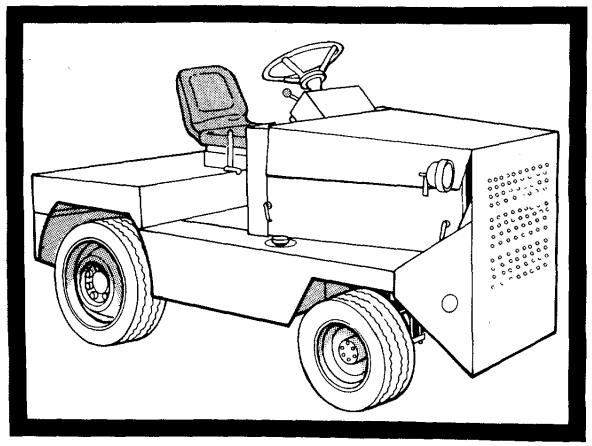
TECHNICAL MANUAL
TECHNICAL ORDER

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS)



TRACTOR, WHEELED, WAREHOUSE, GAS,
4000 LB DRAWBAR PULL
NSN 3930-01-047-8722
NORTHWESTERN MODEL JG40PT-15
ARMY MODEL MHE 251

DEPARTMENTS OF THE ARMY AND THE AIR FORCE

MARCH 1985

WARNING

Before starting the engine, be sure the area is adequately ventilated to avoid danger from exhaust gas. Carbon monoxide occurs from the exhaust fumes of internal combustion engines. It can become dangerously concentrated under conditions of no air movement. Carbon monoxide is a colorless, odorless gas that can kill you. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, drowsiness and coma. Brain damage or death can result from heavy exposure.

Never leave the tractor unattended where it can be a potential hazard to personnel and property.

Do not remove cap from a hot radiator until engine is down for 5 minutes to allow radiator pressure release and avoid burns to personnel.

Do not smoke or use open flames in the area when servicing batteries. Batteries generate hydrogen, a highly explosive gas.

Exercise extreme care when using electrolyte. Electrolyte is a sulfuric acid that can cause severe burns. If electrolyte comes in contact with your clothing or skin, immediately flush the area with cold water. If the solution gets on your face, flush the area with cold water and get prompt medical attention.

Keep hand, floor and controls free of grease, oil or mud to avoid potential serious injury.

Never crawl beneath equipment to perform maintenance unless it is securely blocked.

Do not allow heavy components to dangle where suspended by a lifting device.

Exercise extreme caution when walking near a chain under tension.

Use appropriate equipment (i.e., goggles/shield, gloves) when cleaning with compressed air.

Do not operate compressor over 30 psi. Any excess of 30 psi is a potential danger to your health.

Use wet process when cleaning brake lining. Fiber and dust may cause permanent lung damage and penetrate the skin.

Dry cleaning fluid SD-2, used to clean parts, is potentially dangerous to personnel and property. Use in well ventilated area to avoid danger of fume inhalation. Do not use near open flame or excessive heat - flash point of solvent is 138°F (59°C). Exercise extreme care in using SD-2 solvent because spills on clothing and person can cause severe skin rashes. If the solvent penetrates your clothing or gets on your skin, immediately flush with cold water. If the solution gets on your face or eyes flush with cold water and seek prompt medical attention.

Do not use gasoline or combustible materials near an open flame or excessive heat.

Shut off engine and prepare a metal to metal contact with the nozzle and fuel tank to avoid ignition and inflammable spills.

Change
No. 1

DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
WASHINGTON, D.C., 12 May 1991

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS)

**TRACTOR, WHEELED, WAREHOUSE, GAS
4000 LB DRAWBAR PULL
NSN 3930-01-047-8722
NORTHWESTERN MODEL JG40PT-15
ARMY MODEL MHE 251**

TM 10-3930-636-14&P/TO 36M3-3-37-11, dated 29 March 1985, is changed as follows:

1. *Cover*. Delete index block for "Service Inspection and Maintenance, 4-1".

2. Remove old pages and insert new pages.

3. New or changed material is indicated by a vertical bar in the margin.

Remove Pages	Insert Pages
i (ii blank)	*i (ii Blank)*
iii and iv	*iii and iv*
Blank)	*1-5 (1-6 Blank)*
and 4-2	*4-11(4-2 Blank)*
1 (A-2 blank)	*A-1 (A-2 Blank)*

4. File this change sheet in front of the publication for reference purposes.

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Distribution:

To be distributed in accordance with DA Form 12-25-E, Block 2263, Operator and Unit, Direct and General Support maintenance requirements for TM 10-3930-636-14&P.

TECHNICAL MANUAL

TM 10-3930-636-14&P
TO 36M3-3-37-11

DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
Washington, DC, 29 March 1985

OPERATOR'S,ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

FOR

TRACTOR, WHEELED, WAREHOUSE, GAS
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NSN 3930-01-047-8722
NORTHWESTERN MODEL JG40PT-15
ARMY MODEL MHE 251

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 or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

AUTHENTICATION STATEMENT

This technical manual is an authentication of the manufacturer's commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

Manufactured by:	Northwestern Motor Company 1125 Starr Avenue Eau Claire, Wisconsin 54701
Procured under Contract Nos.:	DSA 700-76-C-8707 DSA 700-77-C-8211

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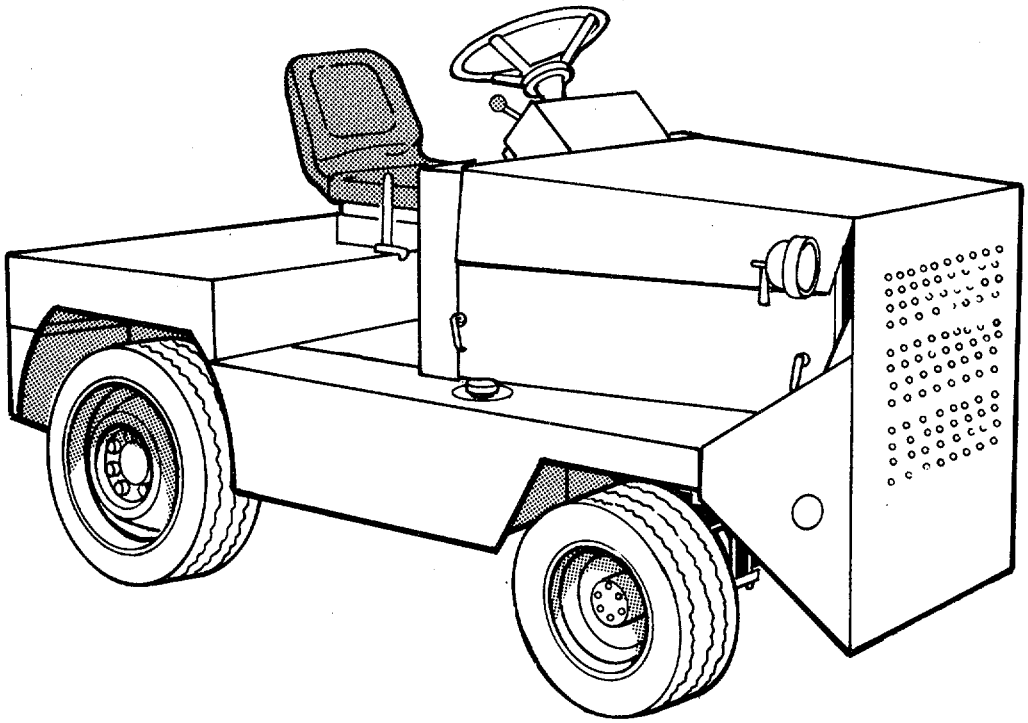


Figure 1-1. Model JG40PT-15 Towing Tractor

SECTION I

INTRODUCTION AND GENERAL DESCRIPTION

1-1. IDENTIFICATION.

1-2. This publication contains operation and maintenance instruction and an illustrated parts hat for the Warehouse Towing Tractors listed below, manufactured by Northwestern Motor Company, Eau Claire, Wisconsin 54701. (See figure 1-1.)

Model No.	Registration No.	Contract No.
JG40PT-16	11-03799 thru 11-03843 USN 11-22082 thru 11-22089 USN 11-25372 thru 11-25390 USN 11-30063 thru 11-30080 USN 265177 and 265178 USMC 77421 thru 77446 DSA 77E321 thru 77E428 USAF 266594 thru 266599 USMC	DSA 700-76-C-8707 DSA 700-77-C-8211

1-3. PURPOSE.

1-4. The towing tractor is a self-propelled, engine driven unit designed for towing loads up to 4000 pounds draw bar pull in warehouses or other suitable areas. A towing pintle or coupler is attached on the rear of the tractor.

1-5. GENERAL DESCRIPTION.

1-6. The towing tractor is a conventional automotive vehicle powered by a six-cylinder internal combustion gasoline engine. Power is transmitted to the rear wheels through a three speed automatic transmission with torque converter, a drive shaft, drop gear case, and rear axle assembly. Hydraulic brakes are provided on the front and rear wheels and are actuated by a foot pedal.

1-7. Steering is accomplished at the front wheels through a conventional manual steering gear without power assist. The steering gear operates through a single tie-rod actuating the front wheels. The front axle assembly is spring mounted.

1-8. The tractor employs a conventional 12-volt electrical system to supply power for the lights, horn, starter motor, ignition system, and instruments. Included in the system are a standard battery and alternator. The electrical system is radio suppressed in accordance with Military requirements as a non-tactical vehicle.

1-9. The tractor frame is welded steel one-piece unit, cross braced to prevent misalignment. Ballast weight is installed on the frame over the rear axle just under the rear body assembly. An adjustable operator's seat is mounted on the rear deck, which is large enough to accommodate an additional rider. Two holes are provided in the front bumper and rear body assembly for lifting the tractor.

NOTE

For additional data on tractor components, refer to Section II.

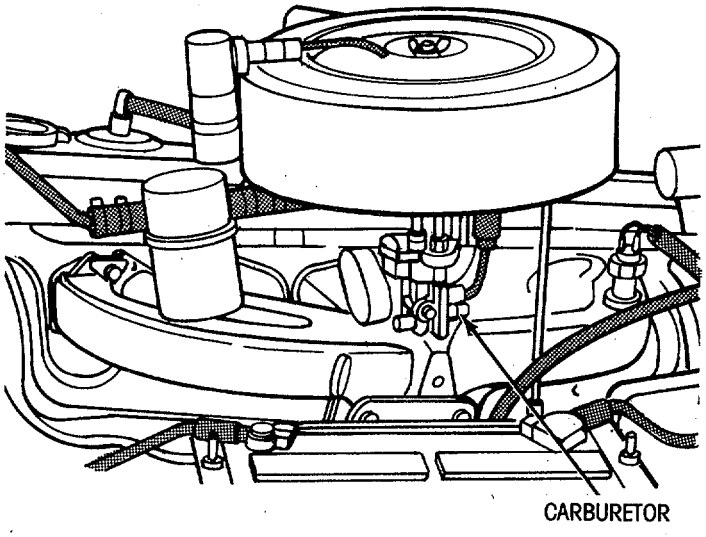


Figure 1-2. Left Side View of Engine

1-10. DETAILED DESCRIPTION.

1-11. ENGINE. The tractor engine is a Chrysler Model H-225 (figure 1-2). This engine is a six-cylinder valve- in-head, four-cycle gasoline-burning type, liquid cooled and pressure lubricated. It features a forged steel balanced crankshaft, forged steel connecting rods, replaceable bearings, and splash-lubricated pistons each with three piston rings. Many parts of the engine are super-finished to provide the maximum in wear- resisting, load-carrying properties in the bearing surfaces. Crankcase ventilation is employed on the vehicles.

1-12. COOLING SYSTEM. Engine cooling is accomplished by water circulation through the cylinder block, head and radiator, pumped by a centrifugal pump on the front of the engine. The radiator is mounted directly in front of the engine. The cooling fan is mounted on the water pump and is belt driven. The cooling system is pressurized for more efficient cooling. A thermostat located on top of the engine regulates water flow to maintain proper operating temperature. The lower part of the radiator is the oil cooler for the transmission fluid. The fluid is pumped from the transmission to the oil cooler and back again through two interconnecting hydraulic lines.

1-13. IGNITION SYSTEM. The distributor (figure 1-3) is an electronic control type and is driven off the engine camshaft. It is mounted on the lower right center of the engine. The ignition coil is installed on the lower right front side of the engine. The spark plugs are located in the right side of the cylinder head.

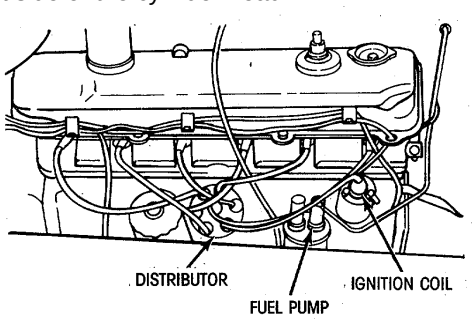


Figure 1-3. Right Side View of Engine

1-14. FUEL SYSTEM.

1-15. FUEL PUMP. The fuel pump (figure 1-3) is mechanically driven from the engine camshaft. The pump is installed on the lower right front side of the engine. A cleanable fuel filter and bowl are integral with the fuel pump. The fuel tank is located in the right fender.

1-16. CARBURETOR. The engine is equipped with a downdraft carburetor (figure 1-2). Fuel is supplied through separate circuits in the carburetor for varying requirements of idling, part throttle operation, acceleration and wide open throttle operation. The carburetor is connected through linkage to the pedal type accelerator at the operator's position. A manual choke is also provided on the instrument panel and is connected to the carburetor through wire linkage.

1-17. AIR CLEANER. The air cleaner (figure 1-2)is a dry element type. It is designed to prevent the entry of dirt and other foreign materials into the engine through the carburetor on which it is mounted.

1-18. GOVERNOR. A vari-speed governor is installed between the carburetor and intake manifold. The governor acts to restrict the fuel flow by means of a shutter valve. The shutter valve is controlled by a stabilizer piston and spring loaded economizer adjusting rod. The governor is pre-set by the manufacturer.

1-19. LUBRICATION SYSTEM. The engine is pressure lubricated by means of a rotary type oil pump, which is driven by the camshaft. Oil drawn through a floating strainer, is forced under pressure to the main oil gallery through the oil filter. The oil from the filter flows into the main oil gallery which supplies oil to all camshaft and main bearings, through drilled passages in each main bearing web. Oil is supplied from the main bearings through drilled passages in the crankshaft to the connecting rod bearings, and through a drilled hole in the connecting rod for the cylinder walls and piston ring lubrication. Oil from the rear camshaft bearing is delivered through passages in the block and cylinder head, through the rocker shaft rear pedestal, into the rocker arm shaft which feeds each rocker arm through metered holes in the shaft. The No. 1 main bearing is chamfered slightly to direct a spray of oil to the timing chain and sprockets. A spring-loaded pressure relief valve in the oil pump maintains oil pressure at the proper level and allows surplus oil to drain back into the pan.

1-20. OIL FILTER. A "screw-on" type oil filter is mounted on the rear of the oil pump body. All of the oil discharged by the oil pump passes through the full flow filter before it enters the engine. The filter has an integral relief valve, which permits oil to by-pass the filter if the element becomes clogged.

1-21. EXHAUST SYSTEM. The exhaust system consists of an exhaust manifold, exhaust pipe, muffler and tail pipe. The exhaust manifold, located on the same side of the cylinder head as the intake manifold, has large- radius curves which permit exhaust gases to leave the cylinders with a minimum of back pressure and power loss. A thermostatic heat control valve is incorporated to direct exhaust heat to a heat chamber beneath the carburetor to help vaporize the fuel for better warm-up performance. All parts of the exhaust system are adequately supported.

1-22. ELECTRICAL SYSTEM

1-23. BATTERY. The battery is a conventional 12- volt type. It is located on the left fender and is accessible through the engine hood.

1-24. ALTERNATOR. Electrical power is supplied by an alternator (figure 1-2) controlled by the regulator. The alternator is mounted on the left front of the engine on an adjustable bracket and is driven by a belt operating from an engine driven sheave. Rotation is counterclockwise as viewed from the drivers seat. The alternator produces power in the form of three-phase alternating current and voltage, which is rectified to direct current by a full-wave rectifier bridge using six diodes. Since the diodes will allow current to flow in only one direction, the alternator does not require a cutout relay.

1-25. ALTERNATOR REGULATOR. The regulator is mounted on the rear of the firewall. It is an electronic switching device. The regulator senses the voltage appearing at the auxiliary terminal of the alternator and supplies the necessary field current to maintain the system voltage at the output terminal. The output current is determined by the load such as headlights, rear light, etcetera.

1-26. STARTER MOTOR. The starter motor is a gear reduction type. It is mounted directly on the automatic transmission housing at the left rear of the engine. The starter motor is coupled to the torque converter ring gear through an overrunning clutch drive.

1-27. LIGHTS AND ACCESSORIES. Two head- lights are located on the front of the tractor. A combination stop and tail light and a rear backup light are located in the left rear of the rear body.

1-28. TRANSMISSION.

1-29. The automatic transmission is a Chrysler Model A727. This transmission combines a torque converter with a fully-automatic 3-speed gear system. The torque converter housing and transmission case are an integral aluminum casting. The transmission consists of two multiple disc clutches, an overrunning clutch, two servos and bands, and two planetary gear sets to provide three forward ratios and a reverse ratio. Shifting and power flow are hydraulically controlled and regulated by a control valve assembly and governor valve. Hydraulic pressure is provided by a single front oil pump.

NOTE

This transmission does not incorporate a rear pump. The tractor cannot be started by towing or pushing**.**

1-30. The torque converter is attached to the crankshaft through a flexible driving plate. Cooling of the converter is accomplished by circulating the transmission fluid through an oil-to-water type cooler. Shifting of the transmission is accomplished with a manual shift lever located just forward and to the right of the steering column. The lever has five detented positions: R (reverse), N (neutral), D (drive), 2 (second), and 1 (low). The gear shift control is linked to the transmission by a cable which runs through the steering column support bracket and engine compartment adequately supported by clamps.

NOTE

This transmission does not have an internal spray type parking lock as indicated by the lack of a P (park) shifting position. It is necessary to set the hand brake when parking the tractor.

1-31. REAR AXLE. The rear axle assembly consists of the rear driving axles, differential and integral drop gear case. The overall reduction ratio is 14.14 to 1. The rear axle assembly is coupled to the automatic transmission by a drive shaft and two universal joints. The entire assembly is attached directly to the main frame; no springs are used.

1-32. FOOT BRAKE. The foot brake is of conventional design using a brake master cylinder, a foot pedal, tubing and wheel cylinders installed on the wheels. The hydraulic pressure developed by pressing the foot pedal is applied to the brake bands which expand against the inner surface of the wheel brake drums to stop or slow the tractor.

1-33. PARKING BRAKE. The parking brake or hand brake is lever actuated by the operator. The brake lever is located to the operator's right. The lever, when pulled, applies brake pressure to the transmission output. The brake bands are on the inside of the brake drum which is attached to the transmission output shaft. The parking brake is completely mechanical.

1-34. STEERING GEAR. The manual steering gear is a recirculating-ball-nut type. The mechanical element of this steering gear is a low-friction, high-efficiency recirculating ball system in which steel balls act as a rolling thread between the steering worm and nut. The nut is one piece and is geared to the sector of the pitman shaft. Lash between the pitman shaft sector and rack of the ball nut is controlled by a preload adjusting screw through the side cover which is retained in the end of the pitman shaft. The ball nut, mounted on the worm, is driven through steel balls which circulate in helical grooves in both the worm and nut. Ball return guides, attached to the nut, serve to recirculate the two sets of balls.

1-35. CONTROLS AND INSTRUMENTS. All driver's controls are conveniently located. All instruments are mounted on the instrument panel on the dash. the function of all controls and instruments is de- scribed in Section III.

1-36. PREPARATION FOR USE.

1-37. INSPECTION. Perform a complete systematic inspection of the tractor for shipping damage. A thorough general visual examination will generally show any damage that occurred in transit. Report all damage to the proper authorities so repairs and claims may be made. While performing the pre-operation services, further inspect those systems and components which require special attention.

1-38. PRE-OPERATION SERVICE. Service fuel system, brakes, electrical system, engine, steering, axles, and transmission as described in Section IV. Perform prescribed lubrication.

1-39. CONSTRUCTION EQUIPMENT.

1-40. DISTRUCTION OF WAREHOUSE TOWING TRACTOR TO PREVENT ENEMY USE. Instructions shall be done in accordance with TM 750-244-6.

1-41. PREPARATION FOR STORAGE OR SHIPMENT. Packaging, packing and marking for shipment shall be done in accordance with TM 740-90-1.

SECTION II

TABLE OF SPECIFICATIONS

2-1. GENERAL

Type of Vehicle ..... Rear wheel drive, towing tractor
Gross Weight ..... 5300 lbs
Drawbar Pull ..... 4000 lbs
Overall Dimensions
- Length (without pintle) ..... 101-1/2 in.
- Height ..... 60 in.
- Width ..... 55 in.

Ground Clearance (min) ..... 6 in.
Speed (max) ..... 15 mph
Turning Radius (min) ..... 9 ft, 7-5/8 in.
Wheel Treads
- Rear ..... 47 in.
- Front ..... 47 in.

2-2. ENGINE.

Model ..... Chrysler H-225
Type ..... In-line valve-in-head, inclined block (30°)
Bore and Stroke ..... 3.41 x 4.12 in.
No. of Cylinder 6
Displacement ..... 225 cu. in.
Compression Ratio ..... 8.2 to 1
Compression Pressure ..... 130-160 lbs
Firing Order 1-5-3-6-2-4
Crankshaft ..... Counterbalanced
No. of Main Bearings 4
Connecting Rods ..... Drop-forged I-beam

Pistons
- Type ..... Horizontal slot w/steel strut
- Material ..... Aluminum alloy
- Piston Length ..... 3.51 in.
- Ring Groove Depth No. 1 ..... 0.179 in.
  - 2 ..... 0.179 in.
  - 3 ..... 0.181 in.

Piston Pins
- Type ..... Press fit in rod
- Diameter ..... 0.9007-0.9009in.
- Length ..... 2.955-2.975 in.
- Clearance in Piston ..... 0.00045-0.00075 in.
- Interference in Rod ..... 0.0007-0.0012 in.

Piston Rings
- Number 3
  - Compression 2
  - Oil 1

Width of Rings
- Compression ..... 0.0775-0.0780 in.
- Oil ..... 0.1860-0.1865 in.

Intake Valves
- Material ..... Carbon manganese steel
- Head Diameter ..... 1.615-1.625 in.
- Stem ..... Solid
- Length ..... 4.668-4.703 in.
- Valve Face Angle ..... 45°
- Adjustment ..... Rocker arm screw
- Lift ..... 0.375 in.

Exhaust Valves
- Material ..... Chrome nickel steel
- Head Diameter ..... 1.355-1.365 in.
- Stem ..... Solid
- Length ..... 4.6878-4.7028 in.
- Valve Face Angle ..... 47°
- Adjustment ..... Rocker arm screw
- Lift ..... 0.360 in.
- Rotators ..... None

Valve Springs
- Number 12
- Free length ..... 2 in.
- Load when Compressed (valve closed) ..... 68-76 psi (1-11/16 in.)
- Load when Compressed (valve open) ..... 160-172 psig (1-5/16 in.)

Timing Chain
- Number of Inks 50
- Pitch ..... 0.50 in.
- Width ..... 0.88 in.

Tappets
- Type ..... Mechanical
- Body Diameter ..... 0.9040-0.9045 in.
- Adjustment (hot)
  - Intake ..... 0.012 in.
  - Exhaust ..... 0.024 in.

Camshaft and Bearings
- Drive ..... Chain
- Number 4
- Bearings ..... Steel backed babbitt
- Thrust Taken By ..... Cylinder Block
- Clearance ..... 0.001-0.003 in.
- Bearing Journals
  - Diameter No. 1 ..... 1.998-1.999 in.
  - 2 ..... 1.982-1.983 in.
  - 3 ..... 1.967-1.968 in.
  - 4 ..... 1.951-1.952 in.

2-3. LUBRICATION SYSTEM.

System Capacity (including filter)..... 5 qts.

Oil Filter Type .....Full-flow screw-on
Oil Pump .....
Make ..... Chrysler
Type .....Rotary
Driven by .....Camshaft
Intake ..... Floating screen
Operating Pressure..... 45 to 55 psig

2-4. FUEL SYSTEM.
Carburetor .....
Make ..... Carter
Type ..... Downdraft
Make
Governor
Make .....Introl Division of Chrysler
Setting .....2400 rpm
Fuel Pump.....
Make .....Chrysler
Pressure .....3-1/2 to 4-1/2 psig
Gasoline Tank .....
Capacity ..... 14 gal.
Material ..... 20 gauge steel

Fuel Grade (min) ..... 80 octane

2-5. COOLING SYSTEM.
Capacity ..... 13 qts.

Radiator - Oil Cooler
Make ..... Northwestern
Pressure Cap.....14 psig
Type .....Tube and fin
Cooling Fan.....

Make ..... Chrysler
No. of Blades 6
Diameter..... 18 in.

2-6. ELECTRICAL SYSTEM.

Alternator (Fungus-proofed)
Make ..... Northwestern
Part No 22952
Rated Output ..... 35 amps
Alternator (Standard)
Make ..... Motorola
Part No..... RA12N451D
Rated Output ..... 35 amps
Distributor (Electronics Ignition Control).....
Make .....Chrysler
Part No 3874082

Ignition Coil
Make..... Chrysler
Part No 3874001

Starter Motor
Make ..... Chrysler
Part No 3755771
Type .....Fungus-proofed
No. of Brushes..... 4
Drive.....overrunning clutch
Spark Plugs
Size ..... 14 mm
Type AG-52
Gap .....035 in.

2-7. TRANSMISSION.

Chrysler
Type .....Automatic with torque converter
Model A-727
Gear Ratios
1- Low ..... 2.45 to 1
2 - Second ..... 1.45 to 1
D - Drive ..... 1 to 1
R - Reverse..... 2.20 to 1
N - Neutral .....
Fluid Capacity..... 19-1/2 pts
Fluid Type.....AQ-ATF, Suffix A

2-8. STEERING.

Make ..... Saginaw
Model 525
Type a. .....Manual recirculating-ball-nut

2-9. FRONT AXLE.

Make .....Rockwell Standard
Model. FAE-951

2-10. REAR AXLE.

Make .....Rockwell Standard
Model TA267
Type .....Bevel gear
Ratio .....14.14 to 1
Bearings ..... Ball and tapered roller

2-11. WHEELS.
Rear Wheels
Make.....Northwestern
No. of Studs..... 8
Tire Size ..... 8.00 x 16/5 C load range
Tire Pressure .....45 psig
Front Wheels
Make .....Northwestern
No. of Studs..... 5
Tire Size .....20-8.5 x 10
Tire Pressure .....45 psig

SECTION III
OPERATION

3-1. GENERAL.

3-2. The instructions in the following paragraphs assume the operator is familiar with and has had instructions in the care and operation of conventional automotive vehicles. This tractor is similar to any automobile having an automatic transmission. Specific operating features of the towing tractor are described in subsequent paragraphs of this section.

3-3. PRINCIPLES OF OPERATION.

3-4. The towing tractor operates in the same manner as any automotive vehicle powered by an internal combustion engine. These basic fundamentals are not covered in this manual. There are no components or accessories on this tractor that have special operating characteristics or functions. The major difference between this tractor and an automobile having a similar size engine is the gear ratio in the rear axle. The higher rear axle ratio results in an increase in pulling (towing) ability with a corresponding decrease in speed. Maximum speed is 15 mph.

3-5. OPERATING CONTROLS AND INSTRUMENTS.

3-6. INSTRUMENT PANEL CONTROLS. The operator's controls on the instrument panel consists of two witches and the choke. Each control is marked.

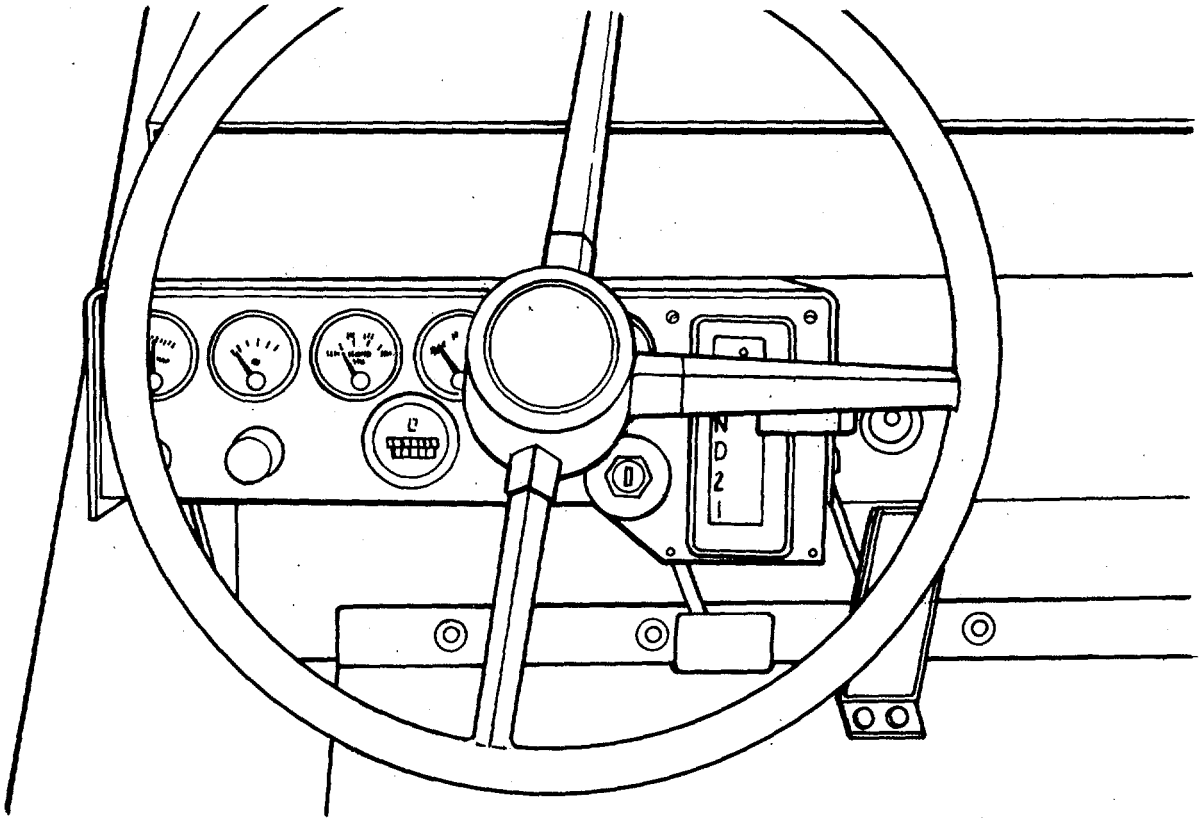


Figure 3-1. Operator's Controls and Instruments

1. The ignition switch is a rotary key type with the conventional markings: OFF, ON and START.
2. The switch marked HEAD and TAIL LIGHTS controls the two forward sealed-beam headlights and the tail light. It must be pulled out to operate these lights.
3. The manual choke control is marked "C" and is located to the left side of the instrument panel. Pulling out the choke control increases the amount of carburetor choke.
4. Fuses for the lighting and horn circuits are located underneath the instrument panel in a fuse block. The two headlights and the tail light use a 10 ampere fuse. The stop light and the rear light each have a 5 ampere fuse. The horn circuit uses a 20 ampere fuse.

3-7. INSTRUMENTS. The panel (see figure 3-1) on the dash includes all indicating instruments.

1. The engine hourmeter registers the HOURS of engine operation. The meter is actuated by a pressure switch installed on the engine oil pump. The pressure switch is closed as the oil pressure is developed in the engine. The hourmeter is sealed and can register to a total of 9999.99 hours before automatically returning to zero.
2. The FUEL gage indicates the amount of fuel in the fuel tank. A sending unit is installed in the tank and is connected to the gage. The gage is marked E, 1/4, 1/2 , 3/4 and F to indicate the relative quantity of fuel in the tank.
3. The OIL pressure gage is energized by a sending unit installed on the engine. The gage indicates oil pressure only and does NOT indicate the oil level. It is marked 0, 20, 40, 60 and 80 with intermediate index marks. If the gage registers below the 20 mark, stop the engine and check for lack of oil.
4. The ammeter, marked AMPERES, registers the rate of charge or discharge. A discharge indication while the engine is operating could mean a faulty alternator. The normal position of the ammeter needle is just to the right of the center mark. Stop the engine if the gage does not indicate a charge during operation.

NOTE

The ammeter will very likely indicate a discharge when the engine is at low idle.

5. The WATER TEMP gage indicates the temperature of the coolant in the cooling system. The needle on the gage should rise when the engine is cold, to between the 150 and 200 marks as the engine warms up. If the needle goes beyond 200, stop the engine and check for a fault in the cooling system.

3-8. BRAKE PEDAL. The brake pedal (figure 3-1) is located to the right of the steering column. When depressed, the pedal actuates the hydraulic brakes on the rear wheels.

3-2

3-9. ACCELERATOR PEDAL. The accelerator pedal (figure 3-1) is located to the right of the brake pedal. The accelerator pedal is connected to the carburetor through mechanical linkage and controls engine speed.

3-10. GEAR SHIFT LEVER. The gear shift lever (figure 3-1) is mounted on the instrument panel. It permits the operator to select one of five detented positions for proper tractor operation: R (reverse), N (neutral), D (drive), 2 (second), and 1 (low). The tractor may be started only when the gear shift lever is in the N (neutral) position.

3-11. PARKING BRAKE LEVER. The parking brake (hand brake) lever is mounted to the right of the operator's seat. The parking brake mechanically sets or releases the brake on the rear of the transmission.

CAUTION

The transmission does not have an internal parking lock. It is necessary to set the hand brake when parking the tractor.

3-12. OPERATING INSTRUCTIONS.

3-13. GENERAL. The operator should familiarize himself with all operating controls and instruments before driving the tractor. Once this has been done, it is recommended that the operator drive the tractor without a tow load until he can handle the vehicle properly.

3-14. STARTING THE ENGINE. The following procedure is applicable to the starting of a cold engine at 0 degrees or above. No provisions for pre-heating the engine are included on this tractor for sub-zero starting.

1. Apply the parking brake as a safety precaution.
2. Place the gear shift lever in N (neutral) position.
3. Open the choke about 1/4 by pulling the choke all the way out and then pushing it back in to the 1/4 open position.
4. Turn the ignition switch to START and hold for a few seconds. Repeat turning the switch if necessary until the engine starts. Do not attempt to start the engine in this way more than four times.
6. If the tractor fails to start (step 4 above), push the choke full in and depress the accelerator pedal to the floor. Attempt to start the vehicle again (step 4).

NOTE

If the tractor still will not start, allow the starter motor to cool before repeating the procedure. This will prevent draining the battery and damaging the starter motor by overheating.

6. After the tractor starts, adjust the choke so that the engine is idling at the slowest smooth setting possible. Allow engine to warm up no less than two minutes.

7. Observe all indicating instruments to be sure each is functioning. Do not operate the engine if the oil pressure fails to register or if the ammeter does not show any tendency to charge.

3-15. DRIVING THE TRACTOR. When the tractor engine is warmed up, the tractor is ready for towing. Use lights as required.

1. Release the parking brake and apply the foot brake.
2. Place the gear shift lever in the proper speed range.

NOTE

The 2 (second gear) or 1 (low gear) range should be used when towing heavy loads, especially up or down inclines, or over rough roads. The D (drive) range is generally best for driving with no load or towing small loads. To back up the tractor, place the gear shift lever in R (reverse).

3. Release the foot brake and depress the accelerator pedal slowly and evenly. As the tractor starts to move and increases speed, the transmission will upshift automatically, unless of course, you are in low or reverse.
4. When towing, allow the tractor to decelerate by releasing the accelerator pedal before applying the foot brakes. The transmission will downshift automatically.

CAUTION

Be sure that the towing pintle or coupler is secure before moving a load.

5. When driving or towing, avoid the tendency to oversteer and turn too sharply. Be sure to allow enough clearance for the towed load.

3-16. STOPPING THE TRACTOR.

1. Bring the tractor to a complete stop and set the parking brake.
2. Place the gear shift lever in neutral.
3. Push the choke full in.
4. Turn off all the lights.
5. Turn off the ignition switch.

3-17. ABNORMAL OPERATION PROCEDURES.

3-18. DIFFICULTY IN STARTING. If the tractor fails to start in the normal way, the engine probably needs service maintenance. Follow local directives regarding starting the tractor in extreme cold weather conditions.

CAUTION

This tractor cannot be started by towing or pushing. Observe proper polarity when using auxiliary power source.

3-19. TOWING THE TRACTOR. If the tractor is inoperative and must be moved, proceed as follows:

1. If the transmission is operating properly, the tractor may be towed safely in neutral at low speed for short distances.
2. If the transmission is NOT operating properly, disconnect the drive shaft before towing.

SECTION IV
PREVENTIVE MAINTENANCE CHECKS AND SERVICES, LUBRICATION, AND TROUBLESHOOTING INSTRUCTIONS

4-1. GENERAL.

4-2. The instructions in this section provide inspection, service, lubrication and adjustment procedures to be performed by using and organizational personnel. The tools required are those normally available in any using organizational tool shop. In addition, troubleshooting information is given at the end of the section.

4-3. PERIODIC SERVICE INSPECTIONS.

4-4. In addition to lubrication, inspect the towing tractor periodically in accordance with the preventive maintenance checks and services outlined in paragraphs 4-4.2 and 4-4.3. The proper performance of PMCS will prevent breakdowns caused by neglect of worn or loose parts. The service intervals are recommended average-use time periods and may require modification due to unusual conditions.

Table 4-1. Table 4-1 has been rescinded.

OPERATOR/CREW
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-4.1 PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS).
Every mission begins and ends with the paperwork. There isn't much of it, but you have to keep it up. The forms and records you fill out have several uses. They are a permanent record of the services, repairs, and modifications made on your vehicle. They are reports to organizational maintenance and to your commander. And they are a checklist for you when you want to know what is wrong with the vehicle after its last use, and whether those faults have been fixed. For the information you need on forms and records, see DA PAM 738-750.

4-4.2 OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

1. Do your before (B) PREVENTIVE MAINTENANCE just before you operate the vehicle. Pay attention to the CAUTIONS and WARNINGS.
2. DURING (D) checks and services of PREVENTIVE MAINTENANCE will be performed while the equipment and/or its component systems are in operation. Pay attention to the CAUTIONS and WARNINGS.
3. Do your after (A) PREVENTIVE MAINTENANCE right after operating the vehicle. Pay attention to the CAUTIONS and WARNINGS.
4. Do your weekly (W) PREVENTIVE MAINTENANCE weekly.
5. Do your monthly (M) PREVENTIVE MAINTENANCE once a month.
6. If something doesn't work, troubleshoot it with the instructions in this manual or notify your supervisor.
7. Always do your PREVENTIVE MAINTENANCE in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.
8. When you do your PREVENTIVE MAINTENANCE, take along a rag or two.
9. While performing PMCS observe caution notes and warning paragraphs preceding those operations which could endanger your safety or result in damage to the equipment.

WARNING

Dry cleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in well ventilated area. Avoid contact with skin, eyes and clothes and don't breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with skin or clothing is made, flush with water. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

10. If anything looks wrong and you can't fix it, write it on your DA Form 2404. The number column is the source for the numbers used on the TM Number Column on DA Form 2404. If you find something seriously wrong, report it to organizational maintenance RIGHT NOW.

a. Keep it clean: Dirt, grease, oil and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (P-D-680) to clean metal surfaces. Use soap and water when you clean rubber or plastic material.

b. bolts, nuts and screws: Check that they are not loose, missing, bent or broken. You can't try them all with a tool, of course, but look for chipped paint, bare metal or rust around bolt threads. Tighten any that you find loose. Report it to organizational maintenance if you can't tighten it.

c. Welds: Look for loose or chipped paint, rust or gaps where parts are welded together. If you find a bad weld, report it to organizational maintenance.

d. Electric wires and connectors: Look for cracked or broken insulation, bare wires and loose or broken connectors. Report damaged or loose wiring to organizational maintenance.

e. Hoses and fluid lines: Look for wear, damage and leaks. make sure clamps and fittings are tight. Wet spots show leaks, of course, but a stain around a fitting or connector can mean

d leak. If a Leak comes from a loose fitting or connector, tighten it. If something is broken or worn out report it to organi7ational maintenance (refer to Maintenance Allocation Chart).

f. Vehicle must be on level ground in order to get correct fluid level measurement.

11. It is necessary for you to know how fluid leaks affect the status of your equipment. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Learn and be familiar with them and REMEMBER -When in doubt, notify your supervisor.

LEAKAGE DEFINITIONS FOR OPERATOR/CREW PMCS

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 the item being checked/inspected.
Class III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Equipment operation is allowable with minor leakage's (Class I or II). Of course, consideration must be given to the fluid capacity in the item/system being checked/inspected. When operating with Class I or II leaks, continue to check fluid levels as required on your PMCS. Class III leaks should be reported to your supervisor or Organizational Maintenance.

Operator/Crew Preventive Maintenance Checks and Services
NOTE: Within designated interval, these checks are to be performed in the order listed.

B-Before D-During A-After W-Weekly M-Monthly

ITEM NO	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUST AS NECESSARY	EQUIPMENT IS NOT READY/ AVAILABLE IF:
						IMPORTANT: PERFORM WEEKLY (W) AS WELL AS BEFORE (B) OPERATION PMCS IF:	
						1. You are the assigned operator and have not operated the vehicle since last week	
						2. You are operating the vehicle for the first time.	
1						EXTERIOR OF VEHICLE	
	•					Check for leaks or appearance of leaks.	Class III or any fuel or brake system leaks.
2						ENGINE OIL LEVEL	
	•					Check oil level is above the add mark. Add oil if necessary to bring level between add and full mark.	
3						TIRES	
	•					Check for excessive wear, cut, cracks, abrasions, low or flat tires. (correct tire pressure is 45 PSI front and rear)	Tires worn, cut or damaged which would result in its failure during operation. One or more tires missing, flat, or unserviceable.
4						LIGHTS	
		•				Check all lights to be sure they operate properly.	
5						BRAKES	
		•				Check for chatter, rubbing, uneven stopping and/or unusual noise.	Brakes will not stop tractor.
6						STEERING	
		•				Check that tractor steers without binding or sticking.	Steering sticks or tractor is hard to steer.

Operator/Crew Preventive Maintenance Checks and Services
NOTE: Within designated interval, these checks are to be performed in the order listed.

B-Before D-During A-After W-Weekly M-Monthly

ITEM NO	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUST AS NECESSARY	EQUIPMENT IS NOT READY/ AVAILABLE IF:
7						ACCELERATOR	
		•				Check that the tractor accelerator operates smoothly.	Pedal sticks.
8						INSTRUMENTS Observe the following instrument readings after achieving normal operating temperatures.	
		•				a. Water temperature gage 150° to 200° F.	Reading on gages do not fall within specified ranges.
		•				b. Oil pressure gage 20 to 80 PSI.	
		•				c. Transmission oil temperature gage 250°F maximum.	If temperature exceeds 250°.
		•				d. Ammeter indicates slightly to the "+" side of "0".	Erratic or continuous high rate of charge or discharge.
9						HORN	
		•				Check horn by pressing the button.	
10						AIR CLEANER	
				•		Restriction indicator.	Indicator is red with engine running.
11.						RADIATOR	
				•		Check coolant level is 1 inch from cap.	

Operator/Crew Preventive Maintenance Checks and Services
NOTE: Within designated interval, these checks are to be performed in the order listed.

B-Before D-During A-After W-Weekly M-Monthly

ITEM NO	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUST AS NECESSARY	EQUIPMENT IS NOT READY/ AVAILABLE IF:
12						BATTERY **WARNING** Do not smoke, or allow any flame or spark in the vicinity while checking or filling the battery. The battery generates hydrogen, a highly explosive gas.	
				•		a. Check level of electrolyte. Level should, be ½ inch over the top of the plates.	Battery cracked or discharged, battery posts and connections loose or unserviceable.
				•		b. Check battery and battery box for corrosion and obvious damage.	Battery missing, damaged or will not crank engine.
13						FAN BELT	
				•		Check fan belt for loose or frayed condition.	Belt is missing, broken or damaged.
14						TRANSMISSION OIL Check fluid level is above the add mark. Add oil if necessary, to bring level between add and full mark.	

4-4.3 ORGANIZATIONAL PREVENTIVE MAINTENANCE, CHECKS AND SERVICES

1. Do your (M) PREVENTIVE MAINTENANCE once each month.
2. Do your (S) PREVENTIVE MAINTENANCE once each 6 months.
3. Do your (A) PREVENTIVE MAINTENANCE once each year.
4. Do your (H) PREVENTIVE MAINTENANCE at the hour interval listed.
5. If something doesn't work, troubleshoot it with the instructions in your TM 10-3930-636-14&P or notify your supervisor.
6. Always do your PREVENTIVE MAINTENANCE in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.
7. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to Direct Support Maintenance RIGHT NOW.
8. When you do your PREVENTIVE MAINTENANCE, take along the tools you will need to make all the checks. Take along a rag; you'll always need at least one.

WARNING

Dry cleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only a well ventilated area. Avoid contact with skin, eyes and clothes and don't breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

A. Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (P-D-680) on all metal surfaces. Use soap and water when you clean rubber or plastic material.
B. Bolts, nuts, and screws: Check them all for obvious looseness, missing, bent or broken condition. You can't try them all with a tool, of course, but look for chipped paint, bare metal, or rust around bolt heads. If you find one you think is loose, tighten it, or report it to Direct Support Maintenance if you can not tighten it.
C. Welds: Look for loose or chipped paint, rust or gaps where parts are welded together. If you find a bad weld, report it to Direct Maintenance.
D. Electric wires and connectors: Look for cracked or broken insulation, bare wire, and loose or broken connectors. Tighten loose connectors and make sure the wires are in good shape.

E. Hoses and fluid lines: Look for wear, damage and leaks and make sure clamps and fittings are tight. Wet spots show leaks, of course, but a stain around a fitting or connector can mean a leak. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, report it to Direct Support Maintenance.

9. It is necessary for you to know how fluid leakage affects the status of your vehicle. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your vehicle. Learn, then be familiar with them and REMEMBER-WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR!

Leakage Definitions for Organizational PMCS

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/inspected.
Class III	Leakage of fluid great enough to form drops that fall from the item checked/inspected.

CAUTION

EQUIPMENT OPERATION IS ALLOWABLE WITH MINOR LEAKAGES (CLASS I OR II). OF COURSE, CONSIDERATION MUST BE GIVEN TO THE FLUID CAPACITY IN THE ITEM/SYSTEM BEING CHECKED/INSPECTED. WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR. EXCEPTIONS ARE FUEL AND BRAKE SYSTEM, WHERE NO LEAKAGE IS ALLOWABLE.

WHEN OPERATING WITH CLASS I OR IT LEAKS, CONTINUE TO CHECK FLUID LEVELS AS REQUIRED IN YOUR PMCS.

CLASS III OR FUEL AND BRAKE SYSTEM LEAKS SHOULD BE REPORTED TO YOUR SUPERVISOR OR DIRECT SUPPORT MAINTENANCE.

Organizational Preventive Maintenance Check and Services

M-Monthly **S-Semiannually** **A-Annually** **H-Hours**

ITEM NO	INTERVAL M	S	A	H	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND REPAIR FILL OR ADJUST AS NECESSARY.
					NOTE PERFORM OPERATOR/CREW PMCS PRIOR TO OR IN CONJUNCTION WITH ORGANIZATIONAL PMCS IF: a. There is a delay between the daily operation of the equipment and the Organizational PMCS. b. Regular operator is not assisting/participating.
				100	ENGINE OIL Drain oil and replace engine oil filter. Refill with enough oil to bring oil level between ADD and FULL mark on dipstick (ref. Fig. 4-1).
				100	LUBRICATION Perform all lubrication service (ref. Fig. 4-1). Check for loose, bent, or worn parts. Replace as necessary.
				200	AIR CLEANER WARNING COMPRESSED AIR USED FOR CLEANING PURPOSES WILL NOT EXCEED 30 PSI. USE ONLY WITH EFFECTIVE CHIP GUARD AND PERSONAL PROTECTIVE EQUIPMENT (GOGGLES/SHIELD, GLOVES, ETC.). Service the air cleaner element and empty the dust cap. Element may be cleaned by compressed air (ref. para 4-28).
				250	FUEL FILTER Replace fuel filter element. Check for evidence of fuel leakage.
				250	SPARK PLUGS Check condition of individual spark plugs. Clean or replace plugs and adjust to proper gap (ref. para 4-15).

Organizational Preventive Maintenance Check and Services

M-Monthly **S-Semiannually** **A-Annually** **H-Hours**

ITEM NO	INTERVAL M	S	A	H	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND REPAIR FILL OR ADJUST AS NECESSARY.
				250	BATTERY WARNING DO NOT SMOKE, OR ALLOW ANY FLAME OR SPARK IN THE VICINITY WHILE CHECKING OR FILLING THE BATTERY. THE BATTERY GENERATES HYDROGEN, A HIGHLY EXPLOSIVE GAS. Test battery to determine cell condition. Recharge or replace battery as required (ref. TM9-61 40-200-1 4). Clean terminals and insure all connections are tight. Inspect battery for corrosion (ref. para 4-11).
				250	MASTER CYLINDER Check master cylinder fluid level; add as required. Check for evidence of leakage (ref. Fig. 4-1).
				250	BRAKES Inspect brake linings for wear. Refer to direct support for relining. Inspect brake lines and wheel cylinders for evidence of leakage. Check brake operation and adjust linings as required. Repack and adjust wheel bearings (ref. para 5-121 and para 5-136).
				250	HAND BRAKES Check for proper application of brake (ref. para 5-194). Inspect linings for wear. Perform complete relining or adjust as required (ref. para 5-194).
				250	REAR AXLE Check oil level and fill to plug level as necessary. Chec for leakage(ref. Fig. 4-1).
				500	TRANSMISSION Change transmission oil and oil filter. Refill with oil to bring fluid level between ADD and FULL mark on dipstick (ref. para 5-184).
			•		COOLING SYSTEM Check coolant for antifreeze and corrosion protection and inspect coolant system for heavy rusted or partially clogged cooling system (ref. TB 750-651).

4-5. COOLING SYSTEM.

4-6. Keep the radiator core free of all foreign matter. Use a soft bristle brush and a reverse flow of compressed pressure air to clean the core. Be careful not to damage the core when cleaning.

4-7. Once a week check the hose clamps for tightness. Replace broken clamps. Be sure hoses are in good condition. Replace any defective hose at once. Replace the radiator pressure cap if it does not test at 14 pounds per square inch. Tighten water pump mounting bolt.

4-8. Once a year the cooling system should be drained and flushed. Local regulations may require that the system be flushed every six months. Use a solution of laundry soda, Federal Specification P-S-641, and water to flush the system. Fill the radiator after cleaning with recommended coolant. Use anti-freeze solution if low temperatures are expected.

4-9. Inspect the fan belt and replace if necessary. Deflection of the belt should be 1/4 inch. If deflection is too great and belt is in good condition, tighten the belt by shifting the position of the alternator as necessary.

4-10. ELECTRICAL SYSTEM.

4-11. BATTERY.

1. Check the level of the battery electrolyte every day. Add distilled water or clear tap water as necessary to cover the plates in each cell completely. If it is necessary to add water to the battery very often, this is a symptom of overcharging and the charging circuit should be checked by maintenance personnel.
2. Check the specific gravity of the battery electrolyte every week. An hydrometer reading of 1.270 to 1.285 indicates a fully charged battery. A reading of 1.230 indicates a half-charge and 1.150 indicates a dead cell. If a low hydrometer reading is consistently obtained, it is an indication of low charging and the regulator and alternator or generator should be inspected and serviced.

NOTE

Do not take a reading shortly after adding water to the battery. The tractor should be run for at least an hour after adding water to permit the electrolyte to mix thoroughly.

3. Clean battery terminals, battery case and cables in accordance with standard practices. Inspect battery and cables for loose connections. Be sure connections are tight. If the clamps are tight but the posts are loose, replace the battery. Send the battery to overhaul personnel for possible salvage.

CAUTION

Observe polarity when installing battery (negative ground). Reverse connections will destroy the alternator diodes. Disconnect negative cable first before removing battery. Disconnect positive cable before charging battery in vehicle.

4-12. LIGHTS. Maintenance of lights usually will be confined to the replacing of lenses or bulbs. The mounting and component parts of these units are shown in figures 6-49 and 6-50.

4-13. STOP LIGHT SWITCH. The stop light switch is located at the front of the brake master cylinder. If the stop light does not work and the wiring from the switch to the stop light is good, replace the switch.

4-14. IGNITION COIL. Clean the exterior of the coil and all spark plug leads with a cloth dampened in cleaning solvent, Federal Specification P-S- 661. Also wipe the exterior of the distributor. Remove the wires from each plug and wipe the plug and the terminal. Be sure all high tension leads are securely connected. Be sure lead boots are properly seated and in good condition.

NOTE

Do not remove cables or nipples from the cap or coil towers unless nipples or cables are damaged. It is very important to maintain a good seal at the towers.

4-15. SPARK PLUGS. The spark plugs should be cleaned and gapped regularly regardless of the engine performance. Examine the plugs as follows:

1. Remove the spark plugs with a spark plug wrench. Be careful not to crack the porcelain.
2. Examine the plug electrodes for:

(a) Burned condition (overheating).
(b) Oily condition (underheating).
(c) Red-brown powdery deposit (normal).

3. Overheating can be caused by a loose plug, lean mixture, incorrect timing; or warped valve.
4. A cool running plug can be caused by a rich fuel mixture, excessive oil consumption, or low speed operation.
5. Clean the plug by sandblasting and recheck the plug gaps. Set the gaps with a round feeler gage. Gap should be 0.035 inches.

NOTE

Make all gap adjustments at the side wire of the plug. If the center electrode is bent, the porcelain will crack, resulting in plug failure.

6. Install plugs, using a plug wrench. Torque plugs from 30 to 32 pound feet. Be sure to install a gasket under each plug. Wipe all oil and dirt from the insulator and install the high tension wires on each plug.
7. If the insulation on the wires from the coil and distributor are dried and cracked, install a new set.

4-16. BRAKE LINES. Examine all brake hydraulic lines for evidence of leaks. Tighten all connections between the various lines. Access to brake lines can be obtained from the underside of the tractor.

4-17. CRANKCASE VENTILATION. Remove crankcase ventilation hose(s) every month and clean thoroughly to remove any carbon or sludge in the line. Every 6 months inspect and clean vent valve and air cleaner. Replace parts as required.

4-18. FUEL SYSTEM.

4-19. FUEL LINES. Inspect fuel line connections periodically to be sure all connections are tight. Keep fuel tank cap tightly in place. If cap becomes corroded, replace the cap. Be sure all fuel lines are securely fastened by the retaining clips.

4-20. TESTING THE FUEL PUMP. The fuel pump should deliver fuel to the carburetor at approximately 3-1/2 to 4-1/2 psig pressure. The pressure can be checked by removing the fuel line from the carburetor and installing a fuel pressure gage. Operate the engine at idle speed on the fuel remaining in the carburetor and check the pump pressure. If the pressure is below limits the pump should be replaced or repaired. A faulty fuel pump may cause sluggish engine performance, particularly under a load.

4-21. HEAT CONTROL VALVE. The purpose of the manifold heat control valve is to direct hot exhaust gas to a heat chamber in the intake manifold (figure6-1 1) and preheat the fuel-air mixture. Thus, the fuel is vaporized to a greater degree before entering the combustion chambers, providing quicker warm up. When the engine is cold, the exhaust gases are deflected to the heat chamber of the intake manifold and then to the exhaust manifold. As the thermostatic coil heats, it loses tension and the valve closes the heat chamber permitting exhaust gas to flow directly through the exhaust manifold. The heat control valve should be checked and lubricated with a graphite penetrating type lubricant every 100 hours of operati6n. Apply solvent-lubricant to both ends of the shaft when the manifold is cool. Move counterweight through its full travel until is it free to move by its own weight. Test the action as follows: With the engine idling, accelerate momentarily to wide open throttle. The counterweight should respond by moving approximately 90 degrees or more (when cold) and return to its normal position. If no movement is observed, the shaft is frozen or the coil spring is weak or broken. If replacing the spring or applying lubricant to the shaft does not correct faulty valve action, notify overhaul personnel for repair.

4-22. CYLINDER HEAD AND MANIFOLDS. Inspect the cylinder head for evidence of leakage around the gasket. Tighten head bolts if necessary. Be sure that all manifold stud nuts and bolts are tight and in place. Torque nuts and bolts as follows:

Cylinder head bolt.	65 lb-ft
Manifold nuts	10 lb-ft
Intake manifold bolts	15 lb-ft
Exhaust pipe flange nuts	30 lb-ft
Cylinder head cover bolt	40 lb-ft
Carburetor mounting nuts	30 lb-ft

CAUTION

Do not overtighten manifold nuts, or fine threads may be stripped.

4-23. LUBRICATION.

4-24. GENERAL. Refer to the lubrication chart, figure 4-1, for points of lubrication, lubrication intervals, quantity and type of lubricant. The prescribed lubrication intervals are for normal operating and climatic conditions. Under abnormal conditions it may be necessary to lubricate the tractor more often. Follow local directives. Supplemental information is given in the following paragraphs.

4-25. FITTINGS. Use pressure type grease equipment on all lubrication fittings. Always clean dirt and old grease from the fitting before lubricating. Apply grease until fresh grease pushes out from the lubricated area.

4-26. ENGINE.

1. Check the engine crankcase oil level daily before using the tractor. Add oil as required at the breather and oil cap to keep the oil level at the FULL mark on the engine oil level indicator.
2. Change oil every 50 hours of operation under normal conditions. Remove the plug from the bottom of the oil pan to drain the oil. Be sure to replace and tighten the oil pan plug before adding new oil.

4-27. ENGINE OIL FILTER. Replace engine oil filter every 100 hours of operation or every other oil change.

1. Unscrew the filter from the oil pump and discard filter.
2. Wipe off the filter seat on the pump.
3. Screw in a new filter until filter gasket contacts pump base. Hand tighten the filter as specified by the filter manufacturer (usually 1/2 to 3/4 turn).
4. Run engine and check for leaks. Add oil to crankcase to bring oil level to FULL Mark on oil level indicator.

4.28. AIR CLEANER. Replace the air cleaner element every 200 hours of operation. A dirty filter can restrict the air intake to the carburetor and reduce engine efficiency.

4-29. TRANSMISSION. The level of the transmission oil should be checked every day. The engine and transmission should be at normal operating temperature. Proceed as follows:

1. With the parking brake set and the engine idling, move the gear shift lever into each shift position ending in neutral.
2. The fluid level should check between the FULL mark and the ADD ONE PINT mark on the transmission oil level indicator. The level should never be above the FULL mark. Add transmission oil at the filler tube to meet this requirement.
3. If it is necessary to check the oil level when the transmission is cold, the level should be at the ADD ONE PINT mark to 3/8 inch below the ADD ONE PINT mark.
4. Be certain that the oil level indicator is seated properly in the filler tube to prevent the entry of dirt.

NOTE

Changing of transmission oil should be done by overhaul personnel. At this time the filter is also changed and certain adjustments are made.

4-30. REAR AXLE AND DROP GEAR CASE.

1. Check the oil level in the rear axle differential housing and drop gear case every week. Keep the oil level to the height of the fill plugs.
2. Change oil every six months. Remove the magnetic drain plug from each housing to drain the oil. It is important at this time to inspect and clean the drain plug. The purpose of the magnetic drain plug is to attract and hold fine particles of metal normal to operational wear and, thus, prevent them from remaining suspended in the oil where they will cause undue wear. Remove all metal particles from the drain plug. These particles are normally very fine. If the particles appear to be irregular or of a larger size, it is an indication of possible malfunction. Notify maintenance personnel of an abnormal condition.
3. Be sure to replace and tighten the magnetic drain plug before filling the rear axle and drop gear case.
4. Keep drive axle breather and drop gear case breather clean at all times.

4-31. BRAKE MASTER CYLINDER. Check the level of fluid in the brake master cylinder every week. Clean off all foreign matter from the cylinder and remove the filler plug from the master cylinder. Add fluid, Military Specification MIL-F-2111, if necessary. Tighten the filler plug after filling.

4-32. FRONT WHEEL BEARINGS (See Figure 6-18). Disassemble as required to remove bearings.

1. Wash the bearings in cleaning solvent. Agitate the solvent to remove all foreign matter. Examine the cups and cones for wear, galling, or scoring. Examine the wheel spindles for wear or galling. Flush out grease from the wheel hub and examine for wear.
2. If cups, cones, hub and spindle are in good condition, pack the bearings in wheel hub using grease, Military Specification, MIL-G-2108. Work grease into recesses in bearings.
3. Minor score marks that can be removed with crocus cloth or a fine mill file shall be corrected. If parts are worn beyond a point where flat spots or grooves exist the parts should be replaced. Replace bearings in sets only. Install a new hub seal.
4. Install the lock washer (13) and one lock nut (11) and torque to 50 pound-feet. Install the second lock washer (12) and lock nut (11) to secure the hub.

4-33. REAR WHEEL BEARINGS (See Figure 6-26). Disassemble as required to remove bearings.

1. Remove the bearing cups (15) and cones (16). Tap the axle with a soft faced hammer to loosen the bearings if necessary.
2. Clean, inspect and lubricate the bearings as described in paragraph 4-32.
3. Examine the oil seal for deterioration and wear. Replace the oil seal and retainer if worn or damaged.
4. Install the bearing cones and cups. Be sure that the cage bore is completely clean.
5. Insert the cap screws (9) with lock washers (10) into the oil seal and retainer (8). Place the gasket (12), bearing retainer (13), and shims (14) over the cap screws. Slide this entire unit over the axle and mount on the bearing cage.

NOTE

Be sure that the same number of shims are installed as were removed.

6. Install the wheel hub (7) on the axle.
7. Place the washer (6) on the axle and thread on the drive shaft nut (5). Torque the nut to between 700 and 900 pound-feet. Secure the nut with the cotter pin.

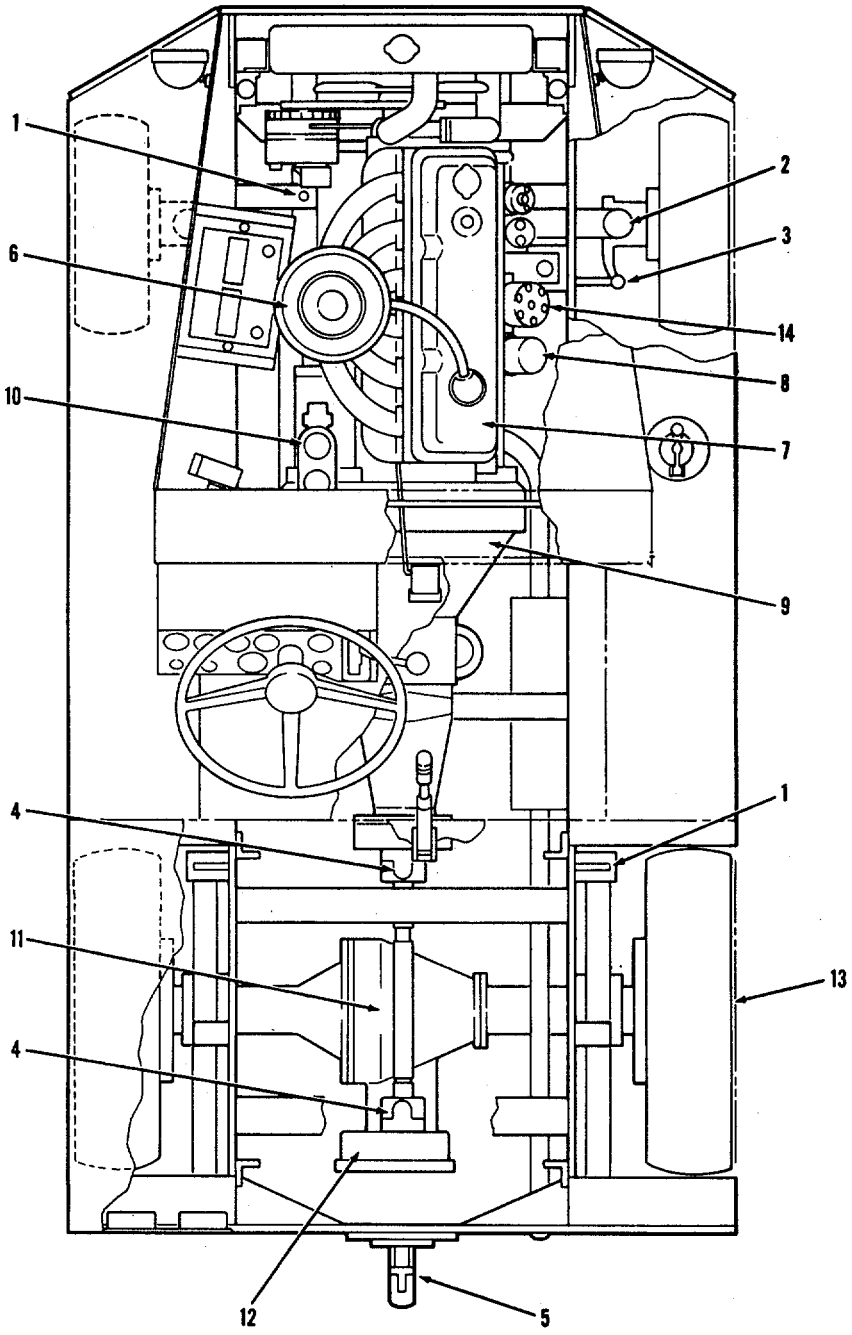


Figure 4-1. Lubrication Chart (Sheet 1 of 2)

Point of Application	Component	Lubricant	Hours of Operation 50	100	200	Remarks
GREASE FITTINGS						
1	Spring Pins	MIL-G-10924	X			1 fitting 4 places
2	Steering Knuckle	MIL-G-10924	X			2 fittings two places
3	Tie Rod Ends	MIL-G-10924	X			1 fitting two places
	Drag Link	MIL-G-10924	X			1 fitting two places
	Brake Pedal	MIL-G-10924	X			1 fitting
4	Universal Joint	MIL-G-10924	X			2 fittings two places
5	Pintle Hook	MIL-G-10924	X			2 fittings
FILL AND CHECK POINTS						
6	Air Cleaner	MIL-L-2104	X			Change every 200 hours.
7	Engine Crankcase	MIL-L-2104C	X			Check daily, change oil every 50 hours
8 .	Oil Filter	MIL-L2104		X		Change oil filter every other engine oil change
9	Transmission	Automatic Transmission Fluid, Type A	X			Check level and add oil as needed. Drain and refill every 6 months (overhaul personnel).
10	Brake Master Cylinder	MIL-B-46176				Add fluid as necessary to fill.
11	Rear Axle	MIL-L-2105C (SAE 90)				Check oil level and fill to plug level as necessary. Change oil every 6 months.
12	Drop Gear Case	MIL-L-2105C				Check oil level and fill to plug level as necessary. Change oil every 6 months.
13	Wheel Bearings	MIL-G-10924			X	Pack wheel bearings every 6 months
14	Distributor	MIL-L-2104C			X	Remove cap and apply 1 drop to reluctor sleeve pad.

Figure 4-1 . Lubrication Chart (Sheet 2 of 2)

4-34. TROUBLESHOOTING.

4-35. Refer to the troubleshooting chart, Table 4-2 for a list of possible troubles, probable causes and remedies. Take appropriate action as indicated in the chart. Do not attempt to take corrective action which is beyond the responsibility of operating personnel.

Table 4-2. Troubleshooting Chart

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE TURNS OVER BUT FAILS TO START	a. Lack of fuel	a. Check fuel gage; fill fuel tank.
	b. Moisture in ignition switch.	b. Wipe moisture from spark plugs, wiring, distributor cap, and coil.
	c. Engine flooded or has vapor lock.	c. Clear vapor lock or allow engine to cool.
	d. Loose ignition wires.	d. Check and connect ignition wires firmly.
	e. Faulty distributor points.	e. Replace points and capacitor.
	f. Fouled spark plugs.	f. Clean plugs or replace if defective.
	g. Defective ignition coil.	g. Test coil and replace if necessary.
	h. Faulty carburetor.	h. Adjust carburetor.
	i. Blown head gasket.	i. Repair engine.
ENGINE STARTS BUT FAILS TO KEEP RUNNING	a. Inadequate choke.	a. Pull out choke enough to permit engine to run until warmed up.
	b. Lack of fuel at carburetor.	b. Check fuel supply; clean fuel lines.
	c. Faulty fuel pump.	c. Clean fuel filter. Check and replace fuel pump if necessary.
	d. Faulty carburetor.	d. Adjust idle setting.
	e. Sticking heat control valve.	e. Lubricate and free heat control valve.
	f. Leaking intake manifold.	f. Replace gasket
	g. Burned valves.	g. Repair engine.
	h. Incorrect tappet clearance.	h. Adjust tappets.
ENGINE WILL NOT CRANK	a. Dead battery.	a. Recharge or replace battery.
	b. Loose battery cable.	b. Tighten cable connections.
	c. Defective starter relay.	c. Repair starter.
	d. Defective starter switch.	d. Replace switch.
	e. Defective neutral starting switch.	e. Replace switch.
	f. Starter motor drive pinion locked.	f. Repair starter.
	g. Defective starter motor.	g. Replace starter motor.
	h. Damaged valves, pistons, camshaft, or crankshaft.	h. Repair engine.
STARTER MOTOR SPINS BUT DOES NOT CRANK ENGINE	a. Starter motor drive dirty or worn and sticks on shaft.	a. Clean starter motor drive. Replace starter motor if necessary.

Table 4-2. Troubleshooting Chart-Continued

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE BACKFIRES BUT WILL NOT START	a. Spark plug wires transposed, thus not firing in proper order.	a. Connect plug wires to plugs in correct order.
	b. Spark plugs shorted.	b. Wipe dirt, oil, water and the like from plugs and cables.
	c. Timing incorrect.	c. Time engine.
ENGINE HAS NO POWER	a. Low grade of fuel.	a. Use proper grade of fuel.
	b. Incorrect timing.	b. Time engine.
	c. Defective spark plugs.	c. Replace plugs.
	d. Faulty fuel pump.	d; Replace fuel pump.
	e. Defective distributor.	e. Adjust or repair distributor.
	f. Blown cylinder head gasket.	f. Replace gasket.
	g. Faulty governor.	g. Repair or replace governor.
ENGINE RUNS ROUGH	a. Engine requires tune-up.	a. Tune engine.
	b. Defect in one or more cylinders (faulty compression).	b. Repair engine.
	c. Valves sticking.	c. Notify overhaul personnel.
	d. Timing incorrect.	d. Retime engine.
FUEL DOES NOT REACH CARBURETOR	a. Clogged fuel line.	a. Blow out fuel lines.
	b. Faulty fuel pump.	b. Test fuel pump. Replace pump if necessary.
	c. Obstruction in carburetor.	c. Repair carburetor.
CARBURETOR FLOODS (continually)	a. Float on carburetor set too high.	a. Repair carburetor.
	b. Dirt under float needle.	b. Repair carburetor.
	c. Fuel pump pressure too high.	c. Check fuel pump pressure. If high, replace fuel pump.
LACK OF SPARK AT ALL PLUGS	a. Faulty ignition coil.	a. Test ignition coil. Replace coil if necessary.
	b. Broken leadwire at input or output of ignition coil.	b. Replace leadwire.
	c. Damaged distributor points.	c. Replace points and capacitor.
LACK OF SPARK AT SOME BUT NOT ALL PLUGS	a. Faulty plug wire.	a. Replace faulty plug wire.
	b. Faulty distributor.	b. Remove and clean distributor cap. Replace cap if burned or has carbon tracks.
	c. Loose connections.	c. Tighten all ignition connections. Wipe off all oil, moisture and dirt.
	d. Defective spark plug(s).	d. Replace defective plug(s).

Table 4-2. Troubleshooting Chart-Continued

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE OVERHEATS	a. Loss of coolant.	a. Inspect for leaks at gaskets, tubing and radiator. Repair or replace faulty components.
	b. Slipping or broken fan belt.	b. Tighten belt tension or replace belt if defective.
	c. Dirty or clogged radiator.	c. Clean radiator core. Flush cooling system.
	d. Leak at head gasket.	d. Repair leak.
	e. Cracked head or block.	e. Repair engine.
ENGINE DOES NOT REACH OPERATING TEMPERATURE	a. Defective or leaking thermostat.	a. Replace thermostat.
LACK OF OIL PRESSURE	a. Loss of oil and leakage. filter. Check pan drain plug.	a. Look for leakage at gaskets and oil
	b. Oil pump broken.	b. Repair oil pump.
	c. Worn bearings.	c. Repair engine.
	d. Defective gage.	d. Replace gage.
BATTERY LOW IN CHARGE	a. Battery defective.	a. Charge or replace battery.
	b. Alternator output below normal.	b. Clean s1ip rings; inspect and replace brushes if worn below limits.
	c. Defective alternator.	c. Repair alternator.
FAULTY STEERING (Loose, hard steering or jerky steering)	a. Tire pressure low.	a. Inflate tires.
	b. Lack of lubrication.	b. Check lubrication of steering gear and front end. Inspect for damage and notify maintenance personnel of fault.
	c. Steering gear maladjusted.	c. Adjust steering gear.
	d. Worn king pins, spindles, bearings, steering gear cam.	d. Repair front end.
BRAKES LOCK	a. Restricted port in master cylinder.	a. Bleed system at wheel cylinder to move vehicle. Remove and clean master cylinder.
	b. Piston cups swollen in master cylinder.	b. Repair master cylinder.
	c. Damaged brake linkage.	c. Repair brakes.
BRAKES SPONGY	a. Air in hydraulic system.	a. Bleed the system and check brake adjustment.

Table 4-2. Troubleshooting Chart-Continued

TROUBLE	PROBABLE CAUSE	REMEDY
BRAKES GRAB	a. Oil or moisture on brake linings.	a. Allow linings to dry. Move vehicle against brake pressure to dry linings and remove oil.
	b. Brakes out of adjustment.	b. Adjust brakes.
BRAKES FAIL	a. Leakage in brake system.	a. Inspect hydraulic lines for loose connections and damage; tighten fittings. Inspect wheel cylinders and master cylinder; report malfunction to maintenance personnel.
	b. Broken brake mechanical linkage.	b. Repair brakes.
	c. Worn brake linings.	c. Replace linings.
PARKING BRAKE LOCKS	a. Broken or jammed mechanical linkage.	a. Replace broken or jammed linkage.
PARKING BRAKE FAILS	a. Brake maladjusted.	a. Adjust brake.
	b. Brake linkage broken.	b. Repair brake.
	c. Worn brake lining.	c. Replace lining.
VIBRATION OR EXCESSIVE NOISE AT U-JOINTS	a. U-Joints lack lubrication.	a. Lubricate U-Joints.
	b. U-Joints improperly assembled.	b. Repair U4Joints.
	c. Worn journals or bearings.	c. Repair U-Joints.
	d. U-Joints loosely assembled.	d. Tighten all mounting bolts.
NOISY DIFFERENTIAL	a. Lack of lubricant.	a. Lubricate differential.
	b. Worn drive pinion, ring gear, or bearings.	b. Repair rear axle.
	c. Bevel drive gears worn or damaged.	c. Repair rear axle.
NOISY REAR AXLE (see preceding trouble)	a. Worn wheel bearings.	a. Replace wheel bearings.
	b. Worn or damaged planetary gear	b. Repair rear axle.
	c. Worn axle shaft bearings.	c. Replace bearings.
POWER DELIVERED ON ONE WHEEL ONLY	a. Broken axle shaft.	a. Repair rear axle.
	b. Broken planetary gear or pinion.	b. Repair rear axle.
	c. Broken planetary spider.	c. Repair rear axle.
ONE REAR WHEEL JAMMED OR LOCKED	a. Locked brake.	a. Refer to brake troubles.
	b. Broken axle shaft.	b. Repair rear axle.
	c. (See preceding trouble.)	c. Broken parts have jammed output Use same remedies as preceding trouble.

Table 4-2. Troubleshooting Chart- Continued

TROUBLE	PROBABLE CAUSE	REMEDY
ACCELERATOR PEDAL STICKS	a. Lack of lubrication.	a. Lubricate linkage pivot points with light weight machine oil.
	b. Linkage damaged.	b. Replace bent linkage.
	c. Pedal return spring broken.	c. Replace spring.

SECTION V
REPAIR INSTRUCTIONS

5-1. GENERAL.

5-2. This section contains instructions for the removal, disassembly, cleaning, inspection, reassembly and installation of tractor components within the capabilities of the using organizations. Maximum use should be made of the exploded views in Section VI, which are referenced in the appropriate repair instructions. All procedures are limited to pertinent and special instructions which are not apparent from the associated illustrations. Generally known shop practices are not described. Basic repair information is given in paragraphs 5-5 through 5-11.

5-3. SPECIAL TOOLS.

5-4. No special service tools are supplied with the tractor. Special tools which are recommended for repair and overhaul are listed in Table 5-3 at the end of the section.

5-5. GENERAL REPAIR INSTRUCTIONS.

5-6. REMOVAL AND DISASSEMBLY. All removal and disassembly should be performed using the exploded views in Section VI, as referenced in the instructions. The order of disassembly follows, in general, the order of index numbers on the illustration(s). Special instructions are noted in the appropriate text. Disassemble components only to the extent necessary to effect repairs.

5-7. CLEANING. When cleaning, keep related parts together so that reassembly of parts in their exact position is possible. Valves, pistons, sleeves and other internal parts which have close tolerance fits in mating bores should be cleaned individually to prevent scoring and marking of surfaces. Special cleaning instructions for particular components are given in the applicable paragraphs.

1. Unless otherwise specified, cleaning should be done using dry cleaning solvent, Federal Specification P-D- 680. The solvent can be applied with clean cloths or used as an immersion solution on small metal parts.

WARNING

Dry cleaning solvent P-D-680, used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use with adequate ventilation. Flash point of solvent is 100 F-138 F.

Do not apply cleaning solvent to wiring or electrical parts except to remove foreign materials from housings.

2. Use compressed air with a maximum pressure of 30 psi to remove debris and dirt as necessary.

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

CAUTION

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

4. Use a soft bristle brush and cleaning solvent to thoroughly clean housings. Clean out all bores, recesses, grooves and tapped holes.

CAUTION

Do not attempt to clean bores by filing or sanding. Abrasive action or bores may damage them and result in malfunction.

5. Wash metal parts in cleaning solvent. Allow the parts to air dry. Do not use compressed air to dry parts. The moisture generally present in air systems may cause corrosion.

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

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

8. Wash seals and preformed packings in a soap and water solution. Rinse thoroughly and allow to air dry.

NOTE

Reassemble and oil metal parts as soon as possible after cleaning. Parts that normally operate in oil, can corrode in an extremely short time after cleaning unless a film of preservative lubricating oil is applied. Do not allow cleaned parts to remain more than two hours without reassembling or applying a film of oil.

5-8. INSPECTION. All parts should be inspected visually for cracks, breaks, scratches, dents, bends, punctures, galling, wear, scoring, stripped threads (if any), distortion and deformation. Special attention should be given to inspection of bearing surfaces, mating surfaces, gaskets and seals. Specific dimensional checks and tests are given in the applicable inspection instructions.

5-9. REPAIR AND REPLACEMENT. Repair is generally limited to structural parts, enclosing and supporting members. These components may be repaired by welding, brazing and refinishing to the extent required. Major repairs of this type should be performed by overhaul facilities. Wiring shall be repaired in accordance with standard automotive practices. Other repair shall consist of the replacement of damaged or defective parts. All parts which do not meet specified dimensional wear limits or tolerances shall be replaced.

5-10. It is recommended that all gaskets, oil seals, preforrned packing and seals be replaced unless otherwise specified by local directives. Seals and packings which show any deterioration or damage must be replaced at reassembly. All defective hardware should be replaced. Where repainting is required, the surface shall be suitably prepared and primed and painted.

NOTE

Use repair kits when available for repair.

5-11. REASSEMBLY AND INSTALLATION. Unless otherwise specified, reassembly and installation are the reverse of removal and disassembly. Use the illustrations in Section VI as referenced in the applicable repair instructions. Special instructions are noted in the appropriate paragraphs. For torque values of bolts, screws, and nuts, refer to Table 5-2 at the end of this section.

5-12. FRAME AND STRUCTURAL PARTS.

5-13. REMOVAL AND DISASSEMBLY. (See figure 6-2.) Remove and disassemble parts as shown in the exploded view.

5-14. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8.

5-15. REPAIR AND REPLACEMENT. Refer to paragraph 5-9.

5-18. REASSEMBLY AND INSTALLATION. (See figure 6-2.) Refer to paragraph 5-11.

5-17. RADIATOR AND COOLING LINES.

5-18. REMOVAL AND DISASSEMBLY (See Figure 6-3).

1. Drain transmission before disconnecting tube assemblies.
2. Drain engine cooling system and radiator before removing hoses or radiator.

5-19. CLEANING AND INSPECTION.

1. Clean core using compressed air with a maximum pressure of 30 psi and small wood stock to dislodge debris. Do not use sharp metal tools or a puncture may result.
2. Reverse flush the radiator.
3. Inspect radiator thoroughly for leaks. Refer unit to overhaul if repair is extensive.

5-20. REPAIR OR REPLACEMENT. Repair a damaged or leaking radiator using standard shop practices. If damage is excessive, replace the radiator. Inspect cooling lines for kinks, punctures, and cracks; replace any restricted or faulty tubes. Check all fittings, hoses and clamps for damage; replace all defective parts. Refer to paragraphs 5-9.

5-21. REASSEMBLY AND INSTALLATION. (See figure 63.) Refer to paragraph 5-11.

1. Fill transmission and engine cooling system.
2. Start engine and check all hose and hydraulic line connections for leaks. Observe engine and transmission operating temperatures to be sure cooling system is functioning properly.

5-22. WATER PUMP.

5-23. REMOVAL AND DISASSEMBLY. (See figure 6-4.)

1. Drain the cooling system completely.
2. Remove the fan belt.
3. Disconnect bypass hose.
4. Remove the fan, spacer and pulley.
5. Remove the water pump. Disassemble as required to repair.

5-24. CLEANING. Refer to paragraph 5-7. Use a wire brush to remove all rust from the separator plate. Clean all parts except bearings, with a suitable solvent and dry with compressed air with a maximum pressure of 30 psi. Bearings should be replaced at overhaul.

5-25. INSPECTION. Refer to paragraph 5-8. A repair kit is available for the water pump and should be used whenever the pump is disassembled. Inspect the pump body for cracks or other visible damage. Replace the pump body if damaged.

5-26. REPAIR AND REPLACEMENT. Refer to paragraph 5-9.

5-27. REASSEMBLY. (See figure 6-4.) Reassembly is the reverse of disassembly.

1. Torque mounting bolts to 30 pound-feet.
2. Fill cooling system.
3. Start engine and check for leaks. Check operating temperature of engine.

5-28. FUEL PUMP.

5-29. REMOVAL AND DISASSEMBLY. (See figure 6-5.)

1. Turn off the shutoff cock in the fuel line from the fuel tank.
2. Disconnect the fuel lines to the fuel pump. Allow fuel to drain into a suitable container.
3. Loosen the screw on the bottom of the retainer and screw assembly. Remove the retainer and screw assembly, with the bowl (6), spring, filter (3), and gasket (4).
4. Remove filter housing and nipple (5) from fuel pump. Do not disassemble further.
5. If the pump is defective, remove it and replace entire unit.

5-30. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8.

5-31. REPAIR AND REPLACEMENT. Refer to paragraph 5-9. Replace all defective parts.

5-32. REASSEMBLY AND INSTALLATION. (See figure 6-5.) Reassembly and installation are the reverse of disassembly and removal.

5-33. CARBURETOR AND AIR CLEANER.

5-34. REMOVAL.

1. Disconnect vent hose at air cleaner.
2. Remove air cleaner (1) from carburetor.
3. Disconnect vent hose, fuel line and vacuum line from the carburetor.
4. Disconnect the choke linkage and the accelerator linkage at the carburetor.

5. Remove two nuts at the base of the carburetor and lift the carburetor off its mounting studs. Place a clean cloth over the opening on the governor and cap the open fuel line to keep out foreign matter.

5-35. DISASSEMBLY. (See figure 6-6.) Disassemble the carburetor in a clean area as free from dust or other foreign matter as possible. Use small containers for the carburetor parts to avoid loss of parts and tag parts as removed with location information for easier reassembly. Use clean tools and keep hands free of grease and oil.

NOTE

Use special tools listed in Table 5-3 as required to disassemble and adjust carburetor.

5-36. CLEANING AND INSPECTION. Refer to paragraphs 57 and 58. After 1000 or more hours of operation, the carburetor may accumulate deposits that impair operation. These deposits will accumulate around the small orifices and metering jets. The most effective cleaner to use is denatured alcohol. An alternate is lacquer thinner.

CAUTION

If solvent or cleaner used requires the use of water as a rinse, it should be "hot". After rinsing, all trace of water must be blown from the passages with air pressure with a maximum pressure of 30 psi. It is further advisable to rinse all parts in clean kerosene or gasoline to be certain no trace of moisture remains. Never clean jets with a wire, drill, or other mechanical means, because the orifices may become enlarged, making the mixture too rich for proper performance.

2. Clean the carburetor body with a soft bristle brush and the cleaning solvent. Be sure to clean the venturi opening and throat thoroughly. Use the brush in all comers.

3. Use the soft bristle brush on all metal parts except the metering jets. Clean the jets with a soft lintless cloth saturated with the cleaning solvent.

5-37. REPAIR AND REPLACEMENT. Refer to paragraph 5-9. Replace all defective parts.

5-38. REASSEMBLY AND INSTALLATION. (See figure 6-6.) Reassembly and installation is the reverse of disassembly and removal.

5-39. ADJUSTMENT.

1. To make the curb idle speed adjustment, proceed as follows:

(a) Turn idle speed adjusting screw in or out to obtain 500 rpm. Be sure that the choke is fully open and that fast idle adjusting screw is not contacting the cam.

(b) Adjust the idle mixture adjusting screw to obtain the highest rpm. While making the adjustment, carefully watch the tachometer and notice that the speed can be decreased by turning the screw in either direction from the setting that gave the highest rpm reading.

(c) From the highest idle speed setting, turn the idle mixture adjusting screw clockwise (leaner) until the speed starts to drop. Turn the screw in the opposite direction (counterclockwise) just far enough to recover the speed that was lost.

NOTE

This procedure will assure that the idle has been set to the leanest mixture possible for smooth idle. This setting is very important.

(d) Since the correct speed was originally set using the speed screw, the speed obtained after finding the leanest smooth idle setting will probably be too fast. Readjust the speed screw to obtain the correct idle speed. Repeat steps (b) and (c) above.

2. To set the fast idle speed, proceed as follows:

(a) With the engine running and warmed-up, open the throttle slightly and rotate the fast idle cam until the fast idle adjusting screw will contact the second step of the fast idle cam.

(b) Release the throttle. The linkage pull-back spring will cause the fast idle adjusting screw to hold the cam in this position.

(c) Turn the fast idle speed adjusting screw clockwise (faster) or counterclockwise (slower) to obtain the fast idle speed.

NOTE

This fast idle speed is used to secure the correct adjustment and is not encountered in normal engine operation. In cold weather, engine oils are thicker and engine friction is relatively high. Under these conditions, fast idle adjustments will result in opening the throttle enough to keep the engine running. Because conditions can vary widely (such as lighter oil, an engine with more hours of operation and lower friction, etc.), it is possible to adjust the fast idle speed to suit any requirements. The recommended setting is intended to meet average conditions and normal operation.

5-40. GOVERNOR.

5-41. REMOVAL. The governor is mounted just below the carburetor. To remove it, first remove the carburetor. Disconnect vacuum and ventilation hoses and lift governor from intake manifold.

5-42. DISASSEMBLY. (See figure 6-7.) The governor should not be disassembled unless absolutely necessary. Disassemble as shown on the exploded view.

5-43. CLEANING. The governor may accumulate deposits of gum and carbon on internal parts after a long period of operation. Clean the governor in the same manner as the carburetor. The governor should be cleaned, in either the assembled or disassembled condition, prior to making any adjustment or repairs. In many cases a sluggish governor can be restored to proper operating performance by cleaning alone.

5-44. INSPECTION. Refer to paragraph 5-8.

5-45. REPAIR AND REPLACEMENT. Refer to paragraph 59. Replace all defective parts.

5-46. REASSEMBLY AND INSTALLATION. (See figure 6-7.) Reassembly is the reverse of disassembly. Calibrate the governor before installing cap as follows:

1. Install the speed adjusting screw (9). Turn screw with wrench 24283 to obtain 10 active coils as shown in figure 5-1.

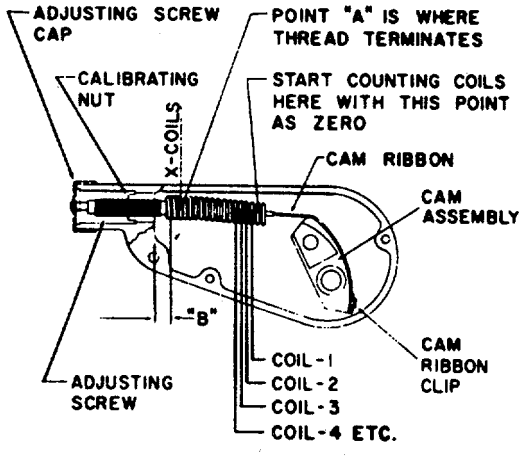


Figure 5-1. Governor Calibration

2. Remove wrench 24283 and insert wrench 25264 to engage nut on adjusting screw. Using wrench 24283 to hold screw from turning, turn wrench 25264 to obtain 3/32 inch dimension B (see figure 5-1). Remove wrenches.

5-47. ADJUSTMENT.

1. Turn the adjusting screw cap clockwise for lower speeds and counterclockwise for higher speeds. All adjustments should be made in small increments.

2. If the governor has a tendency to surge at full throttle, the adjusting screw can be adjusted. This should not be done unless absolutely necessary. Turn the adjusting screw to clockwise one revolution. Then while holding the adjusting screw from turning, turn the nut on the adjusting screw clockwise 1/4 revolution. Continue this procedure until the surge is eliminated.

3. If the governor is slow to react, perform the procedure of preceding step b except turn the screw and nut counterclockwise. Then making this adjustment, it is best to continue adjusting until an actual surge is produced and then readjust to just eliminate the surge.

5-48. ACCELERATOR LINKAGE.

5-49. REMOVAL AND DISASSEMBLY. (See figure 6-8.) Remove and disassemble as shown on the exploded view.

5-50. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 58.

5-51. REPAIR AND REPLACEMENT. Repair of the linkage is confined to the replacement of bent or broken parts. Eliminate ail binding or interference when replacing parts. Refer to paragraph 5-9.

5-52. REASSEMBLY AND INSTALLATION. (See figure 6-8.) Reassembly and installation is the reverse of disassembly and removal. Lubricate pedal arm bearing after reassembly.

5-53. FUEL TANK.

6-54. REMOVAL AND DISASSEMBLY. (See figure 6-9.) Remove components as shown.

CAUTION

Drain fuel tank and line before removal.

5-55. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8.

5-56. REPAIR OR REPLACEMENT. Refer to paragraphs 5-9 and 5-10.

5-57. REASSEMBLY. (See figure 6-9.) Reassembly is the reverse of disassembly. Purge line of air.

5-58. EXHAUST SYSTEM.

5-59. REMOVAL AND DISASSEMBLY. (see figure 6-10.) Remove and disassemble as shown on the exploded view.

5-60. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8. Inspect the tail pipe, exhaust pipe and muffler for corrosion, punctures and other damage.

5-61. REPAIR AND REPLACEMENT. Refer to paragraph 5-9. Replace all defective parts.

5-62. REASSEMBLY AND INSTALLATION. (See figure 6-10.) Reassembly and installation are the reverse of disassembly and removal.

5-63. ENGINE MANIFOLDS.

5-64. REMOVAL AND DISASSEMBLY. (See figure 6-11.) Disassemble as shown on the exploded view.
Note the following instructions.:

1. Remove the carburetor and exhaust pipe before disassembling manifolds.
2. Remove other parts as necessary.

5-65. CLEANING. Tap the manifold castings with a rubber faced mallet to loosen any scale on the inside of each manifold. Blow the loose particles out with a source of compressed air with a maximum pressure of 30 psi. Use a stiff wire brush to ream out the inside of the manifolds. Clean off sharp metal projections on the machined faces with a fine mill file.

5-67. REPAIR-AND REPLACEMENT. Replace all defective parts.

5-68. REASSEMBLY AND INSTALLATION. (See figure 6-11.) Reassembly is the reverse of disassembly.
Tighten mounting nuts and screws as specified in Table 5-2.

5-69. ENGINE AND TRANSMISSION.

5-70. GENERAL. The procedures to be performed in repairing the engine and transmission depend on the extent of repair. Repair of engine accessories can be done without removing the engine and transmission from the tractor. Extensive repair of the engine will require removal from the tractor. The decision to remove the engine and transmission from the vehicle for repair shall be made by the proper authorities. In any event, repair is limited to the tools and equipment available to the using organization. In no case shall the transmission be repaired except at overhaul facilities by qualified personnel.

5-71. REMOVAL. When it is necessary to remove the engine and transmission from the tractor, proceed as follows:

1. Drain the engine crankcase and cooling system and the transmission.
2. Remove the front hood.
3. Remove the radiator and transmission oil coolant lines.
4. Disconnect all wires from the instrument panel to the other tractor components. Label wires to facilitate reassembly.
5. Disconnect the fuel lines to the fuel pump.
6. Disconnect the accelerator linkage from the carburetor.
7. Remove the air cleaner and interconnecting hoses and clamps.
8. Disconnect the drive shaft at the transmission.
9. Disconnect the shift lever cable from the transmission.
10. Disconnect the parking brake cable from the transmission.
11. Disconnect the exhaust pipe at the exhaust manifold.
12. Attach a suitable hoist to the engine and transmission for support and lifting.
13. Remove attaching hardware for the engine and transmission (see figure 6-2).
14. Lift the engine and transmission upward slowly from the tractor frame. It may be necessary to tilt the front of the engine upward so the transmission clears the counter weights and frame.
15. Place the engine and transmission on a suitable support or repair stand.

5-72. INSTALLATION. Installation of the engine and transmission in the tractor is the reverse of removal. Note the following after installation:

1. Perform a thorough inspection to be sure all fuel, coolant line and hydraulic connections are secure.

2. Inspect all electrical connections for correct connections. (See figure 6-45.)
3. Fill the transmission with proper hydraulic fluid.
4. Fill engine crankcase with prescribed lubricant.
5. Fill engine cooling system with prescribed coolant.

5-73. OIL PUMP AND RELIEF VALVE.

5-74. REMOVAL AND DISASSEMBLY. (See figure 6-12.)

1. Drain all engine oil and remove the filter.
2. Remove the oil pan and gaskets. (See figure 6-13.)
3. Remove oil strainer.
4. Take out screws and washers (figure 6-12) securing the pump to the engine block and work the pump out of its recess. Rock the pump back and forth slightly for removal to free the pump drive gear from the camshaft gear.

5-75. CLEANING. Wash all parts of the oil pump in cleaning solvent. Use a soft bristle brush to clean the drive gear and rotors. Use the brush to clean the interior of the pump body. Flush all dirty solvent of the pump parts. Allow parts to air dry and apply a thin film of preservative lubricating oil.

5-76. INSPECTION.

1. Lay a straightedge across the oil pump cover surface. If a 0.0015 inch feeler gage can be inserted between the cover and straightedge, the cover should be replaced.
2. If outer rotor length measures less than 0.649 inch and diameter less than 2.469 inches, replace outer rotor.
3. If inner rotor length measures less than 0.649 inch, replace inner rotor.
4. Slide outer rotor and inner rotor into pump body and place a straightedge across the face (between the bolt holes). If a feeler gage of more than 0.004 inch can be inserted between rotors and straightedge, replace pump body.
5. Remove inner rotor and shaft leaving the outer rotor in pump cavity. Press the outer rotor body to one side with fingers and measure the clearance between outer rotor and pump body. If measurement is more than 0.012 inch, replace the oil pump.
6. If clearance between inner rotor and outer rotor is more than 0.010 inch, replace inner and outer rotors.
7. Inspect the oil pressure relief valve for wear and damage, particularly the spring. Replace any part of the relief valve which is defective. Check load and length specifications for spring. Refer to Table 5-1.

5-77. REASSEMBLY AND INSTALLATION. (See figure 6-12.)

1. Place shaft and rotor (7) and outer rotor (8) in body (13). Press drive gear (6) on shaft using suitable arbor press and bushing. Take care not to distort body or rotors.
2. Install new seal ring (5) in body groove. Attach cover (3) with screw and washers (4). Torque screw to 130 pound-inches.
3. Install relief valve plunger, valve spring, gasket and cap.
4. Install oil pump in engine using new gasket. Torque screws and washers to 200 pound-inches.
5. Install filter.
6. Install oil strainer with tube. (See figure 6-13.)
7. Install oil pan using new gaskets. Torque hex head screws to 200 pound-inches.

NOTE

Be sure mounting surface of oil pan and mating surfaces of block are clean. Make sure gaskets seal properly.

8. Install drain plug and gasket.
9. Fill engine crankcase with prescribed oil.

5-78. BASIC ENGINE.

5-79. DISASSEMBLY. Disassemble the basic engine as shown on the exploded views, figures 6-13 thru 6-16, to the extent required for repair. Remove engine accessories as necessary to perform repair and overhaul operations.

NOTE

Remove dirt, grease and other foreign materials from exterior of engine before disassembly.

1. *Cylinder Head and Values.*

(a) Remove oil pan, oil pump, rocker arm cover. (See figure 6-13.)

(b) Remove rocker shaft bolts (5, figure 6-14) and retainers (6). Lift entire rocker arm assembly from cylinder head. Disassemble rocker assemblies (7) and spacers (10) from shaft (11) as desired.

(c) Withdraw push rod (20). Tag rods to facilitate proper reassembly.

(d) Remove cylinder hex head bolts to detach cylinder head assembly. Remove gasket. Tag cylinder head mounting bolts as each is removed to aid reassembly. Some bolts have tapped heads.

(e) Using valve spring compressor C-3422, compress each valve spring in turn. Remove retainer locks (12 and 13), retainers (14), valve springs (15), shields (16 and 17) and valves (18 and 19).

NOTE

Remove any burrs from valve stem lock grooves to prevent damage to valve guides when valves are withdrawn.

2. *Camshaft.*

(a) Remove pulley (20A, figure 6-13)and vibration damper (21) with suitable puller.

(b) Remove cover screws (23) and take off chain case cover (22) and gasket (25). Refer to paragraph 5-92 for seal replacement.

(c) Remove tappets (21, figure 6-14) using tappet puller C-3661.

(d) Remove timing chain (1).

(e) Remove sprocket screw (3) and washer (4). Pull sprocket (2).

(f) Withdraw camshaft (22) carefully. Do not damage bearings by hitting them with cam lobes.

(g) If camshaft bearings (23, 24, 25 and 26) need replacement, drive out welch plug at rear cam bearing. Install proper size adapters at back of each cam shaft bearing, and drive out bearing shells. Adapters are part of camshaft bearing remover and installer C-3132A.

3. *Pistons and Connecting Rods.* (See figure 6-15.)

a. Remove the top ridge of cylinder bores using cylinder bore ridge reamer C-3012 before removing pistons from the cylinder blocks. Before the pistons are removed from the engine the carbon should be scraped off the top of the piston.

NOTE

Keep the tops of pistons covered during this operation.

(b) Pistons and connecting rods must be removed from the top of cylinder block. Rotate crankshaft so each connecting rod is centered in the cylinder bore.

(c) Remove bolts (8), nuts (7) and connecting rod bearing cap (9).

(d) Install piston and connecting rod remover and installer C-3221 on one connecting rod bolt and protector over the other bolt. Push each piston and rod assembly out of cylinder bore.

(e) Install bearing caps on mating rods.

(f) Remove piston rings (4, 5 and 6).

(g) Remove retaining rings (3).

(h) Arrange piston pin remover and installer C-3724 for the removal of piston pin as shown in figure 5-2.

(i) Install pilot on the main screw.

(j) Install the screw through the piston pin.

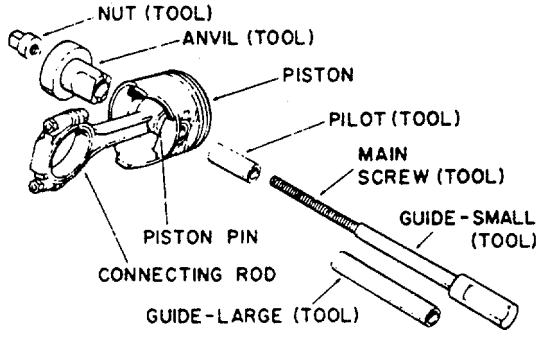


Figure 5-2. Tool Arrangement For Removing Piston Pin

(k) Install anvil over the threaded end of the main screw with small end of anvil against the piston boss. Be sure spring is removed from anvil.

(l) Install nut loosely on the main screw and place the assembly on suitable arbor press. Press the piston pin out of connecting rod.

NOTE

When the pin falls free from connecting rod, stop the press to prevent damage to bottom of anvil.

(m) Remove the tool from piston.

4. Crankshaft and Main Bearings. (See figure 6-16.)

(a) Remove sprocket (1), key (2) and oil slinger (3).

CAUTION

Support crankshaft adequately during removal.

(b) Remove cap screw (5), seal retainer (4) and seals (6 and 7).

(c) Remove cap screw (8), bearing caps (9, 10 and 11), bearing sets (12, 13 and 14) and crankshaft (15).

5-80. CLEANING. Perform the following operations as applicable:

1. Use a brush and clean solvent to thoroughly clean the oil pan. Open up all channels from corners or crevices.

2. Examine the gasket surface on the pan and clean off any sharp metal projections with a file or emery paper. Blow out all residue.

3. Wipe each plug opening and combustion chambers in the cylinder head with a cloth saturated with cleaning solvent. Allow to air dry.

4. Scrape all carbon out of the combustion chambers. Use a wire brush to clean out the plug openings. Use emery cloth to clean off the spark plug gasket surface on the cylinder head. Blow off all residue.

5. Wipe all machined surfaces in the engine block with a cloth saturated with cleaning solvent. Be careful not to score the surfaces with a metal object such as a ring or watch.

6. Use a length of wire to clean out any oil ports or grooves. Clean the ports completely.

7. Use a ridge remover to cut away any ridge present in the cylinders. Clean away all carbon.

8. Clean the valve seats by scraping away the carbon with a valve seat grinder. If the valve seats are pitted, remove enough metal from the valve seat to eliminate the pits and grooves. Clean away all residue.

9. After removing the piston rings with a ring expander, use a ring groove cleaning tool to clean out all deposits.

10. Wipe the piston with a cloth saturated in cleaning solvent. Clean all bushings, pins, and bearing halves individually with cleaning solvent.

11. When cleaning the camshaft and valves, be very careful not to jam metal parts together. Dents, scratches and gouges in the cams or valve faces may require unnecessary parts replacement.

12. Use a soft bristle brush to clean the camshaft. Remove all residue from the crevices on the camshaft and from the oil pump drive gear. Wipe the bearing surfaces and cam lobes with a cloth.

13. Scrape carbon off the valve stems and valve guides. Use emery cloth to clean the valve guides. Use emery cloth to clean the valve stem locks and spring retainer.

14. If the valve face and valve seat are both pitted use grinding compound, Federal Specification SS-C-614, to lap the valve and valve seat for correct fit. The valve face runout must not exceed 0.0015 inch after lapping.

15. Use extreme care in handling the crankshaft, bearings and bearing caps. The bearing surfaces must not be marred in any way if the crankshaft is to be used again.

16. Use a soft bristle brush and cleaning solvent to remove all foreign matter from the crankshaft. Wipe the bearing journals with a lint free cloth.

17. Clean each bearing half with a cloth saturated with cleaning solvent. Clean each oil port with a wood match stick or tooth pick.

18. Use a small brush and cleaning solvent to clean out the bolt holes in the bearing caps. Wipe the bearing caps with a cloth saturated in cleaning solvent.

CAUTION

Rinse off all residue from parts before reassembly.

5-81. ENGINE REPAIR. Paragraphs 5-82 through5-93 provide repair instructions for reworking a used engine. Use these procedures only to the extent necessary to effect repair. Refer to Table 5-1 for wear limits and clearances.

5-82. CYLINDER WALLS. Cylinder walls which are badly scored, scuffed, scratched, or worn beyond specified limits should be rebored. Whatever type of boring equipment is used, boring operation should be closely coordinated with the fitting of pistons and rings in order that specified clearance may be maintained. The cylinder bores should be checked for out-of-round and taper. If the cylinder bores show more than 0.005 inch, the cylinder block should be rebored and honed, and new pistons and rings fitted.

1. Remove light scoring, scuffing, or scratches from the cylinder walls using cylinder bore hone C-823. Usually, a few strokes will clean up a bore and maintain the required limits. The hone may be used for removing metal up to 0.005 inch. Be sure all abrasives are removed from engine parts after honing.

2. The cylinder walls should be deglazed using cylinder bore hone C-3501 equipped with No. 280 grit stones, prior to installation of the new rings or to smooth down the cylinder walls after rough honing. A satisfactory finish can be obtained by giving each cylinder wall 20 strokes in 20 seconds with the hone so that a cross hatch pattern will be obtained.

3. It is recommended that a solution of soap and water be used with a brush and then thoroughly dried. When the bore can be wiped with a clean white cloth and be withdrawn clean, the bore is clean.

5-83. PISTONS. The pistons are cam ground so that the diameter at the pin boss is less than its diameter across the thrust face. This allows for expansion under normal operating conditions. The expansion forces the pin bosses away from each other, and the piston assumes a more round shape. Check pistons for taper and elliptical shape before they are fitted into the cylinder bores (see figure 5-3) The piston and cylinder wall must be clean and dry. The specified clearance between the piston and the cylinder wall is 0.005 to 0.0015 inch.

1. Pistons and cylinder bores should be measured at normal room temperature. 70 degrees F.
2. Measure the piston diameter at the top of skirt 90 degrees to the piston pin axis.
3. Measure the cylinder bores halfway down the cylinder bore and transverse to the engine crankshaft center line.

5-84. PISTON RINGS.

1. Measure the piston ring gap about two inches from bottom of cylinder bore in which it is to be fitted. (An inverted piston can be used to push the rings down to insure positioning rings squarely in the cylinder wall.)

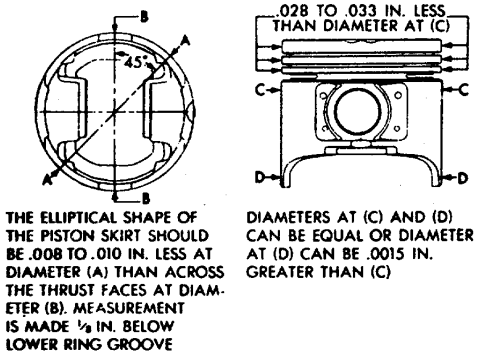


Figure 5-3. Piston Measurements

2. Insert the feeler stock in gap. The ring gap should be between 0.010 to 0.020 inch. The service set oil ring gap is 0.010-0.055 inch.

3. Measure the side clearance between piston ring and ring land. The clearance should be 0.0015 to 0.003 inch for the top compression ring and the intermediate ring, and 0.001 to 0.003 inch for the oil control ring.

4. Starting with the oil ring expander, place expander ring in the lower ring groove and install oil control ring using instructions in package.

5. Install the compression rings in middle and top grooves, using ring installer C-3805. Be sure the mark "TOP" on each compression ring is to the top of piston.

5-85. VALVES AND GUIDES.

1. Clean the valves thoroughly and discard burned, warped and cracked valves.

2. Measure valve stems for wear. Intake valve stem diameter (new valve) should measure 0.372 to 0.373 inch and exhaust valve stem diameter (new valve) should measure 0.371 to 0.372 inch. If the wear exceeds 0.002 inch, replace the valve.

3. Remove carbon and varnish deposits from the inside of valve guides with valve guide cleaner C-756.

4. Measure the valve stem guide clearance as follows:

(a) Install guide wear measuring sleeve C-3026 over the valve stem and install valve. The special sleeve places the valve at the correct height for checking with a dial indicator.

(b) Attach a dial indicator to the cylinder head and set it at right angle of the valve stem being measured.

(c) Move valve to and from the indicator. The total dial indicator reading should not exceed 0.012 inch on intake valves and 0.017 inch on exhaust valves. Ream the guides for valves with oversize stems if dial indicator reading is excessive or if the stems are scuffed or scored.

5. Service valves are available in standard 0.005, 0.015 and 0.030 inch oversizes. Reamers to accommodate the oversize valve stems are as follows: Reamer C-3433 (0.005 inch O.S.), Reamer C-3430 (0.015 inch O.S.), Reamer C-3427 (0.030 inch O.S.). Slowly turn reamer by hand and clean guide thoroughly before installing new valves.

NOTE

Do not attempt to ream the valve guides from standard directly to 0.030 inch. Use step procedure of 0.005, 0.015 and 0.030 inch so the valve guides may be reamed true in relation to the valve seat.

5-86. REFACING VALVES AND VALVE SEATS.

1. The intake and exhaust valve seats and the intake valve face have a 45 degree angle. The exhaust valve face has a 47 degree angle. The valve face and valve seat angles are shown in figure 5-4.

2. Inspect the remaining margin after the valves are refaced. Valves with less than 3/64 inch margin should be discarded.

3. When refacing the valve seats, it is important that the correct size valve guide pilot be used for reseating stones. A true and complete surface must be obtained.

4. Measure the concentricity of valve seat using a dial indicator. The total runout should not exceed 0.003 inch (total indicator reading). When the seat is properly positioned, the width of the intake seats should be 5/64 to 3/32 inch. The width of exhaust seats should be 3/64 to 1/16 inch.

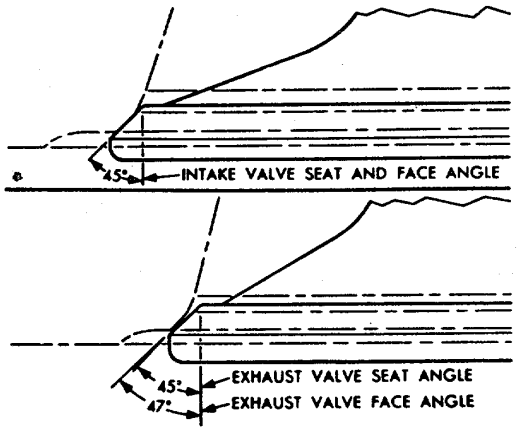


Figure 5-4. Valve Face and Seat Angles

5-87. VALVE SPRINGS.

1. Whenever the valves have been removed for inspection, reconditioning or replacement, the valve springs should be tested. Use a suitable test tool. Specifications for load and length are given in paragraph 2-2. Discard springs that do not meet these specifications.

2. Inspect each valve spring for squareness with a steel square and surface plate. If the spring is more than 1/16 inch out of square, install a new spring.

5-88. CONNECTING ROD BEARING CLEARANCE (PLASTIGAGE METHOD). Connecting rod bearing clearance measurements can be made by the use of Plastigage. After removing the connecting rod cap, wipe off the oil from the crankpin journal and bearing inserts. Place the Plastigage on bearing parallel with crankshaft. Reinstall the cap and tighten attaching nuts alternately to specified torque. Remove cap and measure the width of the compressed material with the graduated scale to determine the bearing clearance. Desired clearance is from 0.0005 to 0.0015 inches. If taper of the compressed material is evident, measure with the graduated scale. If the taper appears to exceed 0.005 inch, the journal should be checked with micrometers.

5-89. CRANKSHAFT MAIN BEARINGS. The Nos. 1, 2 and 4 lower main bearings are interchangeable. The Nos. 2 and 4 upper main bearings are interchangeable. The No. 1 upper main bearing is not interchangeable and is chamfered on the tab side for timing chain oiling and can be identified by a red mark on the edge of the bearing. Upper main bearings are grooved and lower main bearings are plain and are not interchangeable. The No. 3 upper and lower main bearings are flanged to carry the crankshaft thrust loads and are not interchangeable with any other main bearings in the engine. Bearings that are not badly worn or pitted should be reinstalled in the same bearing bore.

NOTE

The bearing caps are not interchangeable and numbers should be checked at removal to insure correct assembly. Refer to Section VI for available standard and undersize bearings. Never install an undersize bearing that will reduce the clearance below specifications.

5-90. MAIN BEARING CLEARANCE. Use same method for main bearings as for connecting rod bearings (paragraph 5-88).

CAUTION

If bearings are measured with the engine in an upright position the crankshaft must be supported in order to take up clearance between the upper bearing insert and the crankshaft journal. This can be done by snugging bearing caps of the adjacent bearings with a strip of 0.005 to 0.015 inch cardboard between lower bearing and journal. Use extreme caution when this is done to avoid unnecessary strain on the crankshaft or bearings, or false reading may be obtained. Do not rotate crankshaft while Plastigage is installed. Be sure to remove cardboard before reinstalling oil pan.

It is permissible to use one 0.001 inch undersize bearing shell with one standard bearing shell, or one 0.002 inch undersize bearing shell with one 0.001 inch undersize shell. Always use the smaller diameter bearing half as the upper. Do not use a new bearing with a used bearing and never use an upper bearing half more than 0.001 inch smaller than the, lower bearing half.

5-91. CRANKSHAFT. The crankshaft journals should be checked for excessive wear, taper and scoring. Examine all bearing halves for wear and scoring. The position of any apparent wear on the bearings will give indication of the journal condition. Journal grinding should not exceed 0.012 inch under the standard journal diameter. Do not grind the thrust faces of No. 3 main bearing. Do not nick the connecting rod or main bearing journal fillets. Check the alignment of the crankshaft using V-blocks and a dial indicator. Check the run out at the center and intermediate bearings. Replace the crankshaft if runout exceeds 0.003 inch. After regrinding, remove the rough edges from crankshaft oil holes and clean out all oil passages.

5-92. CHAIN CASE COVER OIL SEAL REPLACEMENT.

1. *Removal*. Remove oil seal from cover if seal needs replacement using oil seal remover and installer C-3506 as follows:

NOTE

It is normal to find particles of neoprene collected between the seal retainer and crankshaft oil slinger after the seal has been in operation.

(a) Position puller screw of Tool C-3506 through case cover, the inside of case cover up. Position the puller blocks directly opposite each other, and force the angular lip between neoprene and flange of the seal retainer.

(b) Place washer and nut on puller screw. Tighten the nut forcing blocks into gap to a point of distorting the seal retainer lip. Puller is only positioned at this point.

(c) Place sleeve over the retainer and place removing and installing plate into sleeve.

(d) Place the flat washer and nut on puller screw. Hold the center screw and tighten lock nut to remove seal.

2. *Installation*. Install new oil seal in chain case cover using oil seal remover and installer C-3506 as follows:

(a) Insert puller screw through removing and installing plate so that the thin shoulder will be facing up.

(b) Insert puller screw with plate through the seal opening (inside of chain case cover facing up).

(c) Place the seal in cover opening, with neoprene down. Place the seal installing plate into the new seal, with protective recess toward lip of seal retainer.

(d) Install the flat washer and nut on puller screw; hold screw and tighten nut.

(e) The seal is properly installed when neoprene is tight against the face of cover. Try to insert a 0.0015 inch feeler gage between neoprene and cover. If seal is installed properly, the feeler gage cannot be inserted.

(f) Be sure the mating surfaces of chain case cover and cylinder block are clean and free from burrs. Using new gasket (25, figure 6-13), slide the chain case cover assembly over the locating dowels and tighten cover screws (23) to 15 pound-feet.

5-93. ENGINE REASSEMBLY. Use the procedures in paragraphs 5-94 through 5-97 to reassemble the engine. The procedures require the installation and assembly of parts into the block, consequently an engine support stand is desirable so that the engine can be inverted without difficulty.

5-94. CRANKSHAFT AND BEARINGS.

1. Install new rear seals as follows:

(a) Install a new oil seal (6, figure 6-16) in the cylinder block so that both ends protrude:

(b) Tap seal down into position, using a rear main bearing seal installer C-3743 (with bridge removed) until the tool is seated in bearing bore.

(c) Hold tool in this position and cut off portion of seal that extends above the block on both sides.

(d) Install a new seal in the seal retainer (4) so that the ends protrude.

(e) Install bridge on tool C-3443 and tap the seal down into position until tool is seated.

(f) Trim off the portion of the seal that protrudes above the cap.

(g) Install the two side seals (7) in grooves in seal retainer.

2. Place crankshaft (15) in position in crankcase with adequate support.
3. Install seal retainer (4) and tighten cap screws to 30 pound-feet.
4. Install bearing sets (12, 13and 14) with caps (9, 10 and 11). Tighten cap screws to 85 pound-feet.
5. Place key (2) in crankshaft. Press sprocket (1) on end of crankshaft.

5-95. PISTONS AND CONNECTING RODS. (See figure 6-15.)

1. Check the piston pin fit in the piston. It should be a sliding fit in the piston at 70 degrees F. Piston pins are supplied in standard sizes only.
2. Lubricate the piston pin holes in the piston and connecting rod.
3. Arrange the piston pin remover and installer C- 3724 for installation of piston pin (see figure 5-5).

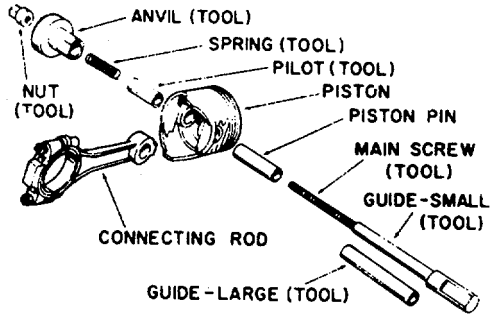


Figure 5-5. Tool Arrangement for Installing Piston Pin

4. Install the spring inside the pilot and install the spring and pilot in the anvil.
5. Install the piston pin over the main screw.
6. Place piston, with "Notch Front" up, over pilot so that the pilot extends through the piston pin holes.
7. Position connecting rod over the pilot which extends through the piston hole. The oil hole in the connecting rod must point toward the right (i.e., toward left side of engine when installed).
8. Install the main screw and piston pin in the piston.
9. Install the nut on main screw to hold assembly together. Place assembly on an arbor press.
10. Press in the piston pin until piston pin bottoms on the pilot, properly positioning the pin in the connecting rod.
11. Remove the tool and arrange the tool parts and piston assembly in the same manner as shown in figure 5-1 for checking pin fit.
12. Place the assembly in a vise. Attach the torque wrench to nut and check torque up to 15 pound-feet. If the connecting rod moves downward on the piston pin, reject this connecting rod and piston pin combination. Install a new connecting rod and repeat the installation and checking procedure.
13. If the connecting rod does not move (under 15 pound-feet torque), the piston and connecting rod interference is satisfactory. Remove the tool.

14. Install connecting rod bearings so that small formed tang fits into machined groove in connecting rod.
15. Limits of taper or out-of-round on any crankshaft journal should be held to 0.001 inch. Refer to Section VI for standard and undersize bearings.

CAUTION

Install the bearings in pairs. Do not use a new bearing with an old bearing. Do not file the rods or bearing caps.

1.. Check piston rings as follows:

(a) Place compression ring gaps diametrically opposite one another and not in line with the oil ring gap.

(b) Turn the oil ring expander gap toward the right side of the engine. Turn the oil ring gap toward the left side of the engine.

16. Immerse the piston head and rings in clean engine oil. Slide the ring installer C-3805, over the piston and tighten with special wrench (part of Tool C-3805). Position of rings must not change during this operation.

NOTE

The notch on the top of the piston must point toward the left side (manifold side) of the engine to lubricate the cylinder walls.

17. Screw the connecting rod bolt protector (part of Tool C-3221) on one rod bolt, and insert the rod and piston into the cylinder bore. Rotate the crankshaft so that connecting rod journal is on center of cylinder bore.

18. Attach the puller part of Tool C-3221 on the other bolt, and guide the rod over the crankshaft journal.

19. Tap piston down in cylinder bore, using the handle of a hammer. At the same time, guide connecting rod into position on crankshaft journal.

20. Install the rod caps; tighten nuts to 45 pound-feet.

5-96. CAMSHAFT AND BEARINGS. (See figure 6-14.)

1. Install the new camshaft bearings with camshaft bearing remover and installer C-3132A by sliding the new camshaft bearing shell over the proper adapter.

2. Position bearing in the tool. Install horseshoe lock and drive bearing shell into place.

CAUTION

Camshaft bearing oil hole must be in exact alignment with the drilled oil passage from the main bearing.

3. Install remaining shells in like manner. Install No. 1 camshaft bearing 3/32 inch inward from front face of the cylinder block.

4. Use welch plug driver C-897 to install a new welch plug at the rear of camshaft.

CAUTION

Be sure this plug does not leak.

5. Lubricate the camshaft lobes and camshaft bearing journals and insert the camshaft in the cylinder block.

NOTE

Whenever an engine is rebuilt and a new camshaft and/or new tappets are installed, one quart of break-in oil should be added to the engine oil to aid in break-in. The oil mixture should be left in the engine for a minimum of 25 hours of operation. Drain the oil mixture at the next normal oil change.

6. Install sprocket (2) and secure with screw (3) and washer (4).
7. Install tappets (21).

NOTE

When replacing the camshaft, all of the tappet faces must be inspected for crown with a straight edge. If any negative crown (dish) is observed, the tappet must be replaced. The tappet must have a definite crown.

8. Turn crankshaft to line up centerline of camshaft and crankshaft with the timing mark on crankshaft sprocket.
9. Install camshaft sprocket (2) and timing chain (1).
10. Line up the timing marks on the sprockets with the centerline of crankshaft and camshaft. Tighten camshaft sprocket screw (3) to 35 pound-feet.
11. Place a scale next to timing chain so that any movement of the chain may be measured.
12. Place a torque wrench and socket over the camshaft sprocket lock bolt and apply torque in the direction of crankshaft rotation to take up the slack; 30 pound-feet (cylinder head installed) or 15 pound-feet (cylinder head removed). With a torque applied to camshaft sprocket bolt, the crankshaft should not be permitted to move. It may be necessary to block the crankshaft to prevent rotation.

13. Holding a scale with dimensional reading even with edge of a chain link, apply torque in the reverse direction 30 pound-feet (cylinder head installed) or 15 pound-feet (cylinder head removed) and note the amount of chain movement.

14. If the chain movement exceeds 11/16 inch, install a new timing chain. If chain is satisfactory, slide the crankshaft oil slinger (3, figure 6-16) over shaft and up against the sprocket (1) (flange away from sprocket).

15. Install pulley (20A) and vibration damper (21) on crankshaft.

5-97. VALVES AND CYLINDER HEAD.

1. Lubricate the valve stems (18 and 19, figure 6-14) and insert them in the cylinder head.
2. Install new oil shields(l6 and 17)on all valve stems (long seal on intake valve and short seal on exhaust valve) and over valve guides. Install valve springs (15) and retainers (14).
3. Compress the valve springs with valve spring compressor C-3422. Install locks (12 and 13) and release tool.

NOTE

If the valves and/or seats are reground measure the installed height of springs. Make sure measurement is taken from the bottom of the spring seat in cylinder head to the bottom surface of spring retainer. (If spacers are installed, measure from the top of spacer.) If height is greater than 111/16 inches, install a 1/16 inch spacer in head counterbore to bring spring height back to normal 1-5/8 inches to 1-11/16 inches.

4. Clean all gasket surfaces of cylinder block and cylinder head and install spark plugs. Check all surfaces with a straight edge if there is any reason to suspect leakage.
5. Coat the new head gasket with a suitable sealer. Install gasket and cylinder head assembly with cylinder head bolts. Starting at top center, tighten all cylinder head bolts to 65 pound-feet in sequence (see figure 5-6). Repeat the procedure, retightening all cylinder head bolts to specified torque.
6. Install push rods.
7. Assemble rocker assemblies and spacers on rocker shaft.
8. Install rocker arm and shaft assembly with "flat" on the end of the rocker shaft "on top" and pointing toward front of engine to provide proper lubrication to the rocker assemblies. Install rocker shaft retainers between rocker arms so they seat on rocker shaft and not on extended bushing of rocker arm. Tighten bolts to 30 pound-feet.
9. Make preliminary cold adjustment on tappets: 0.012 inch intake, 0.024 inch exhaust. Final hot adjustment must be made after complete reassembly and installation of engine.
10. Install air cleaner, valves, valve cover, et cetera.

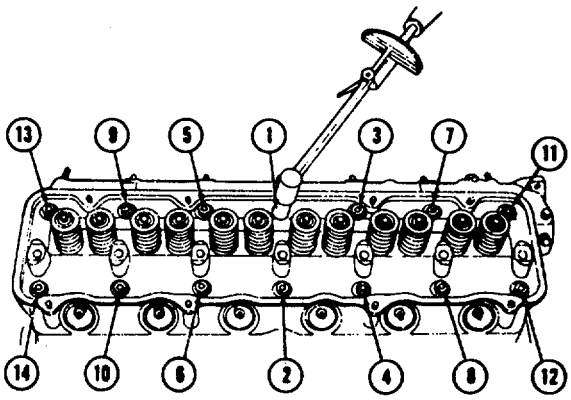


Figure 5-6. Cylinder Head Bolt Tightening Sequence

5-98. STEERING GEAR.

5-99. REMOVAL. (See figure 6-17.)

1. Disconnect the drag link from the pitman arm.
2. Remove the pitman arm.
3. Disconnect the horn wire from the connector assembly.
4. Remove the horn button (4), steering wheel (5) and column cover (6).
5. Remove the steering cap (7) and bushings (11).
6. Remove the clamp (25) and column (26).
7. Remove the cap screws (12), lock washers (13) and hex nuts (14) to detach the steering gear.
8. Withdraw the steering gear from the tractor.

5-100. DISASSEMBLY. (See figure 6-17.) Disassemble as shown on the exploded view noting the following:

1. Place the steering gear in a vise, clamping onto one of the mounting pads. The steering (worm) shaft (35) should be in a horizontal position.
2. Rotate the shaft from stop to stop, counting the total number of turns. Then turn back exactly half way, placing the gear on center.
3. Remove the three bolts (27) attaching the side cover (26) to the housing.
4. Tap lightly on the threaded end of the pitman shaft gear (33) with a plastic hammer and lift the side cover and pitman shaft assembly from the gear housing.

NOTE

If the pitman shaft sector does not clear the opening in the housing easily, turn the wormshaft by hand until the sector will pass through the opening in the housing.

5. Loosen and remove the adjuster plug lock nut (45). Remove the adjuster plug assembly.

6. Draw the wormshaft ball nut assembly from housing.

CAUTION

Use care that the ball nut does not run down to either end of the worm. Damage may be done to the ends of the ball guides if the ball nut is allowed to rotate until stopped at the end of the worm.

7. Where applicable use a suitable size screw driver to pry the lower bearing retainer (41) from the adjuster and remove the bearing.

8. Remove the jam nut from the preload adjuster screw in the side cover. Remove the preload adjuster screw from the side cover by turning the screw clock- wise. Slide the adjuster screw and shim out of the slot in the end of the pitman shaft.

9. Pry out and discard the pitman shaft seal (34).

10. If necessary, remove balls (39) as follows:

(a) Remove screw and clamp retaining the ball guides in ball nut. Draw guides out of ball nut.

(b) Turn the ball nut upside down and rotate the shaft back and forth until all the balls have dropped out of the ball nut into a clean pan. With the balls removed, the ball nut can be pulled endwise off the worm.

5-101. CLEANING AND INSPECTION.

1. With the steering gear completely disassembled, wash all parts in cleaning solvent. Dry them thoroughly with air. With a magnifying glass inspect the bearings and bearing races for signs of indentation. Also check for any signs of chipping or breakdown of the surface. Any parts that show signs of damage should be replaced.

2. Inspect all seals. Any seal that appears worn or has been removed should be replaced.

3. Inspect fit of pitman shaft in bushings in side cover and housing. If these bushings are worn, a new side cover with bushing or housing bushing should be installed.

4. Check steering gear wormshaft assembly for being bent or damaged in any way.

CAUTION

Never attempt to salvage steering parts by welding or straightening.

6. Using a magnifying glass inspect the worm and nut grooves and the surface of all balls for signs of indentation. Check all ball guides for damage at ends where they deflect or pick up the balls from the helical path. Any parts that show signs of damage should be replaced.

5-103. REPAIR AND REPLACEMENT. Refer to paragraph 5-9.

1. Do not remove housing bearing race unless necessary. Use a drift or punch carefully for this purpose. Install new race using special tool T-5755 (Saginaw).

2. Special tool J-5822 and slide hammer J-2619 should be used to remove the adjuster race. Install new race using tool J-5755.

3. If the housing bushing must be pressed out using special tool J-1614 or equivalent, use the same tool with an arbor press to install a new bushing.

5-103. REASSEMBLY. (See figure 6-17.)

1. Reassemble the shaft assembly as follows:

(a) Slip the ball nut (40) over the worm with the ball guide holes up and the shallow end of the rack teeth to the left from the steering wheel position. Align the grooves in the worm and nut by sighting through the ball guides holes.

(b) Place 27 bails (39) into separate containers. Push all but five of the balls from one container into either the upper or lower circuit, using a suitable pin or punch. Push all but five of the balls from the second container into the other circuit.

CAUTION

Do not rotate wormshaft while installing balls. All balls must be enclosed within two circuits.

(c) Lay one-half of the ball guide (38), groove up, on the bench and place the remaining five balls from the count container on it.

(d) Close this half of guide with other half. Hold the two halves together and plug each open end with grease so that balls will not drop out while installing the guide.

(e) Push the guide into the guide holes of the nut. This completes one circuit of balls. If the guide does not push all the way down easily, tap it lightly into place with the handle of a screw driver.

(f) Fill the second ball circuit in the same manner.

(g) Assemble the ball guide clamp to the ball nut and tighten the screw.

2. Check the steering shaft assembly by rotating the ball nut on the worm to see that it moves freely. Do not rotate the ball nut to the end of the worm threads as this may damage the ball guides. If there is any "stickiness" in the motion of the ball nut, some slight damage to the ends of the ball guides or to other gear components may have been overlooked.

3. After a major service overhaul where all of the original factory installed lubricant has been washed out of the steering gear assembly, the threads of the adjuster may be coated with a suitable non-drying, oil resistant

sealing compound such as Permatex No. 2 or equivalent. This is to prevent leakage of gear lubricant from the steering gear assembly. The compound should not be applied to female threads and extreme care should be exercised in applying this compound to the bearing adjuster, as the compound must be kept away from the worm shaft bearing.

4. Apply steering gear lubricant to the worm shaft bearings, pitman shaft bushings, and side cover bushing.
5. Place the steering gear housing in a vise with the worm shaft bore horizontal and the side cover opening up.
6. Install the pitman shaft seal, pitman shaft bushings and worm shaft bearing races and the ball nut.
7. Slip the upper worm thrust bearing (46) over the worm shaft and ball nut assembly into the housing, feeding the end of the shaft through the upper thrust ball bearing race.
8. Place the thrust bearing (42) in the adjuster plug bearing cup and press the stamped retainer (44) into place with a suitable socket. Make sure that the bearing is free to rotate after assembling the retainer.
9. Install the adjuster (44) and lock nut into the lower end of the housing (being careful to guide the end of the worm shaft into the bearing) until nearly all end play has been removed from worm shaft.
10. Position the preload adjuster (32) (with shim) in the slotted end of the pitman shaft. Check the clearance between the adjuster head and bottom of the slot with a feeler gauge. The adjuster must be free to turn, but the clearance should no the greater than .002 inch (0.05 mm). If clearance is greater than specified, or if the adjuster is not free to turn, a preload adjuster shim unit is available. It contains four shims.
11. Lubricate the steering gear with 11 oz. (312 grams) of lubricant. Rotate the worm shaft until the ball nut is at the end of its travel and then pack as much new lubricant into the housing as possible without losing it out the pitman shaft opening. Rotate the worm shaft until the ball nut is at the other end of its travel and pack as much lubricant into the opposite end as possible.
12. Rotate the worm shaft until the ball nut is in the center of travel. This is to make sure that the pitman shaft sector and ball nut will engage properly, with the center tooth of the sector entering the center tooth space in the ball nut.
13. Tape the spline on the end of the pitman shaft to prevent seal damage, then insert the pitman shaft assembly (with preload adjuster screw and shim but without side cover) into the housing so that the center tooth of the sector enters the center tooth space in the ball nut.
14. Pack the remaining portion of lubricant into the housing, and place a quantity in the side cover bushing hole.
15. Place the side cover gasket on the housing.
16. Install the side cover onto the pitman shaft by reaching through the side cover with a screw driver and turning the preload adjuster screw counterclockwise until the screw bottoms; back the screw off one-half turn. Loosely install a new lock nut onto the adjuster screw.
17. Install and tighten the side cover bolts to 30 lb-ft.

5-104. ADJUSTMENT ON BENCH.

1. Tighten the adjuster plug until all end play has been removed and then loosen one-quarter turn.
2. Using a 12-point socket and an in.-lb. Torque wrench, carefully turn the worm shaft all the way to the right corner and then turn back about one-half turn.
3. Tighten the adjuster plug until the proper thrust bearing preload is obtained (paragraph 5-105). Tighten the adjuster plug lock nut to 85 lb-ft.
4. Turn the worm shaft from one stop all the way to the other, counting the number of turns. Then turn the shaft back exactly half the number of turns to the center position.
5. Turn the preload adjuster screw clockwise to remove all lash between the ball nut and sector teeth. Tighten the lock nut.
6. Again using the 12-point socket and an in.-lb. torque wrench, observe the highest reading while the gear is turned through center position. Refer to paragraph 5-105 for proper over-center adjustment.
7. If necessary, readjust preload adjuster screw to obtain proper torque. Tighten the lock nut to 25 lb-ft. And again check torque reading through center of travel.

NOTE

Adjustments may be made with the steering installed. Remove the horn button and disconnect the pitman arm first.

5-105. ADJUSTMENT SPECIFICATIONS.

Adjustment	Torque to Turn Worm Shaft (Inch Pounds)
Worm Bearing preload	5 to 8
Sector preload - in excess of worm bearing preload	4 to 10
Maximum total preload with gear in center position	16

5-106. INSTALLATION. (See figure 6-17.) Install the steering gear in the reverse order of removal.

5-107. FRONT WHEELS AND HUBS.

5-108. Maintenance for front wheels is covered in paragraphs 4-32.

5-109. FRONT AXLE AND DRAG LINK.

5-110. REMOVAL AND DISASSEMBLY. (See figure 6-19.) The drag link, tie rods and front axle itself can be removed independently. Remove and disassemble as shown on the exploded view. The front of the tractor must be jacked up to gain access. Remove front wheels as necessary.

NOTE

Disconnect and cap hydraulic brake lines before axle or brake removal.

5-111. CLEANING. Refer to paragraph 5-7. Wash all parts in cleaning solvent. Use a brush to clean out the internally threaded ends of the drag link. Use a fine mill file to remove burred or scored areas from the ball studs. Replace any ball studs with a worn flat spot.

5-112. INSPECTION. Refer to paragraph 5-8.

5-113. REPAIR AND REPLACEMENT. Repair of front axle compounds shall be confined to the replacement of worn or damaged parts. Pay particular attention to the steering knuckle pin and bushings. Any looseness of the pin to steering knuckle fit can cause rapid wear and premature failure of the pin as well as defective steering.

5-114. REASSEMBLY AND INSTALLATION.

(See figure 6-19.) Reassembly and installation are the reverse of disassembly and removal. Note the following instructions:

1. Press new bushings (35) into the steering knuckles (34). Bushings should be flush with the inside edges of the bearing bores. Line ream bushings to 1.6065-1.6075 inches. Line burnish the bushings to 1.6095-1.6105 inches.
2. Install the plug (23) and stake in place.
3. Position the steering knuckles (34) on the axle tube assembly (36). Install the shims (29) and thrust bearing (30). Shim the knuckle to obtain a clearance between the knuckle and axle tube end of 0.015 inch maximum.
4. Press the knuckle pin (28) in place. Drive the draw pin (27) into the axle tube end to secure. The flat on the draw pin must be aligned with the corresponding flat on the knuckle pin. Various size draw pins are available for proper installation of the knuckle pin.
5. Adjust the tie rod assembly for zero toe-in of the front wheels. Then install the cotter pins (9).
6. Lubricate front axle after reassembly.

5-115. SUSPENSION.

5-116. REMOVAL AND REASSEMBLY. (See figure 6-20 or 6-28A.) Jack up end of tractor and front wheels and axle as applicable. Remove and disassemble as shown on the exploded view.

5-117. CLEANING. Refer to paragraph 5-7. Clean springs with steam, hot soapy water or cleaning solvent. Clean off all road dirt, oil and grease. Wash the spring shackle bolts in cleaning solvent.

5-118. INSPECTION. Refer to paragraph 5-8.

5-119. REPAIR OR REPLACEMENT. Inspect all parts for wear and breakage. Replace all defective, worn, or damaged parts. Refer to paragraph 5-9.

5-120. REASSEMBLY AND INSTALLATION. (See figure 6-20 or 6-28A.) Reassembly and installation are the reverse of disassembly and removal. Lubricate springs after reassembly and installation.

5-121. FRONT BRAKES.

5-122. REMOVAL AND DISASSEMBLY. (See figure 6-21.) Remove and disassemble as shown on the exploded view.

5-123. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8. Inspect the shoes, springs and adjusters for wear and corrosion. Check wheel cylinders for leakage and deterioration.

5-124. REPAIR AND REPLACEMENT. Refer to paragraph 5-9. Replace all defective parts.

NOTE

Use repair kit available to repair wheel cylinders.

5-125. REASSEMBLY AND INSTALLATION. (See figure 6-21.) Reassembly and installation are the reverse of disassembly and removal.

5-126. ADJUSTMENT.

1. Locate the two cam-type adjusters on the rear of the brake plates.
2. Adjust one adjuster at a time by spinning the wheel and turning the adjuster until the brake shoe contacts the brake drum. Back off slightly to permit the wheel to turn freely.
3. Adjust the second adjuster as described in step 3.
4. Adjust the brake shoes on the other front wheel.

5-127. BRAKE CONTROL GROUP.

5-128. REMOVAL AND DISASSEMBLY. (See figure 6-22.) Remove and disassemble as shown on the exploded view.

5-129. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8. Inspect all parts of the master cylinder for wear and deterioration. Check the brake lines and fittings for kinks, restrictions and damaged threads.

5-130. REPAIR AND REPLACEMENT. Refer to paragraphs 5-9 and 5-10. Replace all defective parts.

5-131. REASSEMBLY AND INSTALLATION. (See figure 6-22.) Reassembly and installation are the reverse of disassembly and removal. Fill the master cylinder with hydraulic brake fluid, bleed the brake system and adjust pedal free play.

5-132. BLEEDING BRAKE SYSTEM. If a brake line opens or all fluid is lost from the system, air will enter the system and cause "spongy" brake action. To bleed the system, proceed as follows:

1. Clean all dirt from the master cylinder and fill the cylinder with brake fluid and replace the fill plug.
2. Open the bleed screw on the right gear wheel about 1/8 turn and press the brake pedal slowly. At the bottom of pedal movement, close the bleed screw BEFORE the pedal is released. Repeat the procedure until only brake fluid comes from the bleed screw opening.

NOTE

An alternate method is to connect a tube to the bleed screw and immerse the free end of the tube in a can of hydraulic brake fluid. Keep end of tube immersed and pump brake pedal until no air bubbles appear. Shut off bleed screw and fill master cylinder.

3. Close the bleed screw fully. Fill the master cylinder with fluid and repeat the procedure for the left rear wheel.
4. Repeat the above procedure for the front wheels.
5. When the system is free of air, fill the master cylinder and install the fill plug securely. If the "spongy" brake action returns, the brake lines may have a small leak or the master cylinder may be defective. In this case, repair the brake system.

5-133. BRAKE PEDAL ADJUSTMENT.

1. Check brake pedal free travel for a 1.0 to 1.5 inch travel. Free travel can be felt best by depressing the brake pedal by hand until a resistance is felt.
2. To adjust free travel, loosen the lock nut on the bolt just underneath the brake return spring. Turn the bolt in or out to allow proper free travel. Operate the foot pedal and check free travel. Readjust as necessary. After adjustment, tighten the lock nut to hold the bolt in place.
3. Check the action of the brake pedal return spring. The return spring should move the brake pedal firmly and positively to the normal position. If the spring is defective the weight of the brake arm may cause a brake drag. Install a new spring if necessary.

5-134. REAR WHEELS.

5-135. Maintenance of the rear wheels is covered in paragraph 4-33.

5-136. REAR BRAKES.

5-137. DISASSEMBLY. (See figure 6-27.) Disassemble as shown on the exploded view.

5-138. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8. Inspect the shoes and springs for wear and damage.

5-139. REPAIR AND REPLACEMENT. Replace any part of the brake assembly which is defective. Use repair kit to repair wheel cylinders.

5-140. INSTALLATION. (See figure 6-27.) Installation is the reverse of removal.

5-141. ADJUSTMENT.

1. Locate the two adjusting studs on the rear of the brake plates. The studs are located on the upper part of the brake plate toward the edge.
2. Adjust one stud at a time by spinning the wheels and turning the stud until the brake shoe contacts the brake drum. Back off the stud slightly to permit the wheels to turn freely.
3. Adjust the second stud as described in step 2.
4. Adjust the brake shoes on the other rear wheels as described in steps 2 and 3.

5-142. DRIVE SHAFT.

5-143. REMOVAL AND DISASSEMBLY. (See figure 6-23.) Remove and disassemble as shown on the exploded view.

5-144. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8.

5-145. REPAIR AND REPLACEMENT. Refer to paragraph 5-9. Replace all defective parts.

5-146. REASSEMBLY AND INSTALLATION. (See figure 6-23.) Reassembly and installation are the reverse of disassembly and removal. Lubricate unit after installation.

5-147. REAR AXLE ASSEMBLY.

5-148. REMOVAL.

1. Disconnect or remove the drive shaft.
2. Disconnect the hydraulic brake lines at the rear wheels. Cap brake lines to prevent entry of foreign materials.
3. Raise the rear of the tractor about 12 inches (or more) off the floor and support the tractor by means of blocks, jacks or other suitable means. Install the supports ahead of the rear axle.
4. Place a jack under the rear axle. Support the weight of the axle on the jack and remove the cap screws, lock washers and hex nuts securing the axle to the springs.
5. Carefully lower the rear axle to clear the frame and pull the axle aft. Drain oil from the drop gear case and differential housing.

5-149. DISASSEMBLY. (See figures 6-24, 6-25 and 6-26.) Disassemble as shown on the exploded views.

5-150. CLEANING. Clean each subassembly of the rear axle separately so that similar parts are not interchanged. Keep bearing cones and bearing cups together as a unit so that similar sized cups and cones can be reinstalled in the same location from which removed.

1. Use a bearing washer to clean all roller bearings. Be sure all oil, grease and sludge is removed from the recesses in the bearings. Allow bearings to air dry.

2. Use a soft bristle brush and cleaning solvent to clean gears and pinions. Clean threaded holes, cutout sections, grooves and orifices thoroughly. Use emery cloth and an oil stone to remove peaks and pits from gear teeth and the splines. Worn gears, pinions and splines that cannot be cleaned without removing excess metal must be replaced.

3. Clean all castings with brushes, cloth, and cleaning solvent. Clean out all corners, ridges, grooves, and mounting holes. Wipe the parts dry with lint-free cloth. Use emery cloth and an oil stone to clean and polish bearing recesses. Do not polish in flat spots, if bearing recesses are badly scored or galled.

5-151. INSPECTION. Perform a visual inspection of parts for excessive wear or damage. Badly worn or damaged parts must be replaced. Check during reassembly for proper clearances, end play and backlash. Further inspect as follows:

1. Examine all gears, pinions, bearing cones, bearing cups and bearing recesses for evidence of wear, scoring or galling. Remove minor imperfections with crocus cloth and an oil stone.

2. Inspect the axle shafts for torsional damage. If equipment is available, magnaflux the shafts for internal stress. Replace axles and shafts that are damaged in any way.

5-152. REPAIR AND REPLACEMENT. Refer to paragraphs 5-9 and 5-10. Replace all defective parts.

5-153. REASSEMBLY. (See figures 6-24, 6-25 and 6-26.) Reassembly is the reverse of disassembly. Note the following instructions:

1. Tighten differential cap screws (16, figure 6-25) evenly. Be sure to apply lock wire (15).

2. After installation of differential assembly in carrier halves install the cap screws (26, figure 6-26), lock washers (25) and hex nuts (24). Tighten all cap screws evenly.

NOTE

Be sure that the thrustblock (34) and pin (33) are in place.

3. Install the bearing cups (15), cones (16) and collar (17) on the axle shafts (22). Position the shafts in the tubes so the shaft splines engage the side gear splines. Be sure that the bearings seat properly in the bearing cages. Install two 0.003 inch shims (14), three 0.005 inch shims, and two 0.010 inch shims on each bearing cage, followed by the bearing retainer (13), gasket(12), and retainer and seal assembly (8 and 11). Secure these parts with the cap screws (9) and lock washers (10).

4. After installation of the brake assemblies, install the wheel hub (7) with the studs (2) on each axle shaft. Be sure that the splines engage properly. Install the washers (6) and shaft nut (5). Torque the shaft nuts to 700 pound-feet and secure with cotter pins (4).

5. Install the bearing cups (8, figure 6-25) and cones (7) with the spacer (9) in the bearing cage (4). Use the same size spacer as originally installed unless the drive pinion (10) and bevel gear (13) are to be replaced. If a new gear and pinion set are installed, select the correct spacer to provide proper bearing fit.

6. Install the drive pinion (10) in the bearings. Place the ball bearing (12) on the pinion and secure with the retaining ring (11). Install this entire assembly with the gasket (6) in the differential housing, taking care that the pinion engages the bevel gear properly. The bearing cage must be flush with the face of the differential housing.

7. Place the pinion gasket (3) on the bearing cage (4). Mount the gear case (31, figure 6-24) on the differential housing studs with the castellated nuts (33) and flat washers (34). Apply lock wire (32) to the nuts.

8. Place the washer (2, figure 6-25) on the drive pinion (10). Install the oil seal (37, figure 6-24) and retainer(36). Position the gear (30) on the pinion and key (1, figure 6-25).

9. Install and torque the inner bearing nut (28, figure 6-24) so that the pinion bearings are 0.000 to 0.003 inch loose (5 to 15 pound-inches of torque to turn shaft). Install nut lock (29) and outer bearing nut.

10. Install the bearings (22 and 24, figure 6-24), spacers (25), gear (26) and retaining ring (23) on the input shaft (27). Install this assembly in the gear case (31). Be sure that the bearing (22) seats in the case properly and the gear teeth mesh properly.

11. Install the gear case cover (12) and gasket (16) with 15 nuts (13), lock washers (14) and bolts (15). Tighten the bolts and nuts evenly.

12. Press a new oil seal (21) into the front cap (17). Install this unit and gasket (20) with four cap screws (18) and lock washers (19).

13. Place the yoke (2) on the input shaft with washer (5) and secure with one castellated nut (4) and cotter pin (3).

14. Install the rear cap (7) and gasket (10) with four cap screws (8) and lock washers (9). Thread in the breather (6).

15. Install the drain plugs. Fill the gear case and differential housing with the prescribed lubricant. Refer to Section IV. Install the fill plugs. Check for leaks at the gaskets to be sure all mating surfaces are tight.

5-154. INSTALLATION. Install rear axle assembly in the reverse order of removal.

5-155. TRANSMISSION AND TORQUE CONVERTER.

5-156. REMOVAL FROM TRACTOR.

CAUTION

The transmission and torque converter must be removed and installed as an assembly. Otherwise, the converter drive plate, front pump bushing, and oil seal will be damaged. The drive plate will not support a load; therefore, none of the weight of the transmission should be allowed to rest on the plate during removal or installation.

NOTE

It will be necessary to provide some means of turning the engine over during removal of the transmission and torque converter. This is done most easily by using a remote starter switch which is connected to the starter solenoid.

1. Remove the deck plate and rear body assembly as necessary to gain access to the transmission.
2. Disconnect the drive shaft at the parking brake flange.
3. Disconnect high tension wire from distributor cap.
4. Place the gear shift lever in the Neutral position. Then raise the vehicle on a hoist or support with stands.
5. Remove dust shield (1, figure 6-29) from the front of converter to provide access to the converter drain plug and drive plate to converter bolts.
6. Rotate engine to gain access to the converter drain plug (figure 5-7). Remove plug; rotate converter so drain opening is at the low point.

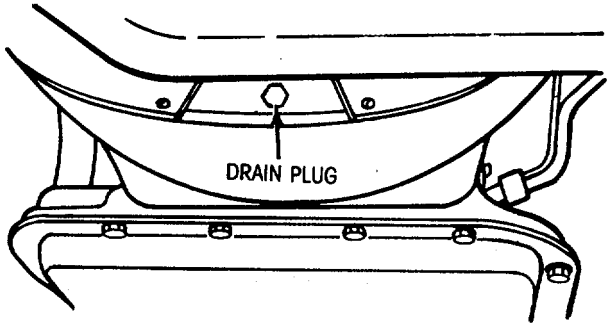


Figure 5-7. Drain Plug Location

7. Remove drain plug (10, figure 6-30) from transmission oil pan and drain the transmission.
8. Rotate engine as required to remove the four cap screws and lockwashers (4, figure 6-29).

CAUTION

Do not rotate converter or drive plate by prying with a screw driver or similar tool as the drive plate might become distorted. Also, the starter motor should never be engaged if the drive plate is not attached to the converter with at least one bolt or if the transmission mounting cap screws have been loosened.

9. Disconnect negative (ground) cable from the battery.
10. Remove the starter motor.
11. Disconnect wire from neutral starting switch.
12. Disconnect the gear shift control cable from the gearshift control lever on the transmission. (See figure 5-8).

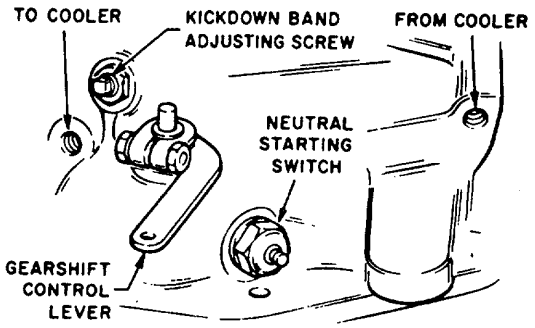


Figure 5-8. Location of Gearshift Control Lever

NOTE

If the control lever is to be removed from the transmission shaft, note the position of the lever on the shaft before removal.

13. Disconnect oil cooler lines and vent line at the transmission and remove oil filler tube.
14. Disconnect parking brake cable from the parking brake.

NOTE

There is no speedometer cable connection to the transmission.

15. Install a suitable engine support fixture that will support rear of the engine.
16. Raise the transmission slightly to relieve the load on the supports. Use a hoist or jack for this purpose.
17. Remove transmission mounting hardware and insulators.
18. Remove six cap screws and washers (7, 8 and 9, figure 6-29) which secure the transmission housing to engine block.
19. Carefully work the transmission and torque converter rearward off the block. Attach a small "C" clamp to the edge of the transmission housing to hold the converter in place. Otherwise the front pump bushing may be damaged.
20. Carefully remove the transmission and torque converter from the tractor. The unit can be raised up from the tractor using a hoist or it can be removed from underneath the tractor. The former method is preferable. If the transmission and converter is to be lowered, the transmission support must be removed.
21. Place the transmission and converter in repair stand C-3750 with adapter C-3882 or equivalent to the one shown in figure 5-9.

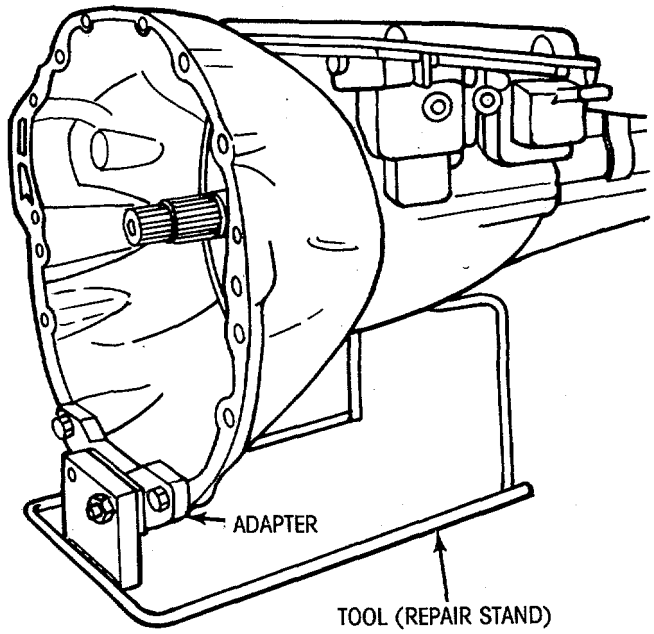


Figure 5-9. Transmission Installed on Control Stand

22. Remove the "C" clamp holding the torque converter to the transmission housing.
23. Remove six cap screws (11, figure 6-29) and to remove the drive plate (10).

5-157. TORQUE CONVERTER FLUSHING AND REMOVAL. In the event that any part has failed in the transmission, the torque converter should be flushed to insure that fine metal particles are not later transferred back into the reconditioned transmission. The torque converter must be removed from vehicle for flushing.

1. Place torque converter in an upright position and pour two quarts of new clean solvent into converter through the impeller hub.
2. Turn and shake the converter so as to swirl the solvent through the internal parts. Turning the turbine and stator with transmission input and reaction shafts will aid in dislodging foreign material.
3. Position the converter in its normal operating position with drain plug at the lowest point. Remove drain plug and drain the solvent. Rotate the turbine and stator, and shake converter while draining to prevent dirt particles from settling.
4. Repeat the flushing operation at least once, or as many times as required until the solvent drained out is clear.
5. After flushing, shake and rotate the converter several times with drain plug out to remove any residual solvent and dirt. Flush any remaining solvent from the converter with two quarts of new transmission fluid. This will prevent any adverse effect the solvent may have on the transmission seals. Reinstall drain plug and tighten to 14 pound-feet.
6. Carefully slide the converter from the transmission, taking care not to damage the impeller hub, input shaft or reaction shaft.

NOTE

The torque converter should not be disassembled.

5-158. GENERAL DISASSEMBLY OF TRANSMISSION. The instructions in this paragraph cover the disassembly of the transmission into major components. This will include the removal of some detail parts which must be removed to gain access. Disassembly procedures for the components are given in paragraphs 5-159 through 5-164. In-vehicle tests which can be performed to determine the cause of transmission malfunction are given in paragraphs 5-185 through 5-187.

NOTE

Prior to removing any of the transmission sub-assemblies, plug all openings and thoroughly clean the exterior of the unit. Cleanliness throughout the entire disassembly and assembly cannot be overemphasized. When disassembling, each part should be washed in a suitable solvent, then dried by compressed air. Do not wipe parts with shop towels. All of the mating surfaces in the transmission are accurately machined. Careful handling of parts must be exercised to avoid nicks or burrs.

1. Measure the drive train end play before removal of the output shaft universal joint flange. This will usually indicate when a change in the thrust washer between the reaction shaft support and front clutch retainer is required to properly adjust end play during assembly (except when major parts are replaced).

(a) Attach a dial indicator to the transmission bell housing with its plunger seated against the end of input shaft (figure 5-10).

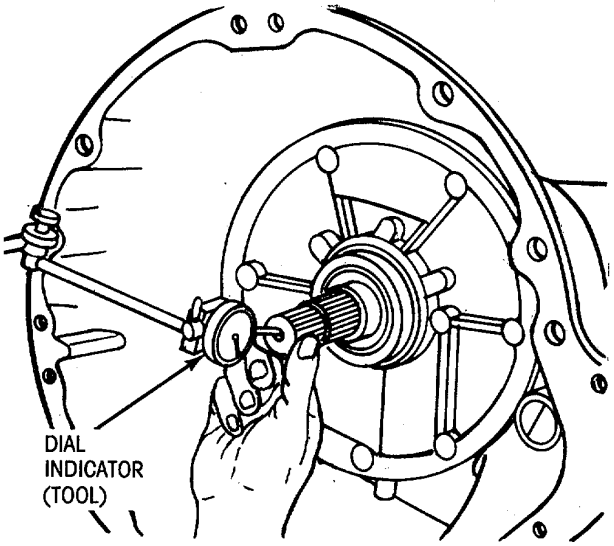


Figure 5-10. Measuring Drive End Plug

(b) Chuck the input shaft in and out to obtain the end play reading.

(c) Record the indicator reading for reference when reassembling the transmission. The end play specifications are 0.036 to 0.084 inch.

2. Remove the parking brake assembly from the transmission extension.

3. Disassemble further as shown on the exploded view. Note the following.

4. To lift out the control valve assembly (15), cock the valve assembly slightly to permit the lever shaft to clear.

5. Using a screwdriver, carefully pry retaining ring (1, figure 6-33) from the weight end of governor valve shaft. Slide the valve and shaft assembly (2 and 3) out of governor housing.

6. Remove ring (14, figure 6-33) from behind the governor housing. Then slide the governor housing and support assembly off the output shaft.

NOTE

If replacement of output shaft support (9, figure 6-30) is required, drive it rearward out of the case with a wood block after the transmission has been disassembled.

7. Remove the front oil pump housing screw and washer assemblies (3, figure 6-38). Remove the vent shield (5).

8. Tighten the front band adjusting screw until the band is tight on the front clutch retainer. This prevents the clutch retainer from coming out with the pump which might cause unnecessary damage-to the clutches.

9. Thread two studs or bolts into the flange holes at 9 and 3 o'clock locations. Pull outward evenly on the two studs alternately to withdraw oil pump and reaction shaft support assembly from the case.

10. Loosen the front band adjuster, remove the band strut, and slide the band out of the case.

11. Slide the front clutch assembly out of the case.

12. Grasp the input shaft, and slide input shaft and rear clutch assembly out of the case.

CAUTION

Be careful not to lose the thrust washer located between rear end of input shaft and forward end of output shaft.

13. While supporting the output shaft and driving shell, carefully slide the assembly forward and out through the case.

CAUTION

Be very careful not to damage ground surfaces on the output shaft during removal.

14. Remove the low-reverse drum. Loosen the rear band adjuster and remove the band strut and link; then remove the band from the case.

5-159. DISASSEMBLY OF SERVOS, BAND AND GOVERNOR ASSEMBLIES. Disassemble as shown on the exploded view, figures 6-33 thru 6-37.

NOTE

Do not remove bushings and sleeve bearings from the front pump body, reaction shaft, clutch or piston retainers unless these parts need replacement. Special tools should be used for the installation of these parts. If special tools or equivalent are not available, replace the subassembly as a unit, when necessary.

5-160. DISASSEMBLY OF FRONT PUMP AND REACTION SHAFT. (See figure 6-38.)

1. Remove the bolts (10) and vent baffle (12). Withdraw the reaction shaft and support assembly (9).

2. Remove the rotor set (11) from the oil pump body assembly (2).

3. Remove and discard the seal rings (8) and gasket (6).
4. Drive the oil seal (1) from the pump body assembly with a blunt punch.
5. Do not press out the bushing (4) unless replacement is required.

5-161. DISASSEMBLY OF CLUTCHES. Disassemble as shown on the exploded view, figures 6-39 and 6-40.

5-162. DISASSEMBLY OF OUTPUT SHAFT AND GEAR TRAIN. (See figure 6-41.)

1. Measure the end play of the planetary gear assemblies, sun gear and driving shell before removing these parts from the output shaft. With the assembly in an upright position, push the rear annulus gear support hub and the shoulder on the output shaft. The clearance should be 0.010 to 0.039 inch. If clearance exceeds limits, replace thrust washers and/or necessary parts.
2. Remove thrust washer (1) from forward end of output shaft (15).
3. Remove selective ring (2) from forward end of output shaft; then slide front planetary gear assembly (3) off the shaft.
4. Slide front annulus gear assembly (5) off the planetary gear set. Remove thrust washer (4) from rear side of planetary gear set.
5. Slide sun gear (10), driving shell (8), and rear planetary gear assembly (12) off the output shaft.
6. Lift sun gear and driving shell off the rear planetary gear assembly. Remove thrust washer (6) from inside the driving shell. Remove ring (7) and plate (9) from sun gear (rear side of driving shell) and slide sun gear out of the shell. Remove front ring (7) from sun gear if necessary. Note that the front end of sun gear (10) is longer than the rear.
7. Remove thrust washer (11) from forward side of rear planetary gear assembly. Remove planetary gear assembly (12) from annulus gear assembly (13). Remove thrust plate (12A).

5-163. DISASSEMBLY OF OVERRUNNING CLUTCH. (See figure 6-42.)

1. Note the position of the overrunning clutch, rollers (3) and springs (4) before disassembly to assist in reassembly.
2. Carefully slide out clutch race (5) and remove rollers (3) and springs (4). If overrunning clutch cam (1) and/or roller spring retainer (2) are found damaged or worn, proceed to step 3.
3. Remove the setscrew from the transmission case below the clutch cam. Insert a punch through the support bolt holes and drive the cam from the case. Alternate the punch from one bolt hole to another to drive the cam out evenly.

5-164. DISASSEMBLY OF CONTROL VALVE.

CAUTION

Never clamp any portion of the valve body or transfer plate in a vise. Any slight distortion of the aluminum body or the transfer plate will result in sticking valves, excessive leakage or both. When removing or installing valves or plugs, slide them in or out carefully. Do not use force.

1. Place the control valve assembly on repair stand if available.
2. Remove three screws and washer assemblies (2, figure 6-31) and lift off the filter (1).
3. While holding the spring retainer (17, figure 6-32) firmly against the spring force, remove the three retaining screws and washer assemblies (18). Remove spring retainer, torque converter control valve spring (19) and line pressure adjusting screw (21) and nut (22).

NOTE

Do not alter the setting of the line pressure adjusting screw and nut. The nut has an interference thread and does not turn easily on the screw.

4. Slide the spring (23) and regulator valve (24) out of the valve body. Slide torque converter control valve (20) out of the valve body.
5. Remove the 14 transfer plate retaining screws and washer assemblies (6, figure 6-31). Carefully lift the transfer plate (5) and steel plate assembly off the valve body.
6. Invert transfer plate assembly. Remove two screws and washer assemblies and the stiffener plate (7).
7. Remove remaining screws securing steel plate (8) to transfer plate, and carefully lift off steel plate.
8. Note location of the six steel balls (37 and 38, figure 6-32) in the valve body, one of them is larger than the other five and is in the larger chamber. Remove the steel balls.
9. Invert valve body and lay it on a clean cloth or paper. Remove retaining ring from the throttle lever shaft. Remove any burrs from the shaft, then while holding manual lever detent ball and spring in their bore, slide manual lever (7, figure 6-31) off the throttle shaft. Remove detent ball and spring.
10. Remove the manual valve (25, figure 6-32). Carefully slide it out of valve body with a rotating motion.
11. Remove throttle valve lever (6, figure 6-31).
12. Remove shuttle cover (15, figure 6-32). Remove retaining ring (13) from the exposed end of shuttle valve (14).

13. Remove throttle lever stop adjusting screw (26) and nut (27). Be careful not to disturb the setting any more than is necessary.

14. Remove remaining parts from valve body as shown.

5-165. CLEANING, INSPECTION, AND REPAIR. Refer to paragraphs 5-7 through 5-10 for general information. In general all defective parts shall be replaced. This includes parts which are excessively worn, deteriorated, corroded, bent and otherwise distorted, galled, pitted, gouged, scored, and otherwise damaged or deformed. Repair which can be performed is given in the following sub-paragraphs.

1. *Governor*. The primary cause of governor operating failure is due to sticking governor valve or weights. Inspect all parts for burrs and wear. Inspect the inner weight for free movement in the outer weight, and outer weight for free movement in the governor body. Inspect the valve for free movement in the governor body. The weights and valve should fall freely in the bores when clean and dry. Rough surfaces may be removed with crocus cloth. Inspect the governor weight spring for distortion. Thoroughly clean all governor parts in clean solvent and inspect for free movement before assembly.

2. *Front Oil Pump and Reaction Shaft*. Inspect interlocking seal rings on reaction shaft support for wear or broken locks, make sure they turn freely in the grooves. Do not remove rings unless conditions warrant. Inspect the pump body and reaction shaft support bushings for wear or scores. Inspect machined surfaces on oil pump body and reaction shaft support for nicks and burrs. Inspect oil pump rotors for scoring or pitting. With rotors cleaned and installed in pump body, place a straight edge, across face of rotors and pump body. Using a feeler gage, check clearance between straight edge and face of rotors; clearance limits are from 0.001 to 0.0025 inch. Measure the rotor tip clearance between the inner and outer rotor teeth; clearance limits are from 0.005 to 0.010 inch.

3. *Control Valve*. Allow the parts with a maximum pressure of 30 psi to soak a few minutes in a suitable clean solvent. Wash thoroughly and blow dry with compressed air. Make sure all passages are clean and free from obstructions.

(a) Inspect the manual and throttle valve operating levers and shafts for being bent, worn or loose. If a lever is loose on its shaft, it may be silver soldered only, or the lever and shaft assembly should be replaced.

CAUTION

Do not attempt to straighten bent levers

(b) Inspect all mating surfaces for burrs, nicks and scratches. Minor blemishes may be removed with crocus cloth, using only a very light pressure. Using a straight edge, check all mating surfaces for warpage or distortion. Slight distortion may be corrected, using a surface plate. Make sure all metering holes in the valve body plate are open. Using a pen light, inspect bores in the valve body for scores, scratches, pits and irregularities.

(c) Check all valve springs for distortion and collapsed coils. Inspect all valves and plugs for burrs, nicks and scores. Small nicks and scores may be removed with crocus cloth, providing extreme care is taken not to round off sharp edges. The sharpness of these edges is vitally important because it prevents foreign matter from lodging between the valve and the valve body, thus reducing the possibility of sticking. Check all valves and plugs for freedom of operation in the valve body bores. When bores, valves and plugs are clean and dry, the valves and plugs should fall freely in the bores.

NOTE

The valve body bores do not change dimensionally with use. Therefore, a valve body that was functioning properly when the vehicle was new, will operate correctly if it is properly and thoroughly cleaned. There is no need to replace the valve body unless it is damaged in handling.

4. *Accumulator Piston and Spring*. Inspect the two seal rings for wear and make sure they turn freely in the piston grooves: It is not necessary to remove rings unless condition warrants. Inspect the piston for nicks, burrs, scores and wear. Check the piston bore in the case for scores or other damage. Check piston spring for distortion. Replace parts as required.

5. *Servo and Band Assemblies*. Inspect seal for deterioration, wear and hardness. Check piston and piston plug for nicks, burrs, scores and wear; piston plug must operate freely in the piston. Check the piston bore in the case for scores or other damage. Check springs for distortion. Check band lining for wear and bond of lining to the band. If lining is worn so grooves are not visible at the ends or any portion of the band, replace the band. Inspect the band for distortion or cracked ends.

6. *Overrunning Clutch*. Inspect clutch rollers for smooth round surfaces, they must be free of flat spots and chipped edges. Inspect roller contacting surfaces in the cam and race for brinelling. Check roller springs for distortion, wear or other damage.

7. *Clutches.*

(a) Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should also be replaced if they show evidence of material flaking off or if the facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect clutch plate and pressure plate surfaces for burning, scoring or damaged driving lugs. Replace if necessary.

(b) Check clutch plate lug grooves in clutch retainer for smooth surfaces; plates must travel freely in grooves. Inspect band contacting surface on clutch retainer for scores. Note the ball check; make sure the ball moves freely. Inspect seal surfaces in clutch retainer for nicks or deep scratches; light scratches will not interfere with sealing of neoprene seal rings. Inspect the clutch retainer bushing for wear or scores.

(c) Inspect inside bore of piston for score marks; if light, remove with crocus cloth. Check seal grooves for nicks and burrs. Inspect seal rings for deterioration, wear, and hardness. Check piston springs, retainer and retaining ring for distortion.

(d) Inspect rear clutch to front clutch thrust washer for wear. Washer thickness should be 0.061 to 0.063 inch; replace if necessary.

8. *Output Shaft and Gear Train.*

(a) Inspect bearing surfaces on output surfaces on output shaft for nicks, burrs, scores or other damage. Light scratches, small nicks or burrs can be removed with crocus cloth or a fine stone. Make sure all oil passages in the shaft are open and clean.

(b) Inspect bushings in sun gear for wear or scores, replace sun gear assembly if bushings are damaged. Inspect all thrust washers for wear and scores; replace if damaged or worn below specifications.

(c) Inspect thrust faces of planetary gear carriers for wear, scores or other damage, replace as required. Inspect planetary gear carrier for cracks and pinions for broken or worn gear teeth. Inspect annulus gear and driving gear teeth for damage. Replace distorted lock rings.

9. *Torque converter.* Inspect the drive plate for cracks and distortion and replace if necessary. Examine the ring gear for broken teeth and deformed teeth; replace the ring gear if damaged. Inspect the entire converter for leakage, breaks, dents and distortion; replace the assembly if defective.

10. Damaged or worn threads in the aluminum transmission case and valve body can be repaired by the use of Heli-Coils. Essentially, this repair consists of drilling out the worn or damaged threads, tapping the hole with a special Heli-Coil tap, and installing a Heli-Coil insert into the tapped hole. This brings the hole back to its original thread size. Some thread drag may occur in screwing a bolt into the installed Heli-Coil insert. Therefore, a torque reading should be taken of the thread drag with an inch-pound torque wrench and added to the specified bolt torque, so that all bolts securing a particular part will be tightened to the same torque.

5-166. GENERAL TRANSMISSION REASSEMBLY. The instructions for reassembly of the transmission in the following paragraphs provide a logical method of reassembly from a completely disassembled unit. Where a component has not required repair or overhaul, use the instructions as a checklist to insure that all parts are installed properly. Note the following instructions:

1. Observe all specified torque values.

2. It is recommended that all gaskets, seal rings, seals and packings be replaced at overhaul, unless otherwise specified by local directions.

3. If the shaft support (9, figure 6-30) was removed, proceed as follows:

(a) Screw two pilot studs C-3288 into the transmission case to guide the shaft support during installation. These same studs may also be used to install the front pump and reaction shaft.

(b) Chill the support in dry ice. After chilling, quickly position the support over the studs and drive it into the transmission case with a wood block and hammer.

(c) Remove the pilot studs after installation.

5-167. REASSEMBLY OF OVERRUNNING CLUTCH. (See figure 6-42.)

NOTE

Shaft support must be installed.

1. Clean all burrs and chips from the cam area in the case.

2. Place the spring retainer (2) on the cam (1), making sure the retainer lugs snap firmly into the notches on the cam.

3. Position the cam in the case with cam serrations aligned with those in the case. Tap the cam evenly into the case as far as possible with a soft mallet.

4. Install cam installer C-3863 and adapter SP-5124as shown in figure 5-11. Tighten nut on tool to seat cam in the case. Make sure cam is firmly bottomed. Then install cam retaining setscrew. Stake the case around the setscrew to secure.

5. Remove cam installing tools. Install and tighten output shaft support retaining screws to 140 pound-inches. Stake the case around the cam in six equidistant places with a blunt chisel.

6. With transmission case in upright position, install the clutch race (5), 12 rollers (3) and 12 springs (4). Check all parts to be sure that they are positioned properly in the transmission case.

5-168. REASSEMBLY OF OUTPUT SHAFT AND GEAR TRAIN. (See figure 6-41.)

1. Install rear annulus gear assembly (13) on output shaft (15). Apply a thin coat of grease to thrust plate (12A) and place it on the shaft making sure that teeth are over the shaft splines.

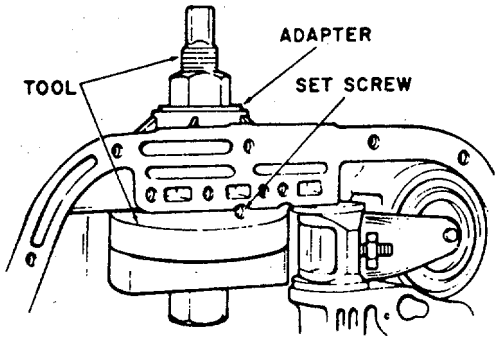


Figure 5-11. Location of Overrunning Clutch Cam

2. Position rear planetary gear assembly (12) in rear annulus gear assembly (13). Place thrust washer (11) on front side of planetary gear assembly.

3. Insert output shaft (15) in rear opening of the rear annulus gear. Carefully work the shaft through the annulus gear and planetary gear assembly. Make sure shaft splines are fully engaged in splines of the annulus gear.

4. Install ring (7) in front groove of sun gear (long end of gear). Insert sun gear (10) through front side of driving shell (8). Install rear thrust plate (9) and retaining ring (7).

5. Carefully slide the driving shell and sun gear assembly on output shaft, engaging sun gear teeth with the rear planetary pinion teeth. Place thrust washer (6) inside front of driving shell.

6. Place thrust washer (4) on rear hub of front planetary gear assembly (3); then slide the assembly into the front annulus gear assembly (5).

7. Carefully work the front planetary and annulus gear assembly on the output shaft, meshing planetary pinions with the sun gear teeth.

8. With all components properly positioned, install selective retaining ring (2) on front end of the output shaft. Re-measure the end play of the assembly (paragraph 4-85). The clearance can be adjusted by the use of various thickness rings. Retaining rings are available in 0.048-0.052 inch, 0.055-0.059 inch, and 0.062-0.066 inch thicknesses.

5-169. REASSEMBLY OF REAR CLUTCH. (See figure 6-40.)

1. Press the input shaft (14) into the piston retainer (12). Install the retaining ring (15).

2. Lubricate the seal rings (16) with transmission oil and install on the input shaft.

3. Lubricate and install inner and outer seals (10 and 11) on the clutch piston assembly (9). Make sure lip of seals face toward head of clutch retainer (17) and are properly seated in the piston grooves.

4. Place piston assembly in retainer (12) and, with a twisting motion, seat piston in bottom of retainers lines and support the assembly so the clutch retainer remains in place.

5. Place the clutch piston spring(8)and spacer ring (7) on top of piston in the clutch retainer. Make sure the spring and spacer ring are positioned in the retainer recess. Start one end of the wave spring (6) in the retainer groove; then progressively push or tap the spring into place making sure it is fully seated in the groove.

6. Install inner pressure plate (5) in retainer with raised portion of plate resting on the spring.

7. Lubricate all clutch plates (4) and discs (3). Install one lined plate followed by a steel plate until all plates are installed. Install outer pressure plate (2) and ring (1).

8. Measure the rear clutch plate clearance by having an assistant press downward firmly on the outer pressure plate; then insert a feeler gage between the plate and the retaining ring. The clearance should be between 0.037 to 0.060 inch. If not, install a retaining ring of proper thickness to obtain the specified clearance. Low limit clearance is desirable. Rear clutch plate clearance is very important in obtaining proper clutch operation. The clearance can be adjusted by the use of various thickness outer retaining rings. Rings are available in 0.060-0.062 inch, 0.074-0.076 inch, 0.088-0.090 inch and 0.106-0.108 inch thicknesses.

5-170. REASSEMBLY OF FRONT CLUTCH. (See figure 6-39.)

1. Lubricate seals (9 and 10) with transmission fluid.

2. Install inner seal (10) on hub of retainer (11). Make sure lip of seal faces down and is properly seated in the groove.

3. Install outer seal (9) on the clutch piston (8) with lip of seal toward bottom of the piston retainer. Place the piston in the retainer; carefully seat the piston in bottom of the retainer. Do not damage seals.

4. Place the springs on piston hub. Position the spring retainer (6) and retaining ring (5) on the springs. Compress springs and seat ring in the hub groove.

5. Lubricate all clutch plates (4) and discs (3). Install one steel plate followed by a lined plate until all plates are installed. Install the pressure plate (2) and retaining ring (1). Make sure the ring is properly seated.

6. With front clutch completely assembled, insert feeler gage between pressure plate (2) and retaining ring (1). The clearance should be 0.024 to 0.123 inch. If not, install a retaining ring of proper thickness to obtain the specified clearance. Retaining rings are the same as those used in the rear clutch.

5-171. REASSEMBLY OF FRONT PUMP AND REACTION SHAFT. (See figure 6-38.)

1. Press a new oil seal (1) into the oil pump body assembly (2). Be sure that the seal seats properly in the body assembly. The lip of the seal must face inward.
2. Install the rotor set (11) in the pump body assembly.
3. Install the reaction shaft and support assembly (9) in the pump body assembly. Position the vent baffle (12) and secure with seven hex head bolts (10).
4. Lubricate the seal rings (8) with transmission fluid and install on the reaction shaft.

5-172. REASSEMBLY OF KICKDOWN BAND. (See figure 6-37.)

1. If removed, install the lever (5), lever shaft (4), plug (3), adjusting nut (1), adjusting screw (2) and anchor (7) in the transmission case.
2. The strut (6) and band assembly (8) will be installed during reassembly of the complete transmission.

5-173. REASSEMBLY OF KICKDOWN SERVO. (See figure 6-36.)

1. Lubricate the seal rings (2 and 7) with transmission fluid and install on piston (8) and guide (3).
2. Carefully push the piston (8) into the transmission case with a twisting motion. Install the piston rod (6), springs (4 and 5) and guide (3).
3. Compress the servo assembly using valve spring compressor C-3422. Do not damage the seal rings.
4. Install the retaining ring (1) to secure the servo assembly.

5-174. REASSEMBLY OF LOW AND REVERSE BAND. (See figure 6-35.)

1. Assemble the short lever (9), lever assembly (5), and link and anchor (7) with the shaft (4). Lubricate the seal ring (3) with transmission fluid and install on the shaft.
2. Install the adjusting screw (1)and adjusting nut (2), but do not tighten.
3. Position the band assembly (8) in the transmission case.
4. Install the strut (6) and connect the link and anchor (7) to the band assembly.
5. Tighten the adjusting screw (1) and nut (2) just enough to hold the strut in place. Be sure that the link and anchor are installed properly to provide running clearance for the low and reverse drum.

5-175. REASSEMBLY OF LOW AND REVERSE SERVO. (See figure 6-34.)

1. Insert the spring (6) and plug (5) in the piston (8) and secure these parts with the retaining ring (4).
2. Lubricate seal ring (7) with transmission fluid and install on the piston (8).
3. Place the piston assembly in the transmission case, followed by the spring (3) and spring retainer (2). Use a twisting motion to insert the piston assembly.
4. Compress the spring using valve spring compressor C-3422 and install the retaining ring (1) to secure.

5-176. REASSEMBLY OF GOVERNOR. (See figure 6-33.)

1. Fasten the governor body (9) to the support (12) with the bolts (10) and bolt locks (11). Be sure that the mating faces of the body and support are clean.
2. Insert the spring (7) and inner weight (6) into the outer weight (8) and secure with the retaining ring (5).
3. Place the weight assembly in the governor body and install the retaining ring (4).
4. Install the seal ring (13) on the governor support.
5. The remaining parts will be installed during reassembly of the complete transmission.

5-177. REASSEMBLY OF CONTROL VALVE.

1. Position the valve body plate (8, figure 6-31) on the transfer plate (5), and install four steel plate-to-transfer plate retaining screw and washer assemblies. Make sure holes in steel plate and transfer plate are aligned; then tighten screws evenly to 28 pound-inches.
2. Install stiffener plate (7) and tighten two retaining screw and washer assemblies to 28 pound-inches.
3. Place the 1-2 and 2-3 shift valve governor plugs (5 and 8, figure 6-32) in their respective bores. Install shuttle valve (14), spring (12) and shuttle valve plug (11).
4. Install plug cover (9) and tighten the five screw and washer assemblies (10) to 28 pound-inches.
5. Install ring (13) on end of shuttle valve. Install shuttle cover (15) and tighten the four screw and washer assemblies (16) to 28 pound-inches.
6. Install the 1-2 and 2-3 shift valves (4 and 7) and springs (3 and 6). Install shift valve cover (1) and tighten the three screw and washer assemblies (2) to 28 pound-inches.
7. Install throttle pressure plug (36), sleeve (34) and line pressure plug (35). Install regulator valve cover (32) and tighten the two screw and washer assemblies (33) to 28 pound-inches.
8. Install the throttle valve (31) and spring (30). Slide the detent plug (28) on kickdown valve (29) with the counterbore side of detent toward valve. Then install the assembly in the valve body.
9. Install throttle lever adjusting screw (26) and nut (27) and tighten lock nut finger tight. Install manual valve (25) in the valve body.

10. Install throttle lever (3, figure 6-31) on the valve body. Insert detent spring and ball in its bore in the valve body. Depress ball and spring and slide manual lever (4) over throttle shaft so that it engages manual valve and detent ball. Install the retaining ring on the throttle lever shaft to secure.

11. Place the six steel balls in the valve body chambers with large ball in the large chamber (figure 5-12).

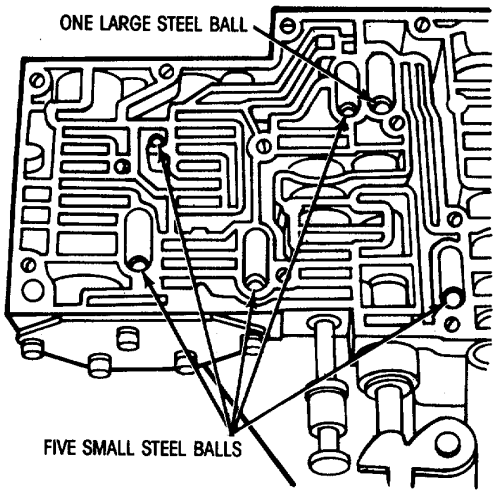


Figure 5-12. Steel Ball Location

12. Position transfer plate assembly on the valve body. Install the 14 screw and washer assemblies (6, figure 6-31) starting at the center and working outward. Tighten screws to 28 pound-inches.

13. Install the torque converter valve (20, figure 6-32) and the regulator valve (24). Position torque converter valve spring (19) and regulator valve spring (23) over ends of their respective valve. Place line pressure adjusting screw assembly (21 and 22) on end of regulator valve spring with long dimension of nut at right angles to the valve body.

14. Install spring retainer (17) making sure converter valve spring is engaged on tang and positioned squarely in the retainer. Tighten the three screw and washer assemblies (18) to 28 pound-inches.

15. Install oil filter (1, figure 6-31) and tighten the three screw and washer assemblies (2) to 28 pound-inches.

NOTE

After the control valve has been serviced and completely assembled, adjust the line pressure as specified in step 16. However, if pressures were satisfactory prior to disassembly, use original setting.

16. Adjust the line pressure as follows:

(a) Measure the distance between the manual valve (valve 1-low position) and line pressure adjusting screw (figure 5-13). This measurement must be 1-7/8 inches; correct by loosening the spring retainer screws and repositioning the spring retainer. The regulator valve may cock and hang up in its bore if the spring retainer is out of position.

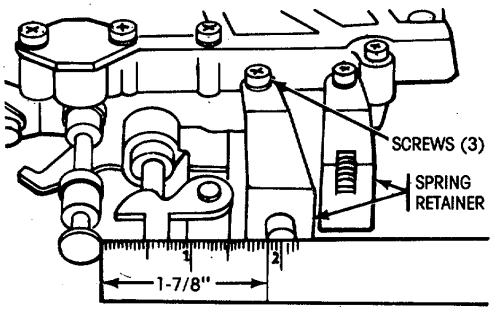


Figure 5-13. Measuring Spring Retainer Location

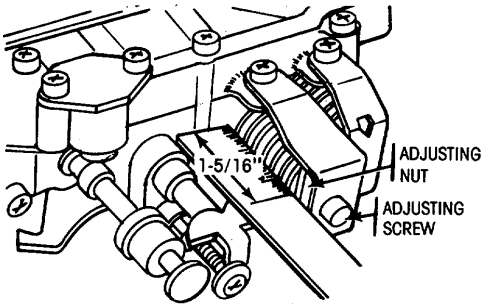


Figure 5-14. Line Pressure Adjustment

(b) The approximate adjustment is 1-5/16 inches, measured from the valve body to inner edge of the adjusting nut (figure 5-14). However, due to manufacturing tolerance, the adjustment can be varied to obtain the specified line pressure.

(c) The adjusting screw may be turned with an Allen wrench. One complete turn of the adjusting screw changes closed throttle line pressure approximately 1-2/3 psig. Turning adjusting screw counterclockwise increases pressure, and clockwise decreases the pressure.

17. The throttle pressure should not be adjusted since the tractor does not employ kickdown function. Do not disturb the setting of the throttle lever adjusting screw and nut.

5-178. TRANSMISSION REASSEMBLY. The procedures in this paragraph cover the reassembly of the transmission from components already assembled, either completely or partially. Reassembly can best be done with the transmission in an inverted or upright position. Use a repair stand to hold the transmission in these positions. Proceed as follows:

1. Install the low and reverse drum (14, figure 6-41) in the transmission.

2. Install the output shaft and gear train in the transmission. While supporting the assembly in the case, insert output shaft (15) through the rear support. Carefully work the assembly rearward engaging the rear planetary carrier lugs into the low-reverse drum slots.

CAUTION

Be very careful not to damage ground surfaces on the output shaft during installation.

NOTE

The front and rear clutches, front band, front oil pump and reaction shaft support are more easily installed with the transmission in an upright position.

3. Apply a coat of grease on the input to output shaft thrust washer (1, figure 6-41), and install the washer on the front end of the output shaft (15).

4. Align the front clutch plate inner splines and place the assembly in position on the rear clutch. Make sure the front clutch plate splines are fully engaged on the rear clutch splines.

5. Align the rear clutch plate inner splines, grasp the input shaft, and lower the two clutch assemblies into the transmission case.

6. Carefully work the clutch assemblies in a circular motion to engage the rear clutch splines over the splines of the front annulus gear assembly. Make sure the front clutch drive lugs are fully engaged in the slots in the driving shell.

7. Slide the band assembly (8, figure 6-37) over the front clutch assembly. Install the band strut (6) and turn in the adjusting screw (2) just enough to hold the strut and anchor in place.

8. If difficulty was encountered in removing the front oil pump and reaction shaft assembly due to an exceptionally tight fit in the case, it may be necessary to expand the case with heat during pump installation. Using a suitable heat lamp, heat the case in the area of the front pump for a few minutes prior to installing the front pump and reaction shaft.

9. If the drive train end play was not within specifications (0.036 to 0.080 inch) when measured (paragraph 5-158), replace the thrust washer (7, figure 6-38) on the reaction shaft support hub with one of the proper thicknesses. The following selective thrust washers are available:

Thickness	Color
0.061-0.063 inch	Green
0.084-0.086 inch	Red
0.102-0.104 inch	Yellow

10. Screw two pilot studs C-3288 into the threaded mounting holes for the front pump in the transmission case at the 3 and 9 o'clock positions. Install a new gasket (6, figure 6-38) over the pilot studs.

11. Install front pump and reaction shaft assembly in the case. Tap it lightly with a soft mallet if necessary. Place the vent shield (5) over the vent opening and install four screw and washer assemblies (3). Remove the pilot studs. Install and tighten the remaining screw and washer assemblies (3) evenly.

12. Rotate the input and output shafts to see if any binding exists. Then tighten the screw and washer assemblies to 150 pound-inches. Check the shafts again for free rotation.

13. Position the partially assembled governor assembly on output shaft. Align the assembly so the governor valve shaft hole in governor body aligns with the hole in the output shaft, then slide the assembly into place. Install retaining ring (14, figure 6-33) behind the governor housing. Tighten housing to support bolts (10) to 100 pound-inches. Bend ends of lock straps over bolt heads.

14. Place the governor valve (2, figure 6-33) on shaft (3). Insert the assembly into housing and through the governor weights. Install the shaft retaining rings (1).

15. Install case cover (7, figure 6-30) and gasket with three screw and washer assemblies (8).

16. Install the ball bearing (6) in the rear of the transmission extension (1) and secure with the retaining ring (5). Install a new oil seal (4) in the transmission extension. Use oil seal installer C-3837 to install seal.

17. Position the transmission extension (1) on the transmission case with gasket (3). Take care that the output shaft slides through the ball bearing and oil seal properly. Fasten the extension to the case with six screw and washer assemblies (2). Tighten the screws to 24 pound-feet torque.

NOTE

The parking brake assembly can be installed at this time or after the transmission and torque converter have been installed in the tractor.

18. Lubricate the seal rings (19 and 20, figure 6-30) with transmission fluid. Install the seal rings on the accumulator piston (18). Place the piston and the spring in the transmission case.

19. Install the neutral starting switch (21) with its packing (22).
20. Install the oil filler tube (24) and its seal (26) with one screw and washer assembly (25).

NOTE

Clean mating surfaces and check for burrs on both the transmission case and control valve transfer plate.

21. Carefully position the control valve assembly (15) in the transmission case. Install the retaining screws finger tight. With the neutral starting switch installed, place the manual valve in the neutral position. Shift the control valve body if necessary to center the neutral finger over the neutral switch plunger. Snug the bolts down evenly; then tighten to 100 pound-inches.
22. Be sure seal for manual shaft is installed. If not, carefully drive a new seal into the case with a socket and mallet. (See figure 5-15.)

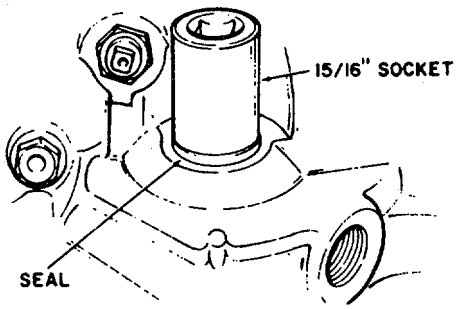


Figure 5-15. Installation of Manual Lever Shaft Seal

23. Install flat washer and gearshift control lever on shaft. Tighten clamp bolt. (See figure 4-30.)
24. Adjust the kickdown band and low-reverse band as described in paragraphs 5-182 and 5-183.
25. Install the oil pan (12) using new gasket (14). Tighten pan screw and washer assemblies (13) to 150 pound-inches.
26. Install the transmission drain plug (10) and gasket (11).

5-179. TRANSMISSION AND TORQUE CONVERTER INSTALLATION.

1. The front pump rotors should be aligned before the torque converter is installed on transmission. This is accomplished during factory assembly using aligning tool C-3881. Insert the tool into the front pump over the input shaft and rotate the tool until the two small holes in the tool are vertical (with transmission mounted in the repair stand).
2. Check for full engagement of the rotor and converter by placing a straight edge on the face of the case. The surface of the converter front cover lug should be at least 1/2 inch to the rear of the straight edge when the converter is pushed all the way into the transmission.
3. Coat converter hub hole in crankshaft with wheel bearing lubricant, Specification MIL-G-2108.
4. Attach a small "C" clamp to edge of transmission housing to hold converter in place during transmission installation.
5. Inspect the converter drive plate (10, figure 6-29) for distortion or cracks and replace if necessary.

CAUTION

The transmission and converter must be installed as an assembly. Otherwise, the converter drive plate, front pump bushing, and oil seal will be damaged. The drive plate will not support a load; therefore none of the weight of the transmission should be allowed to rest on the plate during installation.

6. Fasten the drive plate (10, figure 6-29) to adapter (12) on the crankshaft with six cap screws (11).
7. Using a suitable hoist, lower the transmission and torque converter into the tractor so it is aligned with the engine. The transmission extension should be resting on the frame cross member.
8. Rotate the converter so the stamped V mark on converter front cover will align with the 1/8 inch hole in the inner circle of the drive plate. One of the holes in the converter and drive plate is offset so these parts will be installed in the original position. This maintains the balance of the engine and converter. Carefully work the transmission assembly forward over the adapter plate dowel.
9. After the transmission is in position, install the six cap screw and washer assemblies (7,8 and 9) and tighten to 25 to 30 pound-feet.
10. Install at least one of the drive plate to converter cap screw and washer assemblies (4) and tighten to 270 pound-inches.
11. Install the starter motor and connect battery ground cable.
12. Rotate engine and install the remaining cap screw and washer assemblies (4).
13. Secure the transmission extension insulator to the frame with two cap screws and self-locking nuts. Tighten the cap screws to 35 pound-feet.
14. Connect the drive shaft to the parking brake drum flange.

15. Connect oil cooler lines to the transmission and install oil filler tube.
16. Place the gear shift lever in the neutral position. Install gear shift cable.
17. Connect wire to the neutral starting switch.
18. Install the converter drain plug (figure 5-7) and torque to 14 pound-feet.
19. Install dust shield (1, figure 6-29) in front of the converter assembly.
20. Connect the high tension wire to the distributor cap.
21. Install the deck plate and rear body assembly.
22. Lubricate and adjust the transmission as instructed in paragraphs 5-180 through 5-184.

5-180. TRANSMISSION LUBRICATION, ADJUSTMENT AND TEST. The lubrication and adjustment procedures are in-vehicle services which must be performed by overhaul personnel every six months and/or after repair or overhaul of the transmission. Test data and instructions for the transmission are given in paragraphs 5-186 through 5-187.

5-181. GEARSHIFT CABLE ADJUSTMENT.

1. If necessary, disconnect gearshift cable from gearshift control lever on transmission.
2. Place gearshift lever at steering column in R (reverse) position.
3. Move gearshift control lever on transmission all the way to the rear (in reverse detent).
4. With control lever in reverse position detent and selector lever in reverse position, adjust cable length with clevis and connect cable to the control lever. With correct cable length, the clevis pin should be installed without any forward or rearward movement of the control lever.
5. Move gearshift lever through entire shift range step by step and check transmission lever for corresponding detent movement.
6. Refill the transmission with automatic transmission fluid, type A, to the proper level if necessary.
7. Check operation of the neutral starting switch as follows:

(a) To test the switch, disconnect the wire from the switch.

(b) Connect one lead of a test lamp to the battery current and the other lead to the switch terminal. Move the gear shift lever through the shift positions; the test lamp should light only in the neutral position. If the test lamp does not light, the switch may be faulty, out of adjustment, or the gear shift control cable may be improperly adjusted.

(c) Unscrew the switch from the transmission case allowing the fluid to drain into a container. Move selector lever to the Neutral position, and inspect to see that the switch operating lever finger (figure 5-16) is centered in the switch opening in the case.

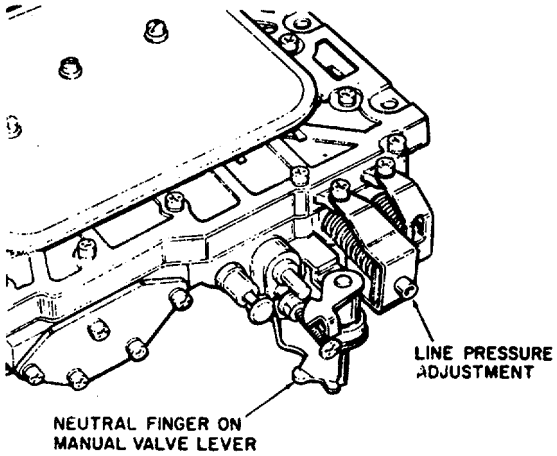


Figure 5-16. Neutral Starting Finger

(d) Screw the switch into the transmission case and tighten 25 to 35 pound-feet. Retest the switch with the test lamp.

CAUTION

Be certain that neutral switch packing is installed.

(e) Readjust the gear shift control cable if necessary.

NOTE

The neutral starting switch may also be checked by attempting to start the engine with the gear shift lever in each shift position. Be sure that the transmission has been lubricated and all power train components have been serviced before performing this procedure.

5-182. KICKDOWN BAND ADJUSTMENT. The kickdown band adjusting screw is located on the left side of the transmission (see figure 5-8).

1. Loosen the lock nut and back off approximately five turns. Check adjusting screw for free turning in the transmission case.
2. Tighten band adjusting screw to 72 pound-inches torque.
3. Back off adjusting screw two turns. Mold adjusting screw in this position and tighten lock nut to 29 pound-feet.

5-183. LOW AND REVERSE BAND ADJUSTMENT.

1. Raise tractor, drain transmission fluid and remove the oil pan.
2. Loosen the adjusting screw lock nut and back off nut approximately five turns (figure 5-17). Check adjusting screw for free turning in the lever.

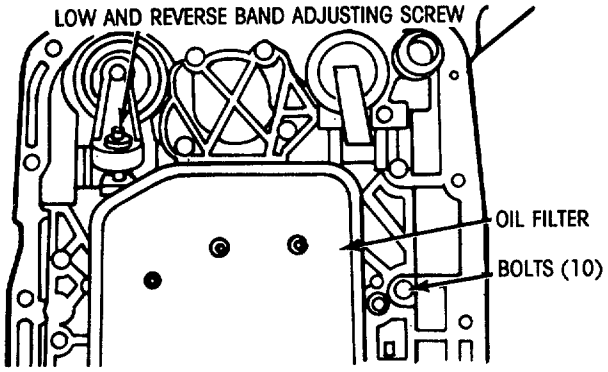


Figure 5-17. Bottom View of Transmission (Pan Removed)

3. Tighten band adjusting screw to 72 pound-inches torque.
4. Back off adjusting screw three turns, hold adjusting screw in this position, and tighten lock nut to 35 pound-feet.
5. Reinstall oil pan using new gasket. Tighten oil pan cap screws to 150 pound-inches.
6. Fill transmission with automatic transmission fluid.

5-184. TRANSMISSION LUBRICATION. The kickdown band, reverse band and gear shift cable should be adjusted prior to filling the transmission with oil. It is assumed that the transmission is drained. If not, drain the transmission.

1. Be sure that a new filter and oil pan gasket have been installed in the transmission, and that the oil pan and gasket are properly installed.
2. Check that the drain plugs for both the torque converter and transmission are installed.
3. Pour eight quarts of automatic transmission fluid, type A, into the transmission.
4. Check the entire tractor to be sure that all power train components have been properly serviced.
5. Set the parking brake.
6. Start the engine and allow it to idle for at least two minutes.
7. Move the gear shift lever through all the shift positions, ending in Neutral. Add sufficient fluid to bring the level to the ADD 1 PINT mark.
8. Check the transmission oil level after the tractor as warmed up.

NOTE

Be sure that the transmission oil level indicator is seated properly in the filler tube.

9. If necessary, adjust the carburetor to obtain proper idle speed.

5-185. TRANSMISSION PRESSURE TESTS.

There are certain hydraulic and air pressure tests which an be performed on the transmission to determine the condition of the transmission and aid in locating possible malfunction. These tests are performed with the transmission installed in the tractor. Test procedures re given in paragraphs 5-186 thru 5-187.

5-186. HYDRAULIC PRESSURE TESTS.

1. *Line Pressure and Front Servo Release Pressure.* Line pressure and front servo release pressure tests must be made in D (drive) range with rear wheels free to turn. The transmission fluid must be at operating temperature (150°F to 200°F).

(a) Install an engine tachometer, raise the vehicle on a hoist, and position the tachometer so it can be read under the vehicle.

(b) Connect two 0-100 psi pressure gages to pressure take-off-points at the side of the accumulator and at the front servo release (figure 5-18).

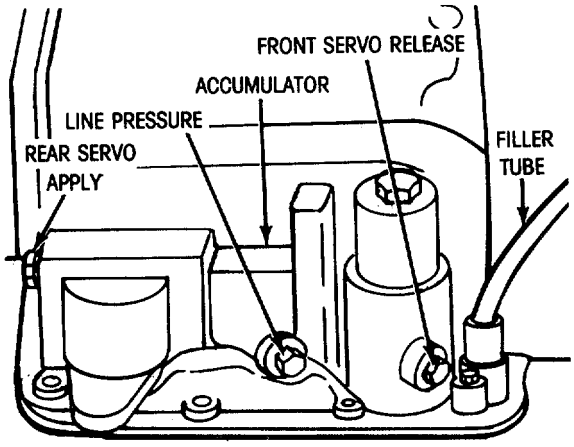


Figure 5-18. Pressure Test Locations (Right Side of Transmission)

(c) With control in D (drive) position, speed up engine slightly until transmission shifts into direct. (Front servo release will be pressurized in direct.) Reduce engine speed slowly to 1,000 rpm. Line pressure at this time (1,000 rpm) must be 54-60 psi, and front servo release pressure must not be more than 3 psi below line pressure.

(d) Move the throttle lever gradually to full throttle position. Line pressure must rise to a maximum of 90-96 psi just before or at kickdown into low gear. Front servo release pressure must follow line pressure up to the kickdown point and should not be more than 3 psi below line pressure. If line pressure is not 54-60 psi at 1,000 rpm, adjust the pressure as outlined in paragraph 5-177, step 16.

(e) If front servo release pressures are less than pressures specified and line pressures are within limits, there is excessive leakage in the front clutch and/or front servo circuits.

2. *Lubrication Pressures.* The lubrication pressure test should be made at the same time that line pressure and front servo release pressures are tested.

(a) Install a "tee" fitting between the cooler return line fitting and fitting hole in transmission case at rear of left side of transmission (figure 5-19). Connect a 0-100 psi pressure gage to the "tee" fitting.

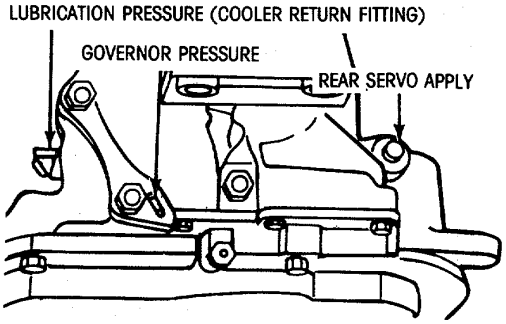


Figure 5-19. Pressure Test Locations (Rear End of Transmission)

(b) At 1,000 engine rpm with throttle closed and transmission in direct, lubrication pressure should be 5-15 psi. Lubrication pressure will be approximately doubled as the throttle is opened to maximum line pressure.

3. *Rear Servo Apply Pressure.*

(a) Connect a 0-300 psi pressure gage to apply pressure take-off point at rear servo (figure 5-19).

(b) With shift lever in R (reverse) position and the engine speed set at 1600 rpm, the reverse servo apply pressure should be 240-280 psi.

4. *Governor Pressure.*

(a) Connect a 0-100 psi pressure gage to the governor pressure take-off point (figure 5-19).

(b) Governor pressures should fall within the limits given below:

Governor Pressure (psi)	Tractor Speed (mph)
16-22	5
38-47	8
65-73	12

(c) If the pressures are incorrect, the governor valve and/or weights are probably sticking

5-187. AIR PRESSURE TESTS. A "No Drive" condition might exist even with correct fluid pressure, because of inoperative clutches or bands. The inoperative units, clutches, bands and servos can be located through a series of tests by substituting air pressure for the fluid pressure (figure 5-20). The front and rear clutches, kickdown servo, and low-reverse servo may be tested by applying air pressure to their respective passage after the control valve assembly has been removed. To make the air pressure tests, proceed as follows:

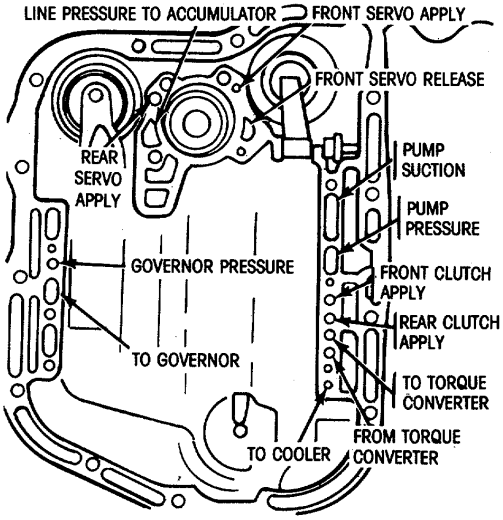


Figure 5-20. Air Pressure Test Locations

CAUTION

Compressed air supply must be free of all dirt and moisture. Use a pressure of 30 psi. .

1. Front Clutch. Apply air pressure to front clutch "apply" passage and listen for a dull "thud" which indicates that the front clutch is operating. Hold the air pressure on for a few seconds and inspect system for excessive oil leaks.

2. Rear clutch. Apply air pressure to the rear clutch "apply" passage and listen for a dull "thud" which indicates that the rear clutch is operating. Also inspect for excessive oil leaks. If a dull "thud" cannot be heard in the clutches, place the finger tips on clutch housing and again apply air pressure. Movement of the piston can be felt as the clutch is applied.

3. Kickdown Servo. Direct air pressure into the front servo "apply" passage. Operation of the servo is indicated by a tightening of the front band. Spring tension on the servo piston should release the band.

4. Low and Reverse Servo. Direct air pressure into the rear servo "apply" passage. Operation of the servo is indicated by a tightening of the rear band. Spring tension on the servo piston should release the band.

NOTE

If the clutches and servos operate properly, no upshift or erratic shift conditions indicate that the malfunctions exist in the valve body assembly.

5. Governor. Governor operating failures can generally be diagnosed by a road test or hydraulic pressure test.

5-188. PARKING BRAKE.

5-189. DISASSEMBLY. (See figure 6-43.)

1. Disconnect the propeller shaft at the parking brake drum flange.
2. Hold the brake drum and remove the drum flange nut and washer.
3. Use a puller to remove the brake drum.
4. Remove two screws and washers to detach the adjusting nut cover plate.
5. Loosen the screw, and nut on the cable clamp. Disengage the ball end of the cable from the operating lever and withdraw the cable from the brake support
6. Remove the brake return spring and grease shield spring.
7. Remove the grease shield. Be careful not to damage the spacer in back of the shield during removal.
8. Disassemble remaining parts as necessary.

5-190. CLEANING. Refer to paragraph 5-7. Do not apply cleaning solvents or oil to the brake linings.

5-191. INSPECTION. Inspect all parts of the parking brake assembly for wear and damage, particularly the brake shoes and spacer. Refer to paragraph 5-8.

5-192. REPAIR AND REPLACEMENT. Replace all parts which are worn excessively or damaged.

5-193. REASSEMBLY. (See figure 6-43.)

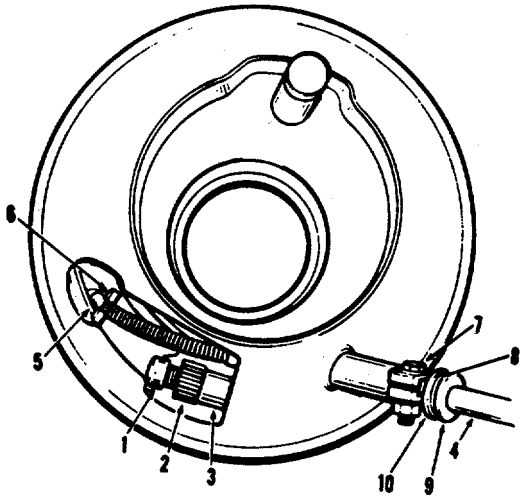
1. Install operating lever (11) with lever screw and nut.
2. Place the neoprene spacer (14) in position on back of brake support (13) with steel sleeve in center of support.
3. Place brake assembly on extension housing with support (13) and brake shoes (9) positioned over the anchor pin (120). Install anchor guide (8) and locking washer (7) on anchor pin.
4. Install grease shield (6) with flat on shield aligned with flat on extension housing. Install grease shield retainer spring (2) with opening of spring toward brake shoe adjusting nut. Make sure spring is properly seated in groove.
5. Install the link (10) and adjusting screw (3), nut (4) and sleeve (5).
6. Slide the brake shoe return spring (1) behind the grease shield spring (2) and hook into position.
7. Engage ball end of cable in brake shoe operating lever (11) and tighten cable clamp bolt.
8. Install cover plate on back side of parking brake, support with two screws and washers. '
9. Install parking brake drum. Install washer with its three projections toward the drum and the nut with convoluted surface contacting the washer. Hold the drum and tighten nut to 175 pound-feet torque.
10. Connect propeller shaft to parking brake flange.

5-194. ADJUSTMENT. Adjust the parking brake for proper application by turning the knurled nut on the end of the hand brake lever. Turn the nut clockwise to adjust for slack. Adjustment for lining wear is made at the rear of the parking brake located on the transmission output shaft. With the hand brake lever released, loosen the adjusting nut (1, figure 5-21) and turn the adjusting screw (2) out to take up lining wear. A small amount of adjustment is ail that should be required. Tighten the adjusting nut. Check operation of the parking brake and read just. if necessary.

5-195. PARKING BRAKE LEVER.

5-196. REMOVAL AND DISASSEMBLY. (See figure 6-44.) Remove and disassemble as shown on the exploded view.

5-197. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8.



1. Adjusting Nut
2. Adjusting Screw
3. Adjusting Sleeve
4. Control Cable
5. Ball End of Control Cable
6. Operating Lever
7. Control Cable Guide Clamp
8. Bushing
9. Dished Washer 3/8 ID
10. Dished Washer 1/2 ID

Figure 5-21. Parking Brake (Rear View)

5-198. REPAIR AND REPLACEMENT. Refer to paragraph 5-9. Replace all defective parts.

5-199. REASSEMBLY AND INSTALLATION. (See figure 6-44.) Reassembly and installation is the reverse of disassembly and installation. Adjust parking brake after reassembly. Refer to paragraph 5-194.

5-200. SHIFT LEVER AND LINKAGE.

5-201. REMOVAL AND DISASSEMBLY. (See figure 6-45.)

1. Place the transmission in neutral.
2. Scribe match marks on the transmission housing and control lever to definitely mark this position.
3. Remove and disassemble as shown on the illustration.
4. Note the position of the clevis and nut on the cable assembly to permit proper assembly.

5-202. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8.

5-203. REPAIR AND REPLACEMENT. Refer to paragraph 5-9. Replace all defective parts.

5-204. REASSEMBLY AND INSTALLATION. (See figure 6-45.) Reassembly and installation are the reverse of disassembly and removal. Note the following instructions:

1. Reassemble clevis and nut on the cable assembly in the original position.
2. Align match marks on control lever and transmission housing.
3. Connect clevis to control lever with transmission actuator assembly set in neutral position.
4. Start the tractor and check the shift lever in all driving positions and neutral.

NOTE

If driving ranges are not correct or if difficulty is found in shifting, adjust the cable and clevis as necessary.

5-205. ALTERNATOR.

5-206. REMOVAL. (See figure 6-47.)

CAUTION

Disconnect negative battery cable before removing alternator.

1. Disconnect lead wires to alternator. Tag wires for installation of alternator.
2. Remove screw and nut at strap. Remove drive belt.
3. Remove screw, lock washer, and nut at mounting bracket to detach alternator.

5-207. DISASSEMBLY. (See figure 6-47.) Disassemble as shown in the exploded view noting the following instructions:

1. Use suitable puller to remove pulley from rotor shaft.
2. After removing brush and cover assembly, isolation diode assembly, thru bolts, separate front housing with rotor assembly intact by carefully prying between the stator slots and front housing. Do not insert prying tool deeper than 1/16 inch to avoid damaging windings. Pry at several points along the mating edges.

CAUTION

Do not burr the edge of the stator core, which will make reassembly difficult.

3. Compress ears of retainer to remove. Remove retainer only after front housing and rotor assembly have been separated from rest of alternator.

4. Drive rotor assembly with bearing from fronthousing by tapping rotor shaft against wood block.

5. Use suitable bearing puller to remove bearing from rotor shaft.

6. Do not unsolder stator to diode assembly and electrical connections. Remove these parts as a unit. If it is necessary to disconnect wires for test or replacement purposes, tag wires for positive identification in reassembly.

5-208. CLEANING AND INSPECTION. Refer to paragraph 5-8 for basic inspection requirements. Perform additional inspection as specified below:

1. Clean housings with dry cleaning solvent, Federal Specification P-S-661. Clean electrical parts with compressed air or wipe with a clean cloth.

2. Check individual diodes with a suitable diode tester. The diodes may also be checked with a 12-volt dc test lamp and 12 vdc power source.

CAUTION

Do not use a test lamp circuit using more than 12 vdc.

Connect test lamp probes across each diode in turn; reverse polarity of probes. Test lamp should light in one direction only.

3. Check continuity of three stator coils with an ohm-meter to test for an open coil. Connections must be made at each pair of coil lead wires; the winding wire junctions must be disconnected. In each case the ohmmeter should indicate no resistance (actually a fraction of an ohm resistance).

4. Check continuity from each stator coil to the stator core with an ohmmeter. In each case the ohmmeter should indicate an open circuit. If there is a resistance reading, there is excessive leakage and the stator must be replaced.

5. Check continuity between coil windings with an ohmmeter. In each case the ohmmeter should indicate an open circuit. If the ohmmeter indicates a short circuit or resistance, the stator must be replaced.

6. Check continuity of rotor with an ohmmeter. Remove brush holder and connect ohmmeter probes to slip rings. Resistance should be approximately 6 ohms. If resistance is high, field coil is open.

7. Connect ohmmeter or a test lamp (12 volt) to field terminal and bracket on brush assembly. Resistance should be high (infinite) or test lamp should not light. If resistance is low or test lamp lights, brush assembly is shorted and must be replaced.

8. Connect an ohmmeter to field terminal and insulated brush on brush assembly. Use an alligator clip to assure good contact to brush. Do not clip the brush. Resistance reading should be zero. Move brush and brush lead wire to make certain that the brush lead wire connections are not intermittent. Resistance reading should not vary when brush and lead wire is being moved around.

9. Connect ohmmeter to bracket and grounded brush on brush assembly. Resistance reading should be zero. Repeat same test on brush lead wire as described in step 8.

5-209. REPAIR OR REPLACEMENT. Do not repair parts of the alternator other than minor wiring repair. Replace all defective parts based on visual inspection and tests.

5-210. REASSEMBLY. (See figure 6-47.) Reassemble in the reverse order of disassembly. Note the following additional instructions:

1. Positive diode assembly must be insulated from rear housing. Be sure to install insulating washers and sleeves.

2. Install front ball bearing in housing using a suitable arbor press. Exert pressure on outer bearing race only.

3. When installing retainer, take care not to damage the ball bearing seal.

4. Press rotor assembly through bearing using a suitable arbor press. Pressure should be applied to the shoulder of the rotor shaft, not the end of the shaft.

5. Install pulley on rotor shaft using suitable arbor press and drive bushing. Support the slip ring end of the rotor shaft with a tool which supports the shoulder of the shaft, not the end of the shaft.

NOTE

A graphite lubricant on the rotor shaft will aid in reassembly of the pulley. Do not use oil or grease on the shaft.

6. Install ball bearing on rotor shaft using a suitable arbor press. Exert pressure on the inner bearing race only.

7. Before reassembling rear housing and stator to front housing and rotor, be certain all diode wires are dressed to prevent the rotor from rubbing the wires.

8. Torque thru bolts evenly to 25-30 pound-inches.

9. The isolation diode assembly must be insulated from the negative diode assembly stud. Be sure to install insulating washers and sleeves.

10. After reassembly, connect an ohmmeter between the auxiliary terminal and ground terminal to check continuity. Then reverse the probe connections. The ohmmeter should indicate a short circuit in one direction and an open circuit in the other direction.

5-211. INSTALLATION. (See figure 6-47.) Installation is the reverse of removal.

1. Check all wiring connections.
2. Adjust drive belt tension.

5-212. ALTERNATOR TEST. Tests can be made with alternator in the vehicle using suitable test equipment such as a Sun Electric Model VAT-20 tester and Sun Electric Model RDT diode tester. Follow equipment manufacturers instructions.

1. Do not disconnect alternator output lead while alternator is operating.
2. Do not disconnect voltage regulator while alternator is operating.
3. Do not ground field terminal.
4. Check battery condition. Use a fully charged battery when testing alternator.
5. Disconnect ground cable of battery when removing and installing the alternator.

5-213. DISTRIBUTOR.

5-214. REMOVAL,. (See figure 6-48.) The distributor can be adjusted and minor repairs accomplished without removing it from the engine. The following procedure permits removal and installation without disturbing the engine timing.

1. Disconnect vacuum hose at distributor. Disconnect distributor pickup lead wire harness connector.
2. Unfasten distributor cap retaining clips and lift off distributor cap.
3. Scribe a mark on the edge of distributor housing to indicate position of the rotor as reference when reinstalling distributor.
4. Remove distributor hold down clamp screw and clamp.
5. Carefully lift distributor from engine.

5-215. DISASSEMBLY. Refer to figure 648, and the following instructions to disassemble the distributor.

1. Remove distributor rotor.
2. Remove the two screws and lockwashers attaching the vacuum control unit to distributor housing, disconnect the vacuum control arm from upper plate, and remove control.
3. Remove reluctor by prying up from the bottom of the reluctor with two pry bars, or screwdrivers (maximum width 7/16 inch). Be careful not to distort or damage the teeth on the reluctor.
4. Remove two screws and lockwashers attaching the lower plate to the housing and lift out the lower plate, upper plate, and pick-up coil as an assembly.
5. Distributor cap clamp springs are held in place by peened metal around the openings and should not be removed.
6. If side play exceeds .006 inch (paragraph 5-220), replace housing or shaft, reluctor sleeve, and governor weight as an assembly.
   (a) Remove distributor shaft retaining pin and slide retainer off end of shaft.
   (b) Use a file to clean burrs, from around pin hole in the shaft and remove the lower thrust washer.
   (c) Push shaft up and remove shaft through top of distributor body.

5-216. CLEANING AND INSPECTION. Refer to paragraphs 5-7 and 5-8.

5-217. REPAIR AND REPLACEMENT. Do not repair distributor parts. Replace all worn or damaged parts during reassembly.

5-218. REASSEMBLY. (See figure 6-48.) Reassemble as follows:

1. Test operation of governor weights and inspect weight springs for distortion.
2. Lubricate governor weights.
3. Inspect all bearing surfaces and pivot pins for roughness, binding or excessive looseness.
4. Lubricate and install upper thrust washer (or washers) on the shaft and slide the shaft into the distributor body.
5. Install distributor shaft retainer and pin.
6. Install lower plate, upper plate and pick-up coil assembly and install attaching screws.
7. Attach vacuum advance unit arm to the pick-up plate.
8. Install vacuum unit attaching screws and washers.
9. Position reluctor keeper pin into place on reluctor sleeve.
10. Slide reluctor down reluctor sleeve and press firmly into place. Install reluctor so that the two arrows are on top. In a clockwise distributor, the arrow at the keeper pin that holds the reluctor in place should point clockwise. In a counterclockwise distributor, the arrow at the keeper pin should point counterclockwise. If the arrow at the keeper does not point in the direction of the distributor rotation, remove the reluctor, turn it one hundred-eighty degrees (180°) and reinstall it. When removing the reluctor, be careful not to lose the keeper pin.

11. Lubricate the felt pad in top of reluctor sleeve with 1 drop of light engine oil and install the rotor.

5-219. INSTALLATION.

1. Position distributor in engine. Make sure the rubber O-ring seal is in the groove of distributor housing. Align rotor with marks previously scribed on distributor housing. Clean top of cylinder block to insure a good seal between distributor base and block.

2. Engage tongue of distributor shaft with slot in distributor oil pump drive gear. If engine has been cranked while distributor is removed, it will be necessary to establish the proper relationship between distributor shaft and No. 1 piston position as follows:

(a) Rotate crankshaft until number one piston is at top of compression stroke. Mark on crankshaft vibration dampner should be in line with the "O" TDC mark on timing chain case cover.

(b) Rotate rotor to the position of number one distributor cap terminal.

(c) Lower distributor into the opening, connect pick-up coil leads and install distributor cap. Make sure all high tension wires "snap" firm in cap towers. Install distributor hold down clamp screw. Tighten screw finger tight.

3. Connect distributor pick-up lead wire at wiring harness connector.

4. Adjust engine timing.

5-220. SHAFT AND BUSHING WEAR TEST. With distributor removed (paragraph 5-214) perform test as follows:

1. Remove distributor cap, if reinstalled.

2. Remove distributor rotor.

3. Clamp distributor is a vise equipped with soft jaws and apply only enough pressure to restrict any movement of the distributor during the test.

4. Attach a dial indicator to distributor housing so indicator plunger arm rests against reluctor.

5. Place one end of a wire loop around the reluctor sleeve just above the reluctor.

6. Hook a spring scale in the other end of the wire loop.

NOTE

The wire loop must be down against the top of the reluctor to insure a straight pull; also be sure that the wire loop does not interfere with the indicator or indicator holding bracket.

7. Apply a one pound pull toward the dial indicator and a one pound pull away from the indicator and read the total movement of the plunger on the indicator dial. If the total indicator plunger movement exceeds .006 inch, replace the distributor housing or shaft assembly.

5-221. DISTRIBUTOR AIR GAP ADJUSTMENT.

1. Align one reluctor tooth with pick-up coil tooth.

2. Loosen pick-up coil hold down screw.

3. Insert .008 non-magnetic feeler gauge between reluctor tooth and pick-up coil tooth.

4. Adjust air gap so that contact is made between reluctor tooth, feeler gauge, and pick-up coil tooth.

5-222. STARTER MOTOR.

5-223. REMOVAL.

NOTE

Repair of the starter motor shall be performed only by experienced shop or overhaul personnel.

1. Disconnect the ground cable at the battery.

2. Disconnect the cables at the starter motor.

3. Disconnect the solenoid lead wire at the solenoid terminal.

4. Remove one stud nut and lock washer, and one bolt attaching the starter motor to the transmission housing.

5. Remove the starter motor and seal.

NOTE

Before removing the starter motor, clean dirt from mounting area to prevent dirt entering torque converter housing. Before installing the new starter motor, be sure that the mounting surface is free of dirt and oil.

5-224. DISASSEMBLY. (See figure 6-49.)

1. Place the starter motor in a vise equipped with soft jaws. Use the vise as a support fixture only. Do not clamp.

2. Remove the bolts, washers, and end head plate.

3. Carefully pull the armature up and out of the gear housing and the frame and field assembly and remove the steel thrust washer and fiber washer.

4. The wire of the shunt field coil is soldered to the brush terminal. One set of brushes is connected to this terminal. The other pair of brushes is attached to the series field coils by means of a terminal screw. Carefully pull the frame and field assembly up just enough to expose the terminal screw and solder connection of the shunt field at the brush terminal. Place two wood blocks between the starter frame and starter gear housing to facilitate removal of the terminal screw.

5. Support the brush terminal by placing a finger behind the terminal and remove the terminal screw.

6. Unsolder the shunt field coil lead from the brush terminal. Remove the field and frame assembly. Do not disassemble further unless parts need replacement.

7. The starter brush holder plate with the starter brush terminal, contact and brushes is serviced as an assembly (18). Remove all old sealer at the brush holder plate and gear housing. Unsolder the solenoid lead wire and unwind the wire from the brush terminal.

8. Remove the screw (19) attaching the brush holder plate to the gear housing. Remove nut (20), steel washer (21) and insulating washer (22) from the solenoid terminal stud (23). Straighten the solenoid wire and remove the brush and plate assembly (18) as an assembly.

9. Remove the solenoid (30), washer (32), retainer (33) and sleeve (31), from the gear housing well.

10. Remove the nut (24), steel washer (25) and insulating washer (26) from the battery terminal stud (27). Remove the battery terminal stud from the holder plate.

11. Remove the solenoid contact assembly (29) from the solenoid. Remove the solenoid return spring (34) from the well of the solenoid moving core (35).

12. Remove the cover (36) from the gear housing. Release the retainer (37) that positions the driven gear (43) on the pinion shaft (45).

CAUTION

The retainer is under tension and a cloth should be placed over the retainer to prevent loss during removal.

13. Release the retaining ring at the front of the pinion shaft. Do not spread the retaining ring any greater than the outside diameter of the pinion shaft otherwise the ring can be damaged.

14. Push the pinion shaft (5) towards the rear of the housing and remove the retaining ring (38) and thrust washer (40), and the clutch assembly (41) with the two shifter fork nylon actuators (42) as an assembly. Remove the gear (43) and friction washer (44).

15. Pull the shifting fork (47) forward and remove the solenoid moving core (35).

16. Remove the shifting fork pivot pin (46) and remove the clutch shifting fork (47).

17. Do not remove the bearings (48 and 49) unless these parts need replacement.

5-225. CLEANING.

1. Blow out all residue from inside the frame and wipe the interior with clean cloth. Do not immerse the starter clutch, armature or field coils in solvent. Insulation will be damaged and lubricant in the clutch will be washed out.

CAUTION

Do not immerse the starter clutch, armature or field coils in solvent. Insulation will be damaged and lubricant in the clutch will be washed out.

2. Wipe the armature with a clean cloth. Do not use cleaning solvent. If the armature commutator is burned, scored, or worn it must be turned down in a lathe. Take very light cuts from the commutator until all defective area is cleaned away. Undercut the mica between the commutator segments about 1/32 inch. Clean off all residue.

3. Coat the armature winding with two thin coats of moisture resistant varnish. Do not get varnish on the commutator.

4. Clean the brush holders with solvent and a soft brush. Clean away all residue.

5. Wipe the exterior of the assembly with a cloth dampened in cleaning solvent.

5-226. INSPECTION. Inspect and repair the starter motor components as follows:

1. Brushes that are worn more than 1/2 the length of new brushes, or are oil-soaked, should be replaced. When resoldering the shunt field and solenoid lead, make a strong low resistance connection using a high temperature solder and resin flux. Do not use acid core solder. Do not break the shunt field wire units, if so equipped, when removing and installing the brushes. Measure the brush spring tension with a spring scale hooked under the spring near the end. Pull the scale on a line parallel to the edge of the brush and take a reading just as the spring end leaves the brush. Spring tension should be 32 to 36 ounces. Replace springs that do not meet specifications.

2. Place the armature in growler and hold a thin seal blade parallel to the core and just above it, while slowly rotating the armature in the growler. A shorted armature will cause the blade to vibrate and be attracted to the core. Replace the armature if shorted.

3. Contact the armature shaft and each of the commutator riser bars with a pair of test lamp test prods. If the lamp lights, it indicates a grounded armature. Replace a grounded armature.

4. Place the armature in pair of "V" blocks and measure the runout with dial indicator. Measure both the shaft and commutator. A bent shaft requires replacement of the armature. When the commutator runout exceeds 0.003 inch, commutator should be refaced and undercut. Remove only sufficient metal to provide a smooth, even surface.

5. Test field coils for ground as follows:

(a) Remove field frame assembly from starter motor.

(b) Carefully drill out the rivet that attaches the series field coil ground lead and shunt field coil lead to the field frame.
(c) Insulate the field coil leads from the field frame.
(d) Test for ground using a 110 volt test lamp. Touch one probe of test lamp to series field coil lead and other probe to field frame. Lamp should not light. Repeat procedure for shunt field coil. If lamp lights, it indicates that field coils are grounded and require replacement.
(e) An impact screwdriver should be used to remove and install field coils to prevent damage to pole shoe screws and for proper tightening. Pole shoes that are loose and not properly seated may cause the armature core to rub on the pole shoes. This will decrease starter motor efficiency and damage the armature core.
(f) Make sure the area between leads and frame is clean. Peen new rivet securely to insure a good electrical contact.

6. Inspect the armature shaft bearing and pinion shaft surfaces and bushings for wear. Try the bushings for wear by inserting the shafts and test for side play. Pre-sized starter motor bushings are available as service bushings. No burnishing or reaming is required to fit the pre-sized bushings.

7. Rotate the clutch pinion. The pinion gear should rotate smoothly in one direction (not necessarily easily), but should not rotate in the opposite direction. If the starter motor clutch unit does not function properly, or the pinion is worn, chipped or burred, replace the clutch unit.

5-227. REPAIR AND REPLACEMENT. Refer to paragraphs 5-8 and 5-9. Replace all defective parts.

5-228. REASSEMBLY. (See figure 6-49.) Proceed as follows:

1. The shifting fork (47) consists of two spring steel plates assembled with two rivets. There should be approximately 1/16 inch side movement to insure proper pinion gear engagement. Lubricate between the plates sparingly with SAE 10 engine oil.

2. Position the shifting fork in the drive housing and install the shifting fork pivot pin (46). One tip of the pin should be straight; the other tip should be bent at a 15 degree angle away from the housing. The fork and pin should operate freely after bending the tip of pin.

3. Install the solenoid cover (35) and engage the shifting fork.

4. Enter the pinion shaft (45) into the housing, and install the friction washer (44) and drive gear (43).

5. Install the clutch assembly (41), thrust washer(40), retaining ring (39) and thrust washer (40). Complete the installation of pinion shaft engaging shifting fork with clutch actuators (42).

6. The friction washer (44) must be positioned on the shoulder of the splines of the pinion shaft (45) before the driven gear (43) is positioned. Install the driven gear retaining ring (37) and install the pinion shaft retaining ring (38).

7. Bend the four tangs of the solenoid retainer (33) "up" to a measurement of 5/32 to 3/16 inch above the surface of the retainer to ensure higher compression and a more positive ground. Space the retainer in the housing bore so that the four tangs rest on the ridge in the housing bore and not in the recesses.

8. Install the solenoid return spring (34) into the bore of the movable core.

9. Install the solenoid contact seal over the solenoid lead wires, inserting the double wires of the terminal stud into the large hole and the solenoid winding lead wire into the small hole.

10. Inspect the condition of the contact assembly (29). If the top of washer is burned from arcing, disassemble the contact assembly and reverse the washer.

11. Install the solenoid contact assembly into the solenoid (30) and reform the double wires to allow for proper entry of the terminal stud into the brush holder with the double wires curved around the contactor. Make sure the switch spring (28) is positioned on the shaft of the solenoid contact assembly.

CAUTION

The contactor must not touch the double wires when the solenoid is energized after the assembly is completed.

12. Assemble the battery terminal stud (27) in the brush and plate assembly, placing the insulating washer (26) under the flat washer (25).

13. Enter the solenoid lead wire through the hole in brush holder and install the solenoid stud (23), insulating washer (22), flat washer (21) and nut (20).

14. Wrap the solenoid lead wire tightly around the brush terminal post and solder securely with a high temperature resin core solder and resin flux.

15. Carefully enter the solenoid coil and brush plate assembly into the bore of the gear housing and position the brush and plate assembly into the gear housing. Align the tongue of the ground terminal with the notch in the brush holder.

16. After the brush holder is bottomed in the housing, install attaching screw (19). Tighten the screw to 10-15 pound-inches. Make sure the insulator (16) is in position.

17. Position the brushes on the armature thrust washer (8). This will hold the brushes out and facilitate proper installation of the armature (6).

18. Install the brush terminal screw.

19. Position the field frame to the exact position on the gear housing and enter the armature into the field frame and gear housing, carefully engaging the splines of the shaft with the reduction gear by rotating the armature slightly to engage the splines.

20. Install the thrust washer (5) and flat washer(4) on the armature shaft.

21. Position the end head plate (1) and install the lock washers (3) and bolts (2). Tighten the through bolts securely.

22. Clean the area at joint between the brush holder plate to field frame and gear housing mating joint. Apply a bead of sealer around the four sides of the joint.

CAUTION

Sealer must be flowed continuously to avoid gaps. After bead has been flowed on, use a brush or small paddle moistened in mineral spirits to press adhesive into joint. Be sure not to get the adhesive on the battery and/or solenoid terminals.

5-229. INSTALLATION.

1. Position a new seal.
2. Position the starter motor and install the attaching bolt, stud and lock washer. Hold the starter motor away from the engine when tightening the nut and bolt to insure proper alignment.
3. Connect the solenoid lead wire to the solenoid terminal.
4. Connect the battery cable to the starter terminal.
5. Connect the battery ground cable.
6. Start the tractor, to test operation of the starter motor.

5-230. ELECTRICAL SYSTEM.

5-231. GENERAL. (See figure 6-46.) Remove and replace defective electrical components shown on the diagram. If extensive repair of the electrical system is required, refer the tractor to overhaul facilities.

5-224. HEAD LIGHTS, REAR LIGHT, AND TAIL AND STOP LIGHT . Refer to Section IV for maintenance.

Table 5-1. Table of Limits

Point of Measurement	Desired Dimension (in.) Min.	Max.	Allowable Dimension (in.)
	ENGINE		
Main Bearings			
Crankshaft journal dia.	2.7495	2.7505	2.7375 min.
Crankshaft journal out of round	0.000	0.001	0.001 max.
Crankshaft end play	0.0035	0.0085	0.0085 max.
Clearance	0.0005	0.0015	0.0025 max.
Connecting Rod Bearings			
Crankshaft journal dia.	2.1865	2.1875	2.1745 min.
Crankshaft journal out of round	0.000	0.001	0.001 max.
Clearance (dia.)	0.0005	0.0015	0.0025 max.
Clearance (side)	0.006	0.012	0.012 max.
Camshaft Bearings			
No. 1 dia	2.000	2.001	2.003 max.
No. 2 dia.	1.984	1.915	1.987 max.
No. 3 dia.	1.969	1.970	1.972 max.
No. 4 dia.	1.953	1.954	1.956 max.
Clearance	0.001	0.003	0.004 max.
End play	0.001	0.004	0.006 max.
Pistons			
Land clearance	0.025	0.030	0.030 max.
Clearance top of skirt	0.0005	0.0015	0.0015 max.
Piston Pins			
Clearance in piston	0.00045	0.00075	0.00075 max.
Interference in rod	0.0007	0.0012	0.0005 min.

Table 5-1. Table of Limits (Cont.)

Point of Measurement	Desired Dimension (in.) Min.	Max.	Allowable Dimension (in.)
	ENGINE		
Piston Rings			
Gap (compression)	0.010	0.020	0.020 max.
Gap (oil)	0.010	0.055	0.055 max.
Side clearance (compression)	0.0015	0.0030	0.0030 max.
Side clearance (oil)	0.0010	0.0030	0.0030 max.
Valves			
Stem to guide clearance	0.002	0.004	0.006 max.
Stem dia. (intake)	0.372	0.373	0.375 max.
Stem dia. (exhaust)	0.371	0.372	0.374 max.
Seat runout	0.000	0.002	0.003 max.
Seat width (intake)	5/64	3/32	
Seat width (exhaust)	3/64	1/16	
Tappets			
Clearance	0.0012	0.0025	0.0025 max.
Cylinder Bore			
Out of round	0.000	0.001	0.001 max.
Taper	0.000	0.010	0.010 max.
Oil Pump			
Cover out of flatness	0.0000	0.0015	0.0015 max.
Outer rotor length	-	-	2.649 min
Outer rotor dia.	-	-	2.469 min.
Inner rotor length	-	-	0.649 min.
Rotor to cover clearance	-	-	0.004 min.
Outer rotor to body clearance	-	-	0.012 max.
Outer rotor to inner rotor clearance	-	-	0.010 max.
	TRANSMISSION		
Front Oil Pump			
Rotor to body end clearance	0.001	0.0025	0.0025 max.
Outer rotor to inner rotor tip clearance	0.005	0.010	0.010 max.
Drive Train			
End play	0.028	0.072	Shim to dimension
Front to rear clutch washer thickness	0.061	0.063	Same
	FRONT AXLE		
Steering Knuckle Bushings			
Inside dia.	1.6065	1.6075	Ream to size
Inside dia (finish)	1.6095	1.6105	Burnish to size
	REAR AXLE		
Drive Pinion Bearings			
Preload	0.000	0.003	Torque to fit

Table 5-1. Table of Limits (Cont.)

Point of Measurement	Desired Dimension (in.) Min.	Max.	Allowable Dimension (in.)
DISTRIBUTOR			
Air Gap	0.010 inch		
Rotation	Clockwise		
Recommended Timing	TDC at 750 rpm - 0.3P		
Shaft side play	0.006 inch max.		
Shaft end play	0.003 to 0.017 inch		
Centrifugal advance	1.0° to 4.5° at 600 rpm 8.0° to 10.5° at 900 rpm 11.5° to 14.0° at 2200 rpm 0.5° to 2.5° at 7 inch Hg		
Vacuum advance	7.0° to 10.0° at 11.5 inch Hg		
STARTER MOTOR			
Voltage	12 Vdc		
Rotation	Clockwise at drive end		
Poles	4		
Brushes	4		
Brush tension	32 to 36 ounces		
Armature			
End play	0.010 inch		
Runout	0.003 inch max.		
Free running test			
Voltage	11 Vdc		
Current draw	90 amps max.		
Speed (min.)	3700 rpm		
Lock resistance test			
Voltage	4 Vdc		
Current draw	475 to 550 amps		
Solenoid switch			
Pull-in coil	13.0 to 15.0 amps at 6.0 Vdc		
Hold-in coil	8.0 to 9.0 amps at 6.0 Vdc		

Table 5-2. Table of Torque Values

Item	Nominal Torque (pound-feet unless otherwise specified)
ENGINE	
Spark Plugs	30
Cylinder Head Cover Bolts	40 pound-inches
Cylinder Head Bolts	65
Chain Case Cover Bolts	200 pound-inches
Fan Attaching Bolts	200 pound-inches
Water Pump Bolts	30
Elbow Fan Bracket Bolts	30
Oil Pump Cover Bolts	130 pound-inches
Oil Pump Attaching Bolts	200 pound-inches
Oil Pan Attaching Bolts	200 pound-inches
Oil Pan Drain Plug	20
Fuel Pump Attaching Bolts	30
Carburetor Attaching Nuts	30
Starter Motor Mounting Bolts	50
Distributor Clamp Bolt	200 pound-inches
Exhaust Pipe Flange Nuts	30
Intake to Exhaust Manifold Bolts	15
Manifold to Cylinder Head Nuts	10
Heat Control Counterweight Clamp Bolt	50 pound-inches
Camshaft Lock Bolt	35
Connecting Rod Cap Nuts	45
Main Bearing Cap Bolts	85
Crankshaft Rear Bearing Seal Retainer	30
Engine Front Mounting	85
Engine Bracket to Block Bolts	45
Engine Bracket to Frame Bolts	45
TRANSMISSION	
Transmission/Adapter Plate Bolts	30
Cooler Line Fitting	75
Converter Drive Plate to Crankshaft Bolts	55
Converter Drive Plate to Torque Converter Bolts	270 pound-inches
Extension Housing Insulator to Frame Bolts	75
Extension Housing to Insulator Bolts	35
Neutral Starting Switch (Initial Control)	60 max.
Converter Drain Plug	14
Oil Pan Drain Plug	24
Oil Pan Bolts	150 pound-inches
Filter Mounting Screws	28 pound-inches
Valve Body Mounting Screws	100 pound-inches
Valve Body Screws	28 pound-inches
Governor Body to Support Bolts	100 pound-inches
Extension Housing to Transmission Case Bolts	24
Front Oil Pump Housing to Transmission Case Bolt	150 pound-inches
Output Shaft Flange Nut	175 pound-inches
Overrunning Clutch Cam Setscrew	40 pound-inches
Reaction Shaft Support to Front Oil Pump Bolts	150 pound-inches
Output Shaft Support	140 pound-inches
Kickdown Band Adjusting Screw Lock Nut	29
Reverse Band Adjusting Screw Lock Nut	35
Oil Filler Tube Bracket Bolts	150 pound-inches

Table 5-2. Table of Torque Values (Cont.)

Item	Nominal Torque (pound-feet unless otherwise specified)
AXLES AND STEERING	
Front Wheel Nuts	50
Spring U-Bolt Nuts	40
Steering Gear Mounting Bolts	40
Rear Wheel Nuts	65
Axle Shaft Nuts	700
Pinion Nut	300
Differential Housing Nuts	65
Gear Case Cover Nuts	45
Gear Case to Differential Housing Nuts	65
Rear Axle Mounting Nuts	85
Rear Axle Bearing Seal Retainer Bolts	130
Brake Drum Mounting Nuts	65
FRAME	
Rear Body Mounting Nuts	45
Hood Support Mounting Nuts	60
Fender Mounting Nuts	60
Bumper Mounting Nuts	45

Table 5-3. Recommended Overhaul Tools

Part No.	Nomenclature	Application	Manufacturer
C-3012	Reamer, Cylinder Ridge	Remove carbon ridge from cylinder walls	Chrysler Corp.
C-3026	Sleeve, Guide Wear Measuring	Measure valve stem guide clearance	Chrysler Corp.
C-3041	Installer, Distributor Bushing	Install distributor drive shaft bushings	Chrysler Corp.
C-3132A	Remover and Installer, Camshaft Bearings	Remove and install camshaft bearings	Chrysler Corp.
C-3204	Installer, Bearing	Install transmission output shaft rear bearing	Chrysler Corp.
C-3221	Remover and Installer, Piston and Connecting Rod	Remove and install pistons and connecting rods	Chrysler Corp.
C-3288	Stud, Pilot	Install front pump and reaction shaft in transmission	Chrysler Corp.
C-3422	Compressor, Valve Spring	Remove and install valve springs and transmission servo springs	Chrysler Corp.
C-3427	Reamer, Valve Guide, 0.030 in. oversize	Ream valve guides for oversize valves	Chrysler Corp.
C-3430	Reamer, Valve Guide, 0.015 in. oversize	Ream valve guides for oversize valves	Chrysler Corp.
C-3433	Reamer, Valve Guide, 0.005 in. oversize	Ream valve guides for oversize valves	Chrysler Corp.

Table 5-3. Recommended Overhaul Tools (Cont.)

Part No.	Nomenclature	Application	Manufacturer
C-3468	Installer, Shaft and Bearing	Install water pump shaft and Bearing	Chrysler Corp.
C-3501	Hone, Cylinder Bore	Deglaze cylinder bores	Chrysler Corp.
C-3506	Remover and Installer, Chain Case Cover Oil Seal	Remove and install oil seal in chain case cover	Chrysler Corp.
C-3661	Puller, Tappet	Remove mechanical tappets	Chrysler Corp.
C-3724	Remover and Installer, Piston Pin	Remove and install piston pins	Chrysler Corp.
C-3743	Installer, Rear Main Bearing Seal	Install rear main bearing seal	Chrysler Corp.
C-3744	Puller, Distributor Bushing	Remove distributor drive shaft bushings	Chyrsler Corp.
C-3749	Repair Stand, Control Valve	Support for repair of transmission control valve	Chrysler Corp.
C-3750	Repair Stand, Transmission	Support for transmission repair	Chrysler Corp.
C-3753	Puller, Seal	Remove water pump seal retainer	Chrysler Corp.
C-3805	Installer, Piston Ring	Install piston rings	Chrysler Corp.
C-3837	Installer, Oil Seal	Install transmission extension housing oil seal	Chrysler Corp.
C-385	Compressor, Piston Ring	Install piston rings and pistons	Chrysler Corp.
C-3863	Installer, Cam	Install transmission overrunning clutch cam	Chrysler Corp.
C-3881	Aligning Tool, Pump Rotor	Install front pump rotors in transmission	Chrysler Corp.
C-3882	Adapter, Repair Stand	Support for transmision repair	Chrysler Corp.
C-756	Cleaner, Valve Guide	Remove deposits from valve guides	Chrysler Corp.
C-823	Hone, Cylinder Bore	Hone Cylinder walls	Chrysler Corp.
C-897	Installer, Welch Plug	Install camshaft rear welch plug	Chrysler Corp.
J-1614	Remover and Installer Pitman Shaft Bushing	Remove and install pitman shaft bushing	Saginaw
J-2619	Slide Hammer	Remove adjuster race	Saginaw
J-5755	Installer, Bearing Race	Install worm shaft bearing race	Saginaw
J-5822	Puller, Bearing Race	Remove worm shaft bearing race	Saginaw
SP-5124	Adapter, Cam	Install transmission overrunning clutch cam	Chrysler Corp.
T-109-239	Scale, Float	Check float height in carburetor	Chrysler Corp.
T-109-43	Remover, Plug	Remove rivet plug from carburetor	Chrysler Corp.
T-109-59T	Remover and Installer. Pump Jet	Remove and install carburetor pump jet	Chrysler Corp.

Repair Parts Supply

1. General:

a. The basic policies and procedures in AR 710-2 and AR 725-50 are generally applicable to repair parts management for Material Handling Equipment (MHE) items.

b. Manufacturers technical manual contains illustrated parts breakdown and lists of repair parts keyed to Federal Supply Code for Manufacturer (FSCM). The commercial technical manual does not reference. repair parts to National Stock Numbers (NSN). The FSCM for Northwestern Motor Co. is 44185. This is the FSCM to be used with the numbers in the Part No. column in the parts listing.

c. Weapon System Designator Code for this vehicle is not applicable.

d. Automated Processing (AUTODIN) of Federal Supply Code for Manufacturers part number requisitions, without edit for matching NSNs, is authorized.

2. Requisitioning Repair Parts (MILSTRIP):

a. Preparation and Transmittal

(1) Requisitions will be prepared in the normal MILSTRIP format.

(2) NSN Repair Parts. Requisitions transmitted by AUTODIN for NSN repair parts will be automatically routed by the Defense Automated Addressing System (DAAS) to the responsible Federal Supply Class Manager.

(3) Non-NSN Repair Parts. Requisitions for non-NSN repair parts may be locally procured or requisitioned from the Defense Construction Supply Center (DCSC). When the manufacturer's part number and the FSCM exceed columns 8-22, prepare an A05/AOE requisition.

(a) Project codes have been assigned to identify non-NSN repair parts requisitions placed on the wholesale supply system. Refer to Appendix H for applicable codes and format.

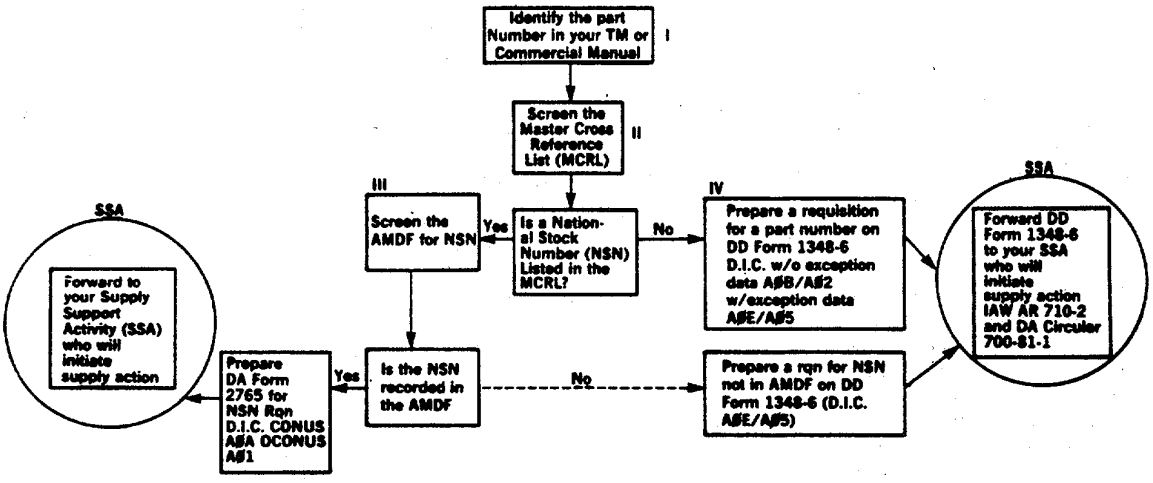
(b) Part numbers not found in military publications or GSA supply catalogs, full exception data will be provided. Exception data is defined as information required for item identification or requisition processing which cannot be put in a mechanized requisition. Refer to Appendix H for applicable codes and format to assist in requisitioning parts for Construction and Material Handling Equipment. Requisitions are mailed to:

Commander
Defense Construction Supply Center
ATTN: DCSC-OSR
Columbus, OH 43215

(4) Non-AMDF Requests. All requests for NSN items not in the AMDF will be identified by an assigned Document Identifier Code (DIC). These requests will be edited for sufficient data to provide identification of higher supply levels. Refer to Appendix H for applicable codes/format for CONUS/OCONUS requests.

b. MHE repair parts that cannot be locally procured will be routed to DCSC. OCONUS activities are not required to attempt local purchase.

DO YOU NEED A REPAIR PART FOR ONE OF YOUR COMMERCIAL CONSTRUCTION OR MATERIALS HANDLING EQUIPMENT ITEMS? YES? THEN FOLLOW THESE 4 EASY STEPS!



NON-NSN REQUISITION (MANUAL)

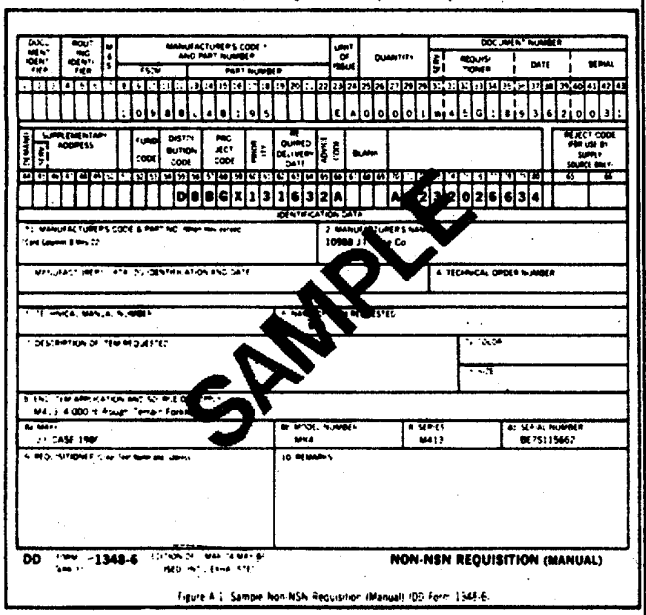


Figure A-1. Sample Non-NSN Requisition (Manual) (DD Form 1348-6).

LEGEND FOR 1348-6

CARD COLUMNS	CONUS	OCONUS
1-3 DOC Ident Code -		
PN w/o Exception Data	AØB	AØ2
PN w/Exception Data	AØE	AØ5
NSN Not in AMDF	AØE	AØ5

4-7 (LV Blank - SSA will complete)

8-22 For Non NSN: Fed Supply Code for Manufacturer (FSCM followed by Part Number (obtain from TM or Commercial Manual)

8-22 For NSN not in AMDF - enter NSN

57-59 Project Code:	MHE	CCE
CONUS	BGX	BGW
OCONUS	JZM	JZC

Reference Code for Cols 71-80:
- A - Technical Order or Tech Manual.
- B - End Item Application.
- C - Noun Description of Item.
- D - Drawing or Specification Number.

Identification of reference Data specified in Col. 70.

NOTE: All other entries will be made IAW AR 710-2/725-50. Project Codes are mandatory entries.

MANUAL BLOCKS:

BLOCK 1. Mfg Code & PN - Enter applicable FSCM and PN when they exceed Cols 8-22. (Cols 8-22 will be left blank).

BLOCKS 2-8. Enter applicable data (obtain from TM or Commercial Manual).

BLOCKS 8a-8d. Obtain data from vehicle data plate.

BLOCK 9. Self explanatory.

BLOCK 10. Enter any applicable exception data such as "NSN not in AMDF".

SECTION VI
PARTS LIST

6-1. GENERAL.

6-2. This section comprises the Illustrated Parts List for JG40PT-15 Warehouse Towing Tractor, manufactured by Northwestern Motor Company, Eau Claire, Wisconsin 54701. This section is divided into a Group Assembly Parts List and a Numerical Index. The Table of Contents also shows the grouping of parts for the tractor.

6-3. GROUP ASSEMBLY PARTS LIST.

6-4. The Group Assembly Parts List consists of a series of parts lists and associated illustrations for the major components, groups and detailed parts of the towing tractor. Parts are listed in the general order of disassembly except for "attaching parts", which are listed after the parts attached or after the listing of a group identical or similar attached parts. Miscellaneous parts supplied in repair kits are associated with a group of parts, but not illustrated, are included in the list of parts for the applicable illustration. Detail parts of assemblies or subassemblies immediately follow the assembly or subassembly and are indented one column to show relationship to the assembly.

6-5. The Fig. and Index No. column gives the figure and index number for the parts shown on the corresponding illustration. Index numbers are assigned in numerical sequence. Parts which are not illustrated are identified by figure number only.

6-6. The Part No. column lists the part numbers assigned by the Northwestern Motor Company. Parts that are available from sources other than Northwestern Motor Company are further identified by the Federal Manufacturer's Code and corresponding part number in parenthesis following the description of the part. Refer to paragraph 617. Parts with no part number are indicated by "No Number" in the Part No. column.

6-7. The Description column gives the noun name of each part together with additional description for complete identification when necessary. Included in the description column, when applicable, are the manufacturer's code and part number.

6-8. The Units Per Assy column gives the number of each particular part required for the tractor at that point of assembly. Parts which are nonprocurable as a separate part are indicated by the sign NP. The symbol AR means "as required".

6-9. The Usable On Code column is used to indicate the application of parts to different tractor models by means of a letter/number code. Refer to table in paragraph 1-2. In some cases notations are made in the description to indicate parts application.

6-10. NUMERICAL INDEX.

6-11. The Numerical Index is an alphabetical listing of all part numbers included in the Group Assembly Parts List. The figure and index number of the part number is given to permit locating each numbered part on its applicable illustration. Cross-references are provided where necessary.

6-12. HOW TO USE THE PARTS LIST.

6-13. WHEN THE PART NUMBER IS KNOWN.

Locate the part number in the numerical index with the corresponding figure and index number. Refer to the related illustration and parts list to find the part.

6-14. WHEN THE PART NUMBER IS NOT KNOWN.

1. Determine the function and application of the part required. Turn to the Table of Contents and select the most appropriate title. Note the illustration page number.
2. Turn to the page indicated and locate the desired part on the illustration.
3. From the illustration, obtain the index number assigned to the part desired. Refer to the accompanying description for specific information regarding the part.

6-15. REPAIR KITS.

6-16. This publication reflects the listing of repair parts kits. Such listings are intended to provide information concerning replacement parts usable at major overhaul and minor repair. Certain replacement parts are stocked only in kits. Standard parts and parts having multi-application are stocked in their appropriate classes and may also be stocked in kits. Kit parts should not be ordered from separate stock to make up a kit.

6-17. FEDERAL MANUFACTURERS CODES.

6-18. The following is a list of Federal Manufacturers Codes and the manufacturers they represent as listed in the Federal Supply Code for Manufacturers, H4-1.

CODE	VENDOR'S NAME AND ADDRESS
01604	Bendix Corporation Hydraulics Division Lakeshore Drive St. Joseph, Michigan 49085
05657	Corbin Hose Clamp Division American Hardware Corp. New Britain, Connecticut 06050
09527	Thomas G. Faria Faria Road Uncasville, Ct 06832
18265	Donaldson Co., Inc. 1400 W. 94th. Street Minneapolis, Minnesota 41014
24161	Gates Rubber Co. 999 South Broadway Denver, Colorado 80217
24455	General Electric Co. Lamp Division of Consumer Products Group Nela Park, Cleveland, Ohio 44100
24617	GeneralMotorsCorp.
24617	General Motors Corp. Detroit, Michigan 48200
26377	Ford Motor Co. General Parts Division 2 Stewart-Place Ypsilanti, Michigan 48197
44185	Northwestern Motor Co. Eau Claire, Wisconsin 54701
49234	Protectoseal Co. 1920 S. Western Avenue Chicago, Illinois 60608
52788	Saginaw Steering Gear Div. General Motors Corp. 3900 Holland Road Saginaw, Michigan 48601
63477	Wagner Electric Corp Motorola, Inc. Wagner Division 6400 Plymouth Ave. St. Louis, Missouri 63133
71400	Bussmann Mfg. Division of McGraw-Edison Co. 2536 W. University St. St. Louis, Missouri 63017
72560	Delco Products Division General Motors Corp. 329 East 1st. Street Dayton, Ohio 45401
74400	John W. Hobbs Corp. Ash St. and Yale Blvd. L Springfield, Illinois 62700
74865	Chrysler Corp. Industrial Engine Division Marysville, Michigan 48040
75715	KD Lamp Division Noma Electric Co. Cincinnati, Ohio 45210
75272	Kickhaefer Mfg. Co, 1964 Wisconsin Ave. Grafton, Wisconsin 53024
75300	Introl Division Chrysler Corporation Ann Arbor, Michigan 48106
76260	Mechanics Universal Joint Div. of Borg-Warner Corp. 2020 Harrison Avenue Rockford, Illinois 61101
76700	Nelson Muffler Corp. P.O. Box 308 Stoughton, Wisconsin 53589
78170	Telefax, Inc. P.O. Box 218 North Wales, Pa. 19454
78500	Rockwell-Standard Corp. Transmission and Axle Div. Clifford at Bagley Detroit, Michigan 48231
79470	Weatherhead Co. Cleveland, Ohio 44108
79136	Waldes-Kohinoor, Inc. 47-16 Austel Place Long Island, N.Y. 11101
79497	Western Rubber Co. 620 E. Dougles Goshen, Ind. 46526
79550	Whitaker Cable Corp. 1301 Burlington North Kansas City, Missouri 64116
80211	Motorola Automotive Products, Inc. 9401 W. Grand Avenue Franklin Park, Illinois 60131
88044	Air Force-Navy Aeronautical Standards Drawing
89522	Indak Mfg. Corp. 1915 Techny Road Northbrook, Illinois 60062
92867	Orscheln Brake Lever Mfg. Co. Moberly, Missouri 65270
94222	Southco, Inc. Lester, Pa. 19113
96906	Military Standards
99343	American Motors 14250 Plymouth Road Detroit, Michigan 48232

FIG & INDEX NO	PART NO	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
	1234667	TOWING TRACTOR		
6-1-	MODEL JG40PT-15	TRACTOR, Towing	1	
-1	No Number	FRAME GROUP (See figure 6-2 for breakdown)	1	
6-1-	22783	ENGINE AND TRANSMISSION ASSEMBLY, Complete	1	
6-1-	22879	ENGINE ASSEMBLY, Complete, less transmission	REF	
6-1-	22878	ENGINE BLOCK ASSEMBLY, With head, piston, valves camshaft, crankshaft and enclosures, less accessories	REF	
-2	No Number	ENGINE BLOCK, Head and pan group (See figure 6-13 for breakdown) 1		
-3	No Number	CAMSHAFT AND VALVE GROUP (See figure 6-14 for breakdown)	1	
-4	No Number	CRANKSHAFT GROUP (See figure 6-16 for breakdown)	1	
-5	No Number	PISTON AND CONNECTING ROD GROUP (See figure 6-15 for breakdown)	1	
4	No Number	ENGINE OIL PUMP AND FILTER GROUP (See figure 612 for breakdown)	1	
-7	No Number	MANIFOLD GROUP (See figure 6-11 for breakdown)	1	
-8	No Number	FUEL PUMP GROUP (See figure 6-5 for breakdown)	1	
-9	No Number	CARBURETOR GROUP (See figure 6-6 for breakdown)	1	
-10	17400	GOVERNOR GROUP (See figure 6-7 for breakdown)	1	
-11	21007	DISTRIBUTOR (See figure 6-48 for breakdown)	1	

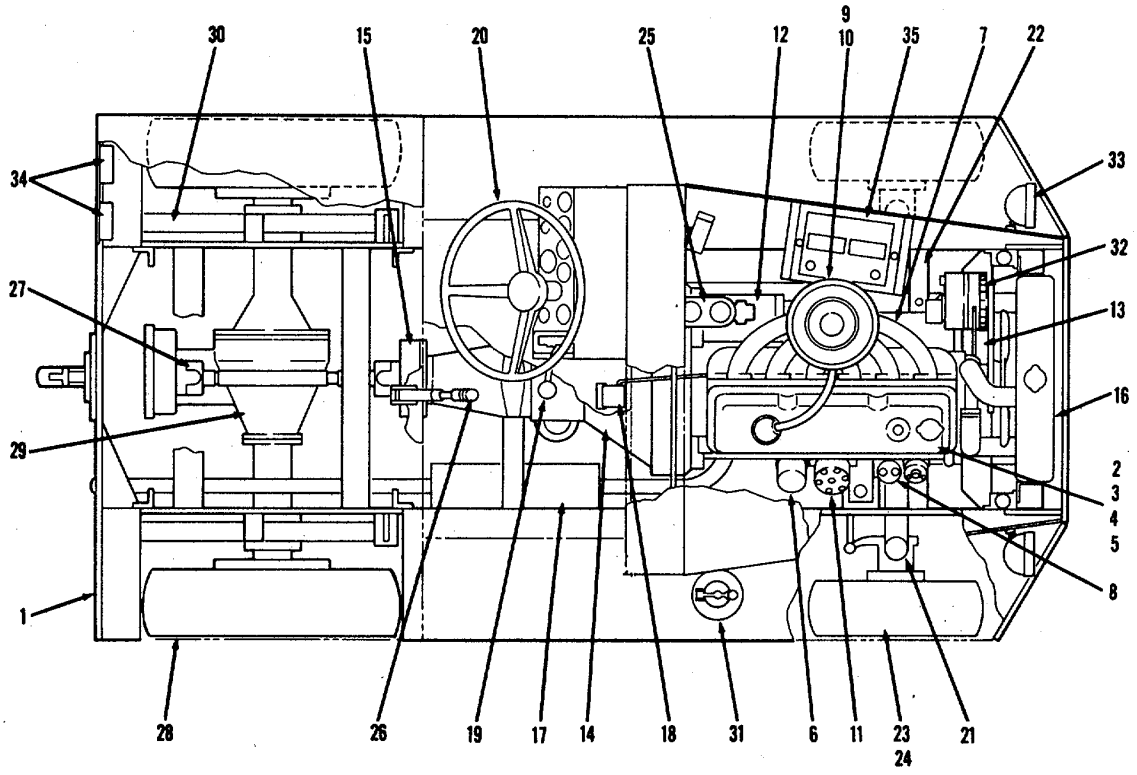


Figure 6-1. Warehouse Towing Tractor

FIG & INDEX NO	PART NO	1234567 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		TOWING TRACTOR		
-12	No Number	STARTER MOTOR GROUP (See figure 6-49 for breakdown)	1	
-13	No Number	WATER PUMP GROUP (See figure 6-4 for breakdown).....	1	
-14	No Number	TRANSMISSION ASSEMBLY (See figure 6-29 for breakdown).....	1	
-15	No Number	PARKING BRAKE ASSEMBLY (See figure 6-43 for breakdown).....	1	
-16	No Number	RADIATOR GROUP (See figure 6-3 for breakdown) 1		
-17	No Number	EXHAUST AND MUFFLER GROUP (See figure 6-10 for breakdown).....	1	
-18	No Number	ACCELERATOR LINKAGE GROUP (See figure 6-8 for breakdown).....	1	
-19	No Number	SHIFT LEVER GROUP (See figure 6-45 for breakdown).....	1	
-20	No Number	STEERING GEAR GROUP (See figure 6-17 for breakdown)	1	
-21	No Number	FRONT AXLE AND DRAG LINK GROUP (See figure 6-19 for breakdown).....	1	
-22	No Number	FRONT SPRING GROUP (See figure 6-20 for breakdown)..	1	
-23	No Number	FRONT WHEEL GROUP (See figure 6-18 for breakdown)...	2	
-24	No Number	FRONT BRAKE GROUP (See figure 6-21 for breakdown)....	1	
-25	No Number	BRAKE CONTROL GROUP (See figure 6-22 for breakdown) ...	1	
-26	No Number	PARKING BRAKE GROUP (See figure 6-44 for breakdown)....	1	
-27	No Number	DRIVE SHAFT GROUP (See figure 6-23 for breakdown).....	1	
-28	No Number	REAR WHEEL GROUP (See figure 6-28 for breakdown).....	2	
-29	22880	REAR AXLE ASSEMBLY (See figure 6-24 through 6-27 for breakdown).....	1	
-30	No Number	REAR SPRING GROUP (See figure 6-29A for breakdown)..	1	
-31	No Number	FUEL TANK GROUP (See figure 6-9 for breakdown).....	1	
6-1-	No Number	ELECTRICAL SYSTEM GROUP (See figure 6-46 for breakdown).....	1	
32	No Number	ALTERNATOR GROUP (See figure 6-47 for breakdown).....	1	
33	No Number	HEAD LIGHT GROUP (See figure 6-50 for breakdown).....	2	
-34	No Number	- REAR LIGHT GROUP (See figure 6-51 for breakdown).....	1	
-35	No Number	BATTERY GROUP (See figure 6-52 for breakdown).....	1	
		FRAME GROUP		
6-2-	No Number	FRAME GROUP (See figure 6-1 for NHA).....	REF	
-1	22980	HOOD ASSEMBLY.....	1	
		(ATTACHING PARTS)		
-2	0912-H	- SCREW, Cap.....	4	
-3	0351-W	WASHER, Lock.....	4	
-4	0303-W	WASHER, Flat ..... _*_	4	
-5	22794	HINGE, Hood	1	
	22795	HINGE, Hood	1	
		(ATTACHING PARTS)		
-6	0913-H	SCREW, Cap	4	
-7	0303-W	WASHER, Flat	4	
-8	0351-W	WASHER, Lock.....	4	
-9	010SN	NUT, Hex	4	
-10	23065	-SCREW	2	
		(ATTACHING PARTS)		
-11	0105-N	NUT, Hex	4	
-12	22814	HOLDDOWN, Hood (94222 No 37-10-086-10).....	2	
		(ATTACHING PARTS)		
-13	01340-B	SCREW, Machine, round hd, No 10-32 x 5/8 in.....	4	
-14	0374-W	WASHER, Lock.....	4	
-15	0132-N	NUT, Hex ..... _*_	4	

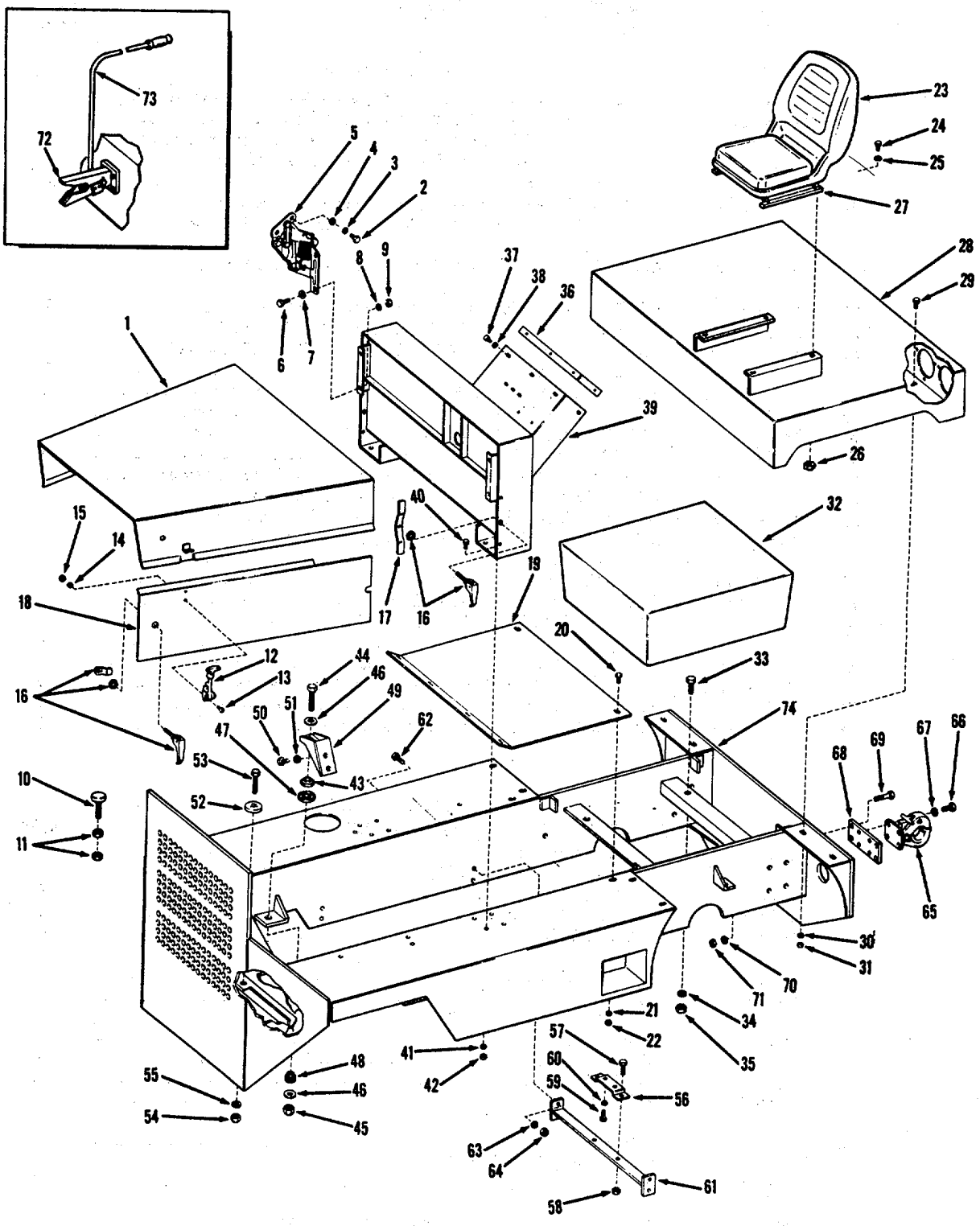


Figure 6-2. Frame Group

FIG & INDEX NO	PART NO	1234567 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FRAME GROUP		
-16	22813	LATCH, Hood (94222 No 6 2-10- 301-20)	4	
-17	22988	SPRING, Latch	2	
-18	22829	PANEL, Side, LH	1	
	22830	PANEL, Side, RH	1	
-19	22816	PLATE, Deck	1	
		(ATTACHING PARTS)		
-20	0912-H	SCREW, Cap	6	
-21	0351-W	WASHER, Lock	6	
-22	0108-N	NUT, Hex	6	
-23	22332	SEAT ASSEMBLY	1	
		(ATTACHING PARTS)		
-24	0906-H	SCREW, Cap	4	
-25	0350-W	WASHER, lock	4	
-26	0105-N	NUT, Hex	4	
		__*__		
-27	22762	RAIL, Slide, RH	1	
	22761	RAIL, Slide, LH	1	
6-2-28	22690	REAR BODY		
		(ATTACHING PARTS)		
-29	0912-H	SCREW, Cap	8	
-30	0351-W	WASHER, Lock	8	
-31	0108-N	NUT, Hex	8	
		__*__		
-32	22636	COUNTERWEIGHT	1	
		(ATTACHING PARTS)		
-33	0922-HH	SCREW, Cap	4	
-34	0354-W	WASHER, Lock	4	
-35	0117-N	Hex Nut	4	
		__*__		
-36	22675	PANEL, Instrument	1	
		(ATTACHING PARTS)		
-37	0904-H	SCREW, Cap	5	
-38	0350-W	WASHER, Lock	5	
		__*__		
-39	22679	SUPPORT ASSEMBLY	1	
		(ATTACHING PARTS)		
-40	0912-H	SCREW, Cap	8	
-41	0351-W	WASHER, Lock	8	
-42	0108-N	NUT, Hex	8	
		__*__		
-43	10323-A	INSULATOR, Engine, side upper (23040 No ST6038A)	1	
		(ATTACHING PARTS)		
-44	0919-HH	SCREW, Cap, hex head	1	
-45	0232A	NUT, Self-locking, hex	1	
-46	0305-W	WASHER, Flat	2	
		__*__		
-47	10323-B	RETAINER, Insulator (23040 No 78-6048A)	1	
-48	10326-A	INSULATOR, Engine, side lower (23040 No 59746039A)	1	
-49	22695	BRACKET, Engine mounting, side	1	
		(ATTACHING PARTS)		
-50	0961-H	SCREW, Cap, hex head	2	
-51	0362-W	WASHER, Lock	2	
		__*__		
-52	17063	INSULATOR, Engine, front	1	
		(ATTACHING PARTS)		
-53	0948-H	SCREW, Cap, hex head	1	
-54	0210A	NUT, Self locking, hex	1	

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			FRAME GROUP		
55	0304-W		WASHER, Flat	1	
	14597		WASHER, Fat	1	
			-*-		
56	14739		INSULATOR, Transmission extension (74865 No. 2231464)	1	
			(ATTACHING PARTS)		
57	0912-H		SCREW, Cap, hex head	2	
58	0213A		NUT, Self-locking, hex	2	
59	0951-H		SCREW, Cap, hex head	2	
60	0352-W		WASHER, Lock	2	
			-*-		
61	22683		SUPPORT, Transmission	1	
			(ATTACHING PARTS)		
62	0921-H		SCREW, Cap, hex head	4	
63	0353-W		WASHER, Lock	4	
64	0112-N		NUT, Plain, hex	4	
			-*-		
65	22773		PINTLE, Towing (96906 No. MS51335-2)	1	
			(ATTACHING PARTS)		
66	0817-H		SCREW, Cap	4	
67	0353-W		WASHER, Lock	4	
			-*-		
68	14159		PLATE, Adapter	1	
			(ATTACHING PARTS)		
69	0822-H		SCREW, Cap	4	
70	0353-W		WASHER, Lock	4	
71	0113-N		NUT, Hex	4	
			-*-		
6-2-72	22965		COUPLER (Army only)	1	
			(ATTACHING PARTS)		
	0968-H		SCREW, Cap	4	
	0353-W		WASHER, Lock	4	
	0112-N		NUT, Hex	4	
			-*-		
6-2-73	22987		HANDLE, Coupler (Army only)	1	
			(ATTACHING PARTS)		
	0912-H		SCREW, Cap	4	
	0351-W		WASHER, Lock	4	
	0108-N		NUT, Hex	4	
			-*-		
6-2-	23042		HANDLE, Rubber (Army only)	1	
74	22700		FRAME ASSEMBLY	1	

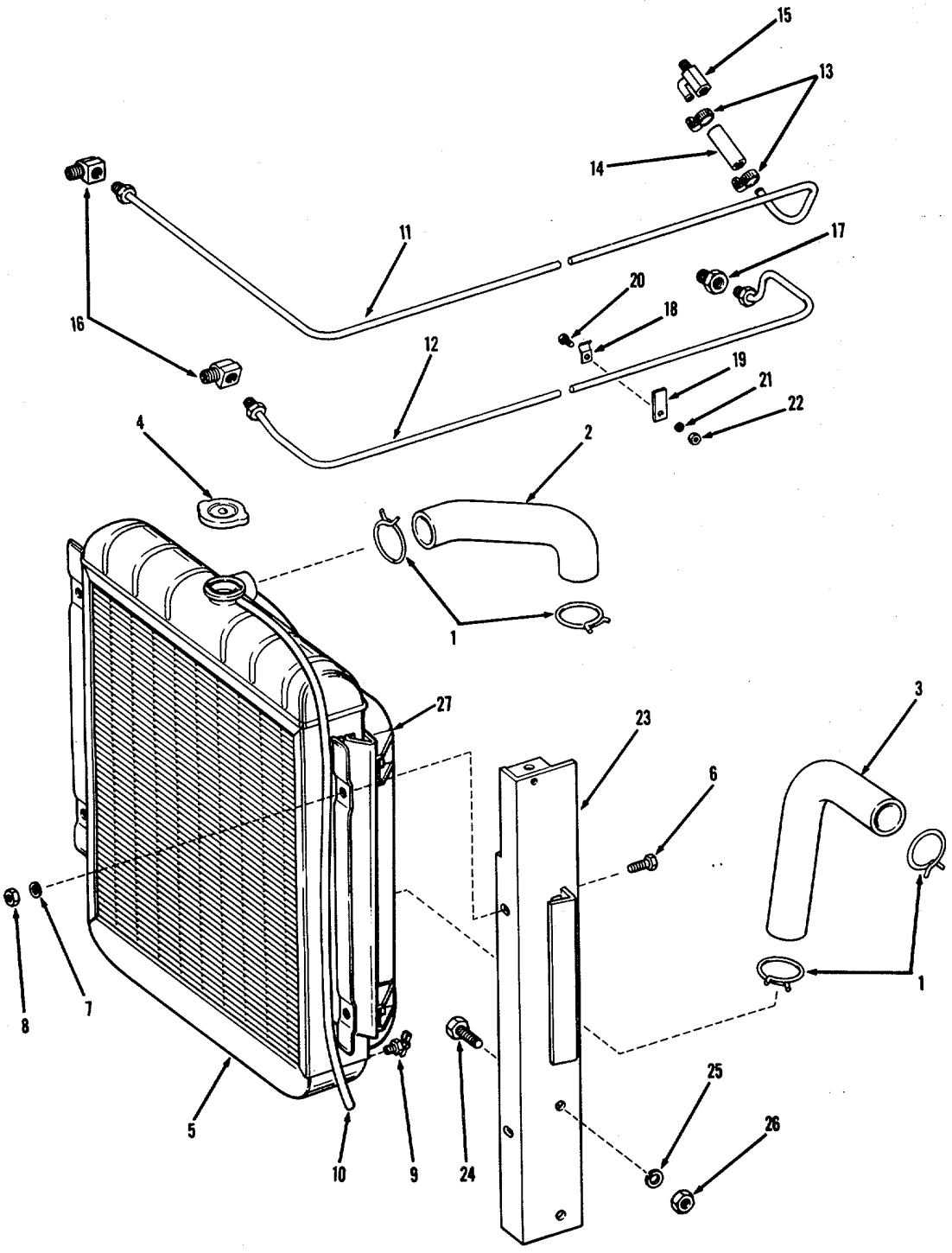


Figure 6-3. Radiator Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			RADIATOR GROUP		
6-3-	No Number		RADIATOR GROUP (See figure 6-1 for NHA)	REF	
1	01900-L		CLAMP, Hose (05657 No. A-30)	4	
2	22803		HOSE, Rubber, upper radiator	1	
3	22804		HOSE, Rubber, lower radiator	1	
4	17243		CAP, Radiator (74865 No. 1541812)	1	
5	22699		RADIATOR	1	
			(ATTACHING PARTS)		
6	0912H		SCREW, Cap, hex head	4	
7	0351-W		WASHER, Lock	4	
8	0108N		NUT, Plain, hex	4	
			-*-		
9	01417-F		COCK, Drain (79470 No. 145)	1	
10	14755		HOSE, Overflow	1	
11	22779		TUBE ASSEMBLY	1	
12	17055		TUBE ASSEMBLY	1	
13	01917-LL		CLAMP, Hose	2	
14	22390		HOSE, Rubber	1	
15	22765		ADAPTER	1	
16	01420-F		ELBOW, Tube (79470 No. 400X5)	2	
17	01427-F		CONNECTOR, Tube (79470 No. 200X5)	2	
18	01934-L		CLIP (75272 No. MTC-1052)	2	
19	16732		BACK, Clip	2	
			(ATTACHING PARTS)		
20	0900-H		SCREW, Machine	2	
21	0349-W		WASHER, Lock	2	
22	0102-N		NUT, Plain, hex	2	
			-*-		
23	22691		SUPPORT, LH	1	
	22692		SUPPORT, RH	1	
			(ATTACHING PARTS)		
24	0921-H		SCREW, Cap	4	
25	0353-W		WASHER, Lock	4	
26	0112-N		NUT, Hex	4	
			-*-		
27	22757		SHROUD (74865 No. 2298327)	1	

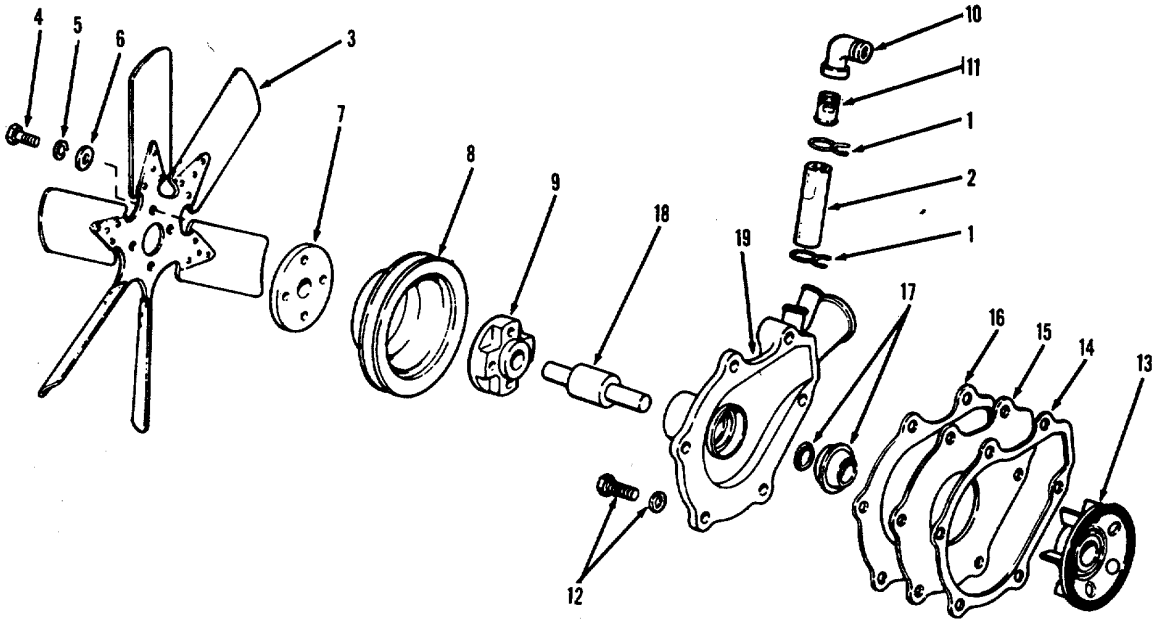


Figure 6-4. Water Pump Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		WATER PUMP GROUP		
6-4-	No. Number	WATER PUMP GROUP (See figure 6-1 for NHA)	REF	
1	13082-B	CLAMP, Hose	2	
2	17394	HOSE, Bypass	1	
3	16457	FAN, Cooling (74865 No. 1924763)	1	
		(ATTACHING PARTS)		
4	0908-H	SCREW, Cap	4	
5	0350-W	WASHER, Lock	4	
6	0302-W	WASHER, Flat	4	
		-*-		
7	17407	SPACER, Fan (74865 No. 1859532)	1	
8	17576	PULLEY (74865 No. 22026 66)	1	
6-4-	22809	V-BELT (24161 No. 8307)	1	
9	17405	HUB (74865 No. 2129265)	1	
10	01431-F	ELBOW (79470 No. 3350)	1	
11	17402	NIPPLE, Bypass (74865 No. 1947643)	1	
6-4-	17397	PUMP ASSEMBLY, Water, with gasket (74865 No2196910)	1	
		(ATTACHING PARTS)		
12	19397	SCREW AND WASHER ASSEMBLY (74865 No. 180124)	6	
		-*-		
13	*17404	IMPELLER (74865 No. 2205549)	1	
14	*17396	GASKET, Separator plate (74865 No. 1947523)	1	
15	*No. Number	PLATE, Separator	NP	
16	*17395	GASKET, Body (74865 No. 19 47521)	1	
17	*17403	SEAL ASSEMBLY (74865 No. 2120955)	1	
18	*No. Number	SHAFT ASSEMBLY, With thrower	NP	
19	No. Number	BODY, Pump	NP	
6-4-	17398	REPAIR KIT, Water pump	AR	

*Procure as part of repair kit, Part No. 17398.

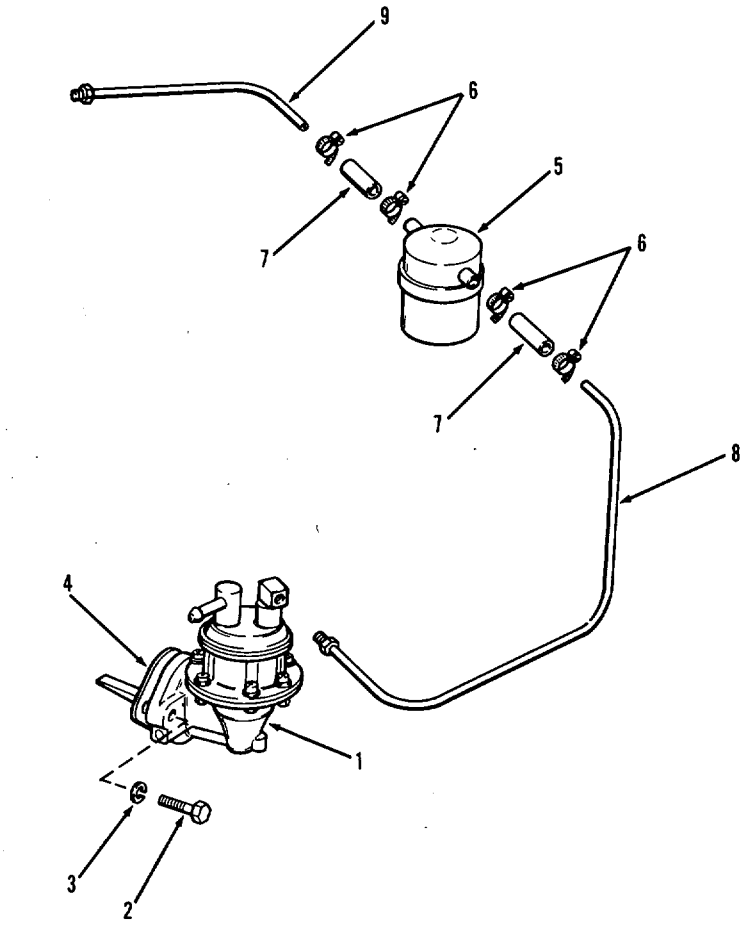


Figure 6-5. Fuel Pump Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FUEL PUMP GROUP		
6-5-	No Number	FUEL PUMP GROUP (See figure 6-1 for NHA).....	REF	
1	21161	PUMP, Fuel (74865 No. 2946434).....	1	
		(ATTACHING PARTS)		
2	0913-H	SCREW, Cap.....	2	
3	0351-W	WASHER, Lock.....	2	
		-*-		
4	17434	GASKET (74865 No. 3577870).....	1	
5	22784	FILTER, Fuel (74865 No. 2202782).....	1	
6	01917LL	CLAMP, Hose.....	4	
7	22390	HOSE, Rubber.....	2	
8	22796	TUBE ASSEMBLY (74865 No. 2946442).....	1	
9	22797	TUBE ASSEMBLY (74865 No. 2406152).....	1	
	22798	CLIP (74865 No. 2406151).....	1	

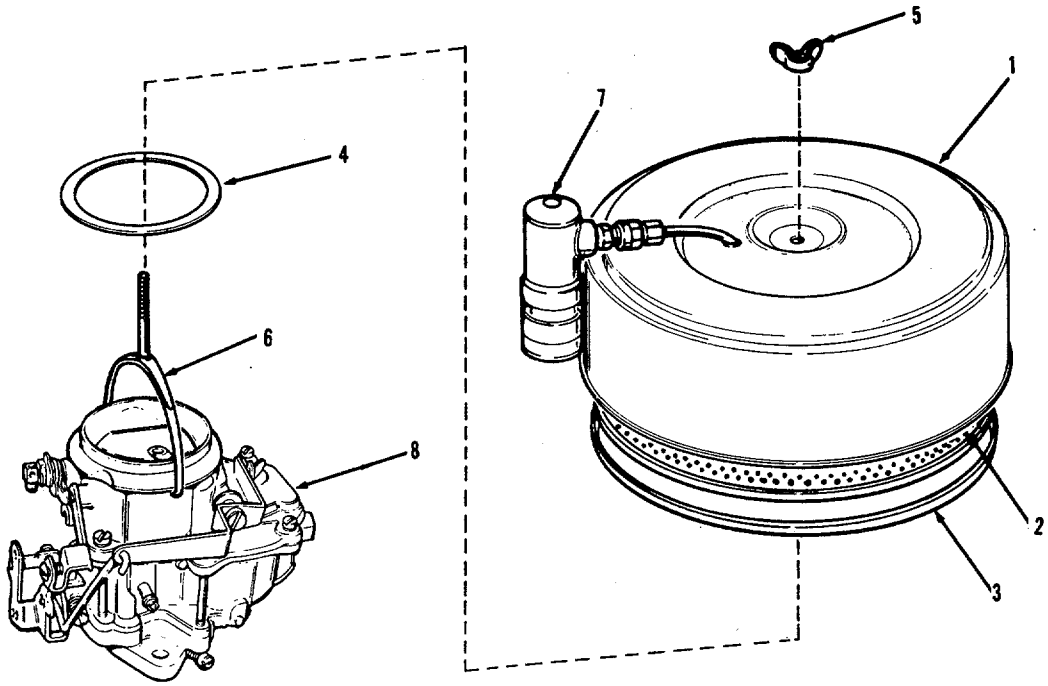


Figure 6-6. Carburetor Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		CARBURETOR GROUP		
6-6-	No Number	CARBURETOR GROUP (See figure 6-1 for NHA)	REF	
6-6-	23113	AIR CLEANER	1	
-1	23043	COVER	1	
-2	20896	FILTER	1	
-3	23046	BASE	1	
-4	21813	GASKET (74865 No. 1947797)	1	
-5	21810	NUT, Wing (74865 No. 148313)	1	
-6	21042	CLAMP (74865 No. 2051394)	1	
-7	22831	INDICATOR (18265 No. RBX00-2220)	1	
-8	20955	CARBURETOR (71500 No. 6220S1653-182)	1	
		(ATTACHING PARTS)		
	0100N	NUT, Plain, hex	2	
	21643	STUD, Mounting	2	
		-*-		
	17388	GASKET (74865 No. 2951889)	1	
6-6-	21653	REPAIR KIT (71500 No. 10374)	AR	
		GOVERNOR ASSEMBLY		
6-7-	17400	GOVERNOR (74865 No. 2406065) (See figure 6-1 for NHA)	REF	
-1	17401	SEAL ASSEMBLY (74865 No. 618052)	1	
-2	17570	COVER, Body (75300 No. 22032)	1	
		(ATTACHING PARTS)		
-3	13262-A	SCREW, Cover (75300 No. H321)	1	
-4	13262-B	SCREW, Drive (75300 No. 21124)	1	

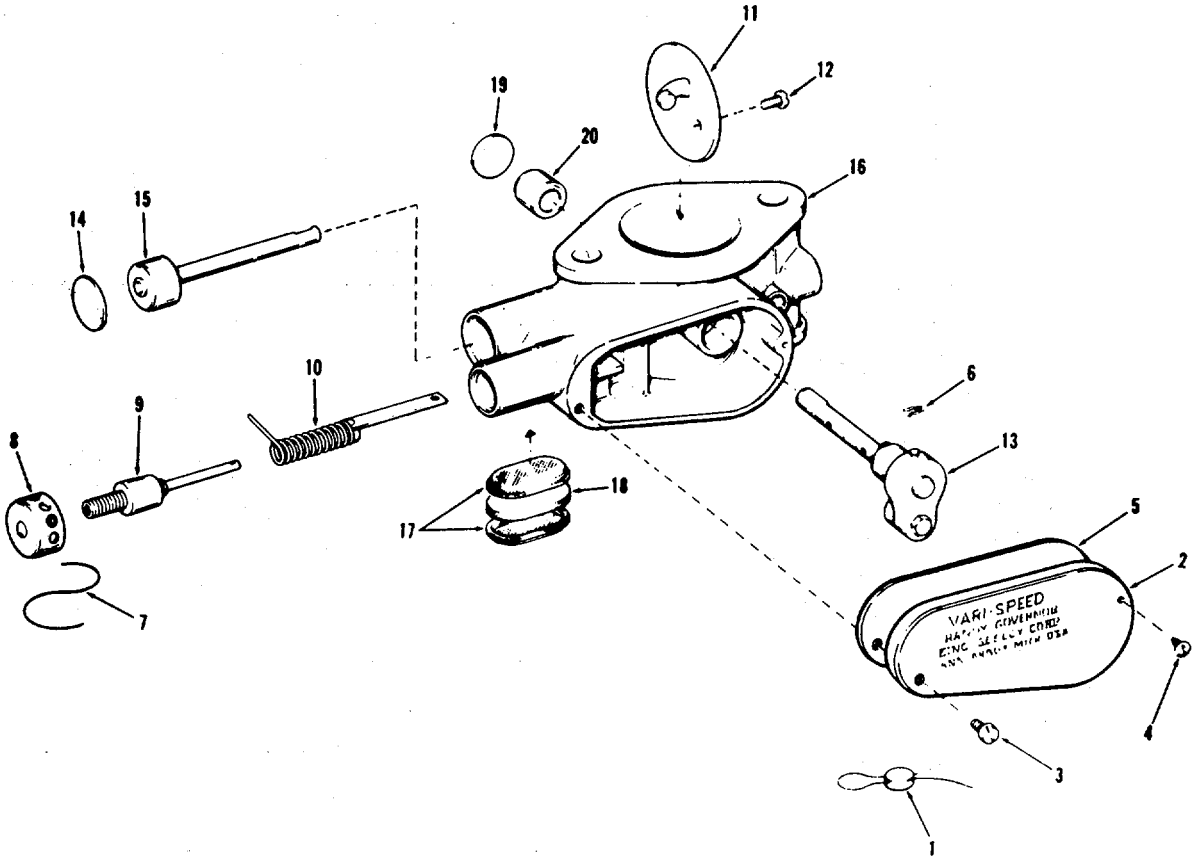


Figure 6-7. Governor Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		GOVERNOR ASSEMBLY		
-5	16066	GASKET, Cover (75300 No. 27894)	1	
-6	13263-A	CLIP, Cam ribbon (75300 No. 22027)	1	
-7	16067	WIRE, Lock (75300 No. 25688)	1	
-8	13264	CAP ASSEMBLY, Adjusting screw (75300 No. 22311)	1	
-9	17571	SCREW ASSEMBLY, Adjusting (75300 No. 25072-11)	1	
-10	17572	SPRING ASSEMBLY, Adjusting (75300 No. 28304)	1	
-11	13266	VALVE ASSEMBLY (75300 No. 25055)	1	
		(ATTACHING PARTS)		
-12	16072	SCREW AND WASHER ASSEMBLY (75300 No. 54983)	2	
-13	17573	SHAFT ASSEMBLY (75300 No. 29583)	1	
-14	*13269	PLUG, Piston (75300 No. 23927)	NP	
-15	*13269-A	PISTON, Stabilizer (75300 No. 27158)	NP	
-16	*No Number	BODY ASSEMBLY, Governor (75300 No. 16083)	NP	
-17	13268	COVER, Filter (75300 No. 22107)	2	
-18	13268-A	FELT, Filter (75300 No. 22108)	1	
-19	*No Number	COVER, Bearing (75300 No. 25512)	NP	
-20	*No Number	BEARING, Roller (75300 No. 24891)	NP	
	17388	GASKET, Flange (74865 No. 2951889)	1	
	17574	SPACER, Governor to carburetor (74865 No. 2406063)	1	

*Not procurable as a separate part.

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		ACCELERATOR LINKAGE GROUP		
6-8-	No Number	ACCELERATOR LINKAGE GROUP	REF	
-1	22828	CABLE, Choke	1	
-2	21911	SPRING (74865 No. 3492454)	1	
	21912	BRACKET, Spring (74865 No. 3641045)	1	
	0916-HH	SCREW, Cap (74865 No. 6028174)	2	
-4	0182-N	NUT, Hex (74865 No. 271169)	1	
-5	0132-N	NUT, Hex (74865 No. 120614)	1	
-6	21925	BALL JOINT (74865 No. 441279)	1	
-7	21860	ROD	1	
-8	21913	BRACKET, Bellcrank (74865 No. 2961592)	1	
	0203-A	NUT, Hex (74865 No. 15 2362)	1	
-9	0434-P	HAIR PIN	1	
	0387-W	WASHER, Flat (88044 No. AN960-4166)	1	
-10	21914	LIP, Retaining (74865 No. E59119)	1	
-11	0450-P	PIN, Cotter (74865 No. 119117)	1	
-12	0323-W	WASHER, Flat (74865 No. 120393)	1	
-13	21906	PINI (74865 No. 9427939)	1	
-14	23103	BELCRANK	1	
6-8-	22799	BRACKET (74865 No. 2125783)	1	
	20782	SUPPORT (74865 No. 2125651)	1	
-15	22985	ROD, Accelerator	1	
		(ATTACHING PARTS)		
-16	0413-P	PIN, Cotter	3	
-17	0386-W	WASHER, Flat (88044 No. AN960-616L)	3	

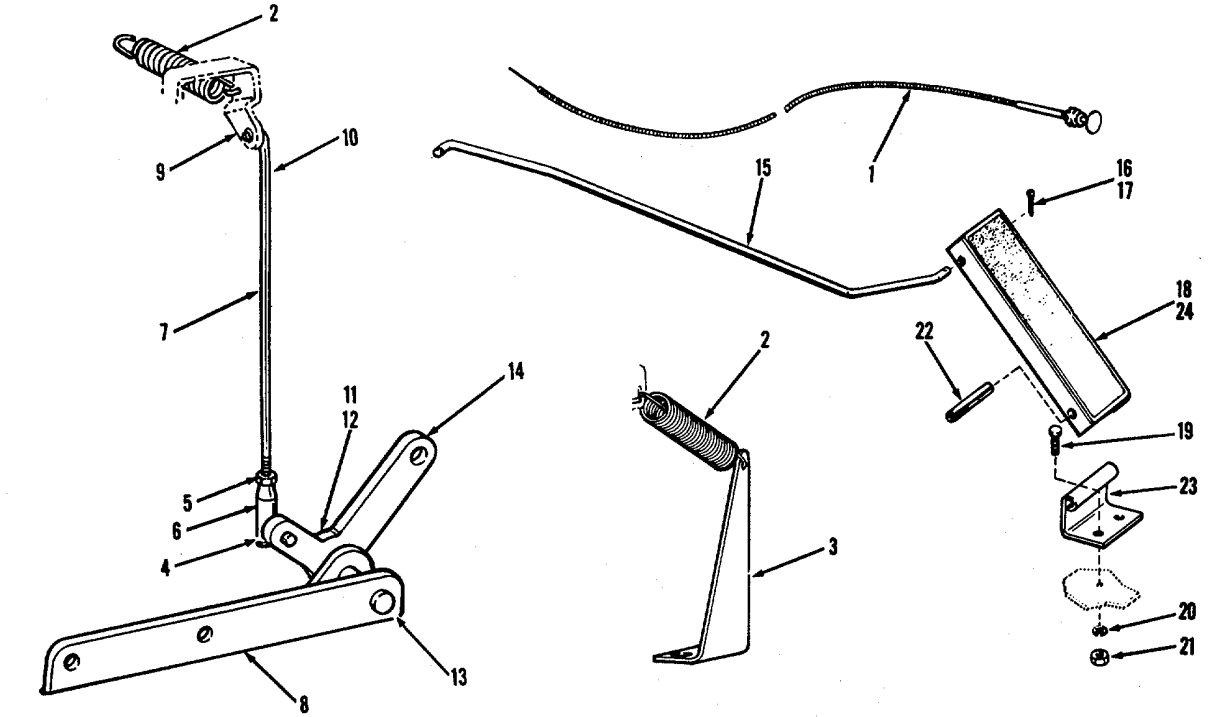


Figure 6-8. Accelerator Linkage Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		ACCELERATOR UNKAGE GROUP		
-18	22972	PEDAL ASSEMBLY	1	
		(ATTACHING PARTS)		
-19	0902-H	SCREW, Cap	2	
-20	0349-W	WASHER, Lock	2	
-21	0102-N	NUT, Hex	2	
-22	0451-P	PIN, Roll	1	
-23	22971	BRACKET	1	
-24	22970	PEDAL, Accelerator	1	
		FUEL TANK GROUP		
6-9-	No Number	FUEL TANK GROUP (See figure 6-1 for NHA)	REF	
-1	01908-L	CLAMP, Hose (05657 No. A-8)	2	
-2	17098	HOSE, Fuel	1	
-3	22770	TIME, Fuel line	1	
-4	01992-L	CLIP, Fuel line	1	
-5	01448-F	COCK, Shutoff (79470 No. 775)	1	

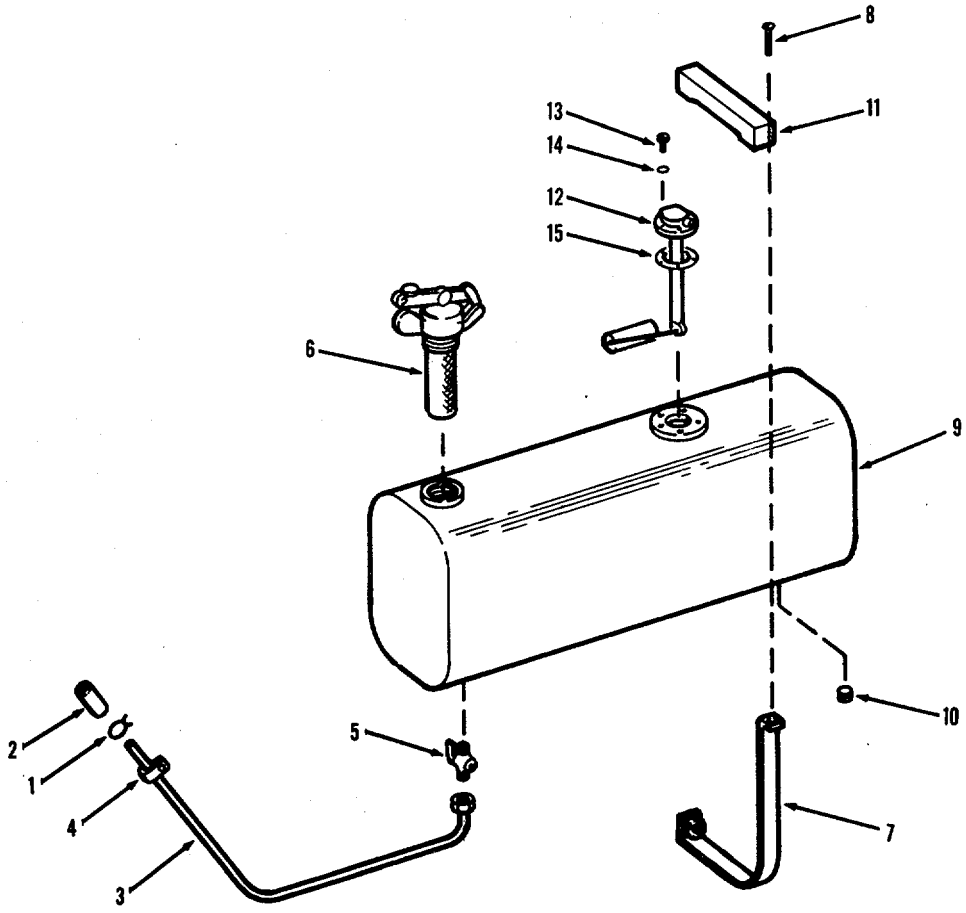


Figure 6-9. Fuel Tank Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FUEL TANK GROUP		
-6	22760	CAP, Fuel tank (49234 No. 1257)	1	
-7	22966	STRAP, Fuel tank	2	
		(ATTACHING PARTS)		
-8	0859-HH	SCREW, Cap	4	
-9	21668	TANK, Fuel	1	
-10	01501-D	PLUG, Pipe, brass, 1/4 NT	1	
-11	22982	BLOCK, Fuel tank	2	
-12	21662	SENDING UNIT, Fuel gage	1	
		(ATTACHING PARTS)		
-13	01318-B	SCREW, Machine, round head, brass, No. 10-32 x 3/8 in	6	
-14	0374-W	WASHER, Lock	6	
		-*-		
-15	21476	GASKET, Sending unit	1	
		EXHAUST GROUP		
6-10-	No Number	EXHAUST GROUP	REF	
-1	22780	PIPE, Tail	1	
-2	22978	BRACKET, Hanger tail	1	
-3	21845	CLAMP, Muffler	3	
-4	21195	MUFFLER (76700 No. T-11095)	1	

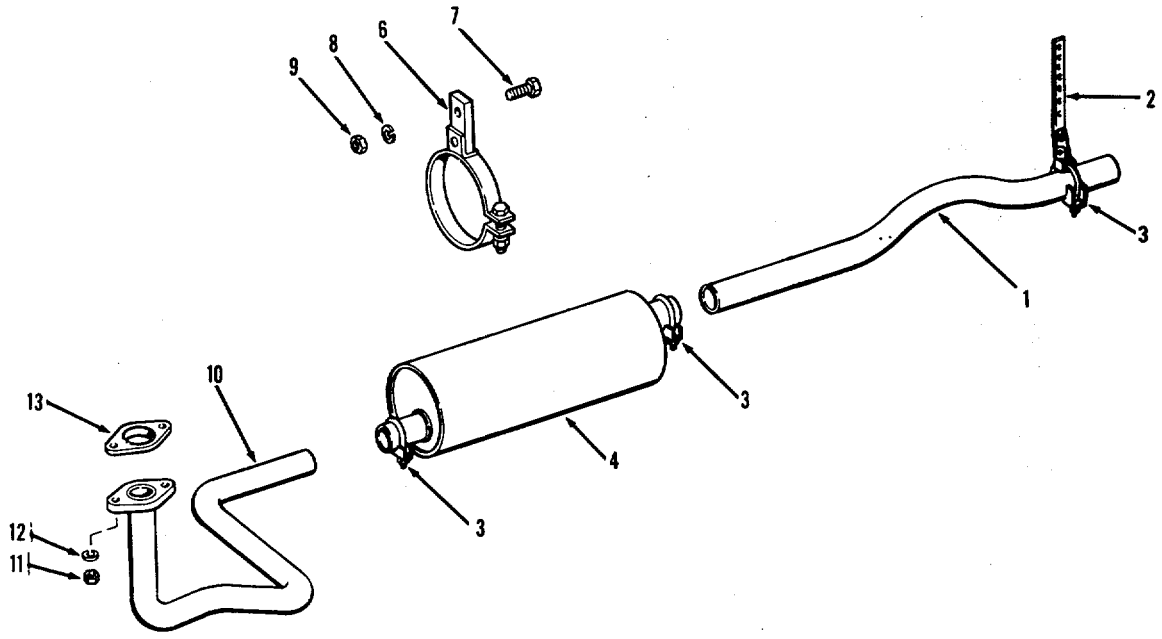


Figure 6-10. Exhaust and Muffler Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			EXHAUST GROUP		
6-10-6	22976		HANGER, Muffler	1	
-7	0906-H		SCREW, Cap	1	
-8	0350-W		WASHER, Lock	1	
-9	0105N		NUT, Hex	1	
-10	22781		PIPE, Exhaust	1	
			(ATTACHING PARTS)		
	10173-N		NUT, Hex	2	
-12	0352-W		WASHER, Lock	2	
-13	10339-HG		GASKET	1	
			ENGINE MANIFOLD GROUP		
6-11-	No Number		ENGINE MANIFOLD GROUP (See figure 6-1 for NHA)	REF	
-1	22910		NUT, Manifold upper end stud (74865 No. 6030210)	2	
-2	22918		NUT, Intake to exhaust manifold stud (74865 No. 6025020)	2	
-3	22908		WASHER, Stud (74865 No. 3751636)	10	
-4	22909		WASHER, Stud (74865 No. 3751637)	2	
-5	17379		STUD, Manifold (74865 No. 6030209)	13	
	22916		STUD, Manifold (74865 No. 152568)	1	
-6	22917		BOLT, Manifold (74865 No. 6030003)	2	
-7	22915		MANIFOLD, Intake (74865 No. 40 49221)	1	
-8	22912		VALVE KIT, Heat control (74865 No. 3420047)	1	
	No Number		COUNTERWEIGHT	1	
	No Number		SHAFT	1	
	No Number		PLATE	1	
	No Number		BUSHING	2	
	No Number		THERMOSTAT	1	
	No Number		SEAL	2	
-9	19394		PIN, Valve stop (74865 No. 2946107)	1	
-10	No Number		SPRING (74865 No. 3462514)	1	
-11	22913		MANIFOLD SET, Exhaust (74865 No. 3744826)	AR	
	No Number		MANIFOLD Exhaust	1	
	22918		Nut	1	
	22914		MOUNTING KIT, Exhaust (74865 No. 3744826)	AR	
-15	2568		STUD	1	
6-11-	22908		WASHER	10	
	22910		NUT	2	
	22909		WASHER	2	
6-11-	22911		GASKET KIT	1	
-12	17371		GASKET, Intake and exhaust manifold (74865 No. 1947762)	1	
-13	17372		GASKET, Intake to exhaust manifold (74865 No. 2843279)	1	
-14	17378		WASHER, Stud (74865 No. 2121223)	1	
-15	21910		GASKET (74865 No. 3671425)	1	
-16	21909		COVER (74865 No. 3671447)	1	
-17	0905H		CAPSCREW	2	
-18	0350-W		WASHER, Lock	2	

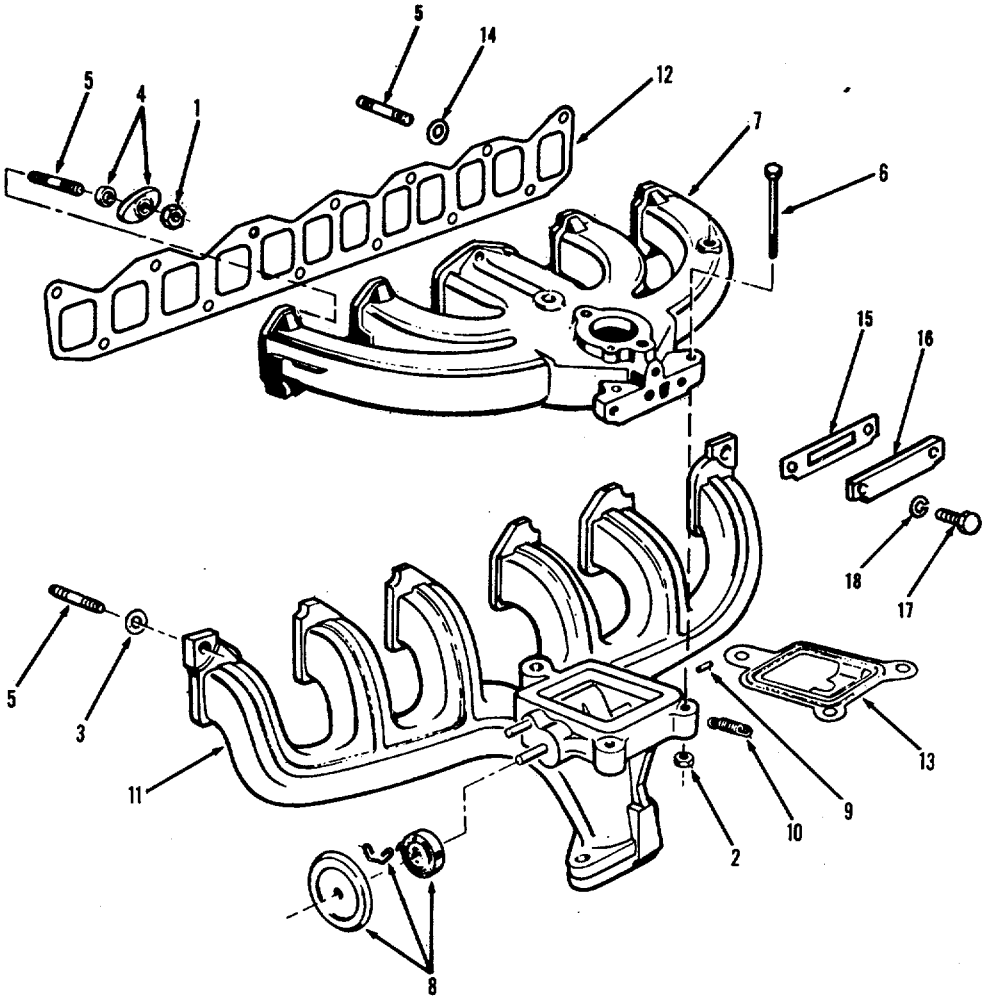


Figure 6-11. Engine Manifold Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			OIL PUMP AND FILTER ASSEMBLY		
6-12-	No Number		OIL PUMP AND FILTER ASSEMBLY (See figure 6-1 for NHA).	REF	
-1	21159		FILTER, Oil, with gasket (74865 No. 3549957).....	1	
6-12-	21160		STANDPIPE (74865 No. 3577848).....	1	
6-12-	17334		PUMP ASSEMBLY, Oil (74865 No. 2463382).....	1	
			(ATTACHING PARTS)		
-2	0908-H		SCREW AND WASHER ASSEMBLY.....	6	

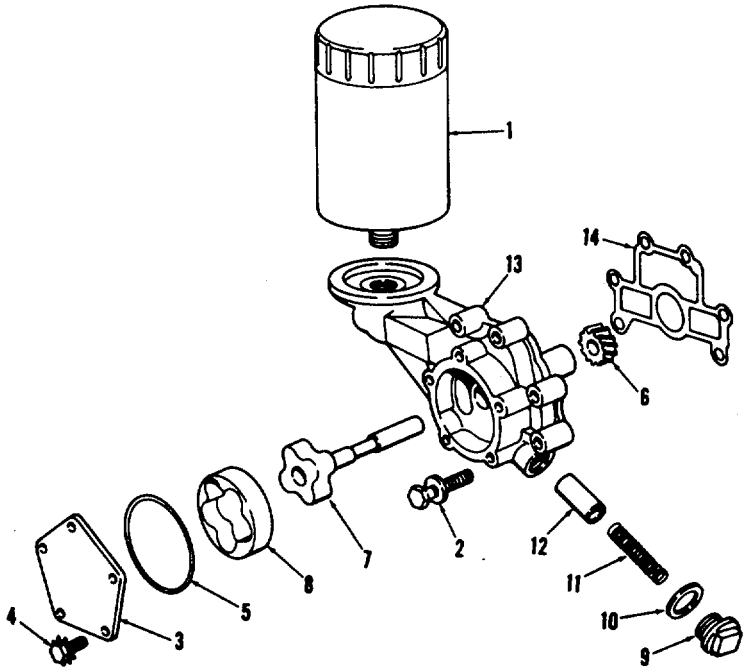


Figure 6-12. Engine Oil Pump and Filter Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		OIL PUMP AND FILTER GROUP		
-3	No Number	COVER, Oil pump	NP	
		(ATTACHING PARTS)		
-4	0902-H	SCREW AND WASHER ASSEMBLY	5	
-5	17337	RING, Seal, cover (74865 No. 2268921)	1	
-6	17339	GEAR, Oil pump drive (74865 No. 1947225)	1	
6-12-	17336	SHAFT AND ROTOR ASSEMBLY (74865 No. 2084415)	1	
-7	No Number	SHAFT AND INNER ROTOR	NP	
-8	No Number	ROTOR, Outer	NP	
-9	14963	CAP, Relief valve (74865 No. 618621)	1	
-10	14964	GASKET, Relief valve cap (74865 No. 618622)	1	
-11	17604	SPRING, Relief valve (74865 No. 1737742)	1	
-12	17335	PLUNGER, Relief valve (74865 No. 2406580)	1	
-13	No Number	BODY, Oil pump	NP	
-14	17338	GASKET, Oil pump (74865 No. 2121404)	1	
		ENGINE BLOCK, HEAD AND PAN GROUP		
6-13-	No Number	ENGINE BLOCK, HEAD AND PAN GROUP		
		(See figure 6-1 for NHA)	REF	
-1	22158	PLUG, Spark (3L-13Y)	6	
-2	17509	COVER, Spark plug cable (74865 No. 1889921)	6	
-3	16551	PLUG, Drain (74865 No. 2600089)	1	

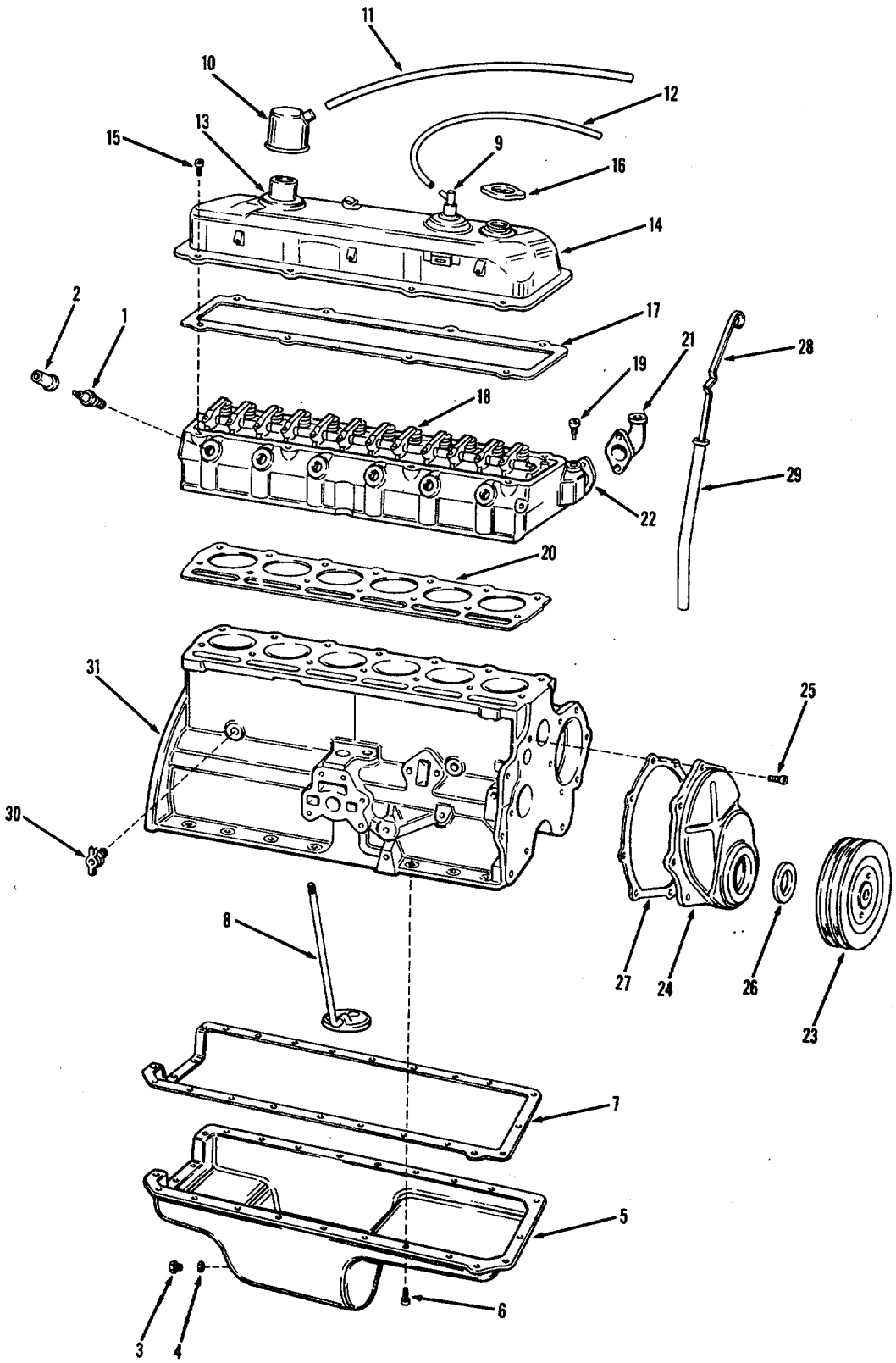


Figure 6-13. Engine Block, Head and Pan Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		ENGINE BLOCK, HEAD AND PAN GROUP		
-4	17367	GASKET, Drain plug (74865 No. 2268513)	1	
-5	17365	PAN ASSEMBLY, Oil (74865 No. 278844)	1	
		(ATTACHING PARTS)		
-6	17368	SCREW, Oil pan (74865 No. 2121573)	18	
	17369	SCREW, Oil pan (74865 No. 1947953)	6	
		-*-		
-7	17340	GASKET SET, Oil pan (74865 No. 2240647)	1	
-8	17362	OIL STRAINER ASSEMBLY, With suction pipe (74865 No. 2780999)	1	
-9	18790	VALVE ASSEMBLY, PCV (74865 No. 3577098)	1	
-10	18791	AIR CLEANER, Vent inlet (74865 No. 3462094)	1	
-11	18792	HOSE, Vent inlet to air cleaner (74865 No. 2825417)	1	
-12	18793	HOSE, Vent inlet to carburetor (74865 No. 883031)	1	
-13	17511	GROMMET, Vent valve (74865 No. 2536926)	1	
-14	18789	COVER, Valve, with cap (74865 No. 2806579)	1	
		(ATTACHING PARTS)		
-15	17513	SCREW, Valvecover	14	
-16	21982	CAP, Breather	1	
-17	17310	GASKET, Valve cover (74865 No. 2899250)	1	
-18	22844	CYLINDER HEAD ASSEMBLY (74865 No. 3698448)	1	
		(ATTACHING PARTS)		
-19	17285	BOLT, Cylinder head (74865 No. 1947687)	14	
		-*-		
-20	17282	GASKET, Cylinder head (74865 No. 1947578)	1	
-21	22847	ELBOW, Outlet (74865 No. 2121524)	1	
-22	17390	GASKET, Elbow (74865 No. 1947671)	1	
	17392	THERMOSTAT, 180F	1	
6-13-	No Number	BLOCK ASSEMBLY, Cylinder (See figure 6-1 for serviceable assemblies)	NP	
-23	17514	DAMPER, Vibration (74865 No. 2806211)	1	
-24	22848	COVER, Chain case, with indicator (74865 No. 4041292)	1	
		(ATTACHING PARTS)		
-25	16036	SCREW, Cover (74865 No. 181086)	6	
		-*-		
-26	22888	OIL SEAL, Chain case cover (74865 No. 3830108)	1	
-27	17313	GASKET, Chain case cover (74865 No. 1947554)	1	
-28	19292	INDICATOR, Oil level (74865 No. 3418421)	1	
-29	19306	TUBE, Indicator (74865 No. 3418423)	1	
-30	01417-F	COCK, Drain (74865 No. 103647)	1	
-31	No Number	BLOCK ASSEMBLY, Cylinder (See figure 6-1 for serviceable assemblies	NP	
6-13-	22351	PLUG, Pipe, cylinder head, 3/8 NPT (74865 No. 1859127)	AR	
	17284	PLUG, Hole, block water, 0.065 in. oversize (74865 No. 2406366)	AR	
	22843	PLUG, Pipe, cylinder block oil gallery (74865 No. 6028668)	1	
	22845	PLUG, Cup, cylinder head (74865 No. 6029497)	2	
	22842	DOWEL, Cylinder block to head and cover (74865 No. 141195)	2	
	16398	DOWEL, Cylinder block to torque converter (74865 No.1122532)	2	
	22839	DOWEL, Cylinder block to torque converter, 0.007 in. overcenter (74865 No. 1736347)	AR	
	22840	DOWEL, Cylinder block to torque converter, 0.014 in. overcenter (74865 No. 1736348)	AR	
	22841	DOWEL, Cylinder block to torque converter, 0.021 in. overcenter (74865 No. 1736353)	AR	
6-13-	22836	GASKET SET, Upper engine (74865 No. 3683827)	AR	
6-13-	22837	GASKET SET, Lower engine (74865 No. 3837643)	AR	
	17448	GASKET OVERHAUL SET	AR	

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		CAMSHAFT AND VALVE GROUP		
6-14-	No Number	CAMSHAFT AND VALVE GROUP (See figure 6-1 for NHA)	REF	
-1	17307	CHAIN, Timing (74865 No. 3514866)	1	
-2	22905	SPROCKET, Camshaft (74865 No. 2806945)	1	
		(ATTACHING PARTS)		
-3	15267	SCREW, Sprocket (74865 No. 181140)	1	
-4	22907	WASHER, Sprocket (74865 No. 6023053)	1	
		-*-		
-5	No Number	BOLT, Rocker shaft (74865 No. 3870322)	6	
-6	17329	RETAINER, Shaft, ends and intermediate (74865 No. 1947616)	6	
	17330	RETAINER, Shaft, center (74865 No. 1947617)	1	
-7	17331	ROCKER ASSEMBLY (74865 No. 1947594)	12	
-8	17318	SCREW, Adjusting (74865 No. 1855238)	1	
-9	No Number	ROCKER	NP	

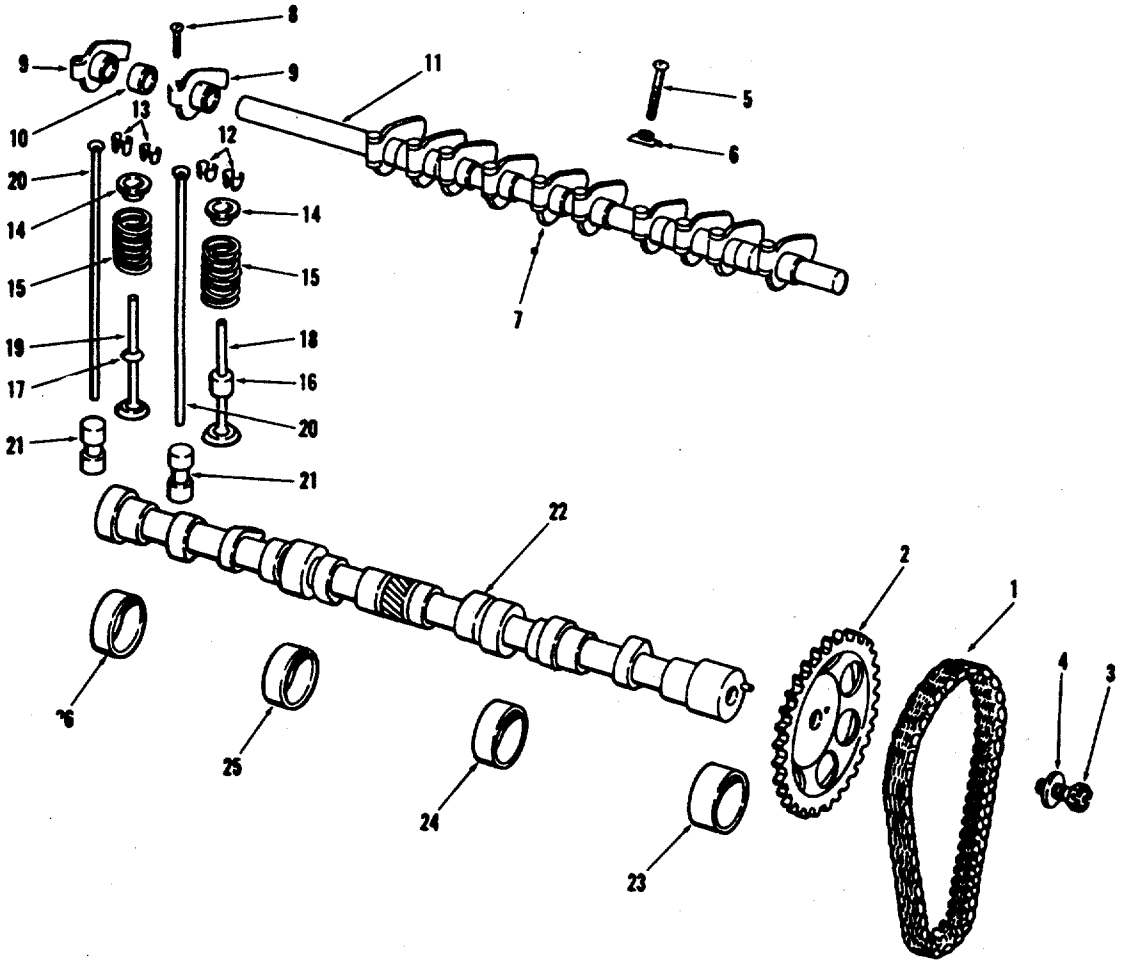


Figure 6-14. Camshaft and Valve Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		CAMSHAFT AND VALVE GROUP		
-10	17320	SPACER, Rocker (74865 No. 2120694)	6	
-11	17324	SHAFT, Rocker, with plug (74865 No. 1947614)	1	
6-14-	17332	PLUG, Shaft (74865 No. 1324268)	2	
-12	17315	LOCK, Spring retainer, intake valve (74865 No. 381875)	12	
-13	17316	LOCK, Spring retainer, exhaust valve (74865 No. 1614666)	12	
-14	22041	RETAINER, Valve spring (74865 No. 2402045)	12	
-15	17323	SPRING, Valve (74865 No. 1739534)	12	
-16	17321	SHIELD, Valve stem oil, intake (74865 No. 2205958)	6	
-17	17322	SHIELD, Valve stem oil, exhaust (74865 No. 2205959)	6	
-18	17327	VALVE, Intake, standard (74865 No. 1947623)	6	
	17534	VALVE, Intake, 0.005 in. oversize (74865 No. 2121578)	AR	
	17535	VALVE, Intake, 0.015 in. oversize (74865 No. 2121579)	AR	
	17536	VALVE, Intake, 0.030 in. oversize (74865 No. 2121580)	AR	
-19	17326	VALVE, Exhaust, standard (74865 No. 3698590)	6	
	22894	VALVE, Exhaust, 0.005 in. oversize (74865 No. 3698591)	AR	
	22895	VALVE, Exhaust, 0.015 in. oversize (74865 No. 3698592)	AR	
	22896	VALVE, Exhaust, 0.030 in. oversize (74865 No. 3698593)	AR	
-20	17328	ROD ASSEMBLY, Push (74865 No. 2120514)	12	
-21	17325	TAPPET, With adjusting screw, standard (74865 No. 2469501)	12	
	22897	TAPPET, 0.005 in. oversize (74865 No. 2469502)	AR	
	22898	TAPPET, 0.015 in. oversize (74865 No. 2469503)	AR	
	22899	TAPPET, 0.030 in. oversize (74865 No. 2469504)	AR	
-22	22900	CAMSHAFT (74865 No. 3512639)	1	
-23	22901	BEARING, Camshaft, No. 1, standard (74865 No. 3830601)	1	
	22902	BEARING, Camshaft, No. 1, 0.010 in. oversize (74865 No. 3830602)	AR	
-24	17303	BEARING, Camshaft, No. 2, standard (74865 No. 1821772)	1	
	17541	BEARING, Camshaft, No. 2, 0.010 in. oversize (74865 No. 2205512)	AR	
-25	17304	.BEARING, Camshaft, No. 3, standard (74865 No. 2121726)	1	
	17542	BEARING, Camshaft, No. 3, 0.010 in. oversize (74865 No. 2205514)	AR	
-26	17305	.BEARING, Camshaft, No. 4, standard (74865 No. 2121727)	1	
	17543	BEARING, Camshaft, No. 4, 0.010 in. oversize (74865 No. 2205516)	AR	
		PISTON AND CONNECTING ROD GROUP		
6-15-	No Number	PISTON AND CONNECTING ROD GROUP (See figure 6-1 for NHA)	REF	
6-15-	17299	PISTON SET, Standard (74865 No. 2084384)	6	
	17560	PISTON SET, 0.005 in. oversize (74865 No. 2084385)	AR	
	17561	PISTON SET, 0.020 in. oversize (74865 No. 2084386)	AR	
	17562	PISTON SET, 0.040 in. oversize (74865 No. 2084387)	AR	
-1	No Number	PISTON	NP	
-2	No Number	PIN, Piston	NP	
-3	No Number	RING, Retaining	NP	
6-15-	17300	RING SET, Standard to 0.009 in. oversize (74865 No. 2448735)	1	
	17563	RING SET, 0.020 to 0.029 in. oversize (74865 No. 2275440)	AR	
	17564	RING SET, 0.040 to 0.049 in. oversize (74865 No. 2275441)	AR	
-4	No Number	PISTON RING, Top compression	NP	
-5	No Number	PISTON RING, Intermediate compression	NP	
	No Number	SPRING, Intermediate compression ring	NP	
-6	No Number	RAIL, Lower piston ring	NP	
	No Number	SPACER, Lower piston ring	NP	

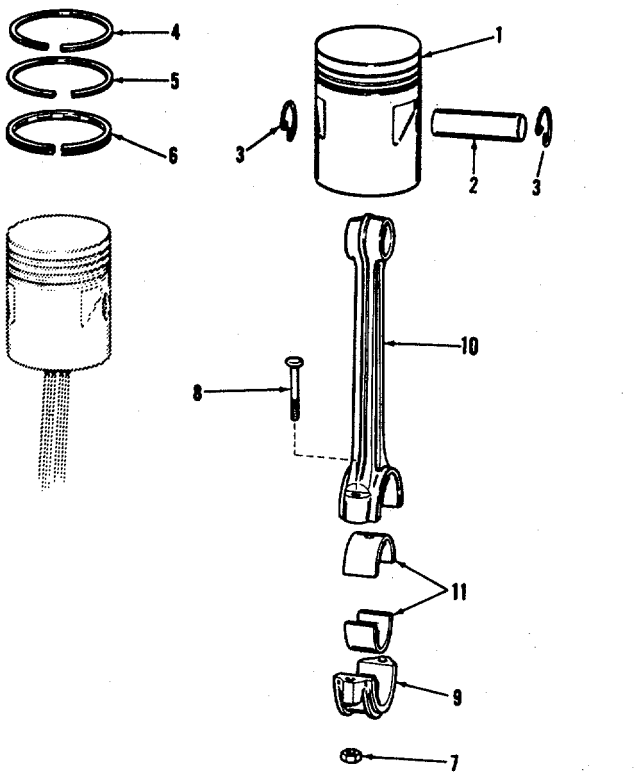


Figure 6-15. Piston and Connecting Rod Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		PISTON AND CONNECTING ROD GROUP		
6-15.	22870	CONNECTING ROD ASSEMBLY (74865 No. 4041994)	6	
-7	13038	NUT, Bearing cap (74865 No. 1737695)	2	
-8	22016	BOLT, Bearing cap (74865 No. 3830614)	2	
-9	No Number	CAP, Bearing	NP	
-10	No Number	CONNECTING ROD	NP	
-11	22871	BEARING SET, Connecting rod, standard (74865 No. 4049256)	6	
	22872	BEARING SET, Connecting rod, 0.001 in. undersize (74865 No. 4049257)	AR	
	22873	BEARING SET, Connecting rod, 0.002 in. undersize (74865 No. 4049258)	AR	
	22874	BEARING SET, Connecting rod, 0.003 in. undersize (74865 No. 4049259)	AR	
	22875	BEARING SET, Connecting rod, 0.010 in. undersize (74865 No. 4049260)	AR	
	22876	BEARING SET, Connecting rod, 0.012 in. undersize (74865 No. 4049261)	AR	

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		CRANKSHAFT GROUP		
6-16-	No Number	CRANKSHAFT GROUP (See figure 6-1 for NHA)	REF	
1	21922	SCREW, Crankshaft (74865 No. 6025547)	1	
2	14821	WASHER, Crankshaft screw (74865 No. 1855561)	1	
3	17296	SPROCKET, Crankshaft (74865 No. 2128912)	1	
4	22071	KEY, Sprocket (74865 No. 6029411)	1	
5	22893	PLUG, Crankshaft (74865 No. 3751037)	1	
6	17544	RETAINER, Bearing seal, rear (74865 No. 1947557)	1	
		(ATTACHING PARTS)		
7	22868	SCREW, Cap (74865 No. 9418004)	2	
		-*-		
6-16-	22869	OIL SEAL KIT, Rear crankshaft (74865 No. 4049266)	1	
8	No Number	OIL SEAL	NP	
9	No Number	SEAL, Retainer	NP	
10	17294	SCREW, Bearing cap (74865 No. 1618695)	8	
11	22889	CAP, Bearing, No. 1 (74865 No. 4027425)	1	
12	22890	CAP, Bearing, No. 2 (74865 No. 4027426)	1	
13	22891	CAP, Bearing, No. 3 (74865 No. 4027427)	1	
14	22892	CAP, Bearing, No. 4 (74865 No. 4027428)	1	
15	22854	BEARING SET, Crankshaft, No. 1, 2 and 4, standard (74865 No. 4049242)	3	
	22855	BEARING SET, Crankshaft, No. 1, 2 and 4, 0.001 undersize (74865 No. 4049243)	3	
	22856	BEARING SET, Crankshaft, No. 1, 2 and 4, 0.002 undersize (74865 No. 4049244)	3	

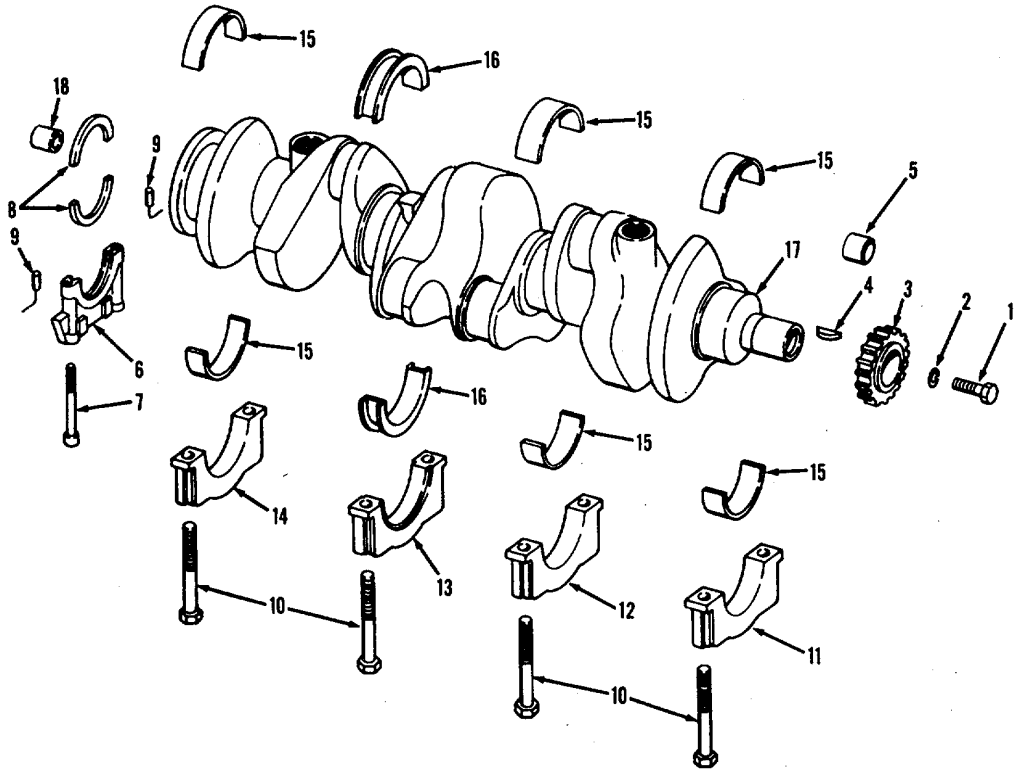


Figure 6-16. Crankshaft Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		CRANKSHAFT GROUP		
	22857	BEARING SET, Crankshaft, No. 1, 2 and 4, 0.003 undersize (74865 No. 4049245)	3	
	22858	BEARING SET, Crankshaft, No. 1, 2 and 4, 0.010 undersize (74865 No. 4049246)	3	
	22859	BEARING SET, Crankshaft, No. 1, 2 and 4, 0.011 undersize (74865 No. 404 9247)	3	
	22860	BEARING SET, Crankshaft, No. 1, 2 and 4, 0.012 undersize (74865 No. 4049248)	3	
-16	22861	BEARING SET, Crankshaft, No. 3, standard (74865 No. 4049249)	1	
	22862	BEARING SET, Crankshaft, No. 3, 0.001 undersize (74865 No. 4049250)	1	
	22863	BEARING SET, Crankshaft, No. 3, 0.002 undersize (74865 No. 4049251)	1	
	22864	BEARING SET, Crankshaft, No. 3, 0.003 undersize (74865 No. 4049252)	1	
	22865	BEARING SET, Crankshaft, No. 3, 0.010 undersize (74865 No. 404925 3)	1	
	22866	BEARING SET, Crankshaft, No. 3, 0.011 undersize (74865 No. 4049254)	1	
	22867	BEARING SET, Crankshaft, No. 3, 0.012 undersize (74865 No. 4049255)	1	
-17	22887	CRANKSHAFT (74865 No. 3751036)	1	
-18	13039A	BUSHING (74865 No. 53298)	1	
		STEERING GEAR GROUP		
6-17-	No Number	STEERING GEAR GROUP	REF	
-1	22883	ARM, Pitman (52788 No. 7829455)	1	
		(ATRACHING PARTS)		
-2	23017	NUT, Hex jam (52788 No. 5667628)	1	
-3	23033	WASHER, Lock, 7/8 in. (52788 No. 5697702)	1	
		-*-		
6-17-	22739	WHEEL ASSY, Steering	1	
-4	22885	BUTTON, Horn (52788 No. 332926)	1	
6-17-	22741	PLUNGER, Horn button (52788 No. 76823)	1	
-5	22740	WHEEL, Steering	1	
-6	22768	COVER, Column	1	
-7	22744	CAP, Steering	1	
		(ATTACHING PARTS)		
-8	0906-H	SCREW, Cap, hex head, 5/16-18UNC by 1 in	2	
-9	0350-W	WASHER, Lock, med spring, 5/16 in	2	
-10	0105-N	NUT, Hex, plain, 5/16-18	2	
		-*-		
-11	10140	BUSHING, Rubber (79497 No. 46038H)	2	
6-17-	22738	STEERING GEAR ASSEMBLY	1	
		(ATTACHING PARTS)		
-12	0923-HH	SCREW, Cap, hex head, 1/2-13UNC by 7, grade 5	3	
-13	0353-W	WASHER, Lock, med spring, 1/2 in	3	
-14	0112-N	NUT, Hex, plain, 1/2-13UNC	3	
		-*-		
-15	23027	NUT, Hex jam, 1/2-20 (52788 No. 114496)	1	
-16	23028	WASHER, Flat (52788 No. 265079)	1	
-17	22990	SPRING (52788 No. 264832)	1	
-17A	22991	SEAT, Spring (52788 No. 264831)	1	
-18	22992	BEARING ASSEMBIJY (52788 No. 7801596)	1	
-19	23029	GROMMET (52788 No. 187540)	1	
-20	23031	CABLE, Horn (52788 No. 7801597)	NP	
-21	22993	BOLT, Hex head, 5/16-24 by 2 in. (52788 No.181347)	1	

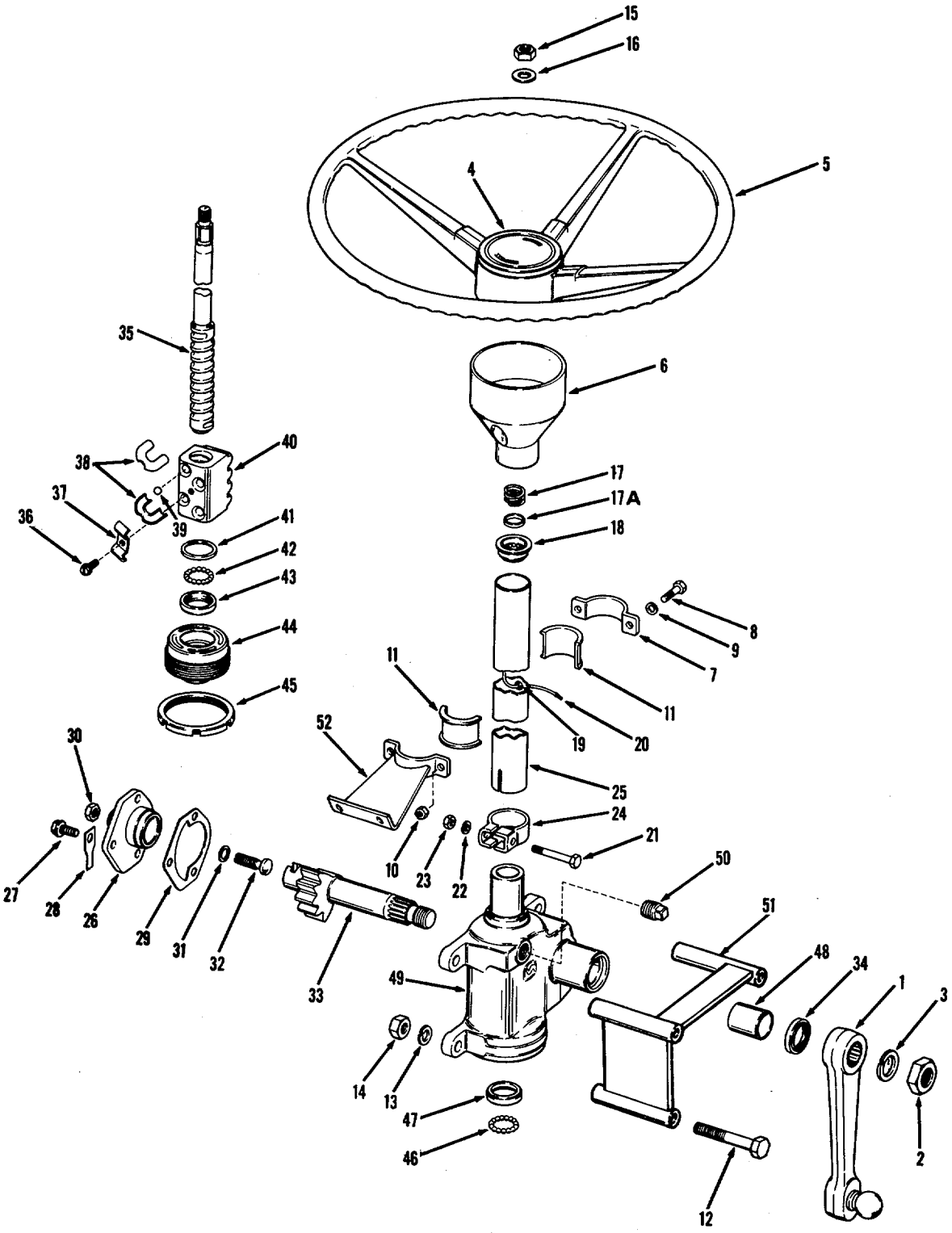


Figure 6-17. Steering Gear Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			STEERING GEAR GROUP		
-22	22994		WASHER, Lock, 5/16 in. (52788 No. 103320)	1	
-23	22995		NUT, Hex, plain, 5/16-24 (52788 No. 103025)	1	
-24	22996		CLAMP, Column (52788 No. 262545)	1	
-25	22997		JACKET, Steering column (52788 No. 7801598)	1	
-26	23000		COVER, Housing side (52788 No. 7802483)	1	
			(ATTACHING PARTS)		
-27	22998		BOLT, Cover (52788 No. 7807009)	3	
			---*--		
-28	No Number		TAG, Building (52788 No. 7826342)	REF	
-29	22999		GASKET, Cover (52788 No. 5666734)	1	
-30	23001		NUT, Hex jam (52788 No. 114495)	1	
-31	23002		SHIM, Lash adjuster (52788 No. 266903)	AR	
	23003		SHIM, Lash adjuster (52788 No. 266905)	AR	
	23004		SHIM, Lash adjuster (52788 No. 266907)	AR	
	23005		SHIM, Lash adjuster (52788 No. 266909)	AR	
-32	23006		ADJUSTER, Gear lash (52788 No. 7802482)	1	
-33	23007		GEAR, Pitman shaft (52788 No. 7812834)	1	
-34	23025		SEAL, Grease (52788 No. 7801626)	1	
6-17-	23008		SHAFT ASSEMBLY, Steering (52788 No. 781295)	1	
-35	23009		SHAFT, Steering (52788 No. 7801600)	NP	
-36	23010		SCREW AND WASHER (52788 No. 187375)	1	
-37	23011		CLAMP, Ball (52788 No. 5666888)	1	
-38	23012		GUIDE, Ball (52788 No. 5666887)	4	
-39	23013		BALL, 0.28125 in. dia. (52788 No. 7808541)	54	
-40	23014		NUT, Ball (52788 No. 7812842)	NP	
6-17-	23015		ADJUSTER ASSEMBLY, Worm bearing (52788 No. 5666681)	1	
-41	23019		RETAINER, Bearing (52788 No. 5668489)	1	
-42	23018		BEARING, Thrust (52788 No. 5666693)	1	
-43	23016		RACE, Thrust bearing (52788 No. 5666683)	1	
-44	23020		ADJUSTER, Bearing (52788 No. 5666682)	1	
-45	23021		NUT, Lock (52788 No. 5676217)	1	
-46	23018		BEARING, Thrust (52788 No. 5666693)	1	
6-17-	23022		HOUSING ASSEMBLY, Steering gear (52788 No. 5692532)	1	
-47	23016		RACE, Thrust bearing (52788 No. 5666683)	1	
-48	23023		BUSHING, Pitman shaft (52788 No. 266316)	1	
-49	23024		HOUSING, Gear (52788 No. 5692534)	NP	
-50	23026		PLUG, Pipe, 1/2 in. square (52788 No. 103868)	1	
6-17-51	22701		BRACKET, Steering gear	1	
6-17-52	22742		BRACKET, Steering column	1	
6-17-	23030		SHIM KIT, Lash adjuster (52788No. 6051421)	1	
			FRONT WHEEL GROUP		
618-	No Number		FRONT WHEEL GROUP (See figure 6-1 for NHA)	REF	
-1	17242		NUT, Wheel	10	
-2	14971		STUD, Wheel (78500 No. 4X1498)	10	
6-18-	22736		WHEEL ASSEMBLY	2	
-3	22975		WHEEL	1	
-4	22974		TIRE, Tubeless, 8.5 x 10	1	
-5	22984		STEM, Valve	1	
-6	14972		CAP, Hub (78500 No. 3262-L-142)	2	
			(ATTACHING PARTS)		
-7	23038		SCREW, Cap, hex head	12	
-8	23037		WASHER, Lock	12	
			*		
-9	14973		GASKET (78500 No. 2208-F-604X)	2	
-10	23034		HUB, Wheel (78500 No. 333-C-1563)	2	
			(ATTACHING PARTS)		
-11	14975		NUT, Lock (78500 No. 1227-L-636X)	4	

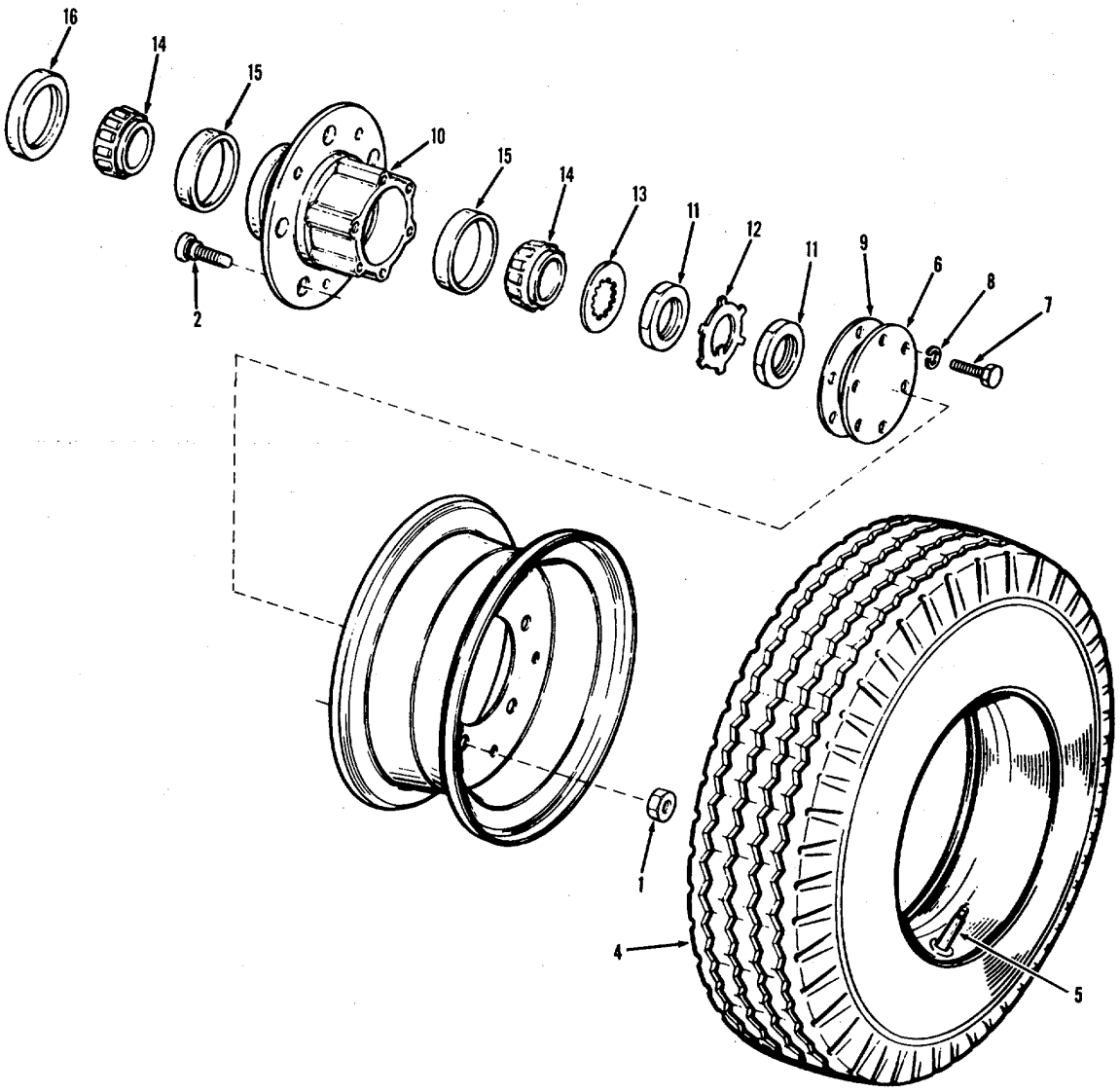


Figure 6-18. Front Wheel Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FRONT WHEEL GROUP		
-12	23035	WASHER, Lock (78500 No. 1229-A-1925).....	2	
-13	23036	WASHER, Lock (78500 No. 1229-Z-1924).....	2	
		*		
-14	14978	CONE, Bearing, roller (78500 No. 18590).....	4	
-15	14979	CUP, Bearing, roller (78500 No. 18520).....	4	
-16	14980	SEAL, Hub (78500 No. A-1205-H-918X).....	2	

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FRONT AXLE AND DRAG LINK GROUP		
6-19-	No Number	FRONT AXLE AND DRAG LINK GROUP (See figure 6-1 for NHA)	REF	
6-19-	22745	LINK ASSEMBLY, Drag		
-1	0411-P	PIN, Cotter	2	
-2	14981	PLUG, Drag link	1	
-2A	23052	PLUG, Drag link	1	
-3	14982	SEAT, BALL	4	
-4	14983	SPRING, Drag link	2	
-5	14984	PLUG, Safety	2	
-6	0500-G	FITTING, Lubrication (96906 No. MS15003-6)	1	
-6A	0506-G	FITTING, Lubrication (96906 No. MS15001-1)	1	
-7	23050	TUBE, Drag link	1	
6-19-	22693	AXLE ASSEMBLY, Front	1	
-8	14986	END ASSEMBLY, Tie rod, left hand (78500 No. A-3144-M-351)	2	
	14987	END ASSEMBLY, Tie rod, right hand (78500 No. A-3144-N-352)	2	
		(ATTACHING PARTS)		
-9	0417-P	PIN, Cotter.	2	
-10	0152-N	NUT, Castellated, hex *	2	
-11	15113	CLAMP, Tie rod end (78500 No. 2257-Y-25)	2	
-12	0808-H	SCREW. Cap, hex head (78.500 No. S-1511)	2	
-13	0350-W	WASHER, Lock	2	
-14	0106-N	NUT, Plain, hex (78500 No. N-15)	2	
-15	15114	TIE ROD (78500 No. 3102-A-2757)	1	
-16	15115	BALL, Steering arm (78500 No. 2100-H-34)	I	
		(ATTACHING TARTS)		
-17	0417-P	PIN, Cotter (78500 No. K-248)	1	
-18	0152-N	NUT, Castellated, hex (78500 No. X-518) *	1	
-19	15116	ARM, Steering, left hand (78500 No. 3122-E-733)	1	
-19A	15117	ARM, Steering, right hand (78500 No. 3133-T-2932)	1	
		(ATTACHING PARTS)		
-20	0423-P	PIN, Cotter (78500 No. K-2612)	2	
-21	0136-N	NUT, Castellated, hex (78500 No. 1227-R-18) *	2	
-22	15118	KEY, Steering arm (78500 No. X-654)	2	
-23	15119	PLUG, Expansion (78500 No. 1250-L-38)	2	
-24	15120	RING, Retaining (78500 No. 1218-N-92)	2	
-25	15121	RETAINER, Oil seal (78500 No. 1205-E-109)	2	
-26	15122	SEAL, Oil (78500 No. 5-X-458)	2	
		Select one of the following draw pins at assembly		
-27	15123	PIN, Draw (78500 No. 7 X-8)	2	
	15124	PIN, Draw (78500 No. 7-X-9)	2	
	15125	PIN, Draw (78500 No. 7-X-10)	2	
-28	15126	PIN, Knuckle (78500 No. 3101-B-106)	2	
-29	15127	SHIM, Knuckle pin (78500 No. 2203-F-110)	AR	
	15128	SHIM, Knuckle pin (78500 No. 2203-E-109	AR	
-30	15129	BEARING, Thrust (78500 No. T-113)	2	
-31	0736S	SCREW, Stop (78500 No. S-978)	2	
-32	0010-N	Nut, Stop screw (78500 No. 14-X-53	2	
-33	0500-G	Fitting, Lubrication (96906 No. MS15003-6)	4	
-34	17198	KNUCKLE ASSEMBLY, Steering, left hand (78500 No. A-3111-S-1449)	1	
	17199	KNUCKLE ASSEMBLY, Steering, right hand (78500 No. A-3111-T-1450)	1	
-35	15132	BUSHING (78500 No. 1225-K-531)	2	
-36	15133	TUBE ASSEMBLY, Axle	1	

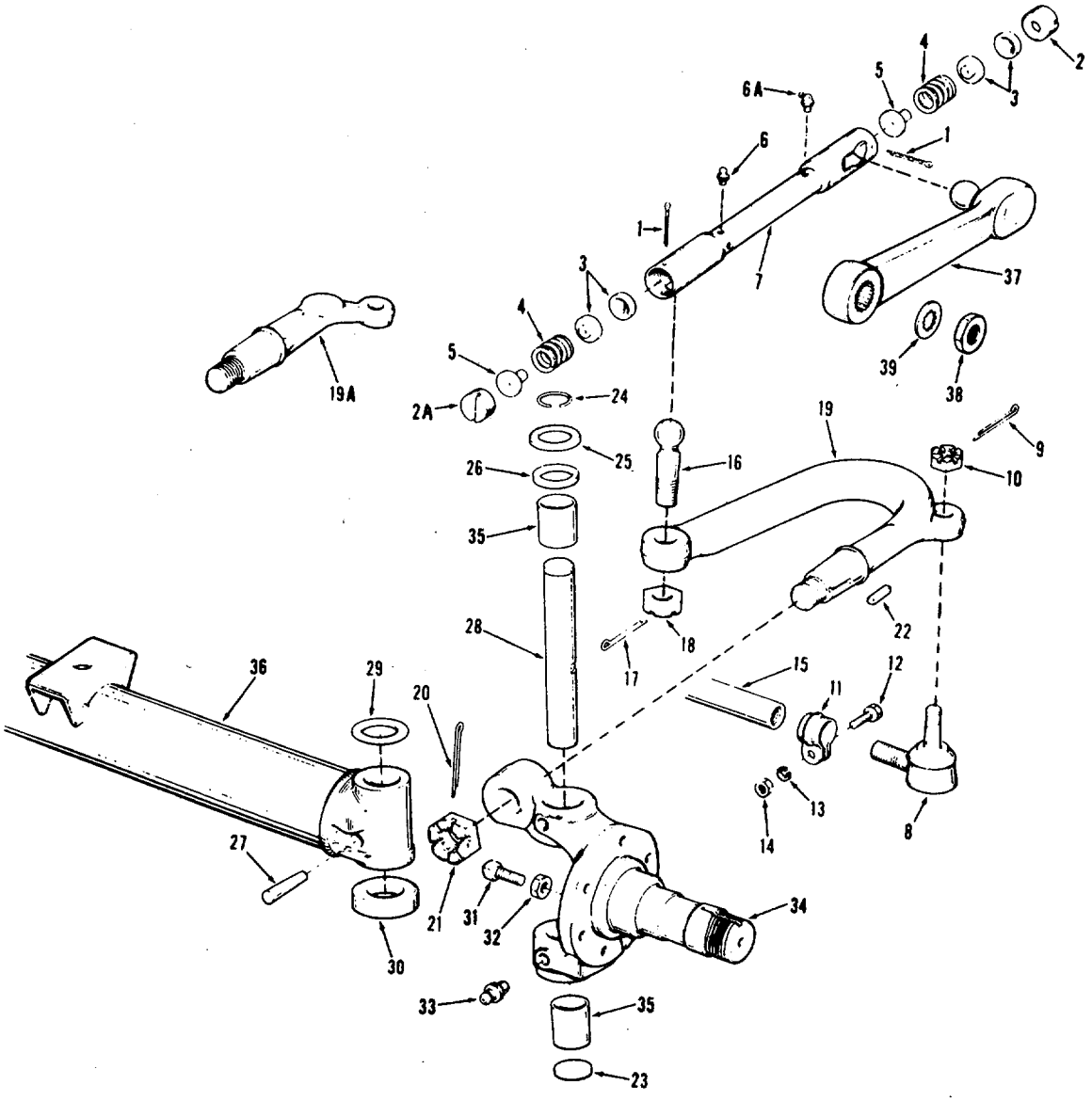


Figure 6-19. Front Axle and Drag Link Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FRONT AXLE AND DRAG LINK GROUP		
-37	22883	ARM, Pitman	REF	
		(ATTACHING PARTS)		
-38	23017	NUT, Lock	REF	
-39	23033	WASHER, Lock	REF	

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FRONT SPRING GROUP		
6-20-	No Number	FRONT SPRING GROUP (See figure 6-1 for NHA)	REF	
-1	0919HH	BOLT, Shackle.....	2	
-2	0354-W	WASHER, Lock.....	2	
-3	0117-N	NUT, Hex.	2	
-4	0500G	FITTING, Grease (96906 No. M15003-6).....	2	

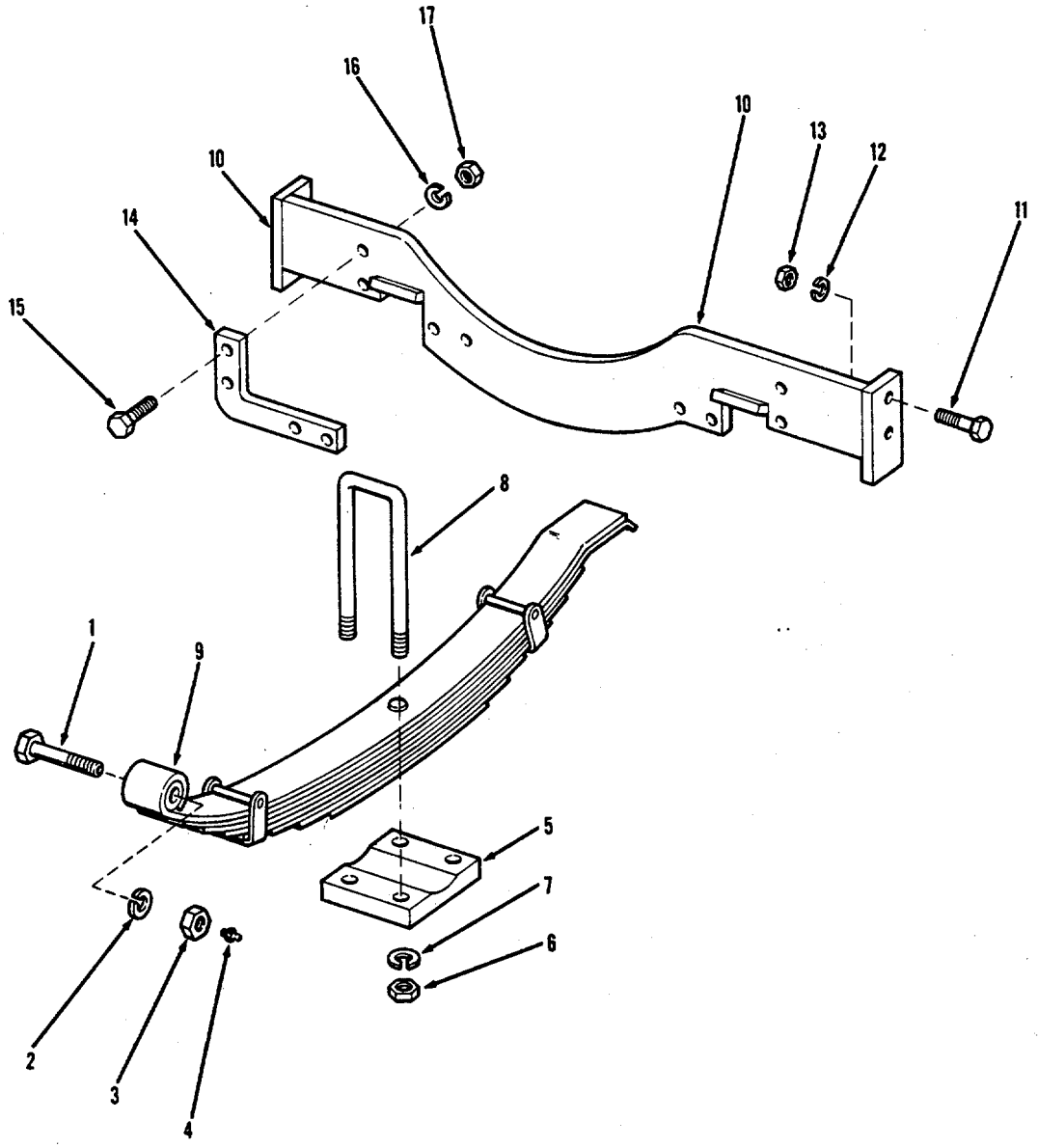


Figure 6-20. Front Spring Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			FRONT SPRING GROUP		
-5	18586		PLATE, U-bolt	2	
			(ATTACHING PARTS)		
-6	0116-N		NUT, Hex	8	
-7	0371-W		WASHER, Lock	8	
-8	18585		U-BOLT	4	
-9	20534		SPRING, Front	2	
-10	22646		HANGER, Spring	1	
			(ATTACHING PARTS)		
-11	0921-H		SCREW, Cap	4	
-12	0353W		WASHER, Lock	4	
-13	0112N		NUT, Hex	4	
-14	22735		CLAMP, Bracket	2	
			(ATTACHING PARTS)		
-15	0921-H		SCREW, Cap	8	
-16	0353-W		WASHER, Lock	8	
-17	0112-N		NUT, Hex	8	
			FRONT BRAKE GROUP		
6-21-	No Number		FRONT BRAKE GROUP (See figure 6-1 for NHA)	REF	
6-21-	17247		BRAKE ASSEMBLY, Front, LH (78500 No. FSH-8-27)	1	
	17246		BRAKE ASSEMBLY, Front, RH (78500 No. FSH-8-26)	1	
-1	17256		SPRING, Shoe return (78500 No. 2758-H-34)	1	
-2	17255		SPRING, Retainer (78500 No. 1718-U-125)	1	
-3	23039		SHOE SET, Brake	1	
-4	17250		LINK ASSEMBLY, Adjusting (78500 No. A-1245-Z-234)	1	

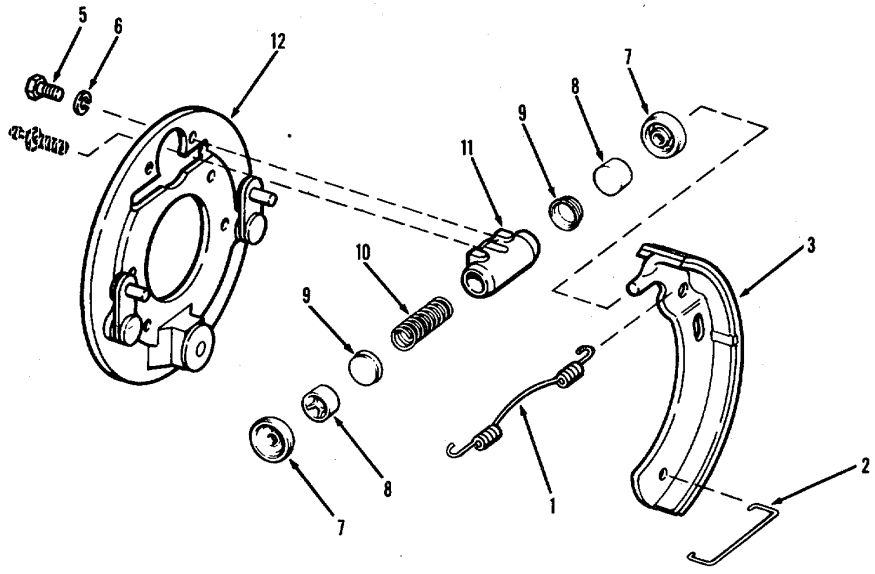


Figure 6-21. Front Brake Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FRONT BRAKE GROUP		
6-21-	17253	CYLINDER ASSEMBLY, Wheel (63471 No. FD68296)	1	
		(ATTACHING PARTS)		
-5	0953H	SCREW, Cap	2	
-6	0356-W	WASHER, Lock	2	
-7	*No Number	BOOT	REF	
-8	*No Number	PISTON	REF	
-9	*No Number	CUP	REF	
-10	*No Number	SPRING	REF	
-11	No Number	HOUSING	NP	
-12	17249	BACKING PLATE, LH (78500 No. A-3236-K-1519)	1	
	17248	BACKING PLATE, RH (78500 No. A-3236-L-1520)	1	
6-21-	23040	REPAIR KIT, Wheel cylinder	AR	
*Procure as part of repair kit				
		BRAKE CONTROL GROUP		
6-22	No Number	BRAKE CONTROI GROUP (See figure 6-1 for NHA)	REF	
-1	10257-C	SPRING, Pedal return.		
6-22	23232	CYLINDER, Brake master (016(04 No. 2231930)	1	
		(ATTACHING PARTS)		
-2	0108-N	NUT, Hex	2	
-3	0351-W	WASHER, Lock	2	
-4	0915-H	SCREW, Cap	2	
		*		
-5	23245	BAIL, Wire (01604 No. 2229847)	1	
-6	23243	COVER (01604 No. 2229844)	1	
-7	23244	GASKET (01604 No. 2229846)	1	
-8	23246	STOP (01604 No. 2227564)	1	
-9	23247	SEAT, Tube (01604 No. 2230568)	2	
-10	23248	RING, Retaining (01604 No . 22291187)	1	
	*23233	PISTON ASSEMBLY, Primary (01604 No. 2229187)	1	
-11	No Number	PISTON (01604 No. 2229186)	1	
-12	23234	SEAL, Double lip (01604 No. 2228214)	1	
-13	23240	PROTECTOR, Cup (01604 No. 2225456)	1	
-14	23236	CUP, Pump (01604 No. 2225457)	1	
-15	23241	RETAINER, Cup (01604 No. 2225428)	1	
-16	No Number	SCREW (01604 No. 2225882)	1	
-17	No Number	RETAINER (01604 No. 2227566)	1	
-18	No Number	SPRING, Return (01604 No. 2230634)	1	
6-22	No Number	PISTON ASSEMBLY (01604 No. 2229189)	1	
-19	*23238	CUP, Pressure (01604 No. 2225454)	1	
-20	*23239	SEAL, 0-ring (01604 No. 618027)	1	
-21	23235	PISTON, Secondary (01604 No. 2229188)	1	
-22	*23240	PROTECTOR, Cup (01604 No. 2225456)	1	
-23	*23236	CUP, Pump (01604 No. 2225457)	1	
-24	23241	RETAINER, Cup (01604 No. 2225428)	1	
25	23242	SPRING (01604 No. 2229258)	1	
-26	No Number	BODY, Cylinder (01604 No. 2229432)	NP	
-27	22694	SPACER	1	
-28	No Number	BOOT (01604 No. 2225633)	1	
-29	22771	ROD, Push	1	
-30	22721	BOLT, Step.	1	
		(ATTACHING PARTS)		
-31	0109-N	NUT, Hex	1	
-32	0351-W	WASHER, Lock	1	
		*		
-33	22979	WASHER, Wave	1	
-34	22670	SHAFT, Pedal	1	
		(ATTACHING PARTS)		
-35	02119-R	RING, Retaining (79136 No. 7100-75)	1	
		*		

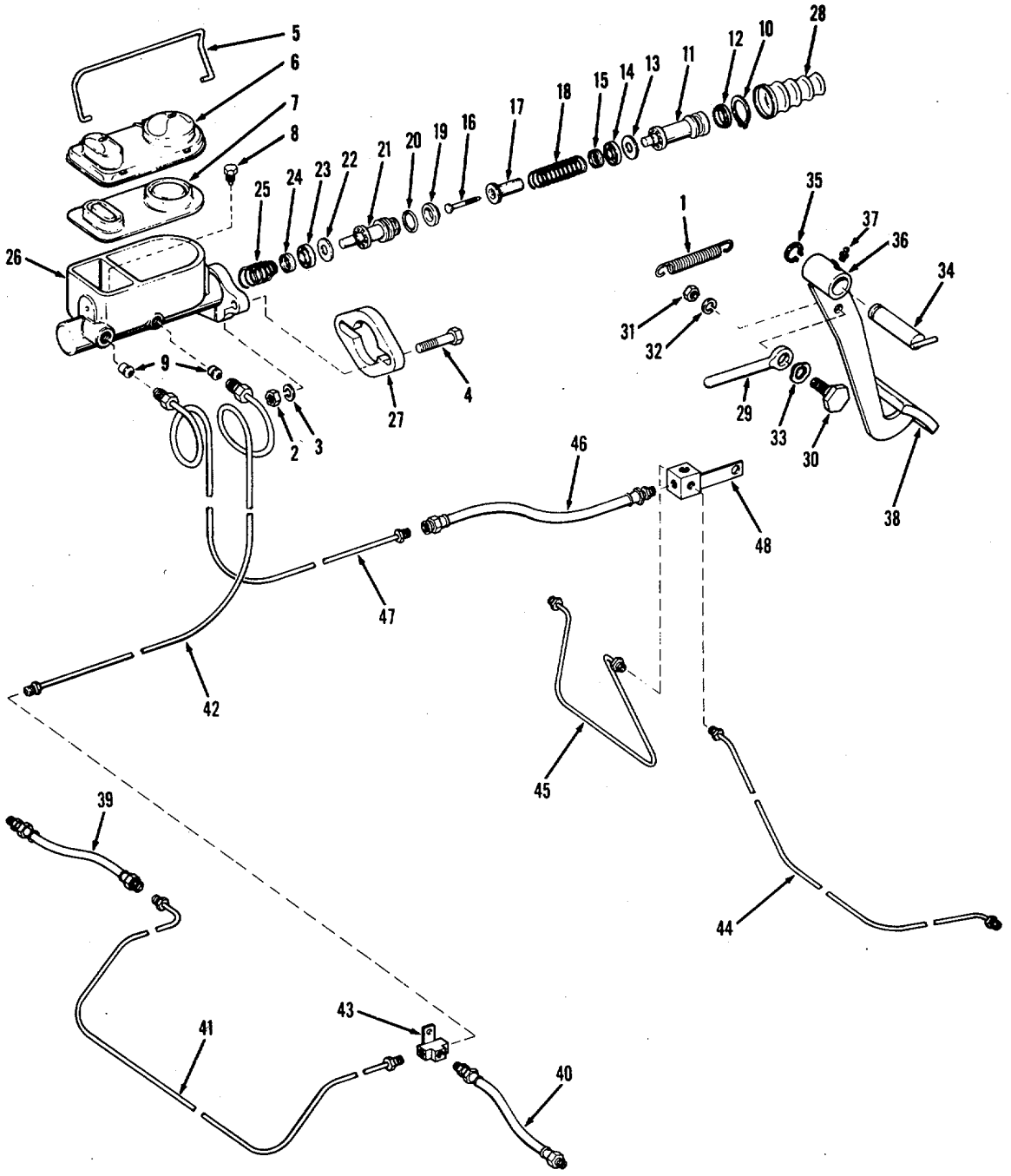


Figure 6-22. Brake Control Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		BRAKE CONTROL GROUP		
-36	22676	PEDAL ASSEMBLY	1	
-37	0508-G	FITTING LUBRICATION (96906 No. MS51001-4)	1	
-38	22572	PAD, Pedal (26377 No. B7A-2457A)	1	
-39	22776	LINE, Brake, flexible front RH	1	
-40	22777	LINE, Brake, flexible front LH	1	
-41	22729	LINE, Brake, front tee to RH front side	1	
-42	22727	LINE, Brake, cylinder to front tee	1	
-43	22774	TEE, Front	1	
-44	22730	LINE, Brake, LH rear axle to tee	1	
-45	22731	LINE, Brake, RH rear axle to tee	1	
-46	22775	LINE, Brake, flexible rear axle	1	
-47	22728	LINE, Brake, cylinder to flex line rear	1	
-48	22764	TEE, Rear	1	
6-22	22778	CLIP, Line (63477 No. F3052S)	2	
6-22	0927-H	SCREW, Cap	1	
6-22	0350-W	WASHER, Lock	1	
6-22	0105-N	NUT, Hex	1	
6-22	23249	REPAIR KIT (01604 No. 2226422)	AR	
*Procure as part of repair kit				
		DRIVE SHAFT GROUP		
6-23-	No Number	DRIVE SHAFT GROUP (See figure 6-1 for NHA)	REF	
6-23-	14506	UNIVERSAL JOINT ASSEMBLY (76260 No. 2A-14003-16)	1	

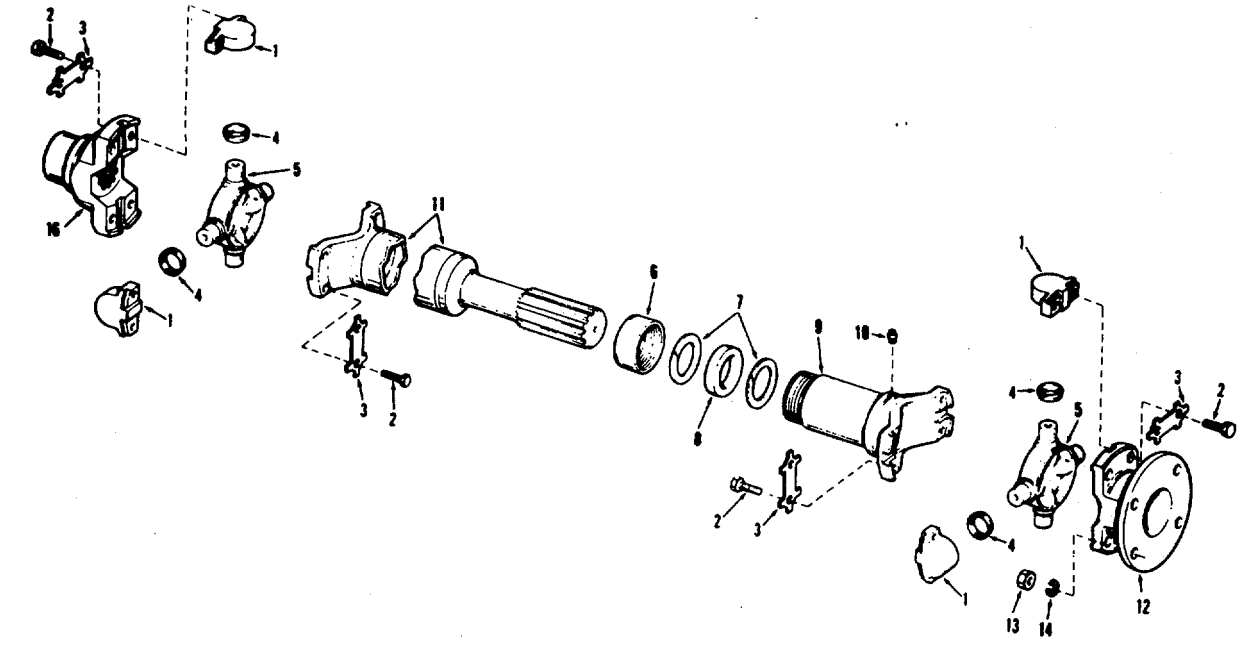


Figure 6-23. Drive Shaft Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		DRIVE SHAFT GROUP		
6-23-	16235	SPIDER AND BEARING ASSEMBLY (76260 No. 114-3100)	2	
-1	*No Number	BEARING	4	
		(ATTACHING PARTS)		
-2	*14786	SCREW, Cap (76260 No. 3569J)	8	
-3	*14787	PLATE, Lock (76260 No. 3549J)	4	
-4	*14789	WASHER, Seal (76260 No. 8195J)	4	
-5	*No Number	SPIDER	1	
-6	14795	RETAINER (76260 No. 901J)	1	
-7	14792	WASHER, Retainer (76260 No. 900J)	2	
-8	14796	WASHER, Felt (76260 No. 6X105)	1	
-9	16606	YOKE, Slip (76260 No. 6A-3000)	1	
-10	01500-D	PLUG, Pipe (24617 No. 219187)	1	
-11	14791	TUBE ASSEMBLY (76260 No. 42-14003-16)	1	
-12	14800	COUPLING, Flanged (76260 No. 3965J)	1	
		(ATTACHING PARTS)		
-13	0109-N	NUT, Plain, hex	4	
-14	0351-W	WASHER, Lock	4	
-15	0501-G	FITTING, Lubrication (96906 No. MS1 5001-1)	2	
-16	14801	COUPLING, Splined (76260 No. 22537J)	1	

*Not procurable as a separate item; order next higher assembly.

		REAR AXLE DROP GEAR CASE		
6-24-	22880	DROP GEAR CASE ASSEMBLY, Rear axle (See figure 6-1 for NHA)	1	
-1	15134	PLUG, Drain (78500 No. 1250-U125)	1	
-2	15135	YOKE, Input shaft, 3C (78500 No. 3897-Z- 2652)	1	
		(ATTACHING PARTS)		
-3	15136	PIN, Cotter (78500 No. K-2412)	1	
-4	15137	NUT, Castellated, hex (78500 No. 13562)	1	
-5	15138	WASHER, Flat (78500 No. 1829-N-638)	1	
-6	15139	BREATHER, Gear case (78500 No. 1199J-166)	1	
-7	15140	CAP, Input shaft rear (78500 No. 3866-A-989)	1	
		(ATTACHING PARTS)		
-8	15141	SCREW, Cap, hex head (78500 No. S-268-1)	4	
-9	15142	WASHER, Lock (78500 No. WA-16)	4	
-10	15143	GASKET, Input shaft rear cap (78500 No. 2808-C- 913)	1	
-11	15144	PLUG, Filler (78500 No. P18)	1	
-12	15145	COVER, Gear case (78500 No. 3876-Z-416)	1	
		(ATTACHING PARTS)		
-13	15146	NUT, Plain, hex (78500 No. N-16-1)	15	
-14	15142	WASHER, Lock (78500 No. WA-16)	15	
-15	15148	BOLT, Machine (78500 No. S-16111/	15	
-16	15149	GASKET, Gear case (78500 No. 2808-X-622)	1	
-17	15150	CAP, Input shaft front (78500 No. 3866-C-991)	1	
		(ATTACHING PARTS(		
-18	15151	SCREW, Cap, hex head (78500 No. S-269-1)	4	
-19	15142	WASHER, Lock (78500 No. WA-16)	4	
-20	15153	GASKET, Input shaft front cap (78500 No. 2808-V-62)	1	
-21	15154	SEAL, Oil, input shaft (78500 No. A180-5-W-413)	1	
-22	15155	BEARING, Ball (78500 No. 3207-ND)	1	
-23	15156	RING, Retaining (78500 No. 1854-A-339)	1	

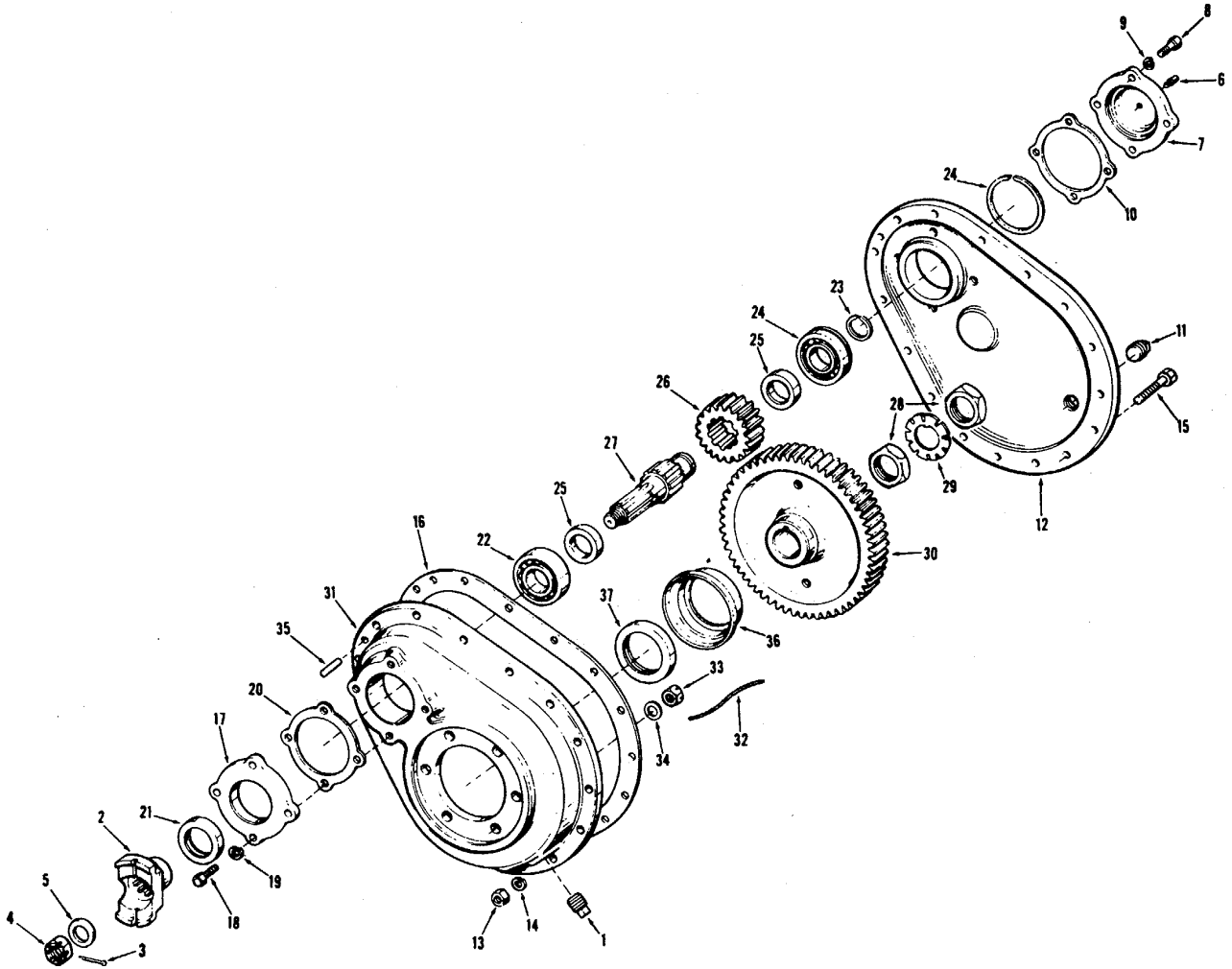


Figure 6-24. Rear Axle Drop Gear Case

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		REAR AXLE DROP GEAR CASE		
-24	15157	BEARING, Ball (78500 No. 43207.ND)	1	
-25	15158	SPACER, Input shaft bearing (78500 No. 1844-P-666)	2	
-26	15159	GEAR, Spur, 19 tooth (78500 No. 3892-V-1790)	1	
-27	15160	SHAFT, Input (78500 No. 3880-C-965)	1	
-28	15161	NUT, Bevel pinion bearing (78500 No. 1227-M-117)	2	
-29	15162	LOCK, Bevel pinion bearing nut (78500 No. 1229-H-528)	1	
30	15163	GEAR, Spur, 57 tooth (78500 No. 3892-X-1142)	1	
-31	15164	CASE, Gear (78500 No. A3875-A-651)	1	
		(ATTACHING PARTS)		
-32	15165	WIRE, Lock (78500 No. LW-1620)	1	
-33	15166	NUT, Castellated, hex (78500 No. N-29-1)	1	
-34	15167	WASHER, Flat (78500 No. 1229-H-424)	6	
-35	15168	PIN, Straight, headless (78500 No. 1846-L-159)	1	
-36	15169	RETAINER, Seal (78500 No. A1-1805-V-204)	1	
-37	15170	SEAL, Oil (78500 No. A1805-B-262)	1	
		DIFFERENTIAL AND CARRIER ASSEMBLY		
6-25-	22880	DIFFERENTIAL AND CARRIER ASSEMBLY (See figure 6-1 for NHA)	REF	
-1	15226	KEY, Gear (78500 No. 16-X-71)	1	
-2	15227	WASHER, Flat (78500 No. 1229-G-813)	1	
-3	15228	GASKET, Pinion (78500 No. 5-X-424)	1	
-4	15229	GAGE, Bevel pinion bearing (78500 No. A16-3226-H-60)	1	
-5	15230	PIN, Straight, headless (78500 No. 1246-C-211)	1	
-6	15231	GASKET, Bearing cage (78500 No. 2808-F-942)	1	
-7	15232	CONE, Bearing (78500 No. HM903247)	2	
-8	15233	CUP, Bearing (78500 No. HM903210)	2	
		Select one of the following in assembly		
-9	15205	SHIM, Bevel pinion bearing, 0.545 in. (78500 No. 2203-1410)	1	
	15206	SHIM, Bevel pinion bearing, 0.546 in. (78500 No. 2203-G-1411)	1	
	15207	SHIM, Bevel pinion bearing, 0.547 in. (78500 No. 2203-H-1412)	1	
	15208	SHIM, Bevel pinion bearing, 0.548 in. (78500 No. 2203-J-1414)	1	
	15209	SHIM, Bevel pinion bearing, 0.549 in. (78500 No. 2203-K-1415)	1	
	15210	SHIM, Bevel pinion bearing, 0.550 in. (78500 No. 2203-L-1416)	1	
	15211	SHIM, Bevel pinion bearing, 0.551 in. (78500 No. 2203-M-1417)	1	
	15212	SHIM, Bevel pinion bearing, 0.552 in. (78500 No. 2203-N-1418)	1	
	15213	SHIM, Bevel pinion bearing, 0.553 in. (78500 No. 2203-P-1420)	1	
	15214	SHIM, Bevel pinion bearing, 0.554 in. (78500 No. 2203-Q-1421)	1	
	15215	SHIM, Bevel pinion bearing, 0.555 in. (78500 No. 2203-R-1422)	1	
	15216	SHIM, Bevel pinion bearing, 0.556 in. (78500 No. 2203-S-1423)	1	
	15217	SHIM, Bevel pinion bearing, 0.557 in. (78500 No. 2203-T-1424)	1	
	15218	SHIM, Bevel pinion bearing, 0.558 in. (78500 No. 2203-U-1425)	1	
	15219	SHIM, Bevel pinion bearing, 0.559 in. (78500 No. 2203-V-1426)	1	
	15220	SHIM, Bevel pinion bearing, 0.560 in. (78500 No. 2203-W-1427)	1	
	15221	SHIM, Bevel pinion bearing, 0.561 in. (78500 No. 2203-X-1428)	1	
	15222	SHIM, Bevel pinion bearing, 0.562 in. (78500 No. 2203-Y-1429)	1	
	15223	SHIM, Bevel pinion bearing, 0.563 in. (78500 No. 2203-Z-1430)	1	
	15224	SHIM, Bevel pinion bearing, 0.564 in. (78500 No. 2203-A-1431)	1	
	15225	SHIM, Bevel pinion bearing, 0.565 in. (78500 No. 2203-B-1432)	1	
-10	17281	PINION	1	
-11	15236	LOCK, Pilot bearing (78500 No. 1229-Y-1299)	1	
-12	15237	BEARING, Ball (78500 No. 1228-E-83)	1	
-13	17281	GEAR, Bevel	1	
		(ATTACHING PARTS)		
-14	15238	RIVET, Bevel gear (78500 No. RV-7712)	12	
-15	15239	WIRE*, Lock (78500 No. LW-1622)	1	
- 16	15240	SCREW, Cap, hex head (78500 No. 15-X-173)	8	

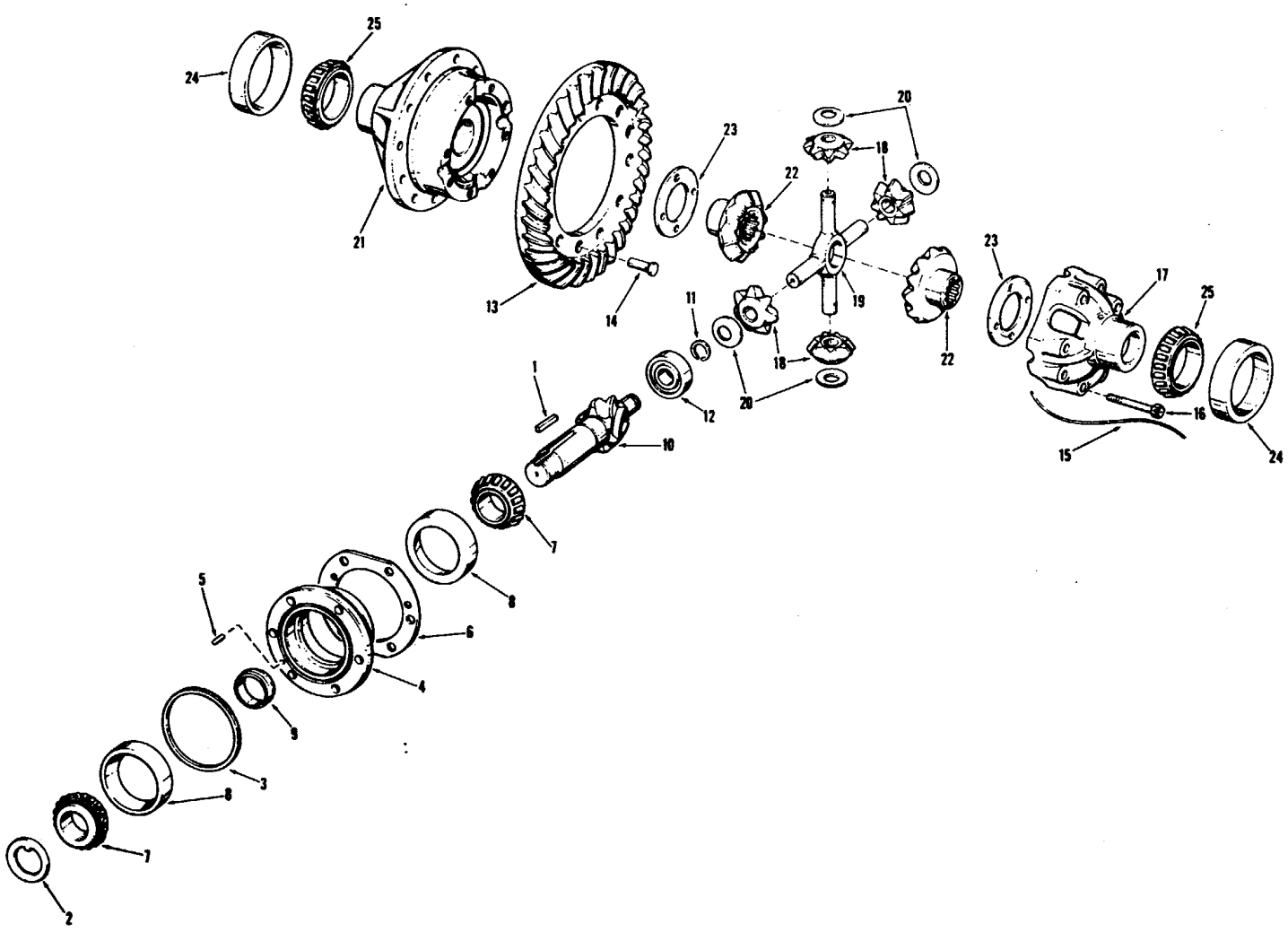


Figure 6-25. Differential and Carrier Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		DIFFERENTIAL AND CARRIER ASSEMBLY		
-17	#15241	CASE, Differential, tongue half (78500 No. A3235 F-214)	NP	
-18	15242	PINION, Differential (78500 No. 2233- M-429)	4	
-19	15243	SPIDER, Differential (78500 No. 3278-T-72)	1	
-20	15244	WASHER, Thrust (78500 No. 1229-U-1061)	4	
-21	#15245	CASE, Differential, flange half (78500 No. A5-3235-D-212)	NP	
-22	15246	GEAR, Side (78500 No. 2834.K-427)	2	
-23	15247	WASHER, Thrust (78500 No. 1229-V-412)	2	
-24	15248	CUP, Bearing (78500 No. 3920)	2	
-25	15249	CONE, Bearing (78500 No. 3984)	2	
*Not procurable separately. Service as a set.				
#Not procurable separately. Order as an assembly.				
		REAR AXLE AND HOUSING		
6-26-	22880	REAR AXLE AND HOUSING (See figure 6-1 for NHA)	REF	
-1	14736	NUT, Wheel stud, 9/16 NF.	16	
-2	15171	STUD, Wheel (78500 No. 20-X-1037)	16	
-3	23211	DRUM, Brake (78500 No. 3819-T5400)	2	
-4	15173	PIN, Cotter (78500 No. K-2418)	2	
-5	15174	NUT, Axle drive shaft (78500 No. 16278)	2	
-6	15175	WASHER, Flat (78500 No. 1829-U-775)	2	
-7	23212	HUB, Wheel (78500 No. 311 R 278)	2	
-8	15177	RETAINER, Oil seal (78500 No. 1805-N-560)	2	
		(ATTACHING PARTS)		
-9	15178	SCREW, Cap, hex head (78500 No. S-2610-1)	12	
-10	15142	WASHER, lock (78500 No. WA-16)	12	
		*		
-11	15180	SEAL, Oil (78500 No. 18 05-U-307)	2	
-12	15181	GASKET, Oil retainer (78500 No. 2808-V-672)	2	
-13	15182	RETAINER, Bearing (78500 No. 1244-A-261)	2	
-14	15183	SHIM, Bearing retainer, 0.003 in. (78500 No. 2803-S-2099)	AR	
	15184	SHIM, Bearing retainer, 0.005 in. (78500 No. 2803-S-2100)	AR	
	15185	SHIM, Bearing retainer, 0.010 in. (78500 No. 2803-S-2101)	AR	
-15	15186	CUP, Bearing (78500 No. 18720)	4	
-16	15187	CONE, Bearing (78500 No. 18790)	4	
-17	15188	COLLAR, Bearing spacer (78500 No. 1874-E- 187)	2	
-18	15189	BRAKE ASSEMBLY (See figure 6-27 for breakdown)	2	
		(ATTACHING PARTS)		
-19	15190	NUT, Plain, hex (78500 No. N-18-1)	12	
-20	15191	WASHER, Lock (78500 No. WA-18)	12	
-21	15192	BOLT, Machine (78500 No. S-1812-1)	12	
		*		
-22	23213	SHAFT, Axle, short (78500 No. A3202-D7622)	1	
	23214	SHAFT, Axle, long (78500 No. A3202-C7621)	1	
-23	No Number	CARRIER AND TUBE ASSEMBLY	NP	
		(ATTACHING PARTS)		
-24	15196	NUT, Plain, hex (78500 No. N-17-1)	11	
-25	15197	WASHER, Lock (78500 No. WA-17)	11	
-26	15198	BOLT, Machine (78500 No. 15-X-493)	11	
		*		
-27	15199	GASKET, Carrier cover (78500 No. 2208-M-1120	1	
-28	No Number	COVER AND TUBE ASSEMBLY	NP	
-29	15201	BREATHER (78500 No. Al199J-166)	1	
-30	16610	PLUG, Drain (78500 No. 1250-S-123)	1	
-31	01519-D	PLUG, Filler (78500 No. P-112)	1	
-32	15202	STUD (78500 No. 4-X-1291)	6	
-33	15203	PIN, Thrust block (78500 No. 1246-D-134)	1	
-34	15204	BLOCK, Thrust (78500 No. 2297-S-175)	1	

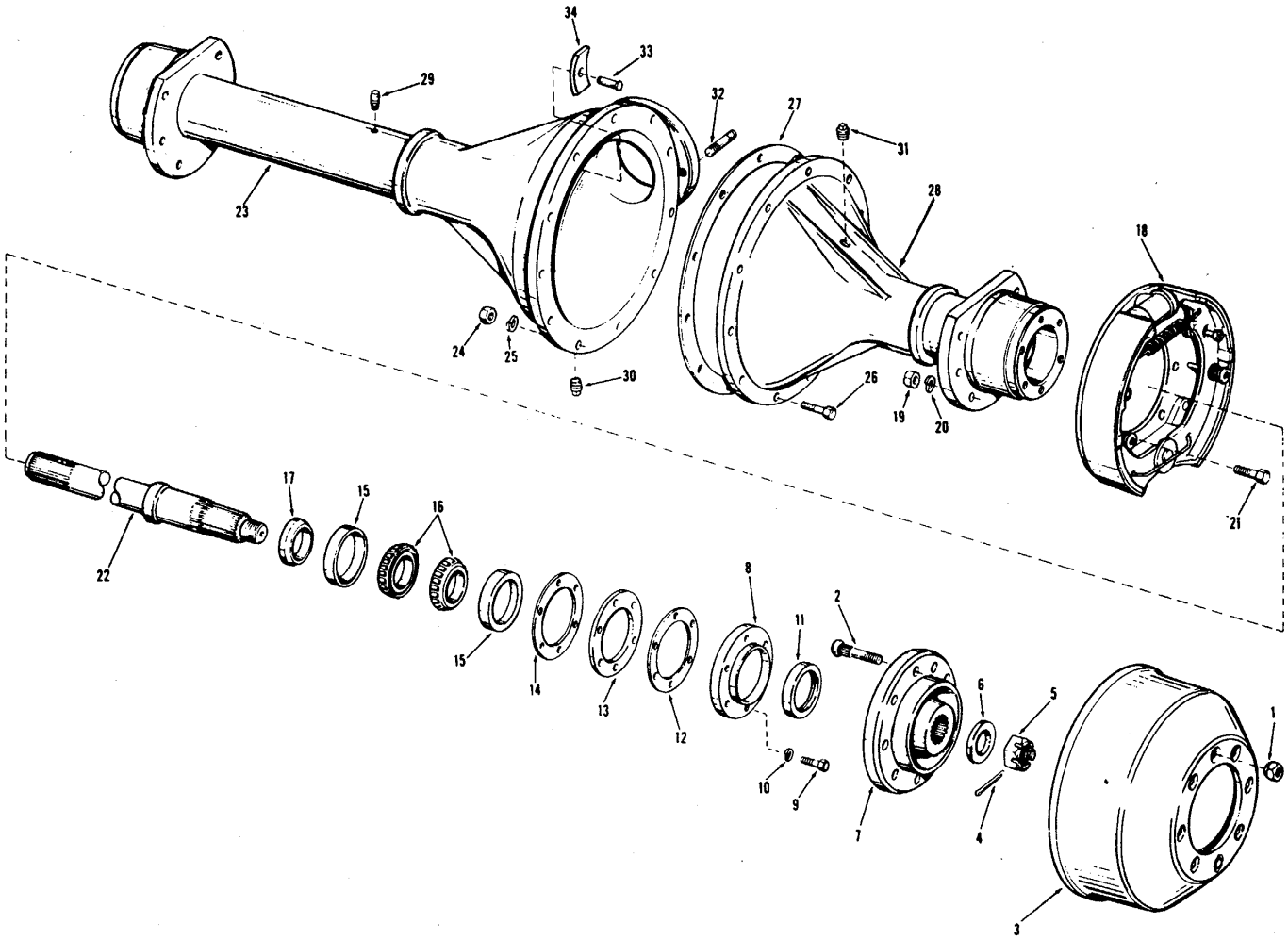


Figure 6-26. Rear Axle and Housing

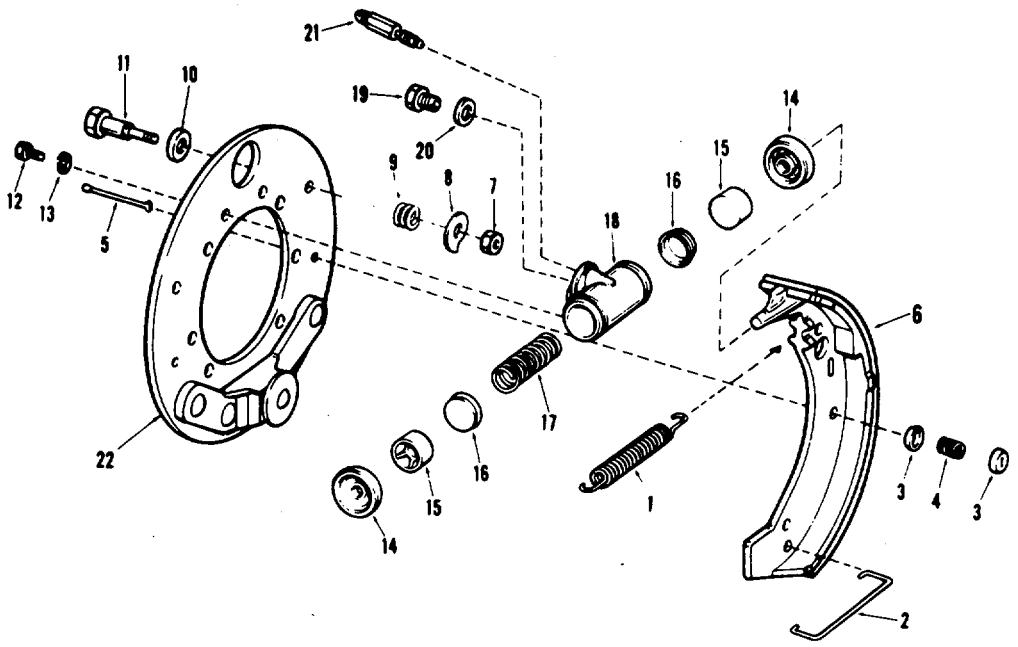


Figure 6-27. Rear Brake Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		BRAKE ASSEMBLY		
6-27-	15189	BRAKE ASSEMBLY (See figure 6-26 for NHA)	REF	
-1	16622	SPRING, Return (78500 No. 275 8-R-18)	1	
-2	14933	SPRING, Retainer (78500 No. 1718-D-108)	1	
-3	14934	RETAINER (78500 No. 1807-A-1)	4	
-4	14935	SPRING, Retainer (78500 No. 2858-M-91)	2	
-5	14936	ROD, Anti-rattle (78500 No. 1779-W-49)	2	
-6	14937	SHOE SET, Brake (78500 No. 3722F188)	1	
-7	14939	NUT, Adjusting cover (78500 No. N-36)	2	
-8	14940	CAM, Adjusting (78500 No. 2847-X-180)	2	
-9	14941	SPRING, Adjusting cam (78500 No. 2758-C-3)	2	
-10	14942	WASHER, Adjusting cam bolt (78500 No. 1729-A-313)	2	
11	14943	BOLT, Adjusting cam (78500 No. 2747-H-8)	2	
6-27-	14944	CYLINDER ASSEMBLY, Wheel (78500 No. A16-3261-N-40) (ATTACHING PARTS)	1	
-12	14945	SCREW, Cap, hex head (78500 No. S-267)	2	
-13	15142	WA HR, Lock (78500 No. WA-16)	2	
-14	*14947	BOOT (63477 No. FC-2991)	2	
-15	*14948	PISTON (63477 No. FC-856)	2	
-16	*12190	CUP (63477 No. FC-857)	2	
-17	*12191	SPRING (63477 No. FC-860)	1	
-18	14951	HOUSING (63477 No. FD-3087)	NP	
-19	14949	CONNECTION, Inlet (78500 No. 1779-D-56)	1	
-20	14950	GASKET, Inlet (78500 No. 2208-V-204)	1	
-21	14938	SCREW, Bleeder (78500 No. 1199-H-1334)	1	
-22	16618	PLATE, Brake (78500 No. 3736-H-112)	1	
6-27-	16616	BRACKET, Brake pivot (78500 No. 3764-M-13)	2	
	16619	RIVET, Pivot bracket (78500 No. RV-1811)	8	
	16620	WASHER, Pilot (78500 No. 1729-L-220)	2	
6-27-	12199	REPAIR KIT, Wheel cylinder (63477 No. FC-5391)	AR	

*Procure as part of repair kit, Part No. 12199.

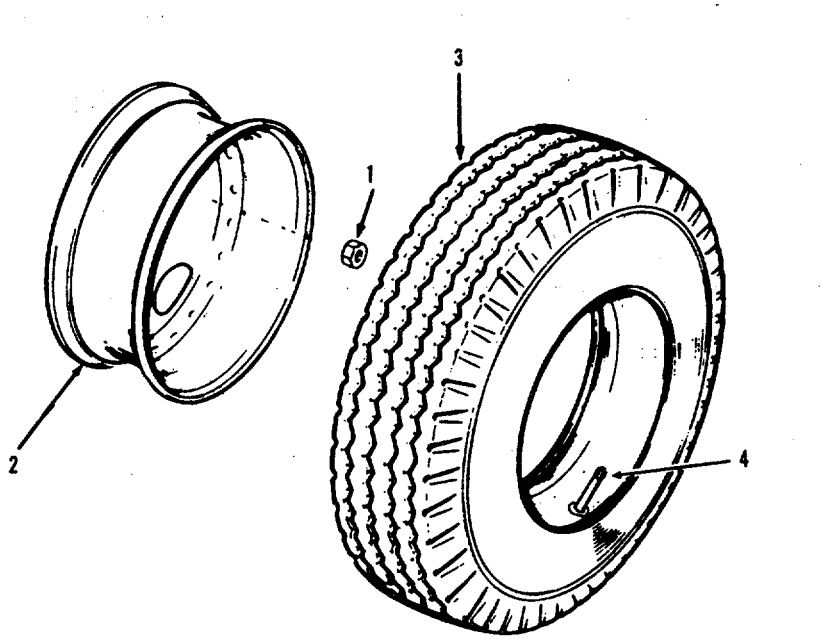


Figure 6-28. Rear Wheel Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		REAR WHEEL GROUP		
6-28-	No Number	REAR WHEEL GROUP (See figure 6-1 for NHA).....	REF	
-1	14736	NUT, Wheel.	16	
-2	22752	WHEEL ASSEMBLY	2	
-3	22755	TIRE, Tubeless, Firestone transport 500, 8.00 x 165, C load range.....	2	
-4	18775	STEM, Valve	2	
		REAR SPRING GROUP		
6-28A-	No Number	REAR SPRING GROUP(See figure 6-1 for NHA).....	REF	
-1	22747	PLATE, Rear spring.....	2	
		(ATTACHING PARTS)		
-2	0119-N	NUT, Hex (88044 No. AN325-10).....	4	
-3	0354-W	WASHER, Lock (96906 No. MS35338-12).....	4	
-4	22748	U-BOLT.....	2	
		*		
-5	0921-HH	SCREW, Cap	2	
-4	0354-W	WASHER, Lock (96906 No.MS35338-12).....	2	
-7	0117-N	NUT, Hex..	2	
-8	20632	SPRING, Rear.....	2	
-9	22702	BRACKET, Rear spring.....	2	
		(ATTACHING PARTS)		
-10	0921-H	SCREW, Cap	8	
-11	0353-W	WASHER, Lock (96906 No. MS353318-10).....	8	
-12	0112N	NUT, Hex	8	
		*		
-13	22737	STOP, Axle	2	

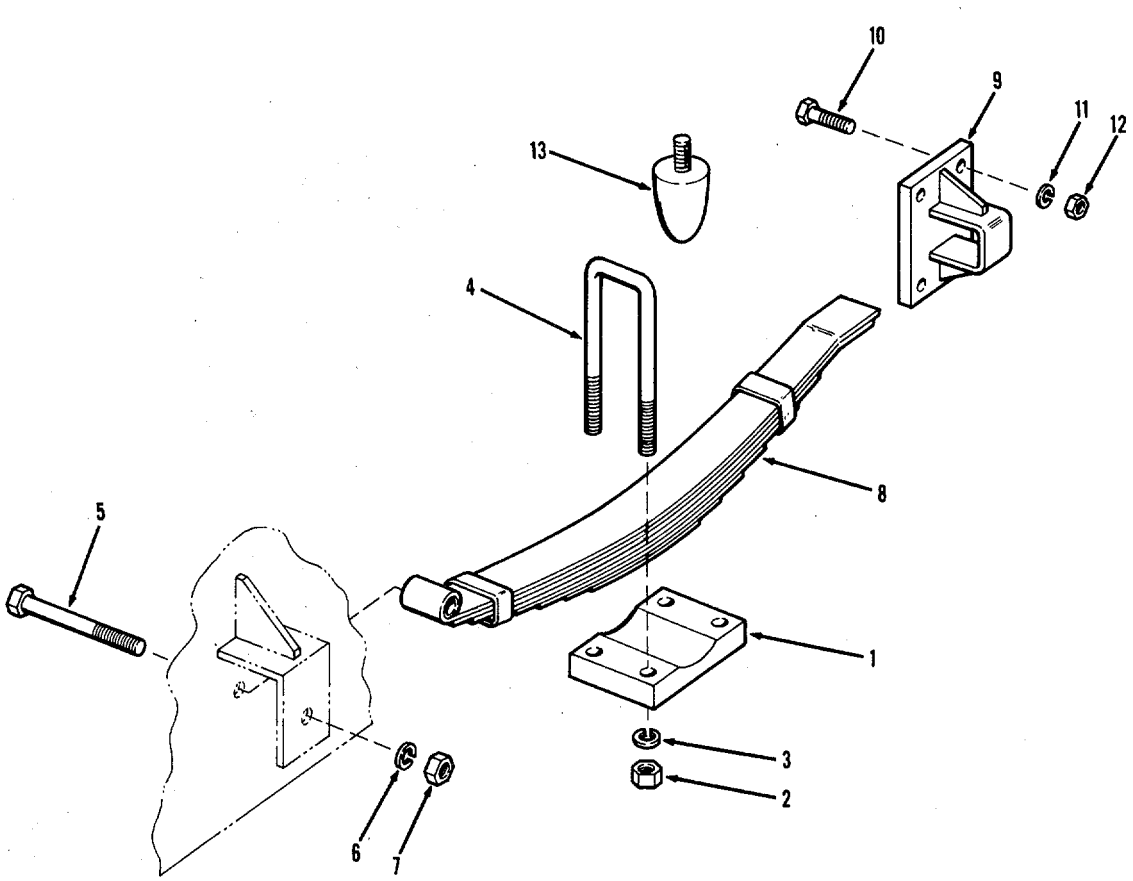


Figure 6-28A. Rear Spring Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		TRANSMISSION AND TORQUE CONVERTER		
6-29	No Number	TRANSMISSION AND TORQUE CONVERTER (See figure 6-1 for NHA).....	REF	
-1	17580	SHIELD, Dust (74865 No. 2892163).....	1	
		(ATTACHING PARTS)		
-2	17581	SCREW AND WASHER ASSY (74865 No. 6023092).....	4	
		*		
	22851	PLUG, Drain, converter (74865 No. 6030035).....	1	
-3	22850	TORQUE CONVERTER (74865 No. 4058465).....	1	
		(ATTACHING PARTS)		
-4	15254	SCREW AND WASHER ASSY (74865 No. 1949765).....	4	
-5	22849	GEAR, Ring (74865 No. 21211961).....	1	
-6	21163	TRANSMISSION ASSY (74865 No. 3675996) (See figure 6-30 for breakdown).....	1	
		(ATTACHING PARTS)		
-7	17582	SCREW AND WASHER ASSY (74865 No. 6024863).....	1	
-8	17583	SCREW AND WASHER ASSY (74865 No. 6024862).....	2	
-9	17584	SCREW AND WASHER ASSY (74865 No. 6027252).....	3	

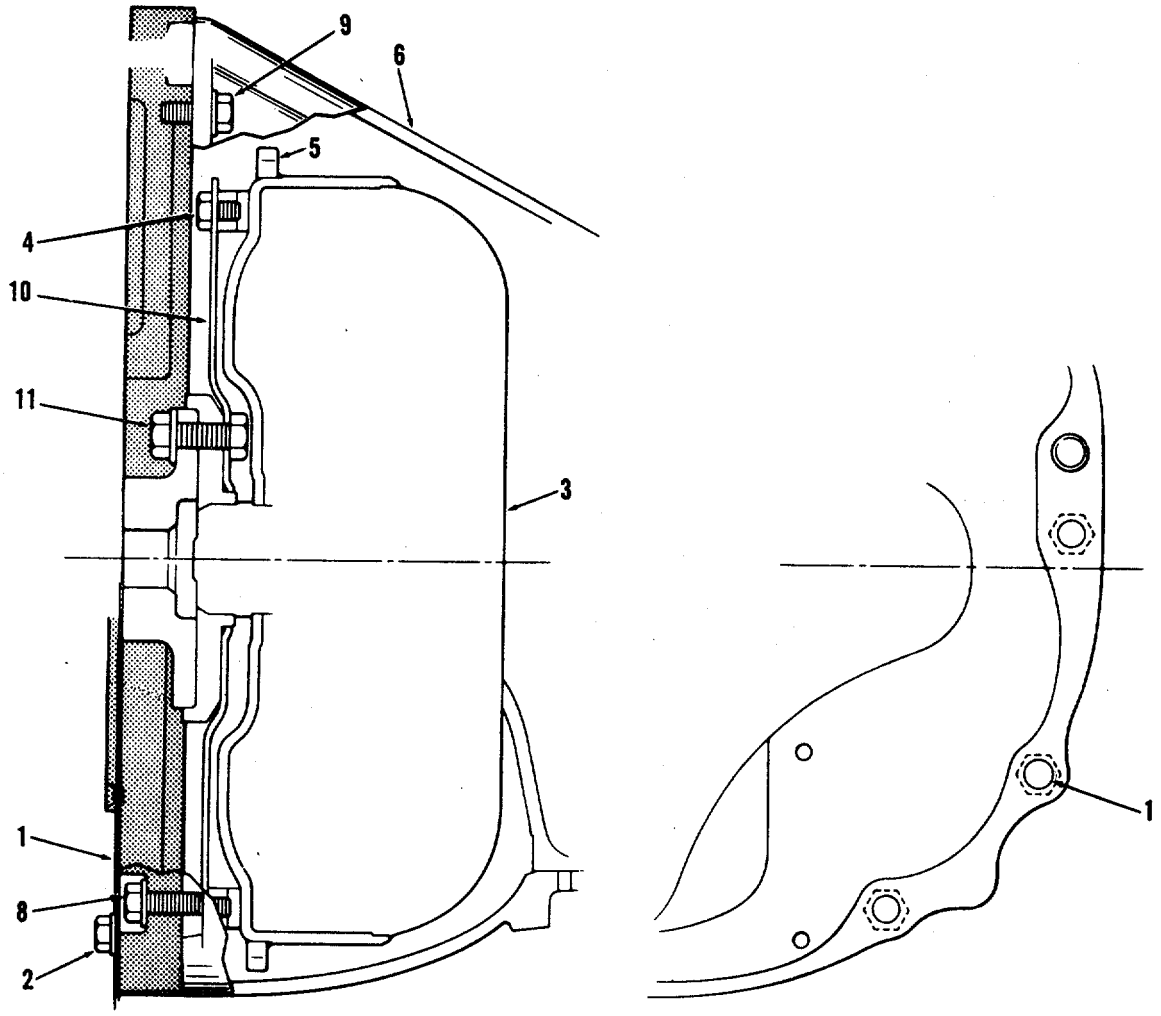


Figure 6-29. Transmission and Torque Converter

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		TRANSMISSION AND TORQUE CONVERTER		
-10	22852	PLATE, Drive (74865 No. 2810745).....	1	
		(ATTACHING PARTS)		
-11	17585	SCREW, Cap, hex head (74865 No. 194924).....	6	
	15015	ROLLER, Overrunning clutch (74865 No. 670776).....	8	
	15016	SPRING, Overrunning clutch roller (74865 No. 1942187).	8	
	22853	SEAL, Hub (74865 No. 3515138).....	1	

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		TRANSMISSION ASSEMBLY		
6-30	21163	TRANSMISSION ASSEMBLY (74865 No. 3675996) (See figure 6-31 through 6-42 for additional breakdown)...	REF	
-1	16554	EXTENSION, Transmission (74865 No. 2538536).....	1	
		(ATTACHING PARTS)		
-2	15303	SCREW AND WASHER ASSEMBLY (74865 No. 6023514)	6	
		*		
-3	16555	GASKET, Extension (74865 No. 2466954).....	1	
-4	15307	SEAL OIL, Output shaft (74865 No. 2205080).....	1	
-5	15308	RING, Retaining (74865 No. 1736432).....	1	

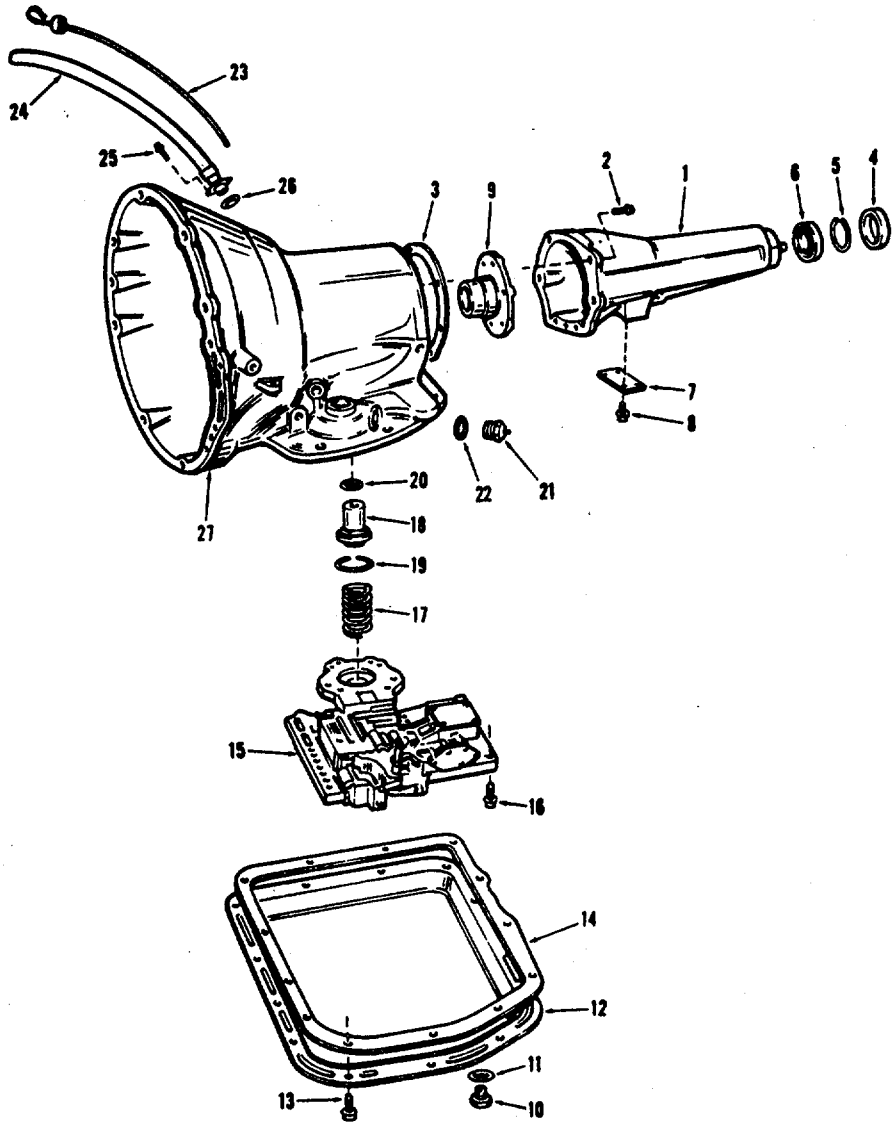


Figure 6-30. Transmission Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		TRANSMISSION ASSEMBLY		
-6	15309	BEARING, Ball, annular (7486 No. 1672194)	1	
-7	17580	COVER, Case (74865 No. 2892163)	1	
		(ATRACHING PARTS)		
-8	17581	SCREW AND WASHER ASSEMBLY (74865 No. 6023092) *	3	
-9	16538	SUPPORT, Shaft (74865 No. 2466882)	1	
-10	15313	PLUG, Drain (74865 No. 2125890)	1	
-11	15314	GASKET, Drain plug (74866 No. 2400863)	1	
-12	15315	PAN, Oil, transmission (74865 No. 24 64419)	1	
		(ATRACHING PARTS)		
-13	14991	SCREW AND WASHER ASSEMBLY (74865 No. 6023355) *	14	
-14	15316	GASKET, Oil pan (74866 No. 2464324)	1	
-15	19399	VALVE ASSEMBLY, Control (See figures 6-31 and 6-32 for breakdown) (74865 No. 3514042)	1	
		(ATTACHING PARTS)		
-16	153167	SCREW, Machine (74865 No. 181066) *	10	
-17	15318	SPRING, Accumulator (74865 No. 2125109)	1	
-18	15319	PISTON, Accumulator (74865 No. 1942153)	1	
-19	15320	RING, Seal (74865 No. 2124255)	1	
-20	15321	RING, Seal (74865 No. 1941831)	1	
-21	17444	SWITCH, Neutral starting (74865 No. 2832820)	1	
-22	15433	PACKING, Preformed, neutral starting switch (74865 No. 2408143)	1	
-23	21162	INDICATOR, Oil level (74865 No. 2466302)	1	
-24	21193	TUBE, Oil filler (74865 No. 2892408)	1	
		(ATTACHING PARTS)		
-25	15324	SCREW AND WASHER ASSEMBLY (74865 No. 180075)	1	
-26	15325	SEAL, Oil filler tube (74865 No. 1316815)	1	
-27	17438	CASE ASSEMBLY, Transmission (74865 No. 2892855)	1	
6-30-	16556	REPAIR KIT, Transmission seal and gasket (74865 No. 2808581)	AR	
		CONTROL VALVE ASSEMBLY		
6-31-	19399	VALVE ASSEMBLY, Control (See figure 6-30 for NHA) (74865 No. 3514042)	REF	
-1	14990	FILTER, Oil (74865 No. 2466849)	1	
		(ATTACHING PARTS)		
-2	16590	SCREW AND WASHER ASSEMBLY (74865 No. 6026390)	3	
-3	16579	LEVER, Throttle Valve (74865 No. 2466854)	1	
6-31-	16888	WASHER, Throttle lever shaft (74865 No. 2538062)	1	
6-31-	16569	RING, Retaining (74865 No. 6025857)	1	
6-31-	14997	SEAL, Throttle valve lever shaft (74865 No. 2466548)	1	
-4	17592	LEVER, Manual valve (74865 No. 2801783)	1	
6-31-	16696	SPRING, Manual lever detent (74865 No. 2466615)	1	
-5	16575	PLATE, Transfer (74865 No. 2801295)	1	
		(ATTACHING PARTS)		
-6	15008	SCREW AND WASHER ASSEMBLY (74866 No. 274980) *	14	
-7	15009	PLATE, Stiffener (74865 No. 19 42237)	1	
		(ATTACHING PARTS)		
	15003	SCREW AND WASHER ASSEMBLY (74865 No. 274092) *	2	
-8	17522	PLATE, Valve body (74865 No. 2892845)	1	
		(ATTACHING PARTS)		
	15003	SCREW AND WASHER ASSEMBLY (74865 No. 274092) *	4	

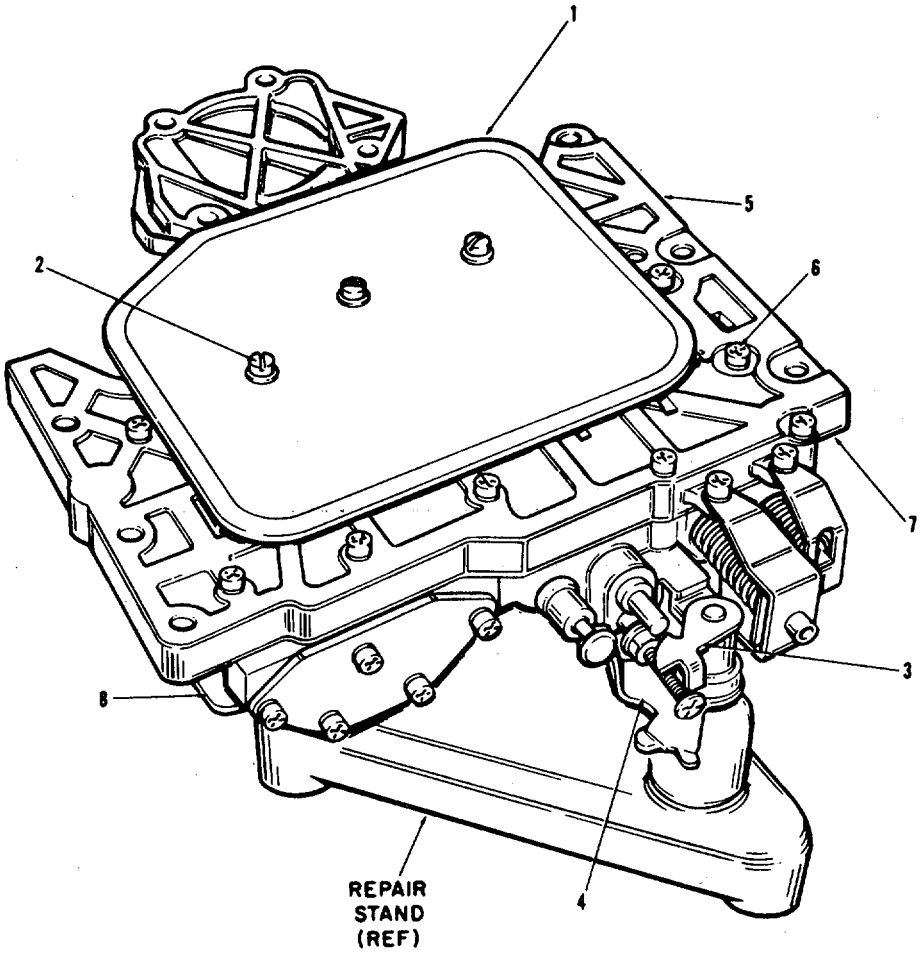


Figure 6-31. Control Valve Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		CONTROL VALVE ASSEMBLY - INTERNAL PARTS		
6-32-	19399	VALVE ASSEMBLY, Control (See figure 6-30 for NHA) (74865 No. 3514042).....	REF	
-1	16563	COVER, Shift valve (74865 No. 2801244)..... (ATTACHING PARTS)	1	
-2	15003	SCREW AND WASHER ASSEMBLY (74865 No. 274092) *	3	
-3	15273	SPRING, Valve, lot and &d (74865 No. 2204547).....	1	
-4	15274	VALVE, Shift, 18t and &d (74865 No. 1941602).....	1	
-5	15275	PLUG, Valve, lot and 2nd (74865 No. 1941603).....	1	
-6	15276	SPRING, Valve, 2nd and 3rd (74865 No. 1942231).....	1	
-7	15277	VALVE, Shift, 2nd and 3rd (74865 No. 1941600).....	1	
-8	15278	PLUG, Valve, 2nd and 3rd (74865 No. 1941601).....	1	
-9	16564	COVER, Shuttle valve plug (74865 No. 2538662)..... (ATTACHING PARTS)	1	
-10	15003	SCREW AND WASHER ASSEBMLY (74865 No. 274092) *	5	

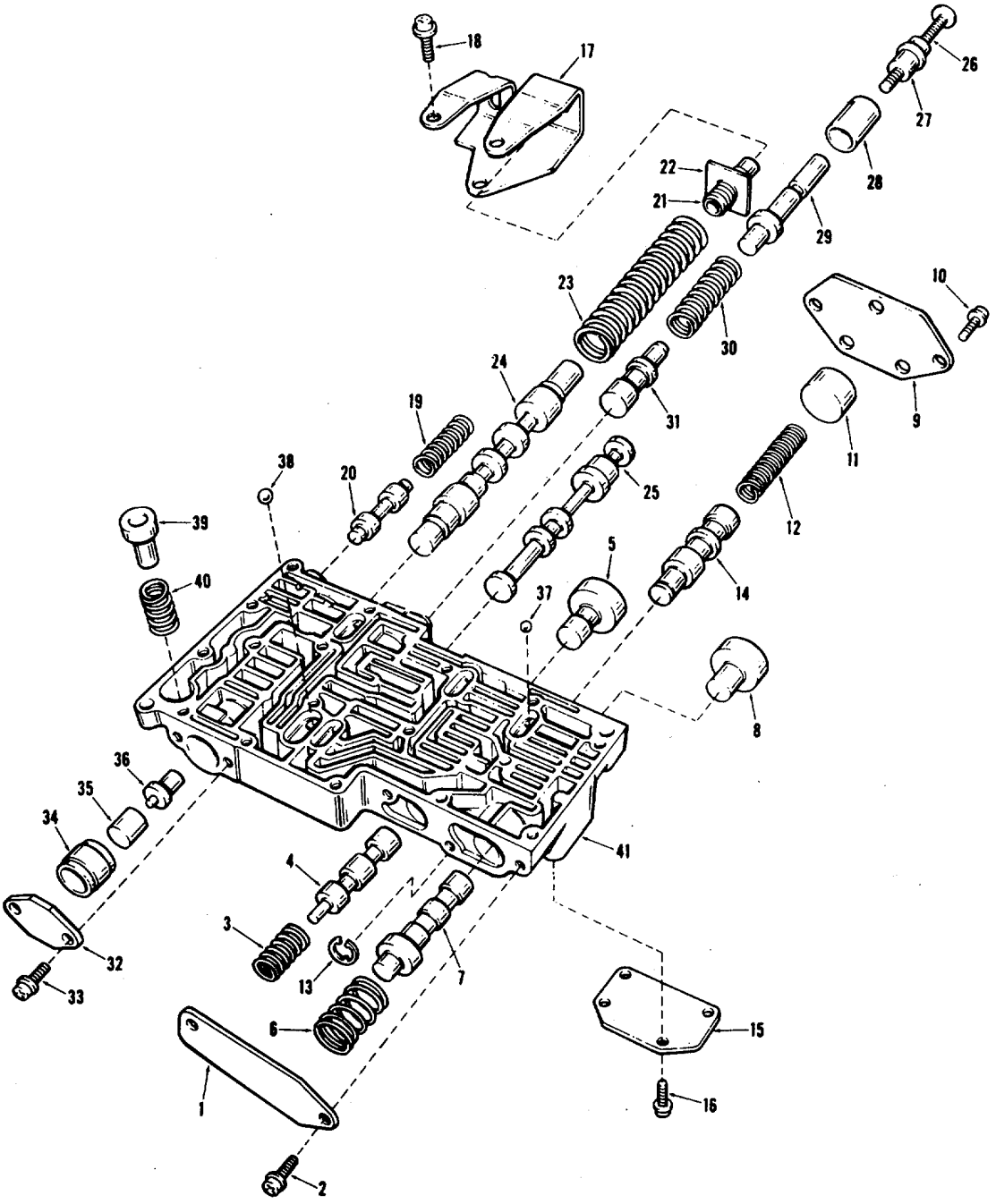


Figure 6-32. Control Valve Assembly - Internal Parts

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		CONTROL VALVE ASSEMBLY - INTERNAL PARTS		
-11	15280	PLUG, Shuttle valve (74865 No. 1854274)	1	
-12	15281	SPRING, Shuttle valve (74865 No. 2124697)	1	
-13	16569	RING, Retaining (74865 No. 6025857)	1	
-14	15282	VALVE, Shuttle (74865 No. 1854275)	1	
-15	15283	COVER, Shuttle (74865 No. 1942227)	1	
		(ATTACHING PARTS)		
-16	15003	SCREW AND WASHER ASSEMBLY (74865 No. 247092) *	4	
-17	15284	RETAINER, Spring (74865 No. 2204975)	1	
		(ATTACHING PARTS)		
-18	15003	SCREW AND WASHER ASSEMBLY (74865 No. 274092) *	3	
-19	15285	SPRING, Control line valve (74865 No. 2124257)	1	
-20	15286	VALVE, Torque converter control (74865 No. 2124256)	1	
-21	15287	SCREW, Line pressure adjusting (74865 No. 2124736)	1	
-22	15288	NUT, Adjusting (74865 No. 2124737)	1	
-23	15289	SPRING, Regulator valve (74865 No. 2124734)	1	
-24	16586	VALVE, Regulator (74865 No. 2240685)	1	
--25	16585	VALVE, Manual (74865 No. 2801259)	1	
	16625	SEAL, Manual valve shaft (74865 No. 2466842)	1	
-26	15292	SCREW, Throttle pressure adjusting (74865 No. 6023343)	1	
-27	17593	NUT, Adjusting (74865 No. 2892353)	1	
-28	15294	PLUG, Valve detent (74865 No. 1941624)	1	
-29	17594	VALVE, Kickdown (74865 No. 2892351)	1	
-30	15296	SPRING, Throttle valve (74865 No. 2892350)	1	
-31	17595	VALVE, Throttle (74865 No. 2892349)	1	
-32	15002	COVER, Regulator valve (74865 No. 2205034)	1	
		(ATRACHING PARTS)		
-33	15003	SCREW AND WASHER ASSEMBLY (74865 No. 274092) *	2	
-34	15298	SLEEVE, Regulator valve (74865 No. 1942213)	1	
-35	15299	PLUG, Line pressure (74865 No. 1942218)	1	
-36	15300	PLUG, Throttle pressure (74865 No. 1942245)	1	
-37	15301	BALL, Check valve, small (74865 No. 104918)	5	
-38	14999	BALL, Check valve, large (74865 No. 147488)	1	
-39	16561	BODY, Control valve (74865 No. 2801869)	1	
		GOVERNOR ASSEMBLY		
6-33-	No Number	GOVERNOR ASSEMBLY	1	
-1	*No Number	RING, Retaining	2	
-2	*No Number	VALVE, Governor	1	
-3	*No Number	SHAFT, Governor	1	
-4	*No Number	RING, Retaining	1	
-5	*No Number	RING, Retaining	1	
-6	*No Number	WEIGHT, Inner	1	
-7	*No Number	SPRING	1	
-8	*No Number	WEIGHT, outer.	1	
-9	*No Number	BODY, Governor	NP	
		(ATTACHING PARTS)		
-10	-No Number	BOLT, Machine	4	
-11	-No Number	LOCK, Bolt -*-	2	
-12	16593	SUPPORT, Governor (74865 No. 2538634)	1	
-13	*No Number	RING, Seal	2	
-14	*No Number	Ring, Retaining	1	
6-33-	16584	REPAIR KIT, Governor (74865 No. 2298541)	AR	

*Procure as part of repair kit, Part No. 16584.

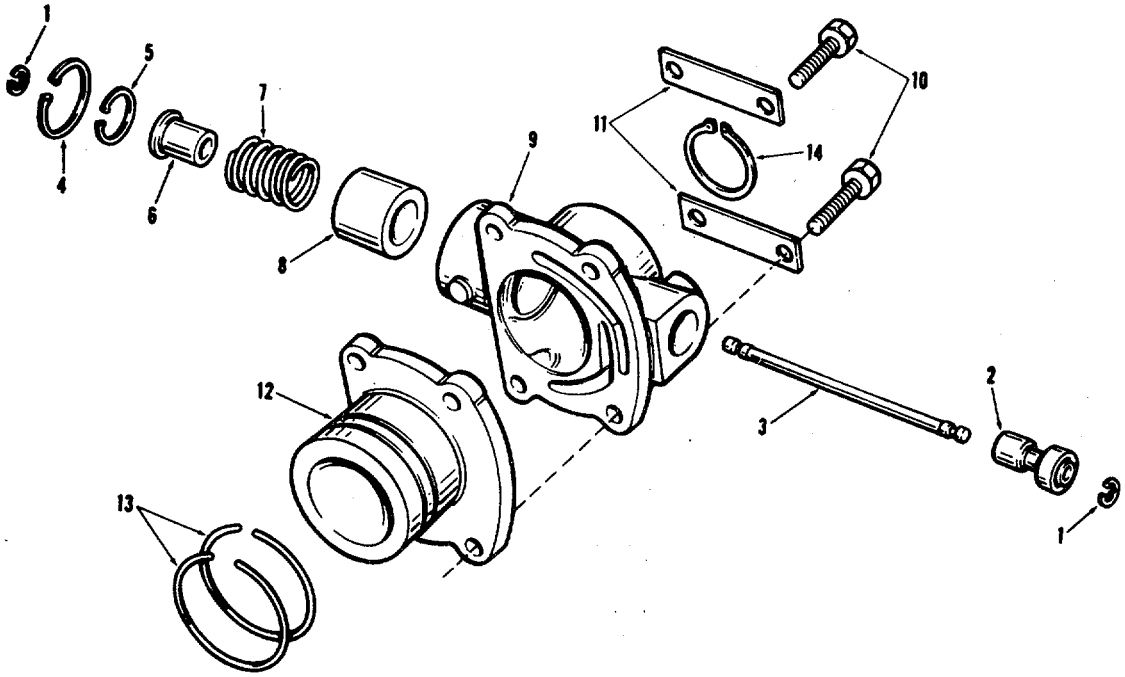


Figure 6-33. Governor Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		LOW AND REVERSE SERVO ASSEMBLY		
6-34-	No Number	SERVO ASSEMBLY, Low and reverse	REF	
-1	14903	RING, Retaining (74865 No. 1942130)	1	
-2	14904	RETAINER, Spring (74865 No. 1942150)	1	
-3	16594	SPRING, Piston (74865 No. 28 01241)	1	
-4	16602	RING, Retaining (74865 No. 6027153)	1	
-5	16576	PLUG, Piston (74865 No. 2801272)	1	
-6	16592	SPRING, Plug (74865 No. 2801273)	1	
-7	14909	RING, Seal (74865 No. 2464481)	1	
-8	16582	PISTON (74865 No. 2801281)	1	
		LOW AND REVERSE BAND ASSEMBLY		
6-35-	No Number	BAND ASSEMBLY, Low and reverse	REF	
-1	15063	SCREW, Adjusting (74865 No. 1942141)	1	
-2	15062	NUT, Adjusting (74865 No. 272121)	1	
-3	16599	RING, Seal (74865 No. 1672358)	1	
-4	15065	SHAFT, Lever (74865 No. 2124857)	1	
-5	15066	LEVER ASSEMBLY (74865 No. 1942137)	1	
-6	15067	STRUT (74865 No. 2204823)	1	
-7	15068	INK AND ANCHOR (74865 No. 2204820)	1	
-8	15069	BAND ASSEMBLY (74865 No. 1942133)	1	
-9	16572	LEVER, Short (74865 No. 2124493)	1	
		KICKDOWN SERVO ASSEMBLY		
6-36-	No Number	SERVO ASSEMBLY, Kickdown	REF	
-1	14903	RING, Retaining (74865 No. 1942130)	1	
-2	14912	RING, Seal (74865 No. 1942123)	2	
-3	14913	GUIDE, Servo (74865 No. 2124865)	1	
-4	14914	SPRING, Outer (74865 No. 2125069)	1	
-5	14915	SPRING, Inner (74865 No. 2124852)	1	

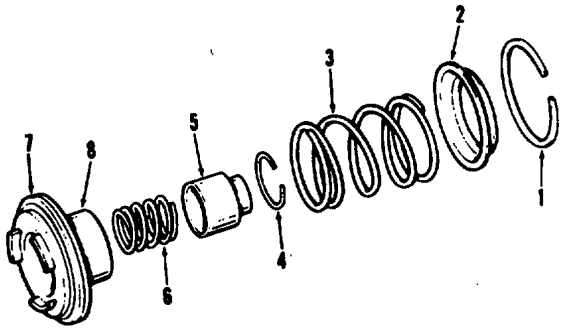


Figure 6-34. Low and Reverse Servo Assembly

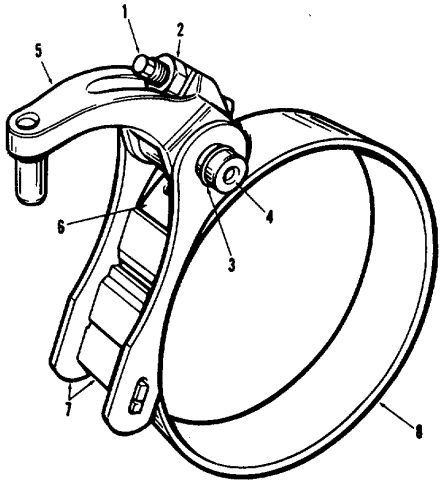


Figure 6-35. Low and Reverse Band Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		KICKDOWN SERVO ASSEMBLY		
-6	14916	ROD, Piston (74865 No. 2124853)	1	
-7	14917	RING, Seal (74865 No. 2124851)	1	
-8	14918	PISTON, Servo (74865 No. 2124950)	1	
		KICKDOWN BAND ASSEMBLY		
6-37-	No Number	BAND ASSEMBLY, Kickdown	REF	
-1	14879	NUT, Adjusting (74865 No. 124934)	1	
-2	14880	SCREW, Adjusting (74865 No. 2400389)	1	
-3	14881	PLUG, Shaft (74865 No. 444654)	1	
-4	14882	SHAFT, Lever (74865 No. 1942132)	1	
-5	16571	LEVER (74865 No. 2204952)	1	
-6	14883	STRUT (74865 No. 2124848)	1	
-7	14885	ANCHOR (74865 No. 1942120)	1	
	14886	BAND ASSEMBLY (74865 No. 2124342)	1	

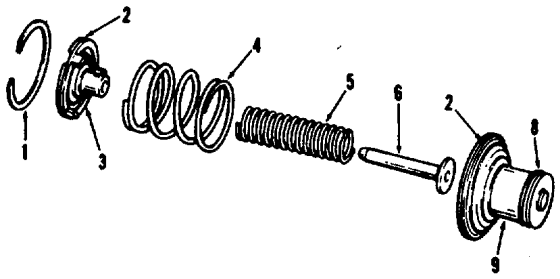


Figure 6-36. Kickdown Servo Assembly

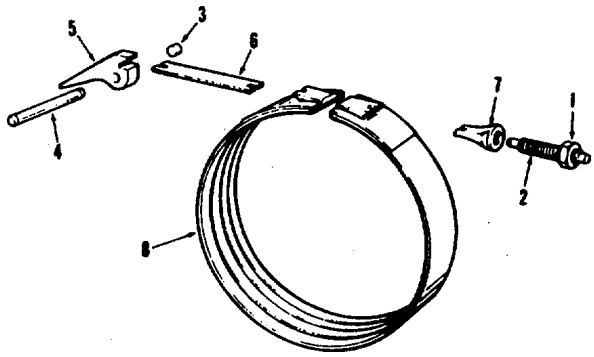


Figure 6-37. Kickdown Band Assembly

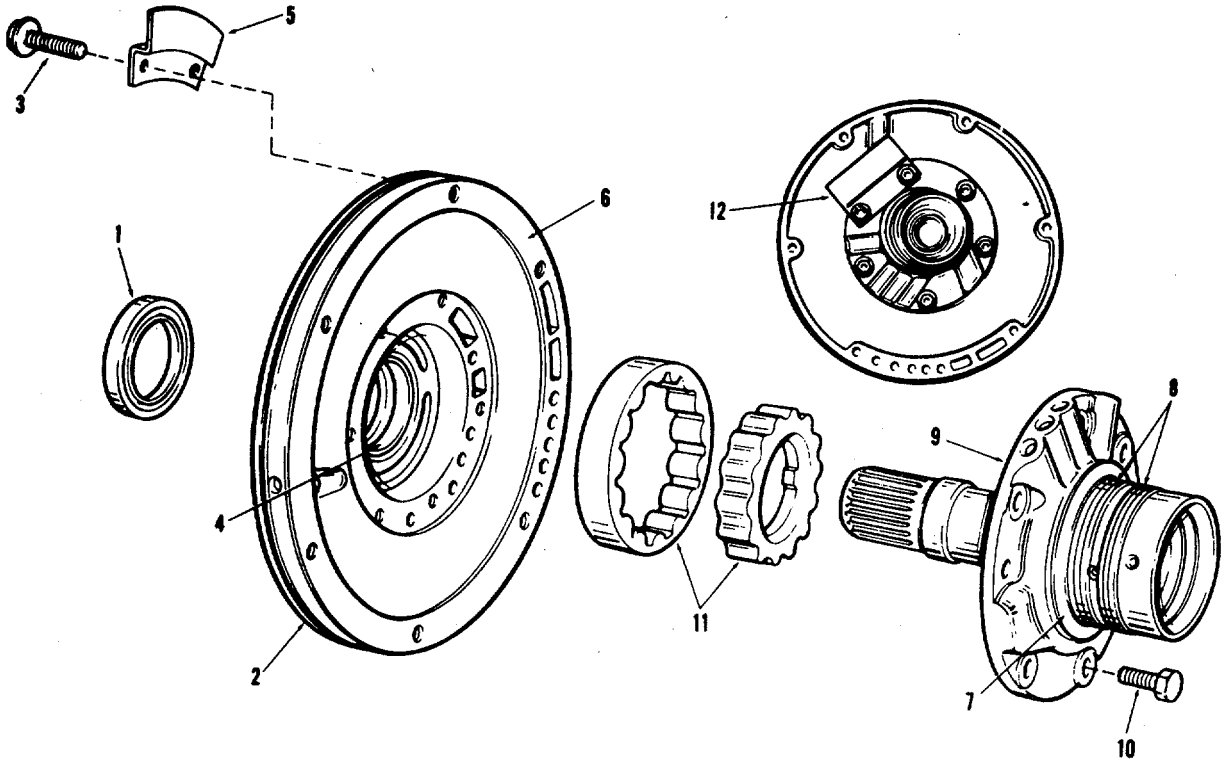


Figure 6-38. Front Pump and Reaction Shaft

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FRONT OIL PUMP AND REACTION SHAFT		
6-38-	No Number	FRONT OIL PUMP AND REACTION SHA FT	REF	
-1	14887	SEAL, Oil (74865 No. 1942021).....	1	
-2	16536	BODY ASSEMBLY, Oil pump with plug (74865 No. 2538973)	1	
		(ATTACHING PARTS)		
-3	14889	SCREW AND WASHER ASSEMBLY (74865 No. 6023943)	7	
		___*___		
-4	14890	BUSHING (74865 No. 2466324).....	1	
-5	17523	SHIELD, Vent (74865 No. 2892679).....	1	
6-38-	17524	PLUG, Vent shield (74865 No. 2892553).....	1	
-6	14893	GASKET, Body (74865 No. 2124846).....	1	
		Select one of the following at assembly		
-7	16568	WASHER, Thrust, 0.061 to 0.063 In. green (74865 No. 2204622).....	1	
	16566	WASHER, Thrust, 0.084 to 0.086 in. red (74865 No. 2204623)	1	
	16567	WASHER, Thrust, 0.102 to 0.104 In. yellow (74865 No. 2400284).....	1	
-8	16535	RING, Seal (74865 No. 2124813).....	2	
-9	16531	REACTION SHAFT AND SUPPORT ASSEMBLY (74865 No. 2801045).....	1	
		(ATTACHING PARTS)		
-10	14899	BOLT, Machine (74865 No. 180076).....	6	
		___*___		
6-38-	16541	BUSHING (74865 No. 2801348).....	1	
-11	17525	ROTOR SET, Pump (74865 No. 2808675).....	1	
-12	14901	BAFFLE, Vent (74865 No. 2400479).....	1	

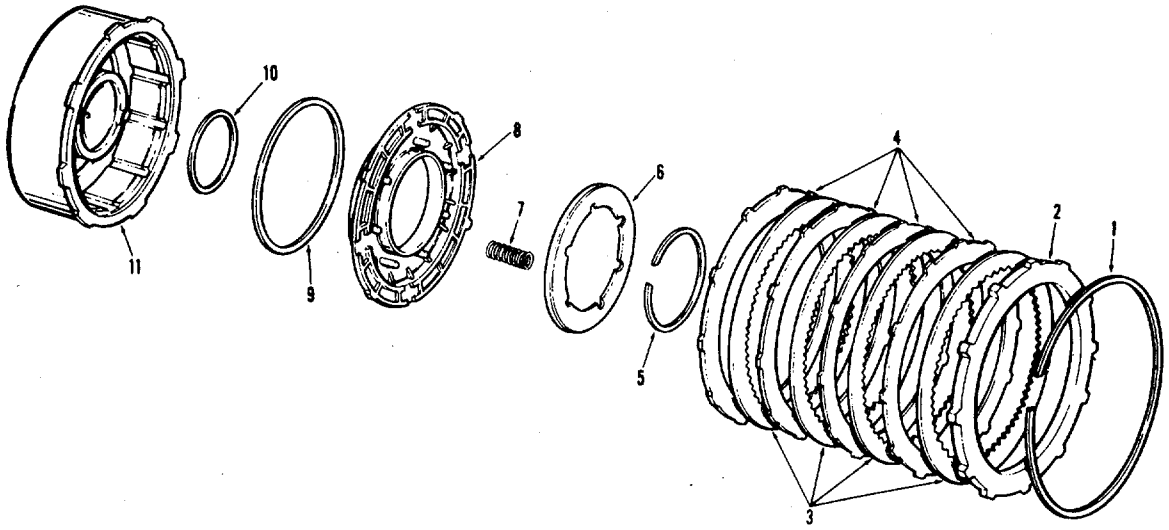


Figure 6-39. Front Clutch Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		FRONT CLUTCH ASSEMBLY		
6-39-	No Number	CLUTCH ASSEMBLY, Front (Not serviced as an assembly).	REF	
		Select one of the following at assembly		
-1	15369	RING, Retaining, 0.060 to 0.062 in. (74865 No. 1942063)	1	
	15370	RING, Retaining, 0.074 to 0.076 in. (74865 No. 1942064)	1	
	15371	RING, Retaining, 0.088 to 0.090 in. (74865 No. 1942065)	1	
-2	15372	PLATE, Pressure (74865 No. 2801961).....	1	
-3	15373	DISC, Front clutch (74865 No. 2124827).....	4	
-4	15374	PLATE, Clutch (74865 No. 2124826).....	4	
-5	15375	RING, Retaining, inner (74865 No. 2124824).....	1	
-6	17526	RETAINER, Spring (74865 No. 2801949).....	1	
-7	16565	SPRING, Clutch (74865 No. 2801243).....	8	
-8	15378	PISTON, Clutch (74865 No. 2124819).....	1	
-9	15379	SEAL, Piston, outer (74865 No. 2124821).....	1	
-10	15380	SEAL, Piston, inner (74865 No. 2124820).....	1	
-11	15381	RETAINER, Piston (74865 No. 2801989).....	1	
6-39-	15382	BUSHING (74865 No. 2205241).....	1	
6-39-	15383	BALL, Check valve (74865 No. 147483).....	1	

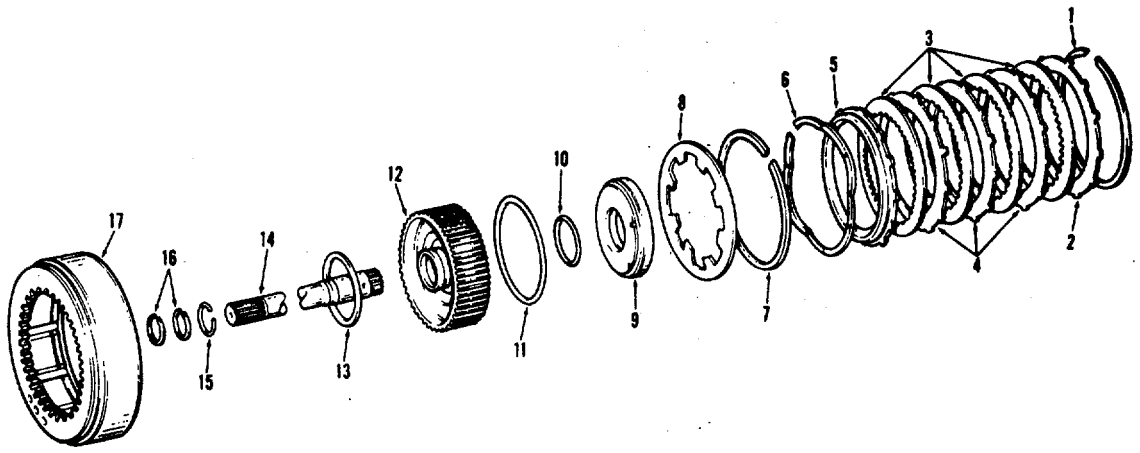


Figure 6-40. Rear Clutch Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		REAR CLUTCH ASSEMBLY		
6-40-	No Number	CLUTCH ASSEMBLY, Rear (Not serviced as an assembly).	REF	
		Select one of the following at assembly		
-1	15369	RING, Retaining, 0.060 to 0.062 in. (74865 No. 1942063)	1	
	15370	RING, Retaining, 0.074 to 0.076 in. (74865 No. 1942064)	1	
	15371	RING, Retaining, 0.088 to 0.090 in. (74865 No. 1942065)	1	
	15384	RING, Retaining, 0.106 to 0.108 in. (74865 No. 2466811)	1	
-2	15372	PLATE, Pressure, outer (74865 No. 2801961)	1	
-3	17529	DISC, Clutch (74865 No. 2801992)	4	
-4	15374	PLATE, Clutch (74865 No. 2124826)	3	
-5	15386	PLATE, Pressure, inner (74865 No. 2466803)	1	
-6	15387	SPRING, Wave (74865 No. 2466806)	1	
-7	16533	SRING, Spacer (74865 No. 2801161)	1	
-8	15389	SPRING, Piston (74865 No. 1942015)	1	
-9	15390	PISTON ASSEMBLY (74865 No. 2204645)	1	
6-40-	15383	BALL, Check valve (74865 No. 147483)	1	
-10	15391	SEAL, Piston, inner (74865 No. 1942054)	1	
-11	15392	SEAL, Piston, outer (74865 No. 2124835)	1	
-12	15393	RETAINER, Piston (74865 No. 2124833)	1	
-13	15394	WASHER, Thrust (74865 No. 2204622)	1	
-14	16545	SHAFT, Input (74865 No. 2801053)	1	
6-40-	15396	BUSHING (74865 No. 2205242)	1	
	15397	BALL (74865 No. 147488)	1	
-15	15398	RING, Retaining (74865 No. 2124872)	1	
-16	16544	RING, Seal (74865 No. 28 01054)	2	
17	15400	RETAINER, Clutch (74865 No. 2466801)	1	

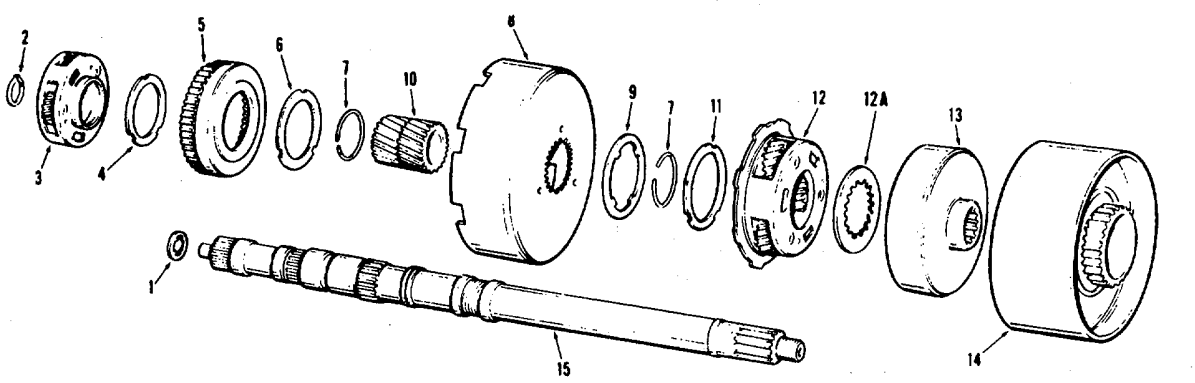


Figure 6-41. Output Shaft and Gear Train

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		OUTPUT SHAFT AND GEAR TRAIN		
6-41-	No Number	OUTPUT SHAFT AND GEAR TRAIN	REF	
-1	16540	WASHER, Thrust (74865 No. 2400843)	1	
		Select one of the following at assembly		
-2	16547	RING, Retaining, 0.048 to 0.052 In. (74865 No. 6022816)	1	
	16548	RING, Retaining, 0.055 to 0.059 In. (74865 No. 6024311)	1	
	16549	RING, Retaining, 0.062 to 0.066 In. (74865 No. 6024312)	1	
-3	15047	GEAR ASSEMBLY, Planetary, front (74865 No. 2466537)	1	
	16581	PINION (74865 No. 2400667)	3	
	16600	SHAFT (74865 No. 24 64178)	3	
	16587	WASHER, Pinion (74865 No. 2801315)	6	
	16603	ROLLER, Pinion (74865 No. 2204647)	69	
	16601	RING, Thrust (74865 No. 2204649)	6	
-4	15048	WASHER, Thrust (74865 No. 1942081)	1	
-5	15049	GEAR ASSEMBLY, Front annulus (74865 No. 2892656)	1	
-6	15048	WASHER, Thrust (74865 No. 1942081)	1	
-7	15051	RING, Retaining (74865 No. 1736521)	2	
-8	16532	SHELL, Driving (74865 No. 2400662)	1	
-9	15053	PLATE, Thrust (74865 No. 1942080)	1	
-10	17532	SUN GEAR ASSEMBLY (74865 No. 2801311)	1	
-11	15048	WASHER, Thrust (74865 No. 1942081)	1	
-12	15056	GEAR ASSEMBLY, Planetary, rear (74865 No. 2466539)	1	
	16581	PINION (74865 No. 2400667)	3	
	16600	SHAFT (74865 No. 2464178)	3	
	17530	WASHER, Pinion (74865 No. 2801315)	6	
	16603	ROLLER, Pinion (74865 No. 2204647)	69	
	16601	RING, Thrust (74865 No. 2204649)	6	
-12A	16573	PLATE, Thrust (74865 No. 2400580)	1	
-13	15057	GEAR ASSEMBLY, Rear annulus (74865 No. 2538185)	1	
-14	15058	DRUM, Low and reverse (74865 No. 2464384)	1	
-15	17533	SHAFT, Output (74865 No. 2892742)	1	

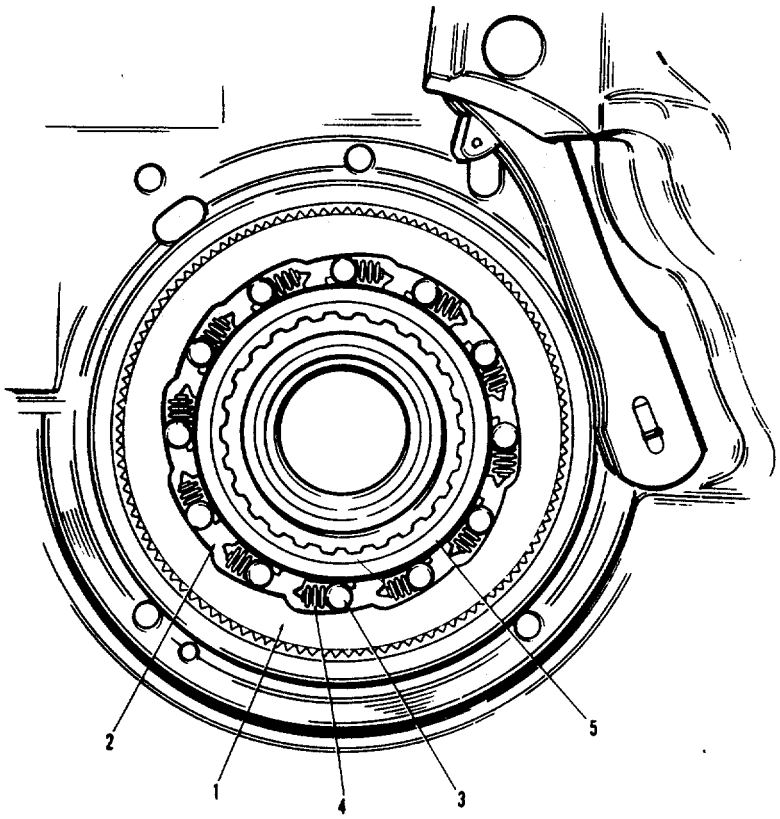


Figure 6-42. Overrunning Clutch

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		OVERRUNNING CLUTCH		
6-42-	No number	OVERRUNNING CLUTCH	REF	
-1	15013	CAM, Overrunning clutch (74865 No. 1942095)	1	
-2	16583	RETAINER, Spring (73865 No. 2801426)	1	
-3	15015	ROLLER, Clutch (74865 No. 670776)	12	
-4	15016	SPRING, Clutch (74865 No. 1942187)	12	
-5	15017	RACE, Clutch (74865 No. 2808669)	1	
		PARKING BRAKE ASSEMBLY		
6-43-	No Number	BRAKE ASSEMBLY, Parking (See figure 61 for NHA)	1	
6-43-	15022	COVER, Adjusting screw (74865 No. 1317858)	1	
		(ATTACHING PARTS)		
	15023	SCREW AND WASHER ASSEMBLY (74865 No. 123316)	2	
6-43-	0102-N	NUT, Hex	1	
6-43-	0349-W	WASHER, Lock	1	
6-43-	0903-H	SCREW, Cap	1	
-1	15027	SPRING, Brake shoe return (74865 No. 1403611)	1	
-2	15028	SPRING, Grease shield (74865 No. 1530775)	1	
-3	15029	SCREW, Brake shoe adjusting (74865 No. 1314478)	1	

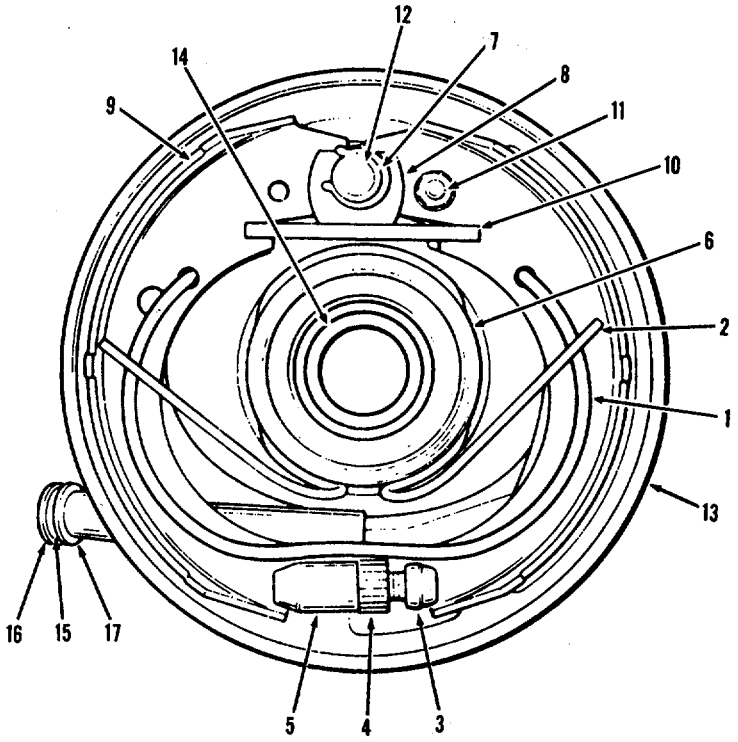


Figure 6-43. Parking Brake Assembly

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		PARKING BRAKE ASSEMBLY		
-4	15030	NUT, Brake shoe adjusting (74865 No. 1314477)	1	
-5	15031	SLEEVE, Brake shoe adjusting (74865 No. 1314476)	1	
-6	15032	SHIELD, Grease (74865 No. 1488901)	1	
-7	15033	WASHER, Anchor (74865 No. 600983)	1	
-8	15034	GUIDE, Anchor (74865 No. 1403574)	2	
-9	15035	SHOE, Brake (74865 No. 2227692)	2	
-10	15036	LINK, Lever (74865 No. 1406677)	1	
-11	15037	LEVER, Operating (74865 No. 2227695)	1	
		(ATTACHING PARTS)		
	15038	SCREW, Lever (74865 No. 1929685)	1	
	15039	NUT, Lever (74865 No. 2129684)	1	
		*		
-12	16614	ANCHOR, Shoe (74865 No. 1488884)	1	
-13	15041	SUPPORT, Brake (74865 No. 1738221)	1	
-14	15042	SLEEVE, Brake support (74865 No. 1488890)	1	
	15043	SPACER, Brake support (74865 No. 1488889)	1	
-15	15426	BUSHING, Rubber (74865 No. 1406964)	1	
-16	15430	WASHER, Dished (74865 No. 1406976)	1	
-17	15427	WASHER, Dished (74865 No. 1406975)	1	
6-43-	15021	DRUM, Brake (74865 No. 1949579)	1	
		(ATTACHING PARTS)		
6-43-	16615	BOLT, Brake drum (74865 No. 1946283)	4	
		*		
6-43-	17580	COVER (74865 No. 2892163)	1	
6-43-	15325	SEAL (74865 No. 1316815)	1	

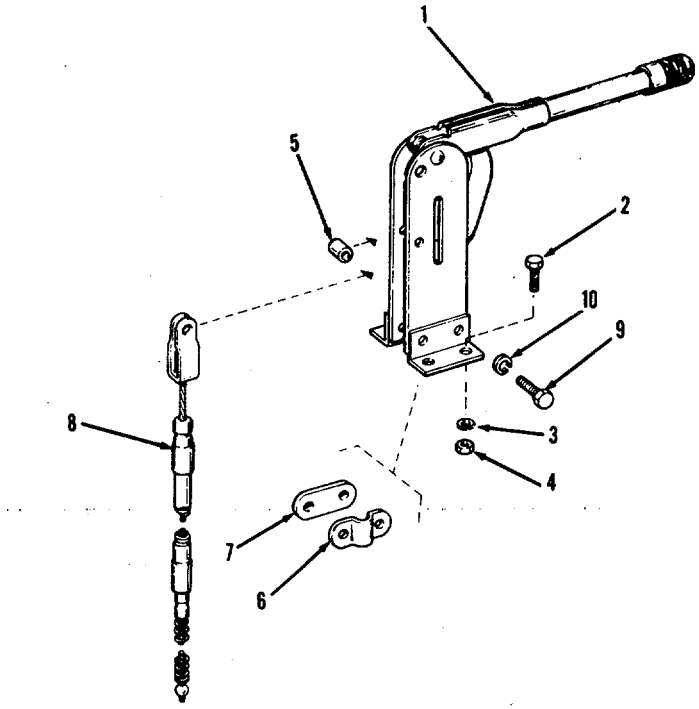


Figure 6-44. Parking Brake Lever Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			PARKING BRAKE LEVER GROUP		
6-44-	No Number		PARKING BRAKE LEVER GROUP (See figure 6-1 for NHA)	REF	
-1	22767		LEVER ASSEMBLY (92867 No. 02183400)	1	
			(ATTACHING PARTS)		
-2	0908-H		SCREW, Cap, hex head	4	
-3	0350W		WASHER, Lock	4	
-4	0105-N		NUT, Plain, hex	4	
			___*___		
-5	15509		SPACER (92867 No. 81000030)	2	
-6	15510		CLAMP, Cable (92867 No. 81000108)	1	
-7	15508		LINK (92867 No. 8 1000131)	1	
-8	22766		CABLE, Parking brake	1	
-9	0905-H		SCREW, Cap hex head	2	
-10	0350-W		WASHER, Lock	2	
			SHIFT LEVER GROUP		
6-45-	No Number		SHIFT LEVER GROUP (See figure 6-1 for NHA)	REF	
-1	16562.		CABLE, Shift (74865 No. 2830501)	1	
			(ATTACHING PARTS)		
-2	0400-P		PIN, Cotter, 1/16 x 1/2 In. lg	1	
-3	15946		PIN, Clevis (74865 No. 121547)	1	

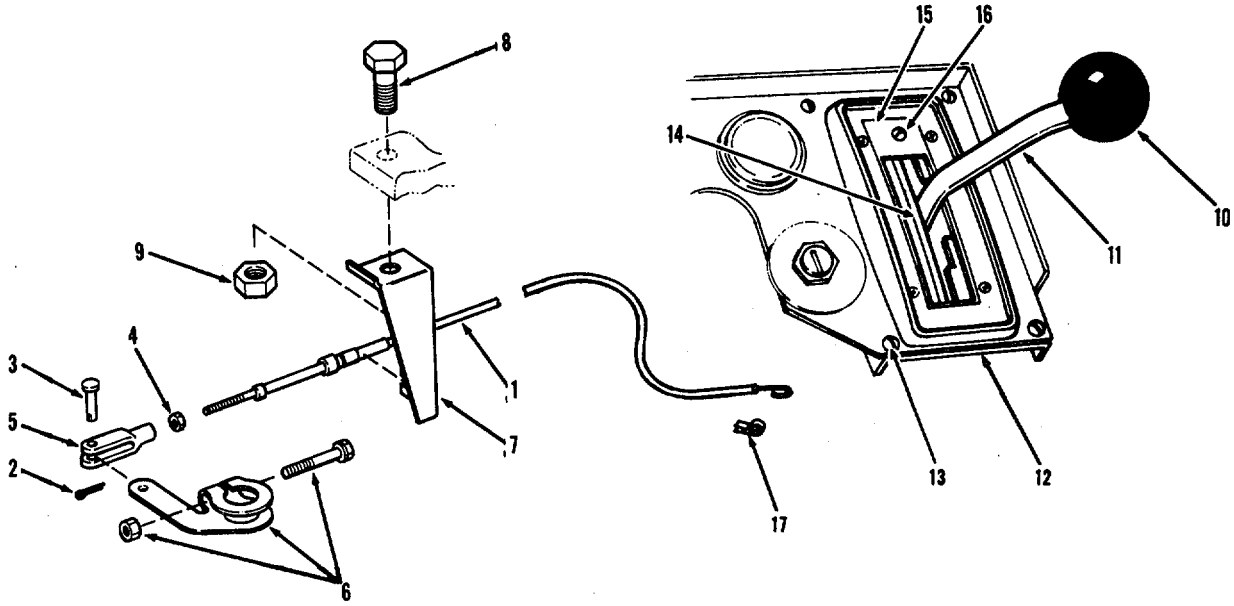


Figure 6-45. Shift Lever and Linkage

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		SHIFT LEVER GROUP		
-4	0132-N	NUT, Hex (74865 No. 120614)	1	
-5		21167 CLEVIS (74865 No.186956)	1	
6-	16578	LEVER, Control (74865 No. 2513936)	1	
-7	16560	BRACKET, Anchor (74865 No. 3821047)	1	
		(ATTACHING PARTS)		
-8	0823-H	SCREW, Cap (74865 No. 182776)	1	
-9	0183-N	NUT, Hex (74865 No. 602935)	1	
-10	16570	KNOB (74865 No. 2908376)	1	
-11	21484	CONTROL, Shift (74865 No. 3821623)	1	
-12	16591	BRACKET, Mounting (74865 No. 2515800)	1	
		(ATTACHING PARTS)		
-13	01308-B	SCREW, Round head, No. 10-24 x 3/4 in	4	
	0374-W	WASHER, Lock, med spring, 3/16 in	4	
	0100-N	NUT, Hex (74865 No. 61 23201)	4	
		*		
-14	21482	BEZEL (74865 No. 3634737)	1	
		(ATTACHING PARTS)		
	21483	SCREW (74865 No. 6029716)	4	
		*		
-15	22962	PLATE, Stop, top	1	
	22963	PLATE, Stop, bottom	1	
		(ATTACHING PARTS)		
-16	01367-B	SCREW, Pan hd, one-way	1	
		*		
	22827	LAMP (74865 No. 127934)	1	
	22826	SOCKET, Lamp (74865 No. 1937108)	1	
-17	16077	CLIP, Cable (74865 No. 6023285)	1	

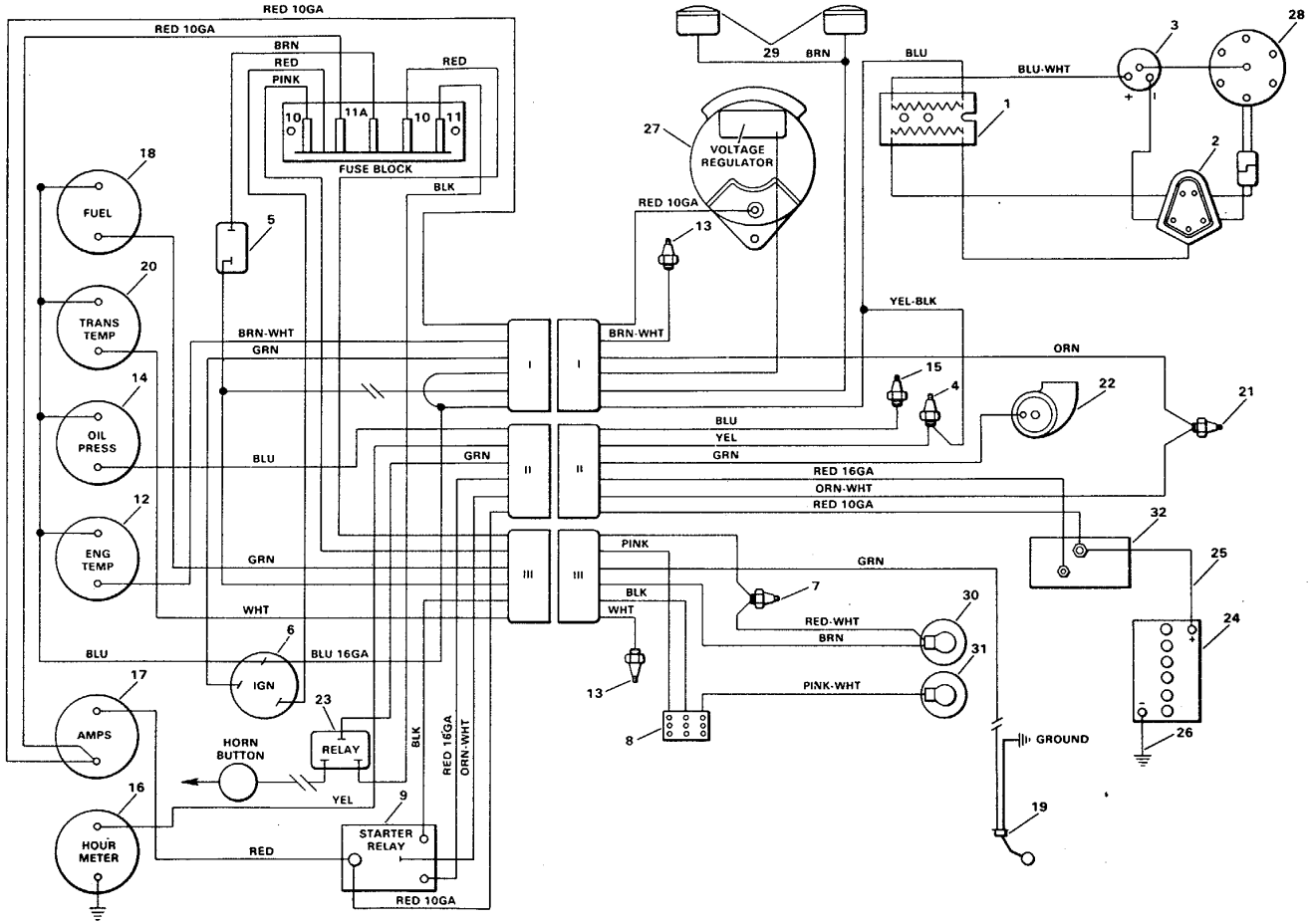


Figure 6-46. Electrical System Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		ELECTRICAL SYSTEM GROUP		
6-46	No Number	ELECTRICAL SYSTEM GROUP (See figure 61 for NHA)	REF	
-1	21151	RESISTOR, Ballast (74865 No. 3675480)	1	
-2	21140	CONTROL, Electrical (74865 No. 2874020)	1	
-3	21152	COIL, Ignition (74865 No. 3874001)	1	
	21153	BRACKET, Coil (74865 No. 2203144)	1	
-4	21649	SWITCH, Pressure, hourmeter (13445 No. 8647)	1	
-5	21697	SWITCH, Push-pull (85922 No. C590A)	1	
	15538	Disc, Light	1	
6	21696	SWITCH, Ignition (85922 No. C457A)	1	
	21762	DISC, Ignition	1	
-7	10370EB	SWITCH, Stoplight.	1	
-8	17444	SWITCH, Neutral starting (74865 No. 2932820)	1	
-9	15072	RELAY, Starter (74865 No. 2444517)	1	
-10	10526-C5	FUSE, Cartridge, 5 ampere (71400 No. AGC5)	2	
-11	10526-C10	FUSE, Cartridge, 10 ampere (71400 No. AGC0)	1	
-11A	10526-C20	FUSE, Cartridge, 20 ampere (71400 No. SFE20)	2	
-12	21663	GAGE, Water temperature.	1	
-13	21664	SENDING UNIT, Water temperature (09527 No. 4156-17)	2	
-14	21665	GAGE, Oil pressure (75300 No. 54145A)	1	
-15	21666	SENDING UNIT, Oil pressure (09527 No. 4151-19)	1	
-16	22758	HOUR METER, Engine	1	
-17	21659	AMMETER	1	
-18	21660	GAGE, Fuel.	1	
-19	21662	SENDING UNIT, Fuel level.	REF	
-20	23041	GAGE, Oil temperature.	1	
-21	15624	SWITCH, Vacuum(13445 No. 9253)	1	
-22	14486	HORN (72560 No. 9000130)	1	
	14487	BRACKET, Horn (72560 No. 1953667)	1	
-23	21756	RELAY, Horn (72560 No. 1116920)	1	
-6-46-	22793	WIRING HARNESS, Engine	1	
	22792	WIRING HARNESS, Dash Section I	1	
	22791	WIRING HARNESS, Dash Section II	1	
	22789	WIRING HARNESS, Dash Section III	1	
	22790	WIRING HARNESS, Rear	1	
	21141	WIRING HARNESS, (74865 No. 3513753	1	
	17730	WIRING HARNESS.	1	
	21698	CONNECTION, Hot feed.	1	
6-46-	10518-FB	STRAP, Ground.	1	
6-46-	17343	CABLE KIT, Ignition (74865 No. 2495510)	1	
6-46-	21893	WIRE ASSEMBLY	1	
	16327	WIRE	1	
	22896	WIRE, Headlight cross	1	
	22788	WIRE , Fuel	1	
6-46-	01922-LL	CLIP, Wire.	4	
	01921-LL	CLIP, Wire	4	
-24	22786	BATTERY, 12 volt (dry charge).	REF	
-25	22964	CABLE, Battery.	REF	
-26	22571	CABLE, Ground.	REF	
-27	22952	ALTERNATOR ASSEMBLY, Fungus-proofed (See figure 6-47 for breakdown)	1	
	21090	ALTERNATOR ASSEMBLY, (80211 No. RA12N451D) (See figure 6-47 for breakdown)	1	
-28	21007	DISTRIBUTOR ASSEMBLY (74865 No. 3874082) (See figure 6-48 for breakdown)	1	
-29	15633	HEAD LIGHT ASSEMBLY (See figure 6-50 for breakdown)	2	
-30	14757	TAIL AND STOP UGHT ASSEMBLY (See figure 6-51 for breakdown)	1	
-31	14752	PINTLE LIGHT ASSEMBLY (See figure 6-51 for breakdown)	1	
-32	21903	STARTER MOTOR (74865 No. 3755771) (See figure 6-49 for breakdown)	1	

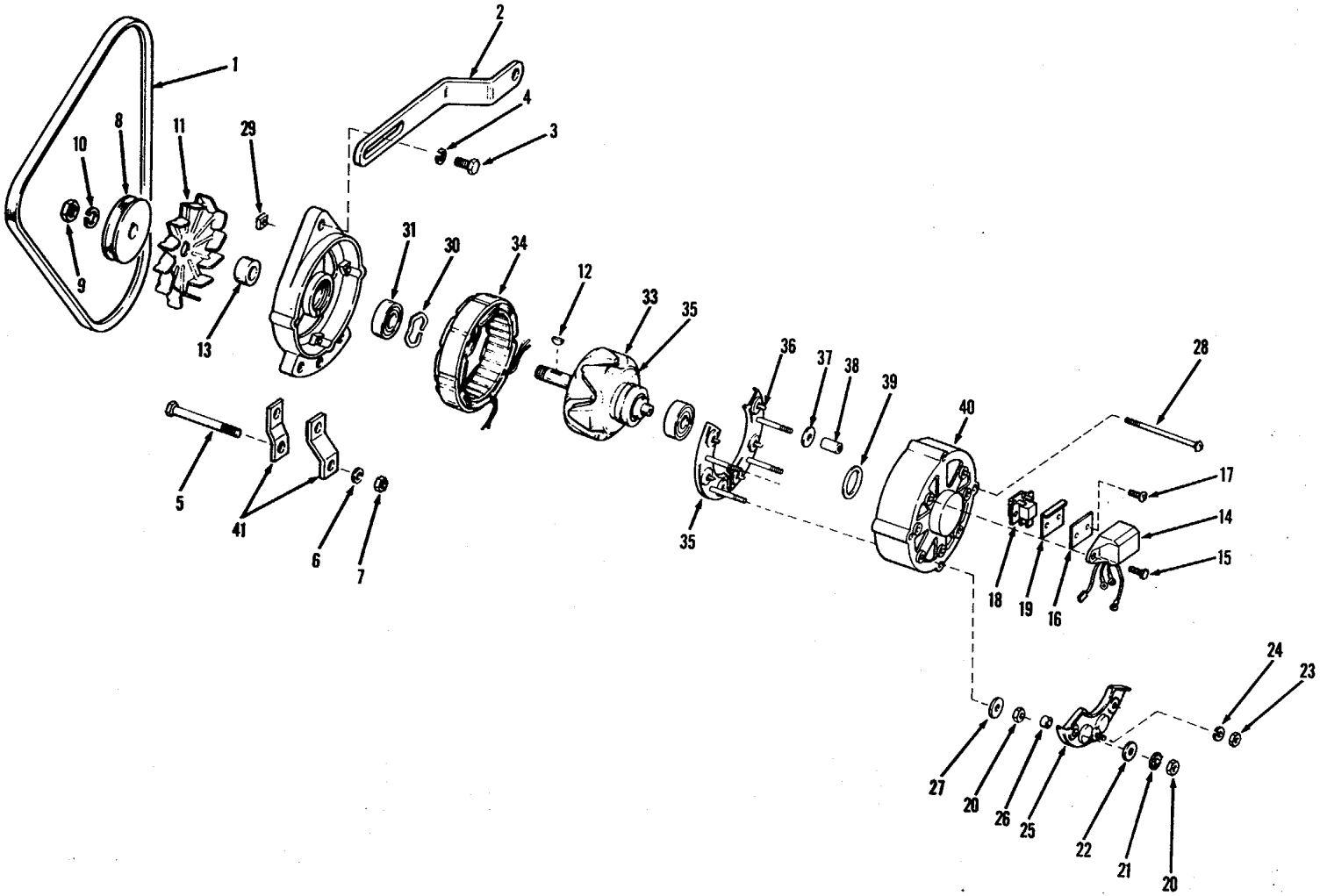


Figure 6-47. Alternator Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		ALTERNATOR GROUP		
6-47-	No Number	ALTERNATOR GROUP	REF	
-1	22809	BELT, V, fan and alternator drive (24161 No. 8307)	REF	
-2	17502	ARM, Belt tension	1	
		(ATTACHING PARTS)		
-3	0905-H	SCREW, Cap, hex head	2	
-4	0350-W	WASHER, Lock	2	
		*		
6-47-	22962	ALTERNATOR (fungus-proofed) (See figure 6-46 for NHA)	REF	
6-47-	21090	ALTERNATOR (80211 No. RA12N451D (See figure 6-46 for NHA)	REF	
		(ATTACHING PARTS)		
-5	0894-H	SCREW, Cap, hex head	1	
6	0351-W	WASHER, Lock	1	
-7	0109N	NUT, Plain, hex	1	
		*		
-8	21091	PULLEY (80211 No. EK114)	1	
		(ATTACHING PARTS)		
-9	0117-N	NUT, Pulley mounting (80211 No. 20-4)	1	
-10	0354-W	WASHER, Lock (80211 No. 20-5)	1	
-11	15956	FAN (80211 No. 7-8)	1	
-12	15957	KEY, Woodruff (80211 No. 20-7)	1	
-13	15958	SPACER (80211 No. 20-6)	1	
-14	22951	REGULATOR (80211 No. 543)	1	
	22961	REGULATOR, Fungus-proofed	1	
		(ATTACHING PARTS)		
-15	02704ST	SCREW, Round head, No. 10 x 1/2 in	2	
-16	22950	COVER, Brush	1	
	22960	COVER, Brush, fungus-proofed	1	
		(ATTACHING PARTS)		
-17	2703ST	SCREW, Round head, No. 8 x 1/2 in	2	
-18	22949	SHIELD	1	
	22959	SHIELD, Fungus-proofed	1	
-19	22948	BRUSH ASSEMBLY (80211 No. 3-1)	1	
-20	0100-N	NUT, Hex, No. 10-24	8	
-21	0374-W	WASHER, Lock, No. 10 external tooth	6	
-22	15962	INSULATOR (80211 No. 15-4)	1	
-23	0102-N	NUT, Hex, 1/4-20	2	
-24	0349-W	WASHER, Lock, 1/4 in	2	
-25	17422	DIODE (80211 No. 1-29)	1	
-26	15963	SLEEVE (80211 No. 15-2)	1	
-27	15975	INSULATOR (80211 No. 153)	1	
-28	01368-B	BOLT, Thru.	4	
-29	0132-N	NUT, Plain, square, No. 10-32	4	
-30	15966	RETAINER, Bearing, front (80211 No. 11-3)	1	
-31	17410	BEARING, Ball, annular (80211 No. 11-1)	1	
-32	22942	HOUSING, Front (80211 No. 14-6)	1	
	22953	HOUSING, Front, fungus-proofed	1	
-33	22943	ROTOR ASSEMBLY (80211 No. 12-1)	1	
	22955	ROTOR ASSEMBLY, Fungus-proofed	1	
-34	17414	STATOR ASSEMBLY (80211 No. 13-1)	1	
	22954	STATOR ASSEMBLY, Fungus-proofed	1	
-35	22945	DIODE ASSEMBLY, Rectifying, negative (80211 No. 1-2)	1	
	22956	DIODE ASSEMBLY, Rectifying, negative, fungus-proofed	1	
-36	22946	DIODE ASSEMBLY, Rectifying, positive (80211 No. 1-1)	1	
	22957	DIODE ASSEMBLY, Rectifying, positive, fungus-proofed	1	
-37	15975	WASHER, Insulating (80211 No. 15-3)	2	

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			ALTERNATOR GROUP		
-38	17417		SLEEVE, Insulating (80211 No. 159)	2	
-39	17418		RETAINER, Bearing, rear (80211 No. 11-10)	1	
-40	22947		HOUSING, Rear (80211 No. 14-56)	1	
	22958		HOUSING, Rear, fungus-proofed	1	
-41	22722		BRACKET, Alternator mounting	1	
647-	0112-N		NUT, Hex 1/2-13	1	
6-47-	0943-H		SCREW, Cap, 1/2-13 x 3-1/2 in	1	
6-47-	0353W		WASHER, Lock, 1/2 in	1	
			DISTRIBUTOR ASSEMBLY		
6-48-	21007		DISTRIBUTOR ASSEMBLY (74865 No. 3874082 (See figure 6-46 for NHA)	REF	
-1	17344		CAP, Distributor (74865 No. 2642986)	1	
-2	17354		ROTOR, (74865 No. 1838516)	1	
-3	16512		WICK, Cam sleeve, with snap ring (74865 No. 1879607).	1	
6-48-	17347		GEAR AND PIN SET (74865 No. 2084653)	1	
-4	No Number		GEAR	1	
-5	No Number		PIN	1	
-6	No Number		WASHER, Lower thrust	1	
-7	No Number		PLATE, Advance arm (ATTACHING PARTS)	NP	
-8	No Number		SCREW, Machine, with washer	NP	
-9	17357		SPRING, Cap retaining (74865 No. 1838508)	2	
-10	No Number		BASE ASSEMBLY	NP	
-11	17520		GASKET (74865 No. 2095630)	1	
-12	17350		RETAINER (74865 No. 2095740)	1	
-13	21514		RELUCTOR (74865 No. 3656862)	1	
-14	21515		PICK-UP AND PLATE (74865 No. 3656866)	1	
-15	21516		GOVERNOR (74865 No. 3874093)	1	
-16	21517		CONTROL, Vacuum (74865 No. 3755036) (ATTACHING PARTS)	1	
-17	No Number		SCREW, Machine	NP	
-18	No Number		SCREW (74865 No. 6026763)	1	
-19	15001		PIN (74865 No. 9414521)	1	
-20	No Number		PIN (74865 No. 9417599)	1	

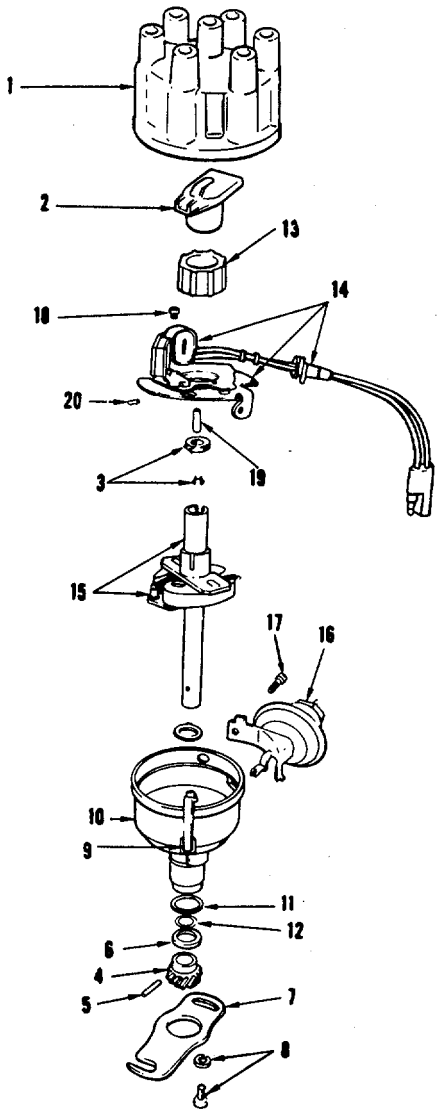


Figure 6-48. Distributor Assembly

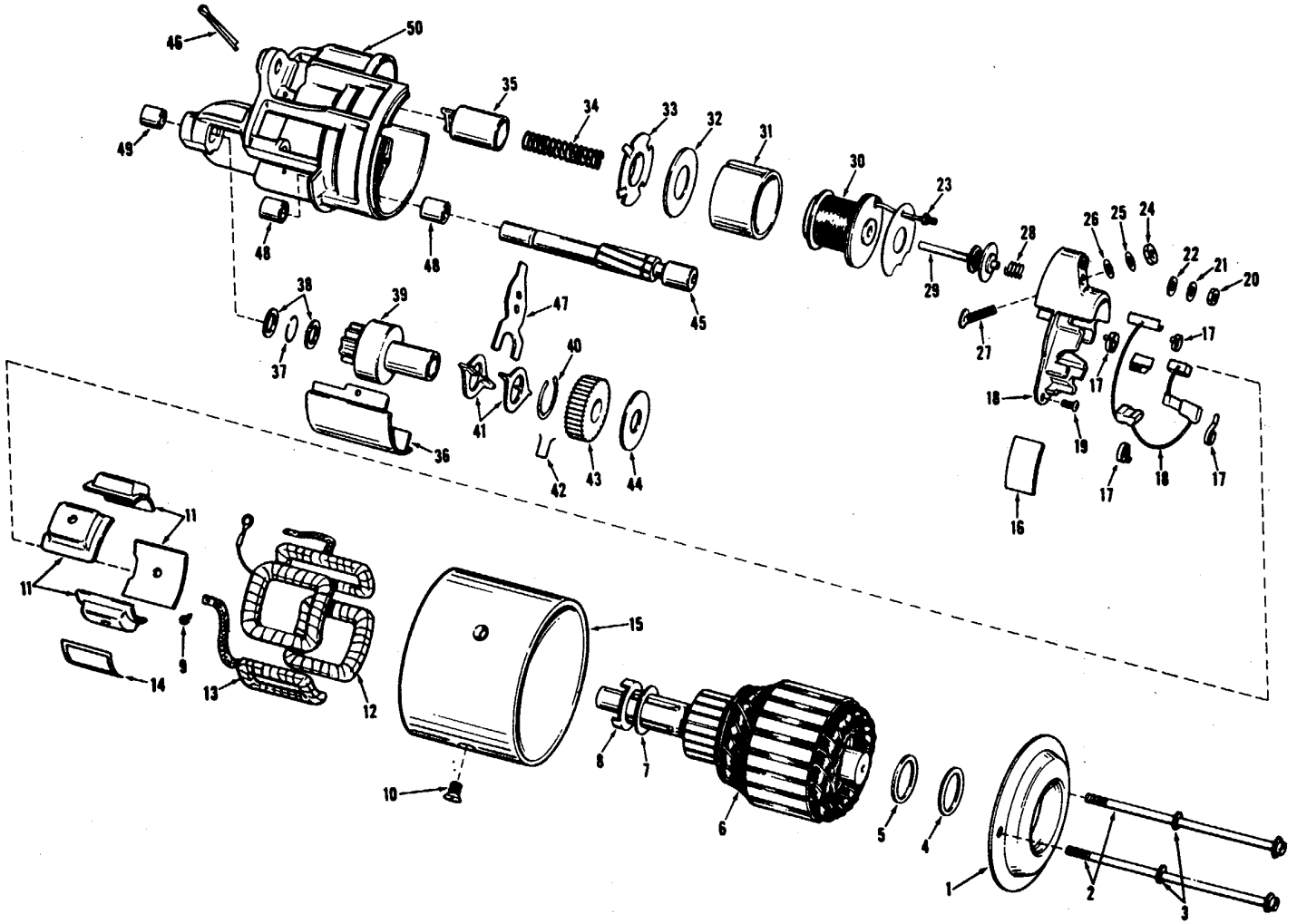


Figure 6-49. Starter Motor Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			STARTER MOTOR GROUP		
6-49-	No Number		STARTER MOTOR GROUP	REF	
6-49-	21903		STARTER MOTOR (74865 No 3755771) (See figure 6-46 for NHA)	REF	
			(ATTACHING PARTS)		
	21642-A		STUD, Mounting	1	
	0111-N		NUT, Stud	1	
	0952-H		SCREW, Cap	1	
	0362-W		WASHER, Lock	1	
-1	15332		PLATE, End head (74865 No 2095076)	1	
			(ATTACHING PARTS)		
-2	15333		BOLT, Machine (74865 No 209515)	2	
-3	15334		WASHER, Lock (74865 No 120380)	2	
-4	*No Number		WASHER, Flat, steel	NP	
-5	*No Number		WASHER, Flat, fiber	NP	
-6	16478		ARMATURE (74865 No 2642072)	1	
-7	*15338		WASHER, Flat	NP	
-8	*15339		WASHER, Thrust	NP	
-9	15340		SCREW AND WASHER ASSEMBLY (74865 No 9417720)	1	
6-49-	*No Number		FRAME AND FIELD ASSEMBLY	1	
-10	*No Number		POLE, Field	NP	
			(ATTACHING PARTS)		
-11	*No Number		SCREW, Machine	NP	
6-49-	16483		COIL SET (74865 No 2275248)	1	
-12	*No Number		COIL, Field series	NP	
-13	*No Number		COIL, Field shunt	NP	
-14	*No Number		INSULATOR, Coil (set of 4)	NP	
6-49	*No Number		RIVET, Tubular, ground	NP	
-15	*No Number		FRAME	NP	
-16	*No Number		INSULATOR	NP	
-17	15342		SPRING SET, Brush set (set of 4) (74865 No 2084666)	1	
-18	15343		BRUSH AND PLATE ASSEMBLY (74865 No 227550)	1	
			(ATTACHING PARTS)		
-19	*15344		SCREW, Machine (Supplied with brush and plate assy)	NP	
6-49	16498		TERMINAL ASSEMBLY, Solenoid (74865 No 2586726)	1	
-20	*No Number		NUT, Plain, hexagon	NP	
-21	*No Number		WASHER, Flat, steel	NP	
-22	*No Number		WASHER, Flat, insulating	NP	
-23	*No Number		STUD, Terminal	NP	
6-49	15439		TERMINAL ASSEMBLY, Battery (74865 No 2275561)	1	
-24	*No Number		NUT, Plain, hexagon	NP	
-25	*No Number		WASHER, Flat steel	NP	
-26	*No Number		WASHER, Flat, insulating	NP	
-27	*No Number		STUD, Terminal	NP	
-28	*No Number		SPRING, Solenoid switch	NP	
-29	*No Number		CONTACT ASSEMBLY	NP	
-30	*No Number		SOLENOID	NP	
-31	*No Number		SLEEVE, Solenoid	NP	
-32	*No Number		WASHER, Flat	NP	
-33	*No Number		RETAINER, Solenoid	NP	
-34	*No Number		SPRING, Return	NP	
-35	16485		CORE, (74865 No 2095155)	1	
-36	15364		COVER, Gear housing (74865 No 2095116)	1	
6-49-	16499		WASHER AND RING SET (74865 No 2275558)	1	
-37	*No Number		RING, Retaining, pinion shaft	1	
-38	*No Number		WASHER, Flat, thrust	2	
-39	16481		CLUTCH ASSEMBLY (74865 No 2444658)	1	

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			STARTER MOTOR GROUP		
6-49-	15357		ACTUATOR SET, With ring (74865 No 2275556)	1	
-40	15355		RING, Retaining (74865 No 2095130)	1	
-41	*No Number		ACTUATOR	NP	
6-49-	15358		GEAR SET, Pinion (74865 No 2275557)	1	
-42	15438		RETAINER (74865 No 2095117)	1	
-43	*No Number		GEAR, Pinion shaft	NP	
-44	17666		WASHER, Friction (74865 No 2095114)	1	
-45	15360		SHAFT, Pinion (74865 No 2095118)	1	
-46	15361		PIN, Pivot (74865 No 2095133)	1	
-47	15362		FORK, Shifting (74865 No 2095134)	1	
6-49-	15365		HOUSING ASSEMBLY, Gear (74865 No 2095112)	1	
-48	16480		BEARING, Sleeve, pinion housing (74865 No 2098986)	2	
-49	15364		BEARING, Sleeve, gear housing (74865 No 2098087)	1	
-50	*No Number		HOUSING, Gear	NP	
6-49-	16496		REPAIR KIT, Solenoid (74865 No 2586725)	AR	
	No Number		RETAINER (Index No 33)	1	
	No Number		SLEEVE (Index No 31)	2	
	No Number		SOLENOID ASSEMBLY	1	
	No Number		WASHER, Flat (Index No 21)	1	
	No Number		WASHER, Flat (Index No 22)	1	
	No Number		WASHER, Flat (Index No 32)	1	
	No Number		NUT, Plain, hexagon (Index No 20)	1	
6-49-	16484		REPAIR KIT, Contact and spring (74865 No 2586724)	AR	
	No Number		CONTACT ASSEMBLY (Index No 29)	1	
	No Number		SPRING (Index No 34)	1	
	No Number		SPRING (Index No 28)	1	
6-49-	15368		REPAIR KIT, Armature thrust washer (74866 No 2275555)	AR	
	No Number		WASHER, Flat, steel, standard	1	
	No Number		WASHER, Flat, steel, 0020 in	1	
	No Number		WASHER, Flat, steel, 0031 in	2	
	No Number		WASHER, Flat, steel, 0045 in	1	
	No Number		WASHER, Flat, Steel, 00625 in	1	
6-49-	17517		SEALER (74865 No 2421838)	AR	
6-49-	21139		SEAL, Starter mounting (74865 No 2892914)	1	

*Not procurable separately. Procure as part of next higher assembly or as part of repair kit.

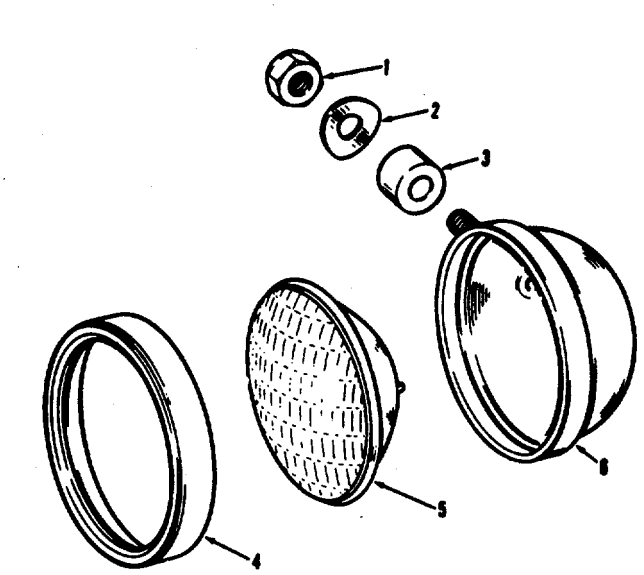


Figure 6-50. Headlight Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			HEADLIGHT GROUP		
6-50-	No Number		HEADLIGHT GROUP	REF	
6-50-	15633		HEADLIGHT ASSEMBLY (74400 No M-4043) (See figure 6-46 for NHA)	REF	
-1	0229-A		NUT, Plain, hexagon (74400 No 7862)	2	
-2	0381-W		WASHER, Lock	2	
-3	15903		BUSHING, Pivot (74400 No 7860)	2	
-4	15904		RETAINER, Lamp (74400 No 4023)	2	
-5	15905		LAMP, Sealed beam, 12 vdc, 35w (24455 No 4411)	2	
-6	15901		SHELL ASSEMBLY (74400 No 7983)	2	
	01825-E		TERMINAL	2	
	01826-E		CONNECTOR	2	

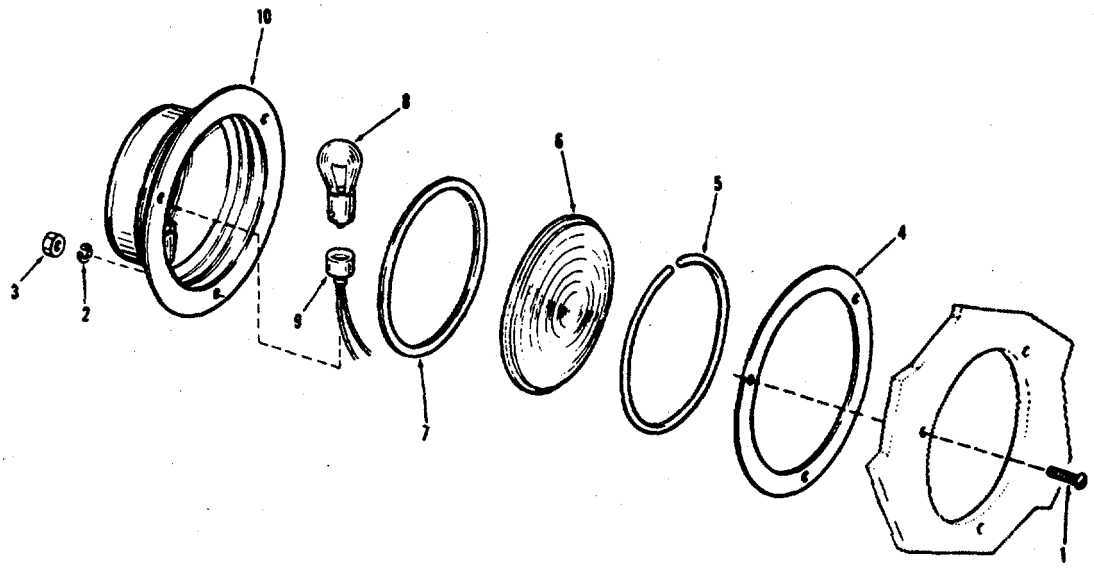


Figure 6-51. Rear Light Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			REAR LIGHT GROUP		
6-51-	No Number		REAR LIGHT GROUP	REF	
6-51-	14757		TAIL AND STOP LIGHT ASSEMBLY (75175 No KD766-ST12) (See figure 6-46 for NHA)	REF	
6-51-	14752		PINTLE LIGHT ASSEMBLY (75175 No KD766-C12) (See figure 6-46 for NHA)	REF	
			(ATTACHING PARTS)		
-1	01340B		SCREW, Machine, round head	3	
-2	0376-W		WASHER, Lock	3	
-3	0132-N		NUT, Plain, hexagon	3	
-4	14834		GASKET (75175 No 34627)	1	
-5	14835		RING, Retaining (75175 No 34626)	1	
-6	14837		LENS, Red (75175 No 3726) (used on P/N 14757 only)	1	
	14843		LENS, Clear (75175 No 3723) (used on P/N 14752 only)	1	
-7	14836		RING, Spacer (75175 No 34625)	1	
-8	14838		LAMP, Incandescent (75175 No 1521) (used on P/N 14757 only	1	
	14642		LAMP, Incandescent (75175 No 1504) (used on P/N 14752 only	1	
-9	14833		CONTACT ASSEMBLY (75175 No 88135) (used on P/N 14757 only)	1	
	14840		CONTACT ASSEMBLY (75175 No 9382) (used on P/N 14752 only)	1	
	14841		BASE ASSEMBLY (75175 No 34520) (used on P/N 14752 only)	1	
-10	14832		HOLDER ASSEMBLY (75175 No 88457) (used on P/N 14757 only)	1	
	14839		HOLDER ASSEMBLY (75175 No 88320) (used on P/N 14752 only)	1	
	1876-E		TERMINAL, Slide	1	

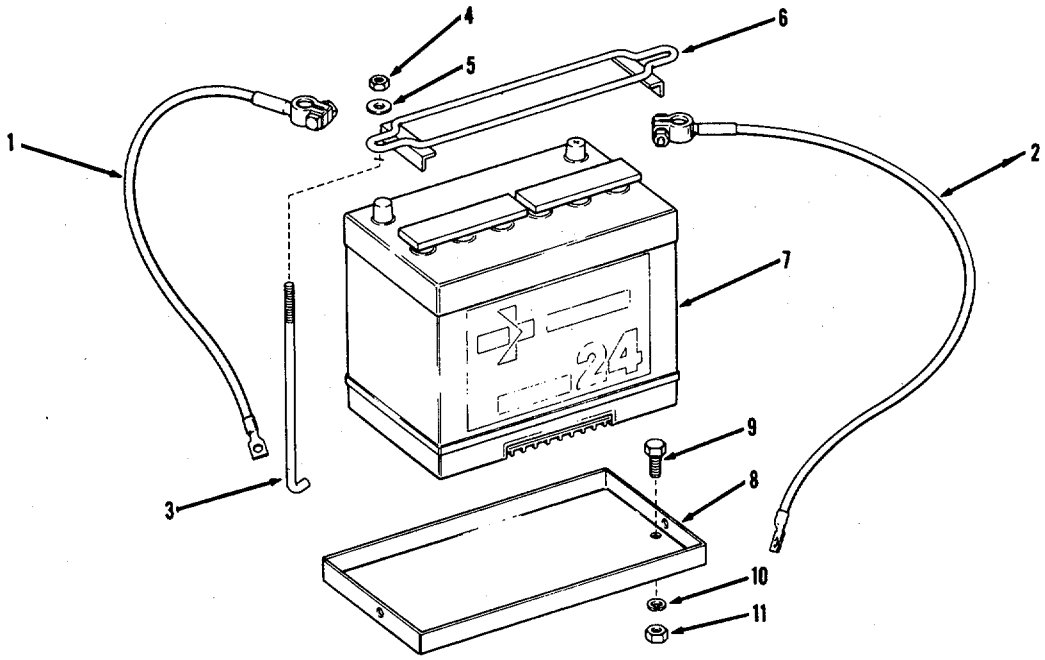


Figure 6-52. Battery Group

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
			BATTERY GROUP		
6-52-	No Number		BATTERY GROUP (See figure 6-1 for NHA).....	REF	
-1	22571		CABLE, Ground (79550 No 351-13).....	1	
-2	22964		CABLE, BATTERY	1	
-3	22821		J-BOLT.....	2	
			(ATTACHING PARTS)		
-4	0105-N		NUT, Plain, hex.....	2	
-5	0302-W		WASHER, Flat	2	
			---*---		
-6	F103934		HOLDDOWN, Battery.....	1	
-7	22786		BATTERY	1	
-8	22820		BASE, Battery.....	1	
			(ATTACHING PARTS)		
-9	0912-H		SCREW, Cap.....	3	
-10	0351-W		WASHER, Lock.....	3	
-11	0108-N		NUT, Plain, hex.....	3	
			---*---		

APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals and miscellaneous publications that are applicable to the end item.

A-2. FORMS

Accident Identification Card	DD Form 518
Equipment Daily or Monthly Log	DA Form 2408-1
Equipment Inspection and Maintenance Work Sheet	DA Form 2404
Maintenance Request	DA Form 2407
Quality Deficiency Report	SF 368
Recommended Changes to DA Publications	DA Form 2028-2
Vehicle Accident Report	SF 91

A-3. FIELD MANUALS

Basic Cold Weather Manual	FM 31-70
First Aid for Soldiers	FM 21-11
Manual for the Wheeled Vehicle Driver	FM 21-305
Northern Operations	FM 31-71
Operation and Maintenance of Materiel in cold weather (0 to -65 F)	FM 9-207

A-4. TECHNICAL MANUALS

Administrative Storage of Equipment	TM 740-90-1
The Army Maintenance Management System (TAMMS)	DA PAM 738-750
Consolidated Index of Army Publications and Blank Forms	DA PAM 25-30
Operator's, Organizational, Direct Support and General Support Maintenance Manual for Lead-Acid Storage Batteries	TM 9-6140-200-14
Painting Instructions for Field Use	TM 43-0139
Nuclear, Biological, and Chemical (NBC) Decontamination	FM 3-5
Preservation of USAMECOM Mechanical Equipment for Shipment and Storage	TM 740-97-2
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use	TM 750-244-6

A-5. MISCELLANEOUS PUBLICATIONS

Accident Reporting and Records	AR 385-40
Fueld, Lubricants, Oils and Waxes	C 9100 IL
Hand Portable Fire. Extinguishers Approved for Army Users	TB 5-4200-200-100
Preparation, Coordination and Approval of Department of the Army Publications	AR 310-3
Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling System	TB 750-651

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APPENDIX B

MAINTENANCE ALLOCATION CHART
SECTION I

INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for the performance of maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance categories.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. Maintenance functions. Maintenance functions will be limited to and defined as follows:

a. 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).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), preserve, drain, paint, or replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or adjusted on instruments or test, measuring and diagnostic equipments used in precision measurement. Consists of comparison 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.

g. 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 fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.

i. Repair. The application of maintenance services[1], including fault location/troubleshooting[2], removal/installation, and disassembly/assembly[3] procedures, and maintenance action[4] to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. 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 (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. 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 materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. Explanation of Columns in the MAC, Section II

a. Column 1, Group Number. Column 1 lists functional group code numbers, which identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00".

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

---

[1] Services - inspect, test, service, adjust, aline, calibrate, and/or replace.

[2] Fault locate/troubleshoot - 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).

[3] Disassemble/assemble - encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componency identified as maintenance significant (i.e., assigned an SMR code) for the category of maintenance under consideration.

[4] Actions - welding, grinding, riveting, straightening, facing, remachinery, and/or resurfacing.

c. Column 3, Maintenance Function. Column 3 lists the functions to be, performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. Column 4, Maintenance Category, Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform that maintenance function at the indicated category of maintenance. If the number of complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. 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/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

C..... Operator or crew

O..... Organizational maintenance

F ..... Direct Support Maintenance

H..... General Support Maintenance

e. Column 5, Tools and Equipment, Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III.

a. Column 1, Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. Column 2, Maintenance Category. The lowest category of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National Stock Number. The National stock number of the tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

B-5. Explanation of Columns in Remarks, Section IV

a. Column 1, Reference Code. The code recorded in column 6, Section II.

b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

MAINTENANCE ALLOCATION CHART FOR
NSN 3930-01-047-8722

SECTION III - TOOL AND TEST EQUIPMENT REQUIREMENTS				
TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
UNLESS OTHERWISE NOTES, ALL MAINTENANCE FUNCTIONS CAN BE ACCOMPLISHED WITH THE TOOLS CONTAINED IN THE FOLLOWING COMMON TOOL SETS.				
1.	O, F, H	TOOL KIT AUTO MAINT: ORG Maint Common #2	4910-00-754-0650	LIN W32730
2.	O, F, H	WRENCH, TORQUE3/4 in. Drive, 100-500 ft lb cap.	5120-00-542-5577	9033917(18876)
3.	F, H	SHOP EQUIP, FUEL & ELEC. SYSTEM ENGINE	4910-00-754-0714	T30414
4.	F, H	SHOP EQUIP, MACHINE SHOP	3740-00-754-0708	T16744
5.	F, H	TOOL KIT MACHINIST	5280-00-511-1950	W44512
6.	F, H	SHOP EQUIP, WELDING	3740-00-357-7268	T16714
7.	F, H	TOOL KIT BODY & FENDER REPAIR	5180-00-754-0643	W33680
8.	O, F, H	TOOL KIT MASTER MECH: EQUIP, MAINT. & REPAIR	5180-00-699-5273	LIN W 45960
9.	F, H	GAGE, HYDRAULIC PRESSURE From 0 to 3000 lbs	6685-00-983-8326	HO278M (38508)

MAINTENANCE ALLOCATION CHART FOR
NSN 3930-01-047-8722

SECTION II - ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
01	ENGINE								
0100	Engine Assembly	Inspection		0.3					
		Test		1.0					
		Service	0.3						
		Replace			8.0				
		Repair			6.0	12.0			
		Overhaul				28.0			
0101	Crank Case, Block, Cylinder Head								
	Block Assembly, Cylinder	Replace				8.0			
		Repair				12.0			
	Cylinder Head	Replace			3.0				
		Repair			3.0				
0102	Crankshaft								
	Crankshaft Assembly	Replace				12.0			
		Repair				12.0			
0103	Flywheel								
	Flywheel Assembly	Replace			1.0				
		Repair			1.0				
0104	Pistons and Connecting Rods	Replace		1.5					
0105	Valves, Camshafts and Timing System								
	Valves	Adjust			1.5				
		Replace			6.0				
		Repair			2.0				
	Camshaft Assembly	Replace				8.0			
		Repair				8.0			

MAINTENANCE ALLOCATION CHART FOR
NSN 3930-01-047-8722

SECTION II - ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0106	Engine Lubrication System								
	Oil Filter Breather	Service	0.1						
		Replace		0.1					
	Pan, Oil	Replace			1.0				
		Repair			1.0				
	Filter Oil	Replace		0.3					
		Service		0.3					
	Pump, Oil	Test			0.6				
		Replace			2.0				
		Repair			2.0				
	Crankcase Vent Line	Service	0.1						
		Replace		0.2					
0108	Manifolds	Replace		1.5					
03	FUEL SYSTEM								
0301	Carburetor								
	Carburetor Assembly	Adjust		0.3					
		Replace		1.0					
		Repair			2.0				
0302	Fuel Pump								
	Fuel Pump Assembly	Test		0.3					
		Replace		1.0					
		Repair		1.0					
	Fuel Filter	Service		0.3					
		Replace		0.5					
0304	Air Cleaner								
	Air Cleaner and Indicator	Inspect	0.1						
		Service		0.2					
		Replace		0.2					

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0306	Tanks, Lines and Fittings								
	Fuel Tank	Service	0.2						
		Replace		0.6					
		Repair				1.5			
	Fuel Lines	Replace		0.5					
		Repair		0.5					
0308	Engine Speed Governor and Controls								
	Governor	Adjust		0.2					
		Replace		0.5					
		Repair		0.5					
0312	Accelerator and Choke Controls								
	Accelerator Linkage	Adjust		0.3					
		Replace		0.5					
		Repair		0.5					
04	EXHAUST SYSTEM								
0401	Muffler and Pipes	Replace		1.0					
05	COOLING SYSTEM								
0501	Radiator	Test		0.3					
		Service	0.2						
		Replace		1.5					
		Repair				2.0			
0503	Water Manifold, Headers, Thermostats and Housing								
	Thermostats	Test		0.5					
		Replace		0.5					
	Hoses, Lines and Fittings	Inspection	0.1						
		Replace		0.5					
0504	Water Pump	Replace		0.5					
		Repair			1.5				

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0505	Fan Assembly								
	Fan Belts	Inspection	0.1						
		Adjust		0.2					
		Replace		0.5					
06	ELECTRICAL SYSTEM								
0601	Alternator	Test		0.5					
		Replace		0.5					
		Repair			2.0				
0602	Voltage Regulator	Test		0.5					
		Replace		0.3					
0603	Starting Motor								
	Relay Solenoid	Test		0.5					
		Replace		0.5					
	Starter	Test		0.5					
		Replace		0.5					
		Repair			1.5				
0605	Ignition Components								
	Distributor, Ignition	Adjust		0.2					
		Replace		0.5					
		Repair			1.0				
	Coil, Ignition	Test		0.2					
		Replace		0.3					
	Spark Plug	Adjust		0.3					
		Replace		0.4					
0607	Instrument Panel								
	Gages	Replace		0.6					
	Switches	Replace		0.6					
0609	Lights	Replace		0.4					
		Repair		0.4					

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0610	Sending Units and Warning Switches								
	Fuel, Oil, Temp, Hour, Vacuum Solenoid	Replace		0.4					
0611	Horn	Inspection	0.1						
		Replace		0.3					
0612	Batteries								
	Battery	Test		0.2					
		Service	0.2						
		Replace		0.3					
	Cables, Battery	Replace		0.3					
0613	Wiring Harness	Replace			2.5				
		Repair			0.5				
07	TRANSMISSION								
0705	Gear Shift Controls								
	Control Unit, Shift	Adjust		0.5					
		Replace			2.0				
		Repair			2.0				
0708	Torque Converter								
	Converter, Torque	Replace			1.0				
0710	Transmission Assembly	Test			1.0				
		Service	0.1	0.5					
		Replace			8.0				
		Repair			6.0	12.0			
0713	Intermediate Clutch								
	Clutch Pack	Replace			4.0				
		Repair			6.0				
0714	Servo Unit								
	Transmission Actuator Front and Rear	Replace			2.0				

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0721	Coolers, Pumps, and Motors								
	Regulator, Transmission	Replace		0.4					
		Repair		0.5					
	Filter, Oil	Replace	0.5						
		Service	0.5						
08	TRANSFER AND FINAL DRIVE ASSEMBLIES								
0801	Transfer Case	Service	0.5						
		Replace		2.0					
		Repair			2.0				
09	PROPELLER AND PROPELLER SHAFTS								
0900	Propeller Shafts								
	Shaft Assembly, Propeller	Service	0.2						
		Replace		0.5	2.0				
		Repair			2.0				
10	FRONT AXLE								
1004	Steering and Leaning Wheel Mechanism								
	Axle Assembly, Front	Service	0.3						
		Replace		4.0					
		Repair		4.0					
11	REAR AXLE								
1100	Rear Axle Assembly								
	Axle Assembly	Replace		2.0					
		Repair		1.0					
1102	Differential								
	Carrier Assembly	Service	0.2						
		Replace		4.0					
		Repair			4.0				

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12	BRAKES								
1201	Hand Brakes								
	Lever, Parking Brake	Test	0.1						
		Adjust		0.5					
		Replace		0.5					
		Repair		1.0					
1202	Service Brake								
	Brake Assembly, Front and Rear	Inspection		0.5					
		Adjust		0.5					
		Replace			2.5				
		Repair			1.0				
1204	Hydraulic Brake System								
	Cylinder Assembly, Front and Rear	Inspection		0.1					
		Replace			0.5				
		Repair			0.4				
	Master Cylinder	Service		0.1					
		Replace		1.0					
		Repair			1.0				
	Brake Lines	Inspection	0.1						
		Replace		1.0					
13	WHEELS								
1311	Wheel Assemblies	Replace		0.5					
1313	Tires and Tubes	Inspection	0.2						
		Service	0.1						
		Replace		1.0					
		Repair		0.5					
14	STEERING								
1407	Power Steering Gear Assembly								

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1407 (contd)	Gear Assembly, Steering	Adjust		0.2					
		Replace			4.0				
		Repair			2.0				
	Drag Link, Tie Rods	Service		0.1					
		Adjust			1.0				
		Replace			2.0				
		Repair			1.0				
	Steering Column	Replace			2.0				
		Repair			1.0				
15	FRAME AND TOWING ATTACHMENTS								
1502	Counterweights	Replace		0.5					
1503	Pintles and Towing Attachments	Service		0.1					
		Replace		0.5					
		Repair		0.3					
16	SPRINGS								
1601	Springs, Front and Rear	Replace			2.0				
		Repair			1.0				
18	BODY, CAB, HOOD, AND HULL								
1806	Upholstery Seats and Carpets								
	Frame, Seat	Adjust	0.1						
		Replace		0.5					
		Repair		0.5					
22	BODY AND CHASSIS ACCESSORY								
2210	Data Plates and Instruction Holders								

MAINTENANCE ALLOCATION CHART FOR	
SECTION IV - REMARKS	
REFERENCE CODES	**REMARKS**
	(NO REMARKS)

ALPHABETICAL INDEX

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches

1 Meter = 100 Centimeters = 1,000 Millimeters = 39.37 Inches

1 Kilometer = 1,000 Meters = 0.621 Miles

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches

1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet

1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1,000 Cu Millimeters = 0.06 Cu Inches

1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces

1 Liter = 1,000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE

5/9 (°F -32) = °C

212° Fahrenheit is equivalent to 100° Celsius

90° Fahrenheit is equivalent to 32.2° Celsius

32° Fahrenheit is equivalent to 0° Celsius

9/5 C° +32 = F°

WEIGHTS

1 Gram = 0.001 Kilograms = 1,000 Milligrams = 0.035 Ounces

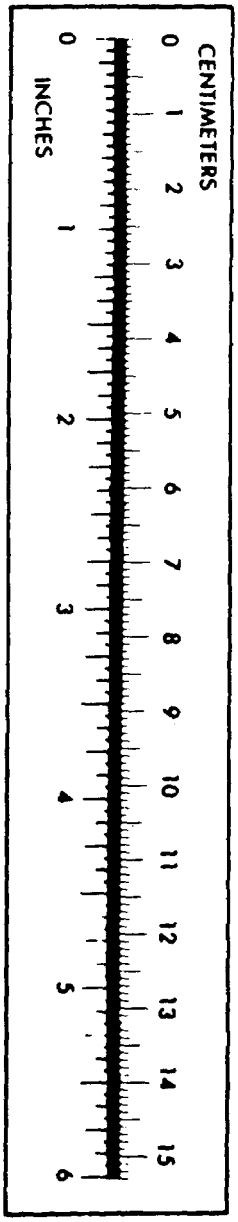
1 Kilogram = 1,000 Grams = 2.2 Lb.

1 Metric Ton = 1,000 Kilograms = 1 Megagram = 1.1 Short Tons

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds Per Square Inch	Kilopascals	6.895
Miles Per Gallon	Kilometers Per Liter	0.425
Miles Per Hour	Kilometers Per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621



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