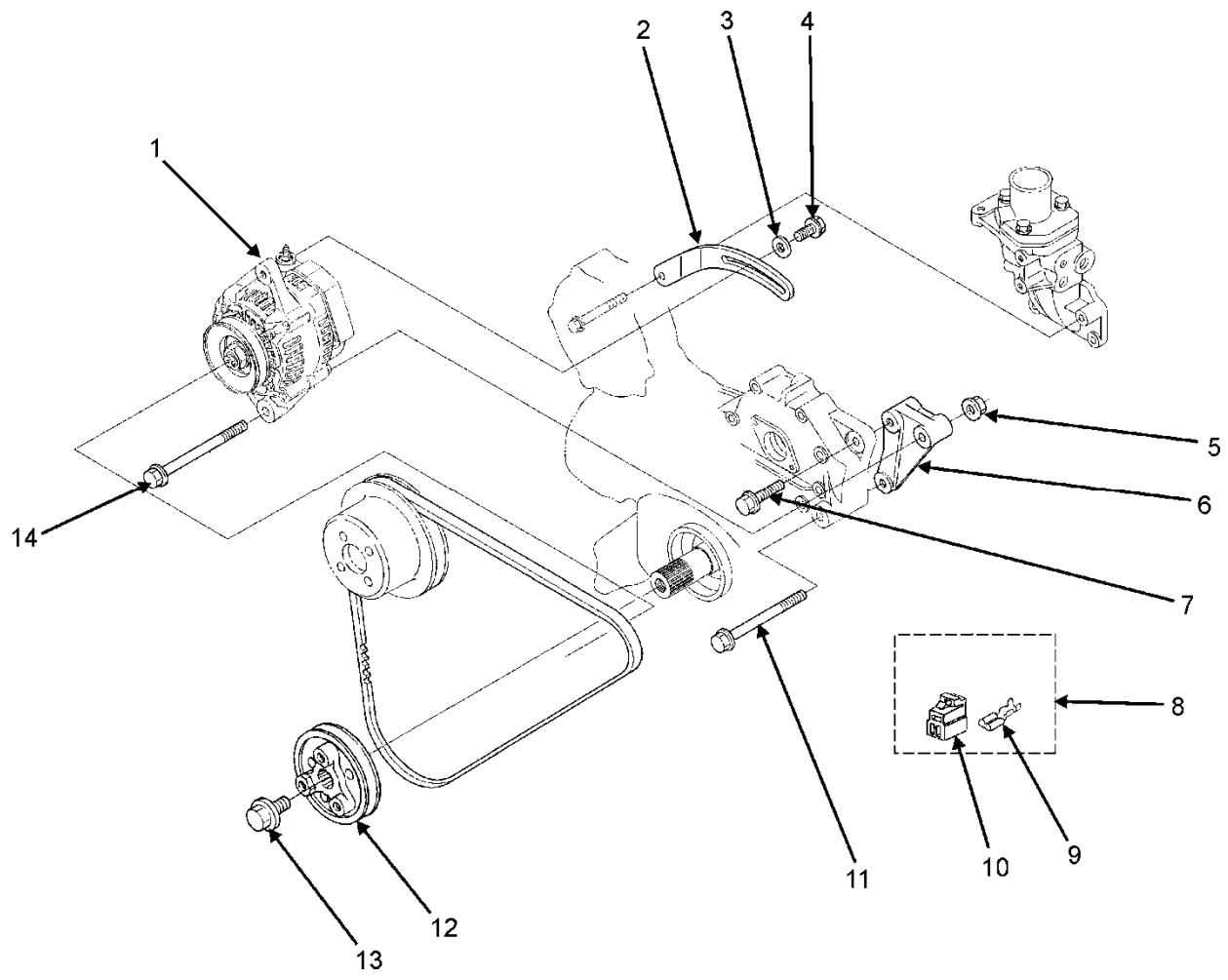


FIGURE 44. ALTERNATOR ASSEMBLY

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0601 ALTERNATOR	
					FIGURE 44. ALTERNATOR ASSEMBLY	
1	PAOZZ		1Q0C4	19260-6401-0	ASSY ALTERNATOR (SEE FIGURE 44 FOR BREAKOUT)	1
2	PAOZZ		1Q0C4	1G539-6442-0	STAY,DYNAMO	1
3	PBOZZ	5310-01-500-2384	0XWR1	04015-60080	WASHER,FLAT	1
4	PAOZZ		1Q0C4	01754-50825	BOLT,FLANGE	1
5	PAOZZ	5310-01-533-3364	1Q0C4	02771-60100	NUT,PLAIN,PLATE	1
6	PAOZZ		1Q0C4	1G549-6435-0	SUPPORT,ALTERNATOR	1
7	PBOZZ	5306-01-320-7032	S4532	01774-51035	BOLT,MACHINE	1
8	PAOZZ		1Q0C4	16678-6583-0	ASSY CONNECTOR	1
9	PBOZZ	5940-01-537-2058	0XWR1	19237-6591-0	TERMINAL,LUG	3
10	PAOZZ		1Q0C4	16631-6584-0	CONNECTOR	1
11	PAOZZ		1Q0C4	01774-51080	BOLT,FLANGE	1
12	PAOZZ		1Q0C4	1C010-7428-2	PULLEY,FAN DRIVE	1
13	PAOZZ		1Q0C4	1C010-9101-0	BOLT	1
14	PAOZZ		1Q0C4	01774-51002	BOLT	1

END OF FIGURE

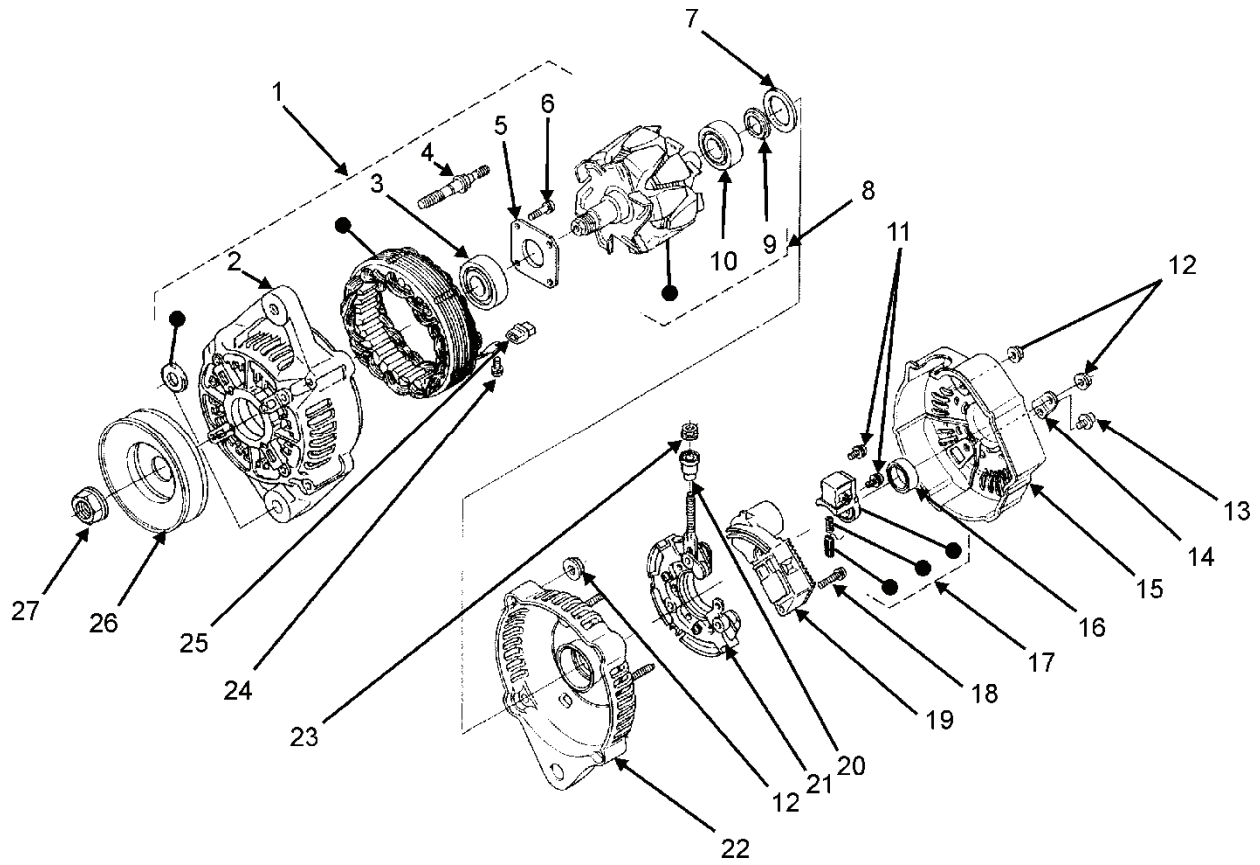


FIGURE 45. ALTERNATOR

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM GROUP 0601 ALTERNATOR	
					<b>FIGURE 45. ALTERNATOR</b>	
					FIGURE 45. ALTERNATOR	
1	XCDZZ		1Q0C4	19260-6402-0	ASSY FRAME,DRIVE END	1
2	XCDZZ		1Q0C4	15881-6480-0	COVER,BEARING	1
3	XCDZZ		1Q0C4	16543-6478-0	BEARING,BALL	1
4	XCDZZ		1Q0C4	16540-6426-0	BOLT,THROUGH	4
5	XCDZZ		1Q0C4	16543-6471-0	PLATE,RETAINER	1
6	XCDZZ		1Q0C4	16543-9303-0	BOLT	4
7	XCDZZ		1Q0C4	16543-6499-0	WASHER	1
8	XCDZZ		1Q0C4	19260-6412-0	ASSY ROTOR	1
9	XCDZZ		1Q0C4	16543-6470-0	RING,SEAL	1
10	XCDZZ		1Q0C4	35999-1766-0	BEARING,BALL	1
11	XCDZZ		1Q0C4	15881-9303-0	SCREW,ROUND HEAD	3
12	PBOZZ	5310-01-507-3960	5X475	15881-9202-0	NUT BLANK	7
13	XCDZZ		1Q0C4	16543-9306-0	SCREW,ROUND HEAD	1
14	XCDZZ		1Q0C4	16543-6498-0	PLATE,TERMINAL	1
15	XCDZZ		1Q0C4	19260-6423-0	COVER,REAR END	1
16	XCDZZ		1Q0C4	16543-6466-0	RING,SEAL	1
17	XCDZZ		1Q0C4	16543-6431-0	HOLDER,BRUSH	1
18	XCDZZ		1Q0C4	16543-9302-0	SCREW,ROUND HEAD	2
19	XCDZZ		1Q0C4	19279-6460-0	ASSY REGULATOR	1
20	XCDZZ		1Q0C4	19260-6491-0	BUSH,INSULATION	1
21	XCDZZ		1Q0C4	19260-6485-0	ASSY RECTIFIER	1
22	XCDZZ		1Q0C4	16543-6406-0	FRAME,END	1
23	XCDZZ		1Q0C4	16543-9203-0	NUT	1
24	XCDZZ		1Q0C4	16543-6490-0	BUSH,INSULATION	4
25	XCDZZ		1Q0C4	16543-9305-0	SCREW,ROUND HEAD	4
26	XCDZZ		1Q0C4	19260-6411-0	PULLEY,ALTERNATOR	1
27	XCDZZ		1Q0C4	16540-9201-0	NUT	1

END OF FIGURE

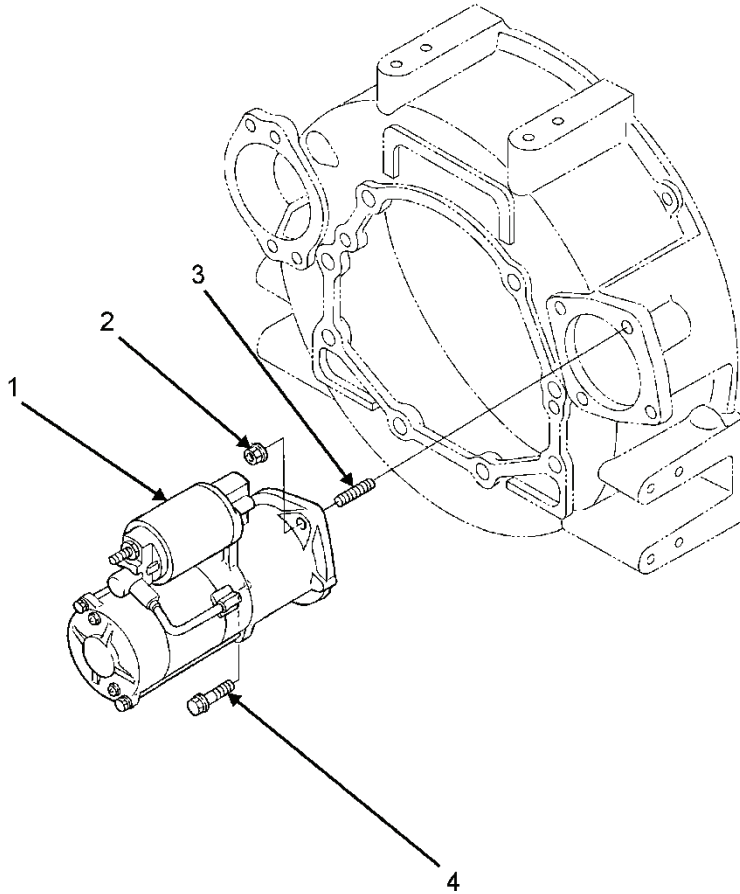


FIGURE 46. STARTER ASSEMBLY

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM GROUP 0603 STARTER ASSEMBLY FIGURE 46. STARTER ASSEMBLY	
1	PAOZZ		1Q0C4	1K012-6301-0	ASSY STARTER (SEE FIGURE 47 FOR BREAKOUT)	1
2	PAOZZ	5310-01-533-3364	1Q0C4	02771-60100	NUT,PLAIN,PLATE	1
3	PAOZZ		1Q0C4	01517-61030	STUD	1
4	PAOZZ	5306-01-320-7032	S4532	01774-51035	BOLT,MACHINE	1

END OF FIGURE

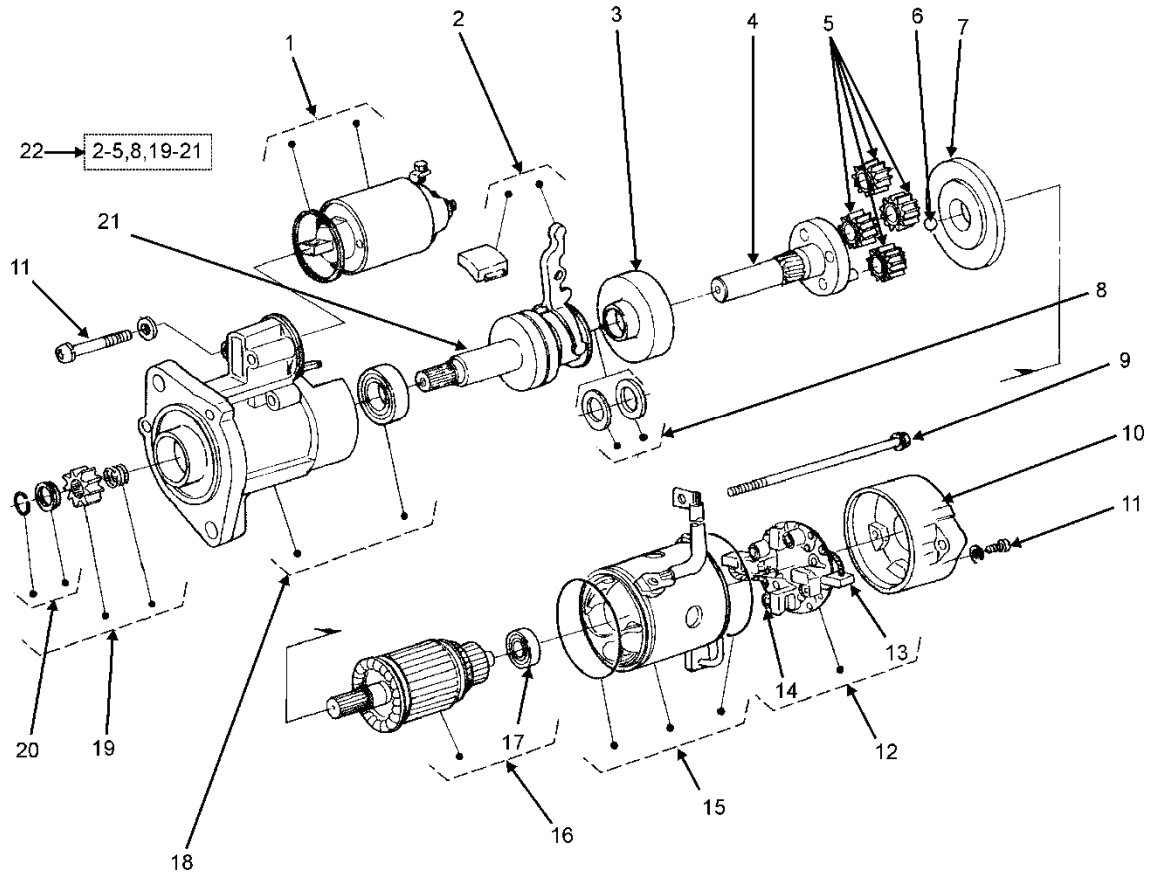


FIGURE 47. STARTER



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0603 STARTER ASSEMBLY	
					FIGURE 47. STARTER	
1	XCDZZ		1Q0C4	1C010-6302-0	ASSY SWITCH,MAGNETIC	1
2	XCDZZ		1Q0C4	1K012-6305-0	ASSY LEVER,SET	1
3	XCDZZ		1Q0C4	1C010-6326-0	SET,INTERNAL GEAR	1
4	XCDZZ		1Q0C4	1K012-6321-0	ASSY SHAFT,GEAR	1
5	XCDZZ		1Q0C4	1C010-6327-0	ASSY GEAR	4
6	XCDZZ		1Q0C4	6C040-8269-0	BALL	1
7	XCDZZ		1Q0C4	1C010-6352-0	SET,PACKING	1
8	XCDZZ		1Q0C4	1C010-6341-0	SET,WASHER	1
9	XCDZZ		1Q0C4	1K012-6332-0	SET,BOLT	1
10	XCDZZ		1Q0C4	1K012-6320-0	ASSY BRACKET,REAR	1
11	XCDZZ		1Q0C4	1K012-6376-0	SET,SCREW	1
12	XCDZZ		1Q0C4	1K012-6338-0	ASSY HOLDER,BRUSH	1
13	XCDZZ		1Q0C4	1K012-6337-0	BRUSH	2
14	XCDZZ		1Q0C4	1K012-6339-0	BRUSH,SPRING	4
15	XCDZZ		1Q0C4	1K012-6308-0	ASSY YOKE	1
16	XCDZZ		1Q0C4	1K012-6307-0	ASSY ARMATURE	1
17	XCDZZ		1Q0C4	1C010-6325-0	BEARING	1
18	XCDZZ		1Q0C4	1K012-6303-0	ASSY BRACKET,FRONT	1
19	XCDZZ		1Q0C4	1K012-6328-0	SET PINION	1
20	XCDZZ		1Q0C4	1C010-6317-0	SET,STOPPER	1
21	XCDZZ		1Q0C4	1C010-6333-0	CLUTCH,OVER RUNNING	1
22	XCDZZ		1Q0C4	1K012-6304-0	ASSY SHAFT,CLUTCH	1

END OF FIGURE

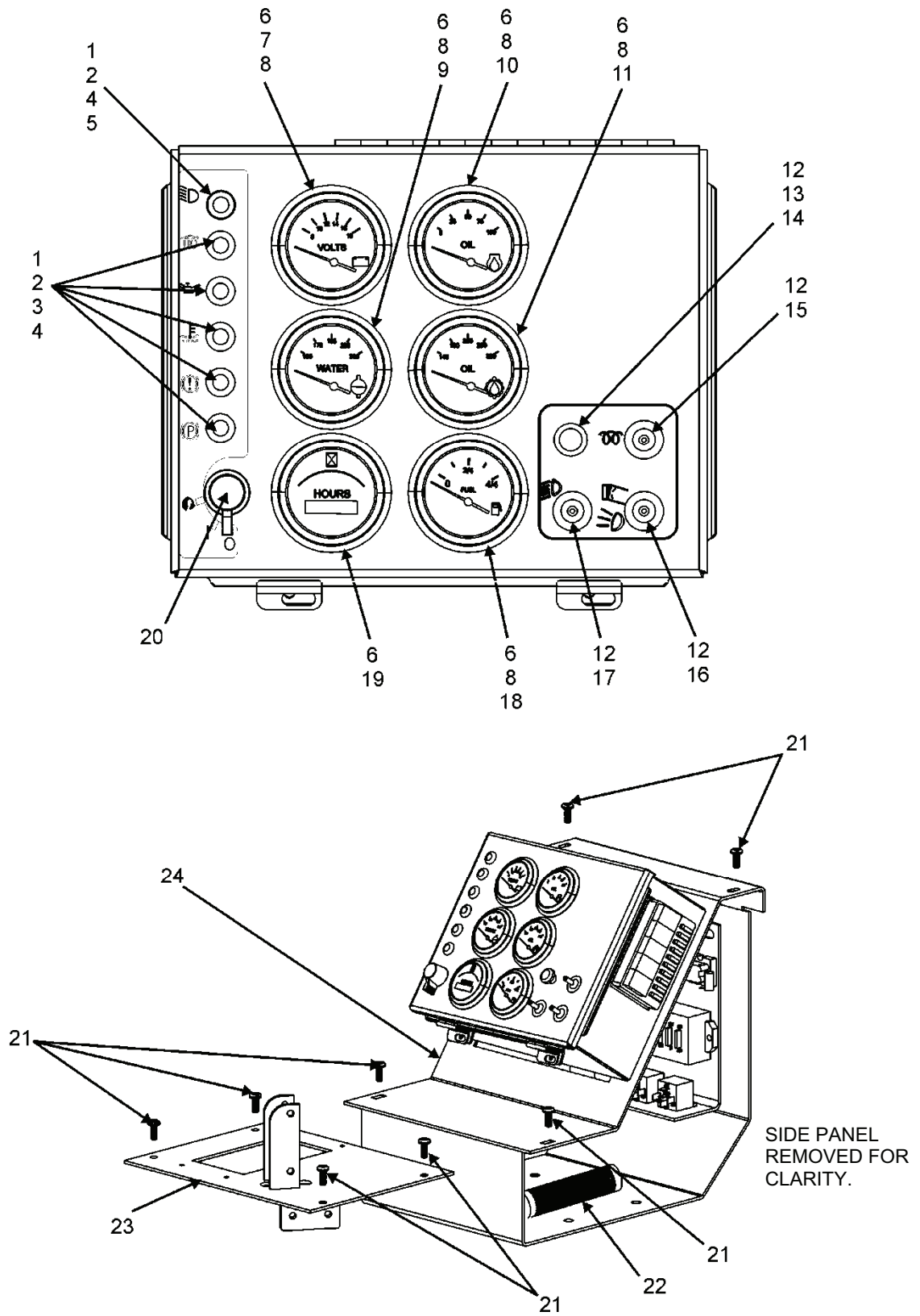


FIGURE 48. INSTRUMENT PANEL

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0607 INSTRUMENT PANEL	
					FIGURE 48. INSTRUMENT PANEL	
1	PAOZZ	6210-01-127-5125	81349	LH73/1	LIGHT,INDICATOR	6
2	PAOZZ	6240-00-965-1381	55335	382	LAMP,INCANDESCENT	6
3	PAOZZ	6210-00-990-4637	81349	LC12RN2	LENS, LIGHT	5
4	PAOZZ		81349	AS568A-113	O-RING,SEAL	6
5	PAOZZ	6210-00-079-8943	81349	LC12GN2	LENS,LIGHT	1
6	PCOZZ	5331-01-399-2158	60764	639111	O-RING	6
7	PAOZZ		16476	104232	GAUGE, VOLTMETER	1
8	PAOZZ		0C2JC	400730-300	LIGHT, NVIS	5
9	PAOZZ	2930-01-455-0817	16476	104242	GAUGE,WATER TEMP.	1
10	PAOZZ		16476	104237	GAUGE, OIL PRESS	1
11	PAOZZ		16476	104240	GAUGE, OIL TEMP	1
12	PAOZZ	5331-01-541-3816	81349	AS568A-012	O-RING	11
13	PAOZZ	5905-00-907-9823	81349	RV4SBYSD101A	RESISTOR,VARIABLE,NONWIRE WOUND	1
14	PAOZZ		2V507	6094K72	KNOB, SHAFT 3/4 IN DIA, 1/4 IN SHAFT	1
15	PAOZZ	5930-00-683-1626	96906	MS24523-30	SWITCH,TOGGLE	1
16	PAOZZ	5930-00-655-4247	96906	MS24524-22	SWITCH,TOGGLE	1
17	PAOZZ	5930-00-683-1628	96906	MS24523-22	SWITCH,TOGGLE	1
18	PAOZZ	6680-01-461-2697	16476	104246	GAGE ROD,LIQUID LEVEL	1
19	PAOZZ	6645-01-355-8913	0P0V0	100222	METER,TIME TOTALIZING	1
20	PBOZZ	2920-01-022-3177	13445	95591	SWITCH,ENGINE STARTER,ELECTRICAL	1
21	PAOZZ	5305-01-347-2253	39428	90272A540	SCREW,MACHINE	8
22	PAOZZ		2V507	2202K67	CYLINDER,DESSICANT	1
23	XDOZZ		44185	47646	PLATE WELDMENT	1
24	XDOZZ		44185	47640	PANEL,DASH	1

END OF FIGURE

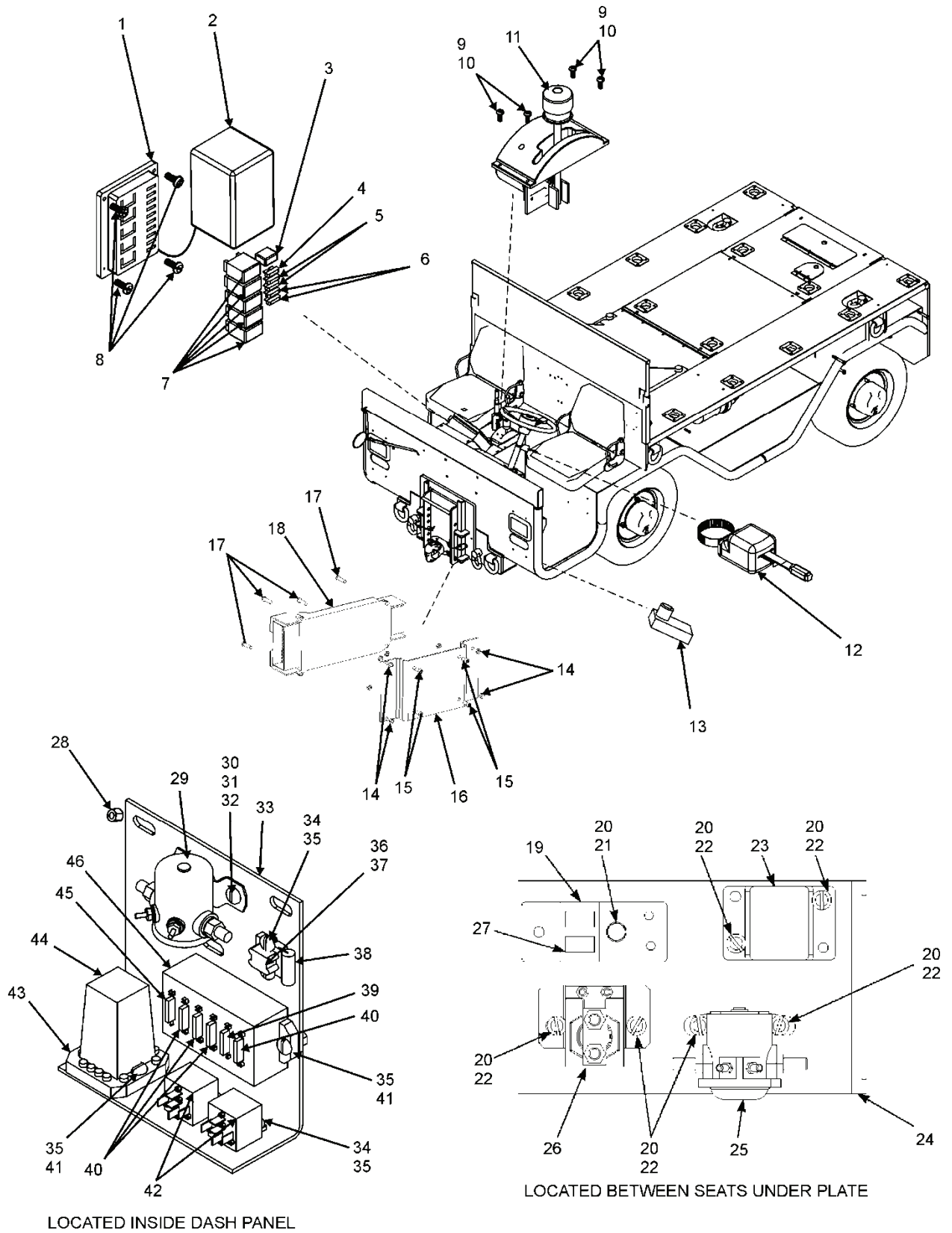
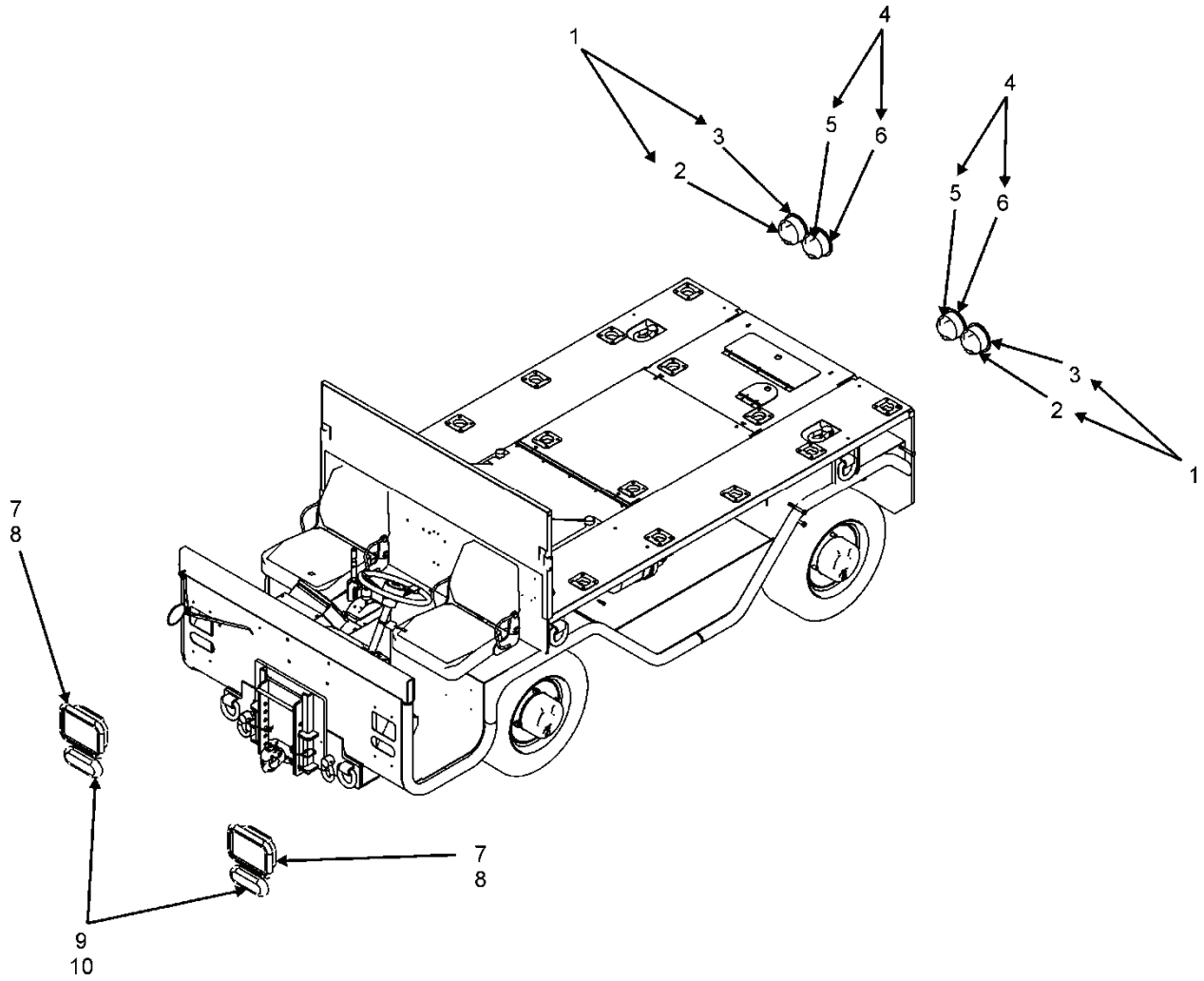


FIGURE 49. MISCELLANEOUS ELECTRICAL COMPONENTS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0608 MISCELLANEOUS ELECTRICAL COMPONENTS	
					FIGURE 49. MISCELLANEOUS ELECTRICAL COMPONENTS	
1	PAOZZ		005K5	15303-2-2-4	FUSEHOLDER	1
2	PAOZZ		005K5	B151-7168-2	CAP	1
3	PAOZZ		005K5	CB211-20	CIRCUITBREAKER	1
4	PAOZZ	5920-01-414-6436	58536	AA55569/02-009	FUSE,INCLOSED LINK	1
5	PAOZZ	5920-01-414-6435	75915	297020	FUSE,INCLOSED LINK	2
6	PAOZZ	5920-01-414-6983	58536	AA55569/02-004	FUSE,INCLOSED LINK	1
7	PAOZZ	5935-01-548-3467	74063	VJ28-95F24-S01	CONNECTOR, PLUG, ELECTRICAL	5
8	PAOZZ	5305-00-989-7435	80205	MS35207-264	SCREW,MACHINE	4
9	PBOZZ	5310-01-537-9039	1SE17	0ETW	WASHER,SPLIT	8
10	PAOZZ	5305-00-984-6196	80205	MS35206-248	SCREW,MACHINE	1
11	PAOZZ		44185	47379	CONTROL,SHIFT (SEE FIGURE 55 FOR BREAKOUT)	1
12	PAOOO		44185	48974	TURN SIGNAL (SEE	1
					FIGURE 56 FOR BREAKOUT)	
13	PAOZZ	2590-01-018-9416	78174	DS72	SWITCH, BEAM SELECTING HEADLIGHT	1
14	PAOZZ	5310-00-877-5797	80205	MS21044N3	NUT,SELF-LOCKING,HEXAGON	4
15	PAOZZ	5305-00-989-7434	96906	MS35207-263	SCREW,MACHINE	4
16	XDOZZ		K7599	475/48901	BRACKET, ECU	1
17	PAOZZ		3A054	95263A388	SCREW, SOCKET HEAD M5 X 04 X 20MM	4
18	PAOZZ		K7599	475/50712	ECU	1
19	PAOZZ		005K5	377011NN022	FUSEHOLDER	1
20	PAOZZ	5310-01-538-1880	1SE17	NAN1	NUT,PLAIN,HEXAGON	7
21	PAOZZ	5305-00-071-2237	80205	MS90725-14	SCREW,CAP,HEXAGON HEAD	1
22	PAOZZ	5305-00-988-1727	96906	MS35206-283	SCREW,MACHINE	6
23	PAOZZ	5920-01-559-9556	58961	46933	FUSE,CARTRIDGE	1
24	XAOZZ		44185	48278	PANEL	1
25	PAOZZ	5945-00-681-9817	93929	RF40NC28	RELAY,THERMAL	1
26	PAOZZ	5950-00-254-0035	13499	672-0239-00	TRANSFORMER,POWER	1
27	PAOZZ		005K5	FMX-60	FUSE	1
28	PBOZZ	5310-01-538-1528	1SE17	NAN2	NUT,PLAIN,HEXAGON	3
29	PAOZZ	5945-00-853-6024	13445	24059	SOLENOID,ELECTRICAL	1
30	PAOZZ	5305-01-347-2253	39428	90272A540	SCREW, MACHINE	2
31	PBOZZ	5310-01-538-0809	1SE17	NAF1	NUT,PLAIN,HEXAGON	2
32	PAOZZ	5310-00-582-5965	80205	MS35338-44	WASHER, LOCK	2
33	XDOZZ		44185	48276	PANEL,ELEC	1
34	PAOZZ	5305-00-984-6196	80205	MS35206-248	SCREW, MACHINE	4
35	PAOZZ	5310-00-207-8758	96906	MS20365-832A	NUT, SELF-LOCKING,HEXAGON	8
36	PAOZZ		85901	5504930-1	END TERMINAL	1
37	XDOZZ		85901	284392-4	BLOCK, TERMINAL	2
38	PBOZZ	5910-00-240-7284	56289	TVA1170	CAPACITOR,FIXED,ELECTROLYTIC	1
39	PAOZZ	5920-01-123-5212	58536	AA55569/01-005	FUSE,INCLOSED LINK	4
40	PAOZZ	5920-01-123-5211	58536	AA55569/01-007	FUSE,INCLOSED LINK	1
41	PAOZZ	5305-00-984-6193	88044	AN515-8-8	SCREW, MACHINE	1
42	PAOZZ		77342	8-1393298-8	RELAY,SPDT	2
43	PAOZZ	5935-01-154-0864	54173	RB08-PC	SOCKET,PLUG-IN ELECTRONIC COMPONENTS	1
44	PAOZZ	2920-01-313-6469	94696	70-169	TERMINAL BLOCK,ELECTRICAL	1
45	PAOZZ	5920-01-188-6294	58536	AA55569/01-011	FUSE,INCLOSED LINK	1
46	PAOZZ		58961	46081	BLOCK,FUSE	1

END OF FIGURE



## FIGURE 50. LIGHTS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0609 LIGHTS	
					FIGURE 50. LIGHTS	
1	PAOOO	6220-01-450-8757	20722	9310C9338-001	STOP LIGHT-TAILLIGHT, VEHICULAR	2
2	PAOZZ	6220-01-284-1880	81834	52772	LAMP UNIT, VEHICULAR	1
3	PAOZZ	5325-01-246-4468	81834	91740	GROMMET, NONMETALLIC	1
4	PAOOO		44185	NW035842K	LIGHT ASSY, BACKUP	2
5	PAOZZ		81834	62271	LIGHT, BACKUP	1
6	PAOZZ	5325-01-246-4468	81834	91740	GROMMET, NONMETALLIC	1
7	PAOZZ		78422	525H-L-9004-12V	HEADLIGHT, SEALED	2
8	PAOZZ	6240-01-285-0264	88204	9004	LAMP, INCANDESCENT	1
9	PAOZZ		12662	M421KR	TURN SIGNAL	2
10	PAOZZ	5945-00-400-6212	81495	1223-276	FLASHER, THERMAL	1

END OF FIGURE

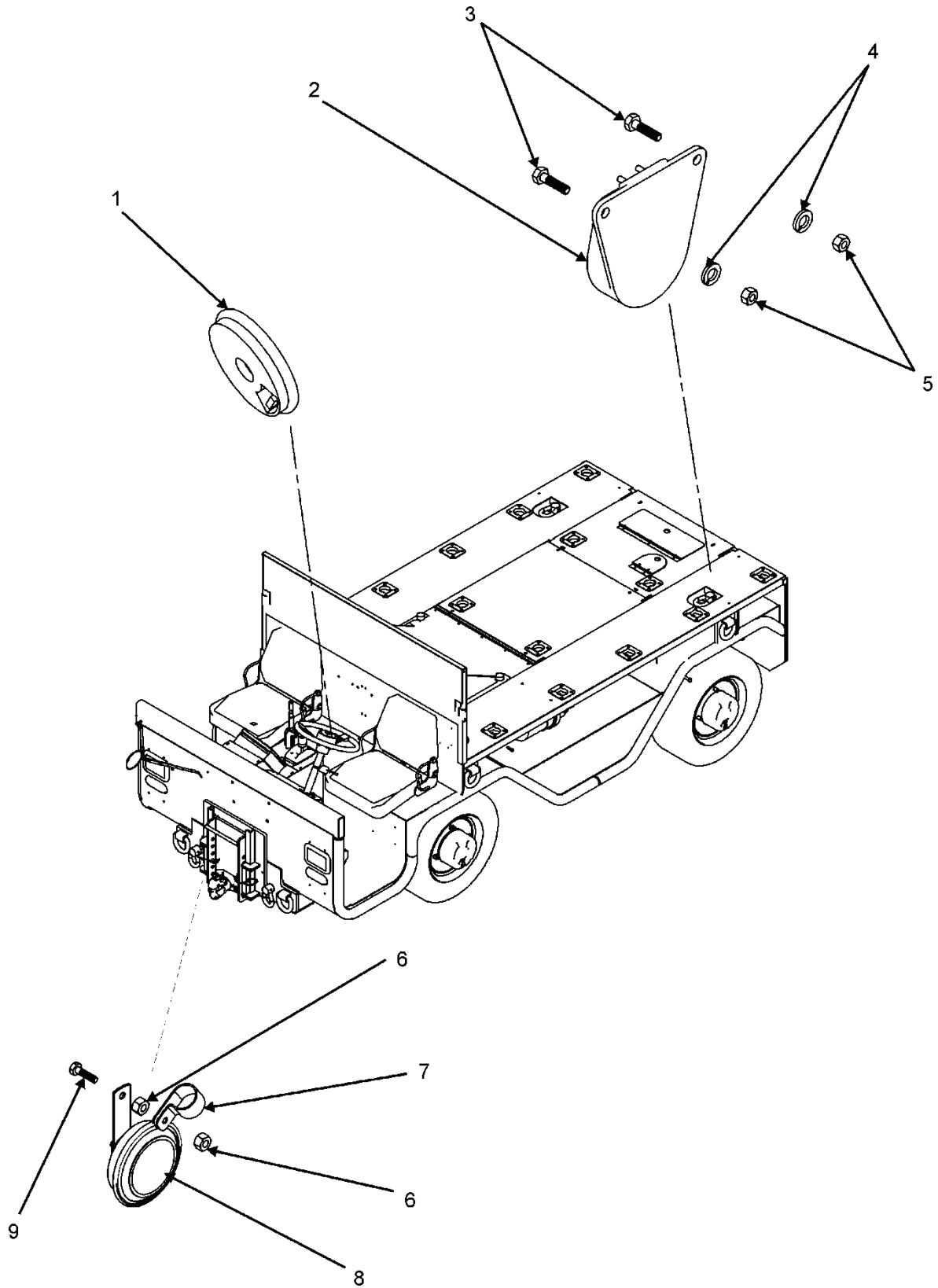


FIGURE 51. HORN, SIREN



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0611 HORN, SIREN	
					FIGURE 51. HORN, SIREN	
1	PBOZZ	5930-01-416-2950	02978	600504	PUSH BUTTON	1
2	PAOZZ	6350-01-263-5399	57013	LDA50	ALARM, BACK-UP, VEHICLE	1
3	PAOZZ	5306-00-225-8499	80205	MS90725-34	BOLT, MACHINE	2
4	PAOZZ	5310-00-514-6674	96906	MS35335-34	WASHER, LOCK	2
5	PAOZZ	5310-00-984-3806	96906	MS51922-9	NUT, SELF-LOCKING, HEXAGON	2
6	PAOZZ	5310-01-538-1880	1SE17	NAN1	NUT, PLAIN, HEXAGON	2
7	PAOZZ	5340-00-200-3045	81343	AS21919WDG24	CLAMP, LOOP	1
8	PAOZZ	6350-00-536-2001	4PXF3	52235	HORN, SIGNAL	1
9	PAOZZ	5305-01-485-6049	80205	MS90725-10	SCREW, CAP, HEXAGON HEAD	1

END OF FIGURE

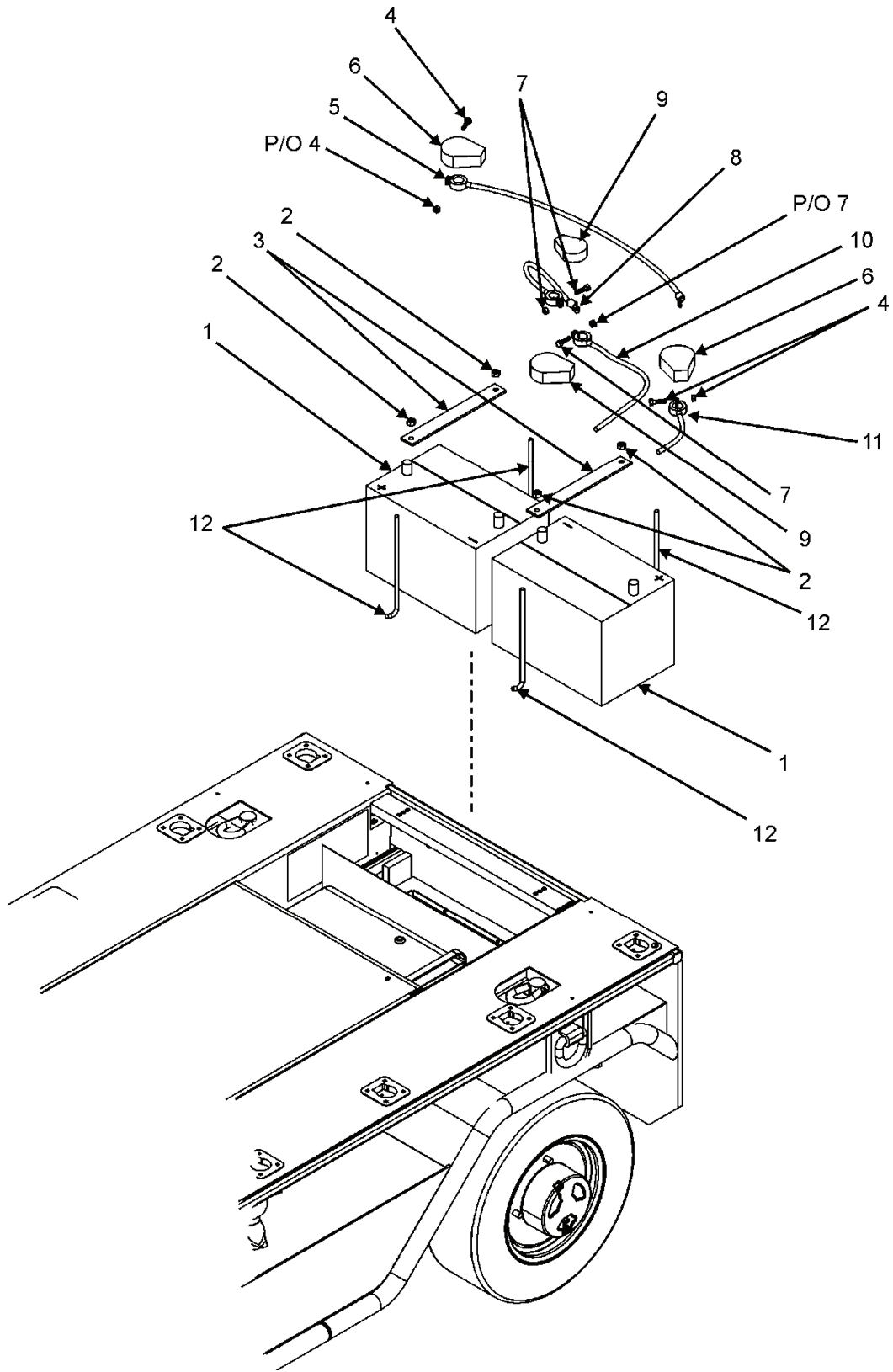
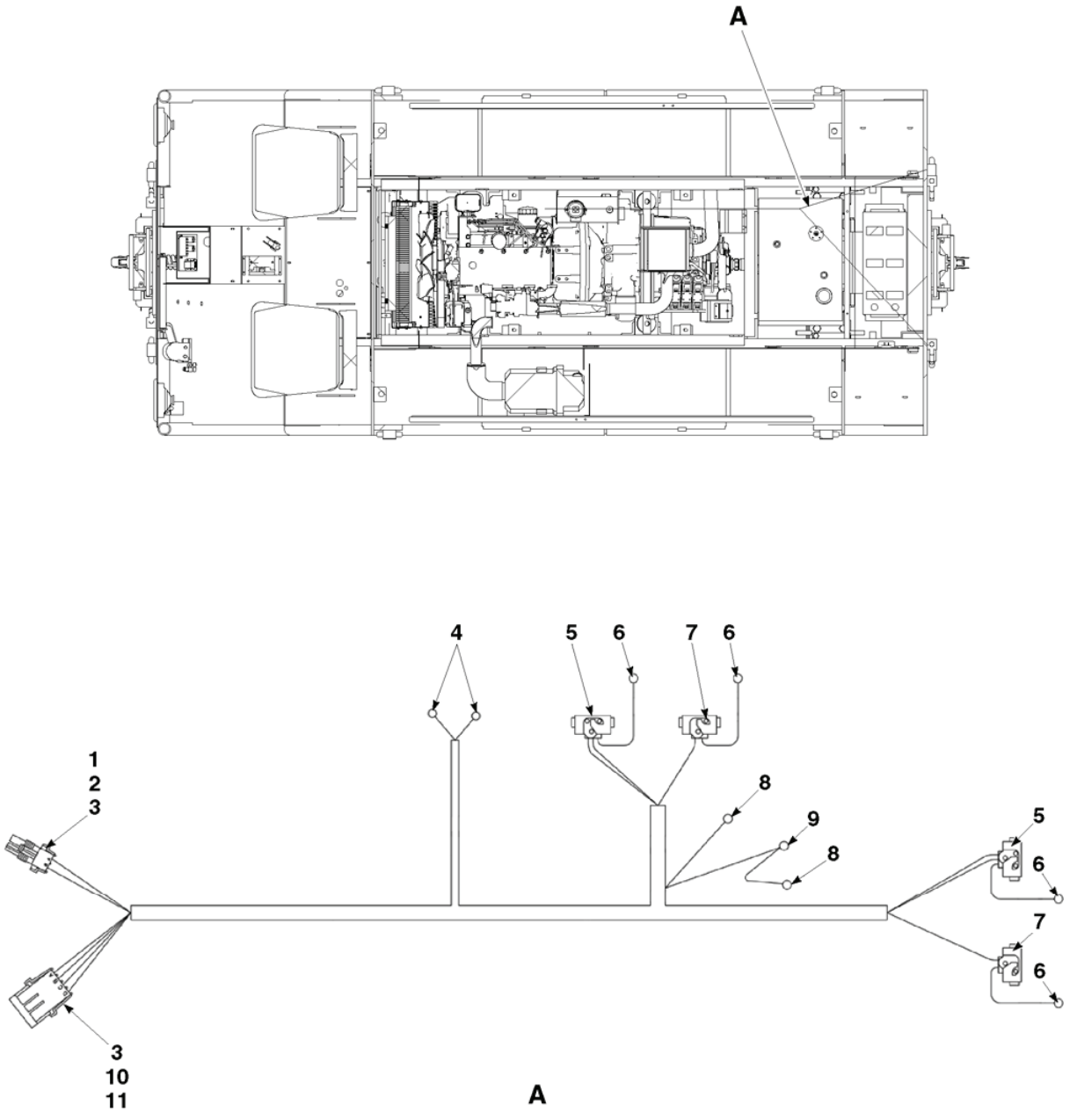


FIGURE 52. BATTERIES

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0612 BATTERIES	
					FIGURE 52. BATTERIES	
1	PAOZZ	6140-01-378-8232	0UJ55	8002-002/MDL. NO. 34	BATTERY, STORAGE	2
2	PBOZZ	5310-01-538-1528	1SE17	NAN2	NUT, PLAIN, HEXAGON	4
3	XBOZZ		44185	49077	HOLDOWN, BATTERY	2
4	PAOZZ		6K495	7752K212	BOLT/NUT KIT BATTERY CABLE, POS	2
5	PAOZZ		44185	49071	CABLE, BATTERY, POS	1
6	PAOZZ	5975-01-421-9934	58961	23505	CABLE NIPPLE, ELECTRICAL	1
7	PAOZZ		6K495	7752K211	BOLT/NUT KIT BATTERY CABLE, NEG	2
8	PAOZZ		44185	49070	CABLE, BATTERY, NEG	1
9	PAOZZ	5975-01-421-9937	58961	23504	CABLE NIPPLE, ELECTRICAL	1
10	PAOZZ		44185	208670	CABLE, BATTERY, NEG	1
11	PAOZZ		44185	49147	CABLE, BATTERY, POS	1
12	PAOZZ	5306-01-504-6498	39428	98760A112	BOLT,HOOK	4

END OF FIGURE

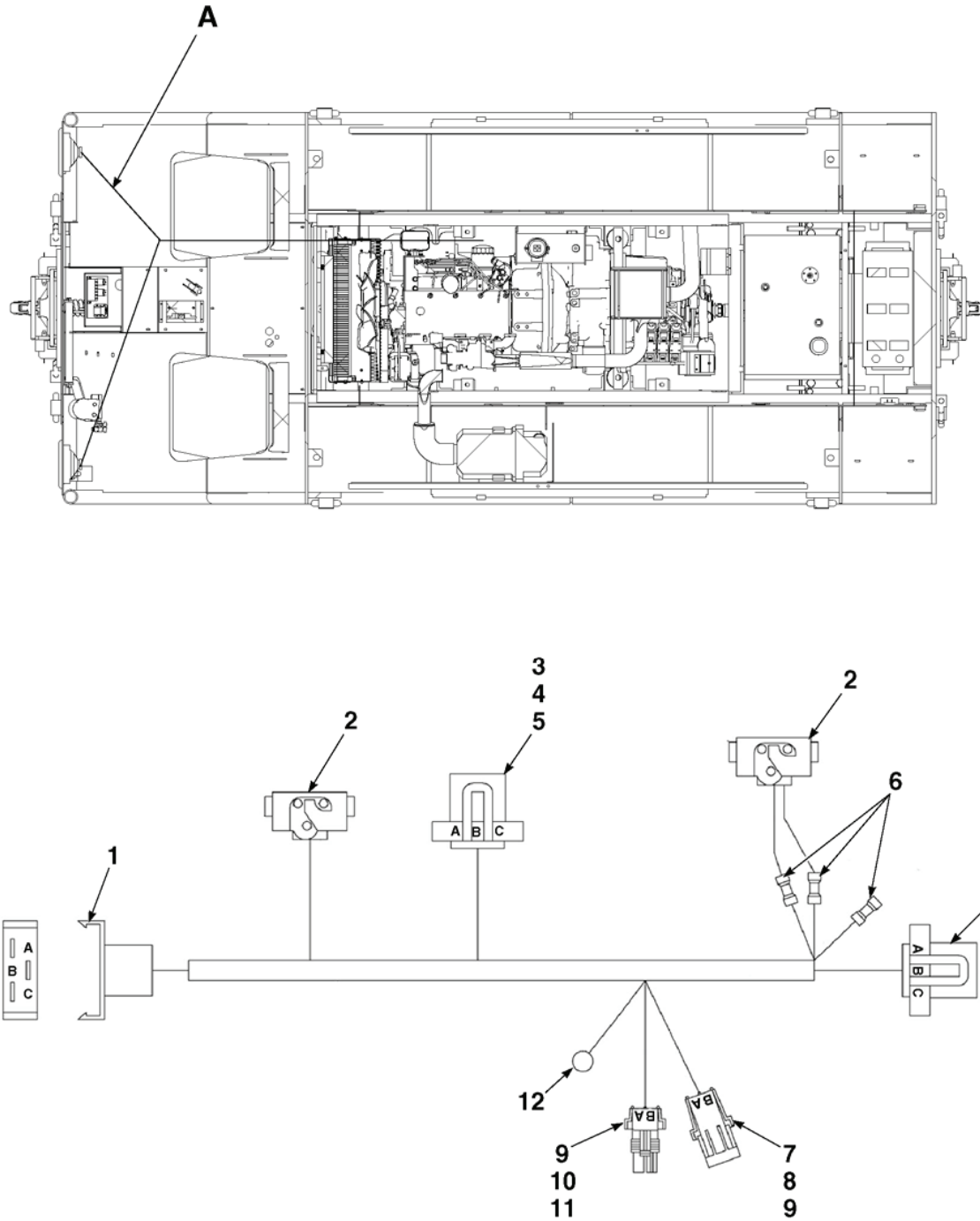


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FIGURE 53. WIRE HARNESS – REAR

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0613 WIRING HARNESSSES	
					FIGURE 53. WIRE HARNESS – REAR	
1	PAOZZ	5935-01-214-5259	77060	12015792	CONNECTOR BODY,PLUG,ELECTRICAL	1
2	PAOZZ	5999-01-422-9740	19207	12420936	CONTACT,ELECTRICAL	2
3	PAOZZ	5330-01-292-5293	77060	12015284	SEAL,CABLE	6
4	PAOZZ	5940-00-617-2896	46522	A2272	TERMINAL,LUG	2
5	PAOZZ	6150-01-079-4024	16004	66843	LEAD,ELECTRICAL	2
6	PAOZZ	5940-00-230-0515	98410	BB-825-14	TERMINAL,LUG	4
7	XBOZZ		81834	67014	PIGTAIL	2
8	PAOZZ	5940-00-143-4774	98410	BB-837-08	TERMINAL,LUG	2
9	PAOZZ	5940-00-283-5281	98410	BB-825-56	TERMINAL,LUG	1
10	PBOZZ	5935-01-336-5396	77060	1201 0974	CONNECTOR BODY,PLUG,ELECTRICAL	1
11	PAOZZ	5999-01-406-4110	77060	12124582	CONTACT,ELECTRICAL	4

END OF FIGURE

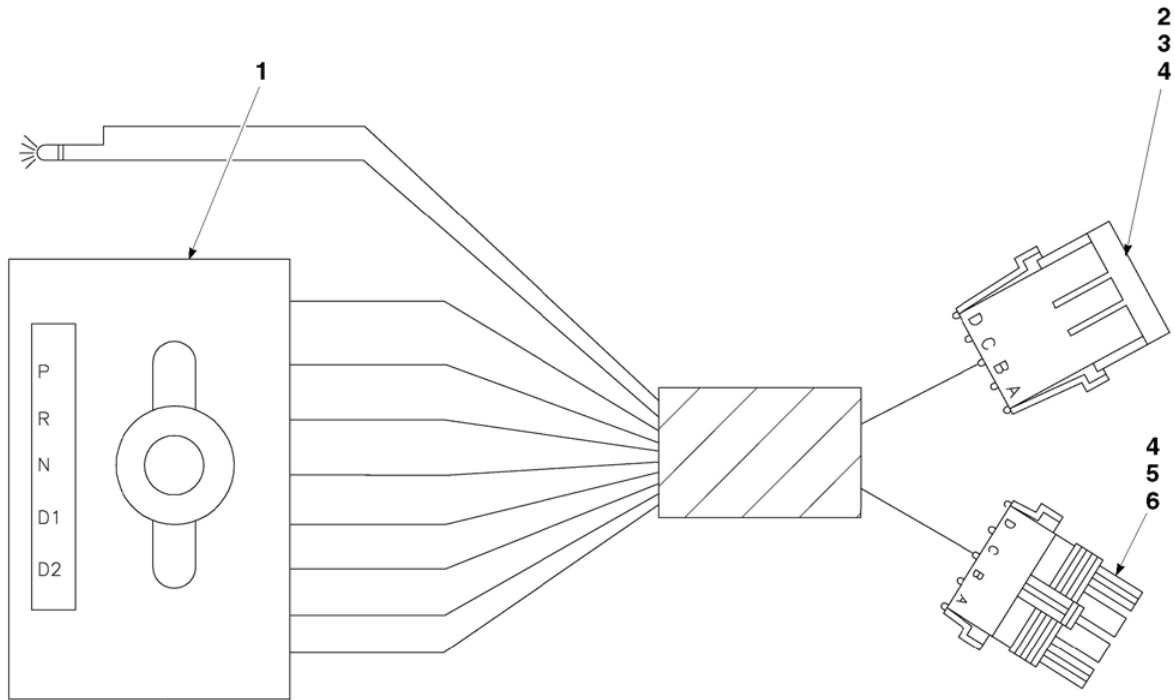


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FIGURE 54. WIRE HARNESS – FRONT

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0613 WIRING HARNESSSES	
					FIGURE 54. WIRE HARNESS - FRONT	
1	PAOZZ	2590-01-018-9416	78174	DS72	SWITCH,BEAM SELECTING,HEADLIGHT	1
2	XBOZZ		12662	421-491	PIGTAIL	2
3	XBOZZ		78422	3253460	PIGTAIL	2
4	PAOZZ	5940-01-469-7988	0FW39	12421926	TERMINAL,STUD	4
5	PAOZZ	5975-01-226-8078	77060	12010293	BOOT,DUST AND MOISTURE SEAL	4
6	XBOZZ		58961	32980	TERMINAL	3
7	PAOZZ	5935-01-214-4163	22785	12010973	CONNECTOR BODY,PLUG,ELECTRICAL	1
8	PAOZZ	5999-01-406-4110	77060	12124582	CONTACT,ELECTRICAL	2
9	PAOZZ	5330-01-292-5293	77060	12015284	SEAL,CABLE	4
10	PAOZZ	5935-01-214-5259	77060	12015792	CONNECTOR BODY,PLUG,ELECTRICAL	1
11	PAOZZ	5999-01-422-9740	19207	12420936	CONTACT,ELECTRICAL	2
12	PAOZZ	5940-00-549-9378	80064	1756198	TERMINAL,LUG	1

END OF FIGURE



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FIGURE 55. WIRE HARNESS – SHIFTER



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0613 WIRING HARNESSSES	
					FIGURE 55. WIRE HARNESS – SHIFTER	
1	PAOZZ		44185	47379	CONTROL,SHIFT ASSY	4
2	PBOZZ	5935-01-336-5396	77060	1201 0974	CONNECTOR BODY,PLUG,ELECTRICAL	1
3	PAOZZ	5999-01-406-4110	77060	12124582	CONTACT,ELECTRICAL	1
4	PAOZZ	5330-01-292-5293	77060	12015284	SEAL,CABLE	4
5	PAOZZ	5935-01-308-8599	45152	1788880	CONNECTOR BODY,PLUG,ELECTRICAL	8
6	PAOZZ	5999-01-422-9740	19207	12420936	CONTACT,ELECTRICAL	1

END OF FIGURE

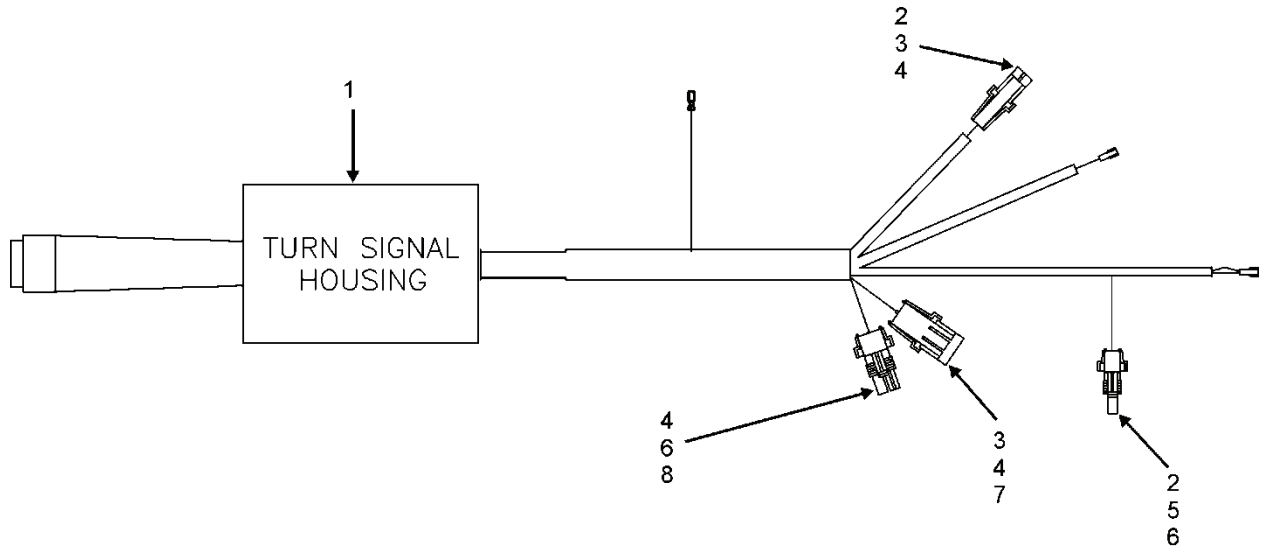
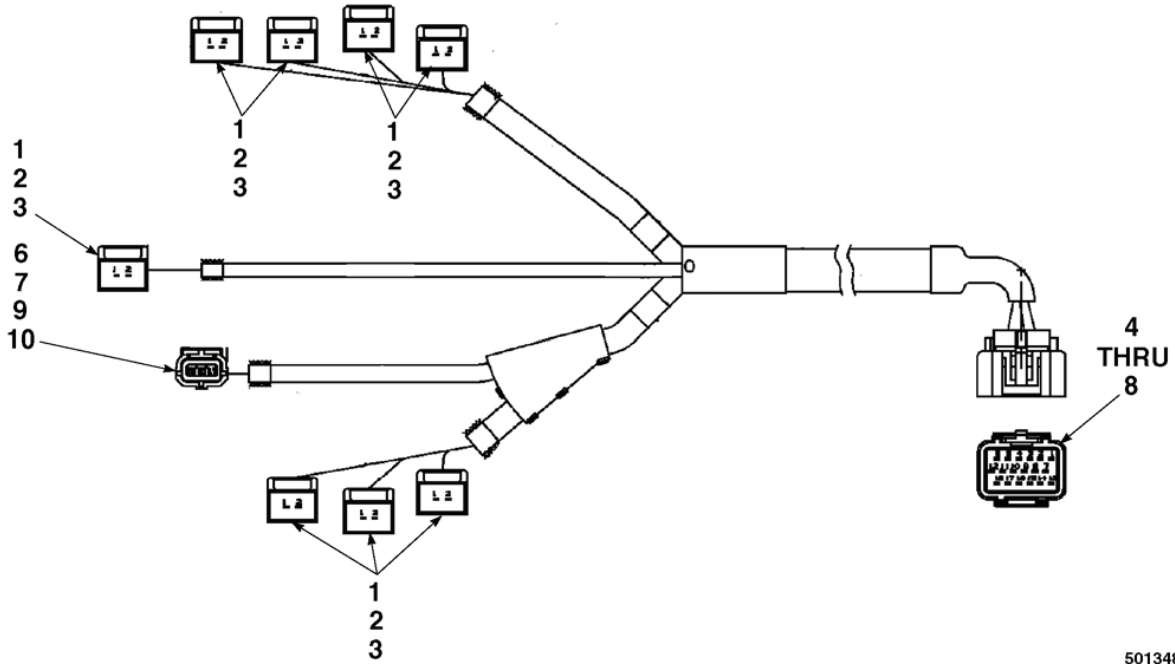


FIGURE 56. WIRE HARNESS - TURN SIGNAL

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0613 WIRING HARNESSSES	
					FIGURE 56. WIRE HARNESS - TURN SIGNAL	
1	PAOZZ		OPR58	VSM920	TURN SIGNAL ASSY	1
2	PAOZZ	5935-01-214-5259	77060	12015792	CONNECTOR BODY,PLUG,ELECTRICAL	1
3	PAOZZ	5935-01-214-4163	22785	12010973	CONNECTOR BODY,PLUG,ELECTRICAL	3
4	PAOZZ	5999-01-406-4110	77060	12124582	CONTACT,ELECTRICAL	3
5	PAOZZ	5330-01-292-5293	77060	12015284	SEAL,CABLE	6
6	PAOZZ	5935-01-291-2814	10988	L124720	CONNECTOR,PLUG,ELECTRICAL	1
7	PAOZZ	5935-01-338-3532	64678	1201 0996	CONNECTOR BODY,PLUG,ELECTRICAL	1
8	PAOZZ	5999-01-422-9740	19207	12420936	CONTACT,ELECTRICAL	3

END OF FIGURE

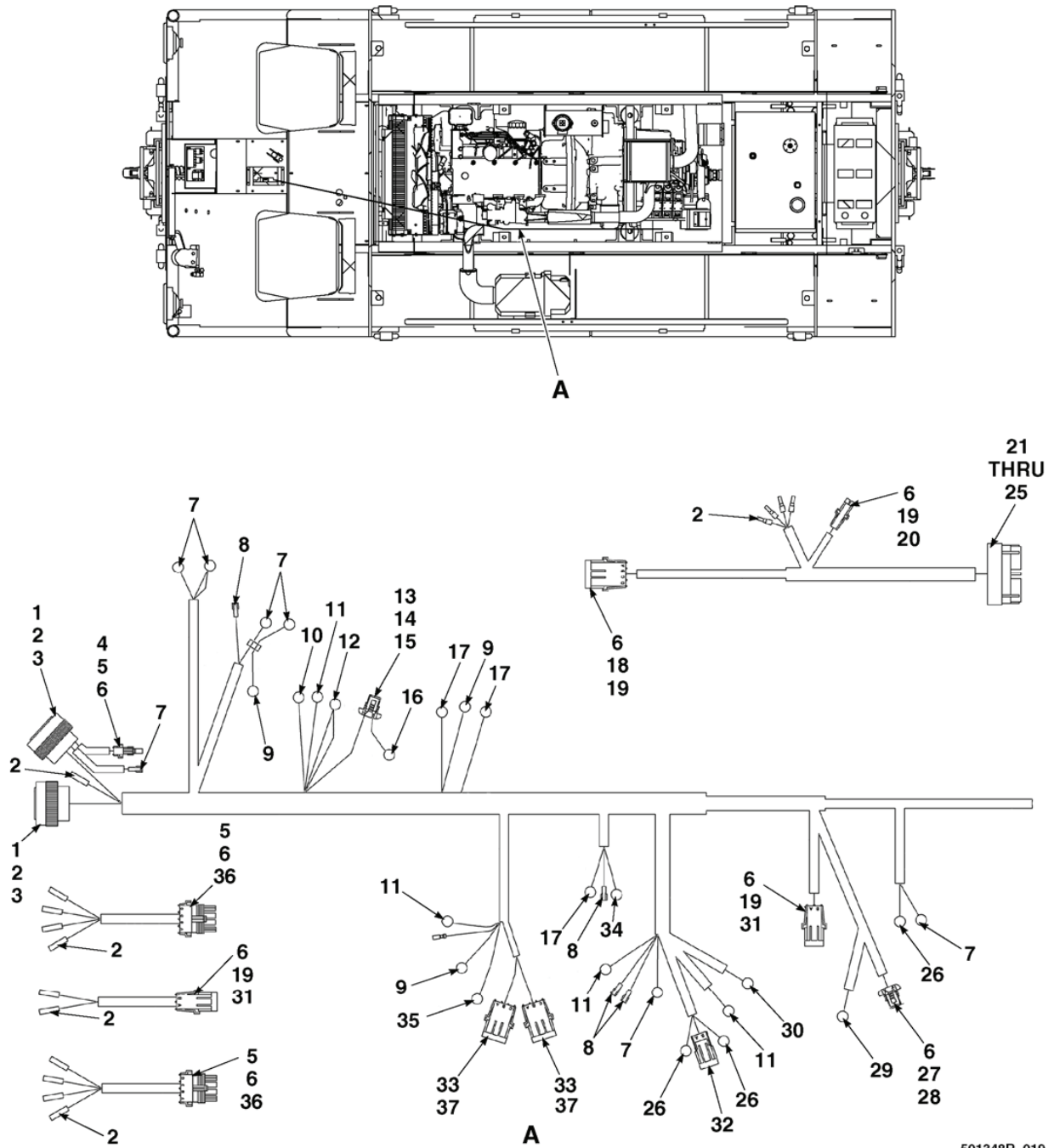


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FIGURE 57. WIRE HARNESS – TRANSMISSION

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0613 WIRING HARNESSSES	
					FIGURE 57. WIRE HARNESS –	
					TRANSMISSION	
1	PAOZZ		K1636	347887-3	HOUSING,TIMER	8
2	PBOZZ	5940-01-560-0703	00779	929939-1	TERMINAL,LUG	16
3	PBOZZ	5330-01-560-2740	00779	828904-1	SEAL,PLAIN	16
4	PAOZZ		K1636	344106-1	RECEPTACLE	1
5	PAOZZ		K1636	C344107-1	PLATE	1
6	PAOZZ		K1636	344113-1	CONNECTOR	16
7	PAOZZ	5340-01-554-4418	45152	8KP461	BOOT,DUST AND MOISTURE SEAL	16
8	PAOZZ		K7599	172748-1	SEAL,DUMMY	5
9	PAOZZ		K1636	344273-1	HOUSING, SOCKET	1
10	PAOZZ		K1636	345256-1	RETAINER, SOCKET	1

END OF FIGURE

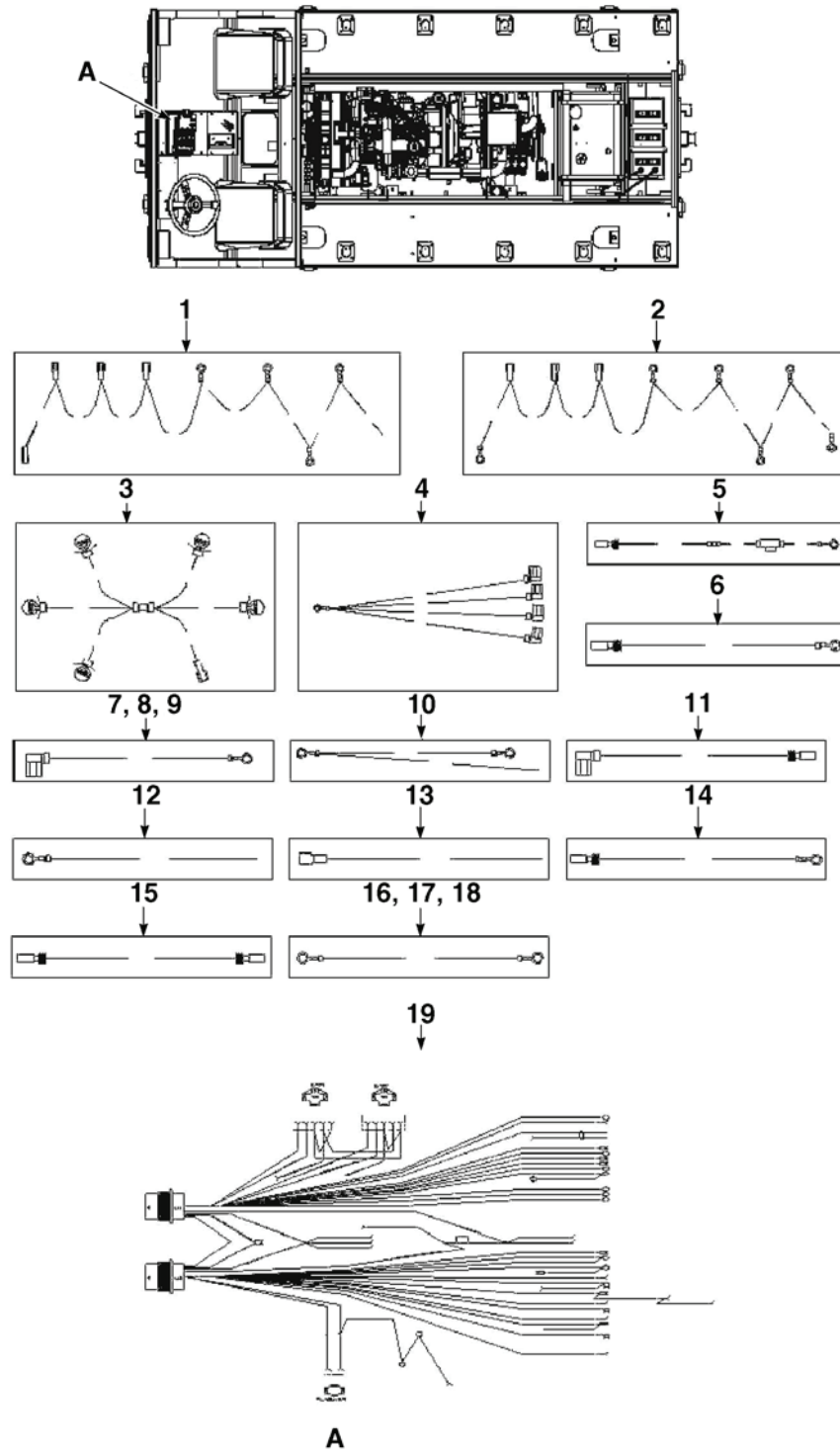


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FIGURE 58. WIRE HARNESS - ENGINE/CHASSIS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0613 WIRING HARNESES	
					FIGURE 58. WIRE HARNESS -	
					ENGINE/CHASSIS	
1	PAOZZ		4AFU8	HDP26-2423	CONNECTOR,RECEPTACLE,ELECTRICAL	2
2	PAOZZ	5999-01-372-4955	11139	0462-209-16141	CONTACT,ELECTRICAL	10
3	PAOZZ	5935-01-174-1235	11139	114017	PLUG,END SEAL,ELECTRICAL CONNECT	8
4	PAOZZ	5935-01-291-2814	10988	L124720	CONNECTOR,PLUG,ELECTRICAL	1
5	PAOZZ	5999-01-422-9740	19207	12420936	CONTACT,ELECTRICAL	5
6	PAOZZ	5330-01-292-5293	77060	12015284	SEAL,CABLE	12
7	PAOZZ	5940-00-143-4774	98410	BB-837-08	TERMINAL,LUG	6
8	PAOZZ	5940-00-048-2810	N0002	3177-3	TERMINAL BOARD	4
9	PAOZZ	5940-00-283-5281	98410	BB-825-56	TERMINAL,LUG	3
10	PAOZZ		2V507	7036K35	TERMINAL,RING	1
11	PAOZZ	5940-00-617-2896	98410	BB-839-10	TERMINAL,LUG	4
12	PAOZZ		58961	32902	TERMINAL,RING	1
13	PBOZZ	5935-01-480-9802	45152	4HB605	CONNECTOR,PLUG,ELECTRICAL	1
14	PAOZZ	5940-01-366-1563	77060	12048074	TERMINAL,QUICK DISCONNECT	2
15	PAOZZ		1V6F3	15324973	SEAL, CONNECTOR	2
16	PAOZZ	5940-00-230-0515	98410	BB-825-14	TERMINAL,LUG	1
17	PAOZZ		2V507	7036K73	TERMINAL,RING	3
18	PBOZZ	5935-01-336-5396	77060	1201 0974	CONNECTOR BODY,PLUG,ELECTRICAL	1
19	PAOZZ	5999-01-406-4110	77060	12124582	CONTACT,ELECTRICAL	7
20	PAOZZ	5935-01-338-3532	64678	1201 0996	CONNECTOR BODY,PLUG,ELECTRICAL	1
21	PAOZZ		K1636	344111-1	CONNECTOR	1
22	PAOZZ		K1636	C344112-1	CONNECTOR	1
23	PAOZZ		K1636	344113-1	CONNECTOR	11
24	PAOZZ	5340-01-554-4418	45152	8KP461	BOOT,DUST AND MOISTURE SEAL	11
25	PAOZZ		00779	C-172748	CONNECTOR	25
26	PAOZZ	5940-00-143-4793	81343	AS25036-110	TERMINAL,LUG	3
27	PAOZZ	5935-01-308-7866	1JB11	15300027	CONNECTOR BODY,PLUG,ELECTRICAL	1
28	PAOZZ	5940-01-469-7988	0FW39	12421926	TERMINAL,STUD	2
29	PAOZZ	5940-00-230-0515	00779	320563	TERMINAL,LUG	1
30	PAOZZ		2V507	7036K32	TERMINAL,RING	1
31	PAOZZ	5935-01-214-4163	22785	22785	CONNECTOR BODY,PLUG,ELECTRICAL	1
32	PAOZZ		1QQC4	1C010-65831	PLUG, FUEL	1
33	PAOZZ		1QQC4	16678-65830	PLUG,ALT	1
34	PAOZZ	5940-00-892-7874	00779	34128	TERMINAL,LUG	1
35	PAOZZ		58961	32903	TERMINAL,RING	1
36	PAOZZ	5935-01-308-8599	45152	1788880	CONNECTOR BODY,PLUG,ELECTRICAL	1
37	PAOZZ		1V6F3	12059168	CONNECTOR	2

END OF FIGURE



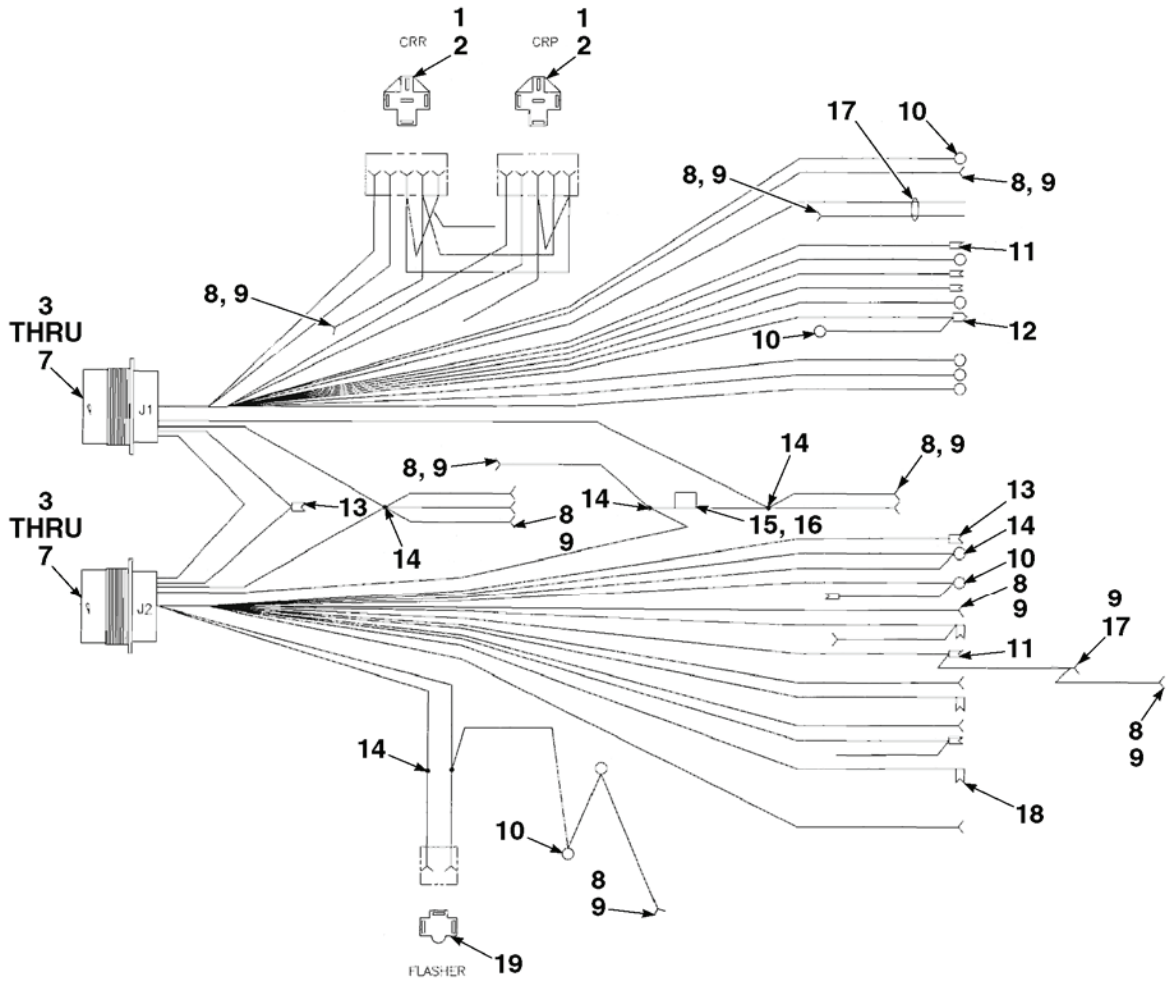
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FIGURE 59. WIRE ASSEMBLY – DASH



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0613 WIRING HARNESSSES	
					FIGURE 59. WIRE ASSEMBLY – DASH	
1	XBFZZ		44185	49203	WIREASSY,POWER	1
2	XBFZZ		44185	49204	WIREASSY,GND	1
3	XBFZZ		44185	49205	WIRE ASSY,GAUGE/LTS	1
4	XBFZZ		44185	49208	WIREASSY,FUSES	1
5	XBFZZ		44185	49202	WIREASSY,FUSE	1
6	XBFZZ		44185	49206	WIREASSY,TAN	1
7	XBFZZ		44185	49210	WIREASSY,RD/WH	1
8	XBFZZ		44185	49215	WIREASSY,JUMPER	1
9	XBFZZ		44185	49216	WIREASSY,JUMPER	1
10	XBFZZ		44185	49212	WIREASSY,JUMPER	1
11	XBFZZ		44185	49214	WIREASSY,BLK	1
12	XBFZZ		44185	49217	WIREASSY,JUMPER	1
13	XBFZZ		44185	49219	WIREASSY,JUMPER	1
14	XBFZZ		44185	49291	WIREASSY,RED	1
15	XBFZZ		44185	49220	WIREASSY,BLK	1
16	XBFZZ		44185	49211	WIREASSY,JUMPER	1
17	XBFZZ		44185	49218	WIREASSY,JUMPER	1
18	XBFZZ		44185	49209	WIREASSY,JUMPER	1
19	XCFZZ		44185	49201	HARNESS,INSTR PNL (SEE FIGURE 60 FOR BREAKOUT)	1

END OF FIGURE



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FIGURE 60. WIRE HARNESS – DASH

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM GROUP 0613 WIRING HARNESSSES FIGURE 60. WIRE HARNESS – DASH	
1	PAOZZ	5935-01-432-9536	77342	VCF4-1001	SOCKET,PLUG-IN ELECTRONIC COMPON	2
2	PAOZZ	5940-00-620-9780	00779	42281-2	TERMINAL,QUICK DISCONNECT	10
3	PAOZZ		4AFU8	HDP24-2423	CONNECTOR	2
4	PAOZZ	5999-01-373-4494	11139	0460-215-16141	CONTACT,ELECTRICAL	39
5	PAOZZ	5935-01-174-1235	11139	114017	PLUG,END SEAL,ELECTRICAL CONNECT	7
6	PAOZZ	5310-01-081-0799	27315	18Z2987	WASHER,LOCK	2
7	PAOZZ	5310-01-519-0209	11139	2411-001-2405	NUT,PLAIN,ROUND	2
8	PAOZZ	5330-01-292-5293	77060	12015284	SEAL,CABLE	16
9	PAOZZ	5940-01-526-8119	45152	7HR366	TERMINAL SET,QUICK DISCONNECT	17
10	PAOZZ	5940-00-143-4793	81343	AS25036-110	TERMINAL,LUG	10
11	PAOZZ		98410	CD-2903	TERMINAL	6
12	PAOZZ		58961	31912	TERMINAL	1
13	PAOZZ	5940-00-048-2810	N0002	3177-3	TERMINAL BOARD	2
14	PAOZZ	5940-00-283-5281	98410	BB-825-56	TERMINAL,LUG	5
15	PAOZZ		1UW16	15303-2-2-4	HOLDER,FUSE	1
16	PAOZZ		75915	02400113_P/LXN	DIODE	1
17	PAOZZ	5975-01-226-8078	77060	12010293	BOOT,DUST AND MOISTURE SEAL	1
18	PAOZZ	5940-01-530-4760	58961	31535	TERMINAL	3
19	PAOZZ		20984	07814-000	CONNECTOR	1

END OF FIGURE

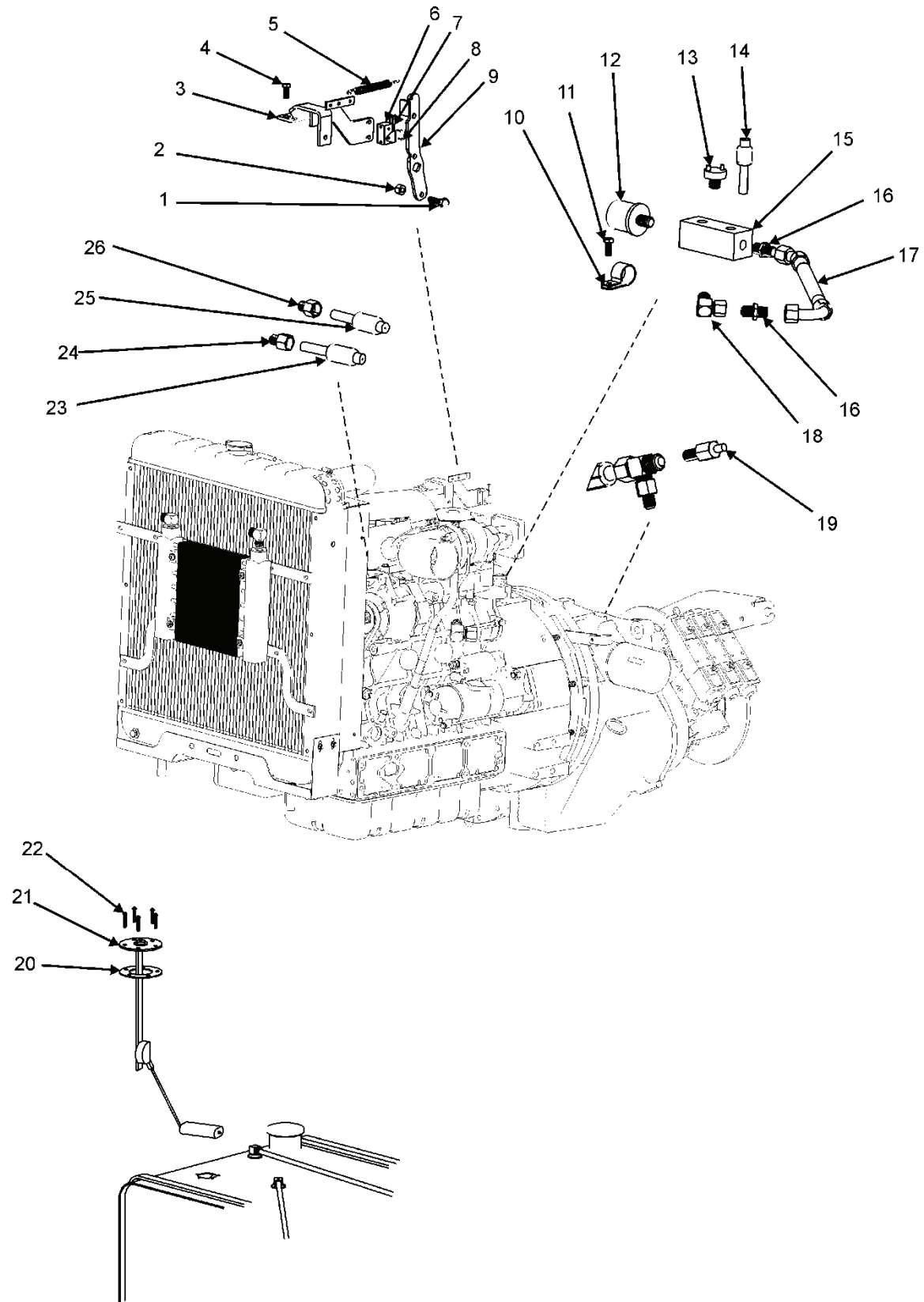


FIGURE 61. SENDING UNITS AND WARNING SWITCHES

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0610 SENDING UNITS AND	
					WARNING SWITCHES	
					FIGURE 61. SENDING UNITS AND WARNING	
					SWITCHES	
1	PAOZZ	5305-00-225-3843	80204	B1821BH025C100N	SCREW,CAP,HEXAGON HEAD	1
2	PAOZZ	5310-01-538-1880	1SE17	NAN1	NUT,PLAIN,HEXAGON	1
3	XBOZZ		44185	47739	MOUNT, THROTTLE	1
4	PAOZZ	5305-01-538-1423	1SE17	525F	SCREW,MACHINE	2
5	PAOZZ	5360-01-145-8840	44185	3492454	SPRING,HELICAL,EXTENSION	1
6	PAOZZ	5930-01-013-3785	91929	BZ-2R55-A2-S	SWITCH,SENSITIVE	1
7	XDOZZ	5930-00-254-0368	91929	AD5721R	ADAPTER,SWITCH ACTUATOR	1
8	PAOZZ	5305-00-505-2723	06710	LS15262V08-10	SCREW, MACHINE 6-32 X 1-1/4 IN	2
9	XDOZZ		44185	47943	THROTTLE WELDMENT	1
10	PAOZZ	5340-00-186-9556	96906	MS9024-24	CLAMP, HOSE	1
11	PAOZZ		2V507	96144A293	SCREW, CAP, HEX HD M12 X 125 X 25MM	1
12	PAOZZ	6620-01-262-5096	44940	193-0244	TRANSMITTER,PRESSURE	1
13	PAOZZ	5930-00-987-4676	31007	217552R91	SWITCH,PRESSURE	1
14	PAOZZ	5930-01-391-8105	OXWR1	15841-3901-0	SWITCH PRESSURE	1
15	XDOZZ		44185	48855	BLOCK, OIL SENDER	1
16	PAOZZ	4730-01-554-6236	5E240	2404-04-02	ADAPTER,STRAIGHT,TUBE TO BOSS	2
17	PAOZZ		44185	48861	HOSE	1
18	PAOZZ		1Q0C4	19484-95981	FITTING, HYDRAULIC	1
19	PBOZZ	2990-01-368-9869	16476	02023-00	SENSOR,AIR CHARGED TEMPERATURE,E	1
20	PAOZZ	5330-01-193-5315	16476	02343-02	GASKET	1
21	PAOZZ		16476	02301-17	SENDING UNIT, FUEL	1
22	PAOZZ	5305-00-984-6208	88044	AN515-10-6	SCREW,MACHINE	5
23	PAOZZ	6685-01-440-2571	16476	02022-00	TRANSMITTER,TEMPERATURE,ELECTRIC	1
24	PAOZZ		73402	BF00440	FITTING, HYDRAULIC	1
25	PAOZZ	2990-01-293-4446	33955	35423-049	SWITCH, ENGINE TEMPERATURE,AUTOMO	1
26	PAOZZ		44185	49116	FITTING, HYDRAULIC	1

END OF FIGURE

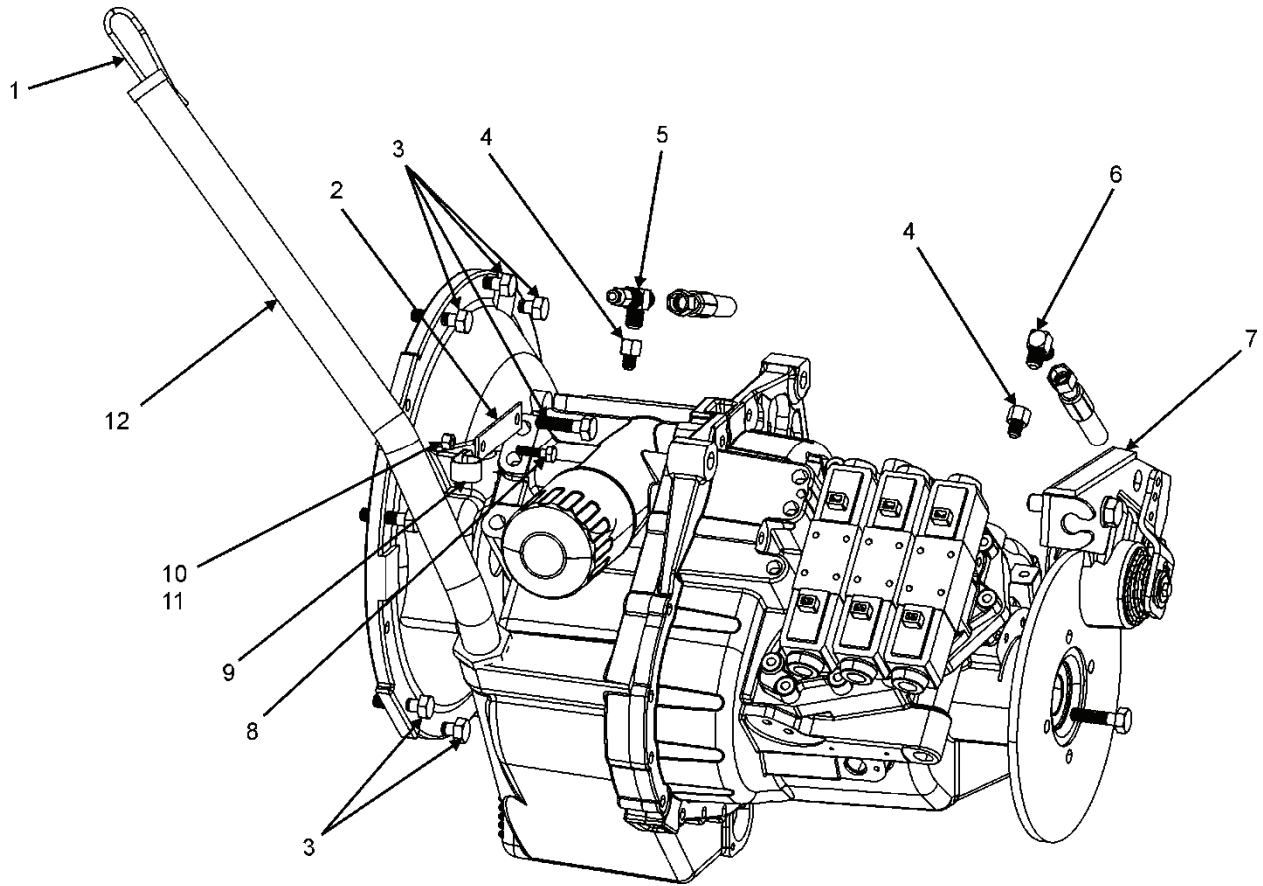


FIGURE 62. TRANSMISSION

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 62. TRANSMISSION	
	XDOZZ		44185	47377-1	TRANSMISSION	1
1	XDOZZ		44185	49921	DIPSTICK, TRANS	1
2	XDOZZ		44185	48857	BRACKET, DIPSTICK	1
3	PAOZZ	5305-00-821-3869	80204	B1821BH038C175N	SCREW,CAP,HEXAGON HEAD	12
4	PAOZZ		45X76	7002-10-10	FITTING, HYDRAULIC	2
5	PAOZZ		44185	49084	FITTING, HYDRAULIC	1
6	PAOZZ	4730-00-917-4891	16662	0001268-1010	ELBOW,TUBE	1
7	XDOZZ		44185	49127	BRACKET	1
8	PAOZZ	5305-01-524-7346	39428	92865A623	SCREW,CAP,HEXAGON HEAD	1
9	PAOZZ	5340- 01-494-3146	39428	3225T8	CLAMP,LOOP	1
10	PAOZZ	5310-00-080-6004	96906	MS27183-14	WASHER,FLAT	2
11	PBOZZ	5310-01-538-1646	1SE17	NAN3	NUT,PLAIN,HEXAGON	1
12	PAOZZ		44185	49922	TUBE, DIPSTICK, TRANS	1

END OF FIGURE

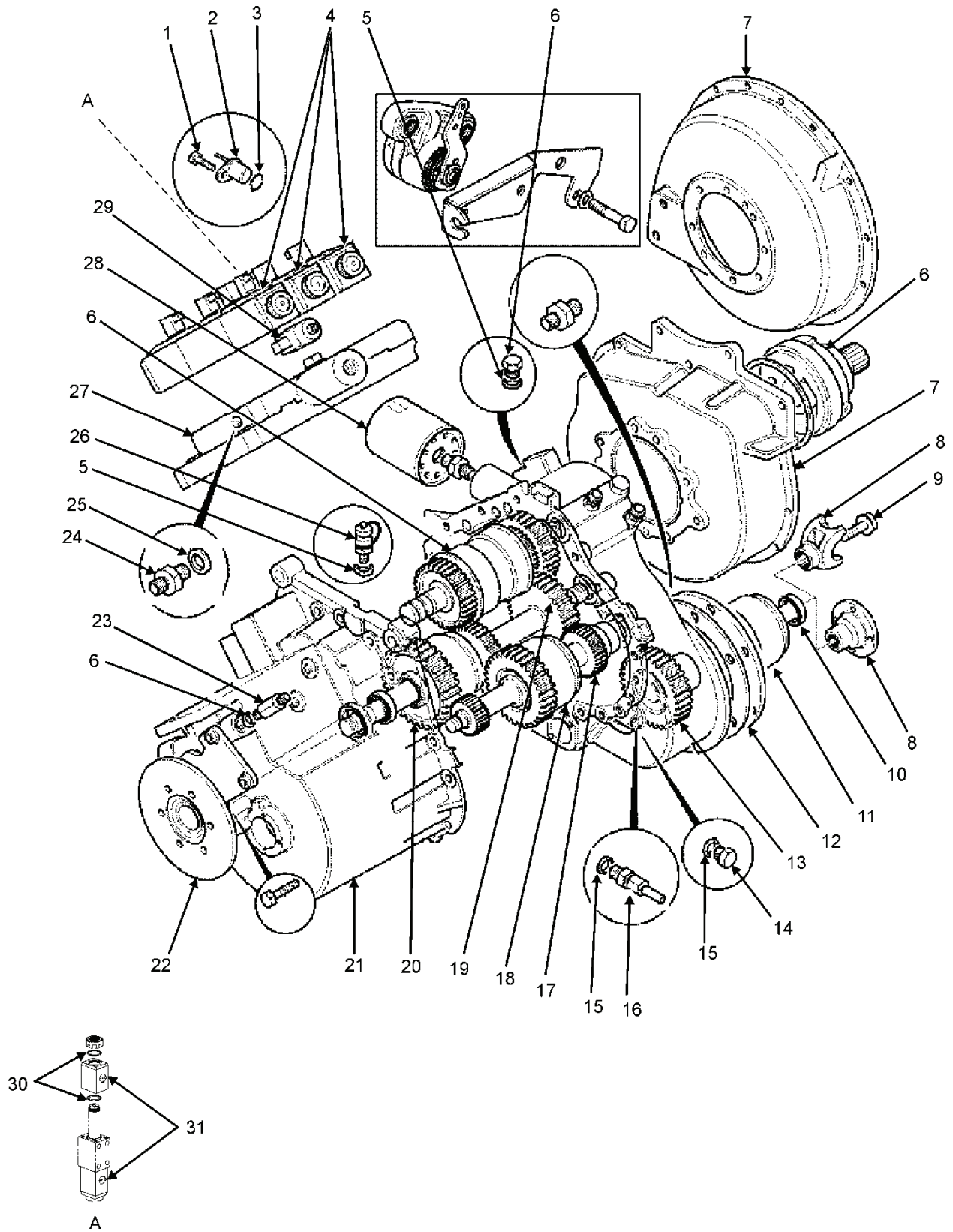


FIGURE 63. TRANSMISSION GEARBOX ASSEMBLY



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 63. TRANSMISSION GEARBOX ASSEMBLY	
1	XCDZZ		K7599	1391/3201	CAPSCREW M6 X 10MM X 12.9	1
2	XCDZZ		K7599	704/30500	SENSOR SPEED	1
3	XCDZZ		K7599	828/00376	O RING 5MM DIA SECTION	1
4	PBFZZ		K7599	25/104700	VALVE SOLENOID	3
5	XCDZZ		K7599	1406/0015	WASHER SEAL	2
6	XCDZZ		K7599	449/13240	GEARBOX COMMON COMPONENTS	1
7	XCDZZ		K7599	449/02102	HOUSING FLYWHEEL	1
8	XCDZZ		K7599	331/12043	FLANGE OUTPUT 4WD GEARBOX	1
9	XCDZZ		K7599	826/00817	NUT M24	1
10	XCDZZ		K7599	904/50023	SEAL	1
11	XCDZZ		K7599	459/10239	CLUTCH ASSEMBLY 4WD SPRING ON	1
12	XCDZZ		K7599	459/30481	COVER 4WD CLUTCH	1
13	XCDZZ		K7599	445/32501	GEAR OUTPUT 44T	1
14	XCDZZ		K7599	1603/0001	ADAPTER BUNDY PIPE	1
15	XCDZZ		K7599	1406/0011	SEAL BONDED	1
16	XCDZZ		K7599	830/11256	PIPE ASSEMBLY 4WD FEEDER PS750	1
17	XCDZZ		K7599	445/31301	GEAR INPUT 24T	1
18	XCDZZ		K7599	459/10267	LAYSHAFT CLUTCH ASSEMBLY	1
19	XCDZZ		K7599	459/10259	MAINSHAFT CLUTCH ASSEMBLY	1
20	XCDZZ		K7599	459/50761	GEAR TRANSFER 45T	1
21	XCDZZ		K7599	459/10265	CASING REAR PS750 SPEEDO	1
22	XCDZZ		K7599	460/35609	FLANGE DISC 35 TEETH	1
23	XCDZZ		K7599	816/10148	ADAPTER	1
24	XCDZZ		K7599	816/15178	ADAPTER	1
25	XCDZZ		K7599	1406/0008	SEAL WASHER	1
26	XCDZZ		K7599	45/908300	CONNECTOR PRESSURE TEST	1
27	XCDZZ		K7599	459/10090	ASSEMBLY ADAPTOR BLOCK STD PRESSURE 4WD	1
28	PBFZZ		29930	404886R1	FILTER ELEMENT, FLUID	1
29	XCDZZ		K7599	25/105100	VALVE SOLENOID C/W AMP CONNECTORS	1
30	PAOZZ		K7599	35/100801	SEAL KIT	3
31	PAOZZ		K7599	25/103001	COIL	3

END OF FIGURE

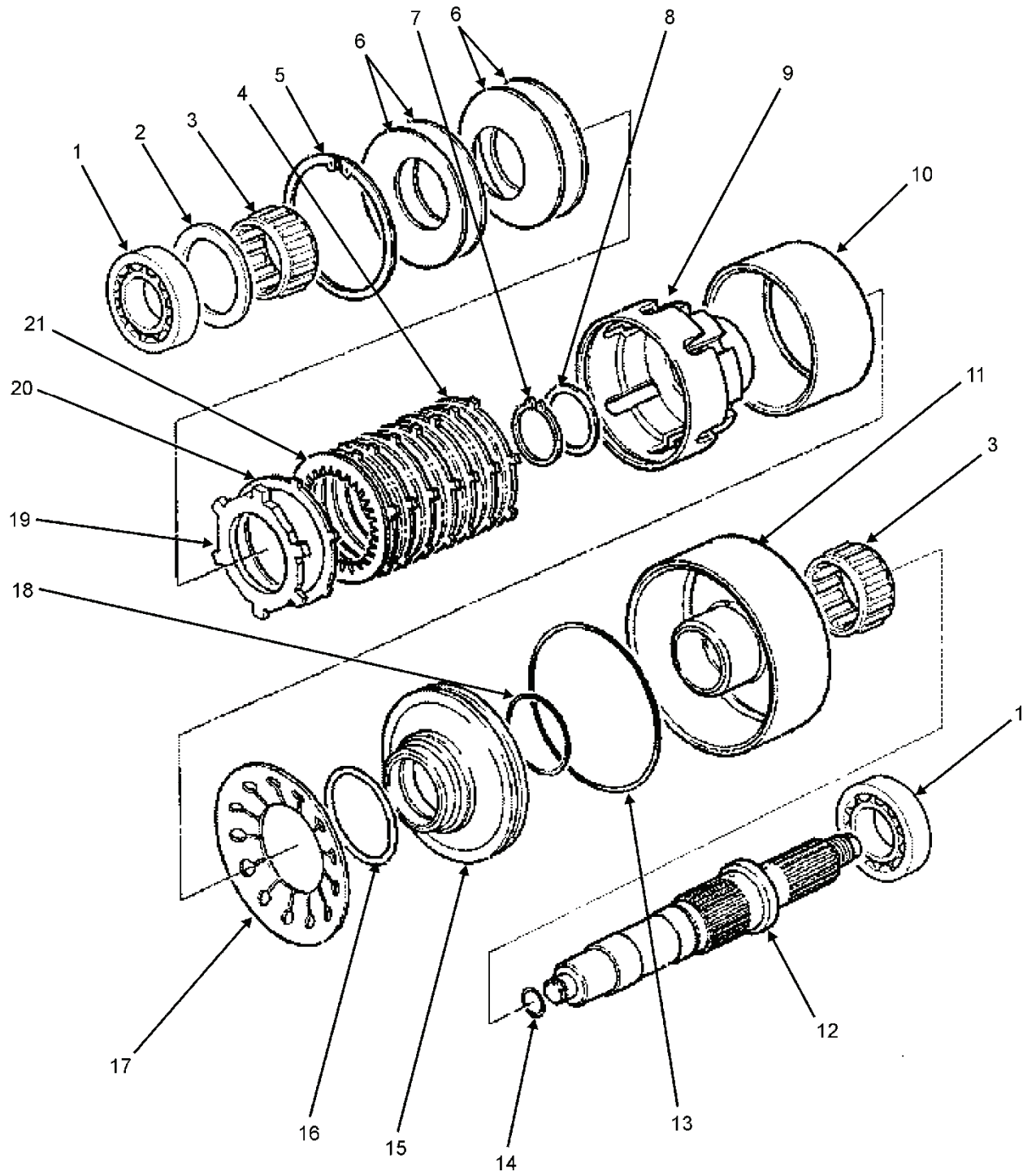


FIGURE 64. TRANSMISSION - 4 WD CLUTCH

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 64. TRANSMISSION - 4 WD CLUTCH	
1	XCDZZ		K7599	907/20031	BEARING TAPER ROLL 35 X 65 X 18	2
2	XCDZZ		K7599	823/10582	WASHER THRUST	1
3	XCDZZ		K7599	917/02600	BEARING NEEDLE ROLLER	2
4	XCDZZ		K7599	445/05107	PLATE COUNTER	11
5	XCDZZ		K7599	2203/1104	CIRCLIP	1
6	XCDZZ		K7599	445/05110	DISC SPRING	4
7	XCDZZ		K7599	821/00447	CIRCLIP	1
8	XCDZZ		K7599	445/19808	WASHER THRUST, 3.5MM THICK PHOSPHATED	1
9	XCDZZ		K7599	445/64701	DRUM CLUTCH	1
10	XCDZZ		K7599	445/19805	SLEEVE ACTUATING	1
11	XCDZZ		K7599	445/19802	HOUSING PISTON	1
12	XCDZZ		K7599	459/50689	SHAFT OUTPUT	1
13	XCDZZ		K7599	2403/0244	O RING	1
14	XCDZZ		K7599	904/14300	SEAL RING 'TURQUOISE'	1
15	XCDZZ		K7599	445/15701	PISTON	1
16	XCDZZ		K7599	445/05114	RING SPRING	1
17	XCDZZ		K7599	445/05118	DISC SPRING	1
18	XCDZZ		K7599	2403/0221	O RING	1
19	XCDZZ		K7599	445/19804	PLATE PRESSURE	1
20	XCDZZ		K7599	445/19807	PLATE SHIM	1
21	XCDZZ		K7599	445/05106	PLATE FRICTION	11

END OF FIGURE

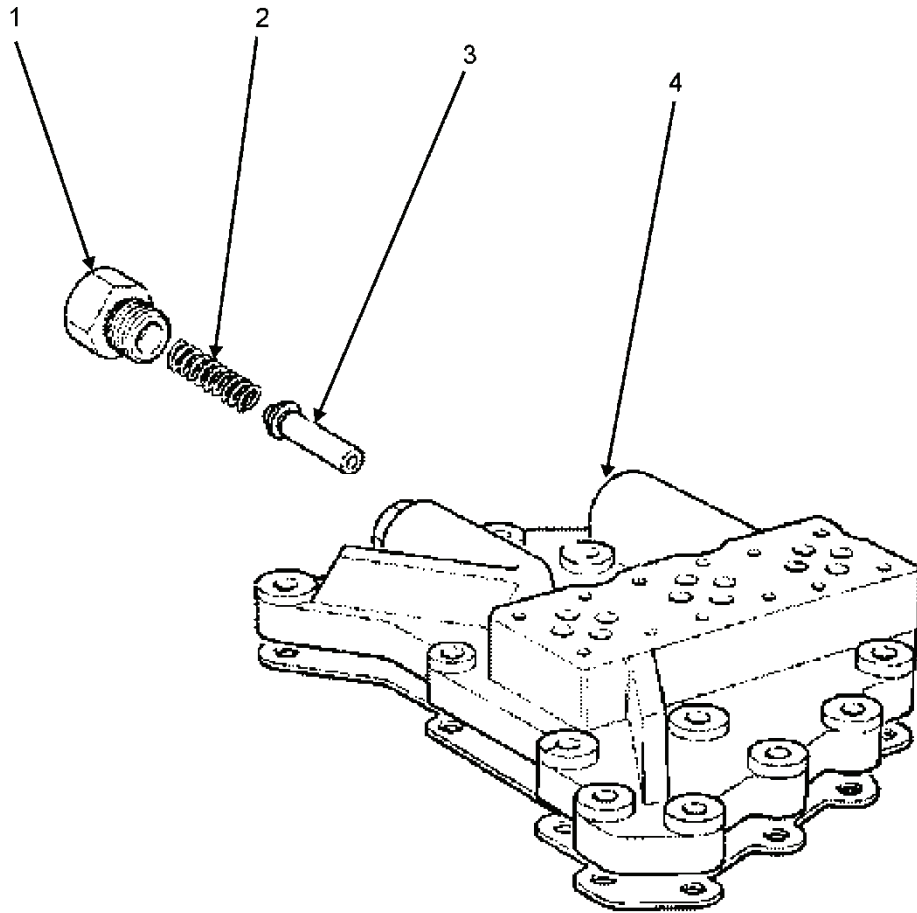


FIGURE 65. TRANSMISSION - ADAPTER BLOCK

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 65. TRANSMISSION - ADAPTER BLOCK	
1	XCDZZ		K7599	816/80061	PLUG	1
2	XCDZZ		K7599	814/00407	SPRING	1
3	XCDZZ		K7599	459/70168	SPOOL ADAPTER SOLENOID	1
4	XCDZZ	.	K7599	449/11451	BLOCK ADAPTOR	1

END OF FIGURE

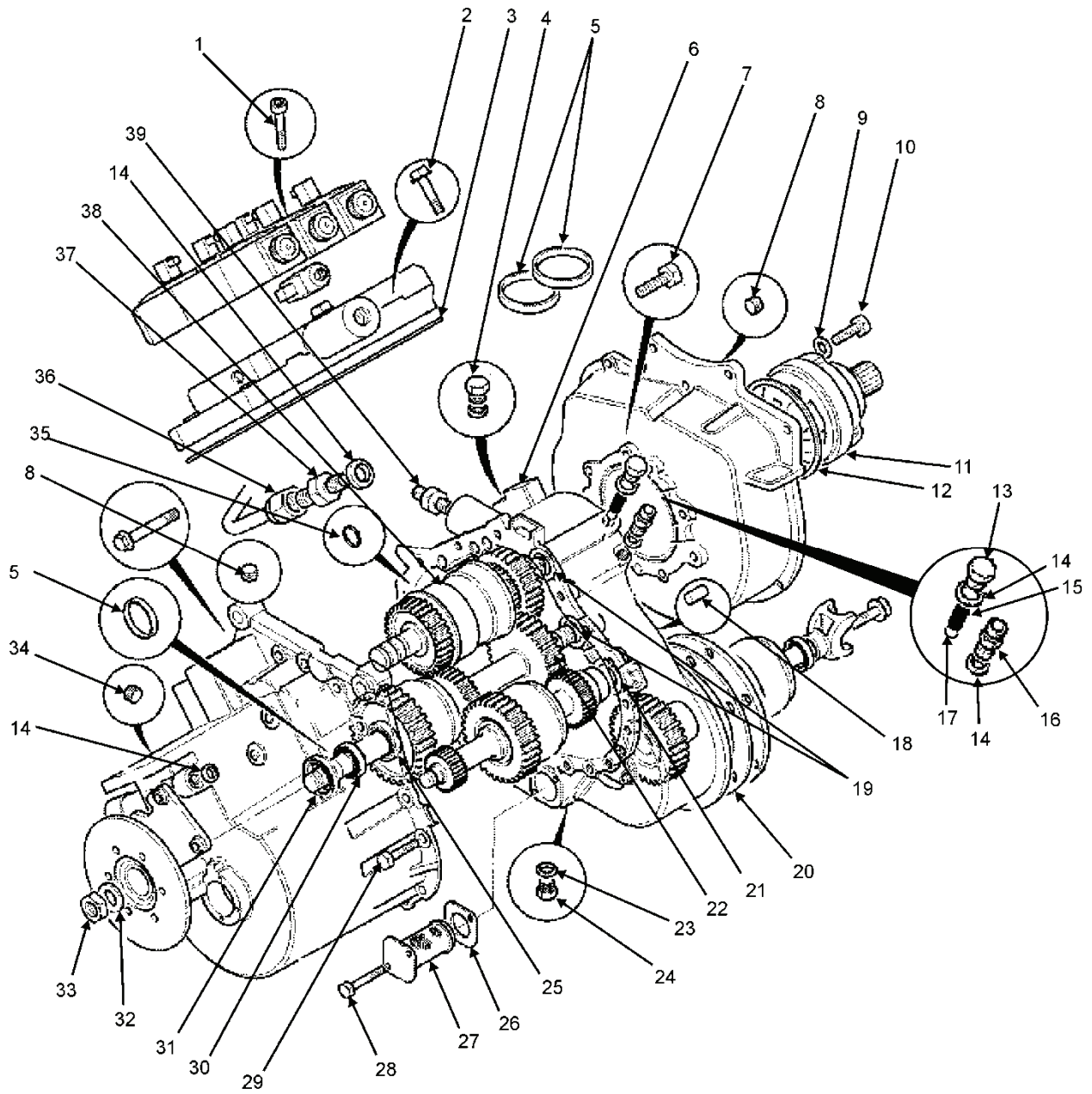


FIGURE 66. TRANSMISSION GEARBOX COMMON PARTS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 66. TRANSMISSION GEARBOX	
					COMMON PARTS	
1	XCDZZ		K7599	1391/3108Z	CAPSCREW M5 X 30MM	12
2	XCDZZ		K7599	1315/0308Z	SCREW M8X30	14
3	XCDZZ		K7599	813/M1221	GASKET - VALVE BLOCK DOWPRINT	1
4	XCDZZ		K7599	816/80005	PLUG 3/8"BSP	1
5	XCDZZ		K7599	921/53400	KIT-SPACER	1
6	XCDZZ		K7599	459/30470	CASING FRONT PS750 4WD	1
					AVAILABLE AS A KIT	
7	XCDZZ		K7599	1315/0409Z	SCREW M10X35MM	11
8	XCDZZ		K7599	816/80053	PLUG 3/8" TAPERED	8
9	XCDZZ		K7599	823/00291	WASHER COPPER	4
10	XCDZZ		K7599	1315/3311Z	BOLT M8 X 45	6
11	XCDZZ		K7599	20/925327	PUMP	1
12	XCDZZ		K7599	813/50041	SEAL REAR	1
13	XCDZZ		K7599	816/80041	PLUG 1/2"BSP 25.65MM A/F	3
14	XCDZZ		K7599	1406/0018	SEAL BONDED 1/2" BSP	7
15	XCDZZ		K7599	814/00222	SPRING	1
16	XCDZZ		K7599	1606/0017	ADAPTER 5/8" X 1/2" M/M	1
17	XCDZZ		K7599	916/00008	BEARING 14DIA BALL	1
18	XCDZZ		K7599	445/14001	DOWEL	6
19	XCDZZ		K7599	823/10738	SHIM 1.0MM PS750 SET-RIGHT	4
20	XCDZZ		K7599	813/50054	GASKET	1
21	XCDZZ		K7599	823/10740	SHIM 1.0MM	1
22	XCDZZ		K7599	459/10247	INPUT CLUTCH ASSEMBLY	1
23	XCDZZ		K7599	1406/0026	WASHER SEAL1 INCH BSP, FITTED UP	1
					TO APRIL 2008 APPROX	
24	XCDZZ		K7599	816/80047	PLUG 1"BSP 42.42MM A/F 1 INCH BSP,	1
					FITTED UP TO APRIL 2008 APPROX	
25	XCDZZ		K7599	907/20045	BEARING TAPER ROLLER	1
26	XCDZZ		K7599	813/50027	GASKET	1
27	XCDZZ		K7599	32/902200	STRAINER SUCTION	1
28	XCDZZ		K7599	1321/0303Z	SCREW M8 X 16	2
29	XCDZZ		K7599	826/01417	BOLT	30
30	XCDZZ		K7599	907/53700	BEARING	1
31	XCDZZ		K7599	904/05100	SEAL	1
32	XCDZZ		K7599	823/00331	WASHER	1
33	XCDZZ		K7599	826/01551	NUT STAKE M30 (46MM HEAD)	1
34	XCDZZ		K7599	816/80051	PLUG 1/8" TAPERED	10
35	XCDZZ		K7599	828/10222	O RING	3
36	XCDZZ		K7599	449/01700	PIPE ASSY MAINSHAFT FEED	1
37	XCDZZ		K7599	1603/0003	ADAPTER	2
38	XCDZZ		K7599	459/10248	REVERSE CLUTCH ASSEMBLY	1
39	XCDZZ		K7599	816/15184	ADAPTER 1/2"BSPX1"UNF	1

END OF FIGURE

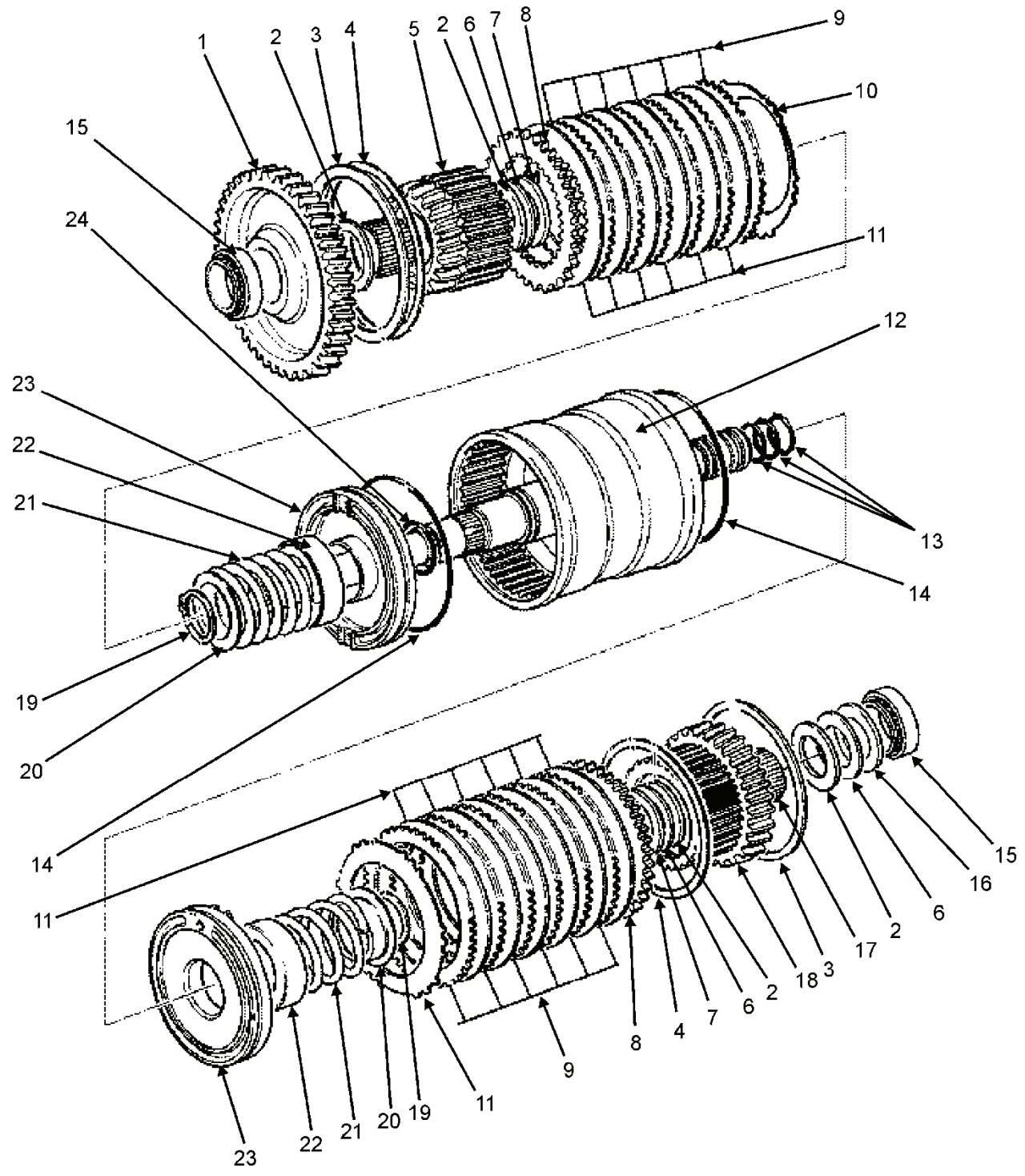


FIGURE 67. TRANSMISSION - REVERSE CLUTCH



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 67. TRANSMISSION - REVERSE CLUTCH	
1	XCDZZ		K7599	459/50683	GEAR 48T	1
2	XCDZZ		K7599	445/26108	WASHER THRUST	4
3	XCDZZ		K7599	2203/1115	CIRCLIP	2
4	XCDZZ		K7599	445/12314	SHIM PLATE, TOOTHED	0
5	XCDZZ		K7599	449/10003	HOUSING PLATE CARRIER ASSY 22T & 45T	1
6	XCDZZ		K7599	917/02800	BEARING THRUST	4
7	XCDZZ		K7599	445/12303	WASHER THRUST	2
8	XCDZZ		K7599	459/10171	KIT PRESSURE PLATE 6MM & 6.5MM	2
9	XCDZZ		K7599	445/12307	PLATE COUNTER	12
10	XCDZZ		K7599	449/10501	DISC SPRING SPLINED	2
11	XCDZZ		K7599	445/30011	PLATE FRICTION	12
12	XCDZZ		K7599	459/50724	HOUSING REVERSE CLUTCH	1
13	XCDZZ		K7599	904/50020	SEAL RING	3
14	XCDZZ		K7599	828/00414	O RING 123.5MM I/D	2
15	XCDZZ		K7599	907/20031	BEARING TAPER ROLL 35 X 65 X 18	2
16	XCDZZ		K7599	823/10327	WASHER THRUST	1
17	XCDZZ		K7599	917/02700	BEARING	2
18	XCDZZ		K7599	449/10002	HOUSING PLATE CARRIER ASSY 31T & 45T	1
19	XCDZZ		K7599	821/00523	CIRCLIP	2
20	XCDZZ		K7599	445/40203	SPRING RETAINING	2
21	XCDZZ		K7599	814/00345	SPRING	2
22	XCDZZ		K7599	445/40204	BAFFLE OIL	2
23	XCDZZ		K7599	449/11370	PISTON ASSEMBLY	2
24	XCDZZ		K7599	828/00224	O RING 39.7MM I/D X 3.53MM	2

END OF FIGURE

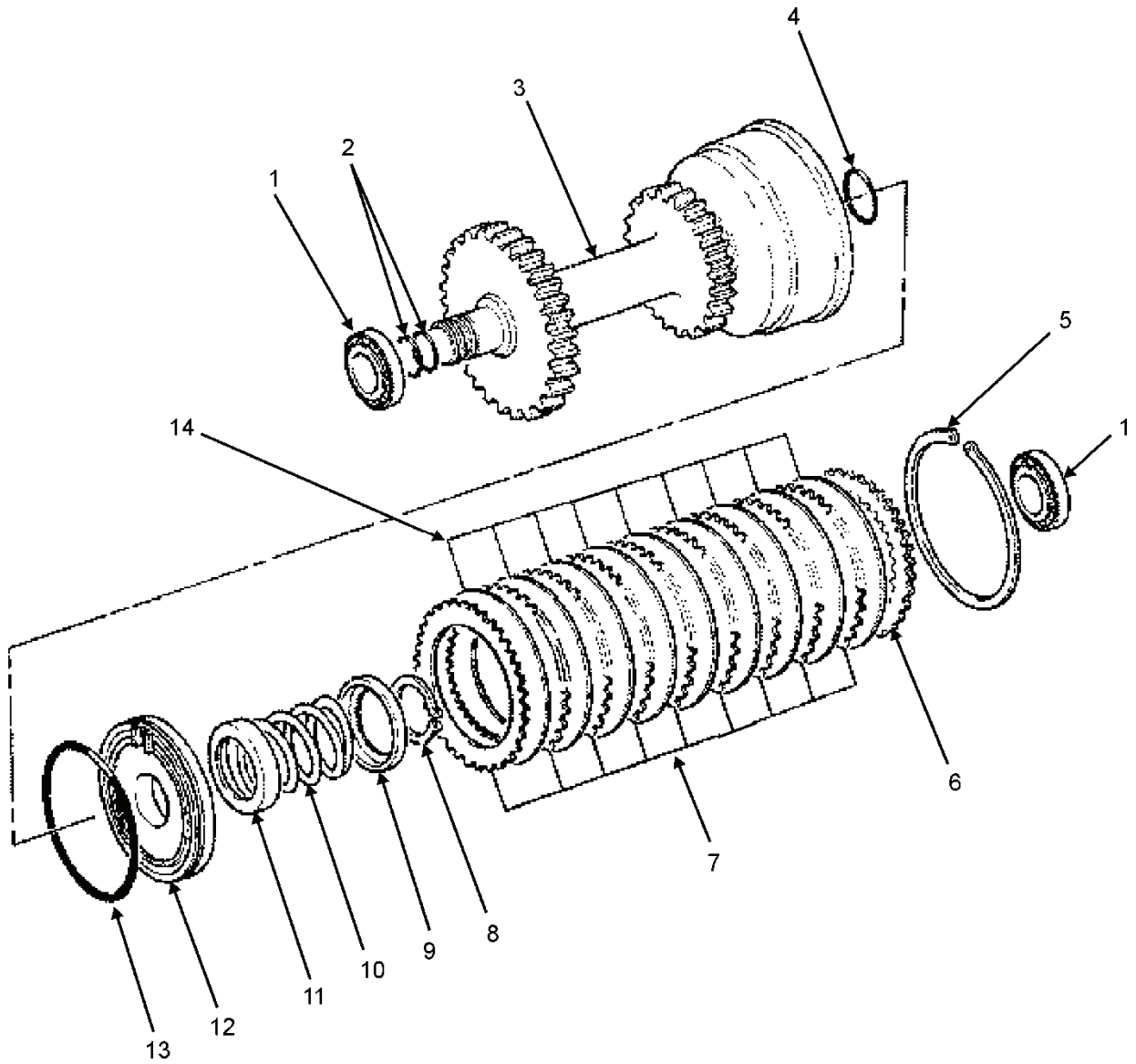


FIGURE 68. TRANSMISSION - MAINSHAFT CLUTCH

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 68. TRANSMISSION - MAINSHAFT CLUTCH	
1	XCDZZ		K7599	907/20031	BEARING TAPER ROLL 35 X 65 X 18	2
2	XCDZZ		K7599	904/50020	SEAL RING	2
3	XCDZZ		K7599	459/50715	GEAR MAINSHAFT	1
4	XCDZZ		K7599	828/00224	O RING 39.7MM I/D X 3.53MM	1
5	XCDZZ		K7599	2203/1115	CIRCLIP	1
6	XCDZZ		K7599	459/10171	KIT PRESSURE PLATE 6MM & 6.5MM	1
7	XCDZZ		K7599	445/12307	PLATE COUNTER	9
8	XCDZZ		K7599	821/00523	CIRCLIP	1
9	XCDZZ		K7599	445/12304	RETAINER SPRING	1
10	XCDZZ		K7599	814/00297	SPRING	1
11	XCDZZ		K7599	331/38655	BAFFLE OIL	1
12	XCDZZ		K7599	449/10900	PISTON ASSEMBLY	1
13	XCDZZ		K7599	828/00414	O RING 123.5MM I/D	1
14	XCDZZ		K7599	445/03205	PLATE FRICTION	9

END OF FIGURE

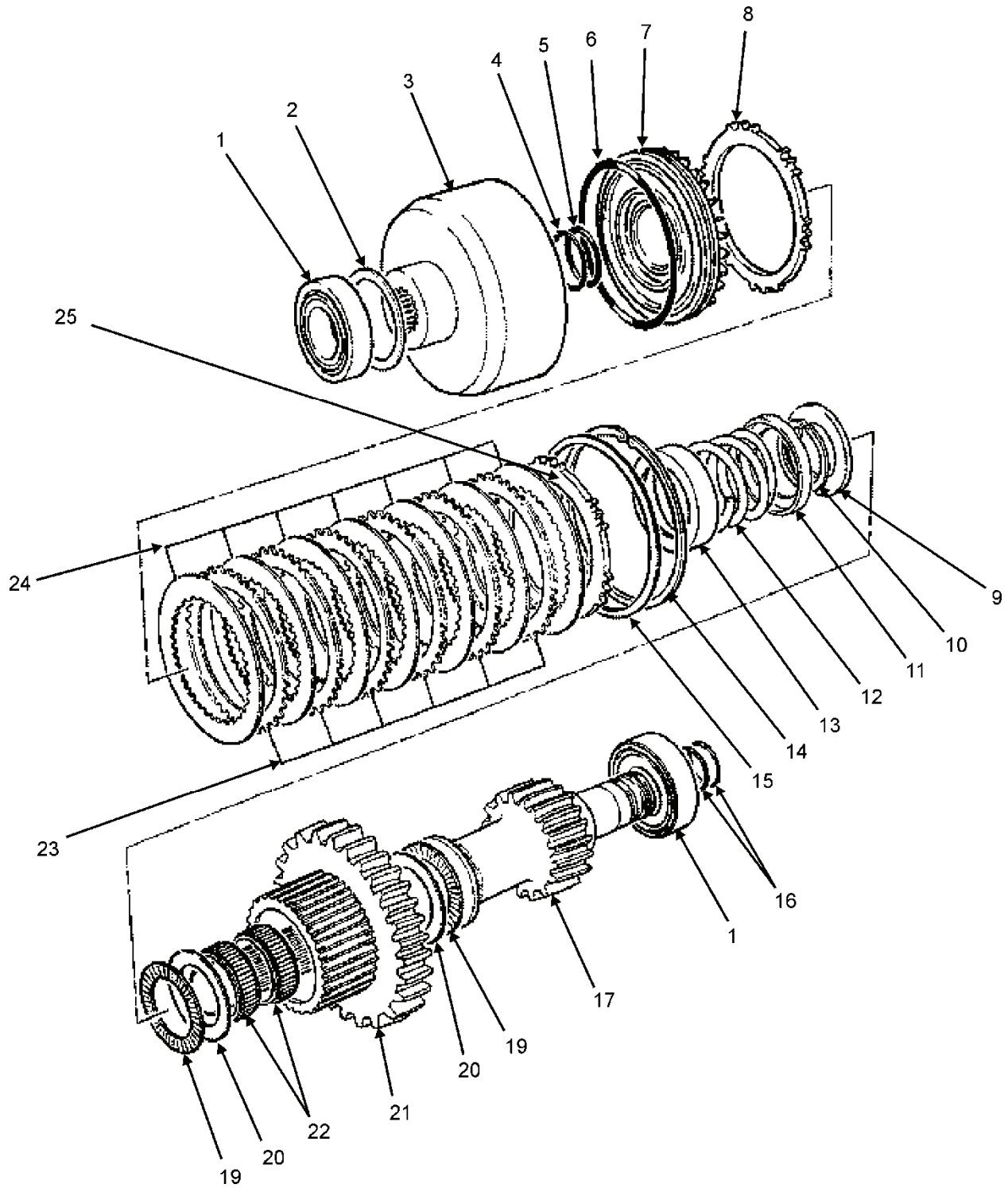


FIGURE 69. TRANSMISSION - LAYSHAFT CLUTCH

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 69. TRANSMISSION -	
					LAYSHAFT CLUTCH	
1	XCDZZ		K7599	907/20049	BEARING TAPER ROLLER	2
2	XCDZZ		K7599	823/10327	WASHER THRUST	1
3	XCDZZ		K7599	459/50411	HOUSING CLUTCH LAYSHAFT	1
4	XCDZZ		K7599	828/00231	O RING	1
5	XCDZZ		K7599	828/00224	O RING 39.7MM I/D X 3.53MM	1
6	XCDZZ		K7599	828/00414	O RING 123.5MM I/D	1
7	XCDZZ		K7599	449/10900	PISTON ASSEMBLY	1
8	XCDZZ		K7599	331/31560	PLATE PRESSURE 4MM	1
9	XCDZZ		K7599	445/30007	WASHER	1
10	XCDZZ		K7599	821/00523	CIRCLIP	1
11	XCDZZ		K7599	445/12304	RETAINER SPRING	1
12	XCDZZ		K7599	814/00297	SPRING	1
13	XCDZZ		K7599	445/12305	BAFFLE OIL	1
14	XCDZZ		K7599	2203/1115	CIRCLIP	1
15	XCDZZ		K7599	445/12314	SHIM PLATE, TOOTHED	0
16	XCDZZ		K7599	904/50020	SEAL RING	2
17	XCDZZ		K7599	459/50680	GEAR LAYSHAFT - 18T PS750	1
19	XCDZZ		K7599	917/50300	BEARING NEEDLE 70 X 50 X 3 MM	2
20	XCDZZ		K7599	831/00113	WASHER THRUST 50 X 70 X 1 MM	2
21	XCDZZ		K7599	449/10812	GEAR 40T	1
22	XCDZZ		K7599	917/50400	BEARING NEEDLE ROLLER	2
23	XCDZZ		K7599	445/12307	PLATE COUNTER	6
24	XCDZZ		K7599	445/30011	PLATE FRICTION	7
25	XCDZZ		K7599	459/10171	KIT PRESSURE PLATE 6MM & 6.5MM	1

END OF FIGURE

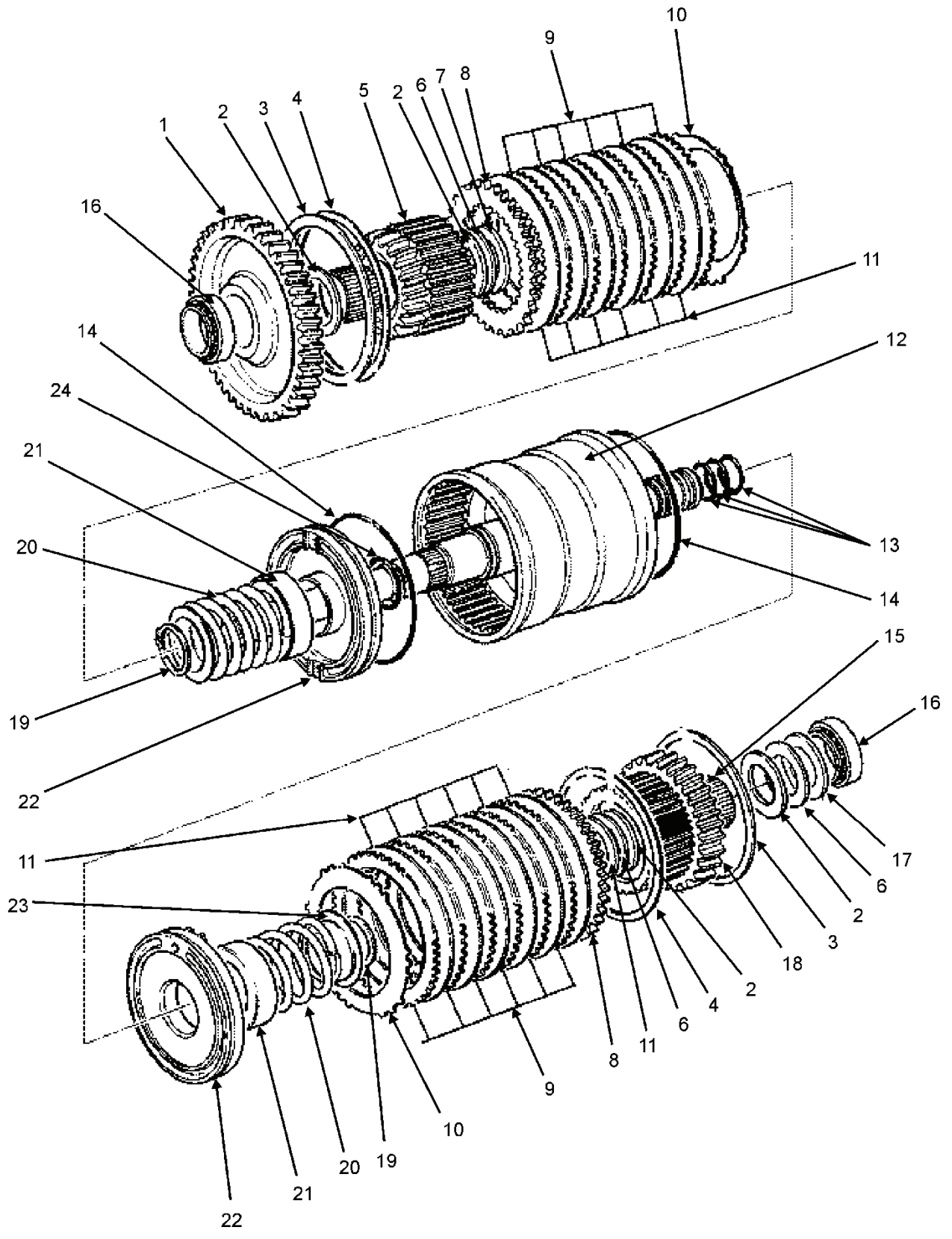


FIGURE 70. TRANSMISSION - INPUT CLUTCH

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 70. TRANSMISSION - INPUT CLUTCH	
1	XCDZZ		K7599	459/50683	GEAR 48T	1
2	XCDZZ		K7599	445/26108	WASHER THRUST	4
3	XCDZZ		K7599	2203/1115	CIRCLIP	2
4	XCDZZ		K7599	445/12314	SHIM PLATE, TOOTHED	0
5	XCDZZ		K7599	449/10003	HOUSING PLATE CARRIER ASSY 22T & 45T	1
6	XCDZZ		K7599	917/02800	BEARING THRUST	4
7	XCDZZ		K7599	445/12303	WASHER THRUST	2
8	XCDZZ		K7599	459/10171	KIT PRESSURE PLATE 6MM & 6.5MM	2
9	XCDZZ		K7599	445/12307	PLATE COUNTER	12
10	XCDZZ		K7599	449/10501	DISC SPRING SPLINED	2
11	XCDZZ		K7599	445/30011	PLATE FRICTION	12
12	XCDZZ		K7599	459/50722	HOUSING INPUT CLUTCH	1
13	XCDZZ		K7599	904/50020	SEAL RING	4
14	XCDZZ		K7599	828/00414	O RING 123.5MM I/D	2
15	XCDZZ		K7599	917/02700	BEARING	2
16	XCDZZ		K7599	907/20031	BEARING TAPER ROLL 35 X 65 X 18	2
17	XCDZZ		K7599	823/10327	WASHER THRUST	1
18	XCDZZ		K7599	449/10002	HOUSING PLATE CARRIER ASSY 31T & 45T	1
19	XCDZZ		K7599	821/00523	CIRCLIP	2
20	XCDZZ		K7599	814/00345	SPRING	2
21	XCDZZ		K7599	445/40204	BAFFLE OIL	2
22	XCDZZ		K7599	449/11370	PISTON ASSEMBLY	2
23	XCDZZ		K7599	445/40203	SPRING RETAINING	2
24	XCDZZ		K7599	828/00224	O RING 39.7MM I/D X 3.53MM	2

END OF FIGURE

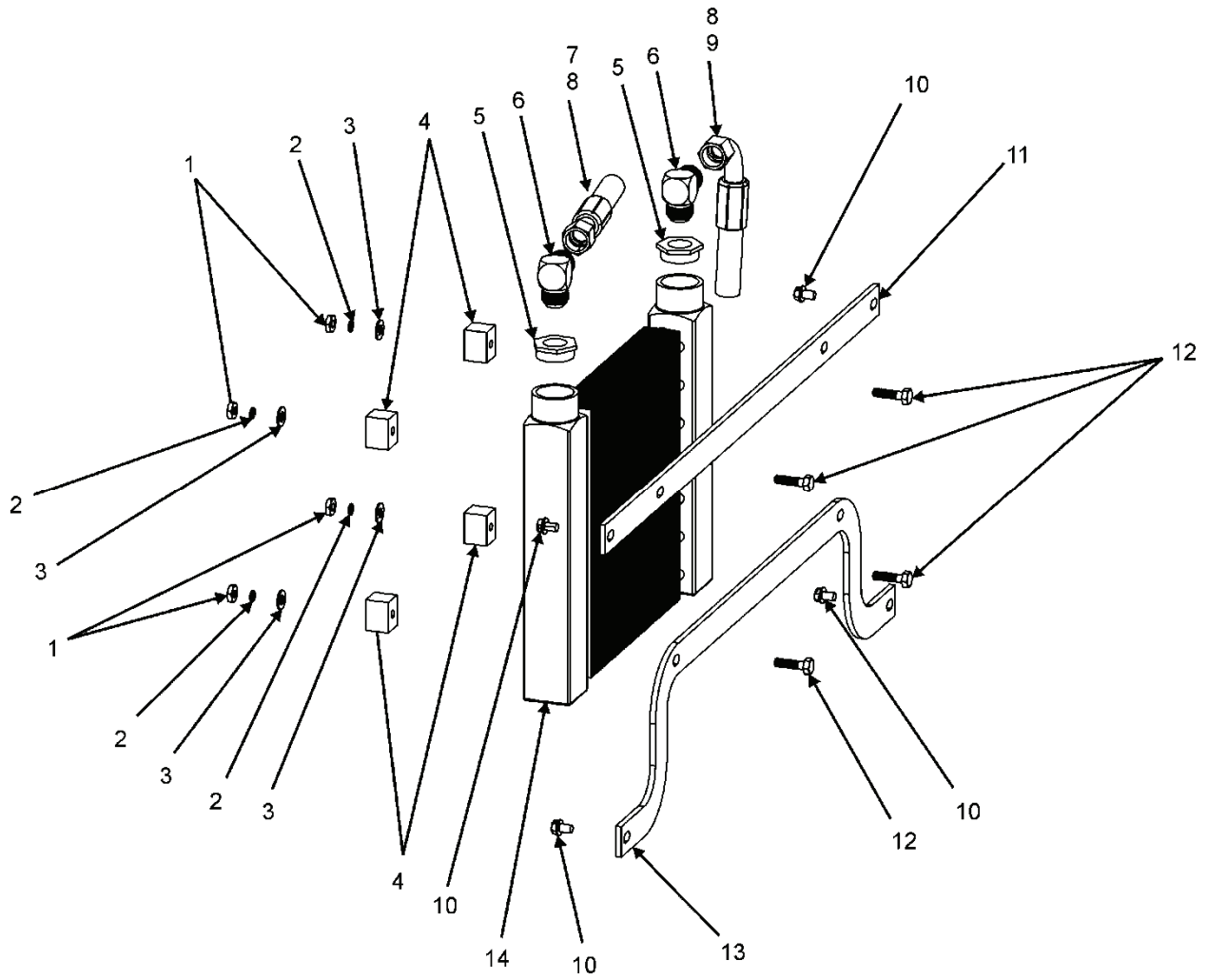


FIGURE 71. TRANSMISSION OIL COOLER



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					FIGURE 71. TRANSMISSION OIL	
					COOLER	
1	PAOZZ	5310-00-543-2629	96906	MS35690-502	NUT,PLAIN,HEXAGON	4
2	PAOZZ	5310-00-081-4219	96906	MS27183-12	WASHER,FLAT	4
3	PAOZZ	5310-00-407-9566	80205	MS35338-45	WASHER,LOCK	4
4	PAOZZ	2815-01-174-9480	1FDW0	DB-515-B	SPACER	4
5	PAOZZ	4730-00-890-4983	5E240	5406-16-8	REDUCER,PIPE	2
6	PAOZZ	4730-01-547-5057	0S1H5	2501-10-08	ELBOW,PIPE TO HOSE	2
7	PAOZZ		44185	48260	HOSEASSY	1
8	PAOZZ		0S1H5	NHS-153-300	SLEEVE, NYLON	1
9	PAOZZ		44185	48259	HOSEASSY 90	1
10	PAOZZ	5305-01-359-8002	19207	12346514-32	SCREW,CAP,HEXAGON HEAD	4
11	XDOZZ		44185	47628	MOUNT, COOLER, UPPER	1
12	PAOZZ		1SE17	TYVV	BOLT, CARRIAGE 5/16-18 X 2-1/2 IN	4
13	XDOZZ		44185	47627	MOUNT, COOLER, LOWER	1
14	PAOZZ		1FDW0	DB1267	OILCOOLER	1

END OF FIGURE

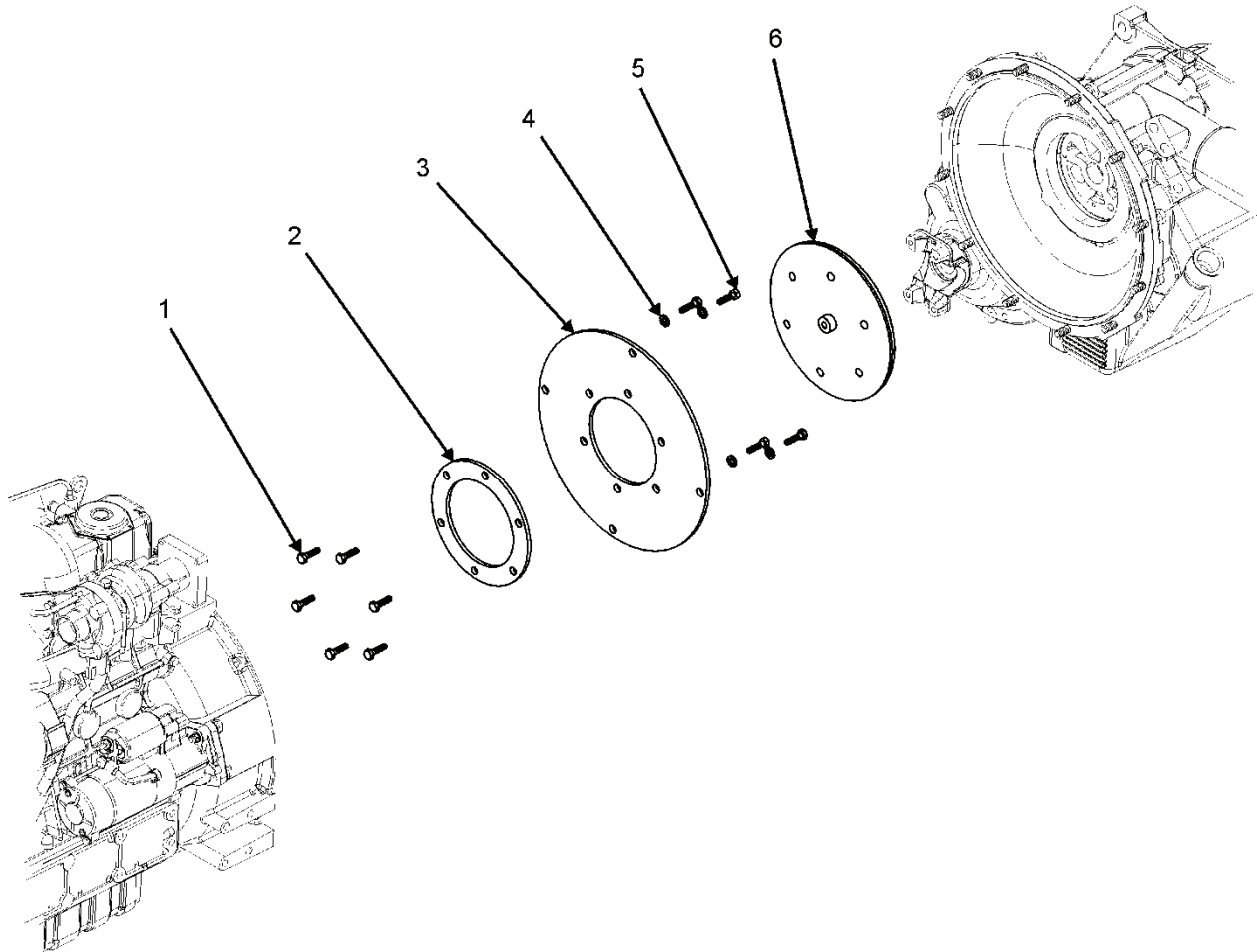


FIGURE 72. TORQUE CONVERTOR

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 TRANSMISSION	
					GROUP 0708 TORQUE CONVERTOR	
					FIGURE 72. TORQUE CONVERTOR	
1	PAOZZ	5305-00-269-3231	80204	B1821BH038F050N	SCREW,CAP,HEXAGON HEAD	6
2	XBOZZ		K7599	04/500302	RING BACKING	1
3	XBOZZ		44185	49029	FLEXPLATE	1
4	PAOZZ	5310-01-350-7866	96906	MS35339-27	WASHER,LOCK	4
5	PAOZZ	5305-00-543-4372	80204	B1821BH038C075N	SCREW,CAP,HEXAGON HEAD	4
6	XBOZZ		K7599	01/500800	TORQUE CONVERTOR	1

END OF FIGURE

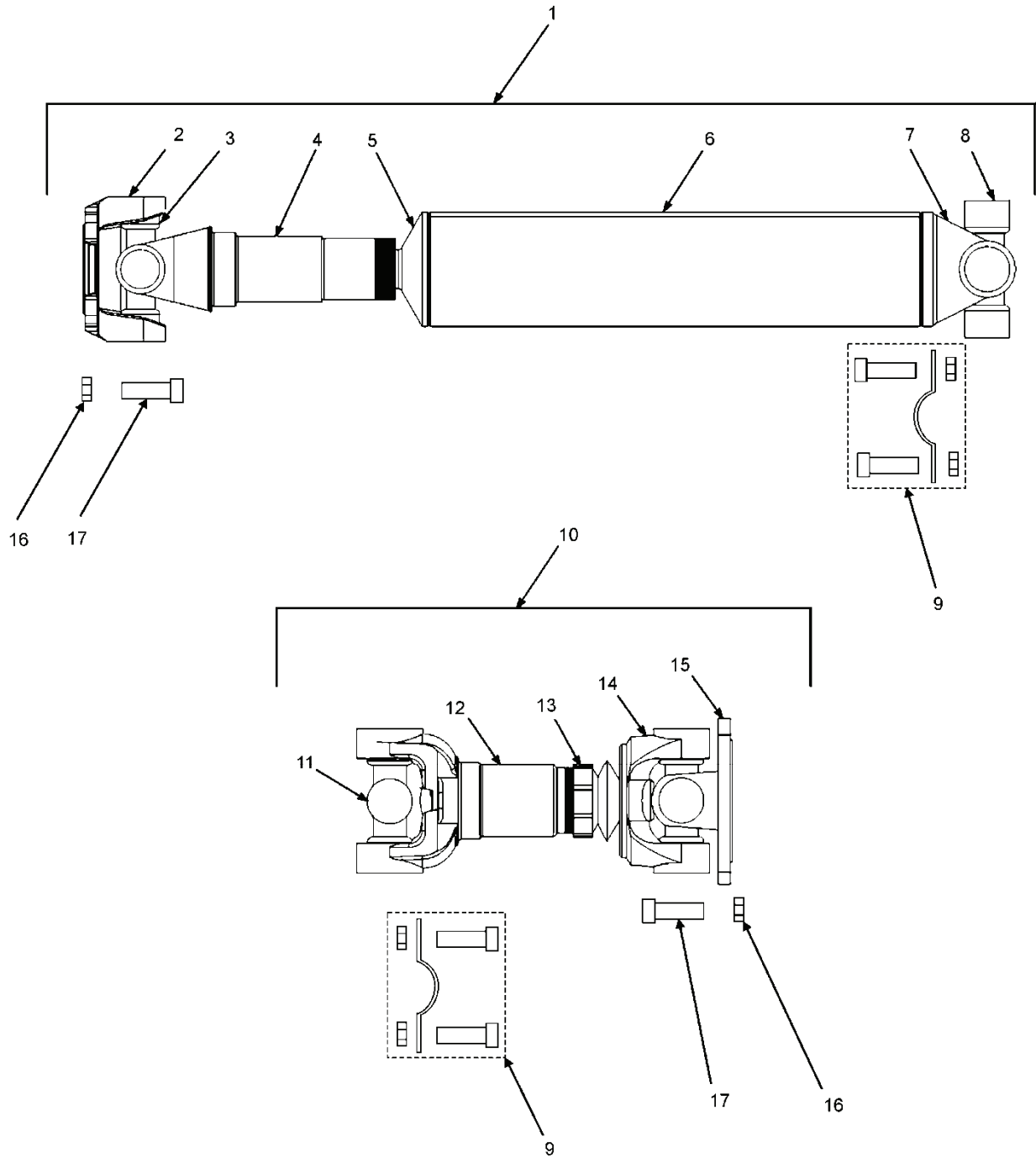


FIGURE 73. DRIVESHAFTS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 09 PROPELLER AND PROPELLER SHAFTS	
					FIGURE 73. DRIVESHAFTS	
1	PAOOO		44185	47515	DRIVESHAFT,FRONT	1
2	XDOZZ		1R7A5	122594_3-2-159:1	FLANGE,YOKE	1
3	PAOZZ	2520-00-702-4578	72447	5160X	PARTS KIT,UNIVERSAL JOINT	1
4	XDOZZ		1R7A5	3-3-508KX	YOKE,SLIP	1
5	XDOZZ		1R7A5	3-40-1491	STUB,SLIP	1
6	XDOZZ		1R7A5	3.50-.083X15.079	TUBE,DRIVE SHAFT	1
7	XDOZZ		1R7A5	3-28-537	YOKE,WELD	1
8	PAOZZ	2520-01-084-3251	81221	3-0188	JOURNAL AND BEARING	1
9	PAOZZ	5340-01-503-7591	1YHH8	8880218	STRAP KIT	4
10	PAOOO		44185	47516	DRIVESHAFT, REAR	1
11	PAOZZ	2520-01-084-3251	81221	3-0188	JOURNAL AND BEARING	1
12	XDOZZ		1R7A5	126379_3-3-1601KX	YOKE,SLIP	1
13	PAOZZ		1R7A5	49298	CAP,DUST	1
14	XDOZZ		1R7A5	126378_126378:1	SHAFT,YOKE	1
15	XDOZZ		1R7A5	122611_122611:1	FLANGE,YOKE	1
16	PAOZZ	5310-00-225-6993	96906	MS51922-33	NUT,SELF-LOCKING,HEXAGON	4
17	PAOZZ	5305-00-071-2069	80204	B1821BH050C150N	SCREW, CAP, HEXAGON HEAD	4
18	PAOZZ	5310-01-445-6444	62503	90040A032	NUT,SELF-LOCKING,HEXAGON	4
19	PAOZZ	5305-00-018-1670	96906	MS35298-89	SCREW, CAP, HEXAGON HEAD	4

END OF FIGURE

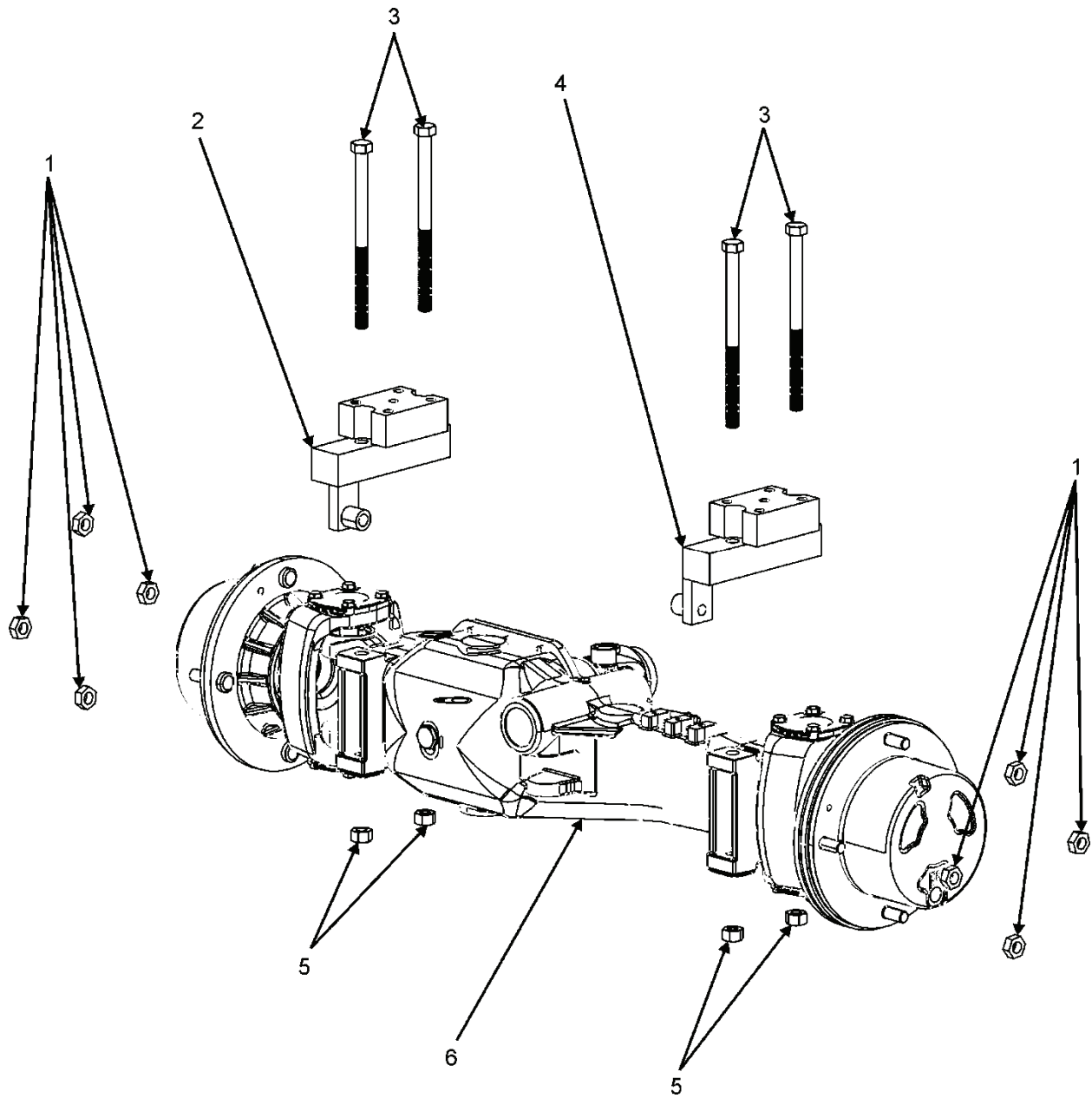


FIGURE 74. FRONT AXLE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 10 FRONT AXLE	
					FIGURE 74. FRONT AXLE	
1	PAFZZ	5310-01-543-2945	0JKF0	826/01008	NUT,SELF-LOCKING,HEXAGON	8
2	XBFZZ		44185	47529	MOUNT WELDMENT, SPG	1
3	PAFZZ		I9008	ISO4017-M24X280-8.8	SCREW, CAP, HEX HD	4
4	XBFZZ		44185	47546	MOUNT WELDMENT, SPG	1
5	PAFZZ		1SE17	29L4	NUT,LOCKM24-3	4
6	PAFDD		44185	47375	AXLE,FRONT (SEE FIGURE 75 FOR BREAKOUT)	1

END OF FIGURE

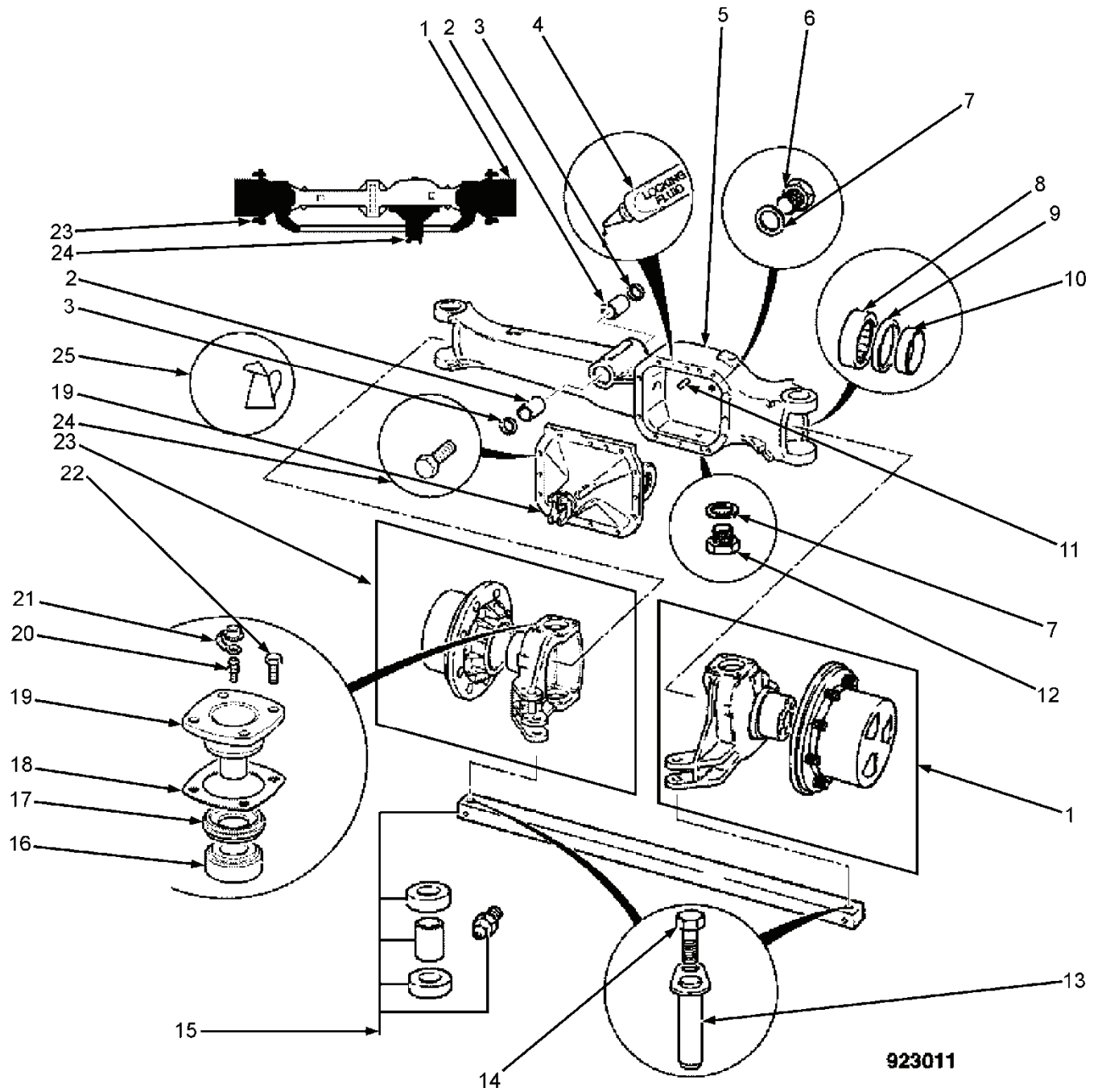


FIGURE 75. FRONT AXLE ASSEMBLY



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
1	PAFFF		K7599	458/M2337	GROUP 10 AXLE ASSEMBLY – FRONT FIGURE 75. FRONT AXLE ASSEMBLY WHEEL HUB ASSEMBLY RH (SEE FIGURE 78 FOR BREAKOUT)	1
2	PALZZ		K7599	808/00352	BUSH	2
3	PALZZ		K7599	904/06500	SEAL	2
4	PALZZ		K7599	4102/1200	SEALANT	1
5	PALZZ		K7599	458/20658	CASING	1
5	PALZZ		K7599	458/M3536	CASING CENTRE CASE MACHININ	1
6	PALZZ	5365-99-775-7916	K7599	816/80037	PLUG FILLER	1
7	PALZZ	5330-996-70-4534	U1068	400-827-4490-41	GASKET	2
8	PALZZ	3120-99-495-7062	K7599	917/50200	BEARING	2
9	PALZZ		K7599	904/50009	SEAL	2
10	PALZZ		K7599	448/04802	RING MASKING	2
11	PALZZ		K7599	445/14001	DOWEL	2
12	PALZZ	4730-99-726-0807	K7599	816/80012	PLUG MAGNETIC 3/4" BSP	1
13	PALZZ		K7599	911/22800	PIN PIVOT 105MM X 25MM DIA.	2
14	PALZZ		K7599	1321/0405Z	BOLT	2
15	PALZZ		K7599	458/10743	TRACKROD ASSEMBLY (SEE FIGURE 77 FOR BREAKOUT)	1
16	PALZZ		K7599	907/50700	BEARING	4
17	PALZZ		K7599	904/50011	SEAL TRUNNION	4
18	PALZZ		K7599	826/01434	BOLT VERBUS RIPP M10 X 35MM	12
19	PALZZ		K7599	440/00102	TRUNNION	4
20	PALZZ	4730-99-774-9330	K1385	816/60056	FITTING, LUBRICATION FITTING, PROTECTION	4
21	PALZZ	4730-99-142-5123	K1489	PM059	CAP, LUBRICATION	6
22	PALZZ		K7599	1321/0408Z	BOLT	16
23	PALZZ		K7599	458/M2336	WHEEL HUB ASSEMBLY LH (SEE FIGURE 79 FOR BREAKOUT)	1
24	PALZZ		K7599	440/05100	DRIVEHEAD ASSEMBLY ( SEE FIGURE 76 FOR BREAKOUT)	1
25	PALZZ		K7599	4003/2005	GREASE HP 50KG	1

END OF FIGURE

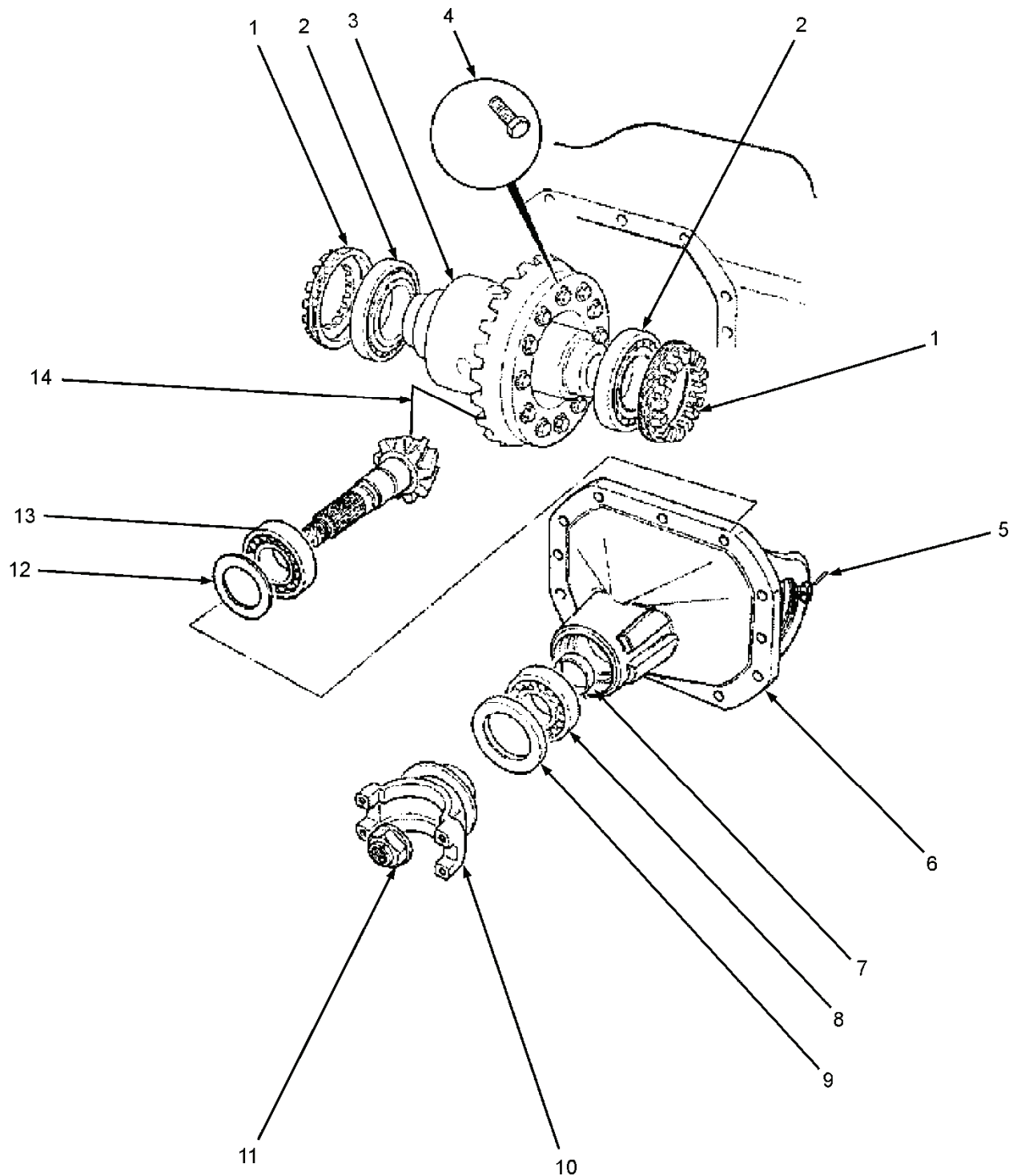


FIGURE 76. DRIVEHEAD - FRONT AXLE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 10 FRONT AXLE	
					FIGURE 76. DRIVEHEAD - FRONT AXLE	
1	XDLZZ		K7599	448/05405	NUT ADJUSTING	2
2	PALZZ	3110-01-285-2569	44185	907/09200	BEARING,ROLLER,TAPERED	2
3	XALZZ		K7599	440/00500	DIFFERENTIAL ASSEMBLY (SEE FIGURE 80 FOR BREAKOUT)	1
4	PALZZ		K7599	826/01084	BOLT VERBUS RIPP M10 X 25MM LONG	12
5	XDLZZ		K7599	826/00818	PIN TENSION	2
6	XALZZ		K7599	440/05101	CASING OUTER	1
7	PALZZ	5365-01-284-9238	44185	448/05402	SPACER COLLAPSIBLE	1
8	PALZZ	3110-01-285-2570	44185	907/09100	BEARING	1
9	PAFZZ		K7599	904/50023	SEAL	1
10	XDLZZ		K7599	440/11900	YOKE	1
11	PAFZZ		K7599	826/11555	NUT STAKE M22	1
12	XDLZZ		K7599	921/01900	KIT-SHIM	1
13	PALZZ	3110-01-285-2571	44185	907/09000	BEARING, ROLLER, TAPERED	1
14	XDLZZ		K7599	458/70000	GEAR CROWN WHEEL & PINION 13T/35T (PINK)	1

END OF FIGURE

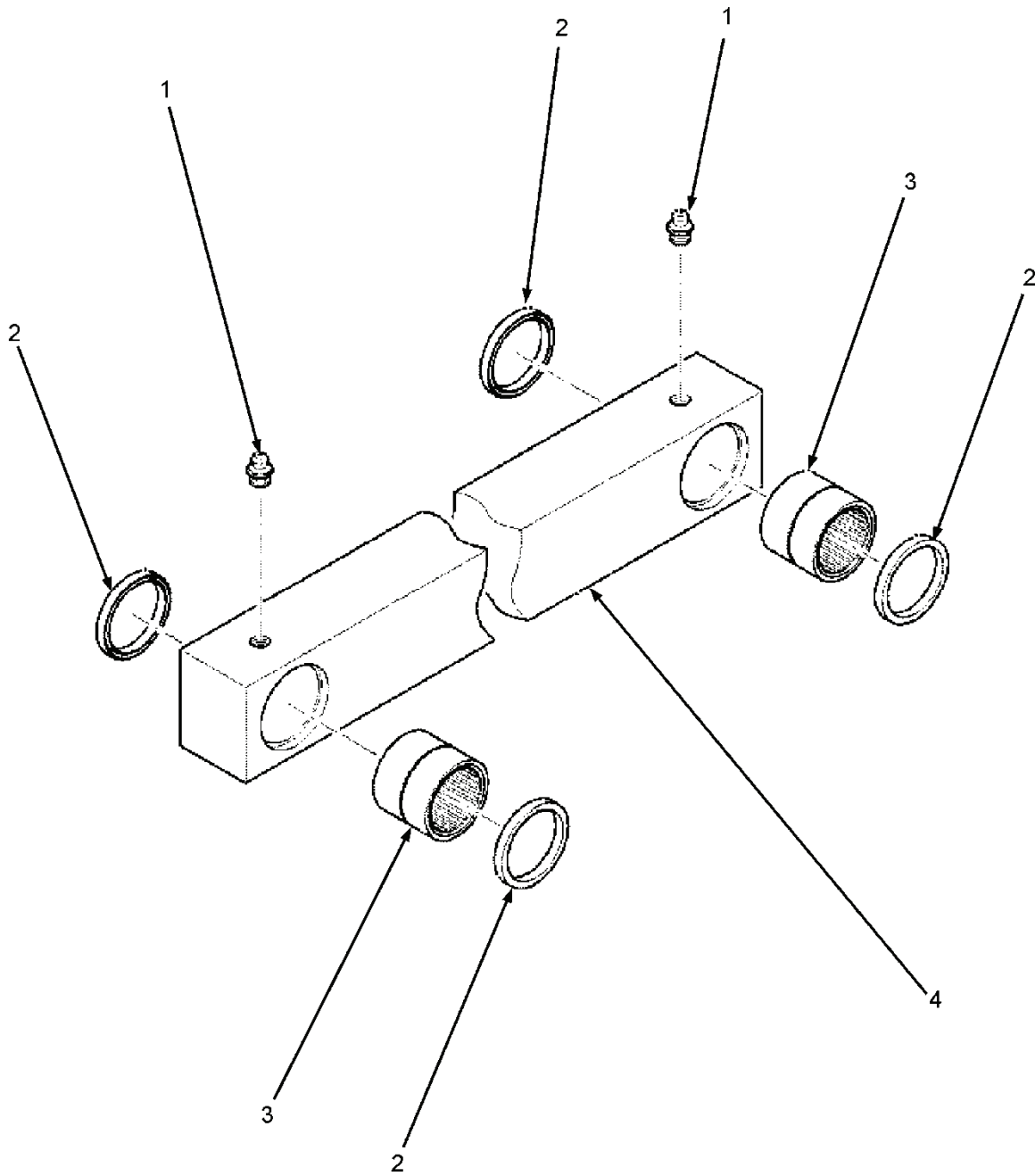


FIGURE 77. TACKROD ASSEMBLY – FRONT AXLE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 10 FRONT AXLE	
					FIGURE 77. TACKROD ASSEMBLY – FRONT AXLE	
1	PAOZZ	4730-99-942-7808	K7599	1450/0001	FITTING, LUBRICATION	2
2	XBLZZ		K7599	904/09300	SEAL OIL	4
3	PAFZZ	3120-01-543-9597	OJKF0	808/00253	BUSH, SLEEVE	2
4	XBLZZ		K7599	458/20492	TRACKROD	1

END OF FIGURE

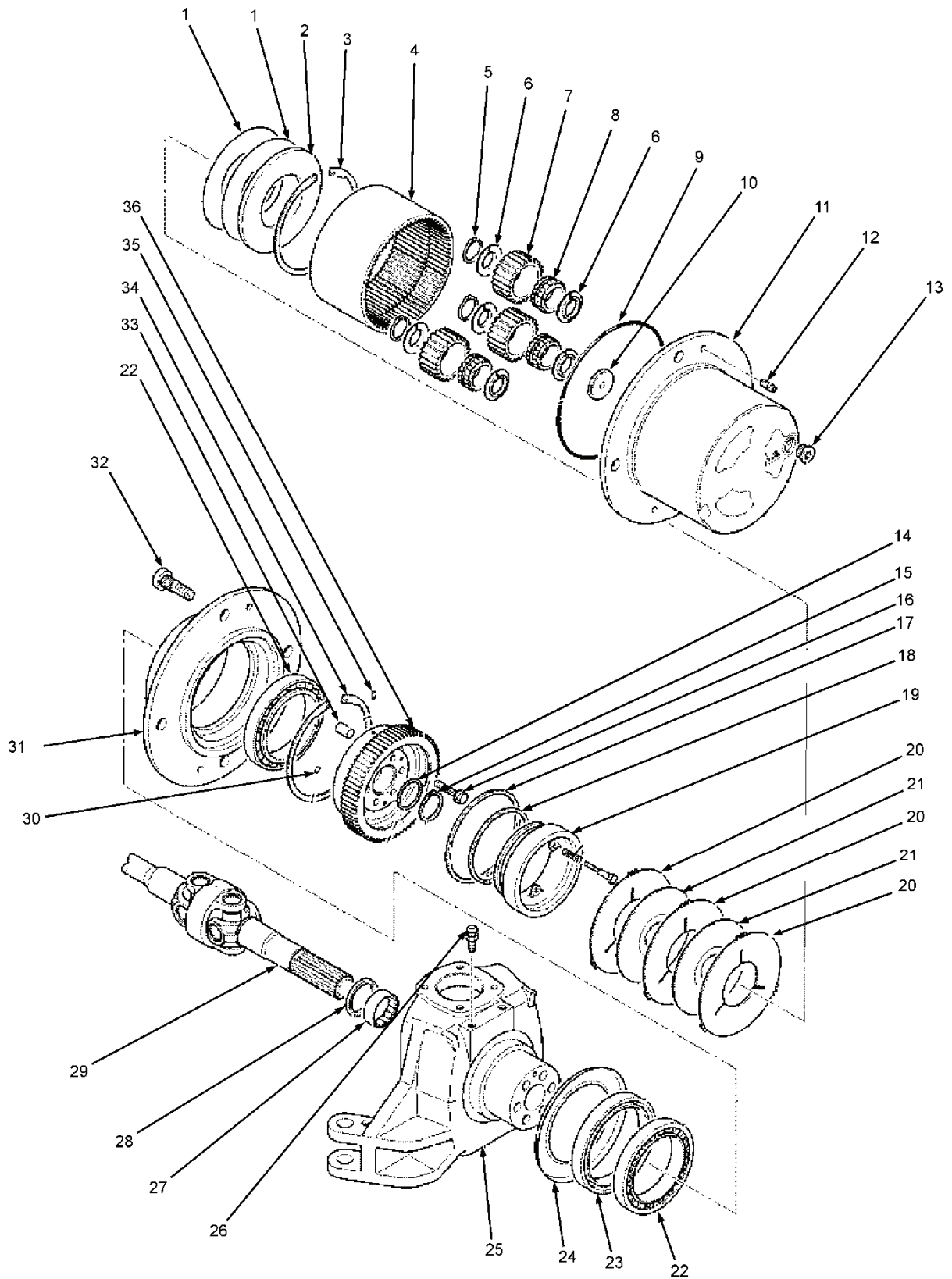


FIGURE 78. WHEEL HUB ASSEMBLY – RH – FRONT AXLE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 10 FRONT AXLE	
					FIGURE 78. WHEEL HUB ASSEMBLY - RH- FRONT AXLE	
1	XCLZZ		K7599	921/52000	KIT-SHIM	2
2	XCLZZ		K7599	440/00708	PLATE PRESSURE	1
3	XCLZZ		K7599	821/00290	CIRCLIP INTERNAL	1
4	XCLZZ		K7599	440/00704	GEAR ANNULUS RING	1
5	XCLZZ		K7599	2203/0041	CIRCLIP	3
6	XCLZZ		K7599	821/00289	CIRCLIP	6
7	XCLZZ		K7599	440/00709	GEAR PLANET	3
8	XCLZZ		K7599	907/50600	BEARING ROLLER	3
9	XCLZZ		K7599	828/00238	O RING	1
10	PBLZZ	5330-99-238-1382	K7599	450/10208	PAD, SPECIAL	1
11	XCLZZ		K7599	440/08102	HUB PLANETARY, CARRIER	1
12	PBLZZ	5306-99-670-4689	K7599	1321/0407Z	BOLT COATED	2
13	PALZZ	4730-01-543-2546	OJKFO	816/82010	PLUG MAGNETIC, M22	1
14	XCLZZ		K7599	921/51200	SPACER	1
15	PALZZ	5325-01-284-9498	44185	2203/0057	CIRCLIP EXTERNAL	1
16	XCLZZ		K7599	826/01060	BOLT M14 X 70MM LONG	6
17	XCLZZ		K7599	813/50026	SEAL BRAKE PISTON (SQUARE SECTION)	1
18	XCLZZ		K7599	813/50025	SEAL BRAKE PISTON (SQUARE SECTION)	1
19	XCLZZ		K7599	440/20002	PISTON BRAKE	1
20	XCLZZ		K7599	458/20286	PLATE BRAKE COUNTER	3
21	XCLZZ		K7599	458/20281	PLATE BRAKE FRICTION	2
22	PBLZZ	3110-99-126-3273	K0036	A-48202	BEARING ASSEMBLY, SPECIAL	2
23	PALZZ	5330-99-577-5661	K7599	904/50033	SEAL OIL 127 X 160 X 15.5-17	1
24	XCLZZ		K7599	458/20403	COVER PLATE HUB SEAL	1
25	XCLZZ			458/M2116	HUB SWIVEL	1
26	XCLZZ		K7599	816/60040	NIPPLE BLEED	1
27	XCLZZ		K7599	917/50500	BEARING	1
28	XCLZZ		K7599	904/50009	SEAL	1
29	XCLZZ		K7599	914/84000	SHAFT DRIVE	1
30	XCLZZ		K7599	828/00208	O RING	2
31	XCLZZ		K7599	458/20831	CARRIER WHEEL BEARING,4 STUD	1
32	PBLZZ	5307-99-474-5206	K7599	826/00923	STUD WHEEL	4
33	XCLZZ		K7599	450/12703	DOWEL HOLLOW	6
34	XCLZZ		K7599	821/00291	CIRCLIP	1
35	XCLZZ		K7599	826/01343	SCREW GRUB, NYLON COATED	2
36	XCLZZ		K7599	458/M2118	CARRIER ANNULUS, ASSEMBLY	1

END OF FIGURE





(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 10 FRONT AXLE	
					FIGURE 79. WHEEL HUB ASSEMBLY - LH - FRONT AXLE	
1	XCLZZ		K7599	921/52000	KIT-SHIM	2
2	XCLZZ		K7599	440/00708	PLATE PRESSURE	1
3	XCLZZ		K7599	821/00290	CIRCLIP INTERNAL	1
4	XCLZZ		K7599	440/00704	GEAR ANNULUS RING	1
5	XCLZZ		K7599	2203/0041	CIRCLIP	3
6	XCLZZ		K7599	821/00289	CIRCLIP	6
7	XCLZZ		K7599	440/00709	GEAR PLANET	3
8	XCLZZ		K7599	907/50600	BEARING ROLLER	3
9	XCLZZ		K7599	828/00238	O RING	1
10	PBLZZ	5330-99-238-1382	K7599	450/10208	PAD, SPECIAL	1
11	XALZZ		K7599	440/08102	HUB PLANETARY, CARRIER	1
12	PBLZZ	5306-99-670-4689	K7599	1321/0407Z	BOLT	2
13	PALZZ	4730-01-543-2546	OJKFO	816/82010	PLUG, PIPE, MAGNETIC	1
14	XCLZZ		K7599	921/51200	SPACER	1
15	PALZZ	5325-01-284-9498	44185	M2203/0057	RING, RETAINING	1
16	XCLZZ		K7599	826/01060	BOLT M14 X 70MM LONG	6
17	XCLZZ		K7599	813/50026	SEAL BRAKE PISTON (SQUARE SECTION)	1
18	XCLZZ		K7599	813/50025	SEAL BRAKE PISTON (SQUARE SECTION)	1
19	XCLZZ		K7599	440/20002	PISTON BRAKE	1
20	PAFZZ		K7599	458/20286	PLATE BRAKE COUNTER	3
21	PAFZZ		K7599	458/20281	PLATE BRAKE FRICTION	2
22	PBFZZ	3110-99-126-3273	K0036	A-48202	BEARING ASSEMBLY, SPECIAL	2
23	PAFZZ	5330-99-577-5661	K7599	904/50033	SEAL OIL 127 X 160 X 15.5-17	1
24	XCLZZ		K7599	458/20403	COVER PLATE HUB SEAL	1
25	XCLZZ		K7599	458/M2116	HUB SWIVEL	1
26	XCLZZ		K7599	816/60040	NIPPLE BLEED	1
27	XCLZZ		K7599	917/50500	BEARING	1
28	XCLZZ		K7599	904/50009	SEAL	1
29	XCLZZ		K7599	914/60197	SHAFT DRIVE	1
30	XCLZZ		K7599	828/00208	O RING	2
31	XCLZZ		K7599	458/20831	CARRIER WHEEL BEARING,4 STUD	1
32	PBLZZ	5307-99-474-5206	K7599	826/00923	STUD WHEEL	4
33	XCLZZ		K7599	450/12703	DOWEL HOLLOW	6
34	XCLZZ		K7599	821/00291	CIRCLIP	1
35	XCLZZ		K7599	826/01343	SCREW GRUB, NYLON COATED	2
36	XALZZ		K7599	458/M2118	CARRIER ANNULUS, ASSEMBLY	1

END OF FIGURE

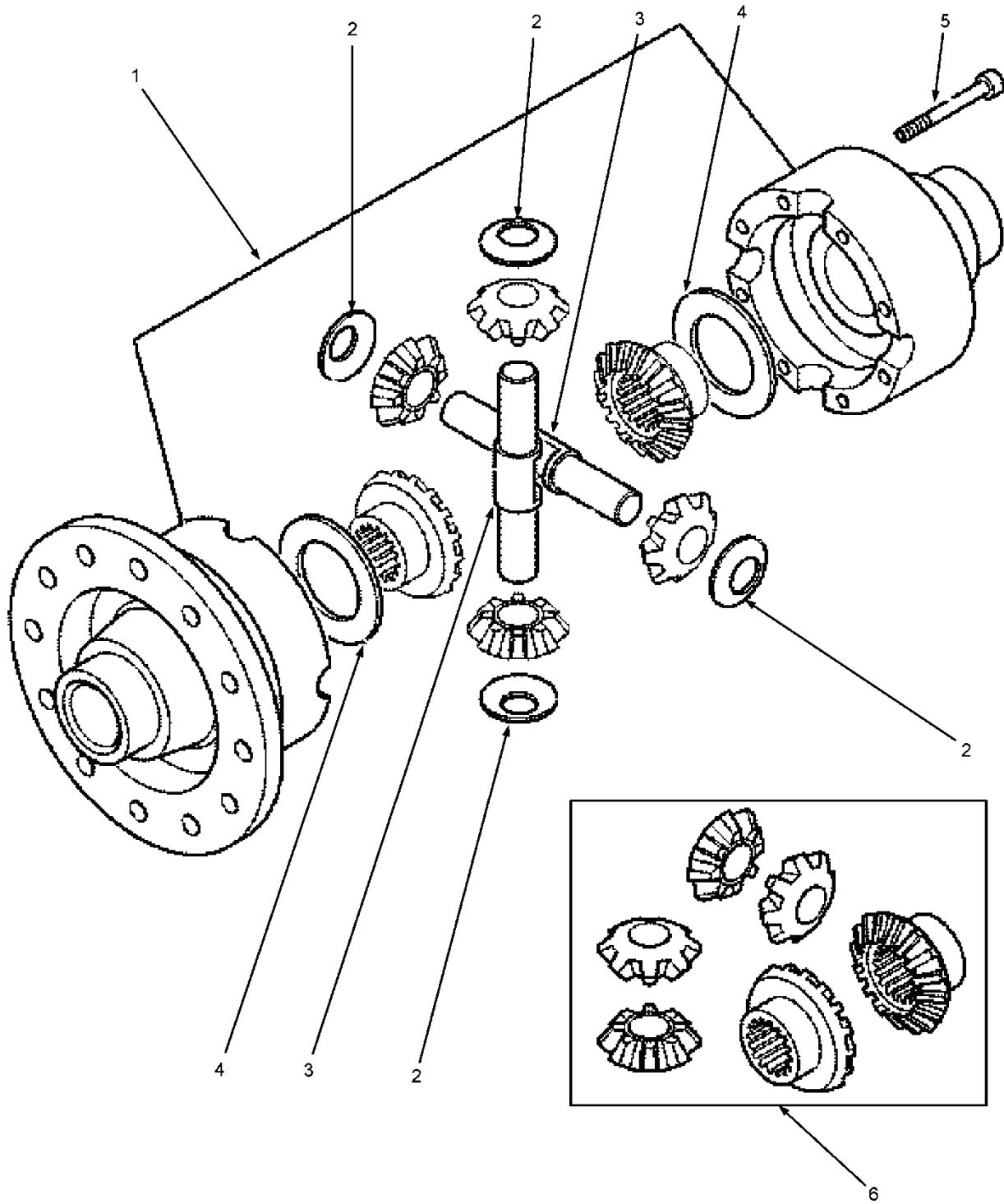


FIGURE 80. DIFFERENTIAL - FRONT AXLE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 10 FRONT AXLE	
					FIGURE 80. DIFFERENTIAL - FRONT AXLE	
1	XCLZZ		K7599	458/10766	CASING ASSEMBLY	1
2	XCLZZ		K7599	808/00273	WASHER	4
3	XCLZZ		K7599	440/00503	PIN TRUNNION	2
4	XCLZZ		K7599	808/00274	WASHER	2
5	XCLZZ		K7599	826/01585	BOLT	8
6	XCLZZ		K7599	440/03800	KIT-GEAR	1

END OF FIGURE

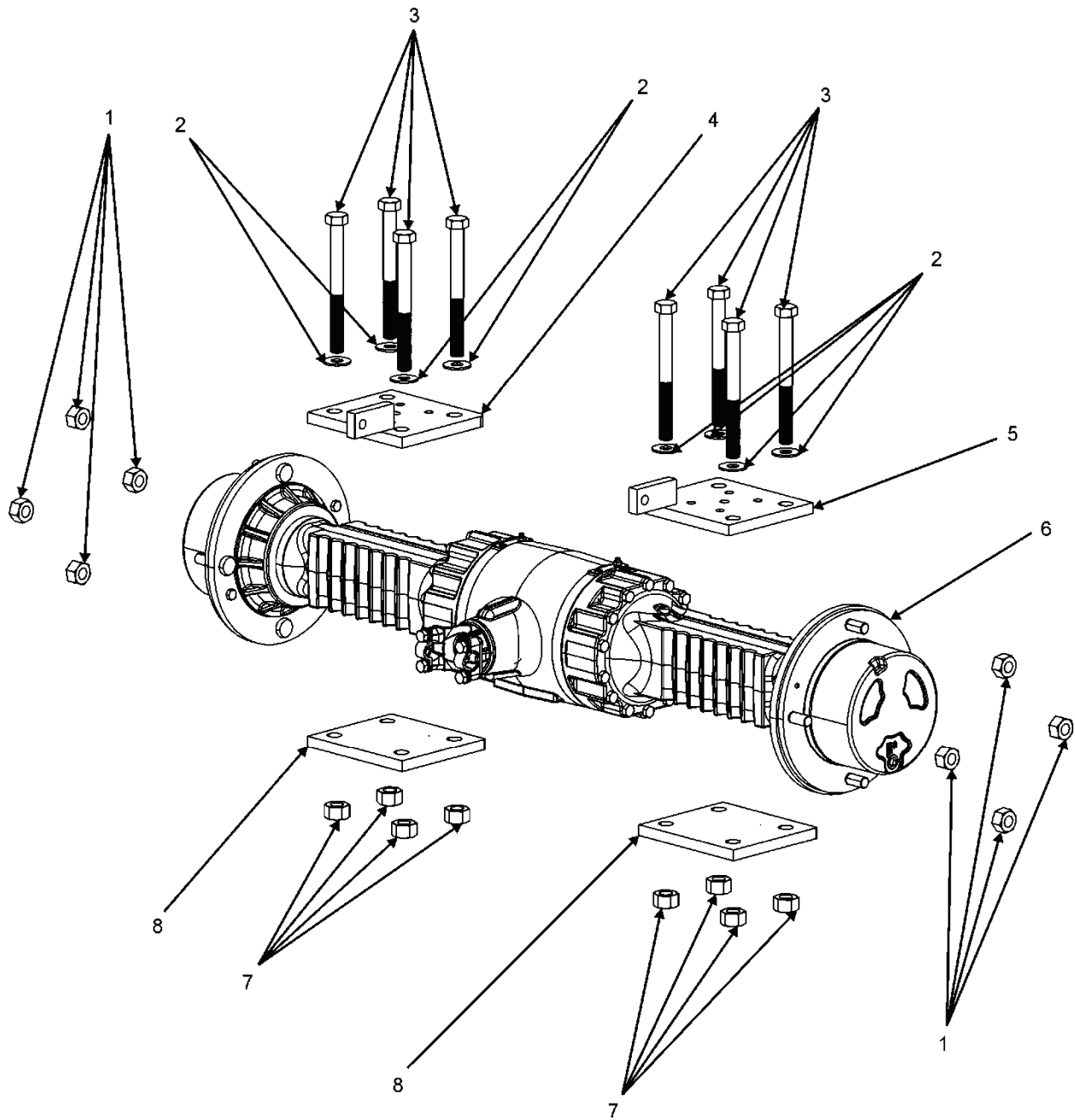


FIGURE 81. REAR AXLE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 11 REAR AXLE	
					FIGURE 81. REAR AXLE	
1	PBOZZ	5310-01-543-2945	0JKF0	826/01008	NUT,SELF-LOCKING,HEXAGON	8
2	PAOZZ	5310-01-491-4241	39428	98023A037	WASHER,FLAT	8
3	PAOZZ		1SE17	C936	7/8-9X9 GRADE 8 HEX HEAD CAP SCREW ZINC	8
4	XBOZZ		44185	47718	MOUNT, REAR AXLE LH	1
5	XBOZZ		44185	47719	MOUNT, REAR AXLE RH	1
6	PAFDD		44185	47376	AXLE, REAR (SEE FIGURE 82 FOR BREAKOUT)	1
7	PAOZZ	5310-01-406-1256	53711	803-1624094 PC 49	NUT,SELF-LOCKING,HEXAGON	8
8	XBOZZ		44185	47510	MOUNT, AXLE, REAR	2

END OF FIGURE

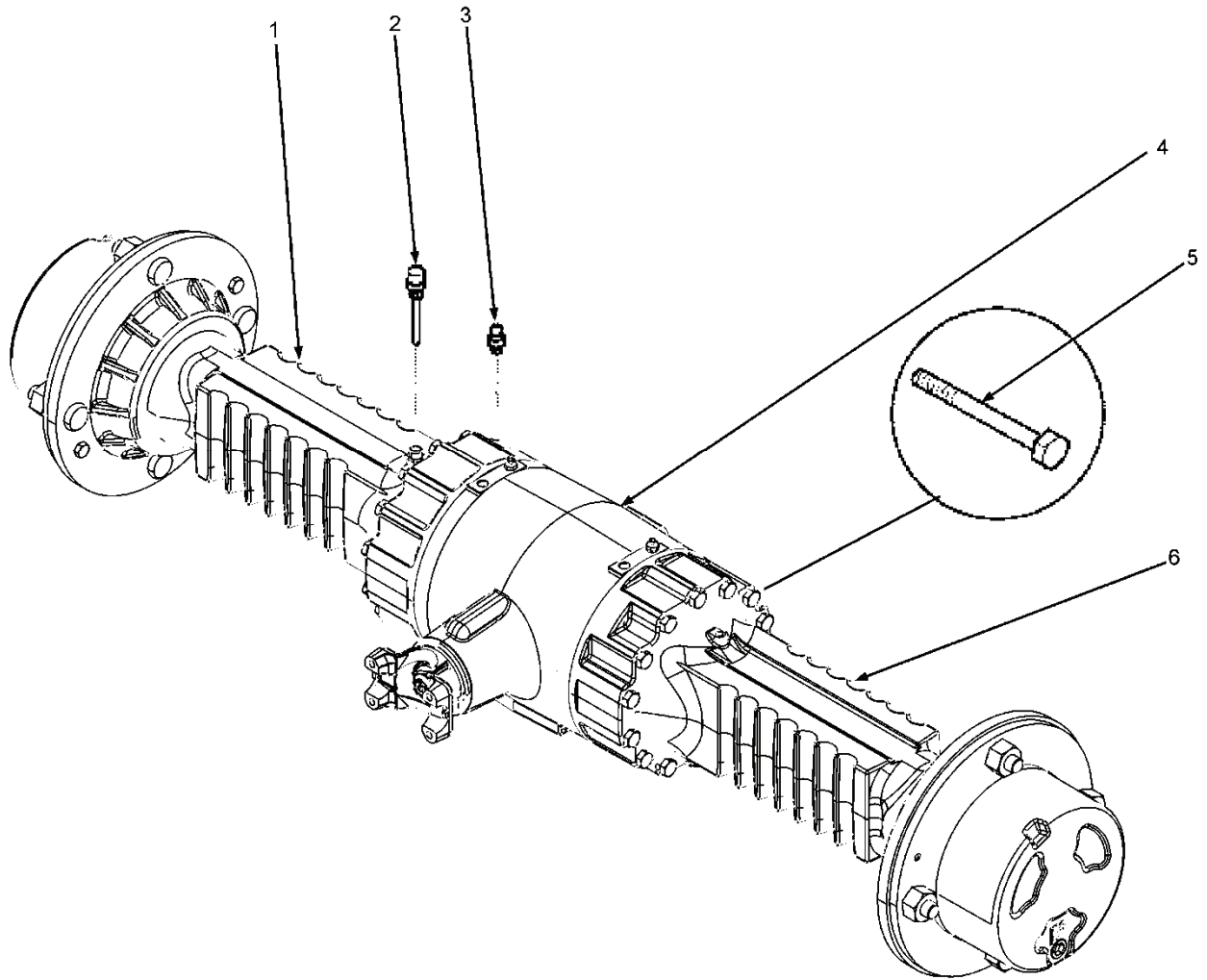


FIGURE 82. REAR AXLE ASSEMBLY

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 11 REAR AXLE	
					FIGURE 82. REAR AXLE ASSEMBLY	
1	XCLZZ		K7599	458/11164	ARM AXLE ARM ASSEMBLY (SEE FIGURE 83 FOR BREAKOUT)	1
2	XCLZZ		K7599	448/56282	BREATHER SPRING TYPE M10 X 1.5 THREAD	1
3	XCLZZ		K7599	816/60040	NIPPLE BLEED	2
4	XCLZZ		K7599	458/M2340	DRIVEHEAD ASSEMBLY (SEE FIGURE 84 FOR BREAKOUT)	1
5	XCLZZ		K7599	1321/3523	BOLT	28
6	XCLZZ		K7599	458/11165	ARM AXLE ARM ASSEMBLY (SEE FIGURE 86 FOR BREAKOUT)	1

END OF FIGURE

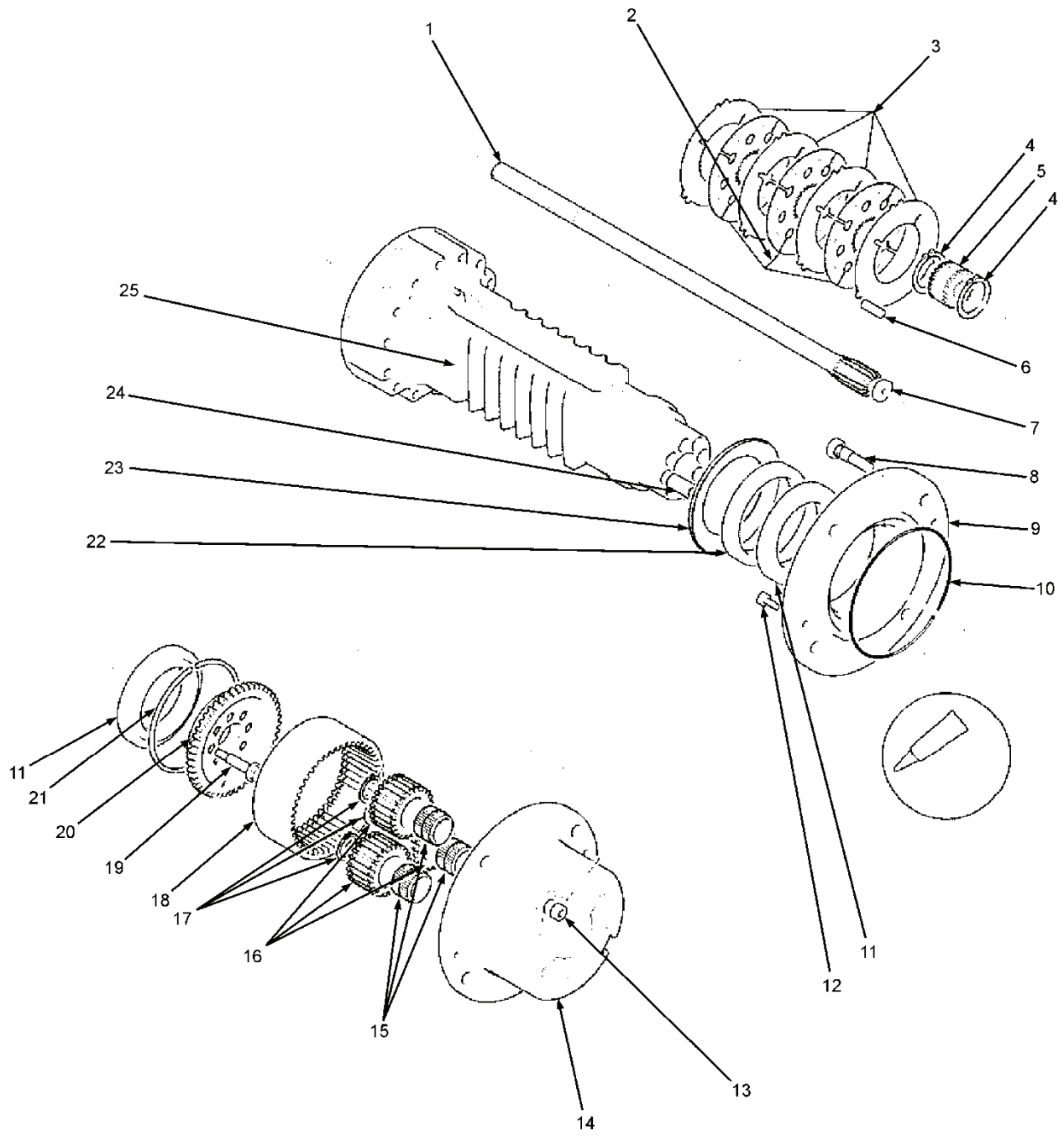


FIGURE 83. AXLE ARM/WHEEL HUB - REAR AXLE



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 11 REAR AXLE	
					FIGURE 83. AXLE ARM/WHEEL HUB - REAR AXLE	
1	XCLZZ		K7599	914/60300	SHAFT DRIVE	
2	PAFZZ		K7599	458/20357	PLATE BRAKE, FRICTION	1
3	PAFZZ		K7599	458/20358	PLATE BRAKE, COUNTER	2
4	XCLZZ		K7599	2203/0071	CIRCLIP EXTERNAL	1
5	XCLZZ		K7599	458/20807	CARRIER BRAKE PLATE	1
6	XCLZZ		K7599	458/20828	PIN REACTION	4
7	XCLZZ		K7599	450/10208	PAD THRUST	1
8	XCLZZ		K7599	826/00923	STUD WHEEL	4
9	XCLZZ		K7599	458/20831	CARRIER WHEEL BEARING, 4 STUD	8
10	XCLZZ		K7599	828/00238	O RING	1
11	XCLZZ		K7599	907/20043	BEARING TAPER ROLLER	1
12	XCLZZ		K7599	1321/0407Z	BOLT COATED	3
13	XCLZZ		K7599	826/00425	PLUG TAPERED 3/4"-14PTF	1
14	XCLZZ		K7599	458/20830	CARRIER PLANETARY HUB, 4-STUD	3
15	XCLZZ		K7599	917/10013	BEARING ROLLER, DOUBLE ROW	3
16	XCLZZ		K7599	458/50043	GEAR PLANET	1
17	XCLZZ		K7599	2203/0051	CIRCLIP	1
18	XCLZZ		K7599	458/20503	GEAR ANNULUS RING	2
19	XCLZZ		K7599	826/01060	BOLT M14 X 70MM LONG	1
20	XCLZZ		K7599	458/20504	CARRIER ANNULUS RING	3
21	XCLZZ		K7599	821/00291	CIRCLIP	4
22	XCLZZ		K7599	904/50033	SEAL OIL 127 X 160 X 15.5-17	3
23	XCLZZ		K7599	458/20403	COVER PLATE HUB SEAL	2
24	XCLZZ		K7599	450/12703	DOWEL HOLLOW	1
25	XCLZZ		K7599	458/20808	ARM AXLE ARM (WITH BREATHER HOLE)	1

END OF FIGURE

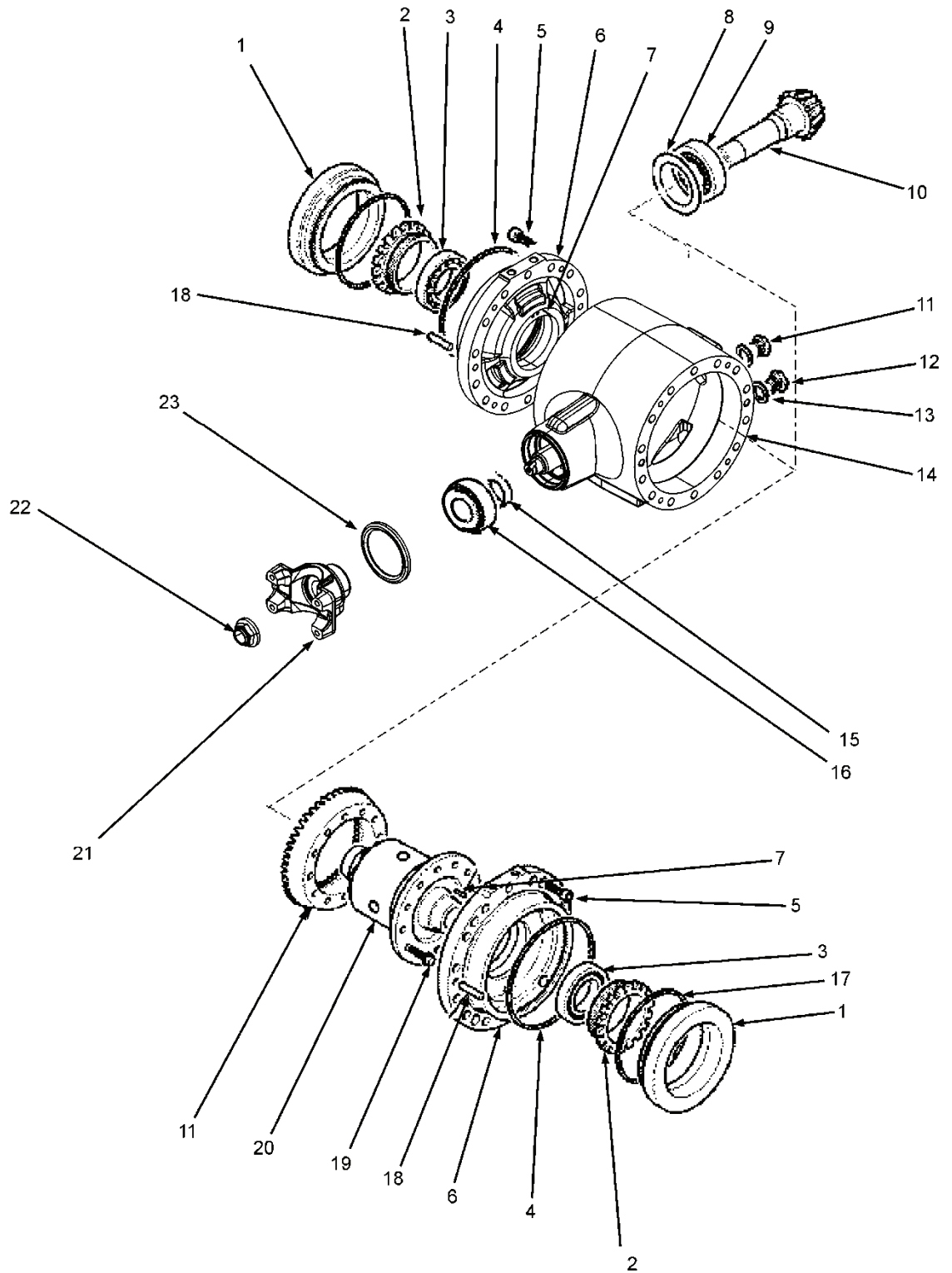


FIGURE 84. DRIVEHEAD - REAR AXLE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 11 REAR AXLE	
					FIGURE 84. DRIVEHEAD - REAR AXLE	
1	XCLZZ		K7599	458/20821	PISTON BRAKE	2
2	XCLZZ		K7599	458/20356	NUT SIDE DIFFERENTIAL	2
3	XCLZZ		K7599	907/09200	BEARING	2
4	XCLZZ		K7599	813/10164	SEAL BRAKE DIA 165MM	2
5	XCLZZ		K7599	1391/3307	SCREW CAP	8
6	XCLZZ		K7599	458/20794	HOUSING BRAKE PISTON	2
7	XCLZZ		K7599	826/00818	PIN TENSION	2
8	XCLZZ		K7599	921/01900	KIT-SHIM	1
9	XCLZZ		K7599	907/09000	BEARING	1
10	XCLZZ		K7599	458/70236	GEAR CROWN WHEEL AND PINION 17T/33T	1
11	PAOZZ	5365-99-775-7916	K7599	816/80037	PLUG, FILLER	1
12	PAOZZ	4730-99-726-0807	K7599	816/80012	PLUG, PIPE, MAGNETIC	1
13	PAOZZ	5330-99-670-4534	U1068	400-827-4490-41	SEAL BONDED 3/4" BSP	2
14	XCLZZ		K7599	458/20829	DRIVEHEAD CASING	1
15	XCLZZ		K7599	921/53300	SPACER	1
16	XCLZZ		K7599	907/09100	BEARING	1
17	XCLZZ		K7599	813/10165	SEAL BRAKE DIA 137MM	2
18	XCLZZ		K7599	458/20805	DOWEL	4
19	XCLZZ		K7599	826/01084	BOLT VERBUS RIPP M10 X 25MM LONG	12
20	XCLZZ		K7599	458/11162	DIFFERENTIAL ASSEMBLY (SEE FIGURE 85 FOR BREAKOUT)	1
21	XCLZZ		K7599	440/11900	YOKE	1
22	XCLZZ		K7599	826/11555	NUT STAKE M22	1
23	XCLZZ		K7599	904/50023	SEAL	1

END OF FIGURE

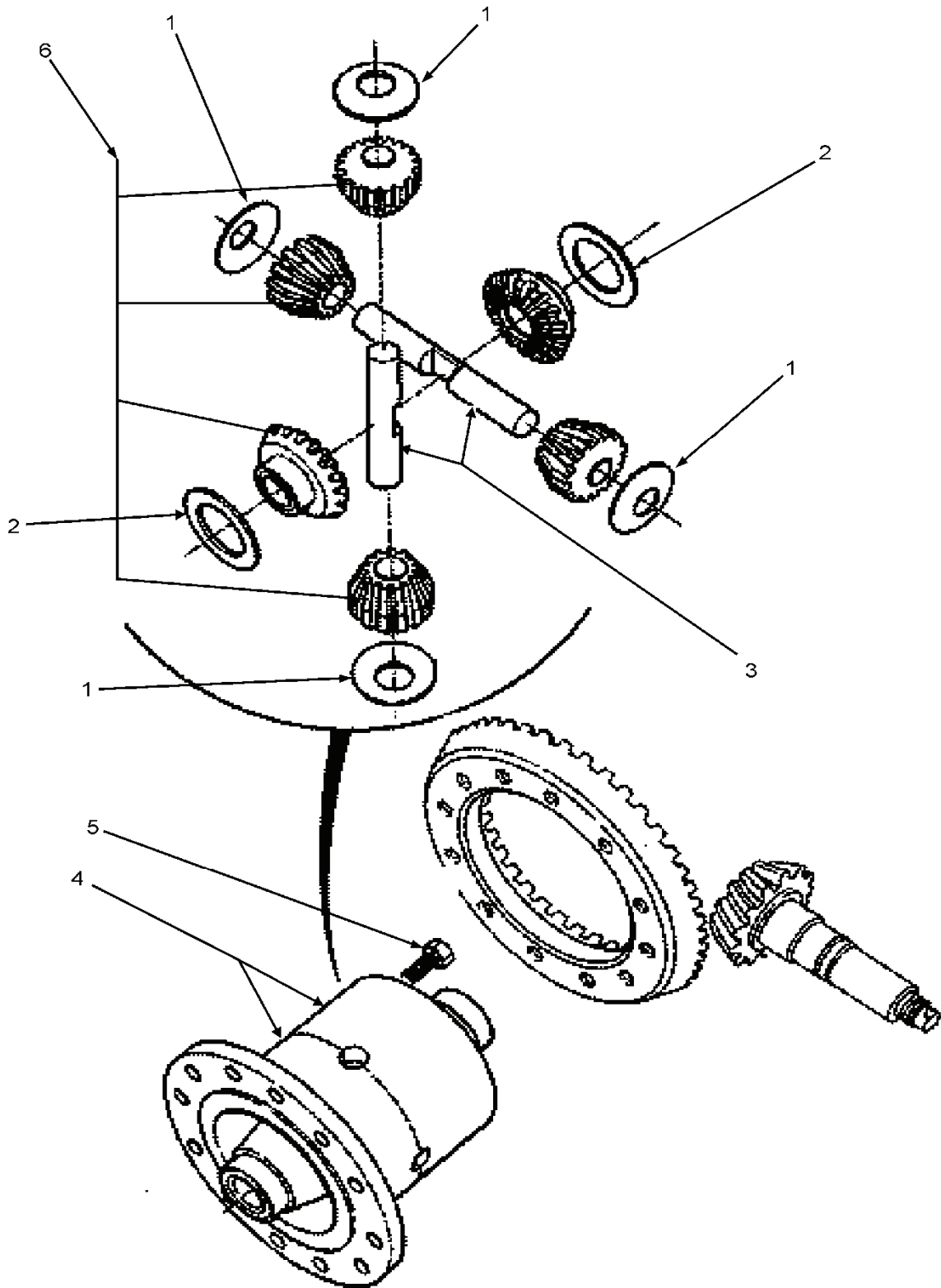


FIGURE 85. DIFFERENTIAL ASSEMBLY - REAR AXLE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 11 REAR AXLE	
					FIGURE 85. DIFFERENTIAL ASSEMBLY – REAR AXLE	
1	XCLZZ		K7599	808/00273	WASHER	4
2	XCLZZ		K7599	808/00274	WASHER	2
3	XCLZZ		K7599	440/00503	PIN TRUNNION	2
4	XCLZZ		K7599	458/11153	CASING ASSEMBLY DIFFERENTIAL	1
5	XCLZZ		K7599	826/01585	BOLT	8
6	XCLZZ		K7599	440/03800	KIT-GEAR	1

END OF FIGURE

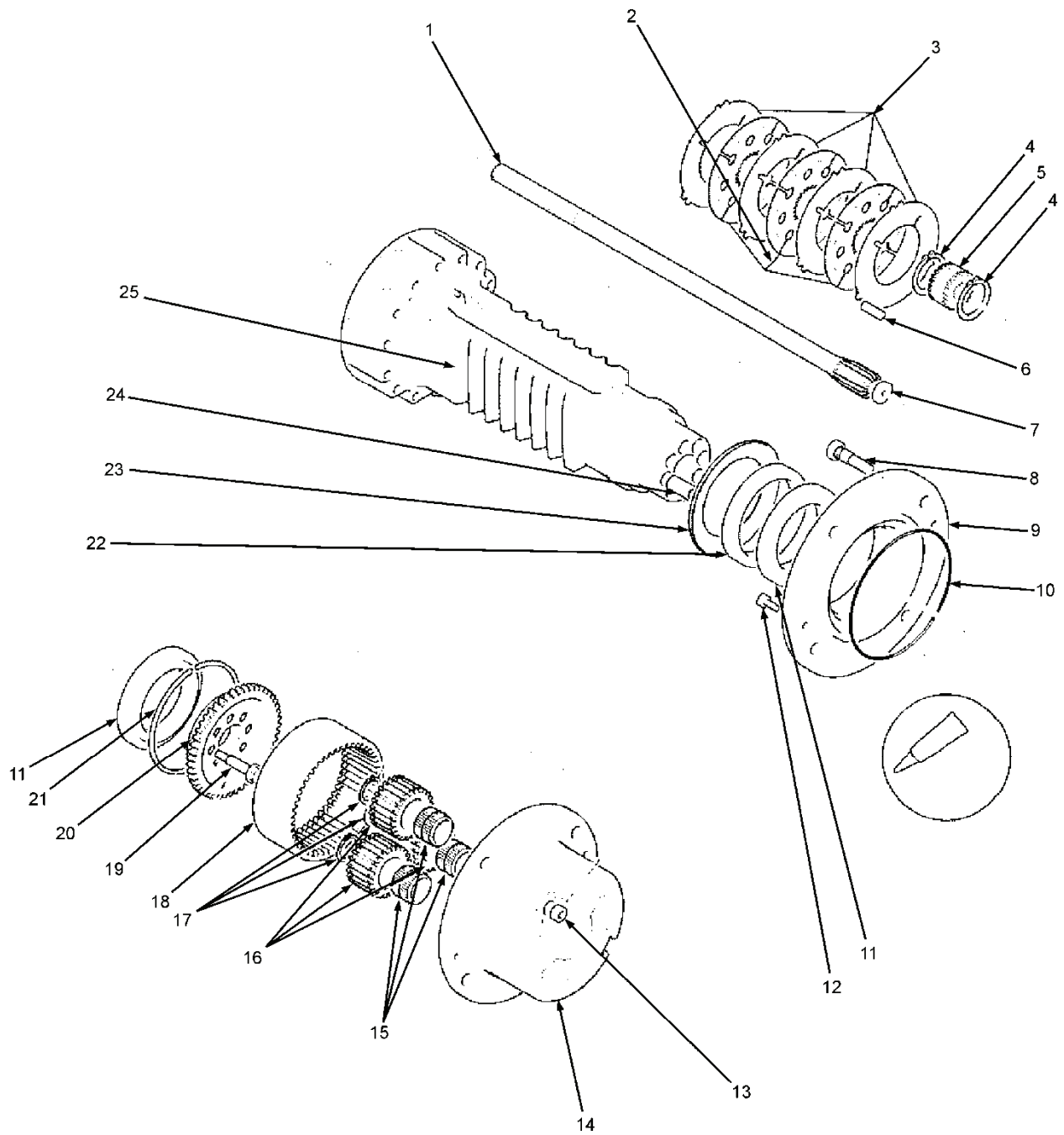


FIGURE 86. AXLE ARM/WHEEL HUB - REAR AXLE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 11 REAR AXLE	
					FIGURE 86. AXLE ARM/WHEEL HUB - REAR AXLE	
1	XCLZZ		K7599	914/60300	SHAFT DRIVE	1
2	XCLZZ		K7599	458/20357	PLATE BRAKE, FRICTION	3
3	PAFZZ		K7599	458/20358	PLATE BRAKE, COUNTER	4
4	PAFZZ		K7599	2203/0071	CIRCLIP EXTERNAL	2
5	XCLZZ		K7599	458/20807	CARRIER BRAKE PLATE	1
6	XCLZZ		K7599	458/20828	PIN REACTION	3
7	XCLZZ		K7599	450/10208	PAD THRUST	1
8	XCLZZ		K7599	826/00923	STUD WHEEL	4
9	XCLZZ		K7599	458/20831	CARRIER WHEEL BEARING, 4 STUD	1
10	XCLZZ		K7599	828/00238	O RING	1
11	XCLZZ		K7599	907/20043	BEARING TAPER ROLLER	2
12	XCLZZ		K7599	1321/0407Z	BOLT COATED	2
13	XCLZZ		K7599	826/00425	PLUG TAPERED 3/4"-14PTF	1
14	XCLZZ		K7599	458/20830	CARRIER PLANETARY HUB, 4-STUD	1
15	XCLZZ		K7599	917/10013	BEARING ROLLER, DOUBLE ROW	3
16	XCLZZ		K7599	458/50043	GEAR PLANET	3
17	XCLZZ		K7599	2203/0051	CIRCLIP	3
18	XCLZZ		K7599	458/20503	GEAR ANNULUS RING	1
19	XCLZZ		K7599	826/01060	BOLT M14 X 70MM LONG	8
20	XCLZZ		K7599	458/20504	CARRIER ANNULUS RING	1
21	XCLZZ		K7599	821/00291	CIRCLIP	1
22	XCLZZ		K7599	904/50033	SEAL OIL 127 X 160 X 15.5-17	1
23	XCLZZ		K7599	458/20403	COVER PLATE HUB SEAL	1
24	XCLZZ		K7599	450/12703	DOWEL HOLLOW	4
25	XCLZZ		K7599	458/20809	ARM AXLE ARM (PLAIN)	1

END OF FIGURE





(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 12 BRAKES	
					GROUP 1202 SERVICE BRAKES	
					FIGURE 87. SERVICE BRAKE	
1	PAOZZ		2V507	90185A621	BOLT, CARRIAGE 3/8 - 16 X 3/4 IN	4
2	PAOZZ	5310-00-809-4061	96906	MS27183-15	WASHER,FLAT	13
3	PAOZZ	5310-01-538-1646	1SE17	NAN3	NUT,PLAIN,HEXAGON	13
4	PAOZZ		44185	47615	MOUNT WELDMENT, BRAK	1
5	XBOZZ		44185	47610	PEDAL WELDMENT	1
6	PAOZZ	5310-01-393-0306	96906	MS27183-23	WASHER,FLAT	2
7	PAOZZ	5310-00-809-4061	96906	MS27183-15	WASHER,FLAT	13
8	PAOZZ	5315-00-234-1627	96906	MS24665-391	PIN, COTTER	2
9	XBOZZ		44185	47654	SHAFT, BRAKE, PIVOT	1
10	PAOZZ	5340-01-319-2081	31633	VF-8-G	RODEND,BRG	2
11	PAOZZ	5305-00-725-2317	0158B	MS90725-64	SCREW,CAP,HEXAGON HEAD	9
12	PAOZZ		44185	47701	ROD,THREADED	1
13	XBOZZ		44185	47707	WELDMENT,MSTRCYL	1
14	PAOZZ	5310-01-538-1646	1SE17	NAN3	NUT,PLAIN,HEXAGON	13
15	XBOZZ		44185	45089-11	HOSEASSY	1
16	PAOZZ	2530-01-382-2068	92865	20-920-500	RESERVOIR	2
17	PAOZZ	5310-01-538-1880	1SE17	NAN1	NUT .250-20 NYLOCK	4
18	PAOZZ	5310-01-537-9035	1SE17	WU51	WASHER,FLAT1/4	4
19	PAOZZ	5305-00-988-1170	96906	MS35206-284	SCREW, MACHINE	4
20	XBOZZ		44185	45089-10	HOSEASSY	1
21	PAOZZ	4730-00-143-3941	96906	MS51527A6	ELBOW,TUBE TO BOSS	2
22	XBOZZ		44185	48362	TUBE, BRAKELINE	1
23	XBOZZ		44185	48361	TUBE, BRAKELINE	1
24	PAOZZ	4730-00-221-2137	88044	AN913-2S	FITTING,PLUG	1
25	XBOZZ		92865	02-020-380	CYLINDER, MASTER	1
26	PAOZZ	5306-00-225-8504	96906	MS90725-40	BOLT,MACHINE	2
27	XBOZZ		92865	02-580-002	VALVE, BRAKE	1
28	XBOZZ		44185	45089-12	HOSEASSY	1
29	XBOZZ		44185	48840	HOSEASSY	2
30	XBOZZ		30780	4JBTXSS	TEE, TUBE	1
31	XBOZZ		44185	48838	HOSEASSY	1
32	XBOZZ		5E240	6500-04-04	ELBOW,PIPE TO TUBE	1
33	PAOZZ	4933-01-214-6263	01276	203102-4-4S	FITTING, HYDRAULIC	1
34	PAOZZ		00624	203005-4-4S	FITTING, HYDRAULIC	2
35	PAOZZ		1SE17	NAN2	NUT,PLAIN,HEXAGON	2
36	XBOZZ		44185	48839	HOSEASSY	1
37	PAOZZ	5305-01-238-7339	80205	MS90725-111	SCREW,CAP,HEXAGON HEAD	1
38	XBOZZ		2V507	6072K213	RODEND	1
39	PAOZZ	5310-01-539-3475	1SE17	NAN5	NUT,SELF-LOCKING,HEXAGON	1
40	PAOZZ	5310-00-809-5998	96906	MS27183-18	WASHER,FLAT	1
41	XBOZZ		44185	47940	WELDMENT, BRAKE	1
42	PAOZZ		84830	LE105JK 03M	SPRING,MUSICWIRE	1
43	PAOZZ			F016289	NUT, HEX, 1/2-20, JAM, ZC	2
44	PAOZZ	5930-00-679-4247	1LW55	1998196	SWITCH,STOPLIGHT	1
45	PAOZZ			F016289	NUT, HEX, 1/2-20, JAM, ZC	1
46	XBOZZ		1SE17	56RA	ROD,THREADED	1
47	PAOZZ	5310-01-156-4417	96906	MS35691-626	NUT,PLAIN,HEXAGON	2

END OF FIGURE

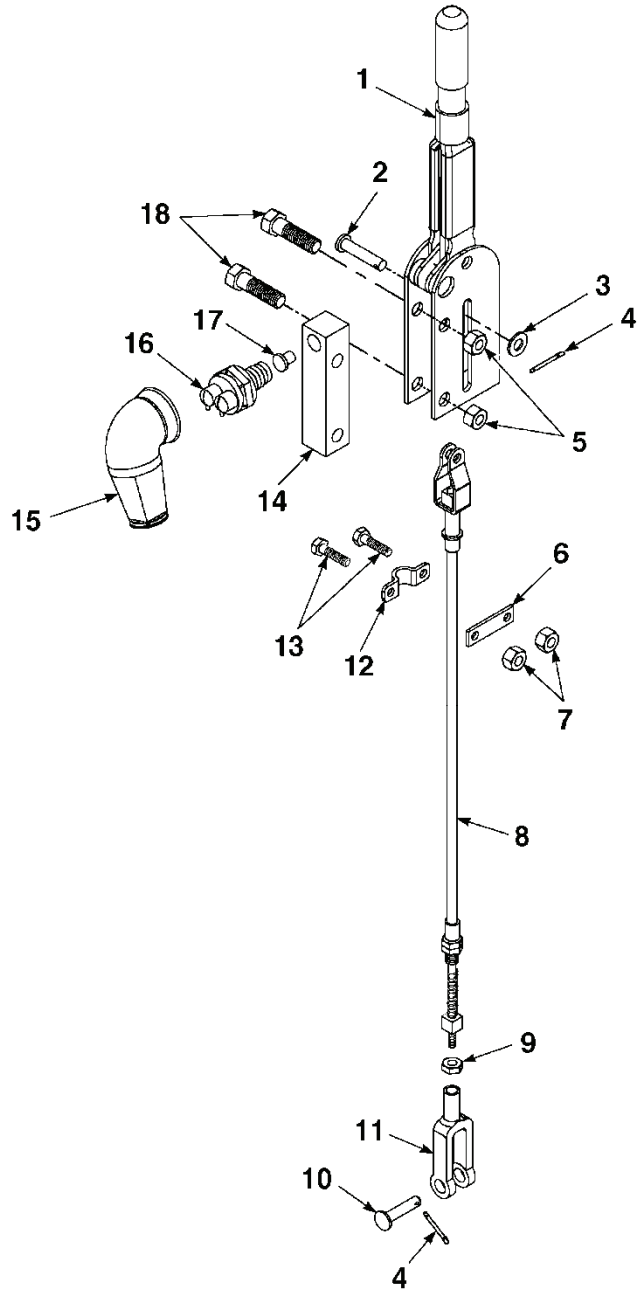


FIGURE 88. HAND BRAKE ASSEMBLY

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 12 BRAKES	
					GROUP 1201 HANDBRAKE ASSEMBLY	
					FIGURE 88. HAND BRAKE ASSEMBLY	
1	PAOZZ		92867	1116000	LEVER, BRAKE	1
2	PAOZZ		2V507	4997245A162243	PIN,CLEVIS	2
3	PAOZZ	5310-00-081-4219	96906	MS27183-12	WASHER,FLAT	2
4	PAOZZ	5315-01-359-1451	96906	MS24665-285	PIN, COTTER	2
5	PBOZZ	5310-01-538-1646	1SE17	NAN3	NUT,PLAIN,HEXAGON	2
6	PAOZZ		92867	81000131	SHIM	1
7	PBOZZ	5310-01-538-1528	1SE17	NAN2	NUT, PLAIN,HEXAGON	2
8	PAOZZ		44185	48053	CABLE, PARK BRAKE	1
9	PAOZZ	5310-00-732-0559	96906	MS51968-8	NUT,PLAIN,HEXAGON	1
10	PAOZZ		2V507	97245A288	PIN	1
11	XDOZZ		1FDW0	5/16-A035840	CLEVIS, CABLE	1
12	PAOZZ	5340-01-070-4475	92867	81000108	STRAP,RETAINING	1
13	PAOZZ	5306-00-225-8499	80205	MS90725-34	BOLT,MACHINE	2
14	PBOZZ	5999-01-199-9132	58536	A-55485/03-017D	MOUNT,SWITCH	1
15	XDOZZ		7Z043	VTE 8404	BOOT, TERMINAL BLOCK	1
16	PAOZZ		77326	21-361P	SWITCH	1
17	PAOZZ		44185	10103	PLUNGER, PARK BRAKE	1
18	PAOZZ	5305-00-942-2196	80204	B1821BH038C100D	SCREW,CAP,HEXAGON HEAD	2

END OF FIGURE

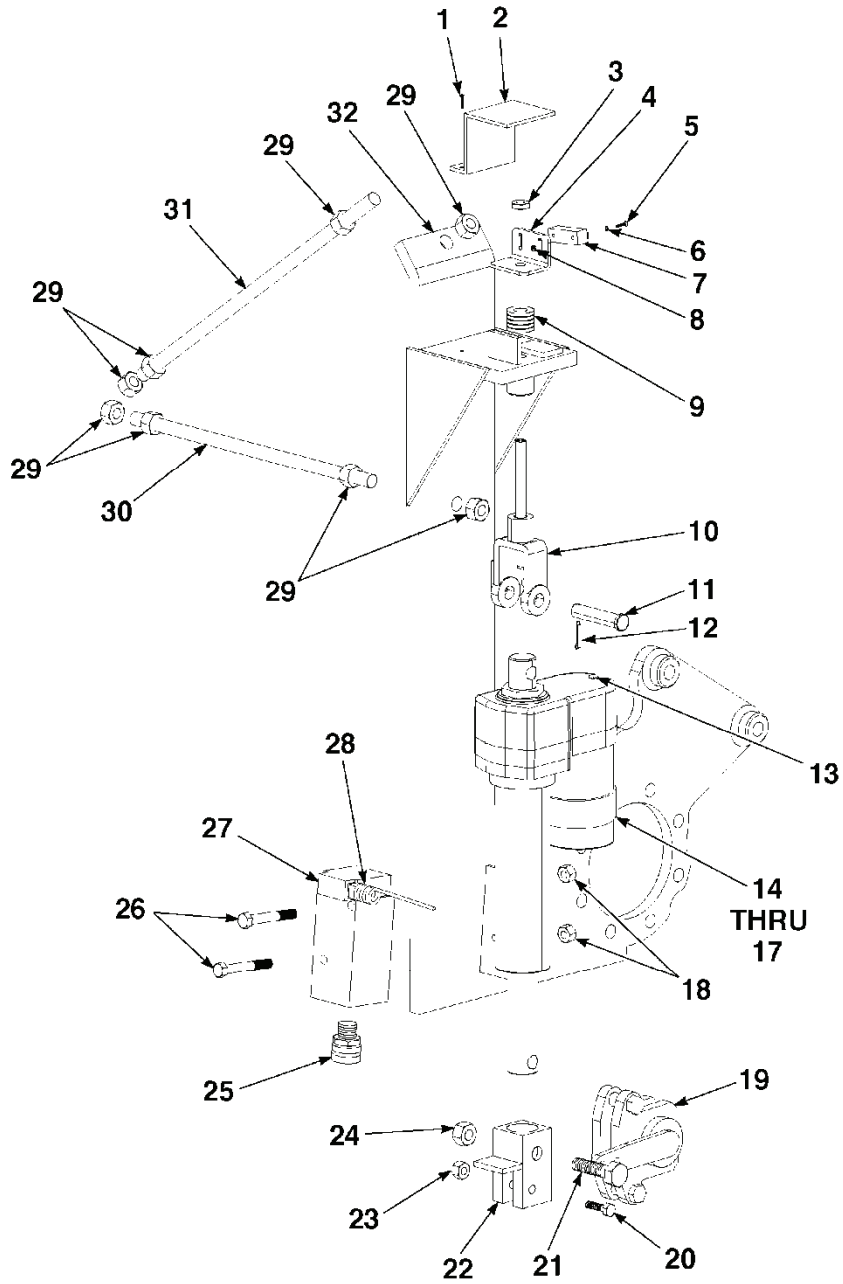


FIGURE 89. PARK POSITION BRAKE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 12 BRAKES	
					GROUP 1206 PARK POSITION BRAKE	
					FIGURE 89. PARK POSITION BRAKE	
1	PAOZZ	5305-00-984-6212	80205	MS35206-265	SCREW, MACHINE	2
2	XBOZZ		44185	48370	COVER, PARK BRAKE	1
3	PAOZZ	5310-01-549-7793	0SUA9	NAF3	NUT,PLAIN,HEXAGON	1
4	XBOZZ		44185	48858	BRACKET, SWITCH	1
5	PAOZZ	2305-00-995-3442	80205	MS35207-268	SCREW, MACHINE	2
6	PAOZZ	5310-00-983-8483	96906	MS27183-5	WASHER,FLAT	2
7	PAOZZ	5930-01-013-3785	91929	BZ-2R55-A2-S	SWITCH,SENSITIVE	1
8	PAOZZ	5310-00-274-8887	06481	G4344-1	NUT,SELF-LOCKING,HEXAGON	2
9	PAOZZ	5310-01-497-6090	2V507	9713K68	WASHER,SPRING TENSION	5
10	XBOZZ		44185	48046	WELDMENT, CLEVIS	1
11	PAOZZ	5315-01-558-7590	39428	94380A645	PIN,STRAIGHT,HEADED	1
12	PAOZZ	5315-01-568-0056	39428	98338A225	PIN,COTTER	1
13	PAOZZ		1Y029	TAC05-1D20	LINEAR ACTUATOR	1
14	PAOZZ		76839	708835	CLAMP,LOOP	1
15	PAOZZ	5306-00-225-8499	80205	MS90725-34	5/16-18X1 GRADE 5 HEX HEAD CAP SCREW ZINC	1
16	PAOZZ	5310-01-538-1528	1SE17	NAN2	NUT,LOCK 5/16-18	1
17	PAOZZ	5310-01-522-6093	96906	MS27183-13	WASHER,FLAT	1
18	PAOZZ	5310-01-527-3369	2V507	90631A411	NUT,SELF-LOCKING,HEXAGON	2
19	PAOZZ		44185	204126	CALIPER, DISC BRK	1
20	PAOZZ	5305-00-226-4831	80204	B1821BH031C150N	SCREW,CAP,HEXAGON HEAD	1
21	PAOZZ	5305-00-880-9634	80205	MS51975-31	SCREW, SHOULDER	1
22	XBOZZ		44185	48051	WELDMENT, CLEVIS	1
23	PAOZZ	5310-01-538-1880	1SE17	NAN1	NUT,PLAIN,HEXAGON	1
24	PAOZZ	5310-01-538-1646	1SE17	NAN3	NUT,PLAIN,HEXAGON	1
25	PAOZZ	5935-00-947-6177	03743	CG1850	ADAPTER,CONNECTOR	1
26	PAOZZ	5305-00-995-3440	80205	MS35207-270	SCREW,MACHINE	2
27	PAOZZ	5930-01-203-1717	01121	802T-H1P	SWITCH,SENSITIVE	1
28	PAOZZ	5930-01-078-4603	01121	802T-W3A	OPERATOR,ROD	1
29	PAOZZ	5310-00-768-0318	96906	MS51967-14	NUT,PLAIN,HEXAGON	8
30	XBOZZ		44185	48860	ROD,SUPPORT	1
31	XBOZZ		44185	48859	ROD,SUPPORT	1
32	XBOZZ		44185	47933	WELDMENT, BRAKEMNT	1

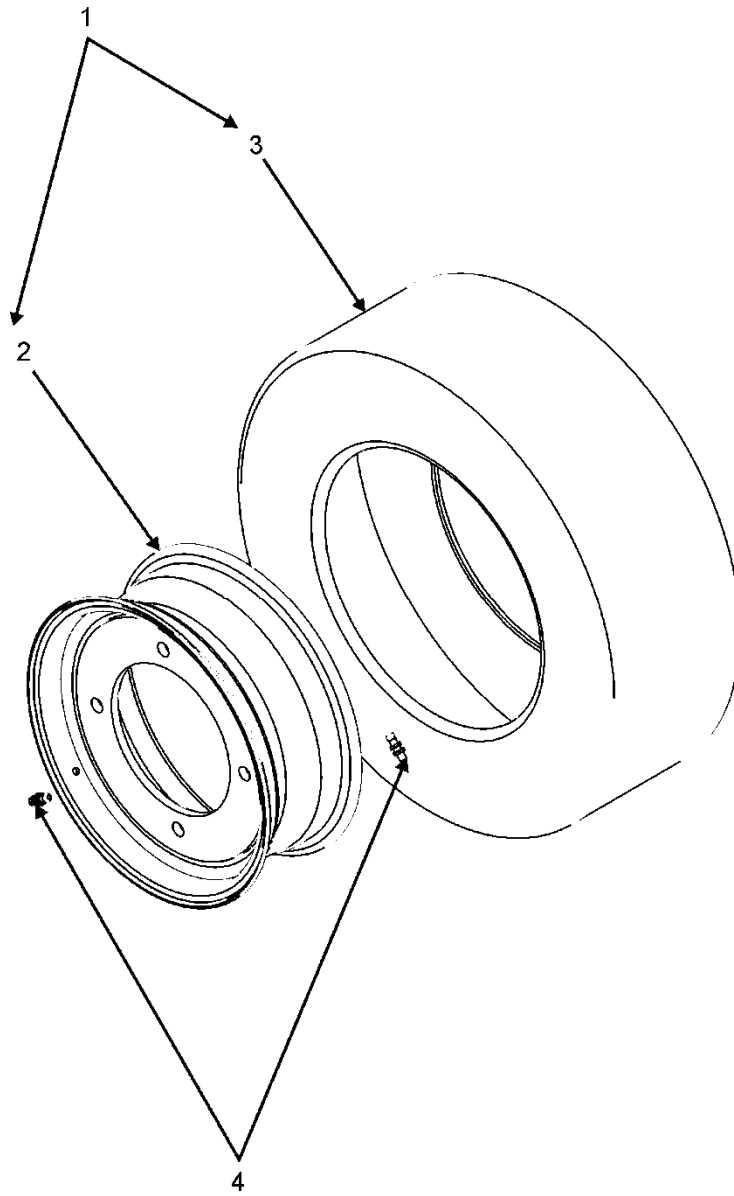


FIGURE 90. WHEEL AND TIRE ASSEMBLY

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 13 WHEELS	
					GROUP 1311 WHEELS	
					GROUP 1313 TIRE	
					FIGURE 90. WHEEL AND TIRE ASSEMBLY	
1	AFOOO		44185	47373	WHEEL/TIREASSY	1
2	PAOZZ		44185	47382	WHEEL	1
3	PAOOO	2610-01-307-8527	81346	ASTM-F1922	TIRE, PNEUMATIC, VEHICULAR	2
4	PAOZZ	4820-01-465-1211	27783	6008B	VALVE,AIR FILLING	8

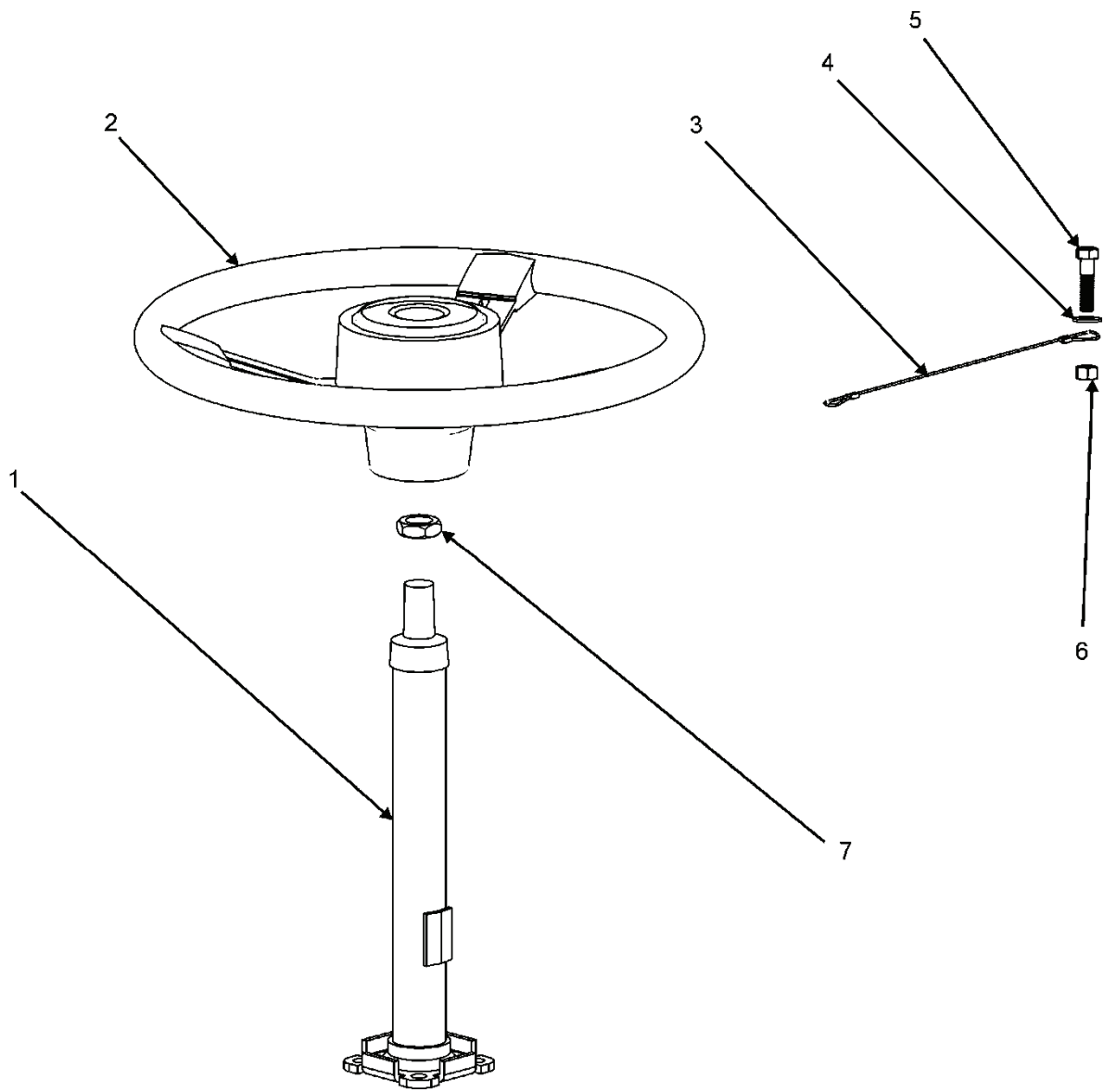


FIGURE 91. STEERING WHEEL AND COLUMN



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 14 STEERING	
					GROUP 1401 STEERING WHEEL/COLUMN	
					FIGURE 91. STEERING WHEEL AND COLUMN	
1	XBOZZ		44185	F6386	COLUMN, STEERING	1
2	XBOZZ		0KAW7	N16353BP	WHEEL, STEERING	1
3	XDOZZ		44185	49009	WHEELLOCK	1
4	PAOZZ	5310-00-080-6004	96906	MS27183-14	WASHER,FLAT	2
5	PAOZZ	5305-00-269-3213	96906	MS90725-62	SCREW,CAP,HEXAGON HEAD	1
6	PAOZZ	5310-00-935-9021	96906	MS51943-35	NUT,SELF-LOCKING,HEXAGON	1
7	PAOZZ	5310-00-514-8103	00198	1741	NUT,PLAIN,ROUND	1

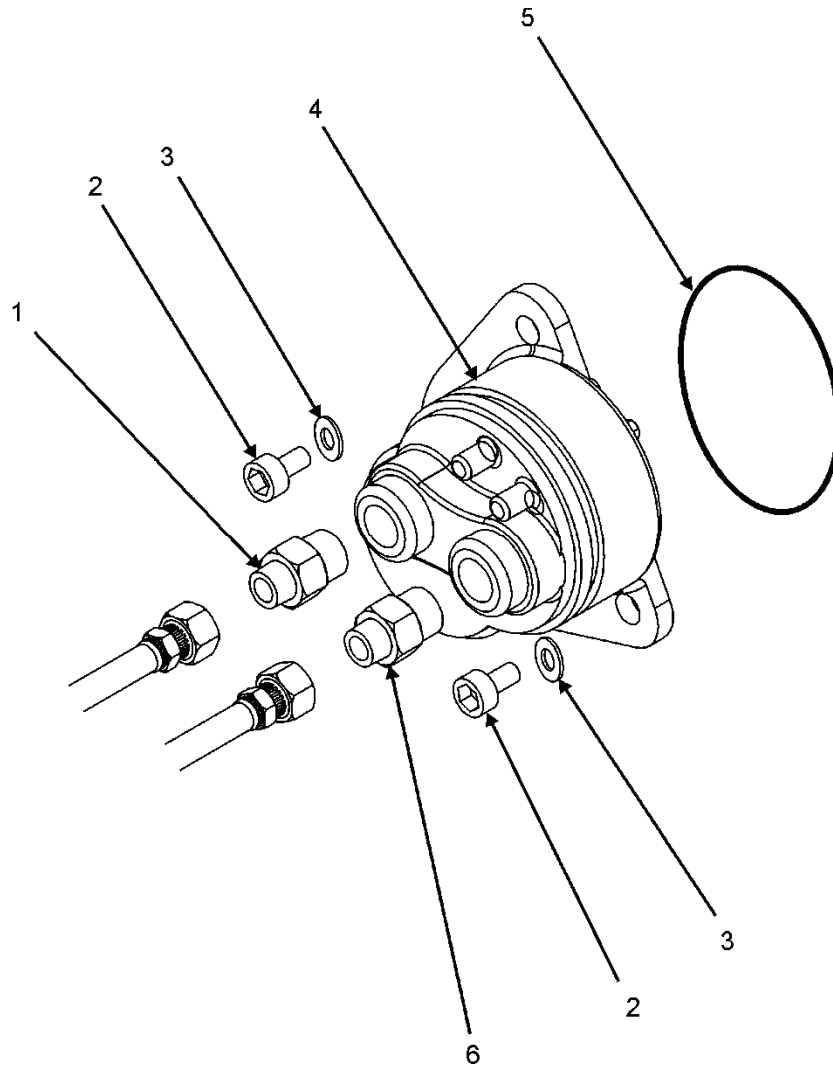


FIGURE 92. GEAR PUMP

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 14 STEERING	
					GROUP 1410 GEAR PUMP	
					FIGURE 92. GEAR PUMP	
1	PAOZZ	4730-00-623-9673	01276	202702-10-8S	ADAPTER,STRAIGHT,TUBE TO BOSS	1
2	PAOZZ		39428	96144A261	SCREW, CAP, SOC HD M10 X 125 X 30MM	2
3	PAOZZ	5310-01-533-3780	39428	91202A242	WASHER,LOCK	2
4	PAOZZ		96151	A-3066-002	PUMP,GEAR	1
5	PAOZZ		30397	1-042	O-RING	1
6	PAOZZ	4730-01-498-6119	5E240	6400-12-12-0	REDUCER,TUBE	1

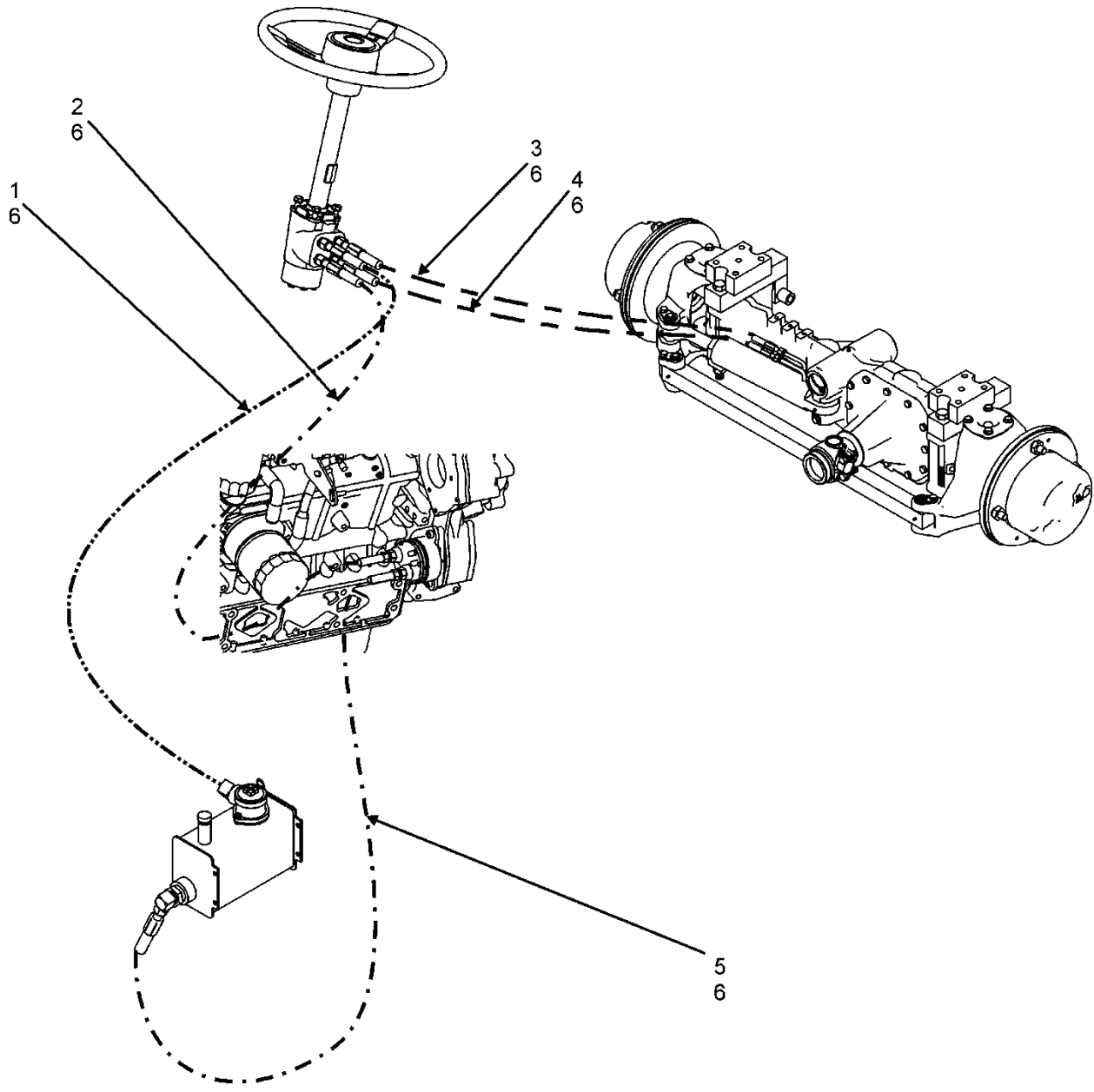


FIGURE 93. HYDRAULIC HOSE/TUBE ASSEMBLIES

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 14 STEERING	
					GROUP 1411 HYDRAULIC HOSE/TUBE	
					ASSEMBLIES	
					FIGURE 93. HYDRAULIC HOSE/TUBE	
					ASSEMBLIES	
1	XBOZZ		44185	207793.10	HOSEASSY	1
2	XBOZZ		44185	207793.9	HOSEASSY	1
3	XBOZZ		44185	48262	HOSEASSY	1
4	XBOZZ		44185	48261	HOSEASSY	1
5	XBOZZ		44185	46240.4	HOSEASSY	1
6	XBOZZ		0S1H5	NHS-100	SLEEVE,NYLON	1

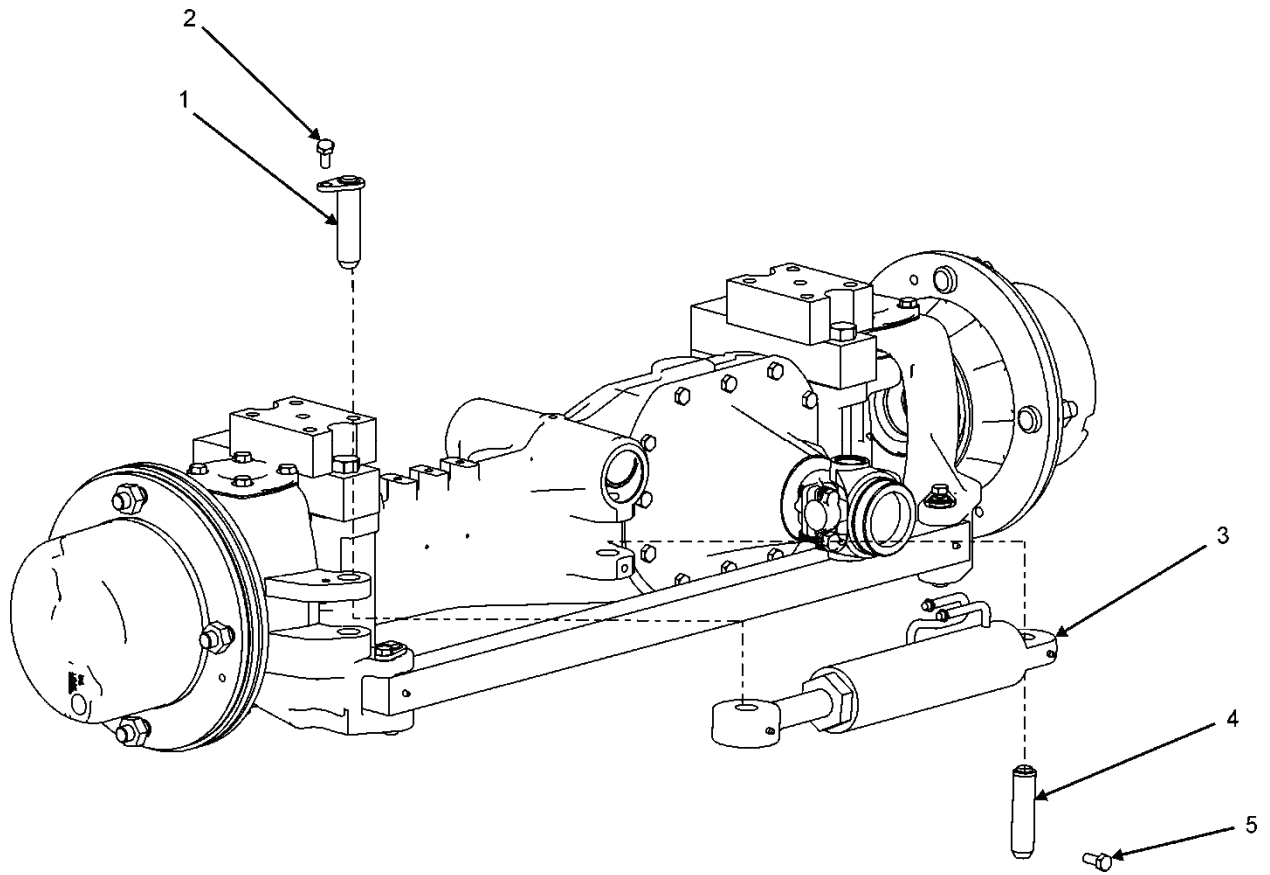


FIGURE 94. STEER CYLINDER

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 14 STEERING	
					GROUP 1412 STEERING CYLINDER	
					FIGURE 94. STEER CYLINDER	
1	PAOZZ	5315-99-411-3367	K7599	911/22800	PIN, PIVOT ASSEMBLY	1
2	PAOZZ	5305-01-572-8716	39428	91180A626	SCREW,CAP,HEXAGON HEAD	1
3	XBOZZ		K7599	553/60189	STEER CYLINDER	1
4	XBOZZ		K7599	812/10071	PIN, PIVOT ASSEMBLY	1
5	PAOZZ		K7599	812/01580	SCREW, LOCKING	1

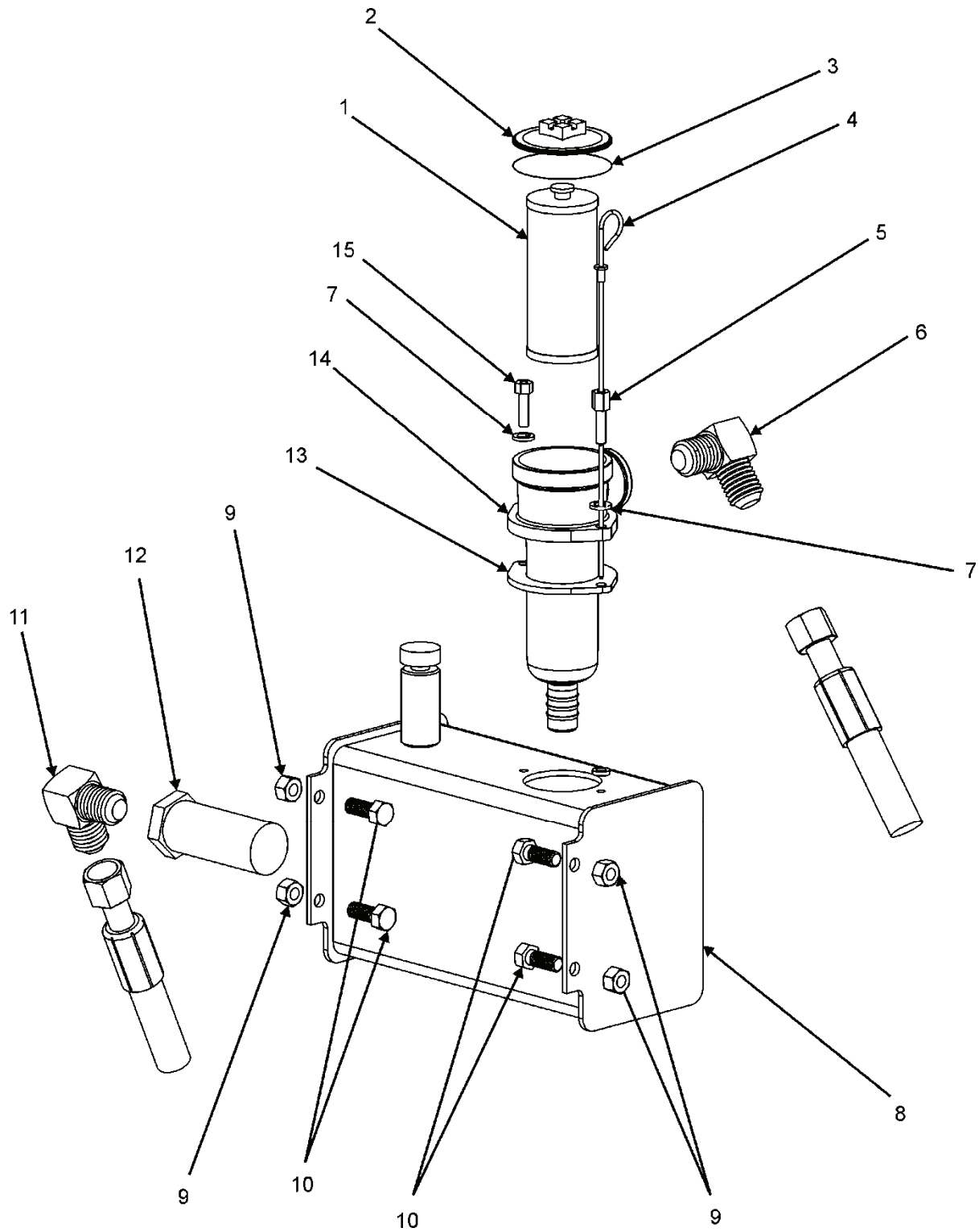


FIGURE 95. HYDRAULIC TANK ASSEMBLY



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 14 STEERING	
					GROUP 1413 HYDRAULIC TANK	
					ASSEMBLY	
					FIGURE 95. HYDRAULIC TANK ASSEMBLY	
1	PAOZZ		1FLG9	3398826	ELEMENT, FILTER, TANK	1
2	XBOZZ		44185	49325	COVER	1
3	PAOZZ	5331-00-167-5135	81343	AS3209-149	O-RING	1
4	XBOZZ		44185	48966	DIPSTICK	1
5	PAOZZ		1FLG9	37 020 009 4	BOLT,DIPSTICK M8 X 125MM	1
6	PAOZZ	4730-01-088-9643	81343	J514	ELBOW,TUBE TO BOSS	1
7	PAOZZ	5310-00-407-9566	80205	MS35338-45	WASHER,LOCK	2
8	XBOZZ		44185	48056	TANK WELDMENT	1
9	PAOZZ	5310-00-497-3891	96906	MS20365-720A	NUT,SELF-LOCKING,HEXAGON	4
10	PAOZZ		1SE17	B405	SCREW, CAP, HEX HD 7-16-14 X 1-1/4 IN	4
11	PAOZZ	4730-01-011-7736	96906	MS51527A12	ELBOW,TUBE TO BOSS	1
12	PAOZZ		55524	ST-15	FILTER, STRAINER	1
13	PAOZZ		1FLG9	3186667	GASKET	1
14	PAOZZ		1FLG9	37 570 971 4	FILTERASSY,TANK	1
15	PAOZZ	5306-00-225-8499	80205	MS90725-34	BOLT,MACHINE	1

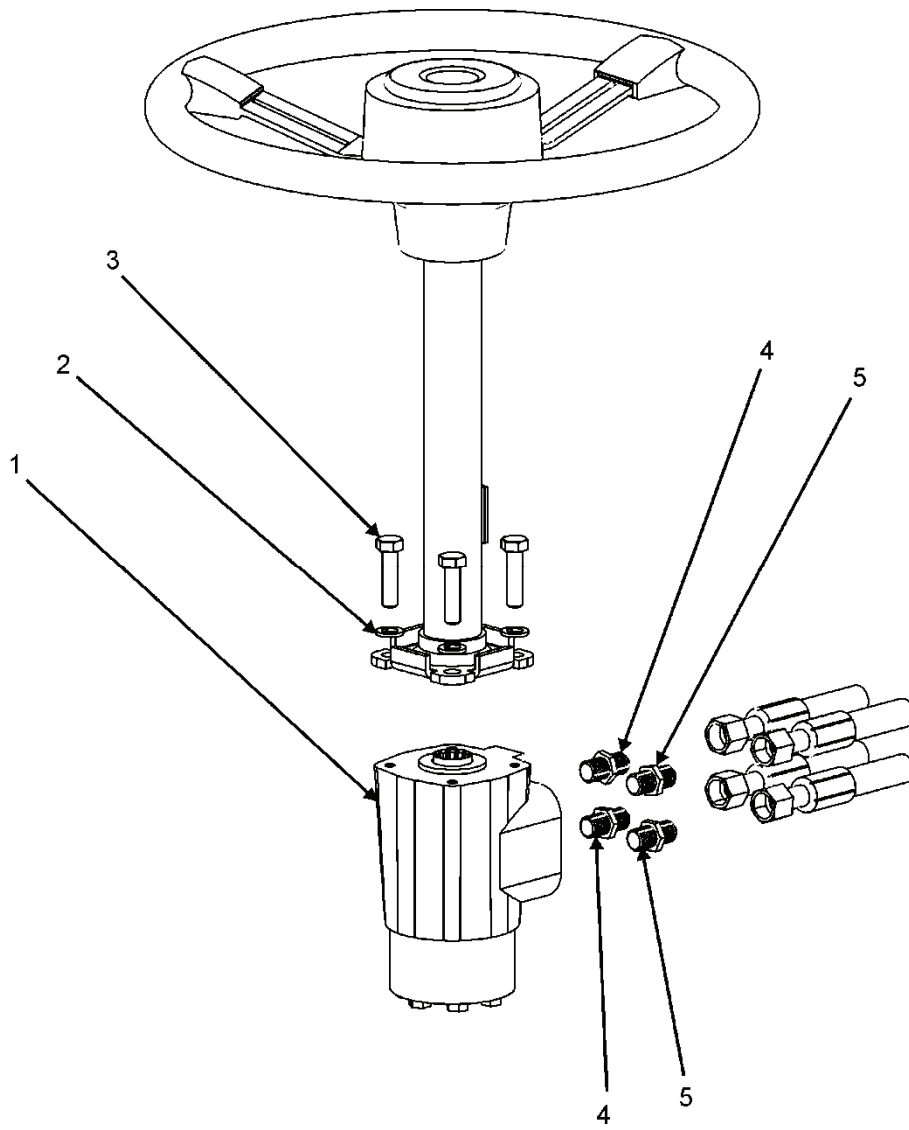


FIGURE 96. ORBITAL VALVE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 14 STEERING	
					GROUP 1414 ORBITAL VALVE	
					FIGURE 96. ORBITAL VALVE	
1	XBOZZ		96151	A-1372-001	STEER UNIT	1
2	PAOZZ	5310-01-533-3780	39428	91202A242	WASHER, LOCK	4
3	PAOZZ	5305-00-010-1032	80212	P540	SCREW, MACHINE	4
4	PAOZZ	4730-00-080-7040	96906	MS51525A6-8	ADAPTER, STRAIGHT, TUBE TO BOSS	2
5	PAOZZ		44185	90413	FTG, HYD, 08MJ-08MB	2

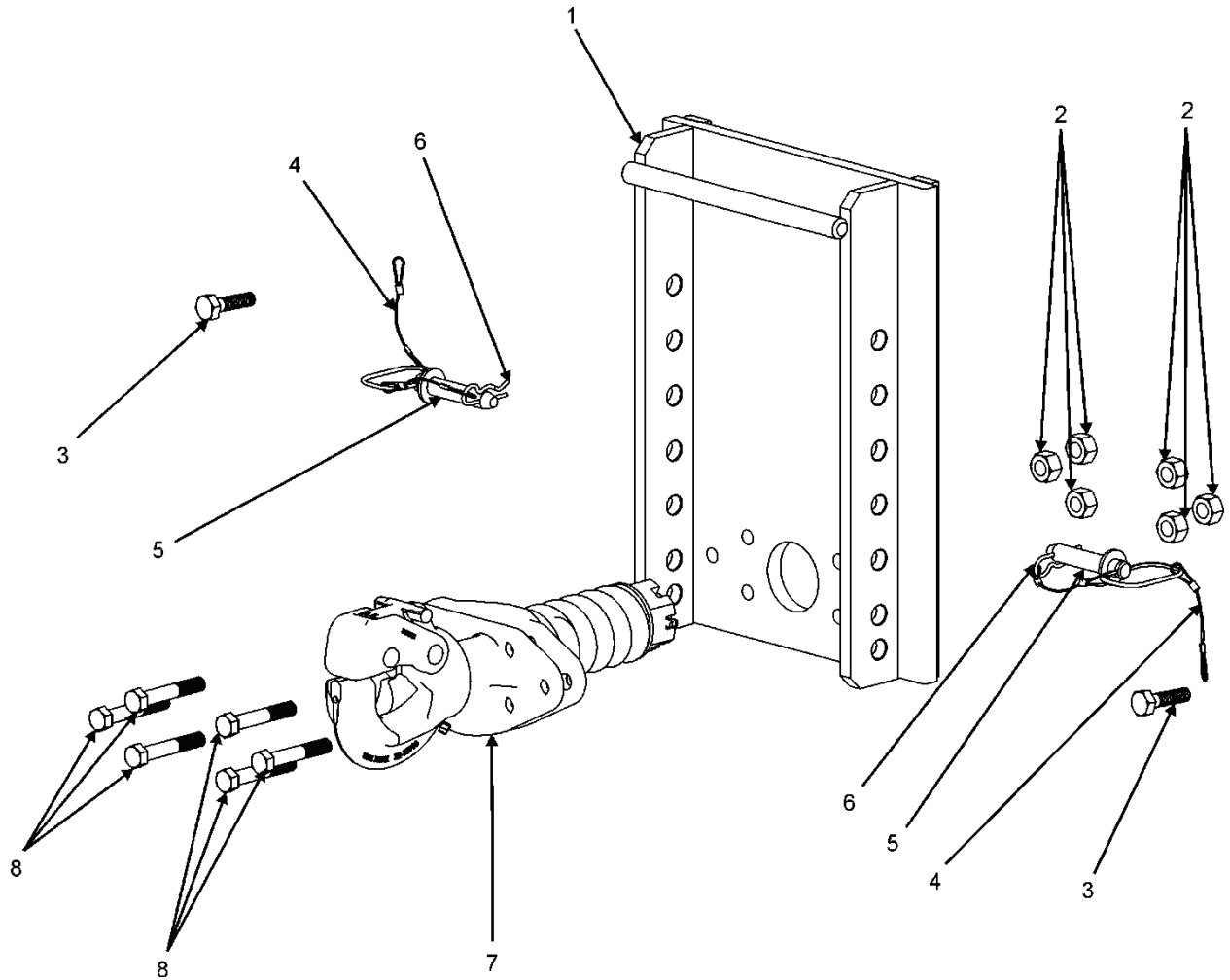


FIGURE 97. PINTLE HITCH ASSEMBLY

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 15 FRAME, TOWING, ATTACHMENTS AND DRAWBARS	
					GROUP 1503 PINTLE HITCH ASSEMBLIES	
					FIGURE 97. PINTLE HITCH ASSEMBLY	
1	XDOZZ		44185	48958	HITCHSLIDE	1
2	PBOZZ	5310-01-539-3475	1SE17	NAN5	NUT,SELF-LOCKING,HEXAGON	12
3	PAOZZ	5305-00-071-2506	80204	B1821BH025C050N	SCREW,CAP,HEXAGON HEAD	2
4	XDOZZ		2V507	98335A127	LANYARD	4
5	PAOZZ		0LFK0	48964	PIN,HITCH	4
6	PAOZZ	5315-01-558-7647	39428	98335A067	PIN,COTTER	4
7	PAOZZ		74410	PH-30SA41	PINTLE,HITCH	2
8	PAOZZ	5305-00-071-2073	80204	B1821BH050C250N	SCREW,CAP,HEXAGON HEAD	2

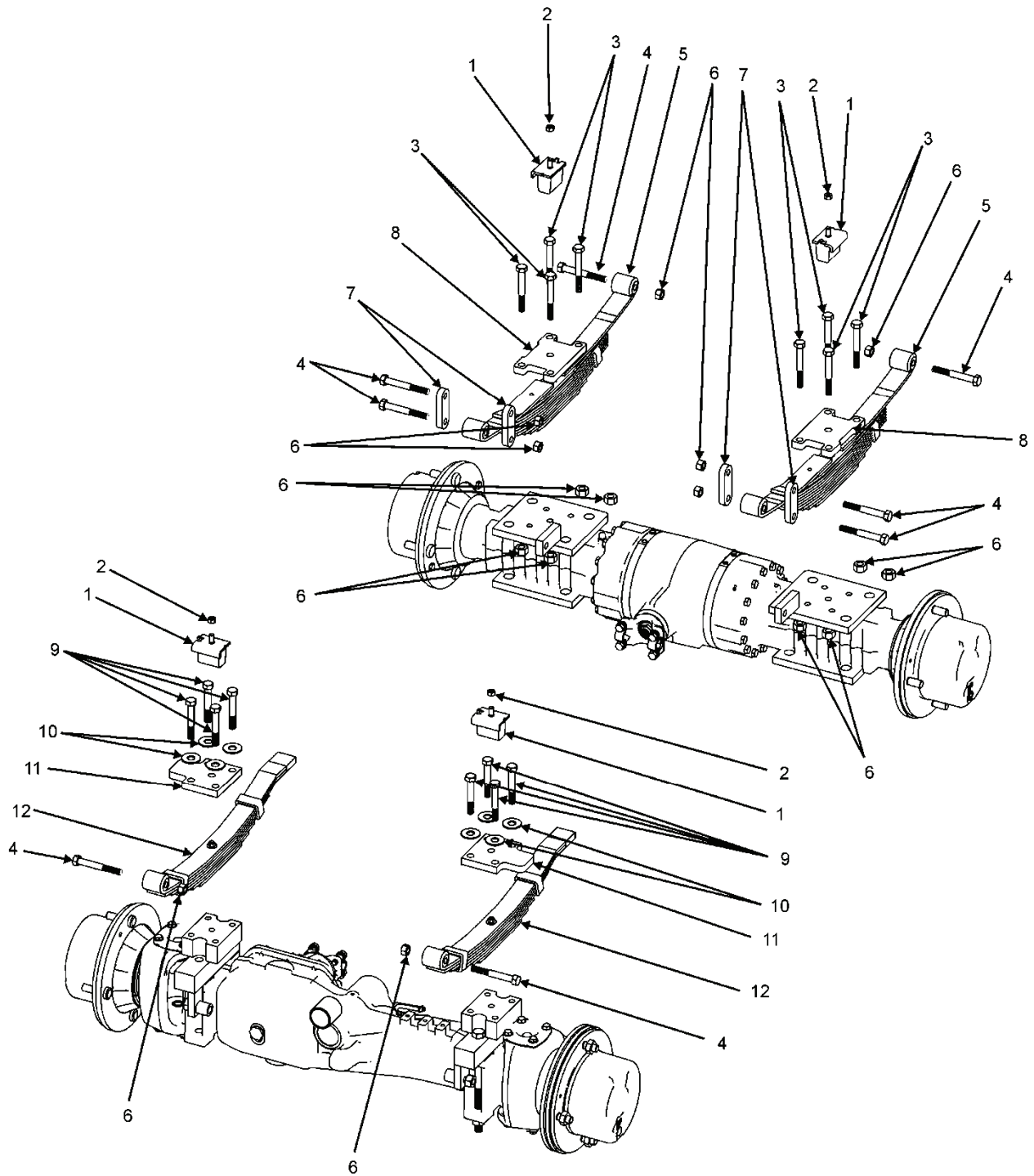


FIGURE 98. SPRINGS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 16 SPRINGS AND SHOCK ABSORBERS	
					GROUP 1601 SPRINGS	
					FIGURE 98. SPRINGS	
1	XBOZZ		57526	C-32-4603-9	SNUBBER, LEAF SPRING	2
2	PAOZZ	5310-00-880-8189	D9182	MS35690-704	NUT,PLAIN,HEXAGON	2
3	PAOZZ	5305-00-732-9207	80204	B1821BH063C550N	SCREW,CAP,HEX HEAD	8
4	PAOZZ	5305-00-726-2568	96906	E0E0	SCREW,CAP,HEX HEAD	6
5	XBOZZ		6H829	39057	SPRING ASSY, REAR	2
6	PAOZZ	5310-01-215-7311	96906	MS51943-13	NUT,SELF-LOCKING,HEXAGON	16
7	XBOZZ		44185	41047	PLATE,SHACKLE	4
8	XBOZZ		44185	48890	MOUNT, REAR AXLE	2
9	PAOZZ	5305-01-552-0307	07070	91257A816	SCREW, CAP, HEX HD 5/8-11 X 5-1/2IN	8
10	PAOZZ	5310-00-045-5001	96906	MS35340-50	WASHER,LOCK	8
11	XBOZZ		44185	47533	PLATE, UPPER	2
12	XBOZZ		44185	47585	SPRING ASSY, FRONT	2

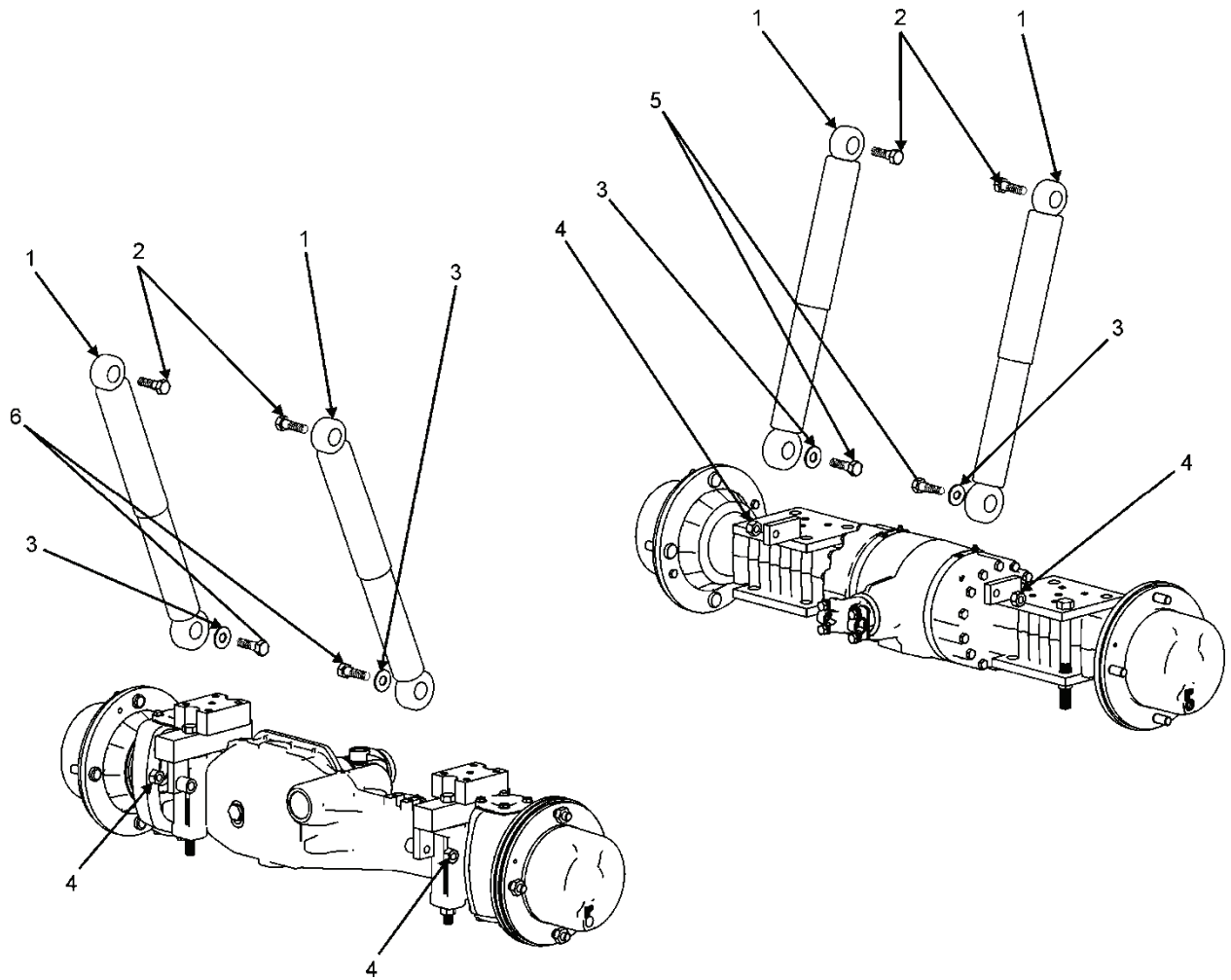


FIGURE 99. SHOCK ABSORBER



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 16 SPRINGS AND SHOCK ABSORBERS	
					GROUP 1604 SHOCK ABSORBERS	
					FIGURE 99. SHOCK ABSORBER	
1	PAOZZ		6A983	66634	SHOCK ABSORBER	4
2	PAOZZ	5305-00-922-7994	80204	B1821BH075C250N	SCREW,CAP,HEXAGON HEAD	2
3	PAOZZ	5310-01-347-4029	96906	MS27183-26	WASHER FLAT	2
4	PAOZZ	5310-00-176-6519	96906	MS35690-1204	NUT,PLAIN,HEXAGON	4
5	PAOZZ	5305-00-905-2700	80204	B1821BH088C250N	SCREW,CAP,HEXAGON HEAD	2
6	PAOZZ	5305-00-947-4362	80204	B1821BH075C500N	SCREW,CAP,HEXAGON HEAD	2

END OF FIGURE

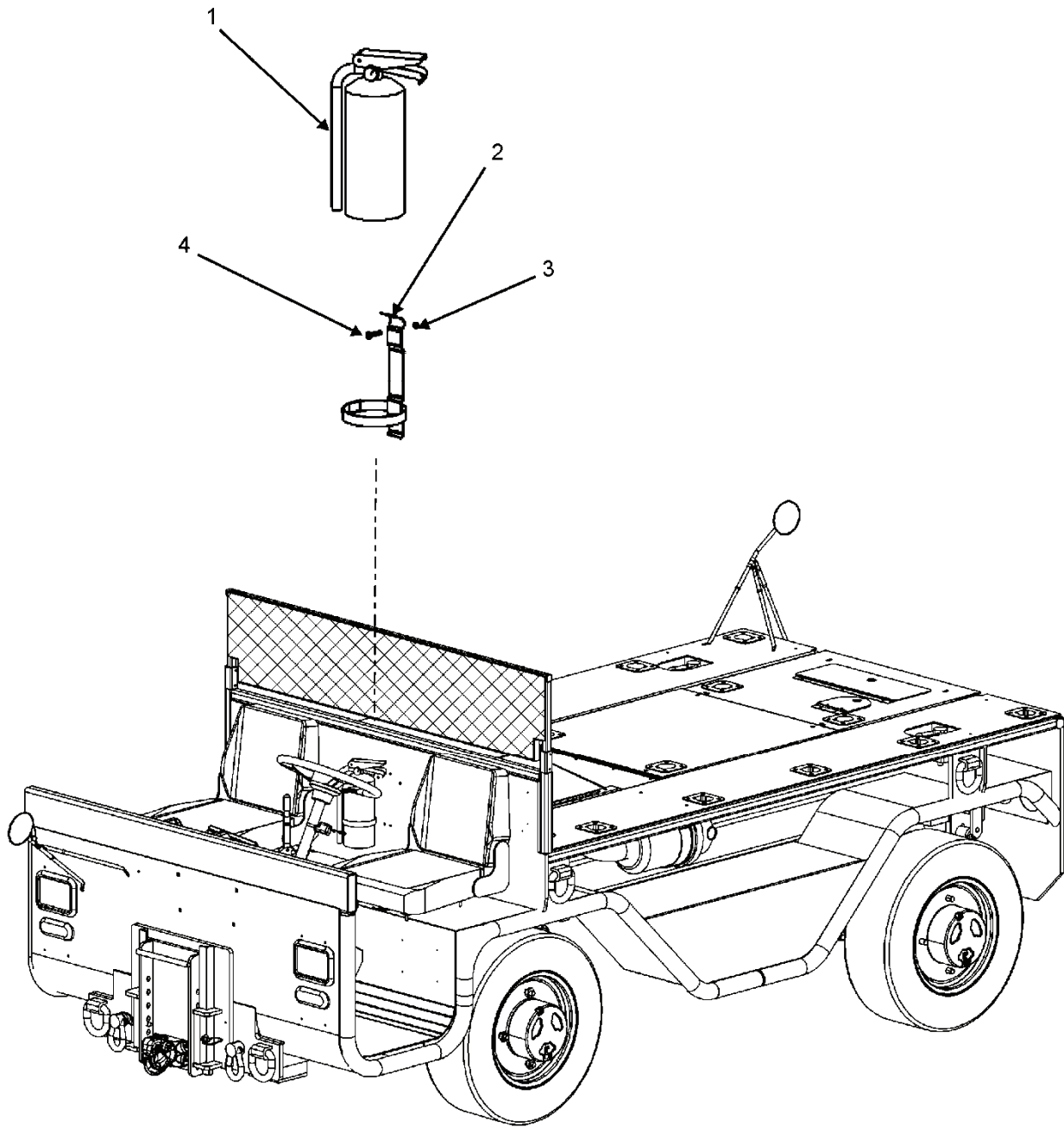


FIGURE 100. FIRE EXTINGUISHER

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 18 BODY, CAB, HOOD AND HULL	
					FIGURE 100. FIRE EXTINGUISHER	
1	PAOZZ	4210-01-432-9910	03670	415899	EXTINGUISHER, FIRE	1
2	PAOZZ	4210-01-541-0695	03670	429146	BRACKET, FIRE EXT.	1
3	PAOZZ	5310-01-538-1880	1SE17	NAN1	NUT, PLAIN, HEXAGON	4
4	PAOZZ	5305-00-988-1727	96906	MS35206-283	SCREW, MACHINE	4

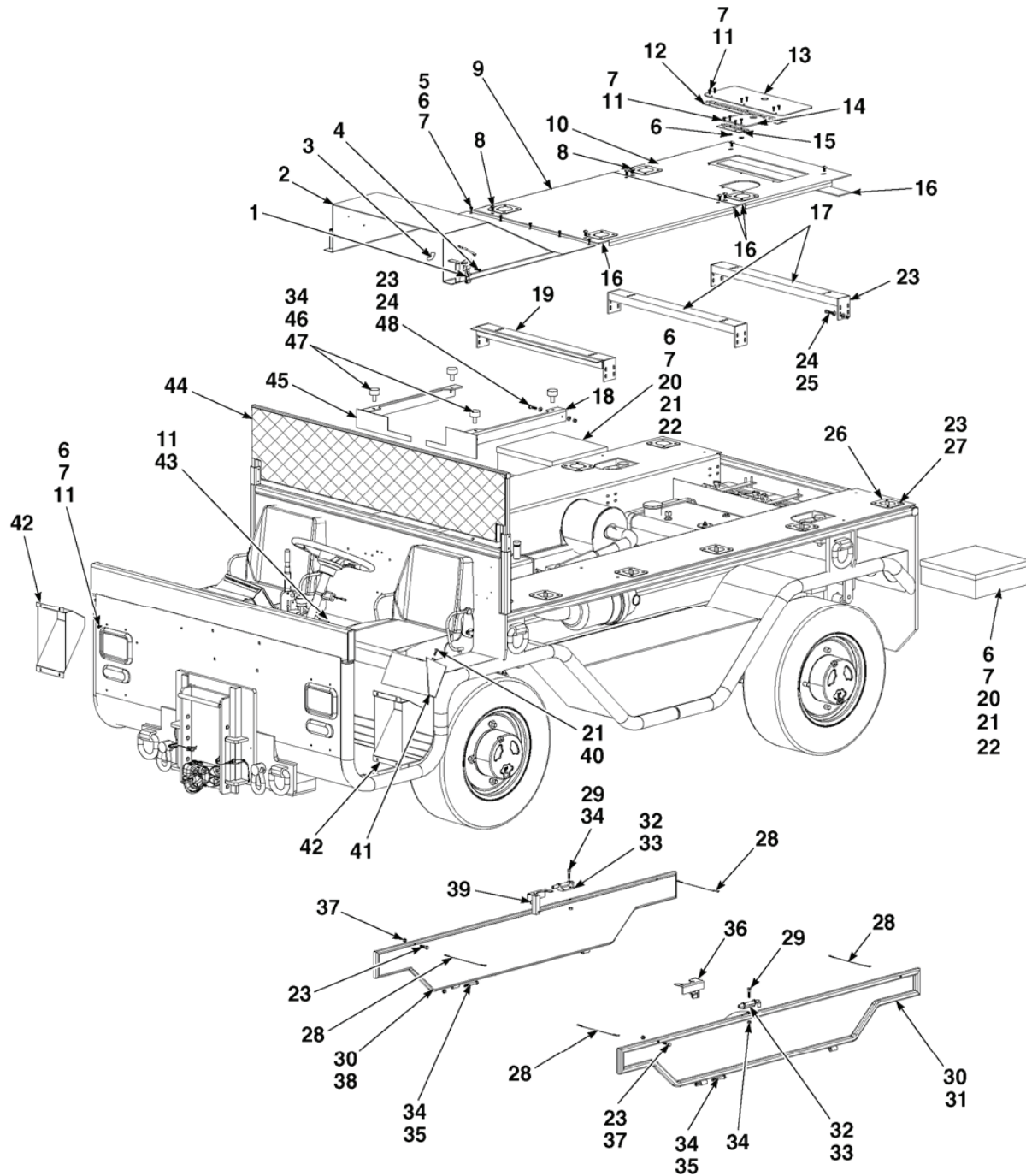


FIGURE 101. ENGINE COVER AND ACCESS PANELS

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 18 BODY, CAB, HOOD AND HULL	
					GROUP 1801 ENGINE COVER AND ACCESS	
					PANELS	
					FIGURE 101. ENGINE COVER AND ACCESS	
					PANELS	
1	PAOZZ	5340-01-271-6844	94222	371008610	LATCH, FLEX DRAW	2
2	XBOZZ		44185	47921	COVERWELDMENT, ENG	1
3	PAOZZ	5310-01-538-0785	1SE17	0EBA	NUT, SELF-LOCKING, HEXAGON	4
4	PAOZZ	5305-00-512-5087	77445	AN520-10-8	SCREW, MACHINE	4
5	PAOZZ	5305-00-988-1727	96906	MS35206-283	SCREW, MACHINE	5
6	PAOZZ	5310-01-537-9035	1SE17	WU51	WASHER, FLAT	15
7	PAOZZ	5310-01-538-1880	1SE17	NAN1	NUT, PLAIN, HEXAGON	23
8	PAOZZ	5305-01-577-1174	39428	91306A423	SCREW, CAP, BTN HEAD 3/8-16 X 1-1/4IN	8
9	XBOZZ		44185	47771	PLATE, DECK, MIDDLE	1
10	XBOZZ		44185	47772	PLATE, DECK, REAR	1
11	PAOZZ	5305-01-347-2253	39428	90272A540	SCREW, MACHINE	18
12	XBOZZ		44185	48931	HINGE, BATTERY COVER	1
13	XBOZZ		44185	48929	COVER, BATTERY	1
14	XBOZZ		44185	NW036670	PLATE, ACCESS DOOR	1
15	XBOZZ		44185	NW035688	HINGE, ACCESS DOOR	1
16	PAOZZ	5330-01-016-7740	82942	SCE41	SEAL	4
17	XBOZZ		44185	47903	SUPPORT, REAR DECK	2
18	XBOZZ		44185	48366	AIR DAM WELDMENT, RH	1
19	XBOZZ		44185	48054	PLATE, DECK SUPPORT	1
20	XBOZZ		44185	48970	BOX, SEALED	2
21	PAOZZ	5305-01-485-6049	80205	MS90725-10	SCREW, CAP, HEXAGON HEAD	2
22	PAOZZ		44185	49271	SPACER 0375 ID X 10 OD X 0375 IN	4
23	PAOZZ	5310-01-538-1646	1SE17	NAN3	NUT, PLAIN, HEXAGON	60
24	PAOZZ	5310-00-809-4061	96906	MS27183-15	WASHER, FLAT	28
25	PAOZZ	5305-00-269-3213	96906	MS90725-62	SCREW, CAP, HEXAGON HEAD	24
26	XBOZZ		20669	2383154	RING, TIE-DOWN	14
27	PAOZZ		1SE17	K305	BOLT, CARRIAGE 3/8-16 X 1-1/4 IN	56
28	XBOZZ		2V507	30645T659	LANYARD, GEAR DOOR	4
29	PAOZZ	5306-01-541-3777	44185	F100309	SCREW, CAP, HEX HD 5/16-18 X 1-3/4 IN	4
30	PAOZZ	2540-01-085-0847	7X677	3792828	BUMPER, HOOD	2
31	XBOZZ		44185	48986	DOOR, SIDELH	1
32	PAOZZ	5315-01-553-0258	39428	98416A017	PIN, SAFETY 5/16 X 2-1/4 IN	2
33	PAOZZ		3007	9297RH-32-HB	LATCH, SPRING	2
34	PAOZZ	5310-00-829-9981	90960	MS35649-2312	NUT, PLAIN, HEXAGON	8
35	PAOZZ		2V507	91257A597	SCREW, CAP, HEX HD 5/16-18 X 3-1/2 IN	4
36	XBOZZ		44185	49056	LATCHWELDMENT, DOOR	1
37	PAOZZ	5305-00-725-2317	0158B	MS90725-64	SCREW, CAP, HEXAGON HEAD	4
38	XBOZZ		44185	48987	DOOR, SIDERH	1
39	XBOZZ		44185	49060	LATCHWELDMENT, DOOR	1
40	PAOZZ	5310-00-582-5965	80205	MS35338-44	WASHER, LOCK 1/4	2
41	XBOZZ		44185	49258	COVER, STEERING	1
42	XBOZZ		44185	48273	COVER, LIGHT	2
43	XBOZZ		44185	47579	PLATE, SEAT, CENTER	1
44	XBOZZ		44185	48561	GUARD, BACK CAB	1
45	XBOZZ		44185	48364	AIR DAM WELDMENT, LH	1
46	PAOZZ		77060	3963260	SCREW, HOOD BUMPER	4
47	PAOZZ	2540-01-085-0847	7X677	3792828	BUMPER	4
48	PAOZZ	5305-00-942-2196	80204	B1821BH038C100D	SCREW, CAP, HEXAGON HEAD	4

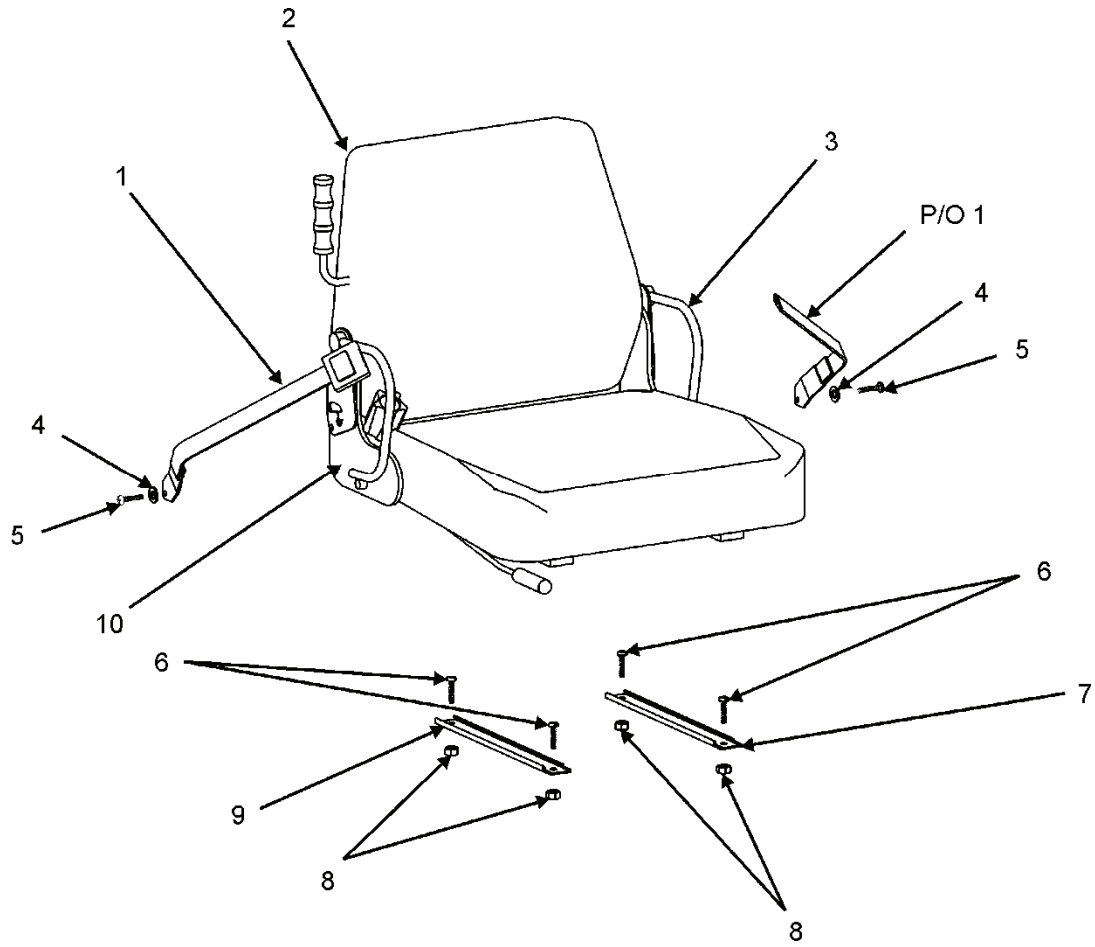


FIGURE 102. SEAT AND SEAT BELT

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 18 BODY, CAB, HOOD AND HULL	
					GROUP 1806 SEAT	
					FIGURE 102. SEAT AND SEAT BELT	
1	XBOZZ		1VJT5	60-02	BELT,VEHICULAR SAFETY	2
2	XDOZZ		3R801	5500	SEAT, SEMI SUSPEN	2
3	XDOZZ		3R801	201567-000LH	LEFT HAND GUARD, HIP, LH	2
4	PAOZZ	5310-01-364-8234	39428	91090A112	WASHER,FLAT	2
5	PAOZZ	5305-00-269-3238	80204	B1821BH038F125N	SCREW,CAP,HEXAGON HEAD	2
6	PAOZZ		1SE17	040G	5/16-18X1 BUTTON SOCKET HEAD CAP SCREW ZINC	4
7	XDOZZ		44185	49254	RAIL,SEAT,LH	2
8	PBOZZ	5310-01-538-1528	1SE17	NAN2	NUT, PLAIN, HEXAGON	1
9	XDOZZ		44185	49255	RAIL,SEAT,RH	1
10	XDOZZ		3R801	201567-000RH	RIGHT HAND GUARD,HIP,RH	2

END OF FIGURE

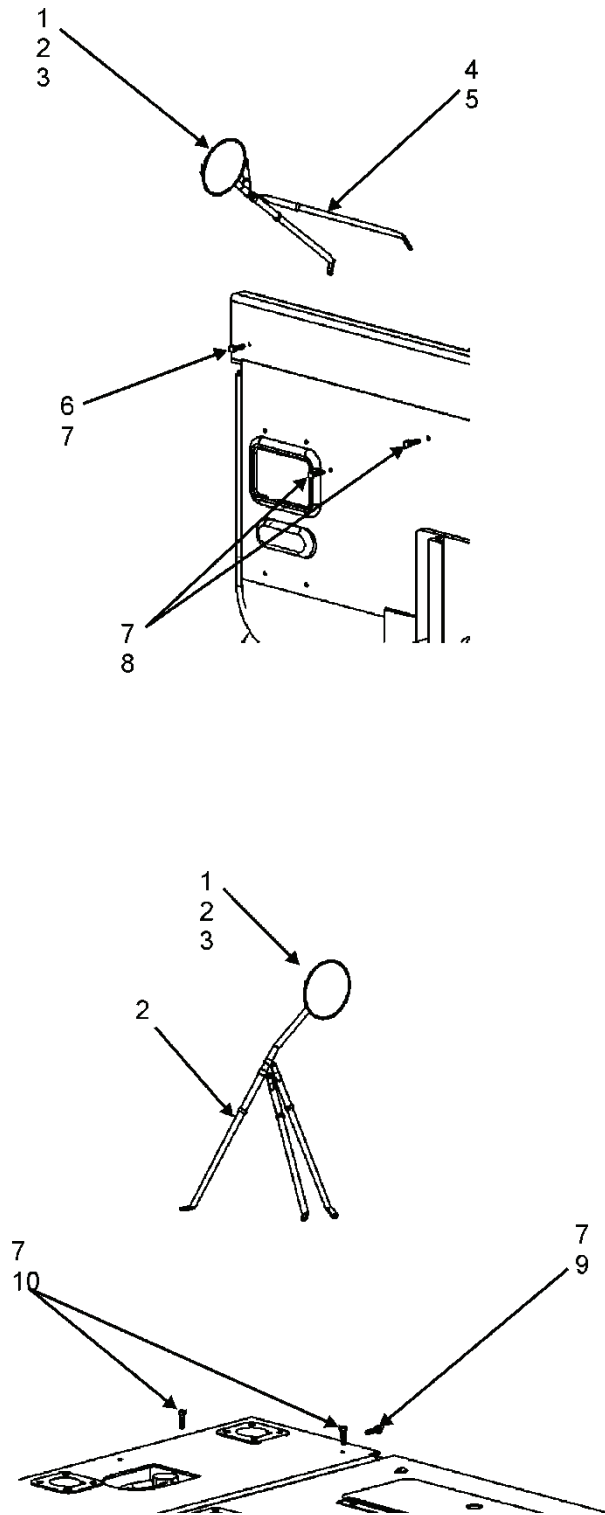


FIGURE 103. MIRRORS



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 22 BODY CHASSIS AND HULL ACCESSORY ITEMS	
					GROUP 2202 MIRRORS	
					FIGURE 103. MIRRORS	
1	XBOZZ		81834	12172	MIRROR	2
2	PAOZZ	5305-00-225-3843	80204	B1821BH025C100N	SCREW, CAP, HEXAGON HEAD	2
3	PAOZZ	5310-00-582-5965	80205	MS35338-44	WASHER, LOCK	2
4	XBOZZ		81834	22002	BRACKET, MIRROR	2
5	PAOZZ	5305-00-071-2513	80204	B1821BH025C250N	SCREW, CAP, HEXAGON HEAD	1
6	PAOZZ	5310-01-538-1528	1SE17	NAN2	NUT, PLAIN, HEXAGON	6
7	PAOZZ	5306-00-225-8496	80205	MS90725-31	BOLT, MACHINE	2
8	PAOZZ	5305-00-226-4831	80204	B1821BH031C150N	SCREW, CAP, HEXAGON HEAD	1
9	PAOZZ	5306-00-225-8499	80205	MS90725-34	BOLT, MACHINE	2

END OF FIGURE

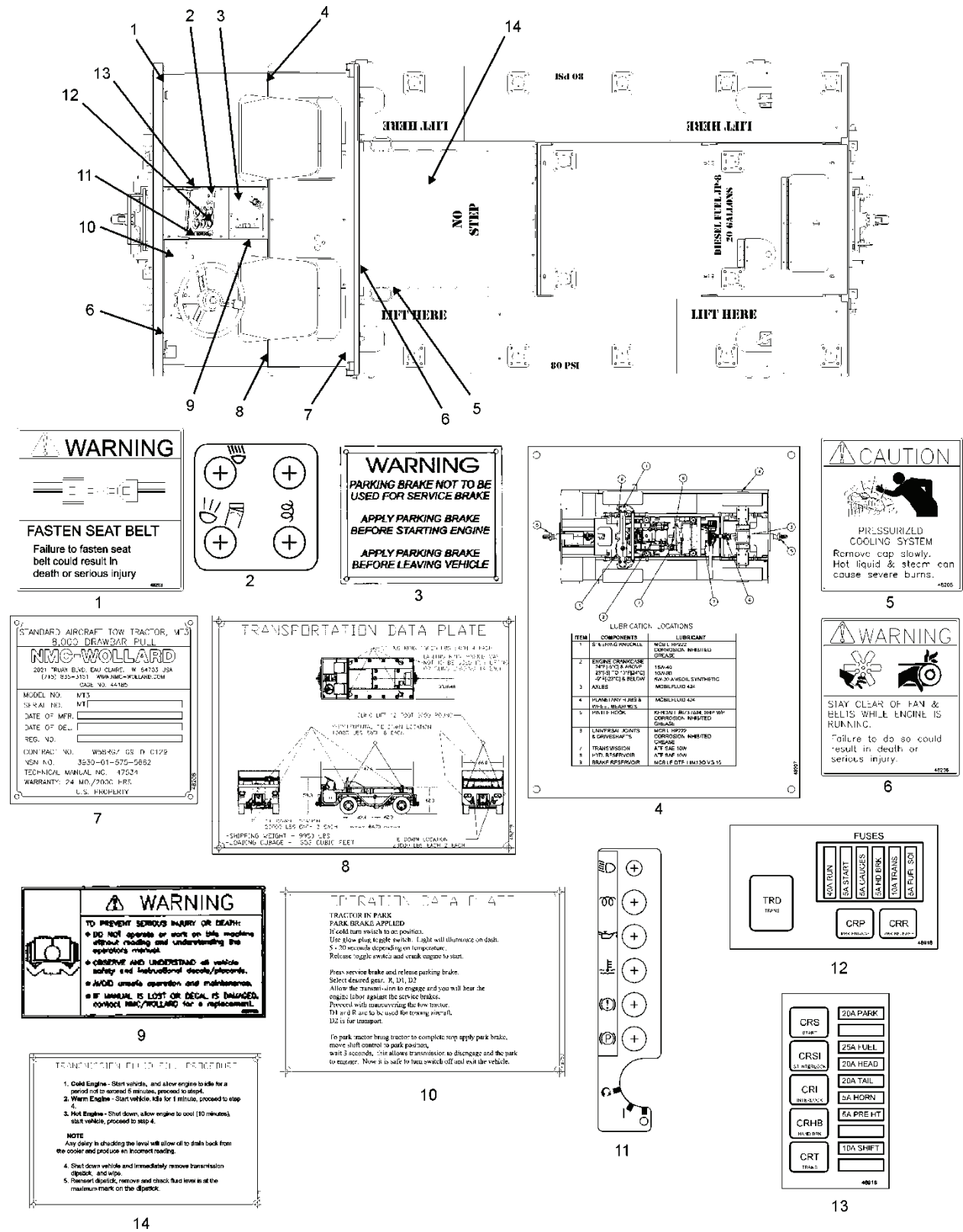


FIGURE 104. DATA PLATES

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ONCODE (UOC)	(7) QTY
					GROUP 22 BODY CHASSIS AND HULL ACCESSORY ITEMS	
					GROUP 2210 DATA PLATES	
					FIGURE 104. DATA PLATES	
1	XBOZZ		44185	48209	DECAL TRANSPORT	1
2	XBOZZ		44185	48207	PLATE, LUBE	1
3	XBOZZ		44185	48205	PLACARD, CAUTION	1
4	XBOZZ		44185	48206	PLACARD, WARNING	2
5	XBOZZ		44185	305732	PLACARD, READ MANUAL	1
6	XBOZZ		44185	48916	DECAL, FUSE/RELAY	1
7	XBOZZ		44185	48199	PLACARD, DASH PANEL	1
8	XBOZZ		44185	NW017237	PLATE, WARNING	1
9	XBOZZ		44185	48918	DECAL, FUSE/RELAY	1
10	XBOZZ		44185	48753	DECAL, OPERATION	1
11	XBOZZ		44185	48208	PLATE, DATA	1
12	XBOZZ		44185	48203	PLACARD, WARNING	2
13	XBOZZ		44185	48920	PLACARD, IGN SWITCH	1
14	XBOZZ		44185	49671	PLACARD, TRANSMISSION FILL	1

END OF FIGURE

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**NATIONAL STOCK NUMBER INDEX**


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<b>STOCK NUMBER</b>	<b>FIG.</b>	<b>ITEM</b>	<b>STOCK NUMBER</b>	<b>FIG.</b>	<b>ITEM</b>
5305 -00 -010 -1032	96	3	5305 -00 -225 -3843	103	2
5310 -00 -013 -1101	39	22	5310 -00 -225 -6993	2	12
4730 -00 -013 -2978	29	14	5310 -00 -225 -6993	73	16
5305 -00 -018 -1670	73	19	5306 -00 -225 -8496	103	7
5310 -00 -045 -5001	98	10	5306 -00 -225 -8499	37	16
5940 -00 -048 -2810	58	8	5306 -00 -225 -8499	38	7
5940 -00 -048 -2810	60	13	5306 -00 -225 -8499	51	3
5305 -00 -051 -0841	29	4	5306 -00 -225 -8499	88	13
5305 -00 -071 -2058	39	20	5306 -00 -225 -8499	89	15
5305 -00 -071 -2069	39	21	5306 -00 -225 -8499	95	15
5305 -00 -071 -2069	73	17	5306 -00 -225 -8499	103	9
5305 -00 -071 -2073	2	10	5306 -00 -225 -8504	87	26
5305 -00 -071 -2073	97	8	5305 -00 -226 -4831	89	20
5305 -00 -071 -2237	49	21	5305 -00 -226 -4831	103	8
5305 -00 -071 -2506	97	3	5306 -00 -226 -4834	33	7
5305 -00 -071 -2513	103	5	5306 -00 -226 -4835	33	9
6210 -00 -079 -8943	48	5	5940 -00 -230 -0515	53	6
5310 -00 -080 -6004	35	5	5940 -00 -230 -0515	58	16
5310 -00 -080 -6004	62	10	5940 -00 -230 -0515	58	29
5310 -00 -080 -6004	91	4	5315 -00 -234 -1627	87	8
4730 -00 -080 -7040	96	4	5910 -00 -240 -7284	49	38
5310 -00 -081 -4219	29	6	5950 -00 -254 -0035	49	26
5310 -00 -081 -4219	38	6	5930 -00 -254 -0368	61	7
5310 -00 -081 -4219	71	2	5305 -00 -269 -3213	91	5
5310 -00 -081 -4219	88	3	5305 -00 -269 -3213	101	25
4730 -00 -089 -2515	39	14	5305 -00 -269 -3231	72	1
4730 -00 -143 -3941	87	21	5305 -00 -269 -3238	102	5
5940 -00 -143 -4774	53	8	5310 -00 -274 -8887	89	8
5940 -00 -143 -4774	58	7	5940 -00 -283 -5281	53	9
5940 -00 -143 -4793	58	26	5940 -00 -283 -5281	58	9
5940 -00 -143 -4793	60	10	5940 -00 -283 -5281	60	14
533 -00 -152 -48043	7	1	5945 -00 -400 -6212	50	10
5331 -00 -167 -5135	95	3	5310 -00 -407 -9566	37	8
5310 -00 -176 -6519	2	13	5310 -00 -407 -9566	71	3
5310 -00 -176 -6519	99	4	5310 -00 -407 -9566	95	7
5340 -00 -186 -9556	61	10	4930 -00 -454 -8099	35	3
5310 -00 -194 -0743	39	25	3040 -00 -484 -3561	37	10
5340 -00 -200 -3045	51	7	5310 -00 -497 -3891	95	9
5310 -00 -207 -8758	49	35	5305 -00 -505 -2723	61	8
4730 -00 -221 -2137	87	24	5305 -00 -512 -5087	101	4
5305 -00 -225 -3841	39	19	5310 -00 -514 -6674	51	4
5305 -00 -225 -3843	37	18	5310 -00 -514 -8103	91	7
5305 -00 -225 -3843	61	1	6350 -00 -536 -2001	51	8

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310 -00 -543 -2629	71	1	4730 -00 -917 -4891	62	6
5305 -00 -543 -4372	72	5	5305 -00 -922 -7994	99	2
5940 -00 -549 -9378	54	12	5310 -00 -935 -9021	91	6
5310 -00 -575 -5329	39	15	5305 -00 -942 -2196	38	13
5310 -00 -582 -5965	49	32	5305 -00 -942 -2196	88	18
5310 -00 -582 -5965	101	40	5305 -00 -942 -2196	101	48
5310 -00 -582 -5965	103	3	5305 -00 -947 -4362	99	6
5940 -00 -617 -2896	53	4	5935 -00 -947 -6177	89	25
5940 -00 -617 -2896	58	11	6240 -00 -965 -1381	48	2
5940 -00 -620 -9780	60	2	5310 -00 -983 -8483	89	6
4730 -00 -623 -9673	92	1	5310 -00 -984 -3806	51	5
4730 -00 -647 -3207	37	19	5305 -00 -984 -6193	49	41
5930 -00 -655 -4247	48	16	5305 -00 -984 -6196	49	10
5930 -00 -679 -4247	87	44	5305 -00 -984 -6196	49	34
5945 -00 -681 -9817	49	25	5305 -00 -984 -6208	61	22
5930 -00 -683 -1626	48	15	5305 -00 -984 -6212	89	1
5930 -00 -683 -1628	48	17	5930 -00 -987 -4676	61	13
2520 -00 -702 -4578	73	3	5305 -00 -988 -1170	87	19
5305 -00 -725 -2317	35	9	5305 -00 -988 -1727	100	4
5305 -00 -725 -2317	87	11	5305 -00 -988 -1727	37	3
5305 -00 -725 -2317	101	37	5305 -00 -988 -1727	49	22
5305 -00 -726 -2568	98	4	5305 -00 -988 -1727	101	5
5310 -00 -732 -0559	88	9	5305 -00 -989 -7434	49	15
5305 -00 -732 -9207	98	3	5305 -00 -989 -7435	49	8
5310 -00 -768 -0318	89	29	6210 -00 -990 -4637	48	3
5310 -00 -809 -4061	38	11	5305 -00 -995 -3440	89	26
5310 -00 -809 -4061	87	2	2305 -00 -995 -3442	89	5
5310 -00 -809 -4061	87	7	4730 -01 -011 -7736	95	11
5310 -00 -809 -4061	101	24	5930 -01 -013 -3785	61	6
5310 -00 -809 -5998	2	11	5930 -01 -013 -3785	89	7
5310 -00 -809 -5998	87	40	5330 -01 -016 -7740	101	16
5310 -00 -809 -8533	2	3	2590 -01 -018 -9416	49	13
5305 -00 -821 -3869	62	3	2590 -01 -018 -9416	54	1
5310 -00 -829 -9981	101	34	2920 -01 -022 -3177	48	20
4730 -00 -834 -8331	29	2	5340 -01 -070 -4475	88	12
5315 -00 -839 -2325	37	5	5930 -01 -078 -4603	89	28
4820 -00 -845 -1096	39	26	6150 -01 -079 -4024	53	5
5945 -00 -853 -6024	49	29	5310 -01 -081 -0799	60	6
2940 -00 -871 -7053	29	8	2520 -01 -084 -3251	73	8
5310 -00 -877 -5797	49	14	2520 -01 -084 -3251	73	11
5310 -00 -880 -7746	37	7	2540 -01 -085 -0847	101	30
5310 -00 -880 -8189	98	2	2540 -01 -085 -0847	101	47
5305 -00 -880 -9634	89	21	4730 -01 -088 -9643	95	6
4730 -00 -890 -4983	71	5	4720 -01 -097 -9228	29	12
5940 -00 -892 -7874	58	34	5920 -01 -123 -5211	49	40
5305 -00 -905 -2700	99	5	5920 -01 -123 -5212	49	39
5905 -00 -907 -9823	48	13	6210 -01 -127 -5125	48	1
4730 -00 -908 -3193	41	2	5360 -01 -145 -8840	61	5

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5935 -01 -154 -0864	49	43	2610 -01 -307 -8527	90	3
5310 -01 -156 -4417	87	47	5935 -01 -308 -7866	58	27
5935 -01 -174 -1235	58	3	5935 -01 -308 -8599	55	5
5935 -01 -174 -1235	60	5	5935 -01 -308 -8599	58	36
2815 -01 -174 -9480	71	4	5305 -01 -309 -7053	2	1
2910 -01 -179 -2597	34	16	2920 -01 -313 -6469	49	44
4720 -01 -179 -3129	29	1	4730 -01 -317 -5264	33	3
5920 -01 -188 -6294	49	45	5340 -01 -319 -2081	87	10
5330 -01 -193 -5315	61	20	5306 -01 -320 -7032	44	7
5999 -01 -199 -9132	88	14	5306 -01 -320 -7032	46	4
5930 -01 -203 -1717	89	27	5310 -01 -320 -7038	27	4
5935 -01 -214 -4163	54	7	5307 -01 -320 -7105	24	30
5935 -01 -214 -4163	56	3	5306 -01 -321 -3374	27	8
5935 -01 -214 -4163	58	31	5325 -01 -321 -3443	11	12
5935 -01 -214 -5259	53	1	5325 -01 -321 -3446	27	9
5935 -01 -214 -5259	54	10	4730 -01 -328 -2272	33	15
5935 -01 -214 -5259	56	2	5935 -01 -336 -5396	53	10
4933 -01 -214 -6263	87	33	5935 -01 -336 -5396	55	2
5310 -01 -215 -7311	98	6	5935 -01 -336 -5396	58	18
5975 -01 -226 -8078	54	5	5935 -01 -338 -3532	56	7
5975 -01 -226 -8078	60	17	5935 -01 -338 -3532	58	20
5305 -01 -238 -7339	87	37	5305 -01 -347 -2253	48	21
4730 -01 -244 -8414	35	7	5305 -01 -347 -2253	49	30
5325 -01 -246 -4468	50	3	5305 -01 -347 -2253	101	11
5325 -01 -246 -4468	50	6	5310 -01 -347 -4029	99	3
6620 -01 -262 -5096	61	12	3030 -01 -347 -6575	43	3
6350 -01 -263 -5399	51	2	5325 -01 -348 -4873	24	16
5340 -01 -271 -6844	101	1	5310 -01 -350 -7866	72	4
5310 -01 -274 -3255	37	6	6645 -01 -355 -8913	48	19
6220 -01 -284 -1880	50	2	5306 -01 -357 -3765	42	5
5365 -01 -284 -9238	76	7	5306 -01 -358 -9526	5	15
5325 -01 -284 -9498	78	15	5306 -01 -358 -9526	12	5
5325 -01 -284 -9498	79	15	5306 -01 -358 -9526	31	6
6240 -01 -285 -0264	50	8	5315 -01 -359 -1451	88	4
3110 -01 -285 -2569	76	2	4730 -01 -359 -4772	34	1
3110 -01 -285 -2570	76	8	5305 -01 -359 -8002	71	10
3110 -01 -285 -2571	76	13	5305 -01 -359 -8002	39	1
5310 -01 -290 -2196	37	11	5310 -01 -364 -8234	102	4
5935 -01 -291 -2814	56	6	5940 -01 -366 -1563	58	14
5935 -01 -291 -2814	58	4	2940 -01 -367 -7515	35	10
5330 -01 -292 -5293	53	3	2990 -01 -368 -9869	61	19
5330 -01 -292 -5293	54	9	5999 -01 -372 -4955	58	2
5330 -01 -292 -5293	55	4	5999 -01 -373 -4494	60	4
5330 -01 -292 -5293	56	5	6140 -01 -378 -8232	52	1
5330 -01 -292 -5293	58	6	2530 -01 -382 -2068	87	16
5330 -01 -292 -5293	60	8	5930 -01 -391 -8105	61	14
2990 -01 -293 -4446	61	25	5310 -01 -393 -0306	87	6

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5315 -01 -393 -1316	8	7	5330 -01 -478 -5144	16	8
5306 -01 -393 -4857	32	7	5330 -01 -478 -5144	32	6
5306 -01 -393 -4864	8	13	5310 -01 -478 -5181	28	16
5331 -01 -399 -2158	48	6	5330 -01 -478 -6366	17	2
5310 -01 -406 -1256	81	7	5330 -01 -478 -6366	22	3
5999 -01 -406 -4110	53	11	4730 -01 -478 -7123	14	2
5999 -01 -406 -4110	54	8	4730 -01 -478 -7123	40	13
5999 -01 -406 -4110	55	3	5306 -01 -479 -0365	27	5
5999 -01 -406 -4110	56	4	5935 -01 -480 -9802	58	13
5999 -01 -406 -4110	58	19	5305 -01 -485 -6049	51	9
5920 -01 -414 -6435	49	5	5305 -01 -485 -6049	101	21
5920 -01 -414 -6436	49	4	5310 -01 -491 -4241	81	2
5920 -01 -414 -6983	49	6	5340 -01 -494 -3146	62	9
5930 -01 -416 -2950	51	1	5310 -01 -496 -6020	22	1
5975 -01 -421 -9934	52	6	5310 -01 -496 -6041	28	12
5975 -01 -421 -9937	52	9	5310 -01 -497 -6090	89	9
5999 -01 -422 -9740	53	2	4730 -01 -498 -6119	92	6
5999 -01 -422 -9740	54	11	5310 -01 -500 -2382	6	14
5999 -01 -422 -9740	55	6	5310 -01 -500 -2384	44	3
5999 -01 -422 -9740	56	8	5315 -01 -500 -4981	32	9
5999 -01 -422 -9740	58	5	5340 -01 -503 -7591	73	9
5305 -01 -428 -6791	35	4	5306 -01 -504 -6498	52	12
5330 -01 -431 -3620	25	12	3431 -01 -506 -4648	4	5
5330 -01 -431 -3620	16	1	5330 -01 -506 -5021	5	8
5330 -01 -431 -3620	26	9	5330 -01 -506 -5021	17	14
5331 -01 -431 -3621	25	11	5365 -01 -506 -5046	21	5
5331 -01 -431 -3621	26	8	3431 -01 -506 -8134	3	18
5935 -01 -432 -9536	60	1	3431 -01 -506 -8134	4	9
4210 -01 -432 -9910	100	1	5365 -01 -506 -8257	40	16
4730 -01 -434 -3360	26	2	5365 -01 -506 -8257	42	1
4730 -01 -434 -3361	26	3	5307 -01 -506 -8297	24	22
5330 -01 -438 -8809	40	8	3431 -01 -507 -0847	11	26
6685 -01 -440 -2571	61	23	3431 -01 -507 -0847	16	6
5310 -01 -440 -6749	36	1	3431 -01 -507 -1185	28	1
5310 -01 -445 -6444	73	18	5340 -01 -507 -1192	28	4
5330 -01 -445 -9423	24	3	5340 -01 -507 -1192	28	7
5330 -01 -445 -9423	28	11	5310 -01 -507 -3960	45	12
5330 -01 -445 -9423	28	13	5310 -01 -519 -0209	60	7
5330 -01 -445 -9423	34	8	5310 -01 -522 -6093	33	11
6220 -01 -450 -8757	50	1	5310 -01 -522 -6093	37	9
2930 -01 -455 -0817	48	9	5310 -01 -522 -6093	89	17
6680 -01 -461 -2697	48	18	5305 -01 -524 -7346	62	8
4820 -01 -465 -1211	90	4	5330 -01 -524 -7431	17	3
5940 -01 -469 -7988	54	4	5330 -01 -524 -7431	42	8
5940 -01 -469 -7988	58	28	5330 -01 -524 -7447	16	14
4820 -01 -474 -6910	35	12	5330 -01 -524 -7447	34	5
5330 -01 -478 -4911	28	3	5330 -01 -524 -7447	34	13
5330 -01 -478 -4911	28	5	4720 -01 -524 -7591	14	8

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4820 -01 -524 -7610	25	4	5310 -01 -533 -2924	10	15
4820 -01 -524 -7610	25	9	5315 -01 -533 -2927	28	15
4820 -01 -524 -7610	26	7	5306 -01 -533 -2940	6	12
4820 -01 -524 -7610	26	10	5307 -01 -533 -2948	4	7
4720 -01 -524 -7615	14	3	5307 -01 -533 -2948	31	8
2910 -01 -524 -7660	21	1	5315 -01 -533 -2975	3	15
5330 -01 -524 -7680	6	11	3120 -01 -533 -2983	9	11
5330 -01 -524 -7680	16	3	3120 -01 -533 -2983	19	3
4730 -01 -524 -7708	33	5	5365 -01 -533 -2987	23	4
4730 -01 -524 -7708	35	6	5360 -01 -533 -3160	27	14
2910 -01 -524 -7918	22	2	5340 -01 -533 -3205	11	20
5330 -01 -524 -8043	17	9	5360 -01 -533 -3207	11	17
5940 -01 -526 -8119	60	9	5330 -01 -533 -3215	24	17
5310 -01 -527 -3369	89	18	4820 -01 -533 -3294	6	6
2910 -01 -529 -7662	35	11	4730 -01 -533 -3297	3	2
5940 -01 -530 -4760	60	18	4730 -01 -533 -3297	3	7
4730 -01 -533 -1441	21	3	4730 -01 -533 -3297	3	13
5365 -01 -533 -1824	8	17	5340 -01 -533 -3311	5	1
4710 -01 -533 -2057	26	12	4710 -01 -533 -3318	26	11
5305 -01 -533 -2067	6	10	5340 -01 -533 -3336	17	8
5306 -01 -533 -2070	20	13	5310 -01 -533 -3364	44	5
5306 -01 -533 -2070	30	9	5310 -01 -533 -3364	46	2
5330 -01 -533 -2071	17	13	5306 -01 -533 -3366	24	14
5330 -01 -533 -2071	24	31	5331 -01 -533 -3408	5	2
5315 -01 -533 -2077	3	12	5331 -01 -533 -3408	17	10
5310 -01 -533 -2080	23	8	5305 -01 -533 -3409	5	19
5310 -01 -533 -2080	34	4	5305 -01 -533 -3409	24	19
4730 -01 -533 -2129	6	7	4730 -01 -533 -3413	5	4
5305 -01 -533 -2472	6	5	5315 -01 -533 -3553	9	7
3130 -01 -533 -2489	7	2	5310 -01 -533 -3554	28	10
5360 -01 -533 -2517	11	27	5305 -01 -533 -3695	26	1
5330 -01 -533 -2522	17	1	5340 -01 -533 -3726	4	2
5330 -01 -533 -2522	24	12	5340 -01 -533 -3726	12	2
4730 -01 -533 -2536	6	3	4730 -01 -533 -3731	3	14
4730 -01 -533 -2536	42	2	5310 -01 -533 -3780	92	3
3120 -01 -533 -2593	9	6	5310 -01 -533 -3780	96	2
5306 -01 -533 -2613	9	12	5306 -01 -533 -3807	12	1
5315 -01 -533 -2652	10	21	5310 -01 -533 -3834	11	4
5315 -01 -533 -2652	10	24	5310 -01 -533 -3834	11	10
5360 -01 -533 -2800	10	26	5325 -01 -533 -3933	9	2
4730 -01 -533 -2804	24	13	5325 -01 -533 -3933	19	2
4730 -01 -533 -2846	5	7	5306 -01 -533 -4120	21	7
4730 -01 -533 -2896	5	14	4730 -01 -533 -4123	3	3
4730 -01 -533 -2907	24	25	5315 -01 -533 -4174	24	9
5315 -01 -533 -2912	24	4	4730 -01 -533 -4178	24	21
3110 -01 -533 -2916	24	7	4730 -01 -533 -4181	3	17
5331 -01 -533 -2921	21	12	4730 -01 -533 -4181	4	4



STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5315 -01 -533 -4182	24	6	5310 -01 -533 -9486	4	8
5365 -01 -533 -4422	3	22	5310 -01 -533 -9486	13	3
5340 -01 -533 -4423	4	11	5310 -01 -533 -9486	23	5
5360 -01 -533 -4688	5	6	5310 -01 -533 -9486	24	10
5330 -01 -533 -4948	17	4	5310 -01 -533 -9486	31	5
5340 -01 -533 -4990	10	14	5330 -01 -534 -0030	11	18
5306 -01 -533 -5237	3	9	5330 -01 -534 -0030	16	5
4730 -01 -533 -5249	3	21	6680 -01 -534 -1062	21	2
4710 -01 -533 -5407	26	5	2815 -01 -536 -0830	4	3
5306 -01 -533 -5742	13	6	2815 -01 -536 -0835	11	2
5306 -01 -533 -5746	40	11	3040 -01 -536 -0859	8	15
5330 -01 -533 -5751	16	4	3040 -01 -536 -0861	8	2
5330 -01 -533 -5751	31	7	3040 -01 -536 -0862	8	14
5310 -01 -533 -5753	20	2	4820 -01 -536 -0868	11	16
5310 -01 -533 -6199	10	17	4820 -01 -536 -0870	11	22
4730 -01 -533 -6209	3	4	4320 -01 -536 -0876	13	2
5310 -01 -533 -6230	11	13	4320 -01 -536 -0878	13	7
4810 -01 -533 -6238	11	14	2815 -01 -536 -0879	23	7
5365 -01 -533 -6239	40	7	2815 -01 -536 -0881	10	19
5305 -01 -533 -6244	11	1	2815 -01 -536 -0881	24	32
5330 -01 -533 -6252	16	15	2920 -01 -536 -0883	36	3
5330 -01 -533 -6252	40	5	4820 -01 -536 -0898	6	4
5340 -01 -533 -6253	13	5	2815 -01 -536 -0899	8	4
4710 -01 -533 -6258	10	11	2815 -01 -536 -0900	8	5
4710 -01 -533 -6260	14	10	2815 -01 -536 -0901	8	3
4710 -01 -533 -6287	26	4	2815 -01 -536 -0902	9	15
5310 -01 -533 -6423	24	27	2815 -01 -536 -0902	19	4
5340 -01 -533 -6757	28	9	2815 -01 -536 -0904	8	9
5331 -01 -533 -6875	17	6	3040 -01 -536 -0905	18	1
5331 -01 -533 -6875	42	4	3040 -01 -536 -0906	18	1
2930 -01 -533 -7027	42	3	3040 -01 -536 -0907	9	9
5331 -01 -533 -7418	5	13	3040 -01 -536 -0907	18	3
5331 -01 -533 -7418	17	11	3040 -01 -536 -0908	18	3
5306 -01 -533 -7420	10	1	3040 -01 -536 -0909	9	10
5330 -01 -533 -7589	38	1	3040 -01 -536 -0909	18	1
5330 -01 -533 -7589	16	2	3040 -01 -536 -0911	18	3
5307 -01 -533 -8058	27	6	2990 -01 -536 -0912	10	12
5306 -01 -533 -8062	24	24	3040 -01 -536 -0914	10	8
5305 -01 -533 -8759	10	10	3040 -01 -536 -0916	10	25
5305 -01 -533 -8759	32	2	5310 -01 -537 -0000	25	1
5330 -01 -533 -9117	12	3	5310 -01 -537 -0006	25	2
5330 -01 -533 -9117	16	16	5331 -01 -537 -0007	10	5
4710 -01 -533 -9215	26	6	5331 -01 -537 -0007	10	7
5306 -01 -533 -9220	4	13	5310 -01 -537 -1199	25	10
5307 -01 -533 -9241	11	5	5940 -01 -537 -2058	15	4
5307 -01 -533 -9241	11	11	5940 -01 -537 -2058	44	9
5365 -01 -533 -9254	40	6	5310 -01 -537 -9035	87	18
4730 -01 -533 -9333	10	13	5310 -01 -537 -9035	101	6

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310 -01 -537 -9039	49	9	5340 -01 -542 -8229	30	3
5310 -01 -538 -0785	101	3	4730 -01 -543 -2546	78	13
5310 -01 -538 -0809	49	31	4730 -01 -543 -2546	79	13
5305 -01 -538 -1423	38	2	5310 -01 -543 -2945	74	1
5305 -01 -538 -1423	61	4	5310 -01 -543 -2945	81	1
5305 -01 -538 -1473	20	3	5935 -01 -543 -5970	15	2
5310 -01 -538 -1528	29	7	5935 -01 -543 -5972	15	3
5310 -01 -538 -1528	33	10	5970 -01 -543 -5975	15	10
5310 -01 -538 -1528	38	15	5970 -01 -543 -5976	15	12
5310 -01 -538 -1528	49	28	5935 -01 -543 -5982	15	6
5310 -01 -538 -1528	52	2	5340 -01 -543 -6042	11	23
5310 -01 -538 -1528	88	7	3120 -01 -543 -9597	77	3
5310 -01 -538 -1528	89	16	4730 -01 -547 -5057	71	6
5310 -01 -538 -1528	102	8	5935 -01 -548 -3467	49	7
5310 -01 -538 -1528	103	6	5310 -01 -549 -7793	89	3
5310 -01 -538 -1646	35	2	5305 -01 -552 -0307	98	9
5310 -01 -538 -1646	38	10	5315 -01 -553 -0258	101	32
5310 -01 -538 -1646	62	11	5340 -01 -554 -4418	57	7
5310 -01 -538 -1646	87	3	5340 -01 -554 -4418	58	24
5310 -01 -538 -1646	87	14	4730 -01 -554 -6236	37	13
5310 -01 -538 -1646	88	5	4730 -01 -554 -6236	61	16
5310 -01 -538 -1646	89	24	5315 -01 -558 -7590	89	11
5310 -01 -538 -1646	101	23	5315 -01 -558 -7647	97	6
5310 -01 -538 -1880	37	4	5920 -01 -559 -9556	49	23
5310 -01 -538 -1880	49	23	5940 -01 -560 -0703	57	2
5310 -01 -538 -1880	51	6	4140 -01 -560 -2099	43	1
5310 -01 -538 -1880	61	2	5330 -01 -560 -2740	57	3
5310 -01 -538 -1880	87	17	5305 -01 -564 -6807	10	20
5310 -01 -538 -1880	89	23	5315 -01 -568 -0056	89	12
5310 -01 -538 -1880	100	3	5305 -01 -572 -8716	94	2
5310 -01 -538 -1880	101	7	2990 -01 -573 -5484	5	17
4730 -01 -539 -1059	35	8	5305 -01 -575 -1984	39	7
5310 -01 -539 -3475	87	39	1740 -01 -575 -5662	1	1
5310 -01 -539 -3475	97	2	5305 -01 -577 -1174	101	8
4210 -01 -541 -0695	100	2	3110 -99 -126 -3273	78	22
5306 -01 -541 -3777	101	29	3110 -99 -126 -3273	79	22
5331 -01 -541 -3816	48	12	4730 -99 -142 -5123	75	21
2815 -01 -542 -6055	11	25	5330 -99 -238 -1382	78	10
5340 -01 -542 -6339	5	11	5330 -99 -238 -1382	79	10
5365 -01 -542 -6383	6	17	5315 -99 -411 -3367	94	1
5365 -01 -542 -6383	14	4	5307 -99 -474 -5206	78	32
5330 -01 -542 -7037	15	1	5307 -99 -474 -5206	79	32
5330 -01 -542 -7039	15	8	3120 -99 -495 -7062	75	8
5940 -01 -542 -7043	15	9	5330 -99 -577 -5661	78	23
5940 -01 -542 -7047	15	11	5330 -99 -577 -5661	79	23
4730 -01 -542 -7049	15	5	5330 -99 -670 -4534	84	13
5940 -01 -542 -7053	15	7	5306 -99 -670 -4689	78	12

<b>STOCK NUMBER</b>	<b>FIG.</b>	<b>ITEM</b>	<b>STOCK NUMBER</b>	<b>FIG.</b>	<b>ITEM</b>
5306 -99 -670 -4689	79	12	5365 -99 -775 -7916	75	6
4730 -99 -726 -0807	84	12	5365 -99 -775 -7916	84	11
4730 -99 -726 -0807	75	12	4730 -99 -942 -7808	77	1
4730 -99 -774 -9330	75	20	5330 -99 -670 -4534	75	7

## PART NUMBER INDEX

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
0001268-1010	62	6	01774-51002	44	14
01/500800	72	6	01774-51004	21	7
01311-10616	10	1	01774-51014	6	15
01517-61030	46	3	01774-51018	20	13
01517-61030	30	8	01774-51018	30	9
01518-50820	27	6	01774-51030	3	11
01754-50612	32	7	01774-51030	34	11
01754-50614	24	30	01774-51035	44	7
01754-50618	27	8	01774-51035	46	4
01754-50814	24	2	01774-51060	11	1
01754-50814	24	28	01774-51080	44	11
01754-50814	4	1	02-020-380	87	25
01754-50814	8	8	02022-00	61	23
01754-50814	21	10	02023-00	61	19
01754-50814	14	9	02056-50060	27	4
01754-50814	43	4	02301-17	61	21
01754-50820	31	6	02343-02	61	20
01754-50820	12	5	02400113_P/LXN	60	16
01754-50820	5	15	02-580-002	87	27
01754-50825	24	23	02751-50060	22	1
01754-50825	40	2	02751-50080	13	3
01754-50825	40	10	02751-50080	24	10
01754-50825	44	4	02751-50080	31	5
01754-50825	23	3	02751-50080	4	8
01754-50830	7	3	02751-50080	23	5
01754-50830	42	6	02756-50080	30	4
01754-50850	40	11	02761-5004-0	36	1
01754-50855	8	13	02771-50120	10	17
01754-50865	12	1	02771-60100	44	5
01754-50870	13	6	02771-60100	46	2
01754-50875	24	24	02776-50140	24	27
01754-50880	42	5	03016-50616	24	19
01755-50814	13	4	03016-50616	5	19

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
03024-50520	26	1	05012-00614	24	20
03054-50408	6	10	05012-00820	3	16
03054-50508	6	5	05012-01016	3	8
03410-50808	11	7	05411-00416	10	21
04/500302	72	2	05411-00416	10	24
04013-60050	27	2	05411-00528	11	30
04013-60100	6	14	05705B-104	33	3
04015-60080	44	3	05705B-C04	35	7
040G	102	6	05712-00515	9	7
0460-215-16141	60	4	05712-00520	8	7
04611-00300	19	2	06311-55030	3	22
04611-00300	9	2	06311-85016	6	7
04612-00160	11	12	07715-01605	8	5
04612-00200	24	16	07715-03209	4	12
04613-50030	27	12	07814-000	60	19
04613-50040	27	15	08101-06203	24	7
04613-50050	27	9	09318-88200	40	13
04613-50120	10	14	09318-88200	14	2
0462-209-16141	58	2	09318-88230	32	11
04724-00170	3	23	09661-70360	34	3
04814-00200	17	10	0EBA	101	3
04814-00200	5	3	0EHU	20	5
04814-00220	21	12	0ETW	49	9
04814-00240	17	10	10/10/7002	62	4
04814-00240	5	2	10/8/2501	71	6
04814-00420	17	6	100222	48	19
04814-00420	42	4	10103	88	17
04814-10070	10	7	1-042	92	5
04814-10070	10	5	104232	48	7
04817-00160	16	7	104237	48	10
04817-50300	16	11	104240	48	11
04817-50300	6	16	104242	48	9
04817-50300	14	5	104246	48	18
05012-00512	24	9	1116000	88	1
05012-00609	24	4	114017	58	3

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
114017	60	5	12346514-32	71	10
1201 0974	53	10	12420936	53	2
1201 0974	55	2	12420936	54	11
1201 0974	58	18	12420936	55	6
1201 0996	56	7	12420936	56	8
1201 0996	58	20	12420936	58	5
12010293	54	5	12421926	54	4
12010293	60	17	12421926	58	28
12010973	54	7	12-460-186	37	15
12010973	56	3	12-460-188	37	20
12015284	53	3	126378_126378:1	73	14
12015284	54	9	126379_3-3-1601KX	73	12
12015284	55	4	1315/0308Z	66	2
12015284	56	5	1315/0409Z	66	7
12015284	58	6	1315/3311Z	66	10
12015284	60	8	1321/0303Z	66	28
12015792	53	1	1321/0405Z	75	14
12015792	54	10	1321/0407Z	78	12
12015792	56	2	1321/0407Z	79	12
12048074	58	14	1321/0407Z	83	12
12059168	58	37	1321/0407Z	86	12
12-120-010	37	12	1321/0408Z	75	22
12124582	53	11	1321/3523	82	5
12124582	54	8	13901-9102-0	24	14
12124582	55	3	1391/3108Z	66	1
12124582	56	4	1391/3201	63	1
12124582	58	19	1391/3307	84	5
12172	103	1	1406/0008	63	25
1223-276	50	10	1406/0011	63	15
12234-6758-0	12	2	1406/0015	63	5
12234-6758-0	4	2	1406/0018	66	14
122594_3-2-159:1	73	2	1406/0026	66	23
122611_122611:1	73	15	14117-4256-0	34	9
12331-9523-0	24	6	14311-6050-4	23	7
12346514-32	39	1	1450/0001	77	1

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
14911-4275-0	34	1	15424-2516-2	20	7
15021-1424-0	11	4	15451-9667-0	17	14
15021-1424-0	11	10	15451-9667-0	5	8
15021-3366-0	24	3	15471-0174-0	4	3
15021-3366-0	28	11	15471-3324-0	32	12
15021-3366-0	28	13	15471-5792-0	10	26
15021-3366-0	34	8	15471-9153-0	24	5
15108-5728-0	27	5	15471-9579-0	32	5
15109-3363-0	40	7	15484-3707-0	14	6
15221-0337-0	4	11	15521-0479-0	17	8
15221-0338-0	3	2	15521-1423-0	11	5
15221-0338-0	3	7	15521-1423-0	11	11
15221-0338-0	3	13	15521-9602-0	3	17
15221-0339-0	3	3	15521-9602-0	4	4
15221-0349-0	4	5	15601-1555-0	8	3
15221-1324-0	11	17	15601-9665-0	28	3
15221-1328-0	11	14	15601-9665-0	28	5
15221-1333-0	11	16	15602-63841	20	9
15221-1398-0	11	15	15707-3336-0	10	13
15221-1443-0	10	15	15707-3375-0	21	5
15221-3365-0	3	19	15841-3901-0	61	14
15221-5628-0	10	4	15841-5316-0	25	6
15221-9153-0	31	8	15841-5323-0	25	3
15221-9153-0	4	7	15841-5323-0	25	13
15261-0337-0	3	14	15841-5335-0	25	7
15261-1336-0	11	22	15841-5362-2	25	11
15261-9202-0	28	12	15841-5362-2	26	8
15300027	58	27	15841-5422-0	28	10
15303-2-2-4	60	15	15841-5427-0	28	9
15303-2-2-4	49	1	15841-9202-0	28	16
15324973	58	15	15841-9203-0	25	1
15401-1172-0	30	3	15841-9404-0	25	2
15401-9569-0	34	4	15841-9602-0	3	18
15401-9569-0	23	8	15841-9602-0	4	9
15401-9665-0	23	2	15841-9810-0	25	13

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
15841-9851-0	25	13	15841-9886-0	25	13
15841-9852-0	25	13	15841-9887-0	25	13
15841-9853-0	25	13	15841-9888-0	25	13
15841-9854-0	25	13	15841-9889-0	25	13
15841-9855-0	25	13	15841-9890-0	25	13
15841-9856-0	25	13	15841-9891-0	25	13
15841-9857-0	25	13	15841-9892-0	25	13
15841-9858-0	25	13	15852-9233-0	28	6
15841-9859-0	25	13	15881-6480-0	45	2
15841-9860-0	25	13	15881-9202-0	45	12
15841-9861-0	25	13	15881-9303-0	45	11
15841-9862-0	25	13	1603/0001	63	14
15841-9863-0	25	13	1603/0003	66	37
15841-9864-0	25	13	1606/0017	66	16
15841-9865-0	25	13	16221-5442-0	28	1
15841-9866-0	25	13	16241-0555-0	6	3
15841-9867-0	25	13	16241-0555-0	42	2
15841-9868-0	25	13	16241-3351-0	6	2
15841-9869-0	25	13	16241-9602-0	40	16
15841-9870-0	25	13	16241-9602-0	42	1
15841-9871-0	25	13	16245-9154-0	24	22
15841-9872-0	25	13	16261-1333-0	11	23
15841-9873-0	25	13	16261-1354-0	11	25
15841-9874-0	25	13	16264-52140	17	2
15841-9875-0	25	13	16264-52140	22	3
15841-9876-0	25	13	16264-8334-2	5	11
15841-9877-0	25	13	16265-9667-0	17	5
15841-9878-0	25	13	16265-9667-0	21	6
15841-9879-0	25	13	16299-33670	32	6
15841-9880-0	25	13	16415-6551-2	36	2
15841-9881-0	25	13	16475-5328-0	25	10
15841-9882-0	25	13	16540-6426-0	45	4
15841-9883-0	25	13	16540-9201-0	45	27
15841-9884-0	25	13	16541-4321-0	34	14
15841-9885-0	25	13	16541-4333-0	34	15



PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
16541-9579-0	34	6	19077-5365-0	25	12
16541-9579-0	34	17	19077-5365-0	26	9
16541-9581-0	34	7	19202-9683-0	17	11
16543-6406-0	45	22	19202-9683-0	5	13
16543-6431-0	45	17	19237-6591-0	44	9
16543-6466-0	45	16	19237-6591-0	15	4
16543-6470-0	45	9	19258-12230	38	1
16543-6471-0	45	5	19258-1223-0	16	2
16543-6478-0	45	3	19260-6401-0	44	1
16543-6490-0	45	24	19260-6402-0	45	1
16543-6498-0	45	14	19260-6411-0	45	26
16543-6499-0	45	7	19260-6412-0	45	8
16543-9203-0	45	23	19260-6423-0	45	15
16543-9302-0	45	18	19260-6485-0	45	21
16543-9303-0	45	6	19260-6491-0	45	20
16543-9305-0	45	25	19268-6578-0	15	8
16543-9306-0	45	13	19268-6587-0	15	12
16551-9580-0	34	10	19268-6593-0	15	11
16631-6584-0	44	10	19279-6460-0	45	19
16678-65830	58	33	193-0244	61	12
16678-6583-0	44	8	19484-95981	61	18
16683-9602-0	3	21	19872-6584-0	15	2
17105-3368-0	16	14	19872-6588-0	15	3
17105-3368-0	34	5	19883-65830	15	1
17105-3368-0	34	13	1998196	87	44
172748-1	57	8	1A024-3352-0	32	8
17371-9580-0	10	10	1C010-0104-8	3	1
17371-9580-0	32	2	1C010-0112-6	3	10
1741	91	7	1C010-0150-3	21	8
1756198	54	12	1C010-0345-0	4	13
1788880	55	5	1C010-0416-2	5	1
1788880	58	36	1C010-0430-0	7	2
18Z2987	60	6	1C010-0445-0	20	14
19071-9602-0	40	9	1C010-0446-0	7	1
19077-53650	16	1	1C010-0446-0	17	9

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
1C010-0456-0	3	9	1C010-2198-0	19	3
1C010-0468-0	20	6	1C010-2198-0	9	11
1C010-0512-0	6	6	1C010-2214-0	9	12
1C010-0520-0	6	4	1C010-2330-0	9	6
1C010-1182-0	16	16	1C010-2353-0	18	1
1C010-1182-0	12	3	1C010-2353-0	9	10
1C010-1235-2	16	4	1C010-2354-0	18	3
1C010-1235-2	31	7	1C010-2354-0	9	9
1C010-1311-3	11	29	1C010-2395-0	18	1
1C010-1312-2	11	28	1C010-2396-0	18	1
1C010-1315-0	16	6	1C010-2397-0	18	3
1C010-1315-0	11	26	1C010-2398-0	18	3
1C010-1316-0	16	5	1C010-2401-2	8	11
1C010-1316-0	11	18	1C010-2402-2	8	1
1C010-1324-0	11	27	1C010-2411-2	9	4
1C010-1348-2	11	24	1C010-2425-0	8	15
1C010-1349-0	11	20	1C010-2436-0	8	2
1C010-1356-0	11	19	1C010-2437-0	8	14
1C010-1402-0	11	9	1C010-2452-0	8	16
1C010-1405-0	11	8	1C010-2498-0	8	17
1C010-1415-0	11	3	1C010-2498-2	8	12
1C010-1435-0	11	2	1C010-3211-0	21	11
1C010-1443-0	11	13	1C010-3229-2	14	1
1C010-1450-6	6	8	1C010-3288-0	5	14
1C010-1452-0	16	3	1C010-3308-0	6	18
1C010-1452-0	6	11	1C010-3332-0	10	11
1C010-1511-0	8	4	1C010-3364-0	3	15
1C010-1617-5	24	8	1C010-3365-0	3	12
1C010-1621-0	24	13	1C010-3507-0	5	17
1C010-1622-0	17	1	1C010-3513-0	5	18
1C010-1622-0	24	12	1C010-3563-0	9	3
1C010-1627-0	8	9	1C010-3641-2	21	2
1C010-1651-2	8	10	1C010-3642-2	21	3
1C010-2131-0	19	4	1C010-3692-2	5	5
1C010-2131-0	9	15	1C010-3695-0	5	6

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
1C010-3696-0	5	7	1C010-5514-0	24	21
1C010-3711-0	42	3	1C010-5577-0	27	11
1C010-3711-4	3	20	1C010-5602-3	10	12
1C010-3711-4	40	15	1C010-5641-3	27	10
1C010-3715-0	14	3	1C010-5648-0	27	14
1C010-3716-0	14	10	1C010-56750	24	32
1C010-3717-2	14	7	1C010-5675-0	10	19
1C010-3718-2	14	8	1C010-5751-2	10	23
1C010-4201-2	34	2	1C010-5762-0	10	25
1C010-4250-0	26	6	1C010-5770-0	10	8
1C010-4301-0	34	12	1C010-5792-0	27	3
1C010-5117-4	24	1	1C010-6001-5	10	2
1C010-5118-0	17	13	1C010-6015-3	10	6
1C010-5118-0	24	31	1C010-6302-0	47	1
1C010-5132-0	23	1	1C010-6317-0	47	20
1C010-5162-0	13	5	1C010-6325-0	47	17
1C010-5165-0	24	25	1C010-6326-0	47	3
1C010-5166-0	17	4	1C010-6327-0	47	5
1C010-5166-3	24	26	1C010-6333-0	47	21
1C010-52032	22	2	1C010-6341-0	47	8
1C010-5211-0	23	4	1C010-6352-0	47	7
1C010-5213-0	24	17	1C010-6556-0	36	3
1C010-5300-0	25	4	1C010-6583-0	15	5
1C010-5300-0	26	7	1C010-65831	58	32
1C010-5317-0	25	5	1C010-6588-0	15	6
1C010-5361-0	25	8	1C010-6591-0	15	7
1C010-5371-0	26	11	1C010-7282-0	16	15
1C010-5372-0	26	12	1C010-7282-0	40	5
1C010-5373-0	26	4	1C010-7303-2	42	7
1C010-5374-0	26	5	1C010-7306-8	42	9
1C010-5390-0	25	9	1C010-7335-2	40	14
1C010-5390-0	26	10	1C010-7343-0	17	3
1C010-5410-2	28	14	1C010-7343-0	42	8
1C010-5412-0	28	15	1C010-74110	43	1
1C010-5415-3	28	8	1C010-7428-2	44	12

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
1C010-8315-0	13	2	1C020-2297-2	18	4
1C010-8335-0	13	7	1C020-2347-0	18	2
1C010-9101-0	44	13	1C020-2347-0	9	8
1C010-9102-0	6	12	1C020-2391-0	18	2
1C010-9103-0	31	1	1C020-2392-0	18	2
1C010-9103-0	5	12	1C020-2634-0	20	12
1C010-9104-0	5	9	1C020-5505-0	10	18
1C010-9110-0	21	9	1C020-5545-3	10	16
1C010-92020	24	33	1C020-7326-0	40	1
1C010-9202-0	27	13	1C020-7327-2	16	13
1C010-9451-0	10	27	1C020-7327-2	40	3
1C010-9601-0	3	4	1C020-9149-0	24	11
1C010-9602-0	5	4	1C020-9665-0	32	1
1C010-9616-0	3	5	1C020-9665-0	10	9
1C010-9696-0	13	1	1C020-9665-0	16	9
1C010-9696-0	13	8	1C020-9665-0	16	9
1C010-9696-0	17	7	1C040-0551-0	6	1
1C011-2105-0	19	1	1C040-1163-0	30	2
1C011-2105-0	9	1	1C040-1710-0	16	12
1C011-2109-0	19	1	1C040-1710-0	30	15
1C011-5510-4	10	3	1C040-1711-0	16	10
1C011-7301-0	40	4	1C040-1711-0	30	6
1C020-0331-0	4	6	1C040-3304-0	32	3
1C020-0360-0	4	6	1C040-3306-3	32	10
1C020-0361-0	4	6	1C040-3321-2	3	6
1C020-0401-0	5	16	1C040-33670	16	8
1C020-0414-0	17	12	1G031-5421-0	28	4
1C020-0414-0	5	10	1G031-5421-0	28	7
1C020-1346-3	11	21	1G513-3655-0	21	4
1C020-1431-0	11	6	1G517-0461-0	20	11
1C020-1632-2	24	18	1G517-2501-0	20	8
1C020-2231-2	9	13	1G517-5615-0	27	7
1C020-2233-2	18	4	1G520-2301-0	9	5
1C020-2233-2	9		1G521-9601-0	40	6
1C020-2296-2	18	4	1G521-9602-0	40	12

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
1G527-1657-0	24	15	1K012-6305-0	47	2
1G533-9936-2	17		1K012-6307-0	47	16
1G539-6442-0	44	2	1K012-6308-0	47	15
1G541-7425-0	43	2	1K012-6320-0	47	10
1G545-5412-0	28	2	1K012-6321-0	47	4
1G549-6435-0	44	6	1K012-6328-0	47	19
1G551-12320	30	11	1K012-6332-0	47	9
1G557-9665-0	32	4	1K012-6337-0	47	13
1G557-9665-0	16	9	1K012-6338-0	47	12
1G563-9935-2	16		1K012-6339-0	47	14
1G772-9103-0	20	10	1K012-6376-0	47	11
1J510-0537-0	6	9	20/925327	66	11
1J530-0302-0	4	10	201567-000LH	102	3
1J530-1176-0	12	4	201567-000RH	102	10
1J530-1287-0	31	4	202702-10-8S	92	1
1J530-1601-0	8	6	203005-4-4S	87	34
1J530-1701-0	30	5	203102-4-4S	87	33
1J530-2111-0	19	5	204126	89	19
1J530-2111-0	9	16	207793.1	93	1
1J530-2191-0	19		207793.9	93	2
1J530-5115-0	24	29	208670	52	10
1J530-5603-2	27	1	20882	29	1
1J530-9150-0	30	14	20-920-009	37	2
1J530-9151-0	30	7	20-920-500	87	16
1J530-9152-0	30	12	21000240	39	12
1J530-9153-0	30	13	21-361P	88	16
1J530-9154-0	30	10	217552R91	61	13
1J550-1231-2	31	2	22002	103	4
1J574-1744-0	31	3	22003-03	35	11
1J574-2201-0	9	14	2202K67	48	22
1K012-5101-2	23	6	2203/0041	78	5
1K012-5715-0	10	22	2203/0041	79	5
1K012-6301-0	46	1	2203/0051	83	17
1K012-6303-0	47	18	2203/0051	86	17
1K012-6304-0	47	22	2203/0057	78	15

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
2203/0071	83	4	31912	60	12
2203/0071	86	4	32/902200	66	27
2203/1104	64	5	320563	58	29
2203/1115	67	3	322135	26	2
2203/1115	68	5	322136	26	3
2203/1115	69	14	322539	40	8
2203/1115	70	3	3225T8	62	9
22785	58	31	3253460	54	3
23504	52	9	3-28-537	73	7
23505	52	6	32902	58	12
2383154	101	26	32903	58	35
2403/0221	64	18	32980	54	6
2403/0244	64	13	331/12043	63	8
24059	49	29	331/31560	69	8
2411-001-2405	60	7	331/38655	68	11
25/103001	63	31	33430-8276-0	32	9
25/104700	63	4	3-3-508KX	73	4
25/105100	63	29	3398826	95	1
26392	29	3	3-40-1491	73	5
284392-4	49	37	34128	58	34
297020	49	5	344106-1	57	4
29L4	74	5	344111-1	58	21
3.50-.083X15.079	73	6	344113-1	57	6
3-0188	73	8	344113-1	58	23
3-0188	73	11	344273-1	57	9
302273	38	12	345256-1	57	10
3042T79	38	8	347887-3	57	1
305732	104	5	3492454	61	5
30645T659	101	28	35/100801	63	30
308400	39	26	35423-049	61	25
30R20	29	13	35466-7446-0	30	1
31535	60	18	35999-1766-0	45	10
3177-3	58	8	37 020 009 4	95	5
3177-3	60	13	37 570 971 4	95	14
3186667	95	13	371008610	101	1

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
377011NN022	49	19	440/05100	75	24
3792828	101	30	440/05101	76	6
3792828	101	47	440/08102	78	11
382	48	2	440/08102	79	11
39 400 40 999	29	5	440/11900	76	10
39057	98	5	440/11900	84	21
3963260	101	46	440/20002	78	19
4/2/2404	37	13	440/20002	79	19
4/2/2404	61	16	445/03205	68	14
4/2/2501	37	19	445/05106	64	21
4/4/6500	87	32	445/05107	64	4
4003/2005	75	25	445/05110	64	6
40-030-004	37	1	445/05114	64	16
400730-300	48	8	445/05118	64	17
400-827-4490-41	75	7	445/12303	67	7
400-827-4490-41	84	13	445/12303	70	7
404886R1	63	28	445/12304	68	9
4102/1200	75	4	445/12304	69	11
41047	98	7	445/12305	69	13
415899	100	1	445/12307	67	9
421-491	54	2	445/12307	68	7
42281-2	60	2	445/12307	69	23
429146	100	2	445/12307	70	9
440/00102	75	19	445/12314	67	4
440/00500	76	3	445/12314	69	15
440/00503	80	3	445/12314	70	4
440/00503	85	3	445/14001	66	18
440/00704	78	4	445/14001	75	11
440/00704	79	4	445/15701	64	15
440/00708	78	2	445/19802	64	11
440/00708	79	2	445/19804	64	19
440/00709	78	7	445/19805	64	10
440/00709	79	7	445/19807	64	20
440/03800	80	6	445/19808	64	8
440/03800	85	6	445/26108	67	2

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
445/26108	70	2	450/10208	83	7
445/30007	69	9	450/10208	86	7
445/30011	67	11	450/12703	78	33
445/30011	69	24	450/12703	79	33
445/30011	70	11	450/12703	83	24
445/31301	63	17	450/12703	86	24
445/32501	63	13	450445	33	4
445/40203	67	20	45089-10	87	20
445/40203	70	23	45089-11	87	15
445/40204	67	22	45089-12	87	28
445/40204	70	21	458/10743	75	15
445/64701	64	9	458/10766	80	1
448/04802	75	10	458/11153	85	4
448/05402	76	7	458/11162	84	20
448/05405	76	1	458/11164	82	1
448/56282	82	2	458/11165	82	6
449/01700	66	36	458/20281	78	21
449/02102	63	7	458/20281	79	21
449/10002	67	18	458/20286	78	20
449/10002	70	18	458/20286	79	20
449/10003	67	5	458/20356	84	2
449/10003	70	5	458/20357	83	2
449/10501	67	10	458/20357	86	2
449/10501	70	10	458/20358	83	3
449/10812	69	21	458/20358	86	3
449/10900	68	12	458/20403	78	24
449/10900	69	7	458/20403	79	24
449/11370	67	23	458/20403	83	23
449/11370	70	22	458/20403	86	23
449/11451	65	4	458/20492	77	4
449/13240	63	6	458/20503	83	18
45 400 92 941	29	10	458/20503	86	18
45/908300	63	26	458/20504	83	20
450/10208	78	10	458/20504	86	20
450/10208	79	10	458/20658	75	5



PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
458/20794	84	6	459/10248	66	38
458/20805	84	18	459/10259	63	19
458/20807	83	5	459/10265	63	21
458/20807	86	5	459/10267	63	18
458/20808	83	25	459/30470	66	6
458/20809	86	25	459/30481	63	12
458/20821	84	1	459/50411	69	3
458/20828	83	6	459/50680	69	17
458/20828	86	6	459/50683	67	1
458/20829	84	14	459/50683	70	1
458/20830	83	14	459/50689	64	12
458/20830	86	14	459/50715	68	3
458/20831	78	31	459/50722	70	12
458/20831	79	31	459/50724	67	12
458/20831	83	9	459/50761	63	20
458/20831	86	9	459/70168	65	3
458/50043	83	16	460	35	3
458/50043	86	16	460/35609	63	22
458/70000	76	14	46081	49	46
458/70236	84	10	460R1230	35	1
458/M2116	78	25	46240.4	93	5
458/M2116	79	25	46933	49	23
458/M2118	78	36	47370	20	4
458/M2118	79	36	47371	20	1
458/M2336	75	23	47373	90	1
458/M2337	75	1	47375	74	6
458/M2340	82	4	47376	81	6
458/M3536	75	5	47377-1	62	
459/10090	63	27	47378	2	2
459/10171	67	8	47378-38	39	27
459/10171	68	6	47378-39	39	2
459/10171	69	25	47378-40	39	3
459/10171	70	8	47378-41	39	6
459/10239	63	11	47378-46	39	9
459/10247	66	22	47379	49	11

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
47379	55	1	47921	101	2
47380	1	2	47928	29	15
47382	90	2	47929	38	3
47388	2	9	47930	1	1
47392	2	5	47933	89	32
47393	2	16	47940	87	41
47495	2	14	47943	61	9
475/48901	49	16	48046	89	10
475/50712	49	18	48051	89	22
47510	81	8	48053	88	8
47515	73	1	48054	101	19
47516	73	10	48056	95	8
47529	74	2	48199	104	7
47533	98	11	48203	104	12
47546	74	4	48205	104	3
47579	101	43	48206	104	4
47585	98	12	48207	104	2
47610	87	5	48208	104	11
47615	87	4	48209	104	1
47627	71	13	48259	71	9
47628	71	11	48260	71	7
47640	48	24	48261	93	4
47646	48	23	48262	93	3
47654	87	9	48273	101	42
47656-2	37	14	48276	49	33
47656-3	37	21	48278	49	24
47701	87	12	48361	87	23
47707	87	13	48362	87	22
47718	81	4	48364	101	45
47719	81	5	48366	101	18
47739	61	3	48370	89	2
47771	101	9	48561	101	44
47772	101	10	48753	104	10
47895	38	9	48838	87	31
47903	101	17	48839	87	36

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
48840	87	29	49127	62	7
48855	61	15	49129	2	15
48856	39	24	49130	2	6
48857	62	2	49130	39	16
48858	89	4	49147	52	11
48859	89	31	49201	59	19
48860	89	30	49202	59	5
48861	61	17	49203	59	1
48877	33	14	49204	59	2
48879	33	6	49205	59	3
48880	33	8	49206	59	6
48890	98	8	49208	59	4
48916	104	6	49209	59	18
48918	104	9	49210	59	7
48920	104	13	49211	59	16
48929	101	13	49212	59	10
48931	101	12	49214	59	11
48932	38	14	49215	59	8
48958	97	1	49216	59	9
48964	97	5	49217	59	12
48966	95	4	49218	59	17
48970	101	20	49219	59	13
48974	49	12	49220	59	15
48986	101	31	49254	102	7
48987	101	38	49255	102	9
49009	91	3	49258	101	41
49029	72	3	49271	101	22
49040	33	1	49291	59	14
49056 ,	101	36	49298	73	13
49060	101	39	49325	95	2
49070	52	8	49671	104	14
49071	52	5	49921	62	1
49077	52	3	49922	62	12
49084	62	5	4997245A162243	88	2
49116	61	26	4HB605	58	13

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
4JBTXSS	87	30	672-0239-00	49	26
5/16-A035840	88	11	68011-5116-0	6	13
512K	39	18	68271-6591-0	15	9
5160X	73	3	68271-6592-0	15	10
517200	38	4	68900652	41	1
52235	51	8	68900653	41	3
525F	38	2	69300001	39	10
525F	61	4	6C040-8269-0	47	6
525H-L-9004-12V	50	7	70-169	49	44
52772	50	2	7036K32	58	30
5346K12	33	15	7036K35	58	10
5388K14	33	5	7036K73	58	17
5388K14	35	6	704/30500	63	2
5406-16-8	71	5	708835	89	14
5406-P-4	39	14	7752K211	52	7
5500	102	2	7752K212	52	4
5504930-1	49	36	79000625	39	8
553/60189	94	3	7HR366	60	9
56RA	87	46	8002-002/MDL. NO. 34	52	1
6/4/5406	35	8	802T-H1P	89	27
60-02	102	1	802T-W3A	89	28
60043	2	4	803-1624094 PC 49	81	7
600504	51	1	808/00253	77	3
6008B	90	4	808/00273	80	2
60230	39	23	808/00273	85	1
60270-5	39	17	808/00274	80	4
6072K213	87	38	808/00274	85	2
6094K72	48	14	808/00352	75	2
62271	50	5	81000108	88	12
639111	48	6	81000131	88	6
6400-12-12-0	92	6	812/01580	94	5
66634	99	1	812/10071	94	4
66843	53	5	813/10164	84	4
67014	53	7	813/10165	84	17
			813/50025	78	18

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
813/50025	79	18	821/00289	79	6
813/50026	78	17	821/00290	78	3
813/50026	79	17	821/00290	79	3
813/50027	66	26	821/00291	78	34
813/50041	66	12	821/00291	79	34
813/50054	66	20	821/00291	83	21
813/M1221	66	3	821/00291	86	21
8-1393298-8	49	42	821/00447	64	7
814/00222	66	15	821/00523	67	19
814/00297	68	10	821/00523	68	8
814/00297	69	12	821/00523	69	10
814/00345	67	21	821/00523	70	19
814/00345	70	20	823/00291	66	9
814/00407	65	2	823/00331	66	32
81500001	39	11	823/10327	67	16
816/10148	63	23	823/10327	69	2
816/15178	63	24	823/10327	70	17
816/15184	66	39	823/10582	64	2
816/60040	78	26	823/10738	66	19
816/60040	79	26	823/10740	66	21
816/60040	82	3	826/00425	83	13
816/60056	75	20	826/00425	86	13
816/80005	66	4	826/00817	63	9
816/80012	75	12	826/00818	76	5
816/80012	84	12	826/00818	84	7
816/80037	75	6	826/00923	78	32
816/80037	84	11	826/00923	79	32
816/80041	66	13	826/00923	83	8
816/80047	66	24	826/00923	86	8
816/80051	66	34	826/01008	74	1
816/80053	66	8	826/01008	81	1
816/80061	65	1	826/01060	78	16
816/82010	78	13	826/01060	79	16
816/82010	79	13	826/01060	83	19
821/00289	78	6	826/01060	86	19

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
826/01084	76	4	9004	50	8
826/01084	84	19	90040A032	73	18
826/01343	78	35	90185A621	87	1
826/01343	79	35	90272A540	49	30
826/01417	66	29	90272A540	101	11
826/01434	75	18	90272A540	48	21
826/01551	66	33	904/05100	66	31
826/01585	80	5	904/06500	75	3
826/01585	85	5	904/09300	77	2
826/11555	76	11	904/14300	64	14
826/11555	84	22	904/50009	75	9
828/00208	78	30	904/50009	78	28
828/00208	79	30	904/50009	79	28
828/00224	67	24	904/50011	75	17
828/00224	68	4	904/50020	67	13
828/00224	69	5	904/50020	68	2
828/00224	70	24	904/50020	69	16
828/00231	69	4	904/50020	70	13
828/00238	78	9	904/50023	63	10
828/00238	79	9	904/50023	76	9
828/00238	83	10	904/50023	84	23
828/00238	86	10	904/50033	78	23
828/00376	63	3	904/50033	79	23
828/00414	67	14	904/50033	83	22
828/00414	68	13	904/50033	86	22
828/00414	69	6	90413	96	5
828/00414	70	14	90631A011	37	11
828/10222	66	35	90631A411	89	18
828904-1	57	3	907/09000	76	13
830/11256	63	16	907/09000	84	9
831/00113	69	20	907/09100	76	8
8880218	73	9	907/09100	84	16
8946K33	29	11	907/09200	76	2
8KP461	57	7	907/09200	84	3
8KP461	58	24	907/20031	64	1

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
907/20031	67	15	917/50200	75	8
907/20031	68	1	917/50300	69	19
907/20031	70	16	917/50400	69	22
907/20043	83	11	917/50500	78	27
907/20043	86	11	917/50500	79	27
907/20045	66	25	9171K252	33	13
907/20049	69	1	91740	50	3
907/50600	78	8	91740	50	6
907/50600	79	8	921/01900	76	12
907/50700	75	16	921/01900	84	8
907/53700	66	30	921/51200	78	14
91090A112	102	4	921/51200	79	14
911/22800	75	13	921/52000	78	1
911/22800	94	1	921/52000	79	1
91180A626	94	2	921/53300	84	15
91180A711	2	7	921/53400	66	5
91202A242	96	2	92820A325	10	20
91202A242	92	3	92820A530	39	13
91202A246	20	2	92865A623	62	8
91257A597	101	35	9297RH-32-HB	101	33
91257A816	98	9	929939-1	57	2
91306A376	39	7	9310C9338-001	50	1
91306A423	101	8	94380A645	89	11
914/60197	79	29	9525	43	3
914/60300	83	1	95263A388	49	17
914/60300	86	1	95591	48	20
914/84000	78	29	96144A261	92	2
916/00008	66	17	96144A293	61	11
917/02600	64	3	9713K68	89	9
917/02700	67	17	97245A272	37	17
917/02700	70	15	97245A288	88	10
917/02800	67	6	98023A037	81	2
917/02800	70	6	98335A067	97	6
917/10013	83	15	98335A127	97	4
917/10013	86	15	98338A225	89	12

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
98416A017	101	32	B1821BH031C225N	33	7
98760A112	52	12	B1821BH031C250N	33	9
A038491	37	10	B1821BH038C075N	72	5
A-1372-001	96	1	B1821BH038C100D	101	48
A2272	53	4	B1821BH038C100D	38	13
A-3066-002	92	4	B1821BH038C100D	88	18
A-48202	78	22	B1821BH038C175N	62	3
A-48202	79	22	B1821BH038F050N	72	1
A-55485/03-017D	88	14	B1821BH038F125N	102	5
AA55569/01-005	49	39	B1821BH044C225N	39	20
AA55569/01-007	49	40	B1821BH050C150N	39	21
AA55569/01-011	49	45	B1821BH050C150N	73	17
AA55569/02-004	49	6	B1821BH050C250N	2	10
AA55569/02-009	49	4	B1821BH050C250N	97	8
AD5721R	61	7	B1821BH063C550N	98	3
AN515-10-6	61	22	B1821BH075C250N	99	2
AN515-8-8	49	41	B1821BH075C500N	99	6
AN520-10-8	101	4	B1821BH088C250N	99	5
AN913-2S	87	24	B1821H075C500N	2	1
AS21919WDG24	51	7	B405	95	10
AS25036-110	58	26	BB-825-14	53	6
AS25036-110	60	10	BB-825-14	58	16
AS3209-149	95	3	BB-825-56	53	9
AS568A-012	48	12	BB-825-56	58	9
AS568A-113	48	4	BB-825-56	60	14
ASTM-F1922	90	3	BB-837-08	53	8
B151-7168-2	49	2	BB-837-08	58	7
B1821BH025C050N	97	3	BB-839-10	58	11
B1821BH025C100N	37	18	BF00440	61	24
B1821BH025C100N	61	1	BF-954	34	16
B1821BH025C100N	103	2	BZ-2R55-A2-S	61	6
B1821BH025C138N	39	19	BZ-2R55-A2-S	89	7
B1821BH025C250N	103	5	C-172748	58	25
B1821BH031C150N	89	20	C-32-4603-9	98	1
B1821BH031C150N	103	8	C344107-1	57	5



PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
C344112-1	58	22	LS15262V08-10	61	8
C936	81	3	M2203/0057	79	15
CB211-20	49	3	M421KR	50	9
CD-2903	60	11	MS20365-720A	95	9
CG1850	89	25	MS20365-832A	49	35
DB1267	71	14	MS21044N3	49	14
DB-515-B	71	4	MS21920-20	29	2
DS72	49	13	MS21920-28	29	14
DS72	54	1	MS24523-22	48	17
E0E0	98	4	MS24523-30	48	15
E571	2	8	MS24524-22	48	16
E9151-3314-0	6	17	MS24665-132	37	5
E9151-3314-0	14	4	MS24665-285	88	4
F016289	87	43	MS24665-391	87	8
F016289	87	45	MS27183-10	37	6
F100309	101	29	MS27183-12	29	6
F516	39	5	MS27183-12	38	6
F5P2	39	4	MS27183-12	71	2
F6386	91	1	MS27183-12	88	3
FA-126	29	8	MS27183-13	33	11
FMX-60	49	27	MS27183-13	37	9
G4344-1	89	8	MS27183-13	89	17
HDP24-2423	60	3	MS27183-14	35	5
HDP26-2423	58	1	MS27183-14	62	10
HH1C0-3243-0	21	1	MS27183-14	91	4
ISO4017-M24X280-8.8	74	3	MS27183-15	38	11
J514	95	6	MS27183-15	87	2
K305	101	27	MS27183-15	87	7
L124720	56	6	MS27183-15	101	24
L124720	58	4	MS27183-18	2	11
LC12GN2	48	5	MS27183-18	87	40
LC12RN2	48	3	MS27183-23	2	3
LDA50	51	2	MS27183-23	87	6
LE105JK 03M	87	42	MS27183-26	99	3
LH73/1	48	1	MS27183-5	89	6

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
MS35206-248	49	10	MS51922-33	2	12
MS35206-248	49	34	MS51922-33	73	16
MS35206-265	89	1	MS51922-9	51	5
MS35206-283	37	3	MS51943-13	98	6
MS35206-283	49	22	MS51943-35	91	6
MS35206-283	100	4	MS51957-100	29	4
MS35206-283	101	5	MS51967-14	89	29
MS35206-284	87	19	MS51968-4	37	7
MS35207-263	49	15	MS51968-8	88	9
MS35207-264	49	8	MS51975-31	89	21
MS35207-268	89	5	MS9024-24	61	10
MS35207-270	89	26	MS90725-10	51	9
MS35298-89	73	19	MS90725-10	101	21
MS35335-34	51	4	MS90725-111	87	37
MS35338-28	39	25	MS90725-14	49	21
MS35338-44	49	32	MS90725-31	103	7
MS35338-44	101	40	MS90725-34	37	16
MS35338-44	103	3	MS90725-34	38	7
MS35338-45	37	8	MS90725-34	51	3
MS35338-45	71	3	MS90725-34	88	13
MS35338-45	95	7	MS90725-34	89	15
MS35339-27	72	4	MS90725-34	95	15
MS35339-29	39	22	MS90725-34	103	9
MS35340-50	98	10	MS90725-40	87	26
MS35649-2312	101	34	MS90725-62	91	5
MS35690-1204	2	13	MS90725-62	101	25
MS35690-1204	99	4	MS90725-64	35	9
MS35690-502	71	1	MS90725-64	87	11
MS35690-704	98	2	MS90725-64	101	37
MS35691-626	87	47	N16353BP	91	2
MS35842-12	41	2	NAF1	49	31
MS51525A6-8	96	4	NAF3	89	3
MS51527A12	95	11	NAN1	49	23
MS51527A6	87	21	NAN1	51	6
MS51922-25	39	15	NAN1	100	3

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
NAN1	101	7	NW035842K	50	4
NAN1	37	4	NW036196	33	2
NAN1	61	2	NW036670	101	14
NAN1	87	17	P10-5532	29	12
NAN1	89	23	P540	96	3
NAN2	103	6	P78-0012	29	9
NAN2	87	35	PH-30SA41	97	7
NAN2	29	7	PM059	75	21
NAN2	33	10	R60P	35	10
NAN2	38	15	RB08-PC	49	43
NAN2	49	28	RF40NC28	49	25
NAN2	52	2	RK 10110	35	4
NAN2	88	7	RK30476	35	12
NAN2	89	16	RV4SBYSD101A	48	13
NAN2	102	8	SAE 30R6-7	33	12
NAN3	35	2	SCE41	101	16
NAN3	101	23	ST-15	95	12
NAN3	38	10	TAC05-1D20	89	13
NAN3	62	11	TKC6	20	3
NAN3	87	3	TS25PL4914050	38	5
NAN3	87	14	TVA1170	49	38
NAN3	88	5	TYVV	71	12
NAN3	89	24	VCF4-1001	60	1
NAN5	87	39	VF-8-G	87	10
NAN5	97	2	VJ28-95F24-S01	49	7
NHS-100	93	6	VSM920	56	1
NHS-153-300	71	8	VTE 8404	88	15
NW017237	104	8	WU51	101	6
NW035688	101	15	WU51	87	18



**CHAPTER 7**  
**SUPPORTING INFORMATION**



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**FIELD MAINTENANCE  
REFERENCES**

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**Scope**

This work package lists all field manuals, forms, technical manuals and miscellaneous publications referenced in this manual.

**Field Manuals**

FM 4-25.11                      First Aid for Soldiers

**Forms**

AR 700-138                      Army Logistics Readiness and Sustainability

DA Form 2404                      Equipment Inspection and Maintenance Worksheet

DA Form 2028                      Recommended Changes to Publications and Blank Forms

DA Form 5988-E                      Equipment Maintenance and Inspection Worksheet

DA PAM 750-8                      The Army Maintenance Management System (TAMMS) Users Manual

DA PAM 738-751                      Functional Users Manual for the Army Maintenance Management Systems – Aviation (TAMMS-A)

SF 368                              Product Quality Deficiency Report

**END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION**

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**MAINTENANCE ALLOCATION CHART (MAC)****INTRODUCTION****The Army Maintenance System MAC**

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

This MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field – includes two sub-columns, Crew (C) and Maintainer (F)

Sustainment – includes two sub-columns, Below Depot (H) and Depot (D).

The maintenance to be performed at field and sustainment levels is described as follows:

1. Crew maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "C" in the third position of the SMR code. A "C" appearing in the fourth position of the SMR code indicates complete repair is possible at the crew maintenance level.
2. Maintainer maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "F" appearing in the third position of the SMR code. An "F" appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to the user after maintenance is performed at this level.
3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "H" appearing in the third position of the SMR code. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.
4. Depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "D" or "K" appearing in the third position of the SMR code. Depot sustainment maintenance can be performed by either depot personnel or contractor personnel. A "D" or "K" appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply systems after maintenance is performed at this level.

The tools and test equipment requirements table (immediately following the MAC) lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks table (immediately following the tools and test equipment requirements) contains supplemental instructions and explanatory notes for a particular maintenance function.

## Maintenance Functions

Maintenance functions will be limited to and defined as follows:

1. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection, gauging and evaluation of cannon tubes.
2. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. **Service.** Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
  - a. **Unpack.** To remove from packing box for service or when required for the performance of maintenance operations.
  - b. **Repack.** To return item to packing box after service and other maintenance operations.
  - c. **Clean.** To rid the item of contamination.
  - d. **Touch up.** To spot paint scratched or blistered surfaces.
  - e. **Mark.** To restore obliterated identification.
4. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.
5. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.
6. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
7. **Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or xing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
8. **Paint (ammunition only).** To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
9. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance, and Recoverability (SMR) code.
10. **Repair.** The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures and maintenance actions to identify troubles and restore serviceability to an item by correcting speci c damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

### NOTE

The following definitions are applicable to the "repair" maintenance function:

- **Services.** Inspect, test, service, adjust, align, calibrate, and/or replace.
- **Fault location/troubleshooting.** The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).
- **Disassembly/assembly.** The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).
- **Actions.** Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

### Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions refer to "Maintenance Functions" outlined above.)

Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as man hours in whole hours or decimals) in the appropriate sub-column. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

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Field:

C	Crew maintenance
F	Maintainer maintenance

Sustainment:

L	Specialized Repair Activity (SRA)
H	Below depot maintenance
D	Depot maintenance

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### NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

**Explanation of Columns in the Tools and Test Equipment Requirements**

Column (1) - Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) - Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) - Nomenclature. Name or identification of the tool or test equipment.

Column (4) - National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) - Tool Number. The manufacturer's part number.

**Explanation of Columns in the Remarks**

Column (1) - Remarks Code. The code recorded in column (6) of the MAC.

Column (2) - Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

**END OF WORK PACKAGE**

**FIELD MAINTENANCE  
MAINTENANCE ALLOCATION CHART (MAC)**

**Table 1. Maintenance Allocation Chart (MAC)**

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
00	MT3 SATS	inspect		0.7				
		service		2.0				
01	Power Pack Assembly	replace		7.0		10	A	
	ENGINE	inspect	0.1	1.0		11	B	
		replace		3.0				
		Repair				40.0		
0103	Flywheel	inspect		0.5				
		replace		1.0				
0106	Oil Filter Cartridge	inspect	0.1	0.1				
		replace		0.2				
03	FUEL SYSTEM	service		2.0				
0302	Fuel Pump	inspect	0.1	0.2				
		Test		0.5				
		replace		1.5				
0305	Fuel Injection Pump	inspect	0.1	0.2				
		replace		1.5				
		Injectors	inspect	0.1	0.5			
0305	Turbocharger	replace		2.0				
		inspect	0.1	0.5				
0306	Fuel Tank, Lines and Fittings	replace		2.5				
		Fuel Tank	inspect	0.1	0.3			

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
0309	Fuel Hose Assemblies	service		0.5				
		replace		1.7				
		inspect	0.1	0.2				
		replace		0.5				
	Fuel Filters							
	Fuel Spin-On Filter	inspect	0.1	0.1				
0304	Fuel/Water Separator	replace		0.2				
		inspect	0.1	0.1				
	Air Cleaner Assembly	service		0.2				
		replace		1.0				
		none						
		inspect	0.1	0.2				
Air Filters	replace	0.2	0.5					
Air Cleaner	inspect	0.1	0.5					
0311	Intake Tube Assembly	replace		1.5				
		inspect	0.1	0.2				
	replace		1.0					
	Engine Starting Aids							
	Glow Plugs	inspect		0.5				
	test		1.0					
0312	Throttle Assembly	replace		2.0				
		service		0.7				
	Slave Cylinder	inspect	0.1	0.2				
	replace		0.6					
	Hose Assemblies	inspect	0.1	0.2				
	replace		0.5					
Pedal Assembly	inspect	0.1	0.5					
	replace		1.5					
	Throttle Master Cylinder	inspect	0.1	0.2				

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
04	EXHAUST SYSTEM	replace		0.6				
		inspect	0.1	0.2				
		service		0.2				
		replace		1.6				
0401	Muffler	inspect	0.1	0.5				
		replace		1.2				
		Exhaust Weldment Pipe (Turbocharger Flange)	inspect	0.1	0.2			
		replace		1.0				
05	COOLING SYSTEM	Exhaust Tail Pipe	inspect	0.1	0.5			
		replace		2.5				
		Radiator	inspect	0.1	0.2			
			service		1.2			
0501	Radiator Isolator Supports	replace		3.5				
		inspect		0.2				
		replace		1.2				
		Overflow Bottle	inspect	0.1	0.2			
0502	Thermostat	replace		0.7				
		replace		1.0				
0503	Radiator Hoses	inspect	0.1	0.2				
		replace		0.5				
0504	Water Pump	inspect	0.1	0.2				
		replace		1.5				
0505	Fan Assembly	Cooling Fan	inspect	0.1	0.3			
		replace		1.0				
		Fan Belt	inspect	0.1	0.2			
		adjust		0.5				

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
06	ELECTRICAL SYSTEM	replace		0.7				
0601	Alternator	inspect	0.1	0.2				
		test		0.5				
		replace		0.7				
0603	Starter	inspect	0.1	0.2				
		test		0.5				
		replace		1.2				
0607	Instrument Panel							
	Dash Panel Gauges	Inspect	0.1	0.5				
		test		1.0				
		replace		1.5				
	Hourmeter	inspect	0.1	0.5				
		replace		0.3				
	Ignition Switch	inspect	0.1	0.2				
		test		0.2				
		Replace		0.4				
	Dash Panel Switches	inspect	0.1	0.2				
		test		0.2				
		replace		1.5				
	Dash Panel Indicator Lights	inspect	0.1	0.2				
		replace		1.0				
	Dash Panel Dimmer Rheostat	inspect	0.1	0.2				
		replace		1.0				
0608	Miscellaneous Electrical Components	none						
	Transmission Shift Control	inspect	0.1	0.2				



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
0609	Speed Sensor	test		1.0				
		replace		1.5				
	ECU	inspect		0.2				
		replace		1.0				
	Fuel (Shut Off) Solenoid	inspect		0.2				
		test		1.0				
	Circuit Breakers	replace		1.0				
		inspect		0.2				
	Circuit Fuses	test		0.5				
		replace		0.7				
	Power Relays	inspect		0.1				
		test		0.1				
	SPDT Relay	replace		0.3				
		inspect		0.1				
	Time Delay Relay	test		0.1				
		replace		0.2				
	Headlight Dimmer Switch	inspect		0.2				
		replace		0.7				
	Directional Signal Arm	inspect	0.1	0.1				
		replace		0.3				
	Lights	inspect	0.1	0.1				
		replace		1.5				

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
0611	Headlight	inspect	0.1	0.1				
		replace		0.2				
	Turn Signal Light	inspect	0.1	0.1				
		replace		0.5				
	Stop/Tail Light Assembly	inspect	0.1	0.1				
		replace		0.5				
	Back-Up Light Assembly	inspect	0.1	0.1				
		replace		0.5				
	Horn, Siren	inspect	0.1	0.2				
		replace		0.7				
0612	Backup Alarm	inspect	0.1	0.2				
		replace		1.0				
	Horn	inspect	0.1	0.2				
		replace		0.3				
0613	Batteries	inspect	0.1	0.2				
		test		0.2				
	Battery	inspect	0.1	0.2				
		replace		0.4				
0613	Battery Cables	inspect	0.1	0.2				
		replace		1.0				
	Wiring Harnesses	inspect		0.5				
		replace		1.0				
	Rear Harness	inspect		0.5				
		replace		1.2				
Front Light Harness	inspect		0.5					
	replace		1.5					
Shifter Harness	inspect		0.5					
	replace		0.5					
Turn Signal Harness	inspect		0.5					

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
0610	Transmission Harness	replace		1.3				
		inspect		0.5				
	Engine/Chassis Harness	replace		1.3				
		inspect		0.5				
	Dash Wire Assembly	replace		1.3				
		inspect		0.5				
	Instrument Panel Harness	replace		2.0				
		inspect		0.5				
	Sending Units and Warning Switches	replace		2.0				
		inspect						
	Oil Pressure Sending Unit	inspect		0.2				
		test		0.2				
	Oil Pressure Switches	replace		0.7				
		inspect		0.1				
	Fuel Sending Unit	test		0.2				
		replace		0.5				
	Cooling Temp Sending Unit	inspect		0.1				
		test		0.5				
	Cooling Temp Switch	replace		0.7				
		inspect		0.2				
	Transmission Temperature Sending Unit	test		0.2				
		replace		0.5				
			inspect		0.2			
			test		0.2			
		replace		1.0				

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
07	TRANSMISSION	inspect	0.1	0.7				
		service		2.0				
		replace		1.5				
		repair				24.0		
	Solenoid Valve	inspect	0.1	0.5				
		test		0.5				
		replace		1.0				
	Filter	inspect	0.1	0.1				
		replace		0.2				
	Transmission Oil Cooler	inspect	0.1	0.7				
replace			2.2					
0708	Torque Converter	replace		2.0				
09	PROPELLER AND PROPELLER SHAFTS	inspect	0.1	0.5				
		replace		1.5				
		inspect	0.1	0.5				
		replace		1.5				
10	FRONT AXLE	service		1.5				
		inspect	0.1	0.7				
		replace		6.5				
		repair				18.0		
11	REAR AXLE	replace		2.0				
		service		1.5				
		inspect	0.1	0.7				
		replace		6.5				
		repair				18.0		
	Brake Friction Plates	replace		3.0				
12	BRAKES							
1202	Service Brake							

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
1201	Hydraulic Master Cylinder	inspect		0.2				
		replace		1.5				
	Stop Light Switch	inspect		0.2				
		test		0.5				
		replace		0.5				
	Brake Valve	adjust		0.5				
		inspect		0.3				
	Brake Lines, Tubes, Hoses	replace		2.5				
		inspect	0.2	0.2				
		service		1.0				
	Brake Reservoir	replace		1.0				
		inspect	0.1	0.2				
		service		0.2				
	Handbrake Assembly	replace		0.6				
		inspect	0.1	0.2				
		adjust		0.5				
	Handbrake Lever	replace		0.5				
		inspect	0.1	0.2				
		adjust		0.5				
	Handbrake Cable Assembly	inspect		1.0				
replace			1.5					
adjust			0.5					
Handbrake Caliper	inspect		0.2					
	replace		1.0					
Handbrake Switch	inspect		0.2					
	test		0.2					
	replace		1.0					
1206	Park Position Brake							
	Park Position Motor	inspect		0.7				
		test		0.5				

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
13	Limit Switch – Upper	replace		1.5				
		inspect		0.2				
		test		0.4				
		replace		0.7				
	Limit Switch - Lower	inspect		0.2				
		test		0.7				
		replace		0.7				
		inspect		0.5				
	Disk Brake Caliper	replace		1.0				
		inspect		0.5				
	1311	WHEELS	Wheels	inspect	0.1	0.2		
	1313	Tire	replace	0.5	0.7			
inspect			0.1	0.2				
14	STEERING	replace		0.5				
		inspect	0.1	0.2				
1401	Steering Wheel	replace		0.5				
		inspect	0.1	0.5				
	Steering Column	replace		2.2				
		inspect		0.7				
1410	Gear Pump	test		0.7				
		replace		1.7				
		inspect	0.1	0.2				
1411	Hydraulic Hose/Tube Assemblies	replace		0.5				
		inspect	0.1	0.2				
1412	Steering Cylinder	replace		1.5				
		inspect	0.1	0.2				
1413	Hydraulic Tank Assembly	replace		0.5				
		inspect	0.1	0.5				
	Tank	service		0.5				

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
1414	Breather	replace		2.0				
		inspect	0.1	0.1				
	Strainer	replace		0.2				
		inspect	0.1	0.3				
		service		0.7				
		replace		0.4				
	Tank Filter Assembly	inspect	0.1	0.3				
		replace		0.5				
Orbital Valve	inspect		0.5					
	replace		2.0					
15	FRAME, TOWING, ATTACHMENTS AND DRAWBARS							
1503	Pintle Hitch Assemblies	inspect	0.1	0.5				
		replace		0.4				
16	SPRINGS AND SHOCK ABSORBERS							
1601	Springs	inspect	0.1	0.5				
		replace		1.5				
1604	Shock Absorber	inspect	0.1	0.3				
		replace		1.0				
18	BODY, CAB, HOOD AND HULL							
1801	Fire Extinguisher	inspect	0.1	0.1				
		replace		0.2				
	Engine Cover	inspect	0.1	0.1				
		replace		0.5				
	Flex Draw Latch	inspect	0.1	0.1				
		replace		0.5				
	Access Panels	inspect	0.1	0.1				
		replace		0.5				

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW C	MAINT-AINER F	BELOW DEPOT H	DEPOT D		
1806	Seat	inspect	0.1	0.5				
		replace		1.3				
22	Seat Belt	inspect	0.1	0.2				
		replace		0.7				
BODY CHASSIS AND HULL ACCESSORY ITEMS								
2202	Mirrors	inspect	0.1	0.1				
		replace		0.2				
2210	Data Plates	inspect	0.1	0.1				
		replace		0.2				

**TOOL IDENTIFICATION LIST**

**INTRODUCTION**

This section lists all common tools and supplements and special tools/fixtures needed to maintain the SATS.

**Explanation of Columns in the Tool Identification List**

Column (1) - Item Number. This number is assigned to the entry in the list and is referenced in the initial setup to identify the item (e.g., "Extractor (WP 0090, item 32)").

Column (2) - Item Name. This column lists the item by noun nomenclature and other descriptive features (e.g., "Gage, belt tension").

Column (3) - National Stock Number. This is the National Stock Number (NSN) assigned to the item; use it to requisition the item.

Column (4) - Part Number/CAGEC. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. The manufacturer's Commercial and Government Entity Code (CAGEC) is also included.

Column (5) - Reference. This column identifies the authorizing supply catalog or RPSTL for items listed in this work package.



Table 2. Tool Identification List.

(1) Item No.	(2) Item Name	(3) National Stock Number (NSN)	(4) Part Number/ (CAGEC)	(5) Reference
1	Torque Wrench, 1/4" Drive		KTC-50986 (00NS2)	SC 9999-01-SK0
2	Torque Wrench, 3/8" Drive		KTC-50989 (00NS2)	SC 9999-01-SK0
3	Torque Wrench, 1/2" Drive		KTC-50991 (00NS2)	SC 9999-01-SK0
4	Torque Wrench, 3/8" Drive		KTC-50987 (00NS2)	SC 9999-01-SK0
5	Torque Wrench, 3/4" Drive		KTC-50988 (00NS2)	SC 9999-01-SK0
6	Multimeter		KTC-SO252 (00NS2)	SC 9999-01-SK0
7	Sling, Engine/Transmission		KTC-S1050 (00NS2)	SC 9999-01-SK0
8	Tool Kit, General Mechanic's Automotive (GMTK)	5180-01-548-7634	PD484 (19200)	SC 9999-01-SK0
9	Standard Automotive Tool Set (SATS)	4910-01-490-6453	SC 4910-95-A81 (59678)	SC 9999-01-SK0
10	Stand Weldment, Engine Pack (Local Manufacturer)		49555 (44185)	WP 0120 00

(1) Item No.	(2) Item Name	(3) National Stock Number (NSN)	(4) Part Number/ (CAGEC)	(5) Reference
11	Engine Power Pack Maintenance Mounts (Local Manufacturer)		49506  (44185)	WP 0120 00
12	Engine Power Pack Maintenance Mounts (Local Manufacturer)		49507  (44185)	WP 0120 00
13	Trans Lift Weldment (Local Manufacturer)		49366  (44185)	WP 0120 00
14	Tape Measure		KTC-S0697  (00NS2)	SC 9999-01-SKO
15	Hydraulic Floor Jack (5 Ton)	4910-00-289-7233	93660  (36251)	SC 9999-01-SKO
16	Jack Stand		KTC-S6607  (00NS2)	SC 9999-01-SKO
17	Load Tester		KTC-S6602  (00NS2)	SC 9999-01-SKO
18	Oil Filter Wrench		KTC-S0981  (00NS2)	SC 9999-01-SKO
19	Floor Creeper		KTC-S0158  (00NS2)	SC 9999-01-SKO
20	Rubber Gloves		KTC-S0208  (00NS2)	SC 9999-01-SKO
21	Funnel		KTC-S0206  (00NS2)	SC 9999-01-SKO

(1) Item No.	(2) Item Name	(3) National Stock Number (NSN)	(4) Part Number/ (CAGEC)	(5) Reference
22	Dial Indicator		KTC-S1019 (00NS2)	SC 9999-01-SKO
23	Gear Puller		KTC-S6353 (00NS2)	SC 9999-01-SKO
24	Soft Faced Hammer		KTC-S0221 (00NS2)	SC 9999-01-SKO
25	Transmission/Differential Jack		KTC-S6604 (00NS2)	SC 9999-01-SKO
26	Grease Gun		KTC-S0217 (00NS2)	SC 9999-01-SKO
27	Battery Post Brush		KTC-S0136 (00NS2)	SC 9999-01-SKO
28	Wire Brush		KTC-S0146 (00NS2)	SC 9999-01-SKO
29	Crimping Tool		KTC-S0159 (00NS2)	SC 9999-01-SKO
30	Removal Tool		KTC-S1033 (00NS2)	SC 9999-01-SKO
31	Soldering Iron		KTC-S0695 (00NS2)	SC 9999-01-SKO
32	Fuse Puller Tool		KTC-S0269 (00NS2)	SC 9999-01-SKO

**Table 3. Remarks**

(1) Reference Code	(2) Remarks
A	Power pack assembly Cradle is a local manufactured item and must be procured prior to removal of power pack assembly.
B	Engine power pack maintenance mounts are local manufactured items and must be procured prior to removal of engine power pack.
C	Engine right front bottom isolator mount must be modified, see WP 0120 00.

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**OPERATOR MAINTENANCE  
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS**

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**COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS**

**INTRODUCTION**

**Scope**

This work package lists COEI and BII for the MT3 SATS Tow Vehicle to help you inventory items for safe and efficient operation of the equipment.

**General**

The COEI and BII information is divided into the following lists:

**Components of End Item (COEI).** This list is for information purposes only and is not authority to requisition replacements. These items are part of the MT3 SATS Tow Vehicle. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

**Basic Issue Items (BII).** These essential items are required to place the MT3 SATS Tow Vehicle in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the MT3 SATS Tow Vehicle during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

**Explanation of Columns in the COEI List and BII List**

Column (1) Illus Number. Gives you the number of the item illustrated.

Column (2) National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (3) Description, Part Number/(CAGEC). Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEI and BII is also included in this column. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (4) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment.

Column (5) U/I. Unit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (2).

Column (6) Qty Req. Indicates the quantity required.

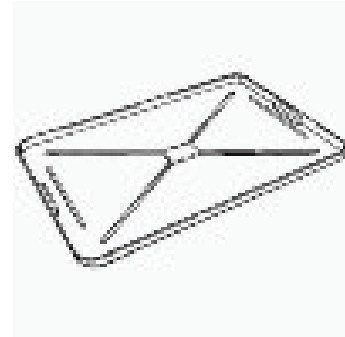
**Table 1. COMPONENTS OF END ITEM LIST**

(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number / (CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Req.
N/A	N/A	N/A	N/A	N/A	N/A

**Table 2. BASIC ISSUE ITEMS LIST**



Item 1



Item 2



Item 3



Item 4

(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number / (CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
1.	2549-01-459-4266	Wheel Chocks		Ea	1
2.	4940-01-504-5270	Drip Pan		Ea	1
3.	2540-00-528-7360	Tire Chains		Ea	4
4.	Local Manufacturer	10 Ft. Grounding Cable		Ea	1

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE  
EXPENDABLES AND DURABLE ITEMS**

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**SCOPE**

This work package lists the expendable and durable items you will need to operate and maintain the 6K forklift. This listing is for informational purposes only and is not authority to requisition the listed items.

These items are authorized to you by CTA 50-970, *Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items)*, or CTA 8-100, *Army Medical Department Expendable/Durable Items*.

**EXPLANATION OF COLUMNS**

1. **Column (1) - Item Number.** This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item [e.g., Use antifreeze (Item 1, WP 0025 00)].
2. **Column (2) - Level.** This column identifies the lowest level of maintenance that requires the listed item.  
C - Operate/Crew
3. **Column (3) - National Stock Number (NSN).** This is the NSN assigned to the item which you can use to requisition it.
4. **Column (4) - Description, Item Name, CAGEC, and Part Number.** This provides the other information you need to identify the item.
5. **Column (5) - Unit of Measure (U/M).** This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

Table 1. Expendables and Durable Items

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, AND PART NUMBER	(5) U/M
1	O	8010-01-260-5915	ADHESIVE, 3-M, No. 80 (TRAK 8526038) 1 Can (04963)	OZ
2	O	6810-00-543-7415	ALCOHOL, Denatured (OMU53) 27 CFR 21,35	GAL
3		6505-01-534-9143	ISOPROPYL ALCOHOL, P/N 13222E0694 (97403)	BT
4	O	6810-00-527-2476	ETHYL ALCOHOL, ABSOLUTE P/N A-A-59282 (58536)	GL
5	O		ANTIFREEZE: Permanent, Ethylene Glycol, Inhibited P/N MIL-A-46153 (81349)	
		6850-01-464-9125	1 Gallon Can	GAL
		6850-00-664-1403	1 Gallon (Recycled Engine Coolant)	GAL
6	O	8135-00-753-4661	BARRIER MATERIAL: Grade A P/N MIL-B-121 (81349)	RO
7	O	5340-00-450-5718	CAP and PLUG Set P/N 10935405 (19207)	EA
8	C		CLEANING COMPOUND: Solvent, Type III P/N MIL-PRF-680 (813490)	
		6850-01-474-2319	1 Gallon Can	CN
		6850-01-474-2320	5 Gallon Can	CN
		6850-01-474-2321	55 Gallon Drum	DR
9	F	5350-00-584-4654	CLOTH, Medium Grit, Emery P/N ANSI B74.18 (80204)	PG
10	O	8030-00-243-3285	COMPOUND, Anti-seize P/N MIL-T-83483 (81349)	TU
11	F	8010-00-664-1414	COMPOUND, Prussian Blue Marking P/N AA3108-2A-001Q (58536)	QT
12	O	8040-00-851-0211	COMPOUND, Sealing P/N RTV-732 Black (71794)	TU
13	F	7930-00-282-9699	DETERGENT: General Purpose, Liquid (83421) 7930-00-282-9699 6 ONE GALLON CONTAINERS	BX
14	O		DRYCLEANING SOLVENT: MIL-PRF--680, Type II (81348)	
		6850-00-110-4498	1 Pint Can	PT
		6850-00-274-5421	5 Gallon Drum	GAL
		6850-00-285-8011	55 Gallon Drum	GAL
		6850-00-637-6135	Bulk	GAL



(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, AND PART NUMBER	(5) U/M
15	O	9150-01-197-7693 9150-01-197-7689 9150-01-197-7692	GREASE, Automotive and Artillery GAA, P/N MIL-G-10924 (81349) (SAE-J-310) 14 oz. Cartridge 6 Pound Can 35 Pound Can	OZ LB LB
16	O	8010-00-242-2089	Mineral Spirits paint thinner P/N TT-T-291	GL
17	O	9140-00-286-5287 9140-00-286-5296 9140-00-286-5286	OIL, Fuel, Diesel, DF-1 Winter P/N VVF800 (81349) 5 Gallon Can 55 Gallon Drum Bulk	GAL GAL GAL
18	O	9150-00-252-6383 9150-00-223-4134 9150-00-082-7524 9150-00-265-9408	HYDRAULIC FLUID P/N MIL-PRF-5606 (81349) 1 Quart (plastic) Can 1 Gallon 10 Gallon 55 Gallon Drum	QT GAL GAL GAL
19	O	9130-01-031-5816	FUEL, TURBINE: Aviation P/N MILT83133 GR JP8 (81349)	GAL
20	O	9140-00-286-5295 9140-00-286-5296 9140-00-286-5294	OIL, Fuel, Diesel, DF-2 Regular P/N VVF800 (81349) 5 Gallon Can 55 Gallon Drum Bulk	GAL GAL GAL
21	O	9150-01-518-9477 9150-01-152-4118	OIL, Lubricating OE/HDO-15/40, P/N MIL-PRF-2104 (81349) 1 Quart Can 5 Gallon Can	QT GAL
22	O	9150-00-402-2372 9150-00-491-7197	OIL, Lubricating, Engine Arctic OEA, P/N MIL-L-46167 (81349) 5 Gallon Can 55 Gallon Drum	GAL GAL
23	O	9150-01-518-9471 9150-00-183-7807	OIL, Lubricating, Transmission/Hydraulic OE/HDO-10 P/N MIL-L-2140D (81349) 1 Quart Can 55 Gallon Drum	QT GAL
24	O	9150-00-189-6727 9150-00-186-6668 9150-00-191-2772	OIL: Lubricating, OE/HDO 10 P/N MIL-PRF-2104 (81349) 1 Quart Can 5 Gallon Can 55 Gallon Drum	QT GAL GAL

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, AND PART NUMBER	(5) U/M
25	O	9150-01-433-7974 9150-01-433-9150 9150-01-433-7978	LUBRICATING OIL: internal combustion engine, tactical service, OE/HDO 30 P/N MIL-PRF-2104 (81349) 1 Quart Can 5 Gallon Can 55 Gallon Drum	QT GAL GAL
26	O	9150-00-231-6689	LUBRICATING OIL: general purpose, preservative, PL-S, P/N VV-L-800 (81348)	QT
27	O	9150-00-889-3523 9150-00-407-0973	OIL, Preservative P/N MIL-PRF-46002 (81349) 1 Quart Can 55 Gallon Drum	QT DR
28	F	5330-01-197-7789	PADS, Scotch Brite P/N 12000260 (11924)	PG
29	O	6850-01-386-4895	ALKALI-TYPE PAINT REMOVER P/N FREEDOM KLEEN (OK209) 50 LB	BX BX
30	O	5350-00-619-9167	PAPER, Emery, Grit #80 P/N A-A-1047 (58536)	PG
31	C	7920-00-823-9773	TOWEL PAPER, lint free cloth P/N 7920-00-823-9773 (83421)	
32	O	9150-00-250-0926	PETROLATUM -Technical P/N 14P1 (82146) 1.75 Pound Can	LB
33	O	9150-00-250-0933	PETROLATUM TECHNICAL P/N W-P-236 (81348)	LB
34	O	7920-00-205-3570	RAG, Wiping P/N A-A-531 (58536)	LB
35	O	7920-00-205-1711	RAG: Wiping, P/N 7920-00-205-1711 (64067)	LB
36	F	5350-00-619-9166	SANDPAPER No. 100 P/N ANSI B74.18 (80244)	PG
37	O	8030-01-014-5869	SEALANT, Loctite 242 Type II Grade N P/N MIL- S-46163 (80244)	OZ
38	F	8030-01-142-3131	SEALANT, Loctite 262, 250 Cubic Centimeter Bottle P/N 26241 (05972)	BT
39	O	8030-01-158-6070	SEALANT, Loctite 271 Type I Grade L P/N MIL- S-46163 (80244)	BT

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, AND PART NUMBER	(5) U/M
40	O	8030-01-063-7510	SEALANT, Loctite 277 Type I Grade L P/N MIL-S-46163 (80244)	BT
41	O	8030-00-204-9149	SEALANT, Loctite 59241 P/N 392050 (61603)	TU
42	F	8030-00-251-3980	ANTI SEIZE COMPOUND P/N MIL-PRF-907, (813490)	LB
43	F	8030-00-656-1426	SEALANT, Permatex, Aviation Form A Gasket No. 3, P/N MIL-S-45180C (77247)	TU
44	O	8030-00-111-2762	SEALER, Ribbon, 50 Cubic Centimeter Bottle P/N 29031 (05972)	BT
45	O	7930-00-282-9699	SOAP, Liquid P/N 7930-00-282-9699 (83421)	GAL
46	O	6810-00-264-6618	SODIUM BICARBONATE, P/N AA374-2 (58536)	LB
47	O	5975-00-984-6582	STRAP, Tie Down, 6 Inch Length, Black Package of 100 P/N MS3367-1-0 (96906)	HD
48	O	9905-00-537-8954	TAG: Marker P/N MIL-T-12755, (81349)	
49	O	8030-00-889-3534	TAPE, ANTISEIZING (1/4in.) P/N MIL-T-27730 (81349)	EA
50	O	8030-00-889-3535	TAPE, ANTISEIZING (1/2in.) P/N MIL-T-27730 (81349)	EA
51	O	8010-00-180-6343	VARNISH, OIL P/N 700C88Q (58963)	QT
52	O	6810-00-356-4936	DISTILLED-DEIONIZED WATER P/N 6Z9250 (80063)	BT
53	O	8030-01-475-2007	SEALANT, Loctite 574, P/N 24017 (05972)	OZ
54	F	3439-00-914-8390	FLUX, BRAZING, P/N O-F-499 (81348)	OZ
55	F	3439-00-188-6988	SOLDER, LEAD ALLOW, P/N ASTM B 32, (81346)	EA
56	O	8030-00-213-3279	CORROSION PREVENTIVE COMPOUND, P/N M85054-1-C02 (81349)	OZ
57	O	7920-00-514-2417	SWABBING BRUSH, P/N 803-12 (75147)	BX
58	O	7510-00-852-8180	TAPE, PRESSURE SENSITIVE ADHESIVE, P/N MIL-T-22085 (81349)	RD
59	O	5640-00-103-2254	TAPE, DUCT, P/N 1791K70 (39428)	RD

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, AND PART NUMBER	(5) U/M
60	O	9150-01-586-8157	OIL, AXLE; MOBILE FLUID 424, P/N 98932P (0TS34)	GAL
61	O	9150-01-278-1357	LUBRICATING OIL,ENGINE 5W-30 GRADE SYNTHETIC BASE	GAL

**FIELD MAINTENANCE  
TORQUE LIMITS**

**WARNING**

Shut off and tag out the vehicle before adjusting, lubricating, cleaning or otherwise servicing. Failure to do so could result in an unexpected startup which could result in injury or death.

Follow the recommended maintenance program to prevent unsafe operation or accidents.

Keep maintenance area clean and dry. Oily and wet spots are slippery, greasy rags are a fire hazard, and wet spots are dangerous around electrical equipment.

**CAUTION**

Using non-original replacement parts is not recommended. Their use may cause unit failure and/or affect vehicle safety.

**NOTE**

Before attempting to repair the MT3 SATS, be familiar with the information on these pages.

**BOLT TIGHTENING DATA**

The following tables contain detailed information about variables for torque management to achieve correct fastener joint tightening. This is an advisory guide and responsibility for its application rests with the user.

**NOTE**

Do not use these values if a different torque value is given for a specific procedure.

If the fastened part is aluminum, reduce torque 25%.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, they should be tightened to the strength of the original fastener.

Locknuts: Tighten plastic-insert or crimped-steel-type locknuts to approx. 50% of the dry torque shown (applied to the nut, not the screw head).

**Table 1. US Bolt Identification**

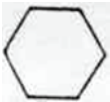



U.S. Bolt Grades						
						
	<b>SAE 2</b>	<b>SAE 5</b>	<b>SAE 7</b>	<b>SAE 8</b>		
I.D. Marks	No markings	3 lines	5 lines	6 lines		
Material	Low Carbon	Medium-carbon, tempered	Medium-carbon, quenched & tempered	Medium-carbon, quenched & tempered		
Tensile strength (Minimum)	74,000 psi	120,000 psi	150,000psi	160,000 psi		




Table 2. Standard SAE Torque Chart (Course Threads)

Standard Steel Bolts Torque Specifications Standard Dry Torque in Foot-Pounds							
Bolt Size (in.)	Coarse Threads (ths/in.)	SAE Grade 0-1-2 74,000 psi Low Carbon Steel	SAE Grade 3 100,000 psi Med. Carbon Steel	SAE Grade 5 120,000 psi Med. Carbon Heat T. Steel	SAE Grade 6 133,000 psi Med. Carbon Temp. Steel	SAE Grade 7 133,000 psi Med. Carbon Alloy Steel	SAE Grade 8 150,000 psi Med. Carbon Alloy Steel
1/4	20	6	9	10	12.5	13	14
5/16	18	12	17	19	24	25	29
3/8	16	20	30	33	43	44	47
7/16	14	32	47	54	69	71	78
1/2	13	47	69	78	106	110	119
9/16	12	69	103	114	150	154	169
5/8	11	96	145	154	209	215	230
3/4	10	155	234	257	350	360	380
7/8	9	206	372	382	550	570	600
1	8	310	551	587	825	840	700
1 1/8	7	480	872	794	1304	1325	1430
1 1/4	7	375	1211	1105	1815	1825	1975
1 3/8	6	900	1624	1500	2434	2500	2650
1 1/2	6	1100	1943	1775	2913	3000	3200
1 5/8	5.5	1470	2660	2425	3985	4000	4400
1 3/4	5	1900	3463	3150	5189	5300	5650
1 7/8	5	2360	4695	4200	6980	7000	7600
2	4.5	2750	5427	4550	7491	7500	8200

**Table 3. Standard SAE Torque Chart (Fine Threads)**

<b>Standard Steel Bolts (Fine Threads)</b> <b>Torque Specifications</b> <b>Standard Dry Torque in Foot-Pounds</b>				
<b>Size (In. - # of threads)</b>	SAE Grade 2 74,000 psi Low Carbon Steel	SAE Grade 5 120,000 psi Med. Carbon Heat T. Steel	SAE 133,000 psi Med. Carbon Alloy Steel	SAE 150,000 psi Med. Carbon Alloy Steel
1/4-28 (NF)	6	10	12	14
5/16-24 (NF)	12	19	24	29
3/8-24 (NF)	22	35	45	50
7/16-20 (NF)	34	55	70	80
1/2-20 (NF)	52	90	100	120
9/16-18 (NF)	71	120	150	170
5/8-18 (NF)	115	180	210	240
3/4-16 (NF)	180	300	360	420
7/8-14 (NF)	230	470	580	660
1-12 (NF)	350	710	860	990

Table 4. Metric Torque Chart

Metric Bolt Torque Table Estimated with clamp load as 75% of proof load as specified in ISO 898-1						
Property Class	8.8 		10.9 		12.9 Socket Head Cap Screw 	
Minimum Tensile Strength MPa	M6 - M16: 800 M20 - M30: 830		1040		1220	
Nominal Size and Thread Pitch	Bolt Torque Specs in Foot Pounds or (Inch Pounds)					
	DRY	LUBED	DRY	LUBED	DRY	LUBED
M5 x 0.80	-54	-41	-78	-59	-91	-68
M6 x 1.00	-92	-69	-133	-99	-156	-116
M7 x 1.00	-156	-116	-222	-167	-260	-195
M8 x 1.25	-225	-169	-333	-242	-377	-284
M10 x 1.50	37	28	53	40	62	47
M12 x 1.75	65	49	93	69	108	81
M14 x 2.00	104	78	148	111	173	130
M16 x 2.00	161	121	230	172	269	202
M18 x 2.50	222	167	318	238	372	279
M20 x 2.50	314	235	449	337	525	394
M22 x 2.50	428	321	613	460	716	537
M24 x 3.00	543	407	776	582	908	681
M27 x 3.00	796	597	1139	854	1331	998
M30 x 3.50	1079	809	1543	1158	1804	1353
M33 x 3.50	1468	1101	2101	1576	2455	1842
M36 x 4.00	1886	1415	2699	2024	3154	2366



**Table 5. Metric Torque Chart (Course Thread/Pitch)**

Metric Steel Bolts Torque Specifications Standard Dry Torque in Foot-Pounds					
Bolt Size Millimeters	Coarse Thread Pitch	Standard 5D 71,160 psi Med. Carbon Steel	Standard 8G 113,800 psi Med. Carbon Steel	Standard 10K 142,000 psi Med. Carbon Steel	Standard 12K 170,674 psi Med. Carbon Steel
6mm	1	5	6	8	10
8mm	1	10	16	22	27
10mm	1.25	31	40	45	49
12mm	1.25	34	54	70	86
14mm	1.25	55	89	117	137
16mm	2	83	132	175	208
18mm	2	111	182	236	283
22mm	2.5	182	284	394	464
24mm	3	261	419	570	689

**Table 6. 37° TUBE FITTINGS & PIPE FITTINGS**

37° TUBE FITTINGS & PIPE FITTINGS						
Dash #	37° Swivel Nut Ft-Lbs	37° Flats from Finger Tight	O-Ring Lock Nut Ft.-lbs.	Pipe Dia. (Inch)	NPT Ft.-lbs.	NPT Turns from Finger Tight
-4	10	2	8	1/4	25	2 1/2
-6	20	1 1/4	13	3/8	40	2 1/2
-8	40	1	21	1/2	54	2 1/2
-10	60	1	33	-	-	2 1/2
-12	80	1	48	3/4	78	2 1/2
-16	110	1	63	1	112	2 1/2
-20	130	1	-	1 1/4	154	2 1/2
-24	160	1	-	1 1/2	211	2 1/2
-32	250	1	-	2	300	2 1/2

Torque Conversion: Ft-Lbs = 0.7376xN-m      N-m = 1.356xFt-Lbs

**NOTE**

Do not use these values if a different torque value is given for a specific procedure.

## FLUIDS AND CAPACITIES AND AMBIENT TEMPERATURE RANGES

The SATS vehicle can be operated over a wide range of ambient temperatures. Always use the fluids recommended in the following table.

**Table 7. SATS Vehicle Fluid Requirements for Ambient Temperature Ranges**

Item	Ambient Temp	Specification	Capacity
<b>Engine Coolant</b>	32°F and above 0°C and above	50/50 Ethylene Glycol Antifreeze/Water Mixture ASTM4985 GM6038M Specification	2.4 gal (9.0 L)
	-25°F and below - 32°C and below	62/38 Ethylene Glycol Antifreeze/Water Mixture ASTM4985 GM6038M Specification	
<b>Engine Fuel</b>	14°F and above - 10°C and above	No. 2-D S500 or S15 (Diesel)	20 gal (76 L)
	14°F and below - 10°C and below	No. 1-D S500 or S15 (Diesel)	
	All	JP-8 (meeting Nato Code F34) Jet-A1 (Meeting Nato Code F35) <b>(A reduction in power with jet fuels)</b>	
<b>Engine Oil</b>	77°F and above 25°C and above	SAE30 or SAE10W-30 or SAE 15W-40 (Must meet MIL-L-2104C or API Classification CF or Higher)	3.5 gal (13.2 L)
	32°F to 77°F 0°C to 25°C	SAE20 or SAE10W-30 or SAE 15W-40 (Must meet MIL-L-2104C or API Classification CF or Higher)	
	32°F to 24°F 0°C to 25°C	SAE10 or SAE10W-30 or SAE 15W-40 (Must meet MIL-L-2104C or API Classification CF or Higher)	
	10°F to 23°F 24°C to -5°C	SAE10W-30 (Must meet MIL-L-2104C or API Classification CF or Higher)	
	-9°F and below - 23°C and below	SAE 5W-30 Amsoil Synthetic (Do Not use until after 50 hrs of runtime.) (Must meet MIL-L-2104C or API classification CF or higher)	
<b>Transmission Fluid</b>	23°F to 115°F - 5°C to 46°C	MobilATF210, (SAE30) Meeting ESP-M2C33G	3.9gal(14.8L)
	-25°F to 104°F - 32°C to 40°C	MobilATF210, (SAE10) Meeting ESP-M2C33G	
<b>Axle Differentials (Front and Rear)</b>	All	Mobil Fluid 424 or Meeting APIGL4, M2C-41B/134D, JD20C, MFM1135/M1141/M1143	1gal(4L)
<b>Axle Outer Hubs</b>	All	Mobil Fluid 424 or Meeting APIGL4, M2C-41B/134D, JD20C, MFM1135/M1141/M1143	0.26gal(1L)
<b>Hydraulic Tank Fluid (Steering)</b>	All	ATF SAE10W	1.5gal(5.7L)
<b>Throttle Reservoir</b>	All	HYDRAULIC FLUID P/N MIL-PRF-5606 (81349)	Approx 5 oz.
<b>Service Brake Fluid (Reservoirs)</b>	All	HYDRAULIC FLUID P/N MIL-PRF-5606 (81349) <b>DO NOT USE Standard Brake Fluid</b>	1qt (0.95L) EACH

END OF WORK PACKAGE

By Order of the Secretary of the Army:

Official:

A handwritten signature in black ink that reads "Joyce E. Morrow". The signature is written in a cursive style with a large, stylized initial "J".

JOYCE E. MORROW  
*Administrative Assistant to the  
Secretary of the Army*

1022302

GEORGE W. CASEY, JR.  
*General, United States Army  
Chief of Staff*

Distribution:

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## ***These are the instructions for sending an electronic 2028***

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@wherever.army.mil>

To: 2028@redstone.army.mil

Subject: DA Form 2028

1. **From:** Joe Smith
2. **Unit:** home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub no:** 55-2840-229-23
9. **Pub Title:** TM
10. **Publication Date:** 04-JUL-85
11. **Change Number:** 7
12. **Submitter Rank:** MSG
13. **Submitter FName:** Joe
14. **Submitter MName:** T
15. **Submitter LName:** Smith
16. **Submitter Phone:** 123-123-1234
17. **Problem:** 1
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure:** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text:**

This is the text for the problem below line 27.



<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b>  <small>For use of this form, see AR 25-30; the proponent agency is ODISC4.</small>	Use Part II ( <i>reverse</i> ) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM)	DATE  <h2 style="text-align: center;">8/30/02</h2>
--	---	--

TO: ( <i>Forward to proponent of publication or form</i> )( <i>Include ZIP Code</i> ) Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-MA-NP Redstone Arsenal, AL. 35898	FROM: ( <i>Activity and location</i> )( <i>Include ZIP Code</i> ) MSG, Jane Q. Doe 1234 Any Street Nowhere Town, AL 34565
--	--

**PART 1 - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS**

PUBLICATION/FORM NUMBER <h3 style="text-align: center;">TM 9-1005-433-24</h3>	DATE <h3 style="text-align: center;">16 Sep 2002</h3>	TITLE Organizational, Direct Support, And General Support Maintenance Manual for Machine Gun, .50 Caliber M3P and M3P Machine Gun Electrical Test Set Used On Avenger Air Defense Weapon System
--	--	---

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON
1	WP0005 PG 3		2			Test or Corrective Action column should identify a different WP number. <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%) rotate(-45deg); font-size: 100px; opacity: 0.5; pointer-events: none;">             EXAMPLE           </div>

\* Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE  <h3 style="text-align: center;">MSG, Jane Q. Doe, SFC</h3>	TELEPHONE EXCHANGE/ AUTOVON, PLUS EXTENSION  <h3 style="text-align: center;">788-1234</h3>	SIGNATURE
--	---	-----------

<b>TO:</b> (Forward direct to addressee listed in publication) Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-MA-NP Redstone Arsenal, AL. 35898	<b>FROM:</b> (Activity and location) (Include ZIP Code) MSG, Jane Q. Doe 1234 Any Street Nowhere Town, AL 34565	<b>DATE</b> 8/30/02
---	--	------------------------

**PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

PUBLICATION NUMBER			DATE	TITLE				
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

**PART III - REMARKS** (Any general remarks, corrections, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

**EXAMPLE**

TYPED NAME, GRADE OR TITLE MSG, Jane Q. Doe, SFC	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 788-1234	SIGNATURE
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<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b>  For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM)	DATE
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TO: (Forward to proponent of publication or form)(Include ZIP Code) Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-MA-NP Redstone Arsenal, AL 35898	FROM: (Activity and location)(Include ZIP Code)
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**PART 1 - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS**

PUBLICATION/FORM NUMBER	DATE	TITLE
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ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON

*\* Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/ AUTOVON, PLUS EXTENSION	SIGNATURE
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<b>TO:</b> (Forward direct to addressee listed in publication) Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-MA-NP Redstone Arsenal, AL 35898	<b>FROM:</b> (Activity and location) (Include ZIP Code)	<b>DATE</b>
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**PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

**PART III - REMARKS** (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

--

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

## The Metric System and Equivalents

### Linear Measure

1 centimeter = 10 millimeters = .39 inch  
 1 decimeter = 10 centimeters = 3.94 inches  
 1 meter = 10 decimeters = 39.37 inches  
 1 dekameter = 10 meters = 32.8 feet  
 1 hectometer = 10 dekameters = 328.08 feet  
 1 kilometer = 10 hectometers = 3,280.8 feet

### Weights

1 centigram = 10 milligrams = .15 grain  
 1 decigram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 decagram = 10 grams = .35 ounce  
 1 hectogram = 10 decagrams = 3.52 ounces  
 1 kilogram = 10 hectograms = 2.2 pounds  
 1 quintal = 100 kilograms = 220.46 pounds  
 1 metric ton = 10 quintals = 1.1 short tons

### Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce  
 1 deciliter = 10 centiliters = 3.38 fl. ounces  
 1 liter = 10 deciliters = 33.81 fl. ounces  
 1 dekaliter = 10 liters = 2.64 gallons  
 1 hectoliter = 10 dekaliters = 26.42 gallons  
 1 kiloliter = 10 hectoliters = 264.18 gallons

### Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

### Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch  
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

## Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

## Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
----	---------------------------	-------------------------------	------------------------	----

