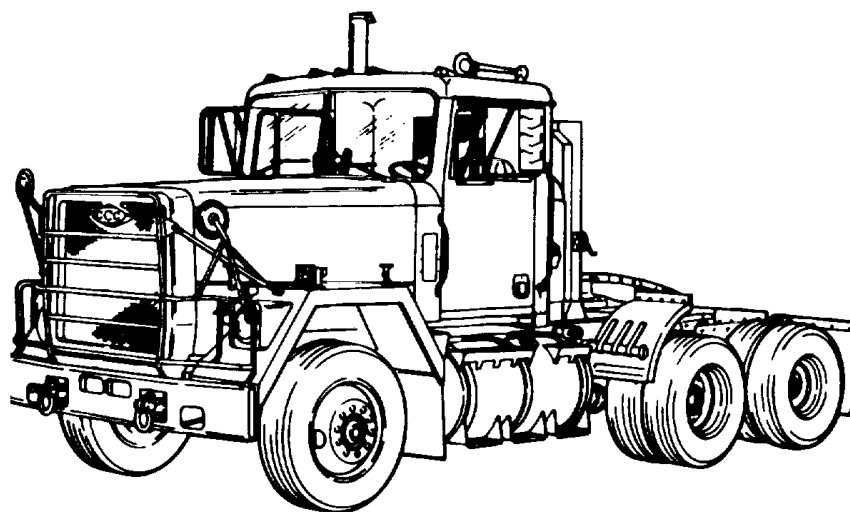


**TECHNICAL MANUAL
DIRECT SUPPORT AND
GENERAL SUPPORT
MAINTENANCE**

**TRUCK TRACTOR, LINE HAUL,
50,000 GVWR, 6 x 4, M915A1**

(NSN 2320-01-125-2640)



**HEADQUARTERS,
DEPARTMENT OF THE ARMY**

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DECEMBER 1983

TECHNICAL MANUAL
TM 9-2320-283-34-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 16 December 1983

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

TRUCK TRACTOR, LINE HAUL,
50,000 GVWR, 6 X 4, M915A1

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to Commander, U.S. Army Tank-Automotive Command, ATTN: DRSTA-MB, Warren, MI 48090. A reply will be furnished to you.

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HOW TO USE THIS MANUAL

As a maintenance technician, you are responsible for maintaining the equipment covered in this manual. The best way to do this is with the aid of your maintenance manual. Below is a sample problem.

PROBLEM: Organizational maintenance mechanic reports that the rear tandem axle lockout will not engage.

1. Turn to the cover of your manual.

On the right-hand side you will find a listing for "SERVICE AND TROUBLESHOOTING INSTRUCTIONS". Along with the listing is a page number and a black marker. Follow either the page number reference or the black marker to the first page in the service and troubleshooting section.

2. What is the quickest way to find the solution to the problem? Turn to paragraph 2-6.

This is the "TROUBLESHOOTING SYMPTOM INDEX". Follow the numerical listing "REAR TANDEM AXLES" until you see item 18 "Lockout will not engage". Now go to the page listed directly to the right of the malfunction.

3. What caused the problem? Turn to page 2-9, paragraph 2-7, Troubleshooting.

Here you will find the most likely causes of the problem. After following each step in the order listed and finding the problem, let's say, "The differential lockout is defective", go to the referenced paragraph (para 3-71).

4. How do you fix the problem? Turn to paragraph 3-71.

This is the maintenance procedure for the differential lockout.

It is arranged step-by-step so everything you need to know to maintain the differential lockout is covered. Now you are ready to correct the problem.

Your maintenance manual is easy to use. Also, you eliminate mistakes because you always are made aware of the warnings and cautions you need to know for personnel and equipment safety.

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CHAPTER 1

INTRODUCTION

1-1. OVERVIEW.

This chapter familiarizes the technician with standard forms, record data, and the equipment to be maintained at the Direct Support and General Support Maintenance levels. This information is covered in the following sections:

Section I General Information

Section II Equipment Description and Data

Section I. GENERAL INFORMATION

1-2. SCOPE.

- a. Type of Manual: Direct Support and General Support Army Maintenance.
- b. Model Number and Equipment Name: M915A1, truck tractor, line haul, 50,000 GVWR, 6 x 4.

1-3. MAINTENANCE FORMS, RECORDS AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Procedures for destruction of Army equipment to prevent enemy use can be found in TM 750-244-6.

1-5. PREPARATION FOR STORAGE OR SHIPMENT

Information concerning storage or shipment of equipment can be found in TM 740-90-1. Additional information concerning storage of Cummins NTC-400engine can be found in TM 9-2815-225-34&P.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your M915A1 Truck Tractor 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. Put it on an SF368 (Quality Deficiency Report). Mail it to Commander, U.S. Army Tank-Automotive Command, ATTN: DRSTA-M, Warren, Michigan 48090. We'll send you a reply.

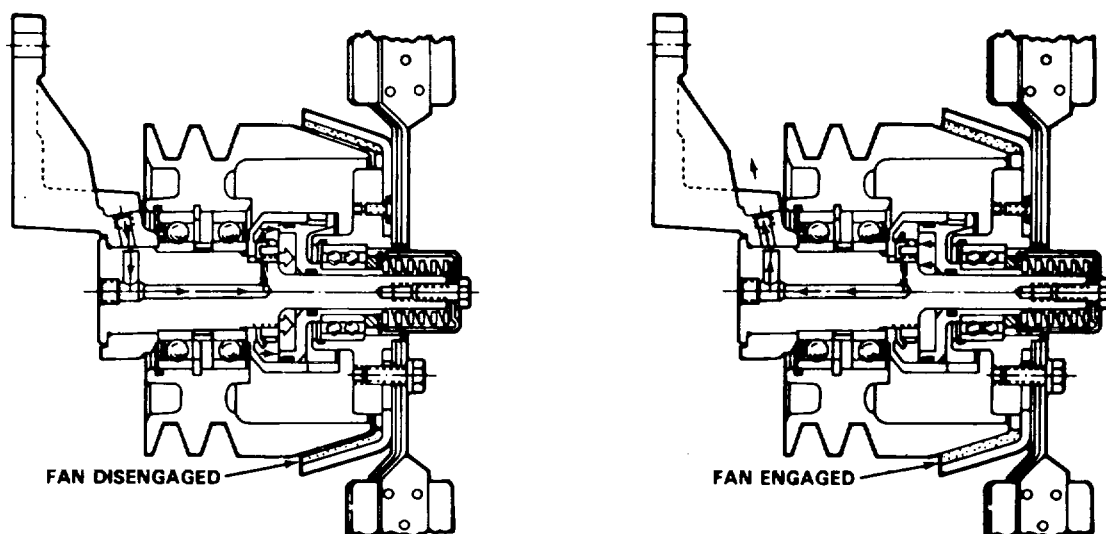
Section II. EQUIPMENT DESCRIPTION AND DATA

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

a. General. Specific capabilities, characteristics, and features of components for which maintenance is authorized at Direct and General Support maintenance level are described in b through o below. Additional descriptions and data covering the M915A1 vehicle are given in TM 9-2320-283-10 and TM 9-2320-283-20.

b. Engine. Description of characteristics, capabilities, and features of the Cummins NIC-400 diesel engine can be found in TM 9-2815-225-34&P.

c. Fan Clutch. The fan clutch is controlled by a temperature sensitive air valve installed in the engine block. The control valve directly senses coolant temperature. Provided coolant temperature remains below the setting of the valve, air passes through it to disengage the fan clutch. When coolant temperature rises to the valve setting, it closes and exhausts air pressure from the fan clutch which engages the fan.



TA230030

EQUIPMENT DESCRIPTION AND DATA.

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES (Continued).

d. Alternator-Rectifier. The alternator-rectifier consists of three basic subassemblies. These subassemblies are described in 1 through 3 below:

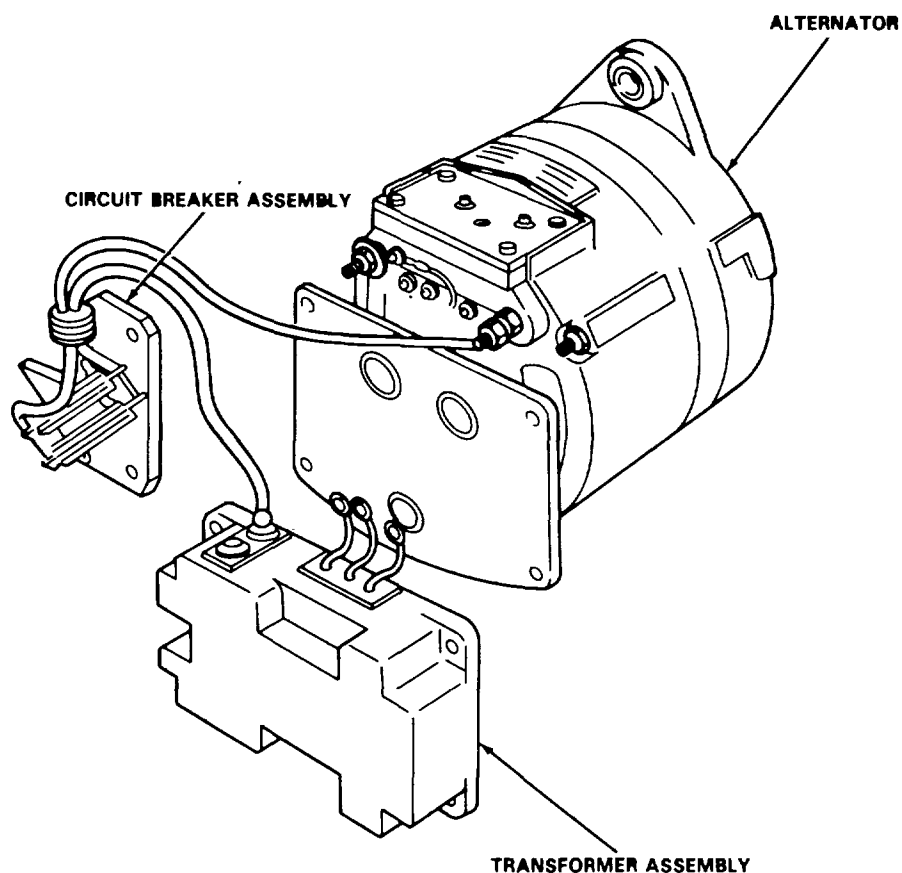
1. Alternator. The alternator is a self-load limiting device featuring a fully adjustable, built-in solid-state voltage regulator. The rated output of the alternator is 85 amperes at 14 volts dc nominal and has a maximum speed of 8,000 rpm. Six silicon diodes mounted in heat sinks convert alternating current into direct current. A capacitor connected between the heat sinks assists in suppressing transient voltage spikes which could possibly injure the diodes. The brushes and voltage regulator are located in a waterproof housing and may be removed for replacement or inspection without dismantling the entire alternator. The regulator is also equipped with transient voltage protection and will withstand instantaneous opening of the charging circuit under full load conditions.

2. Transformer Assembly. The transformer assembly consists of a 3-phase transformer to obtain electrical isolation from the alternator, and a 3-phase, full wave rectifier to provide dc output. It is energized from the ac terminals of the alternator to which it is connected by 3 leads. The transformer assembly replaces the conventional series parallel switch and is used to provide a source of power for charging the cranking batteries on 12-volt vehicles equipped with 24-volt cranking motors. The system batteries are charged by the transformer-rectifier unit.

EQUIPMENT DESCRIPTION AND DATA.

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES (Continued).d. Alternator-Rectifier (Continued).

3. Circuit Breaker Assembly. The circuit breaker assembly is an automatically resetting protective device which limits the current flow from the transformer assembly. In the event cranking batteries become fully discharged or shorted out, the current flow from the transformer assembly could become so high that it would cause a failure to the transformer assembly. The circuit breaker assembly limits the current flow to about 25 amperes under all battery conditions.



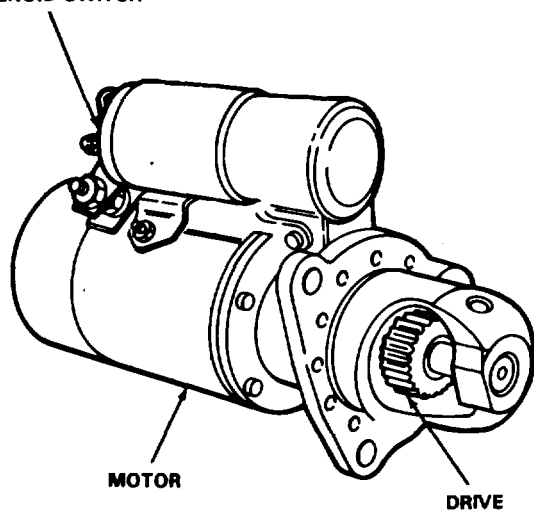
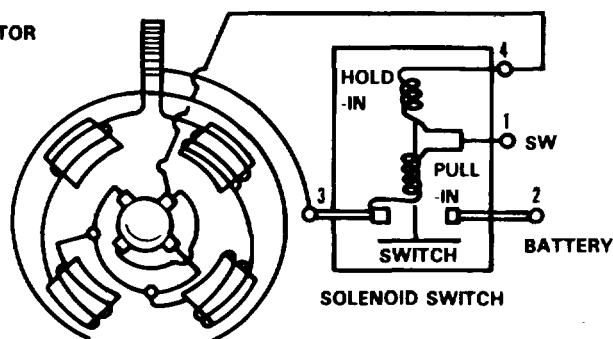
TA238040

EQUIPMENT DESCRIPTION AND DATA.

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES (Continued).

e. Starter Motor and Solenoid. The starter motor is a 24-volt, water-resistant motor with an electric shift engagement, overrunning clutch drive. The water-resistant solenoid switch is mounted on the motor field ring. The solenoid switch actuates the clutch drive through a hinged yoke and linkage assembly.

When the START button is pressed, two circuits in the solenoid switch are energized: the pull-in coil and the hold-in coil. The solenoid switch moves the drive assembly into mesh with the engine flex disk and ring gear (flywheel) and, in the proper sequence, closes the cranking contacts in the switch. When the cranking contacts close, the pull-in coil is then in parallel with the contacts and no current flows in this circuit. The hold-in coil holds the cranking switch closed and also holds the pinion in the cranking position. When the engine starts, the overrunning clutch in the drive allows the pinion to run free until the START button is released. At this time the solenoid switch is deenergized and the drive returns to an at-rest position by the return spring in the solenoid switch.

SOLENOID SWITCH**MOTOR****LOOKING AT COMMUTATOR END****MOTOR AND SWITCH ELECTRICAL CIRCUIT**

TA238041

EQUIPMENT DESCRIPTION AND DATA.

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES (Continued).

f. Transmission. The transmission is fully automatic with five forward speeds and one reverse speed. Ratios are established by four planetary gear sets. The planetaries are controlled by six hydraulically-applied clutches. All gearing is in constant mesh. Major components are described in 1 through 10 below:

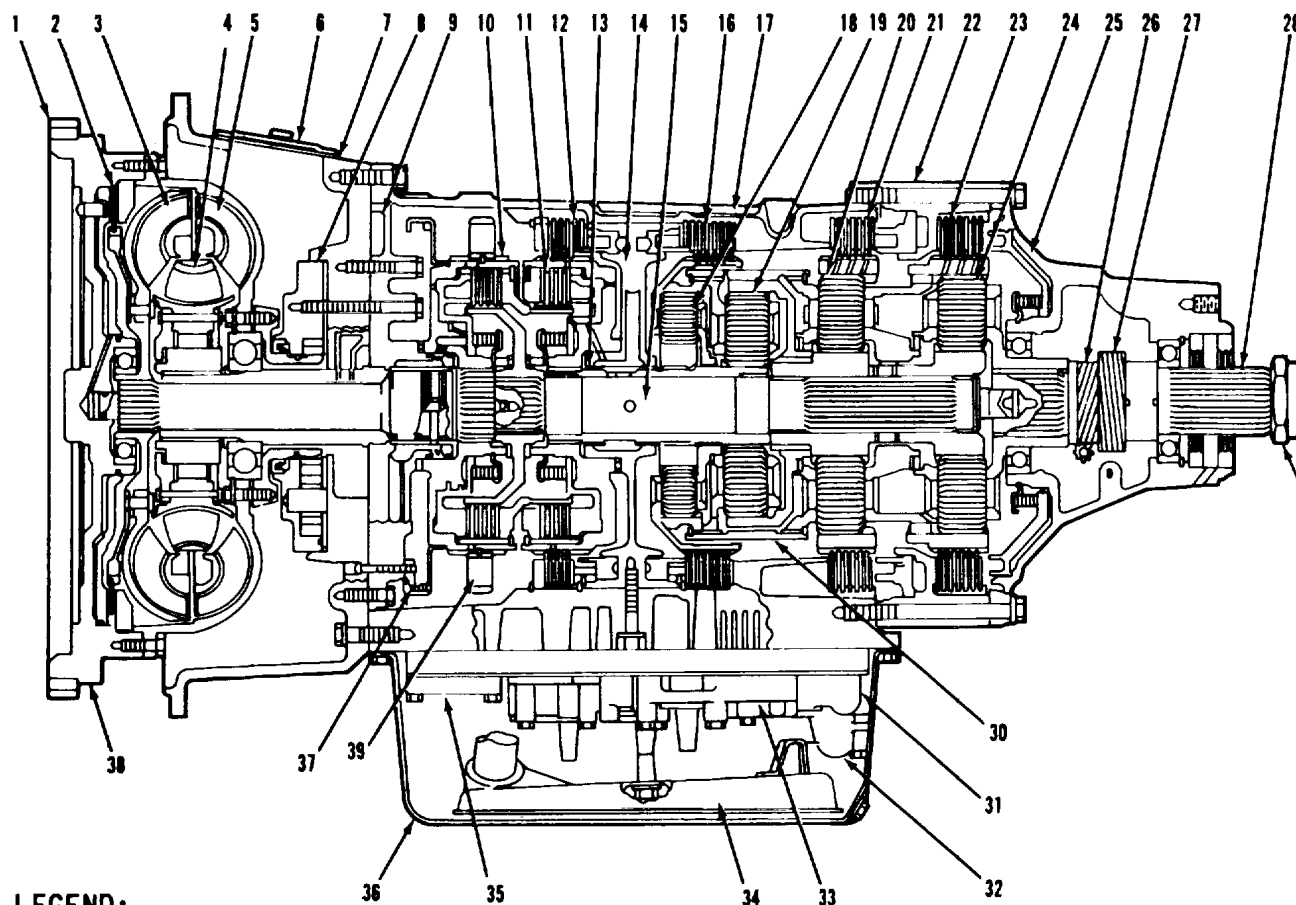
1. Torque Converter. A three element torque converter transmits power from the engine to the transmission gearing. The torque converter serves as both a fluid coupling and a torque multiplier. The three elements, pump, stator, and turbine are vaned cast aluminum. The pump assembly is the input element and is driven by the engine through the flex disk and ring gear (flywheel). The stator is the torque multiplying element. The turbine is the output element.

The torque converter assembly is continually filled with oil, which flows through the converter to cool and lubricate it. When the converter is driven by the engine, the pump vanes throw oil against the turbine vanes. The impact of the oil against the turbine vanes tends to rotate the turbine.

The turbine transmits torque to the transmission gearing. At engine idle speed, the impact of oil against the turbine vanes is not great. At high engine speed, the impact is much greater than at idle, and high torque is produced by the turbine.

EQUIPMENT DESCRIPTION AND DATA.

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES (Continued).



LEGEND:

- | | |
|---------------------------------------|------------------------------------|
| 1. STARTER RING GEAR | 21. FIRST CLUTCH |
| 2. LOCKUP CLUTCH | 22. ADAPTER HOUSING ASSEMBLY |
| 3. TORQUE CONVERTER TURBINE | 23. LOW-REVERSE CLUTCH |
| 4. TORQUE CONVERTER STATOR | 24. LOW PLANETARY CARRIER ASSEMBLY |
| 5. TORQUE CONVERTER PUMP | 25. REAR COVER ASSEMBLY |
| 6. ACCESSORY COVER | 26. GOVERNOR DRIVE GEAR |
| 7. TORQUE CONVERTER HOUSING | 27. SPEEDOMETER DRIVE GEAR |
| 8. TRANSMISSION INPUT PUMP | 28. OUTPUT SHAFT |
| 9. FORWARD SUPPORT AND VALVE ASSEMBLY | 29. OUTPUT FLANGE RETAINING NUT |
| 10. FORWARD CLUTCH ASSEMBLY | 30. GEAR UNIT CONNECTING DRUM |
| 11. FOURTH CLUTCH ASSEMBLY | 31. LOW SHIFT VALVE ASSEMBLY |
| 12. THIRD CLUTCH | 32. LOW TRIMMER VALVE ASSEMBLY |
| 13. SUN GEAR AND SHAFT ASSEMBLY | 33. VALVE BODY ASSEMBLY |
| 14. CENTER SUPPORT HOUSING ASSEMBLY | 34. OIL FILTER |
| 15. MAIN SHAFT ASSEMBLY | 35. COVER PLATE |
| 16. SECOND CLUTCH | 36. OIL PAN |
| 17. TRANSMISSION HOUSING | 37. PITOT TUBE |

EQUIPMENT DESCRIPTION AND DATA

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES (Continued).f. Transmission (Continued).1. Torque Converter (Continued).

Oil thrown into the turbine flows to the stator vanes. The stator vanes change the direction of oil flow and directs the oil to pump in a direction that assists the rotation of the pump. It is the redirection of the oil in a manner to assist the pump that enables the torque converter to multiply input torque. Greatest torque multiplication occurs when the turbine is stalled and the pump is rotating at its highest speed. Torque multiplication decreases as the turbine rotates and gains speed. When turbine speed approaches the speed of the pump, oil flowing to the stator begins striking the backs of the stator vanes. This rotates the stator in the same direction as the turbine and pump. At this point, torque multiplication stops and the converter becomes, in effect, a fluid coupling.

2. Lockup Clutch. The lockup clutch consists of a piston, a clutch, and a backplate. These are located inside the flex disk and ring gear (flywheel). The piston and backplate rotate with the converter pump. The clutch plate is located between the piston and backplate and is splined to the converter turbine.

When sufficient rotational speed is achieved, hydraulic pressure compresses the lockup clutch plate between the piston and backplate, locking all three together. Thus, the converter pump and turbine are locked together, and provide a direct drive from the engine. As rotational speed decreases, the lockup clutch is released.