

TECHNICAL MANUAL
OPERATION AND MAINTENANCE

AIRCRAFT TOWING TRACTOR

TYPE MB-4

MODELS G-40-E, G-40-F, G-40-G

THE AMERICAN-COLEMAN COMPANY

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REMOVAL AND INSTALLATION OF ASSEMBLIES

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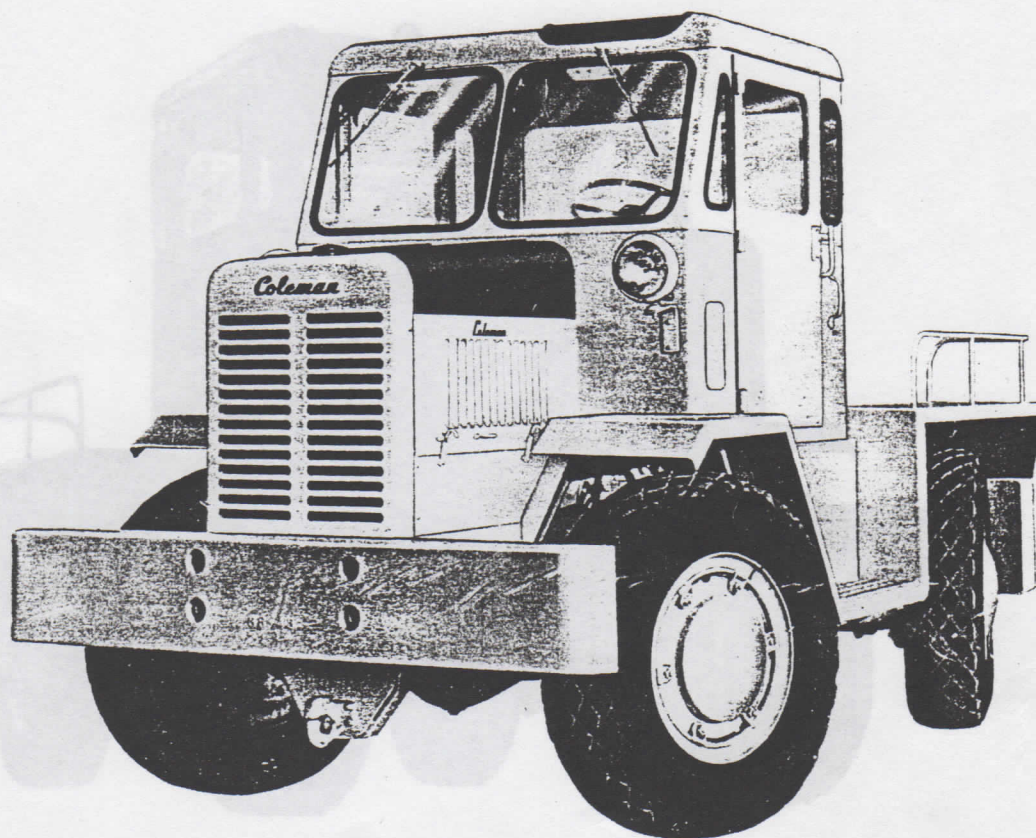
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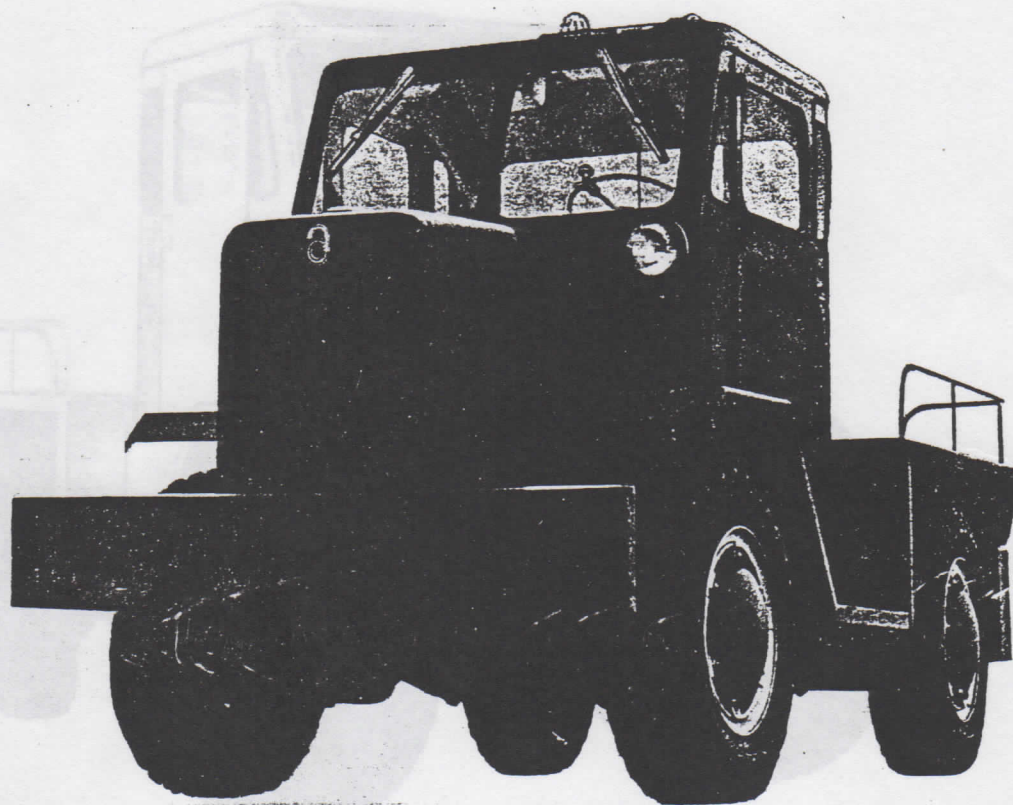
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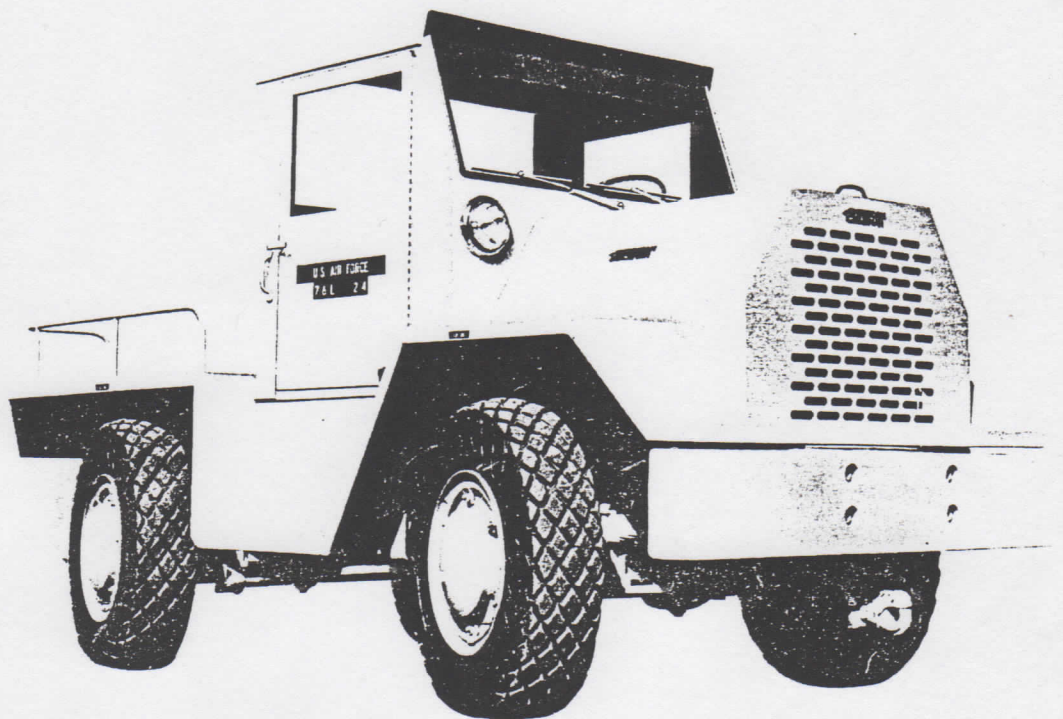
Model G-40-E

Figure 1. Aircraft Towing Tractor, USAF Type MB-4 (Sheet 1 of 3).



Model G-40-F

Figure 1. Aircraft Towing Tractor, USAF Type MB-4 (Sheet 2 of 3).



Model G-40-G

Figure 1. Aircraft Towing Tractor, USAF Type MB-4 (Sheet 3 of 3).

SECTION I

DESCRIPTION

1-1. INTRODUCTION.

1-2. This manual contains operating and maintenance instructions for USAF Type MB-4 Aircraft Towing Tractors (figure 1), Models G-40-E, G-40-F, and G-40-G, manufactured by The American-Coleman Company, Littleton, Colorado 80160. The tractor model numbers, and their registration numbers, covered by this manual are listed in table 1-1.

1-3. Other publications required to complete this manual are:

a. T.O. 00-20B-5: Vehicle and Base Support Equipment Inspection and Maintenance System and Records Administration.

b. T.O. 36-1-23: Serviceability Standards for USAF Vehicles.

c. T.O. 36A10-3-23-3: Overhaul Instructions.

d. T.O. 36A10-3-23-4: Illustrated Parts Breakdown.

1-4. PURPOSE OF EQUIPMENT.

1-5. The USAF Type MB-4 Aircraft Towing Tractor is a full-time 4-wheel drive, 4-wheel steer tractor designed primarily to tow and push aircraft weighing up to 140,000 pounds gross weight.

1-6. GENERAL DESCRIPTION.

1-7. The tractor (figure 1-1) has an enclosed all-weather cab and is powered by a V-8 gasoline engine. All controls and indicators required for tractor operation are located in the cab. Power is transmitted to steerable front and rear driving axles through a four-speed automatic transmission

and a transfer case. The tractor has a 12-volt electrical system radio suppressed in accordance with MIL-STD-461, Class D3 for nontactical vehicles.

1-8. COMPONENT DESCRIPTION.

1-9. ENGINE. The engine is an industrial type four cycle V-8 with overhead valves. Engine speed is controlled by an accelerator pedal on the floor of the cab to the right of the steering column and brake pedal. The maximum speed of the engine is regulated by a velocity governor on the engine intake manifold below the carburetor. The engine used on the G-40-E has a breaker type ignition system. The engine used on the G-40-F and G-40-G tractors has an electronic type ignition system. The engine is started by an electric starting motor located on the engine flywheel housing and actuated by an ignition switch on the instrument panel. The engine is liquid cooled and lubricated by an integral pressure lubrication system. Emissions are controlled by a positive crankcase ventilation system.

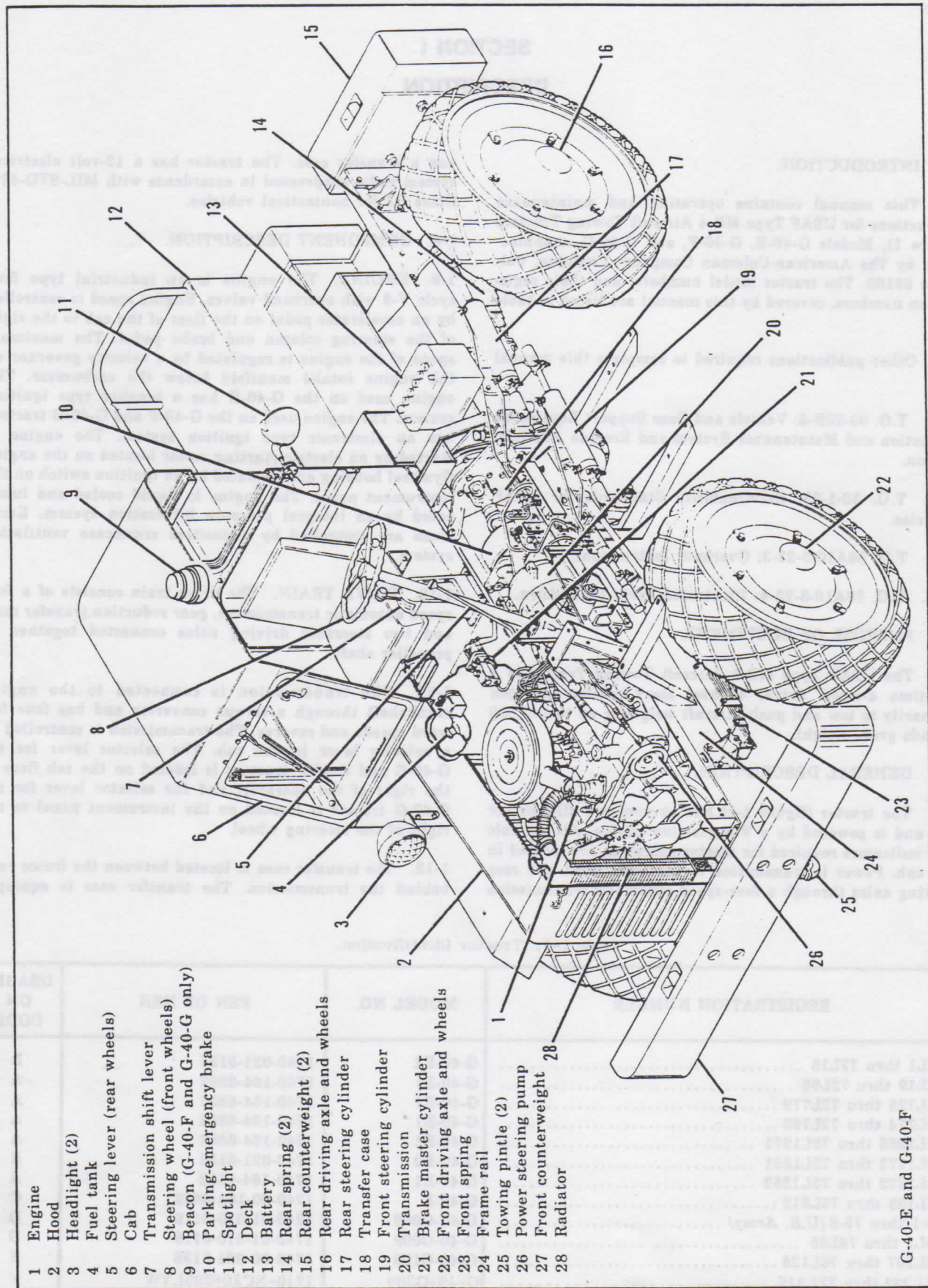
1-10. DRIVE TRAIN. The drive train consists of a four speed automatic transmission, gear reduction transfer case, and two steerable driving axles connected together by propeller shafts.

1-11. The transmission is connected to the engine crankshaft through a torque converter and has four forward speeds and reverse. The transmission is controlled by a selector lever in the cab. The selector lever for the G-40-E and G-40-F tractors is located on the cab floor to the right of the operator, and the selector lever for the G-40-G tractor is located on the instrument panel to the right of the steering wheel.

1-12. The transfer case is located between the frame rails behind the transmission. The transfer case is equipped

Table 1-1. Tractor Identification.

REGISTRATION NUMBER	MODEL NO.	FSN OR NSN	USABLE ON CODE
72L1 thru 72L18	G-40-E2	1740-021-5138	B
72L19 thru 72L60	G-40-E1	1740-164-6852	A
72L723 thru 72L772	G-40-E1	1740-164-6852	A
72L774 thru 72L798	G-40-E1	1740-164-6852	A
73L1255 thru 73L1271	G-40-E1	1740-164-6852	A
73L1272 thru 73L1331	G-40-E2	1740-021-5138	B
73L1332 thru 73L1352	G-40-E1	1740-164-6852	A
75L183 thru 75L312	G-40-F	1740-00-164-6852	C
75-1 thru 75-6 (U.S. Army)	G-40-G009	1740-01-010-0119	D
76L1 thru 76L85	G-40-G009	1740-01-010-0119	D
76L107 thru 76L125	G-40-G109	1740-00-021-5138	E
77L333 thru 77L345	G-40-G309	1710-NC108295LYW	F



G-40-E and G-40-F

Figure 1-1. Aircraft Towing Tractor (Sheet 1 of 2)

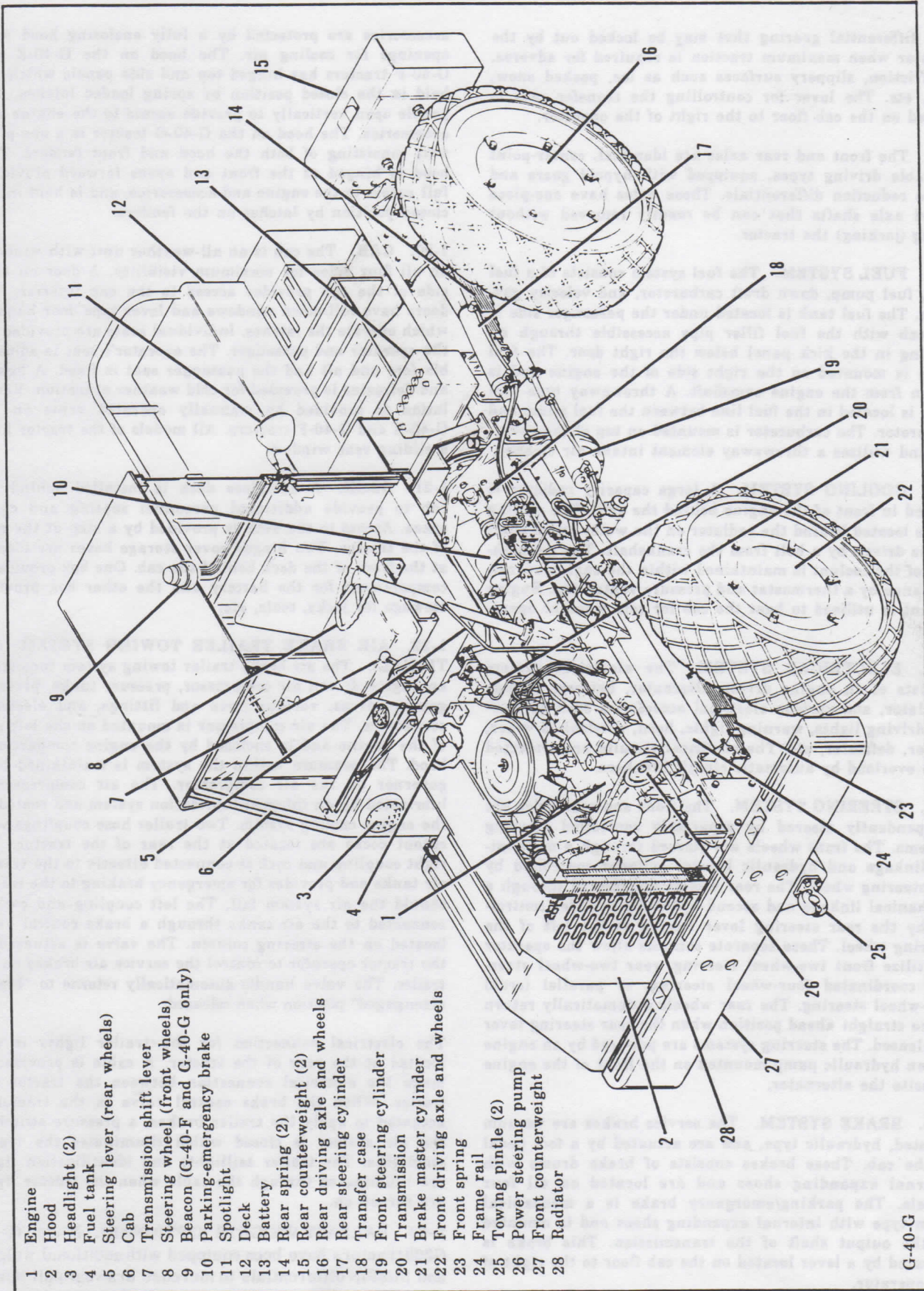


Figure 1-1. Aircraft Towing Tractor (Sheet 2 of 2)

with differential gearing that may be locked out by the operator when maximum traction is required for adverse, low friction, slippery surfaces such as ice, packed snow, sand, etc. The lever for controlling the transfer case is located on the cab floor to the right of the operator.

1-13. The front and rear axles are identical, center-point steerable driving types, equipped with hypoid gears and single reduction differentials. These axles have one-piece forged axle shafts that can be readily removed without lifting (jacking) the tractor.

1-14. **FUEL SYSTEM.** The fuel system consists of a fuel tank, fuel pump, down draft carburetor, and velocity governor. The fuel tank is located under the passenger side of the cab with the fuel filler pipe accessible through an opening in the kick panel below the right door. The fuel pump is mounted on the right side of the engine and is driven from the engine camshaft. A throwaway type fuel filter is located in the fuel line between the fuel pump and carburetor. The carburetor is mounted on top of the governor and utilizes a throwaway element intake air cleaner.

1-15. **COOLING SYSTEM.** A large capacity radiator is located in front of the engine behind the grill. The cooling fan is located behind the radiator on the water pump shaft and is driven by a belt from the crankshaft. The temperature of the coolant is maintained within the engine operating range by a thermostat and pressure vented cap. Engine coolant is utilized to heat the cab for cold weather operation.

1-16. **ELECTRICAL SYSTEM.** The electrical system consists of an engine driven alternator, battery, voltage regulator, and various electrical accessories such as starter, driving lights, warning lights, horn, windshield wiper, heater, defroster, etc. The electrical circuits are protected from overload by automatic circuit breakers.

1-17. **STEERING SYSTEM.** The front and rear axles are independently steered by separately controlled steering systems. The front wheels are steered through a mechanical linkage and hydraulic booster cylinder controlled by the steering wheel. The rear wheels are steered through a mechanical linkage and second hydraulic cylinder controlled by the rear steering lever located to the left of the steering wheel. These separate controls allow the operator to utilize front two-wheel steering, rear two-wheel steering, coordinated four-wheel steering, or parallel (crab) four-wheel steering. The rear wheels automatically return to the straight ahead position when the rear steering lever is released. The steering systems are powered by an engine driven hydraulic pump mounted on the front of the engine opposite the alternator.

1-18. **BRAKE SYSTEM.** The service brakes are vacuum assisted, hydraulic type, and are actuated by a foot pedal in the cab. These brakes consists of brake drums with internal expanding shoes and are located on all four wheels. The parking/emergency brake is a mechanical drum type with internal expanding shoes and is mounted on the output shaft of the transmission. This brake is actuated by a lever located on the cab floor to the right of the operator.

1-19. **ENGINE COMPARTMENT HOOD.** The engine and

accessories are protected by a fully enclosing hood with openings for cooling air. The hood on the G-40-E and G-40-F tractors has hinged top and side panels which are held in the closed position by spring loaded latches. The panels open vertically to provide access to the engine and accessories. The hood on the G-40-G tractor is a one-piece unit consisting of both the hood and front fenders. This hood is hinged at the front and opens forward providing full access to the engine and accessories, and is held in the closed position by latches on the fenders.

1-20. **CAB.** The cab is an all-weather unit with windows on all four sides for maximum visibility. A door on each side of the cab provides access to the cab interior. The doors have roll-down windows and lever type door handles which operate the latches. Individual seats are provided for the operator and passenger. The operator's seat is adjustable fore and aft and the passenger seat is fixed. A heater and defroster is provided for cold weather operation. Ventilation is provided by manually operated vents on the G-40-E and G-40-F tractors. All models of the tractor have a sliding rear window.

1-21. **DECK.** A one-piece deck is installed behind the cab to provide additional personnel seating and cargo space. Access to the deck is provided by a step at the rear of the tractor. Two hinged cover storage boxes are located at the front of the deck behind the cab. One box provides a compartment for the battery and the other box provides stowage for jacks, tools, etc.

1-22. **AIR BRAKE TRAILER TOWING SYSTEM (OPTIONAL).** The air brake trailer towing system consists of an engine driven air compressor, pressure tanks, pressure gauge, valves, various lines and fittings, and electrical connectors. The air compressor is mounted on the left side of the engine and is enclosed by the engine compartment hood. The pressure within the system is maintained by a governor on the air compressor. The air compressor is lubricated by an integral lubrication system and cooled by the engine cooling system. Two trailer hose couplings with cutout cocks are located at the rear of the tractor. The right coupling and cock is connected directly to the tractor air tanks and provides for emergency braking to the trailer should the air system fail. The left coupling and cock is connected to the air tanks through a brake control valve located on the steering column. The valve is actuated by the tractor operator to control the service air brakes on the trailer. The valve handle automatically returns to "brakes disengaged" position when released.

The electrical connection for the trailer lights is also located at the rear of the tractor. A cable is provided to make the electrical connection between the tractor and trailer. When the brake control valve in the tractor is actuated to apply the trailer brakes, a pressure switch in the air system is closed which illuminates the trailer stoplights. The trailer taillights and identification lights are illuminated through the cable when the tractor lights are turned on.

1-23. **BALLAST WEIGHTS (OPTIONAL).** Model G-40-G309 tractors have been equipped with additional weights and NoSPIN differentials to increase drawbar pull during adverse weather conditions. The weights are secured to the underside of the front and rear axles and may be re-

moved during summer operation to reduce fuel consumption and tire wear. The gear ratio of the differentials has been changed for increased drawbar pull and improved throttle modulation.

1-24. DIFFERENCES BETWEEN MODELS G-40-E, G-40-F, AND G-40-G. The basic differences between the aircraft towing tractors described in this manual are:

a. The G-40-G tractor has a restyled cab and hood providing improved operator visibility and comfort.

b. The G-40-F and G-40-G tractors have factory installed warning beacons.

c. The G-40-G tractor has an improved steering system with the most noticeable feature being the change in the rear steering lever.

d. The instrument panel on the G-40-G tractor has been restyled with some repositioning of the instruments and the addition of instruction plates.

e. The transmission shift lever on the G-40-G tractor has been moved from the floor to the instrument panel.

f. The ignition system on the G-40-E tractor is of the breaker type and the ignition system on the G-40-F and G-40-G tractors is of the electronic type (no points) including a separate control module.

SECTION II

TABLE OF SPECIFICATIONS

2-1. GENERAL.

Type of vehicle	Aircraft towing tractor
USAF type designation	MB-4
Manufacturers model designation	G-40-E, G-40-F, G-40-G
Gross weight	10,700 lbs (18,000 lbs, G-40-G309)
Overall length	161.5 in. (G-40-E, G-40-F) 166.5 in. (G-40-G)
Overall width	79.5 in. (G-40-E, G-40-F) 78.5 in. (G-40-G)
Overall height	
Top of cab	97.0 in. (G-40-E, G-40-F) 94.5 in. (G-40-G)
Top of beacon	103.0 in. (G-40-F) 100.5 in. (G-40-G)
Ground clearance	
Front axle	12.0 in. (8.0 in., G-40-G309)
Rear axle	12.0 in. (8.0 in., G-40-G309)
Wheel base	90.0 in.
Tread	64.0 in.
Drawbar pull	10,000 lbs
Hitch height	14.0 in.
Travel speeds (maximum governed)	
First	7 mph (6 mph, G-40-G309)
Second	11 mph (10 mph, G-40-G309)
Third	17 mph (15 mph, G-40-G309)
Drive	24 mph (21 mph, G-40-G309)
Reverse	5 mph (4.5 mph, G-40-G309)
Turning circle (maximum)	
Four-wheel steering	30 ft
Two-wheel steering	41 ft

2-2. ENGINE.

Type	V-8
Manufacturer	Chrysler
Model number	LH-318 (G-40-E, G-40-F) I-318 (G-40-G)
Fuel	Gasoline, regular grade (90 octane)
Horsepower	140 hp at 3,700 rpm
Net torque	220 ft lbs at 2,400 rpm
Curb idle speed	700 rpm
Fast idle speed	1,600 rpm
Governed speed	3,700 rpm
Number of cylinders	8
Bore	3.91 in.
Stroke	3.312 in.
Displacement	318 cu in.
Compression ratio	8.25 to 1 (G-40-E, G-40-F) 8.6 to 1 (G-40-G)
Cylinder numbering	
Left bank	1-3-5-7
Right bank	2-4-6-8
Firing order	1-8-4-3-6-5-7-2

2-3. ENGINE LUBRICATING SYSTEM.

Type	Full pressure
Oil capacity (with filter)	5 quarts
Oil filter	
Location	Right rear engine block
Type	Throwaway
Manufacturer	Commercial
Oil pump	
Location	Engine sump
Type	Rotary
Drive	From camshaft
Pressure	45-65 psi at 1,000 rpm
Manufacturer	Chrysler

2-4. DRIVE TRAIN.

Torque converter	
Location	Flywheel housing
Manufacturer	Allison
Transmission	
Location	Behind engine
Type	Hydraulic
Oil capacity	17 quarts
Gear ratios	
Neutral	0
First	3.45 to 1
Second	2.25 to 1
Third	1.41 to 1
Drive	1 to 1
Reverse	5.02 to 1
Drive range and sequence	Reverse, neutral, 1-2-3-D, 1-2-3, 1-2, 1
Manufacturer	Allison
Model number	AT-540
Transfer case	
Location	Behind transmission
Oil capacity	6 pints
Gear ratio	2.6 to 1
Manufacturer	American-Coleman
Axles (two)	
Differential gear	
ratio	6.285 to 1 (G-40-E, G-40-F) 6.166 to 1 (G-40-G) 7.17 to 1 (G-40-G309)
Oil capacity	11 pints
Manufacturer	American-Coleman
Tires	
Size	11:00-20
Ply rating	8
Tread pattern	Diamond (all weather)
Manufacturer	Commercial

2-5. FUEL SYSTEM.

Fuel	Gasoline
Fuel grade	Regular (90 octane)
Fuel tank	
Location	Right side under cab
Capacity	20 gallons

Radiator cap	
Location	Top of radiator
Type	Pressure vented, 7 psi
Manufacturer	Commercial
Drain cock	
Location	Bottom of radiator
Type	Screw stem
Manufacturer	Commercial
Thermostat	
Location	Top of engine behind fan
Rating	180° F
Manufacturer	Commercial
Water pump	
Location	Front of engine behind fan
Type	Rotary
Manufacturer	Chrysler

2-8. EMISSION CONTROL SYSTEM.

Crankcase breather
 Location Right rocker arm cover
 Manufacturer Chrysler

Positive crankcase ventilation valve
 Location Left rocker arm cover
 Manufacturer Chrysler

2-9. ELECTRICAL SYSTEM.

Battery	
Location	Behind cab
Type	Wet cell
Voltage	12
Ground	Negative
Capacity	200 ampere hours
Manufacturer	Commercial
Alternator	
Location	Right front engine block
Rotation	Clockwise (at drive end)
Rating	41 ampere
Manufacturer	Chrysler
Voltage regulator	
Location	Firewall
Manufacturer	Chrysler
Starting motor	
Location	Left rear engine block
Cranking current draw	165 to 180 amperes (with engine at operating temperature)
Manufacturer	Chrysler
Starting relay	
Location	Firewall
Type	Armature
Manufacturer	Chrysler
Heater-defroster	
Location	Right side of cab
Type	Hot water
Blower	Electric
Manufacturer	Hupp (G-40-E, G-40-F) Evans (G-40-G)
Windshield wiper	
Motor location	Top of windshield (G-40-E, G-40-F) Behind instrument panel (G-40-G)
Manufacturer	American-Bosch

Headlight
 Location Front of cab
 Type Sealed beam
 Lamp number Guide 6012 or equal
 Manufacturer Commercial
 Factory installed beacon (G-40-F, G-40-G)
 Location Top of cab, outside
 Manufacturer Commercial
 Dome light (G-40-G)
 Location Top of cab, inside
 Lamp number 1141
 Manufacturer Arrow
 Spotlight
 Location Rear of cab below rear window
 Manufacturer Unity
 Instrument panel lamp numbers
 Illuminating 53
 Air pressure warning light (optional) 1891
 Air pressure gauge (optional) 57
 Temperature indicator 96196
 Heater switch (G-40-E, G-40-F) 53
 Stoplight-taillight
 Location Left rear of tractor
 Lamp number 1599
 Manufacturer K.D. Lamp
 Floodlight
 Location Right rear of tractor
 Lamp number 4411
 Manufacturer K.D. Lamp

2-10. STEERING HYDRAULIC SYSTEM.

Pump
 Location Left front engine block
 Type Rotary
 Manufacturer Ross (G-40-E, G-40-F)
 Saginaw (G-40-G)
 Steering gear
 Location End of steering column
 Manufacturer Ross (G-40-E, G-40-F)
 Saginaw (G-40-G)
 Steering cylinders (two)
 Location Left frame rail
 Manufacturer Garrison
 Cam and valve assembly
 Location Left frame rail
 Manufacturer American-Coleman
 Drag link and valve assembly
 Location Left frame rail
 Manufacturer American-Coleman

2-11. BRAKE SYSTEM.

Service brakes
 Location All four wheels
 Type Hydraulic
 Manufacturer American-Coleman

Parking-emergency brake
 Location Rear of transmission
 Type Mechanical
 Manufacturer Bendix
 Master cylinder
 Location Firewall
 Manufacturer Wagner
 Wheel cylinders
 Location All four wheels
 Manufacturer Wagner
 Vacuum booster
 Location Inside left frame rail
 Manufacturer Bendix

2-12. AIR BRAKE TRAILER TOWING SYSTEM (OPTIONAL).

Operating pressure 90 to 105 psi
 Air compressor
 Location Left side of engine
 Type Two cylinder, reciprocating
 Capacity 12 cu ft per minute
 Speed 3,000 rpm (maximum)
 Bore 2.5 in.
 Stroke 1.687 in.
 Manufacturer Bendix
 Model number Tu-Flo 500
 Governor
 Location Air compressor
 Loading pressure setting 90 psi
 Unloading pressure setting 105 psi
 Manufacturer Bendix
 Air tanks (two)
 Location Right side of tractor under cab
 Capacity 750 cu in.
 Manufacturer Bendix
 Auxiliary brake valve
 Location Steering column
 Manufacturer Bendix
 Pressure switch
 Location Firewall
 Pressure setting 54 to 66 psi
 Manufacturer Bendix
 Brake switch
 Location Firewall
 Manufacturer Bendix
 Pressure relief valve
 Location Air tank
 Pressure setting 150 psi
 Manufacturer Bendix
 Drain cock (two)
 Location Air tanks
 Manufacturer Bendix
 Quick disconnect coupling (two)
 Location Rear of tractor
 Manufacturer Bendix
 Cutout cock (two)
 Location Rear of tractor
 Manufacturer Bendix

SECTION III

SPECIAL TOOLS AND TEST EQUIPMENT

No special tools or test equipment are supplied or required for minor maintenance of these tractors.

SECTION IV

PREPARATION FOR USE

4-1. GENERAL.

4-2. The tractor is given a complete operations; inspection before shipment. The radiator is filled with a half-and-half mixture of ethylene glycol and water, the fuel is drained, the tires are overinflated, and the battery is disconnected. Upon receipt, perform a visual inspection of the tractor for items lost or damaged during transit.

WARNING

Tractor weight is nearly 5.5 tons (9 tons for G-40-G309). Make sure that a crane of sufficient capacity is used to lift the tractor.

4-3. Unload the tractor using a lifting sling as shown in figure 4-1. The tractor is not equipped with lifting eyes for crane and cable lifting so it will be necessary to use spreader bars to prevent damage to the tractor.

4-4. PREPARATION FOR USE.

4-5. INSPECTION AND LUBRICATION. Inspect and lubricate the tractor as follows:

a. Perform an inspection of the tractor as outlined in T.O. 36-1-23.

b. Perform required lubrication as described in section VI of this technical order.

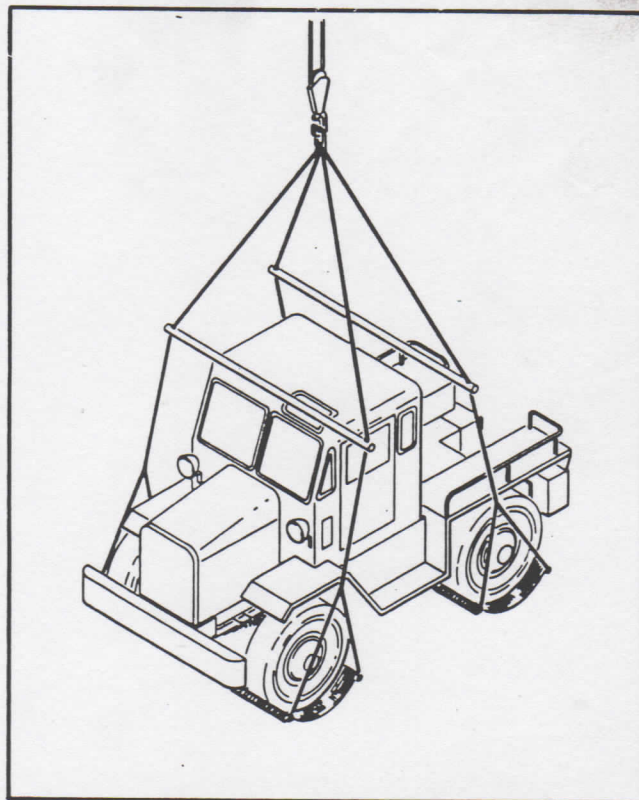


Figure 4-1. Crane Lifting Method

SECTION V

OPERATION

5-1. INTRODUCTION.

5-2. This section contains operating instructions for the USAF Type MB-4 Aircraft Towing Tractor. In addition, a discussion of principles of operation for certain systems is given to aid in understanding tractor operation.

5-3. PRINCIPLES OF OPERATION.

5-4. The operating principles and basic fundamentals with which the operator should be familiar have been omitted. Operating procedures of the more complicated systems and components are explained in the following paragraphs.

5-5. **FUEL SYSTEM.** Fuel is drawn from the side mounted fuel tank and delivered to the carburetor by an engine driven fuel pump. The fuel-air mixture delivered to the engine passes through a velocity governor which gradually restricts the flow of the fuel-air mixture as engine rpm approaches the upper limit of the governor setting. The governor is installed below a twin barrel downdraft carburetor. The carburetor used on the G-40-E tractor has a manual choke and the carburetor used on the G-40-F and G-40-G tractors have automatic chokes. An in-line fuel filter removes sediment and other foreign material from the gasoline before it reaches the carburetor.

5-6. **ELECTRICAL SYSTEM.** The electrical system consists of a 12 volt battery (14, figure 5-1) which is kept charged by an engine driven alternator (18). Charging rate and current flow is controlled by a voltage regulator (4). A key operated ignition switch on the instrument panel (6) controls all circuits, except for horn and lights, actuates the starting motor (17), and provides for accessory operation without engine operation. All circuits are protected by automatic circuit breakers which open the circuit when an overload condition occurs and close the circuit when the overload condition ceases. Headlights (1), dome light (8), beacon (9), spotlight (10), floodlight (11), stoplight-tailight (12), instrument panel lights, and transmission shift lever lamp are provided for night operation. Windshield wipers (7) are provided for operation in inclement weather and a heater-defroster is provided for operation in cold weather. The electrical system is radio suppressed in accordance with MIL-STD-461, Class D3.

5-7. **STEERING SYSTEM.** The steering system contains two separate steering systems each controlled by its own steering device. The front wheels are steered by the steering wheel (4, figure 5-2) with power assist provided by the front steering cylinder (7). The rear wheels are steered by the rear steering lever (1) with power assist provided by the rear steering cylinder (6). Power is provided by an engine driven pump (10) mounted on the engine. The pump delivers oil under pressure to the front drag link and valve assembly (8) and rear valve and cam assembly (5). The

G-40-E and G-40-F tractors have a flow control valve (2) installed to regulate oil flow, and the pump used on the G-40-G tractor has an integral flow control valve. When the steering wheel is turned, it moves the pitman arm on the steering gear (11) which displaces the spool of the control valve in the drag link and valve assembly (8) from its neutral (centered) position. This action directs oil to the front steering cylinder (7) which moves the front wheels through the drag link (9). When the front wheels have reached the position determined by the steering wheel, the spool of the control valve is returned to its neutral position equalizing the pressure in the steering cylinder to stop wheel movement. The tractor can be steered without hydraulic assist should the engine stop or the hydraulic system fail.

Moving the rear steering lever (1) displaces the spool of the control valve in the cam and valve assembly (5) which directs oil to the rear steering cylinder (6). When the rear wheels have reached the position determined by the rear steering lever, the rear steering linkage moves a cam which positions the spool of the control valve to its neutral position equalizing the pressure in the steering cylinder to stop wheel movement. When the rear steering lever is released, it will return to the neutral (straight ahead) position.

The hydraulic system is completely closed and once the hydraulic oil has been through the system, it is returned to the pump for recirculation. Since the pump can maintain a pressure that may exceed the system requirements, an integral relief valve allows excess oil to circulate within the pump until it is needed.

5-8. **BRAKE SYSTEM.** The brake system consists of a conventional hydraulic master cylinder (5, figure 5-3) and hydraulic wheel cylinders (2, 3, 6, and 7). However, instead of the master cylinder being connected directly to the wheel cylinders, it is connected to a vacuum booster (4). The vacuum booster has a large chamber separated by a sliding piston. One side of the chamber is connected to the engine intake manifold for a vacuum source and the other side of the chamber is open to the atmosphere through an air valve. When the brake pedal is pushed, the pressure generated in the master cylinder operates the air valve to let air into the pressure side of the booster chamber. This pressure differential created by atmospheric pressure on one side and vacuum on the other causes the piston to move towards the vacuum side. The piston is connected to a second master cylinder on the booster chamber which provides pressure to the wheel cylinders to operate the brakes. The piston is spring loaded towards the pressure side and releasing the brake pedal decreases the pressure on the pressure side which causes the piston to return to the center or neutral position.

5-9. **AIR BRAKE TRAILER TOWING SYSTEM (OPTIONAL).** The optional trailer air brake system is provided for towing trailers with air brakes. The system

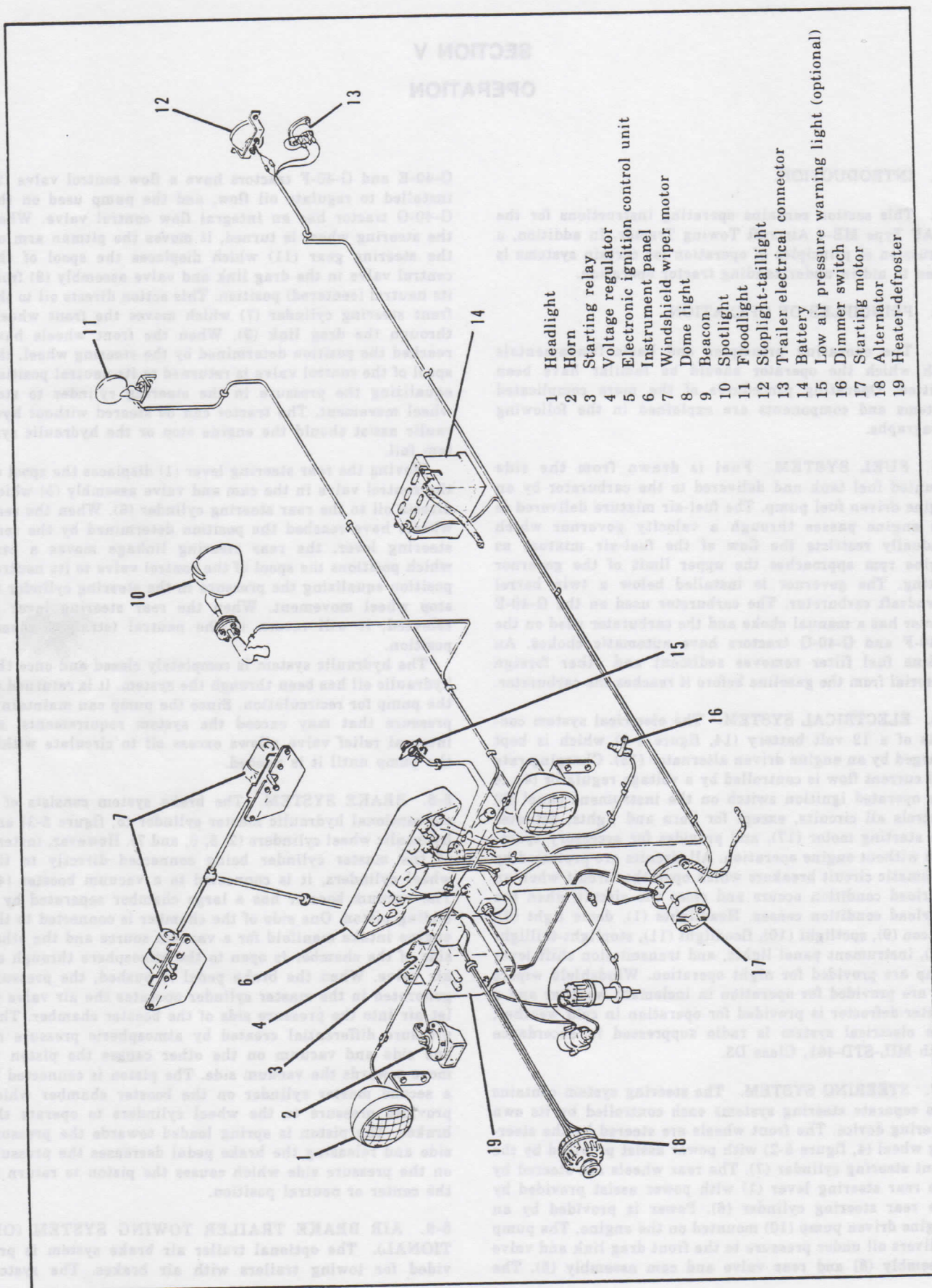


Figure 5-1. G-40-E Electrical System (Sheet 1 of 3)

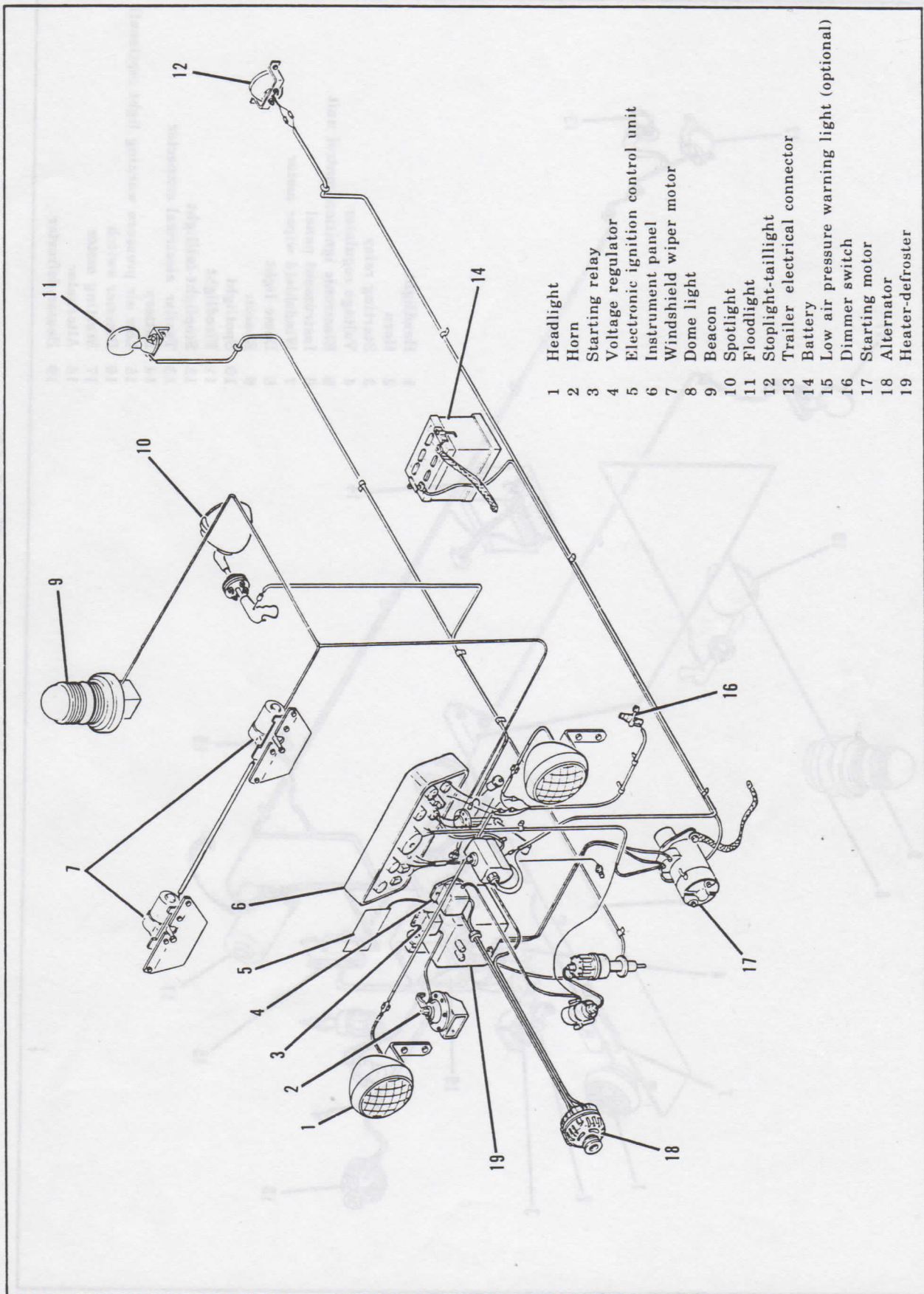


Figure 5-1. G-40-F Electrical System (Sheet 2 of 3)

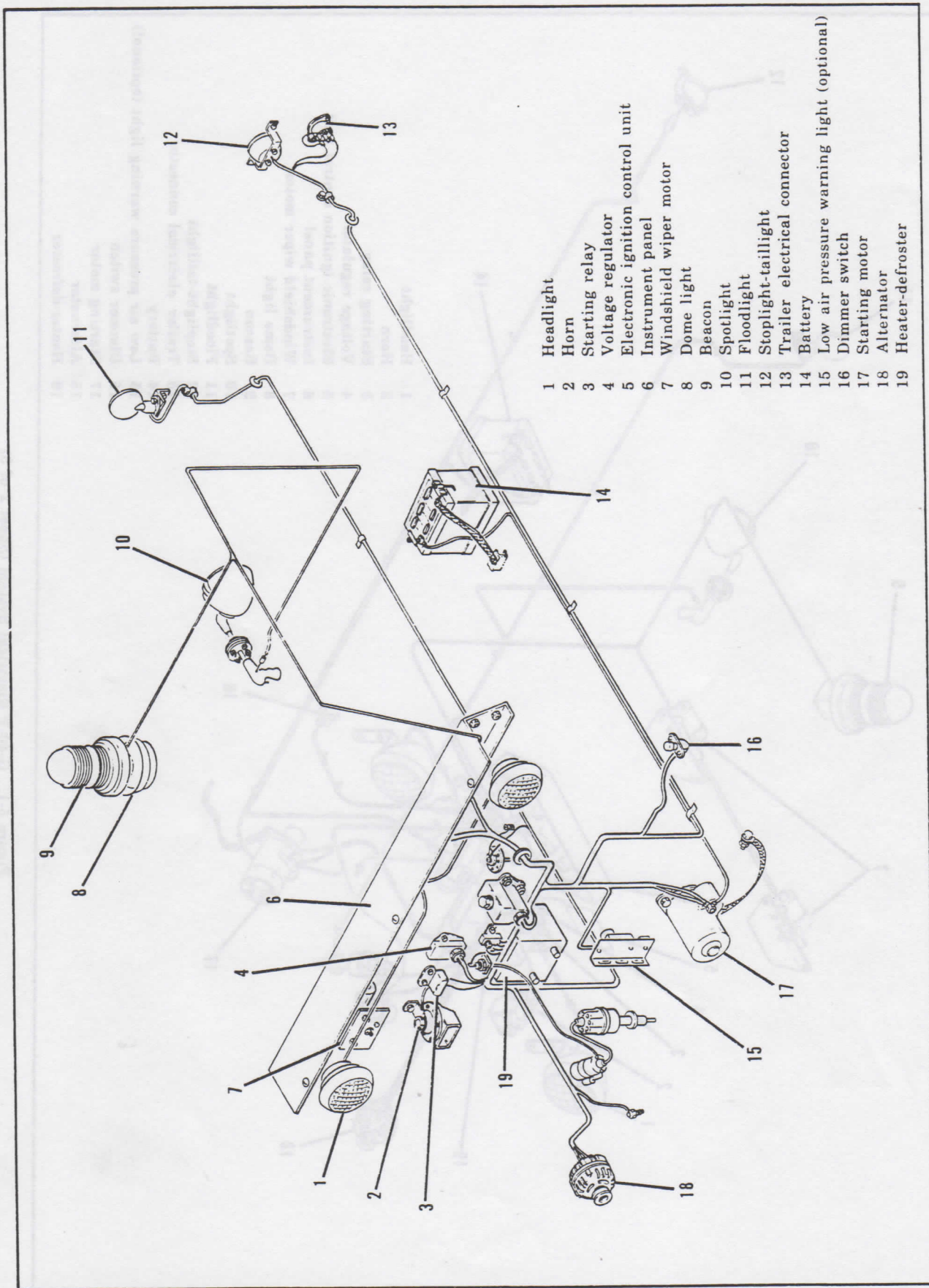


Figure 5-1. G-40-G Electrical System (Sheet 3 of 3)

- 1 Rear steering lever
- 2 Flow control valve (G-40-E and G-40-F)
- 3 Steering column
- 4 Steering wheel
- 5 Cam and valve assembly
- 6 Rear steering cylinder
- 7 Front steering cylinder
- 8 Drag link and valve assembly
- 9 Drag link
- 10 Pump (with oil reservoir)
- 11 Steering gear

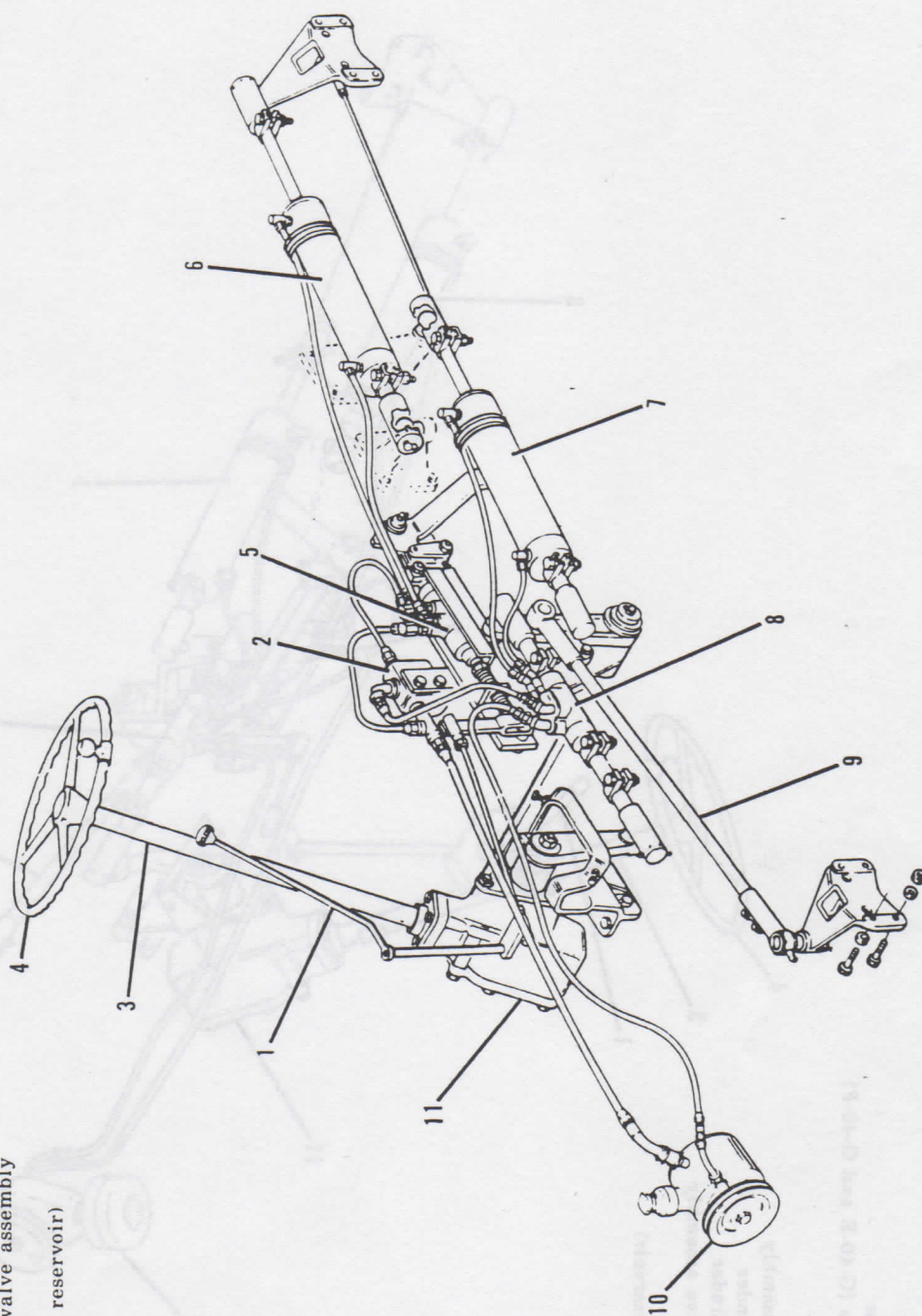


Figure 5-2. G-40-E and G-40-F Steering System (Sheet 1 of 2)

- 1 Rear steering lever
- 2 Flow control valve (G-40-E and G-40-F)
- 3 Steering column
- 4 Steering wheel
- 5 Cam and valve assembly
- 6 Rear steering cylinder
- 7 Front steering cylinder
- 8 Drag link and valve assembly
- 9 Drag link
- 10 Pump (with oil reservoir)
- 11 Steering gear

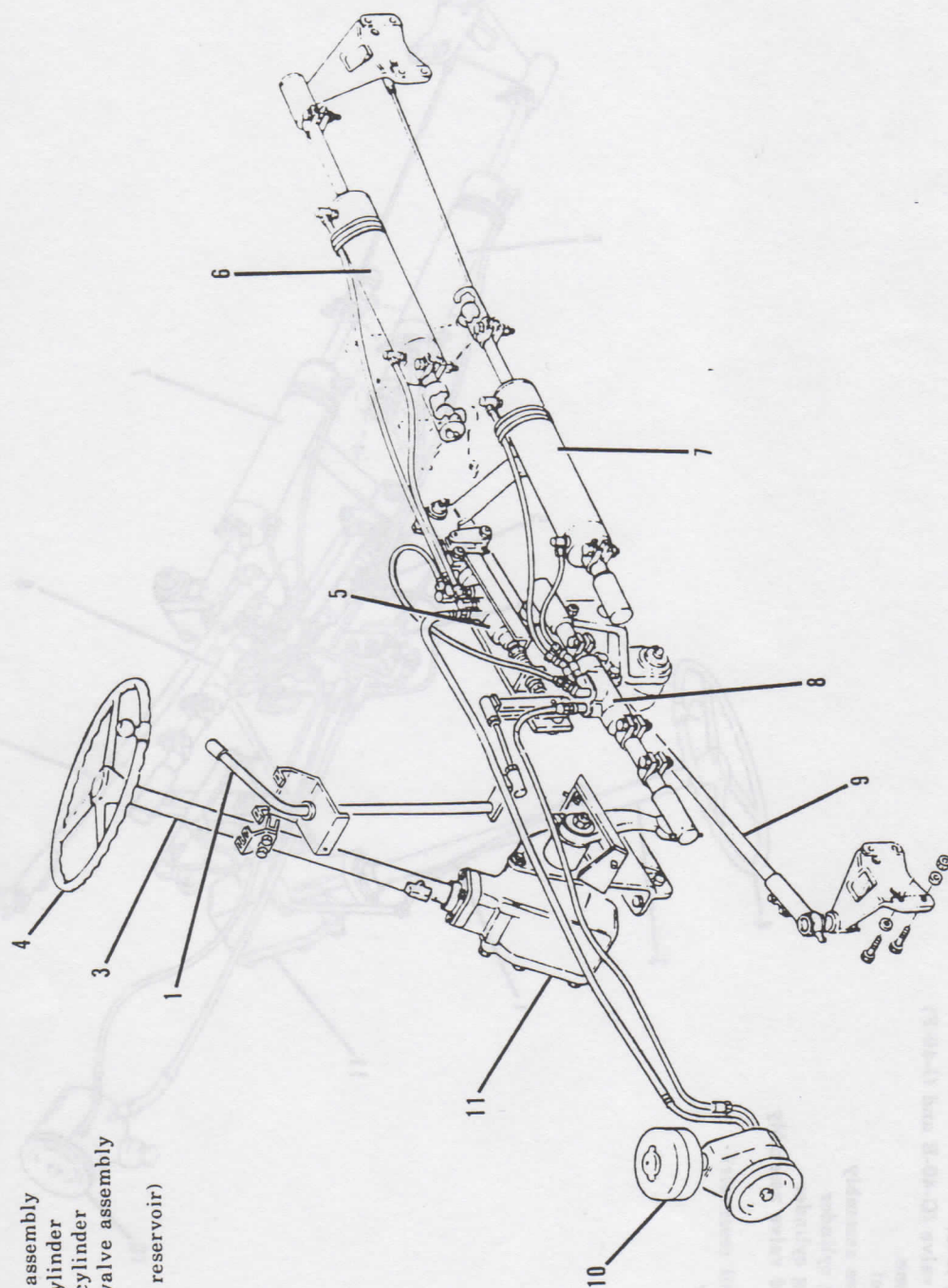


Figure 5-2. G-40-G Steering System (Sheet 2 of 2)

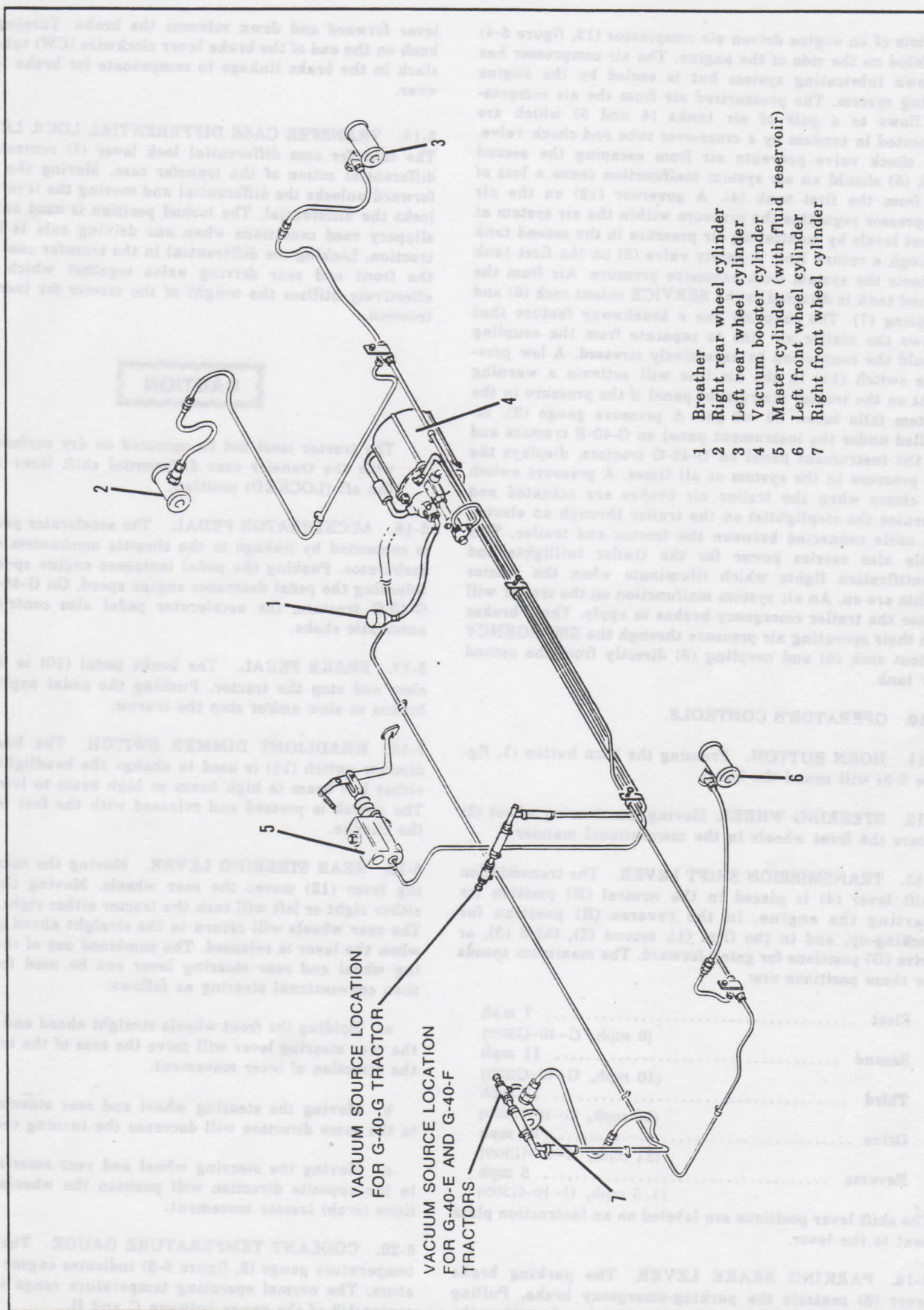


Figure 5-3. Brake System

consists of an engine driven air compressor (13, figure 5-4) mounted on the side of the engine. The air compressor has its own lubricating system but is cooled by the engine cooling system. The pressurized air from the air compressor flows to a pair of air tanks (4 and 5) which are connected in tandem by a cross-over tube and check valve. The check valve prevents air from escaping the second tank (5) should an air system malfunction cause a loss of air from the first tank (4). A governor (12) on the air compressor regulates the pressure within the air system at preset levels by monitoring air pressure in the second tank through a return line. A safety valve (3) on the first tank protects the system from excessive pressure. Air from the second tank is directed to the SERVICE cutout cock (6) and coupling (7). The coupling has a breakaway feature that allows the trailer air line to separate from the coupling should the connection be excessively stressed. A low pressure switch (11) in the air line will activate a warning light on the tractor instrument panel if the pressure in the system falls below 60 ± 6 psi. A pressure gauge (2), installed under the instrument panel on G-40-E tractors and on the instrument panel on G-40-G tractors, displays the air pressure in the system at all times. A pressure switch (1) closes when the trailer air brakes are actuated and operates the stoplight(s) on the trailer through an electrical cable connected between the tractor and trailer. This cable also carries power for the trailer taillights and identification lights which illuminate when the tractor lights are on. An air system malfunction on the trailer will cause the trailer emergency brakes to apply. These brakes get their operating air pressure through the EMERGENCY cutout cock (8) and coupling (9) directly from the second air tank.

5-10. OPERATOR'S CONTROLS.

5-11. HORN BUTTON. Pressing the horn button (1, figure 5-5) will sound the horn.

5-12. STEERING WHEEL. Moving the steering wheel (2) steers the front wheels in the conventional manner.

5-13. TRANSMISSION SHIFT LEVER. The transmission shift lever (4) is placed in the neutral (N) position for starting the engine, in the reverse (R) position for backing-up, and in the first (1), second (2), third (3), or drive (D) positions for going forward. The maximum speeds for these positions are:

First	7 mph
	(6 mph, G-10-G309)
Second	11 mph
	(10 mph, G-10-G309)
Third	17 mph
	(15 mph, G-10-G309)
Drive	24 mph
	(21 mph, G-10-G309)
Reverse	5 mph
	(1.5 mph, G-10-G309)

The shift lever positions are labeled on an instruction plate next to the lever.

5-14. PARKING BRAKE LEVER. The parking brake lever (6) controls the parking-emergency brake. Pulling the lever up and back applies the brake and moving the

lever forward and down releases the brake. Turning the knob on the end of the brake lever clockwise (CW) takes up slack in the brake linkage to compensate for brake lining wear.

5-15. TRANSFER CASE DIFFERENTIAL LOCK LEVER. The transfer case differential lock lever (7) controls the differential action of the transfer case. Moving the lever forward unlocks the differential and moving the lever back locks the differential. The locked position is used only for slippery road conditions when one driving axle is losing traction. Locking the differential in the transfer case locks the front and rear driving axles together which more effectively utilizes the weight of the tractor for increased traction.

CAUTION

The tractor must not be operated on dry surfaces with the transfer case differential shift lever in the aft (LOCKED) position.

5-16. ACCELERATOR PEDAL. The accelerator pedal (9) is connected by linkage to the throttle mechanism on the carburetor. Pushing the pedal increases engine speed and releasing the pedal decreases engine speed. On G-40-F and G-40-G tractors, the accelerator pedal also controls the automatic choke.

5-17. BRAKE PEDAL. The brake pedal (10) is used to slow and stop the tractor. Pushing the pedal applies the brakes to slow and/or stop the tractor.

5-18. HEADLIGHT DIMMER SWITCH. The headlight dimmer switch (11) is used to change the headlights from either low beam to high beam or high beam to low beam. The switch is pressed and released with the foot to make the change.

5-19. REAR STEERING LEVER. Moving the rear steering lever (12) moves the rear wheels. Moving the lever either right or left will turn the tractor either right or left. The rear wheels will return to the straight ahead position when the lever is released. The combined use of the steering wheel and rear steering lever can be used for other than conventional steering as follows:

a. Holding the front wheels straight ahead and moving the rear steering lever will move the rear of the tractor in the direction of lever movement.

b. Moving the steering wheel and rear steering lever in the same direction will decrease the turning radius.

c. Moving the steering wheel and rear steering lever in the opposite direction will position the wheels for oblique (crab) tractor movement.

5-20. COOLANT TEMPERATURE GAUGE. The coolant temperature gauge (3, figure 5-6) indicates engine temperature. The normal operating temperature range is in the center 1/2 of the gauge between C and H.

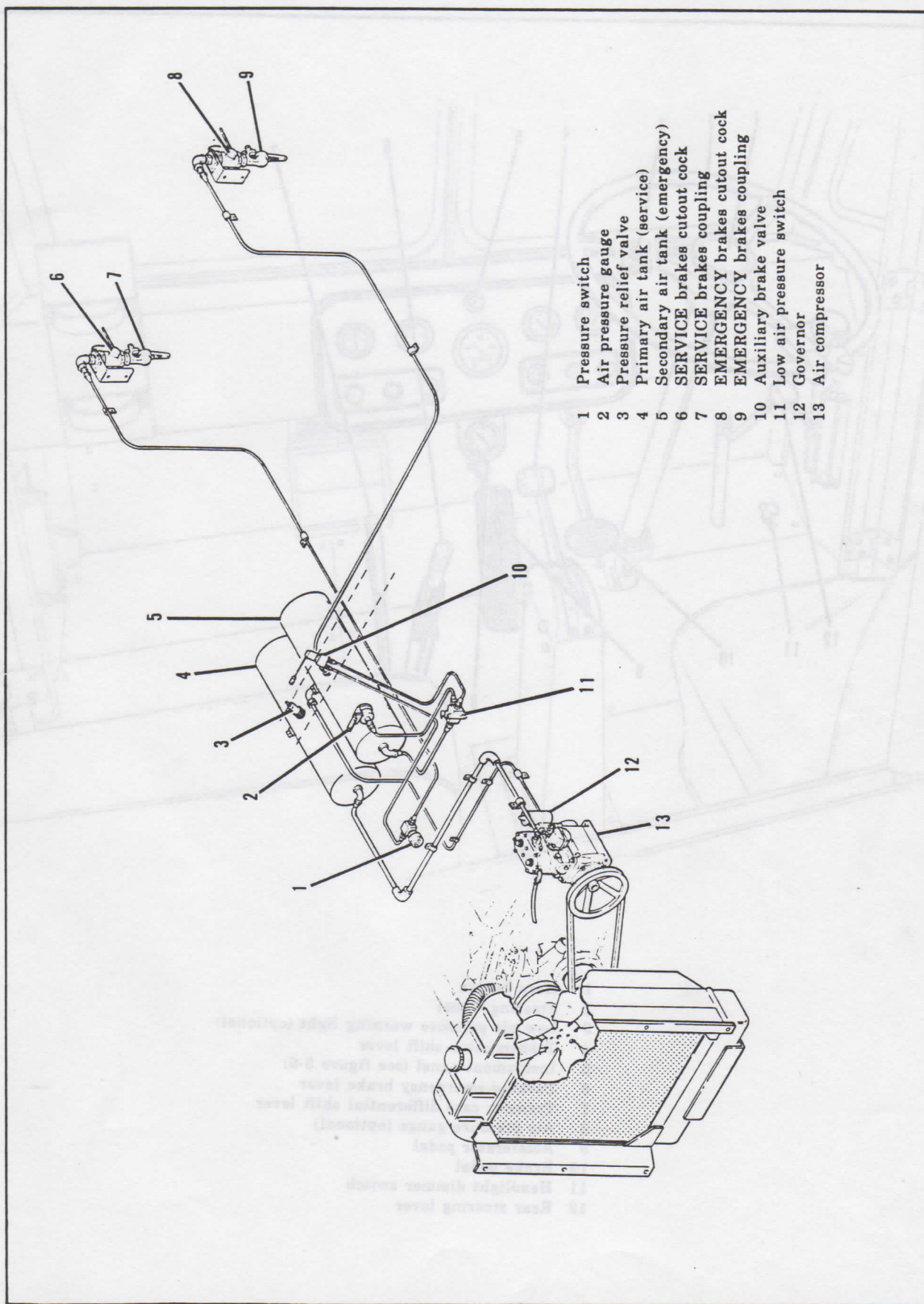
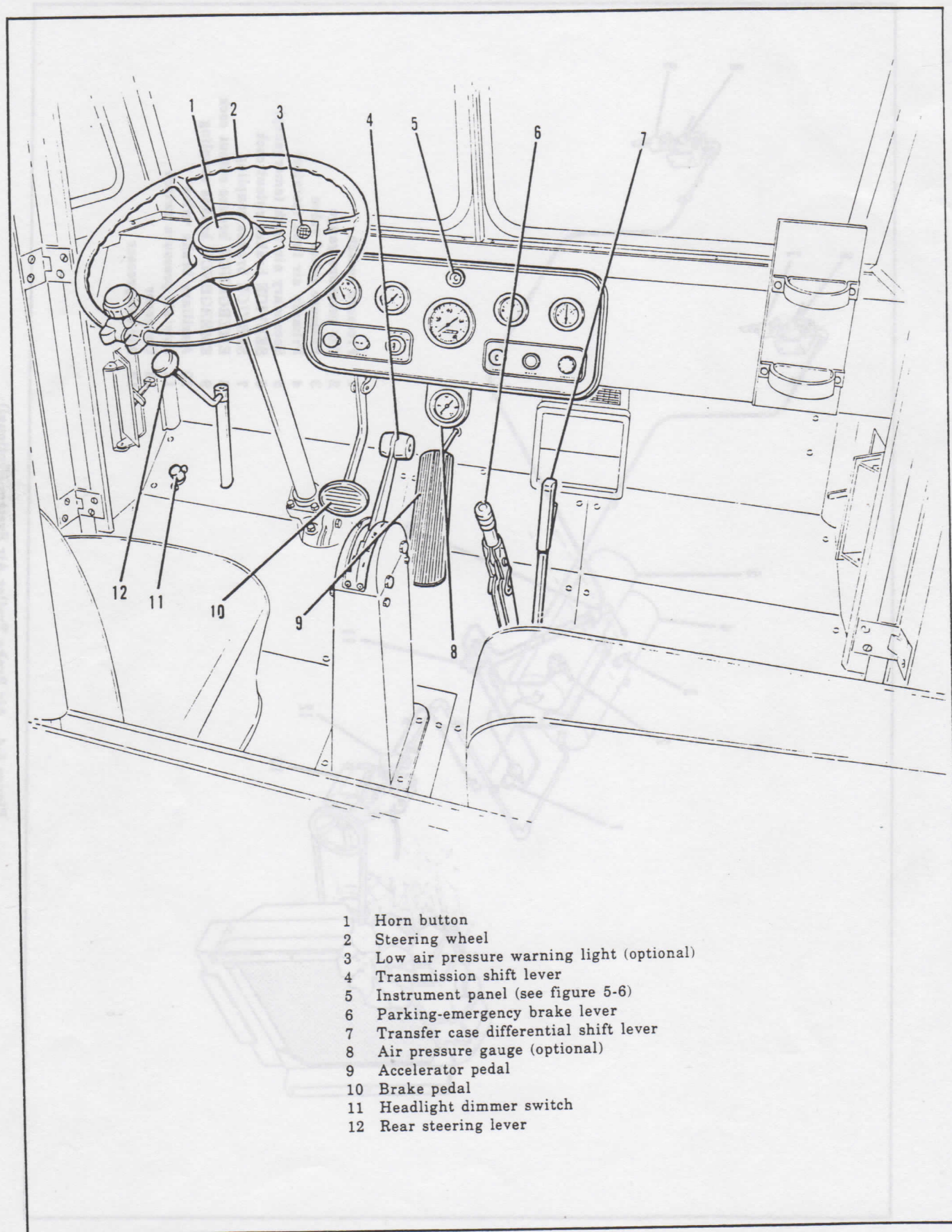


Figure 5-4. Air Brake Trailer Air System (Optional)



- 1 Horn button
- 2 Steering wheel
- 3 Low air pressure warning light (optional)
- 4 Transmission shift lever
- 5 Instrument panel (see figure 5-6)
- 6 Parking-emergency brake lever
- 7 Transfer case differential shift lever
- 8 Air pressure gauge (optional)
- 9 Accelerator pedal
- 10 Brake pedal
- 11 Headlight dimmer switch
- 12 Rear steering lever

Figure 5-5. G-40-E and G-40-F Operator Controls (Sheet 1 of 2)

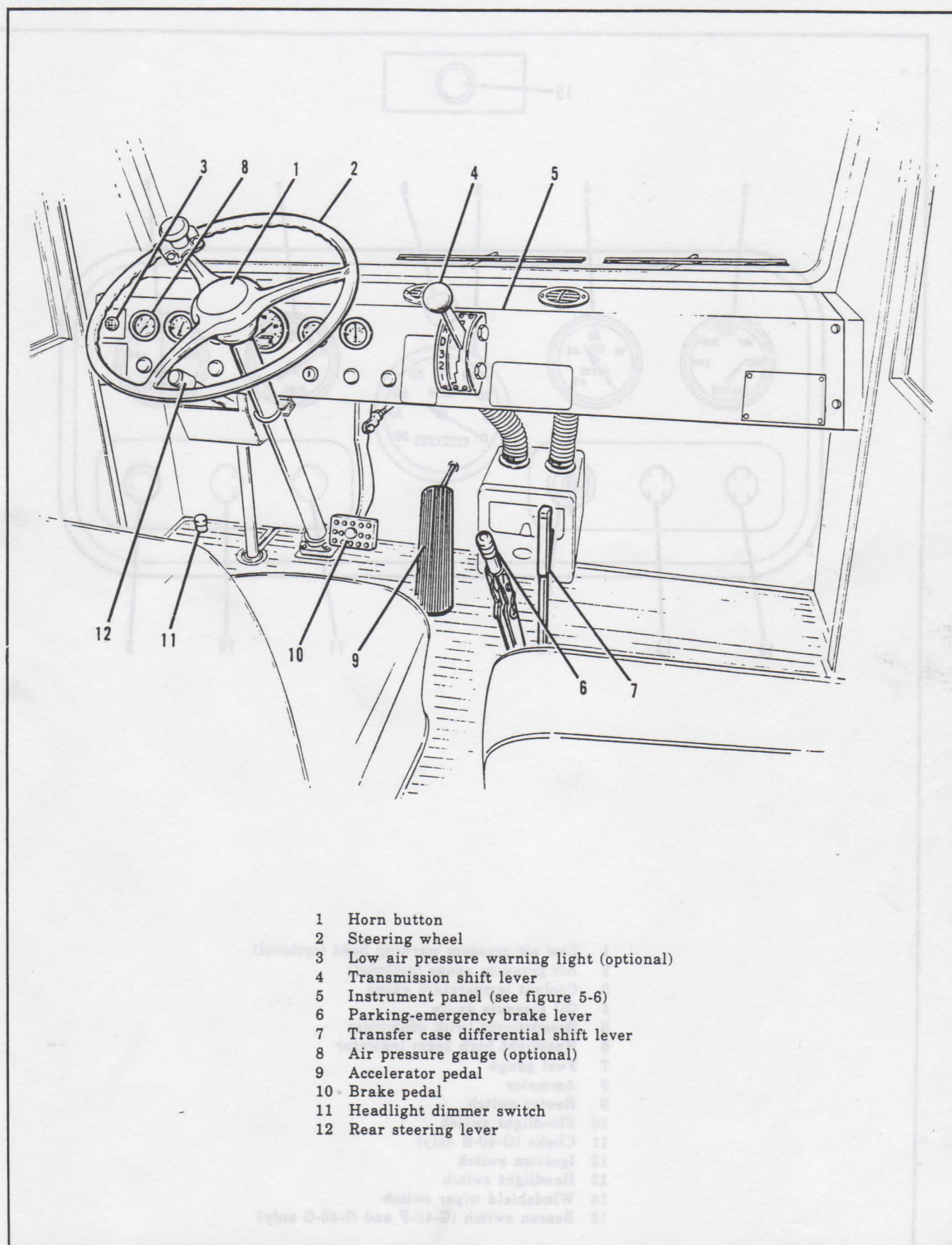
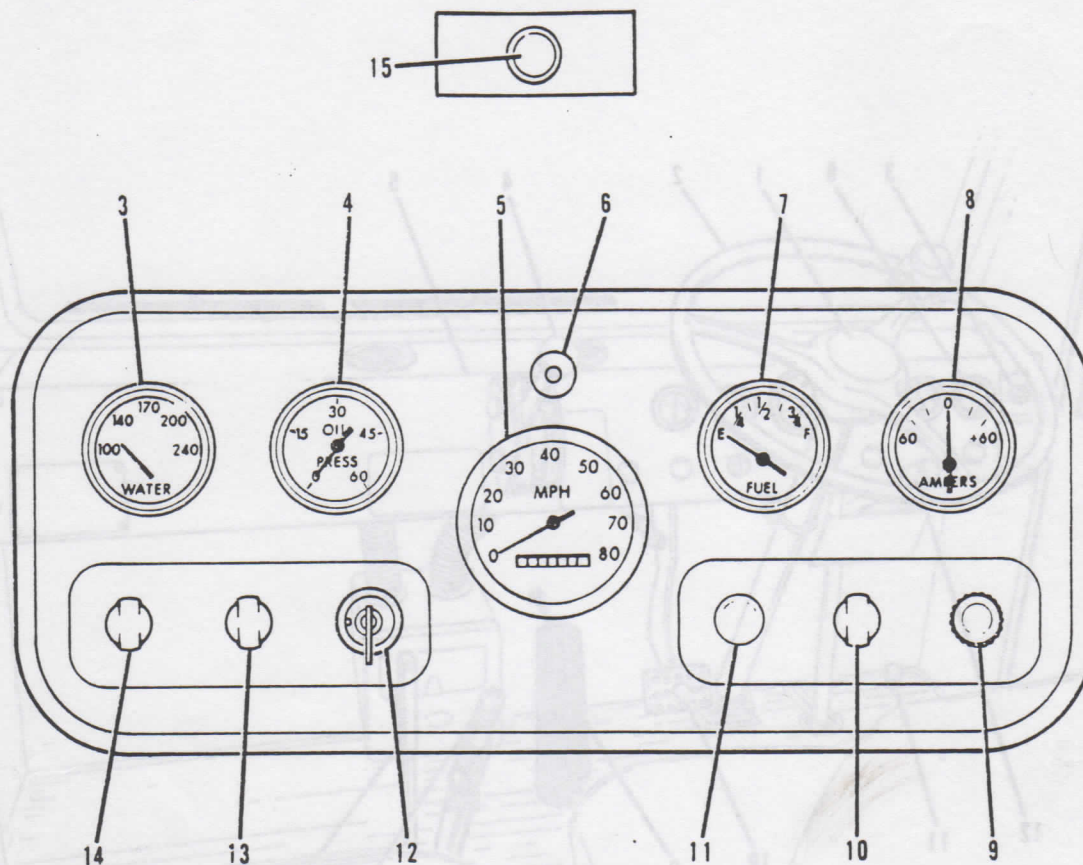
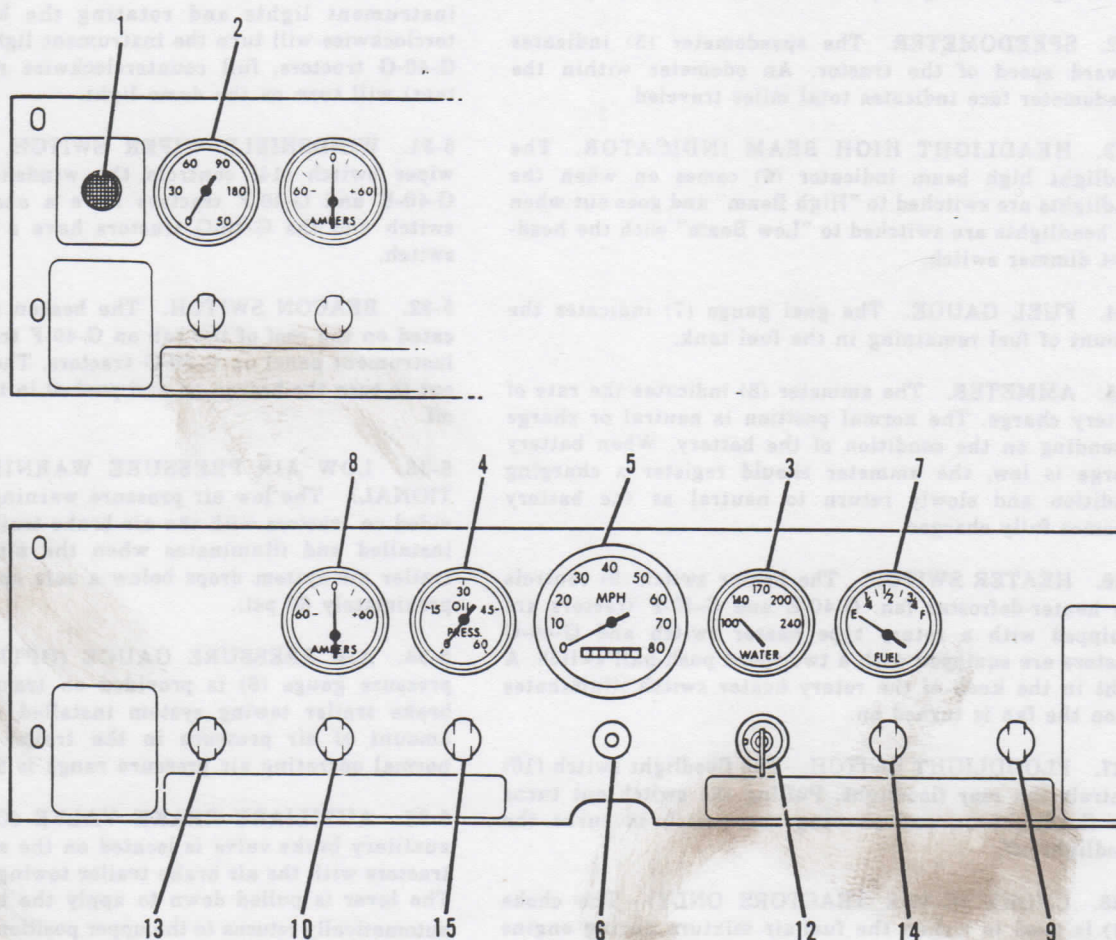


Figure 5-5. G-40-G Operator Controls (Sheet 2 of 2).



- 1 Low air pressure warning light (optional)
- 2 Air pressure gauge (optional)
- 3 Coolant temperature gauge
- 4 Oil pressure gauge
- 5 Speedometer (with odometer)
- 6 Headlight high beam indicator
- 7 Fuel gauge
- 8 Ammeter
- 9 Heater switch
- 10 Floodlight switch
- 11 Choke (G-40-E only)
- 12 Ignition switch
- 13 Headlight switch
- 14 Windshield wiper switch
- 15 Beacon switch (G-40-F and G-40-G only)

Figure 5-6. G-10-E and G-10-F Instrument Panel (Sheet 1 of 2).



- 1 Low air pressure warning light (optional)
- 2 Air pressure gauge (optional)
- 3 Coolant temperature gauge
- 4 Oil pressure gauge
- 5 Speedometer (with odometer)
- 6 Headlight high beam indicator
- 7 Fuel gauge
- 8 Ammeter
- 9 Heater switch
- 10 Floodlight switch
- 11 Choke knob (G-40-E only)
- 12 Ignition switch
- 13 Headlight switch
- 14 Windshield wiper switch
- 15 Beacon switch (G-40-F and G-40-G only)

Figure 5-6. G-40-G Instrument Panel (Sheet 2 of 2)

5-21. **OIL PRESSURE GAUGE.** The oil pressure gauge (4) indicates engine lubricating oil pressure. The normal operating lubricating oil pressure range is 30 to 35 pounds.

5-22. **SPEEDOMETER.** The speedometer (5) indicates forward speed of the tractor. An odometer within the speedometer face indicates total miles traveled.

5-23. **HEADLIGHT HIGH BEAM INDICATOR.** The headlight high beam indicator (6) comes on when the headlights are switched to "High Beam" and goes out when the headlights are switched to "Low Beam" with the headlight dimmer switch.

5-24. **FUEL GAUGE.** The fuel gauge (7) indicates the amount of fuel remaining in the fuel tank.

5-25. **AMMETER.** The ammeter (8) indicates the rate of battery charge. The normal position is neutral or charge depending on the condition of the battery. When battery charge is low, the ammeter should register a charging condition and slowly return to neutral as the battery becomes fully charged.

5-26. **HEATER SWITCH.** The heater switch (9) controls the heater-defroster fan. G-40-E and G-40-F tractors are equipped with a rotary type heater switch and G-40-G tractors are equipped with a two-speed push-pull switch. A light in the knob of the rotary heater switch illuminates when the fan is turned on.

5-27. **FLOODLIGHT SWITCH.** The floodlight switch (10) controls the rear floodlight. Pulling the switch out turns the floodlight on and pushing the switch in turns the floodlight off.

5-28. **CHOKE (G-40-E TRACTORS ONLY).** The choke (11) is used to richen the fuel-air mixture during engine warm-up or for starting the engine during cold weather. Pulling the knob out actuates the choke and pushing the knob in releases the choke.

NOTE

G-40-F and G-40-G tractors have automatic chokes. Pushing the accelerator pedal all the way to the floor and then releasing it actuates the choke which should only be used when starting a cold engine.

5-29. **IGNITION SWITCH.** The ignition switch (12) is operated by key. The key is inserted with the switch in the O or OFF position. Moving the switch to the S or START position actuates the starting motor and energizes the ignition circuits. When the engine starts, the switch is released to the I or IGNITION position which is the normal position for all tractor operations. The A or ACC position is used when power to the electrical accessories is required without the engine running or the ignition circuit energized.

5-30. **HEADLIGHT SWITCH.** The headlight switch (13) controls the headlights, taillights, instrument lights, and on G-40-G tractors, the dome light. Pulling the switch to the first detent turns on the taillights and instrument

lights, and to the second detent the headlights. Rotating the knob increases or decreases instrument light brightness. Rotating the knob fully clockwise will turn off the instrument lights and rotating the knob fully counterclockwise will turn the instrument lights on bright. For G-40-G tractors, full counterclockwise rotation (into detent) will turn on the dome light.

5-31. **WINDSHIELD WIPER SWITCH.** The windshield wiper switch (14) controls the windshield wipers. The G-40-E and G-40-F tractors have a one-speed push-pull switch and the G-40-G tractors have a two-speed rotary switch.

5-32. **BEACON SWITCH.** The beacon switch (15) is located on the roof of the cab on G-40-F tractors and on the instrument panel on G-40-G tractors. The switch is pulled out to turn the beacon on and pushed in to turn the beacon off.

5-33. **LOW AIR PRESSURE WARNING LIGHT (OPTIONAL).** The low air pressure warning light (3) is provided on tractors with the air brake trailer towing system installed and illuminates when the air pressure in the trailer air system drops below a safe operating level (approximately 60 psi).

5-34. **AIR PRESSURE GAUGE (OPTIONAL).** The air pressure gauge (8) is provided on tractors with the air brake trailer towing system installed and indicates the amount of air pressure in the trailer air system. The normal operating air pressure range is 90 to 105 psi.

5-35. **AUXILIARY BRAKE VALVE (OPTIONAL).** The auxiliary brake valve is located on the steering column of tractors with the air brake trailer towing system installed. The lever is pulled down to apply the trailer brakes and automatically returns to the upper position when released.

5-36. OPERATION.

5-37. **PRESTART CHECKS.** Before starting the engine, perform the following checks:

- Check tires for proper inflation of 20 psi.
- Check radiator for proper coolant level and area in front of radiator for obstructions.
- Inspect all radiator, heater, and hydraulic hoses for deterioration.
- Check all hoses and fittings for coolant and oil leaks.
- Check fan and alternator belts for proper adjustment and deterioration.

f. Check oil levels in engine, transmission, and power steering pump for normal operating range.

g. Check all lights for proper operation. Push brake pedal and check that stoplight illuminates.

h. Turn ignition switch to first position and check fuel gauge for adequate fuel quantity.

5-38. STARTING ENGINE.

WARNING

Transmission does not have PARK position. Make sure that transmission is in NEUTRAL (N) and that parking brake is set before starting engine or after parking tractor.

a. Set parking brake by pulling up and back on parking brake lever.

NOTE

If necessary, adjust slack out of parking brake linkage by turning knob on end of brake lever clockwise (CW).

b. Place transmission in NEUTRAL (N).

c. Push accelerator pedal to floor and release. If manual choke is installed, pull choke knob out approximately 1/2 length of its travel.

d. Turn ignition switch to second position to engage starter. Release ignition switch when engine starts.

CAUTION

If engine does not start within 30 seconds, release ignition switch, wait 20 seconds and attempt engine start. If repeated efforts to start engine are unsuccessful, notify maintenance personnel.

e. Check for oil pressure indication and allow engine to warm-up for 5 to 8 minutes. If manual choke is installed, adjust choke as necessary to keep engine running during warm-up. A slight pulsation of the oil pressure gauge may occur during idle and is a normal condition.

CAUTION

If oil pressure gauge does not indicate at least 30 pounds pressure at idle, immediately shut-down engine and notify maintenance personnel.

f. Check ammeter indication. Ammeter should indicate charge after engine starts then gradually return to neutral as battery becomes charged.

5-39. CLEARING FLOODED ENGINE (AUTOMATIC CHOKE).

If engine fails to start and flooding is suspected of being the cause, hold the accelerator pedal all the way to the floor and crank the engine for 30 seconds then wait for 20 seconds and crank the engine again for 30 seconds. Repeat this sequence as necessary until engine clears and starts.

Notify maintenance personnel if engine does not start after several attempts..

WARNING

After engine is started transmission must not be shifted to any drive gear until engine has warmed up and engine RPM is reduced to curb idle speed (700 RPM).

5-40. OPERATION UNDER NORMAL (DRY) ROAD SURFACE CONDITIONS.

a. Place transmission shift lever in desired gear. Use first (1) gear when towing and second (2), third (3), or drive (D) under other conditions.

NOTE

The transmission always starts forward motion in first gear then shifts up to the gear selected, and when slowing and stopping, downshifts from the gear selected to first.

b. Place differential shift lever in forward (UN-LOCKED) position. If differential shift lever is difficult to shift, drive forward or backward a short distance, stop tractor, and attempt to shift lever. Repeat this procedure until lever can be shifted.

CAUTION

Severe damage to the tractor drive train may result if:

- (1) the differential shift lever is shifted when the tractor is in motion or
- (2) the tractor is operated on dry road surfaces with the differential shift lever in the aft (LOCKED) position.

5-41. OPERATION UNDER ADVERSE (SLIPPERY) ROAD SURFACE CONDITIONS.

a. Place transmission shift lever in first (1) gear.

b. Place differential shift lever in aft (LOCKED) position. If differential shift lever is difficult to shift, drive forward or backward a short distance, stop tractor, and attempt to shift lever. Repeat this procedure until lever can be shifted.

CAUTION

Severe damage to the tractor drive train may result if:

- (1) the differential shift lever is shifted when the tractor is in motion or
- (2) the tractor is operated on dry road surfaces with the differential shift lever in the aft (LOCKED) position.

c. Place differential shift lever in forward (UN-LOCKED) position as soon as adverse road surface conditions are passed.

5-42 FORWARD

CAUTION

Do not operate the tractor with the differential shift lever in the aft (LOCKED) position unless slippery road surface conditions exist.

a. Select desired transmission driving range for each operation: first (1) for towing and second (2), third (3), or drive (D) for road or highway travel.

b. Release parking brake and push accelerator pedal to move tractor.

5-43. REVERSE.

WARNING

Make sure that area behind tractor is clear of all personnel and obstacles before backing-up tractor.

a. With tractor stopped, shift transmission to neutral (N) then to reverse (R) and proceed to back-up tractor when all personnel and obstructions are clear.

b. Release parking brake and push accelerator pedal to move tractor.

5-44. TOWING.

Refer to the respective aircraft or weapon system manual for proper towing instructions.

5-45. STOPPING.

a. Release accelerator pedal and allow engine to slow tractor.

b. Push brake pedal to continue slowing tractor. Completely stop tractor with firm pressure on brake pedal.

c. When tractor stops, place transmission in neutral (N), set parking brake, and release pressure from brake pedal.

5-46. TRACTOR SHUTDOWN.

a. Turn off all lights and accessories.

b. Turn off ignition switch.

c. Make sure transmission is in neutral (N) and parking brake is set.

d. Close all windows and vents.

5-47. TRAILER TOWING.

NOTE

The following procedures cover trailers with air brakes but apply to trailers without air brakes as far as connecting the trailer to the tractor and making the electrical connections for the lights. In all cases, refer to the applicable weapon system manual for proper towing instructions.

a. Shutdown tractor.

b. Check that cutout cocks (6 and 8, figure 5-4) are in OFF position.

c. Connect trailer to towing pintle and install safety pin.

d. Connect trailer air hoses to couplings on tractor, Trailer SERVICE brake air hose goes to right coupling (7) and trailer EMERGENCY brake air hose goes to left coupling (9).

e. Install electrical cable between tractor and trailer.

f. Start tractor engine.

g. Open cutout cocks and check air system pressure on air pressure gauge (8, figure 5-5). Note if low air pressure warning light (3) illuminates.

h. Check that air pressure is within operating range of 90 to 105 psi.

i. Operate auxiliary brake valve (10, figure 5-4) and check that trailer stoplight(s) illuminates.

j. Turn on tractor lights and check that trailer tail-light(s) and identification lights illuminate.

k. When towing trailer, operate trailer brakes in conjunction with tractor brakes to stop.

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Table 6-1.

	INSPECTION INTERVALS		
	DAILY	PERIODIC	SAFETY
	When used	3 months or 300 operating hours, whichever comes first	Annually, 12,000 miles or 1200 operating hours whichever comes first
ELECTRICAL SYSTEM			
Check operation of all lights	X		
Check operation of windshield wipers, heater and horn	X		
Inspect and clean all connections as required	X		
Inspect for broken or chafed wires, loose conduit and fittings	X		
BATTERY			
Check liquid level	X		
Clean terminals, battery box and tighten holder		X	
STARTER MOTOR AND ALTERNATOR			
Check alternator belt tension	X		
Tighten electrical connections		X	
Check mounting bolts		X	
Check starter motor and alternator brushes for wear			X
FUEL SYSTEM			
Check fuel lines and tank for leaks or damage	X		
Clean air cleaner filter		X	
Check carburetor idle		X	
Inspect fuel pump		X	
ENGINE			
Check oil level	X		
Inspect crankcase ventilation hoses		X	
Tighten cylinder head bolts			X
Tighten manifold bolts			X
Check PCV valve			X
POWER STEERING			
Check and fill reservoir	X		
Inspect hoses and tighten connections		X	
Check and adjust pump belt tension	X		
Inspect booster cylinders, pump and valves; tighten mounting bolts		X	

Table 6-1. Periodic Inspection Chart (Sheet 2 of 3)

	INSPECTION INTERVALS		
	DAILY	PERIODIC	SAFETY
	When used	3 months or 300 operating hours, whichever comes first	Annually, 12,000 miles or 1200 operating hours whichever comes first
TRANSMISSION			
Check fluid level	X		
Inspect fluid coolant lines	X		
Inspect parking brake linkage		X	
Tighten mounting bolts		X	
FRONT AND REAR AXLES			
Check oil level		X	
Inspect tie rods and clevis pin joints		X	
Inspect drive shafts and universal joints		X	
Tighten axle mounting bolts		X	
BRAKES			
Check brake pedal travel	X		
Inspect brake line connections for leaks	X		
Check pedal free play		X	
Inspect fluid level in brake master cylinder		X	
Inspect vacuum power booster unit		X	
Remove wheels, inspect linings			X
TIRES			
Inspect for wear and damage	X		
Check tire pressure (20 psi)	X		
Tighten lug bolts	X		
Inspect wheel bearings			X
TRANSFER TRANSMISSION			
Check for external leaks	X		
Check fluid level		X	
TRAILER AIR SYSTEM			
Inspect all air lines for leaks, loose fittings and damaged lines.	X		
Check air compressor and tractor cooling system	X		
Inspect air compressor drive belt	X		
Drain water from air tanks (drain cock on each tank)	X		
Check governor setting and operation of compressor		X	
Inspect electrical wires, connector and cable for deterioration, loose connections and damage		X	
WEIGHTS			
Tighten nuts on weight mounting studs to 200 foot pounds lubricated.		X	

Table 6-1. Periodic Inspection Chart (Sheet 3 of 3)

6-5. COOLING SYSTEM MAINTENANCE.

6-6. **RADIATOR.** Continued efficient operation of the engine is dependent upon an adequately maintained cooling system. Overheating of the engine can mean lost operating time and unnecessary overhaul procedures. Using the inspection procedures to detect faults can eliminate costly repairs:

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

b. 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 7 pounds per square inch. Tighten water pump mounting bolts.

c. Drain and flush system.

(1) Open radiator drain cock and remove engine drain plugs. Drain all coolant, close drain cock and replace drain plugs.

(2) Fill radiator with water and add radiator cleaner, Military Specification MIL-C-10597. Start engine and operate for 30 minutes at idle speed.

(3) Check for leaks and defective hoses while engine is operating.

(4) Stop engine and drain coolant. Replace defective hoses as required. Close drain cock and replace drain plugs.

(5) Fill radiator with 50% water and 50% ethylene glycol solution.

d. Inspect the fan drive belt and replace if necessary. Deflection of drive belt should not exceed 3/4 inch. If deflection is too great and belt is in good condition, tighten the belt by shifting the position of the alternator. Be sure to tighten alternator arm after adjustment.

6-7. **THERMOSTAT.** The cooling system thermostat is located in its housing. It should be removed annually and inspected for proper operation. Replace faulty thermostat.

6-8. ELECTRICAL SYSTEM MAINTENANCE.

6-9. **BATTERY.** Clean and service the battery as follows:

a. Loosen and remove battery cables. Clean the battery and cable terminals.

WARNING

Avoid skin contact with battery corrosion and battery acid. If skin contact occurs, flush immediately with water.

b. Apply a light coat of grease, Military Specification MIL-G-10924, to battery and cable terminals after battery cables are connected.

c. Check battery fluid with a hydrometer.

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.

6-10. ALTERNATOR.

a. The alternator (also fan) drive belt must be inspected periodically for wear and tension. Adjust position of the alternator if the belt is loose. Replace a worn or cracked drive belt.

b. Inspect all electrical connections at the alternator. Clean and tighten connections as necessary.

c. Alternator brushes should be inspected for wear annually. This is best accomplished by removing the alternator; instructions are given in section VII.

6-11. **ALTERNATOR REGULATOR.** The regulator requires no service other than inspecting, cleaning and tightening electrical connections. If trouble develops in the charging system, all electrical connections should be checked first before replacing any components. If the fault is not loose connections, worn alternator brushes or defective battery, a thorough systematic check of the electrical system should be performed by overhaul personnel with suitable test equipment.

6-12. **LIGHTS.** Maintenance of lights usually will be confined to the replacing of lenses or bulbs. Lenses are held in place by panels or rings and can be removed by loosening the attaching screws. Bulbs are of the bayonet type and are removed by pressing inward and turning counterclockwise. When replacing lenses, be sure to install gaskets used to seal the lamp. Test operation of light(s) after lamp replacement.

6-13. **STARTER MOTOR.** The construction of the starter motor is such that repair should not be attempted by the using organization. If the tractor starts with difficulty and the trouble appears to be a defective starter motor, replace the unit and return the defective starter motor to overhaul personnel. Replacement instructions are given in section VII.

6-14. **IGNITION SYSTEM.** Trouble in the ignition system usually is indicated by difficulty in starting or a rough running engine. The coil is used to step up the low voltage to a higher value for proper starting and running. A dirty or damp coil may cause the voltage to short circuit, reducing the voltage supplied to the plugs. To eliminate this possibility use a cloth dampened with cleaning solvent to clean the exterior of the coil and all spark plug leads. 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. The spark plugs should be cleaned and gapped regularly.

6-15. DISTRIBUTOR. (G-40-E models, see figure 6-1) The engine ignition tune-up is mainly concerned with the distributor. The following procedures are not a tune-up but can be used to eliminate engine trouble:

- a. Remove the distributor cap.
- b. Examine the cap for cracks, carbon runners or corroded high tension terminals. Replace the distributor cap if any of these conditions exist.
- c. Examine the inserts in the cap. During normal use, the vertical face of the inserts will become slightly burned. If burning is excessive, the cap should be replaced. If the horizontal face of the inserts are burned, it usually indicates a short rotor and the rotor should be replaced.
- d. Examine the rotor for cracks. Examine the metal strip for a burned condition. The end of the strip will be burned under normal conditions, but if the top of the strip is burned, the rotor should be replaced.
- e. If a capacitor tester is available, remove the capacitor (6, figure 6-1) and test for a capacitance of 0.250 to 0.285 microfarads. Replace the capacitor if it is outside this value.

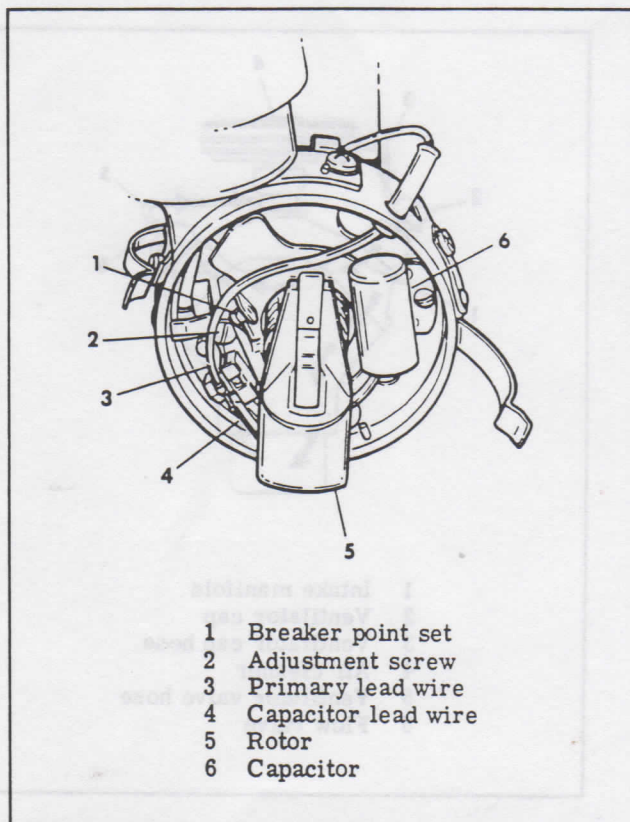


Figure 6-1. Distributor Adjustment

f. Inspect the breaker point contacts. The point set need not be replaced or adjusted if they are a grayish color and are only slightly pitted and are within 0.014 to 0.019 inch gap setting.

6-15A. DISTRIBUTOR. (G-40-F and G-40-G models, see figure 6-1A) The distributor used in these models is an air gap type. Procedure steps a through d of paragraph 6-15 apply.

e. To set air gap, align one reluctor tooth with pick-up pole and loosen pick-up coil hold-down screw. Insert a 0.008 in. nonmagnetic feeler gage between reluctor tooth and pick-up coil and adjust pick-up coils so that 0.008 in. feeler gage is snug. Tighten hold-down screw and recheck gap.

6-16. FUEL SYSTEM MAINTENANCE.

6-17. AIR CLEANER. Service the air cleaner as specified on lubrication chart, figure 6-4.

6-18. CRANKCASE VENTILATION SYSTEM. (See figure 6-2 for G-40-E models and figure 6-2A for G-40-F and G-40-G models) Deposits can accumulate in the valve, hoses, and carburetor parts. A plugged ventilation system may in turn cause excessive engine crankcase sludge formation. It may also cause rough or erratic engine idle or excessive oil leakage. Operation of the system should be checked for proper function annually or more frequently if the tractor is used extensively for short trips (under 10 miles driving) or extensive idling.

- a. Test for clogged ventilator cap hose.

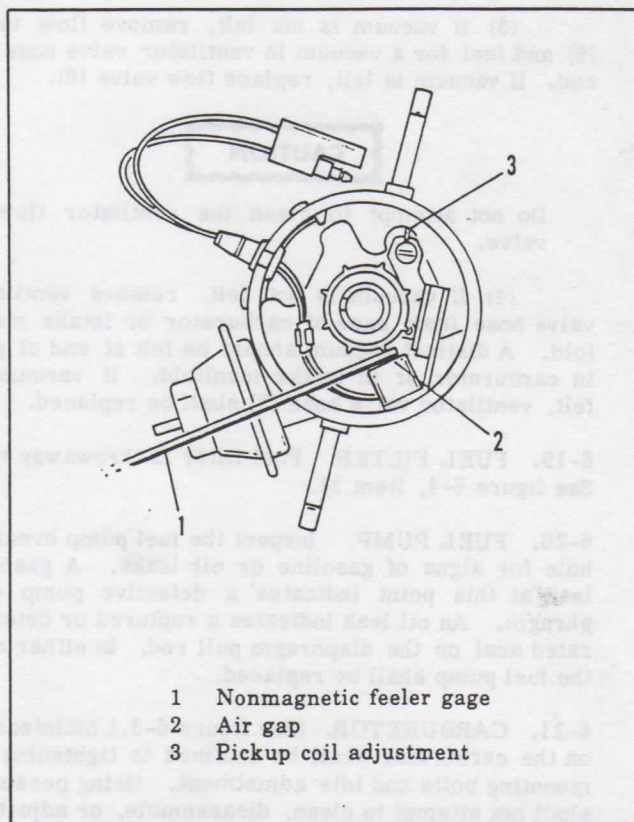


Figure 6-1A. Air Gap Adjustment

(1) With engine running at idle, remove ventilator cap hose (3) from air cleaner (4).

(2) When finger is replaced over hose opening, a vacuum should be felt.

NOTE

If vacuum is felt, a final test is made to be certain shuttle in ventilator valve is free. With engine not running remove ventilator valve (6) from cylinder head cover and shake. A clicking noise should be heard. If noise is heard the unit is operating and no further service is necessary.

(3) If no vacuum was felt when finger was placed over ventilator cap hose (3) opening, remove ventilator cap (2) with engine idling and hold stiff paper over oil fill pipe opening. In a few seconds paper should be sucked against opening with a holding force. A holding force now indicates the ventilator cap hose (3) is plugged. Remove and clean hose.

b. Test for clogged ventilator valve hose, flow valve or carburetor.

(1) If the paper was not sucked against the oil-fill pipe with engine running and ventilator cap (2) removed, remove flow valve (6) from the cylinder head cover.

(2) If flow valve (6) or ventilator valve hose (5) are not clogged, a hissing noise will be heard as air passes through flow valve (6) and a strong vacuum felt when a finger is placed over the valve inlet.

(3) If vacuum is not felt, remove flow valve (6) and feel for a vacuum in ventilator valve hose (5) end. If vacuum is felt, replace flow valve (6).

CAUTION

Do not attempt to clean the ventilator flow valve.

(4) If vacuum is not felt, remove ventilator valve hose from base of carburetor or intake manifold. A distinct vacuum should be felt at end of pipe in carburetor or in intake manifold. If vacuum is felt, ventilator valve hose (5) shall be replaced.

6-19. **FUEL FILTER.** Fuel filter is throwaway type. See figure 6-4, item 32.

6-20. **FUEL PUMP.** Inspect the fuel pump breather hole for signs of gasoline or oil leaks. A gasoline leak at this point indicates a defective pump diaphragm. An oil leak indicates a ruptured or deteriorated seal on the diaphragm pull rod. In either case the fuel pump shall be replaced.

6-21. **CARBURETOR.** (See figure 6-3.) Maintenance on the carburetor shall be confined to tightening the mounting bolts and idle adjustment. Using personnel shall not attempt to clean, disassemble, or adjust the carburetor other than an idle adjustment. If the en-

gine stalls or idles too fast, the idle adjustment screws may be adjusted to obtain the RPM desired. This adjustment should be made with the engine at operating temperature. Adjustment should be made in small increments. If this adjustment does not relieve erratic engine operation, trouble may lie in the idle mixture adjustment. Check dwell and timing for proper setting on G-40-E models. Dwell and timing on G-40-F and G-40-G models are not adjustable due to the electronic ignition system and air gap distributor. To adjust idle mixture, the transmission must be in neutral and the air cleaner in proper position before adjusting both carburetor idle adjustment screws to obtain the specified RPM. Use exhaust gas analyzer to insure correct fuel-air mixture setting. Idle mixture adjustment limiter caps shall not be removed during normal carburetor adjustment. If engine idle cannot be adjusted satisfactorily or if the engine runs rough or erratically, notify maintenance personnel.

6-22. **FUEL LINES.** Inspect fuel line connections 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.

6-23. EXHAUST SYSTEM MAINTENANCE.

6-24. The exhaust pipes, crossover pipe and spark arrestor should be inspected for loose mounting and signs of deterioration. Examine the clamps and U-bolts for looseness and tighten if necessary. Inspect the pipes and spark arrestor for rust, dents and punctures. If these components are damaged or defective, they shall be replaced.

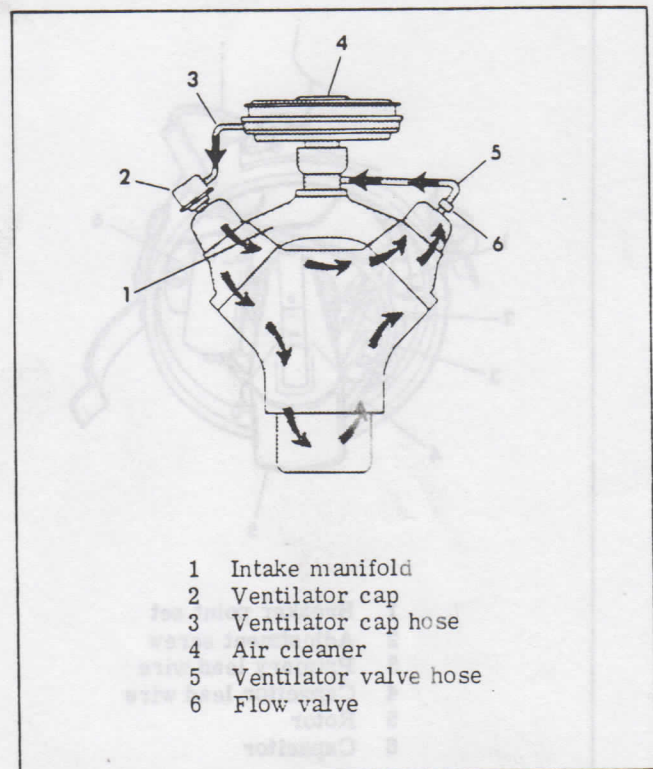


Figure 6-2. Crankcase Ventilation System

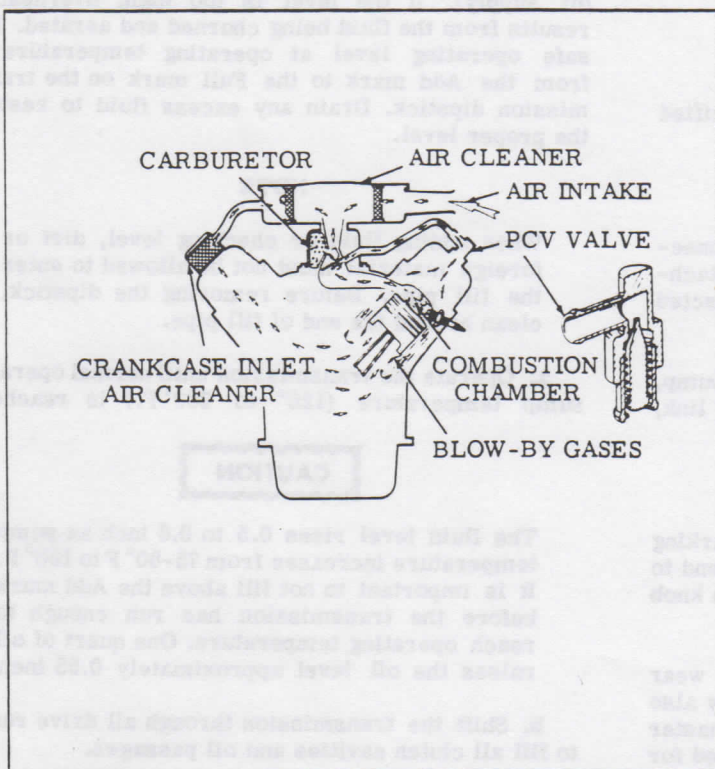


Figure 6-2A. Closed Crankcase Ventilation System

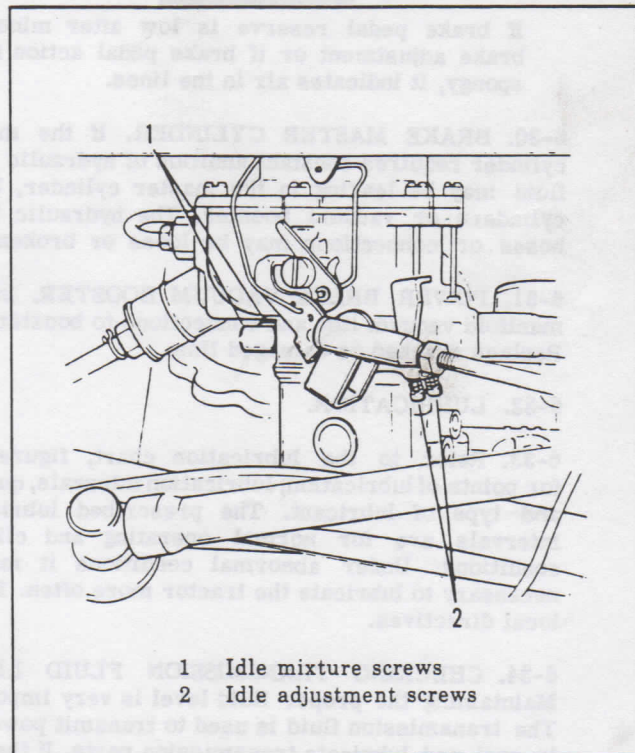


Figure 6-3. Carburetor Adjustment

6-25. POWER STEERING MAINTENANCE.

6-26. HYDRAULIC COMPONENTS.

a. Service hydraulic pump reservoir as specified in lubrication chart, figure 6-4.

b. Check hydraulic pump drive belt tension.

c. Inspect power steering hydraulic line connections to be sure all connections are tight. All attaching bolts and clamps should likewise be inspected for looseness and tightened as necessary.

d. Inspect the booster cylinders, hydraulic pump, reservoir, flow control valve, front valve drag link, and rear steer cam and valve for leakage.

6-27. BRAKE MAINTENANCE.

6-28. PARKING BRAKE ADJUSTMENT. The parking brake lever has an adjustment knob on the end to compensate for a slight amount of wear. Turn knob clockwise to tighten.

6-29. BRAKE PEDAL. Normal brake lining wear reduces pedal reserve. Low pedal reserve may also be caused by the lack of brake fluid in the master cylinder. The wear condition may be compensated for by a minor brake adjustment. Check fluid level in master cylinder and add as required. Adjust pedal free play if necessary. If brake pedal has more than 3/4 distance travel from pedal to the floor, brakes must be adjusted.

WARNING

If brake pedal reserve is low after minor brake adjustment or if brake pedal action is spongy, it indicates air in the lines.

6-30. BRAKE MASTER CYLINDER. If the master cylinder requires constant addition of hydraulic fluid, fluid may be leaking in the master cylinder, brake cylinders or vacuum booster. The hydraulic lines, hoses or connections may be loose or broken.

6-31. POWER BRAKE VACUUM BOOSTER. Inspect manifold vacuum line and connections to booster unit. Replace cracked or damaged line.

6-32. LUBRICATION.

6-33. Refer to the lubrication chart, figure 6-4, 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.

6-34. CHECKING TRANSMISSION FLUID LEVEL. Maintaining the proper fluid level is very important. The transmission fluid is used to transmit power and to cool and lubricate transmission parts. If the level is too low, the result can be poor performance (converter and clutches will not receive adequate

oil supply). If the level is too high, overheating results from the fluid being churned and aerated. The safe operating level at operating temperature is from the Add mark to the Full mark on the transmission dipstick. Drain any excess fluid to restore the proper level.

NOTE

When adding fluid or checking level, dirt or foreign material must not be allowed to enter the fill pipe. Before removing the dipstick, clean around the end of fill pipe.

a. Operate the transmission until normal operating sump temperature (120° to 200° F.) is reached.

CAUTION

The fluid level rises 0.5 to 0.6 inch as sump temperature increases from 75-80° F to 180° F. It is important to not fill above the Add mark before the transmission has run enough to reach operating temperature. One quart of oil raises the oil level approximately 0.55 inch.

b. Shift the transmission through all drive ranges to fill all clutch cavities and oil passages.

c. Shift the transmission to neutral and operate the engine at idle speed.

d. Apply the parking brake, with vehicle parked level.

e. Check fluid level on the dipstick. It should register at the Full mark, under the conditions stated above.

6-35. CHANGING TRANSMISSION FLUID AND FILTER. Transmission fluid and filter should be changed every 25000 miles of operation or every 12 months whichever occurs first.

NOTE

The transmission should be at operating temperature (120° F. minimum) when fluid is drained. This will insure quicker and better drainage.

a. (See figure 6-5.) Remove the fill tube from the oil pan and allow the oil to drain.

NOTE

All of the oil in the transmission and external system cannot drain - some will remain in the system. Approximately 11 quarts are required to refill the transmission.

b. After draining is completed, remove 21 washer-head screws (1) that retain the oil pan (2) to the transmission case. Discard the pan gasket (3) and clean the pan with mineral spirits or thinner.

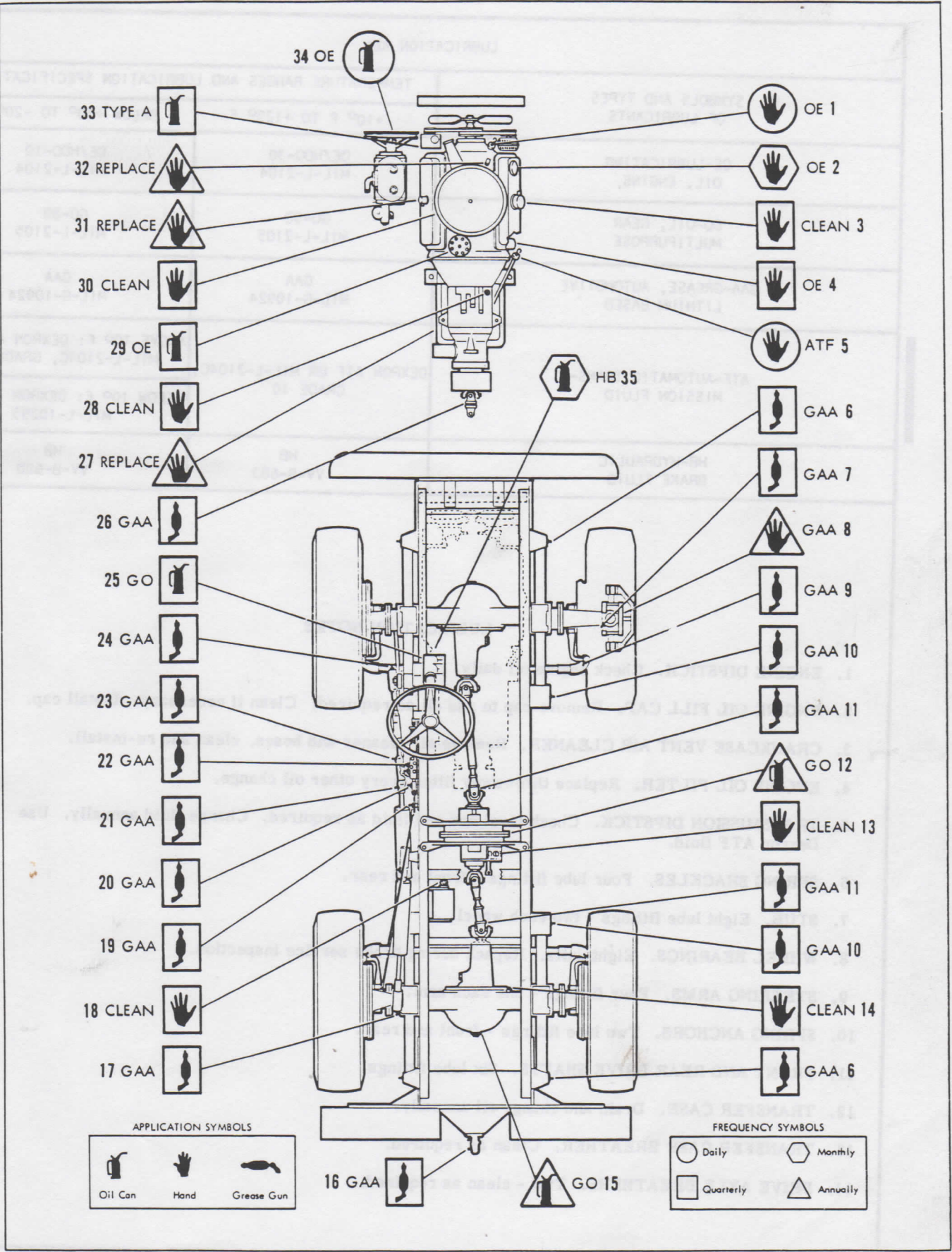


Figure 6-4. Lubrication Chart (Sheet 1 of 3)

LUBRICATION KEY		
SYMBOLS AND TYPES OF LUBRICANTS	TEMPERATURE RANGES AND LUBRICATION SPECIFICATIONS	
	+10° F TO +125° F	BELOW +10° TO -20° F
OE-LUBRICATING OIL, ENGINE	OE/HDO-30 MIL-L-2104	OE/HDO-10 MIL-L-2104
GO-OIL, GEAR MULTIPURPOSE	GO-90 MIL-L-2105	GO-80 MIL-L-2105
GAA-GREASE, AUTOMOTIVE LITHIUM BASED	GAA MIL-G-10924	GAA MIL-G-10924
ATF-AUTOMATIC TRANSMISSION FLUID	DEXRON ATF OR MIL-L-2104C, GRADE 10	ABOVE 10° F: DEXRON ATF OR MIL-L-2104C, GRADE 10
		BELOW 10° F: DEXRON ATF OR MIL-L-10295
HB-HYDRAULIC BRAKE FLUID	HB VV-B-68J	HB VV-B-680
<p style="text-align: center;">LUBRICATION NOTES</p> <ol style="list-style-type: none"> ENGINE DIPSTICK. Check engine oil daily. ENGINE OIL FILL CAP. Remove cap to add oil as required. Clean if necessary. Install cap. CRANKCASE VENT AIR CLEANER. Remove air cleaner and hoses, clean and re-install. ENGINE OIL FILTER. Replace throwaway filter every other oil change. TRANSMISSION DIPSTICK. Check level and add fluid as required. Change fluid annually. Use Dexron ATF fluid. SPRING SHACKLES. Four lube fittings - front and rear. STUB. Eight lube fittings - two each wheel. WHEEL BEARINGS. Eight units. Repack during brake service inspection. STEERING ARMS. Four fittings - one each arm. SPRING ANCHORS. Two lube fittings - front and rear. FRONT AND REAR DRIVE SHAFTS. Six lube fittings. TRANSFER CASE. Drain and change oil annually. TRANSFER CASE BREATHER. Clean as required. DRIVE AXLE BREATHERS. Two - clean as required. 		

Figure 6-4. Lubrication Chart (Sheet 2 of 3)

LUBRICATION NOTES (CONT)

15. DIFFERENTIALS. Drain and change oil annually - front and rear.
16. PINTLE HOOKS. Two lube fittings - front and rear.
17. REAR BOOSTER CYLINDER ROD END. Two lube fittings - one each end.
18. BRAKE BOOSTER BREATHER. Clean as required.
19. REAR STEER CAM PIVOT. One lube fitting.
20. REAR STEER CAM LINKAGE. One lube fitting.
21. FRONT BOOSTER CYLINDER ROD ENDS. Two lube fittings - one each end.
22. BELL CRANK. One lube fitting.
23. FRONT VALVE DRAG LINK. Two lube fittings - one each end.
24. STEERING DRAG LINK. Two lube fittings - one each end.
25. STEERING GEAR. Check and replenish as required. Change oil annually.
26. MAIN DRIVE SHAFT. Two lube fittings.
27. TRANSMISSION FILTER. Replace annually.
28. TRANSMISSION BREATHER. Clean as required.
29. DISTRIBUTOR. Remove cap and rotor. Apply two drops of OE-10 to felt wick. Install rotor and cap.
30. AIR CLEANER FILTER. Clean filter quarterly with low pressure compressed air. Direct air stream from inside out. Replace filter every year or as required.
31. CRANKCASE VENT VALVE. Replace annually.
32. FUEL FILTER. Replace annually.
33. POWER STEERING PUMP RESERVOIR. Replenish as required.
34. AIR COMPRESSOR. Remove oil fill plug gage, check oil level, and add oil as required daily. Change oil quarterly. Remove air strainer and breather, clean elements, and install. Replace air strainer element as required.
35. HYDRAULIC BRAKE SYSTEM. Fill hydraulic brake master cylinder reservoir quarterly with fluid, Federal Specification VV-B-680.

LINKAGE AND PIVOT POINTS. Apply lubricant to the following as required. Do not overlubricate.

- a. Accelerator control linkage.
- b. Parking brake control linkage.
- c. Door hinges.
- d. Battery and tool box cover hinges.

Figure 6-4. Lubrication Chart (Sheet 3 of 3)

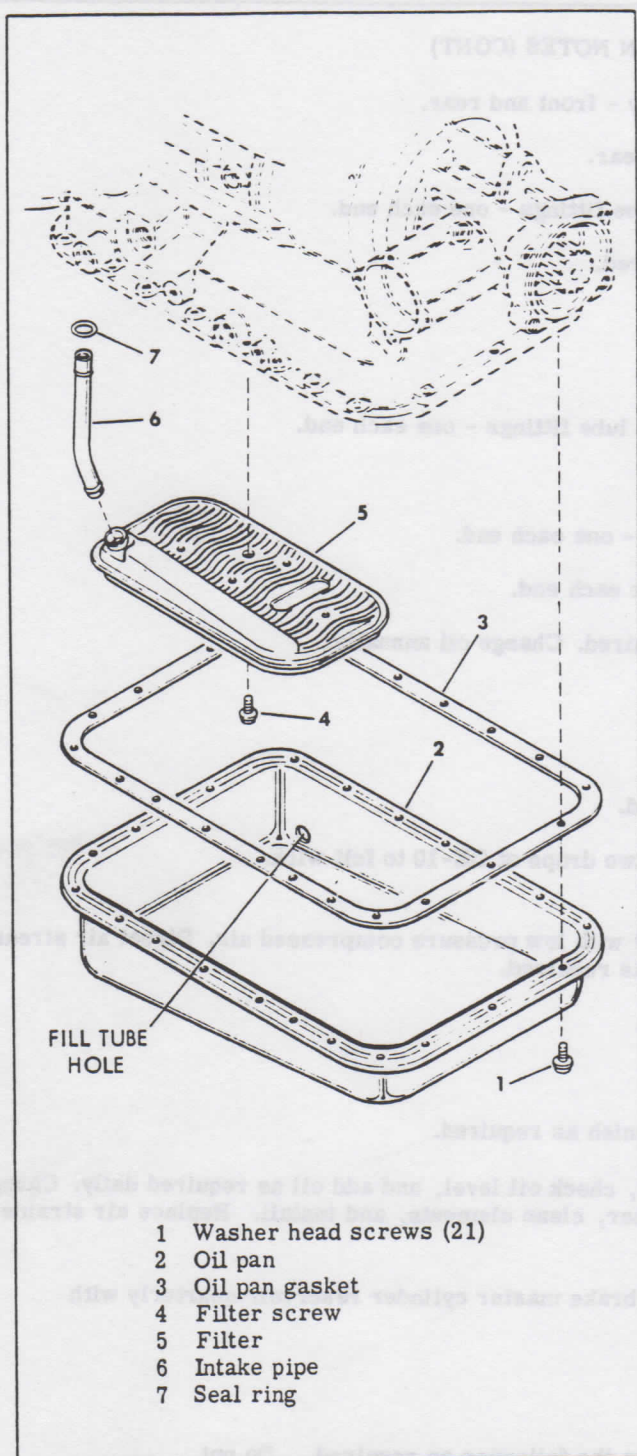


Figure 6-5. Transmission Filter

c. Remove the one screw (4) retaining the filter (5). Pull out the filter and oil intake pipe (6).

d. Install a new seal ring (7) onto the top end of the oil intake pipe, and lubricate the seal ring with the same type fluid as used to refill the transmission.

e. Insert the intake pipe and seal ring into the hole in the bottom of the transmission. Install a new oil filter (includes grommet) onto the intake pipe.

f. Install the filter screw (4) and tighten it to 10 to 13 pound-feet torque.

g. Install the oil pan gasket onto the oil pan (using oil-soluble grease to hold the gasket in place if necessary).

CAUTION

Do not use gasket-type sealing compounds any place either inside the transmission or where they might get washed into the transmission. Also, only oil-soluble greases may be used for temporarily retaining parts during assembly. Nonsoluble vegetable base cooking compounds or fibrous greases must not be used inside the transmission.

h. Install the oil pan with deeper end under the oil intake (front end of transmission), guiding it carefully into place, and avoiding any dirt or foreign material getting into pan, until a corner washer-head screw (1) can be started into the housing by hand a few turns. Install the other three corner screws in the same manner.

i. Install the remaining 17 washer-head screws by hand, carefully threading each through the gasket and into the transmission. Bottom all of the screws before tightening any of them.

j. Tighten all 21 screws evenly, while checking gasket fit, to 10 to 13 pound-feet torque.

k. Install the filler tube at the side of the pan.

l. Remove dipstick and pour approximately 10 quarts of fluid into the transmission. Check and top off fluid level as specified in paragraph 6-34.

6-36. TROUBLE AND REMEDY.

6-37. Refer to table 6-2, Trouble and Remedy Chart, for a list of common operation difficulties, the probable cause and corrective action.

TROUBLE	PROBABLE CAUSE	CHECKOUT PROCEDURE AND REMEDIAL ACTION
ENGINE TURNS OVER BUT FAILS TO START	<ol style="list-style-type: none"> 1. Lack of fuel 2. Moisture in ignition system 3. Engine flooded 4. Vapor lock 5. Clogged fuel line 6. Faulty distributor 7. Defective ignition coil 8. Faulty ignition cables 9. Faulty carburetor 	<ol style="list-style-type: none"> 1. Check fuel gage; fill fuel tank 2. Wipe moisture from spark plugs, wiring, distributor cap, and coil 3. Depress accelerator pedal fully and hold to the floor until engine starts 4. Allow engine to cool 5. Remove and clear fuel lines 6. Inspect and repair 7. Replace 8. Replace 9. Adjust and repair
ENGINE WILL NOT CRANK	<ol style="list-style-type: none"> 1. Weak battery 2. Loose or corroded battery connections 3. Defective starter motor or relay 4. Hydrostatic lock 5. Damaged valves, pistons, camshaft, or crankshaft 	<ol style="list-style-type: none"> 1. Recharge or replace 2. Clean and tighten connections 3. Repair and/or replace 4. Remove plugs and crank engine. If engine cranks, water is in cylinders. Remove head, clean cylinders, determine where water enters cylinders and repair 5. Repair and/or replace
ENGINE STARTS BUT FAILS TO KEEP RUNNING	<ol style="list-style-type: none"> 1. Inadequate choke 2. Idle mixture too lean or too rich 3. Lack of fuel at carburetor 4. Faulty fuel pump 5. Faulty carburetor 6. Leaking intake manifold 	<ol style="list-style-type: none"> 1. Adjust choke linkage 2. Adjust carburetor idle and check air filter 3. Check fuel supply; clean fuel lines 4. Replace filter and check fuel pump pressure 5. Check carburetor, particularly float chamber. Repair or adjust 6. Inspect manifold and gaskets. Replace gaskets if necessary

Table 6-2. Trouble and Remedy Chart (Sheet 1 of 7)

TROUBLE	PROBABLE CAUSE	CHECKOUT PROCEDURE AND REMEDIAL ACTION
ENGINE OVER-HEATS	<ol style="list-style-type: none"> 1. Loss of coolant 2. Dirty or clogged radiator 3. Faulty thermostat 	<ol style="list-style-type: none"> 1. Inspect for leaks at gaskets, tubing and radiator. Repair or replace faulty components 2. Clean radiator core. Flush cooling system 3. Replace
ENGINE BACK-FIRES BUT WILL NOT START	<ol style="list-style-type: none"> 1. Spark plug wires transposed, thus not firing in proper order 2. Spark plugs shorted 3. Timing incorrect 	<ol style="list-style-type: none"> 1. Connect plug wires to plugs in correct order 2. Wipe dirt, oil and water from plugs and cables 3. Time engine
ENGINE HAS NO POWER	<ol style="list-style-type: none"> 1. Incorrect timing 2. Defective distributor 3. Defective spark plug 4. Faulty fuel pump 5. Faulty carburetor 6. Blown cylinder head gasket 	<ol style="list-style-type: none"> 1. Time engine 2. Inspect, adjust and repair distributor 3. Replace with plugs of proper heat range 4. Replace 5. Remove and overhaul carburetor 6. Replace
ENGINE RUNS ROUGH	<ol style="list-style-type: none"> 1. Engine requires tuneup 2. Defect in one or more cylinders (faulty compression) 3. Valves sticking 4. Timing incorrect 	<ol style="list-style-type: none"> 1. Tune engine 2. Check compression and overhaul if necessary 3. Overhaul valve system 4. Time engine
FUEL DOES NOT REACH CARBURETOR	<ol style="list-style-type: none"> 1. Clogged fuel line 2. Faulty fuel pump 3. Obstruction in carburetor 	<ol style="list-style-type: none"> 1. Blow out fuel lines 2. Replace 3. Remove, clean and repair

Table 6-2. Trouble and Remedy Chart (Sheet 2 of 7)

TROUBLE	PROBABLE CAUSE	CHECKOUT PROCEDURE AND REMEDIAL ACTION
CARBURETOR FLOODS (continually)	<ol style="list-style-type: none"> 1. Float on carburetor set too high 2. Dirt under float needle 3. Fuel pump pressure too high 	<ol style="list-style-type: none"> 1. Adjust float level 2. Clean carburetor 3. Check fuel pump pressure. If high, replace fuel pump
LACK OF SPARK AT ALL PLUGS	<ol style="list-style-type: none"> 1. Faulty ignition coil 2. Broken leadwire at input or output of ignition coil 3. Damaged distributor 	<ol style="list-style-type: none"> 1. Replace 2. Replace 3. Repair
LACK OF SPARK AT SOME BUT NOT ALL PLUGS	<ol style="list-style-type: none"> 1. Faulty plug wire 2. Loose connections 3. Faulty distributor 	<ol style="list-style-type: none"> 1. Replace 2. Tighten all ignition connections 3. Repair
LACK OF OIL PRESSURE	<ol style="list-style-type: none"> 1. Loss of oil 2. Defective oil sending unit 3. Defective gage 4. Oil pump broken 5. Worn bearings 	<ol style="list-style-type: none"> 1. Check oil system for leaks 2. Replace 3. Replace 4. Replace 5. Replace
ENGINE DOES NOT REACH OPERATING TEMPERATURE	<ol style="list-style-type: none"> 1. Defective thermostat 	<ol style="list-style-type: none"> 1. Replace
FAULTY STEERING (Loose, hard steering or jerky steering)	<ol style="list-style-type: none"> 1. Tire pressure low 2. Steering gear maladjusted 3. Worn pivot bearings, spindles, bearings, steering gear cam 	<ol style="list-style-type: none"> 1. Inflate tires 2. Adjust 3. Repair steering system
POWER STEERING INTERMITTENT ASSIST	<ol style="list-style-type: none"> 1. Low fluid level 2. Slipping belt 3. Flow control valve sticking 4. Low pump pressure 	<ol style="list-style-type: none"> 1. Correct fluid level 2. Adjust or replace 3. Replace 4. Replace pump

Table 6-2. Trouble and Remedy Chart (Sheet 3 of 7)

TROUBLE	PROBABLE CAUSE	CHECKOUT PROCEDURE AND REMEDIAL ACTION
POWER STEERING NO ASSIST	<ol style="list-style-type: none"> 1. Broken hydraulic line 2. Flow control valve sticking 3. Pump seizure 	<ol style="list-style-type: none"> 1. Replace 2. Pressure test pump 3. Replace
POWER STEERING PUMP NOISY	<ol style="list-style-type: none"> 1. Belt noise 2. Pulley loose or out of round 3. Crankshaft pulley loose or damaged 	<ol style="list-style-type: none"> 1. Inspect for proper tension 2. Replace 3. Tighten or replace as required
BRAKES LOCK	<ol style="list-style-type: none"> 1. Restricted port in master cylinder 2. Piston cups swollen in master cylinder 3. Damaged brake linkage 	<ol style="list-style-type: none"> 1. Bleed system at wheel cylinder to move vehicle. Remove and clean master cylinder 2. Remove and replace piston cups. Flush and replace fluid 3. Inspect, repair or replace parts
BRAKES SPONGY	<ol style="list-style-type: none"> 1. Air in hydraulic system 	<ol style="list-style-type: none"> 1. Bleed the system and check brake adjustment
BRAKES GRAB	<ol style="list-style-type: none"> 1. Moisture on brake linings 2. Brakes out of adjustment 3. Oil or grease on lining 	<ol style="list-style-type: none"> 1. Allow linings to dry. Move vehicle against brake pressure to dry linings 2. Adjust brakes 3. Correct oil leak and replace lining
BRAKES FAIL	<ol style="list-style-type: none"> 1. Broken brake hydraulic line 2. Broken brake mechanical linkage 3. Worn brake linings 	<ol style="list-style-type: none"> 1. Locate and replace broken line 2. Disassemble and replace broken brake linkage 3. Reline brakes
EXCESSIVE VEHICLE CREEP	<ol style="list-style-type: none"> 1. Engine idle too high 	<ol style="list-style-type: none"> 1. Adjust engine idle speed
VEHICLE MOVEMENT IN NEUTRAL	<ol style="list-style-type: none"> 1. Improper linkage adjustment 2. Faulty transmission clutches 	<ol style="list-style-type: none"> 1. Adjust 2. Repair transmission
SLIPPAGE IN ALL GEARS	<ol style="list-style-type: none"> 1. Transmission fluid level low 2. Low transmission clutch pressure 	<ol style="list-style-type: none"> 1. Add fluid. Investigate cause of leakage and repair 2. Repair transmission

Table 6-2. Trouble and Remedy Chart (Sheet 4 of 7)

TROUBLE	PROBABLE CAUSE	CHECKOUT PROCEDURE AND REMEDIAL ACTION
SLIPPAGE IN ANY GIVEN GEAR	<ol style="list-style-type: none"> 1. Faulty transmission clutch 2. Defective transmission clutch seals 3. Defective converter hub seal ring 	<ol style="list-style-type: none"> 1. Repair transmission 2. Repair transmission 3. Repair transmission
NO DRIVE IN ANY TRANSMISSION RANGE	<ol style="list-style-type: none"> 1. Transmission fluid level low 2. Transmission fluid filter clogged 3. Faulty range selection linkage 4. Low transmission main pressure 5. Defective transmission clutch piston seals 	<ol style="list-style-type: none"> 1. Add fluid. Investigate cause of fluid loss and repair 2. Replace filter 3. Repair linkage 4. Repair transmission 5. Repair transmission
ERRATIC SHIFTING	<ol style="list-style-type: none"> 1. Transmission fluid level low 	<ol style="list-style-type: none"> 1. Check and add fluid as required. Investigate cause of leakage and repair
ROUGH SHIFTING	<ol style="list-style-type: none"> 1. Faulty range selection linkage 2. Faulty transmission timing valve 3. Sticking valves in transmission 	<ol style="list-style-type: none"> 1. Adjust or repair as required 2. Repair transmission 3. Repair transmission
TRANSMISSION OVERHEATS	<ol style="list-style-type: none"> 1. Fluid level low 2. Fluid level high 3. Restricted oil cooler lines 4. Faulty oil cooler (radiator) 5. Stator slipping 6. Faulty converter ground sleeve bushing 	<ol style="list-style-type: none"> 1. Add fluid 2. Drain to lube requirements 3. Inspect lines and clean as needed 4. Inspect radiator and repair 5. Repair transmission 6. Repair transmission
TRANSMISSION FLUID LOSS AT FILL TUBE	<ol style="list-style-type: none"> 1. Loose dipstick 2. Clogged transmission breather vent 3. Fluid level high 	<ol style="list-style-type: none"> 1. Install properly 2. Clean 3. Drain to lube requirements

Table 6-2. Trouble and Remedy Chart (Sheet 5 of 7)

TROUBLE	PROBABLE CAUSE	CHECKOUT PROCEDURE AND REMEDIAL ACTION
TIRES WEARING UNEVEN	<ol style="list-style-type: none"> 1. Wheels loose 2. Low air pressure 3. Improper steering adjustment 	<ol style="list-style-type: none"> 1. Tighten wheel nuts 2. Inflate tires 3. Adjust steering
BATTERY LOW IN CHARGE	<ol style="list-style-type: none"> 1. Battery defective 2. Alternator output below normal 3. Loose or worn alternator belts 4. Defective alternator 	<ol style="list-style-type: none"> 1. Replace 2. Repair and adjust charging system 3. Adjust or replace 4. Repair or replace
CHARGING RATE TOO HIGH	<ol style="list-style-type: none"> 1. Defective regulator 	<ol style="list-style-type: none"> 1. Replace
ALTERNATOR OUTPUT TOO LOW	<ol style="list-style-type: none"> 1. Loose connection 2. Worn brushes 3. Field coils shorted 4. Defective diode(s) 	<ol style="list-style-type: none"> 1. Tighten all connections 2. Replace 3. Repair or replace 4. Replace
STARTER MOTOR WILL NOT CRANK ENGINE	<ol style="list-style-type: none"> 1. Dead battery 2. Defective starter switch 3. Defective starter relay 4. Defective neutral starting switch 5. Starter motor drive locked 6. Defective starter motor 	<ol style="list-style-type: none"> 1. Charge or replace battery 2. Replace 3. Replace 4. Replace 5. Replace 6. Repair or replace
STARTER MOTOR SPINS BUT DOES NOT CRANK ENGINE	<ol style="list-style-type: none"> 1. Starter motor drive dirty or worn and sticks on shaft 	<ol style="list-style-type: none"> 1. Clean starter motor drive. Replace worn parts
VIBRATION OR EXCESSIVE NOISE AT U-JOINTS	<ol style="list-style-type: none"> 1. U-Joints improperly assembled 2. Worn journals or bearings 	<ol style="list-style-type: none"> 1. Align 2. Replace U-Joints
NOISY DIFFERENTIAL	<ol style="list-style-type: none"> 1. Lack of lubricant 2. Worn drive pinion, ring gear, or bearings 3. Bevel drive gears bearing worn 	<ol style="list-style-type: none"> 1. Lubricate differential 2. Replace 3. Replace

Table 6-2. Trouble and Remedy Chart (Sheet 6 of 7)

TROUBLE	PROBABLE CAUSE	CHECKOUT PROCEDURE AND REMEDIAL ACTION
NOISY AXLE	1. Worn wheel bearings	1. Replace
DIFFERENTIAL LOCK LEVER HARD TO SHIFT	1. Locking ball spring cap screw not properly adjusted.	1. Adjust cap screw as specified in paragraph 1-127 of T.O. 36A10-3-23-3.
ACCELERATOR PEDAL STICKS	1. Lack of lubrication 2. Linkage damaged 3. Pedal return spring broken	1. Lubricate 2. Repair 3. Replace
HORN DOES NOT OPERATE	1. Loose electrical connections 2. Defective horn 3. Defective horn button	1. Tighten connections 2. Replace 3. Replace
SPEEDOMETER DOES NOT OPERATE OR OPERATES ERRATICALLY	1. Speedometer drive loose 2. Defective speedometer drive 3. Defective speedometer 4. Dry cable	1. Tighten drive 2. Replace 3. Replace 4. Lubricate
AIR TANKS DO NOT HOLD PRESSURE	1. Leaks in air system 2. Open emergency cut-out cock 3. Defective check valve	1. Tighten loose fittings 2. Close cut-out cock 3. Replace
LOW SYSTEM AIR PRESSURE	1. Leaks in air system 2. Dirty air compressor air strainer 3. Restricted discharge line 4. Drive belt slipping 5. Inlet valves stuck 6. Worn inlet valves	1. Tighten loose fittings 2. Clean 3. Clean 4. Adjust 5. Repair air compressor 6. Repair air compressor
NOISY AIR COMPRESSOR	1. Loose drive pulley 2. Inadequate lubrication 3. Restrictions in cylinder head or discharge line 4. Excessive wear in air compressor	1. Secure 2. Check oil level and replenish 3. Repair 4. Repair
AIR COMPRESSOR NOT UNLOADING	1. Defective unloader pistons 2. Intake cavity restrictions 3. Defective governor 4. Sticking unloader mechanism	1. Repair 2. Repair 3. Repair 4. Repair

Table 6-2. Trouble and Remedy Chart (Sheet 7 of 7)

SECTION VII

REMOVAL AND INSTALLATION OF ASSEMBLIES

7-1. GENERAL.

7-2. This section contains instructions for the removal, minor repair, adjustment and installation of components, assemblies and accessories which fall within the scope of operational maintenance.

7-3. HEADLIGHTS.

7-4. REMOVAL. (See figure 7-1.) The tractor is equipped with two headlights. Removal of components is the same for both units.

a. Remove screw (5) and remove rim (6). Remove three screws (8) and remove retainer (7).

b. Remove lamp (9) from body (11). Unplug wiring assembly (10).

c. Remove nut (1) and lock washer (2) and special washers (3 and 4). Remove body (11) from bracket.

7-5. MINOR REPAIR. Replace cracked, broken or fogged lamp-unit. Replace worn, weathered or damaged wiring assembly. Inspect all parts for damage

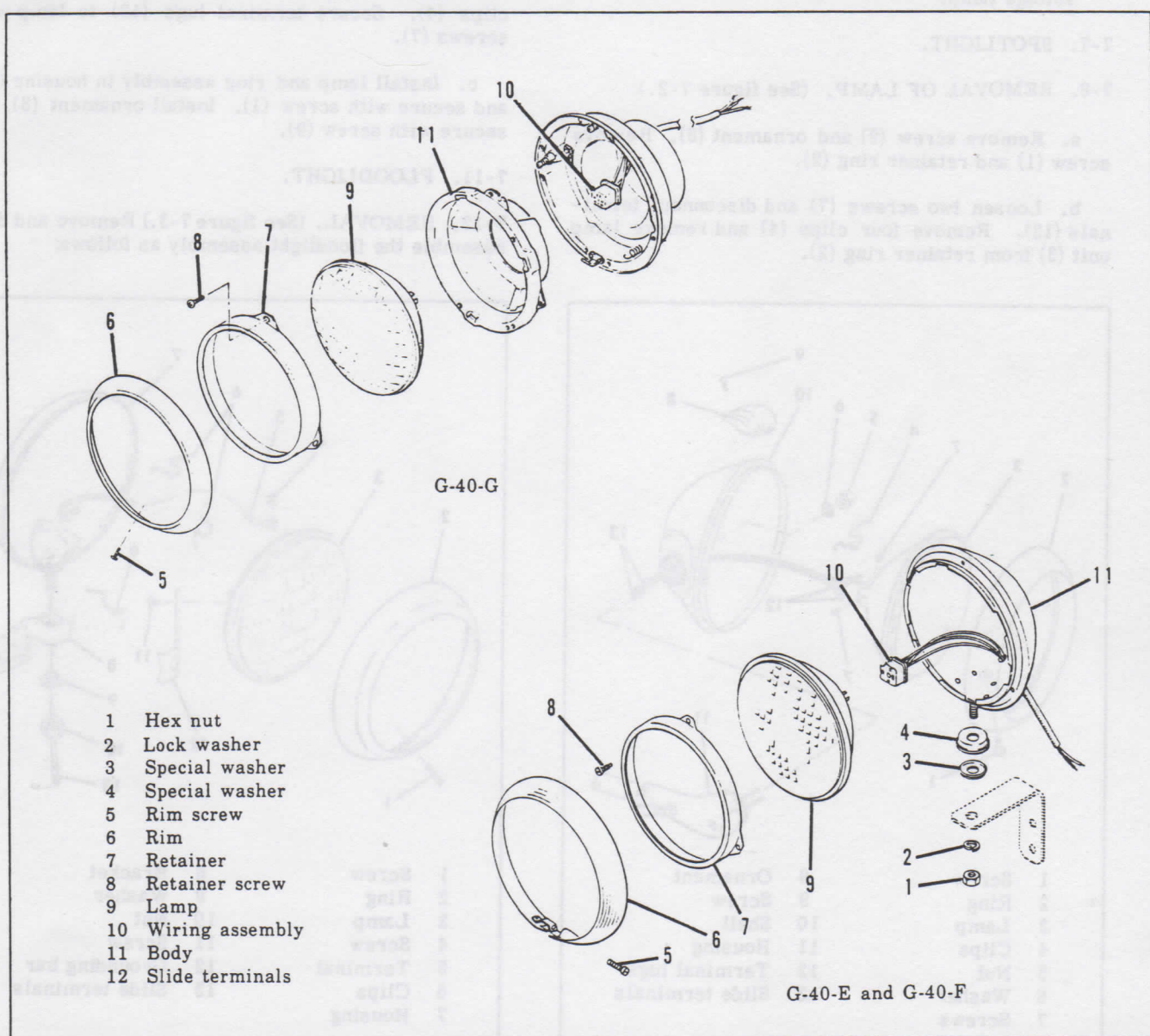


Figure 7-1. Headlight

and replace all non-repairable parts. inspect all screw threads before assembly.

7-6. INSTALLATION.

a. Install special washers (3) and 4) on body (11) and secure body to bracket with lock washer (2) and nut (1).

b. Install wiring assembly (10) in body and plug in leads.

c. Plug lamp (9) in wiring assembly (10). Install retainer (7) and secure with three screws (8). Install rim (6) and secure with screw (5).

CAUTION

When replacing lamp unit, always use proper voltage lamp.

7-7. SPOTLIGHT.

7-8. REMOVAL OF LAMP. (See figure 7-2.)

a. Remove screw (9) and ornament (8). Remove screw (1) and retainer ring (2).

b. Loosen two screws (7) and disconnect terminals (12). Remove four clips (4) and remove lamp unit (3) from retainer ring (2).

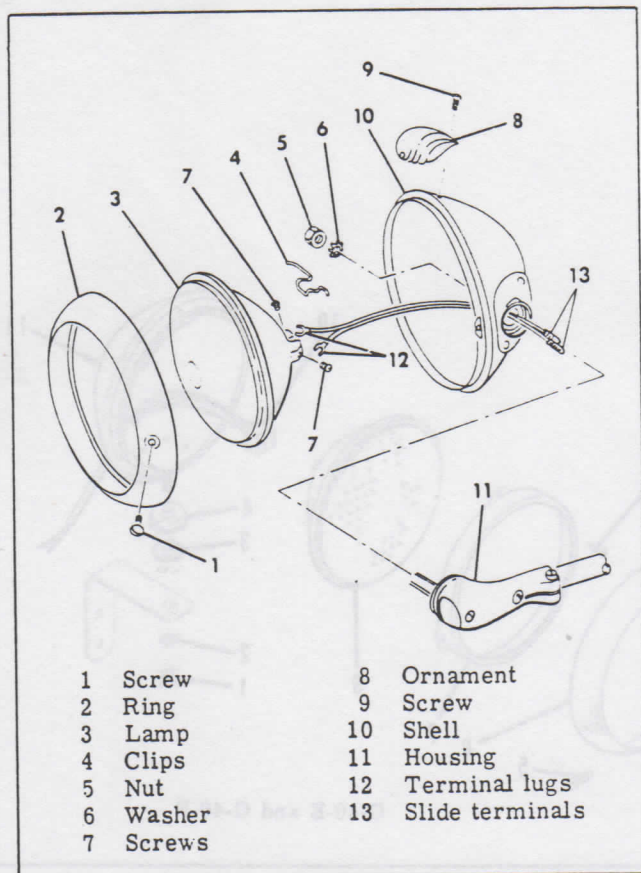


Figure 7-2. Spotlight

c. Remove nut (5) and washer (6) and remove shell (10) from housing (11).

7-9. MINOR REPAIR. Replace broken, cracked or burned out lamp unit. Inspect all parts for damage and corrosion. Clean corroded parts and replace non-repairable parts. Inspect threads on all hardware before installation.

7-10. INSTALLATION.

a. Place terminals (12) through shell (10). Secure shell (10) to housing (11) with washer (6) and nut (5).

CAUTION

When replacing lamp unit, always use proper voltage lamp.

b. Install lamp (3) in retainer ring (2) with four clips (4). Secure terminal lugs (12) to lamp with screws (7).

c. Install lamp and ring assembly in housing (10) and secure with screw (1). Install ornament (8) and secure with screw (9).

7-11. FLOODLIGHT.

7-12. REMOVAL. (See figure 7-3.) Remove and disassemble the floodlight assembly as follows:

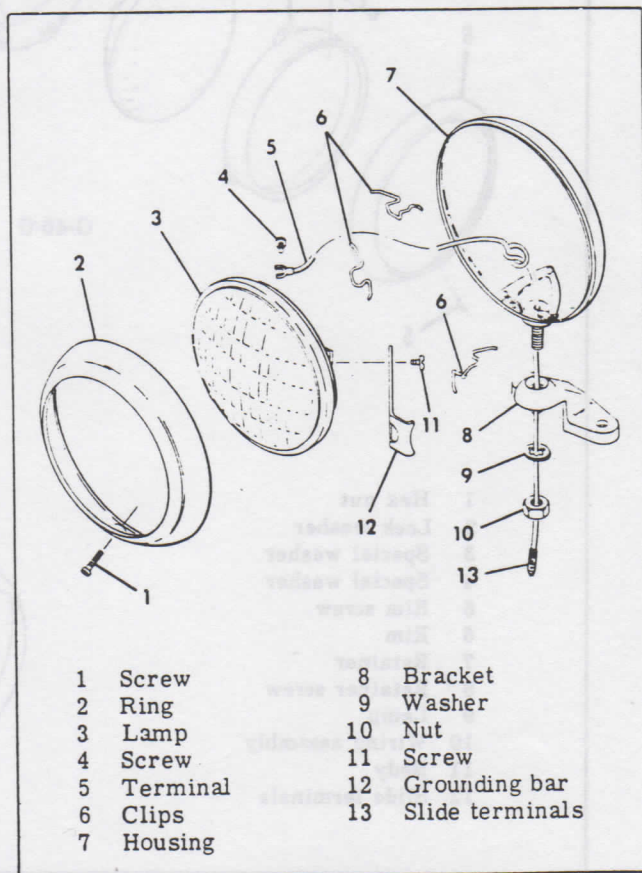


Figure 7-3. Floodlight

a. Remove screw (1) and remove ring (2). Remove three clips (6) and remove lamp (3) from housing (7).

b. Loosen screw (4) and remove terminal (5). Remove screw (11) and grounding bar (12).

c. Remove nut (10) and washer (9) and remove housing (7) from bracket (8).

7-13. MINOR REPAIR. Replace broken, cracked or burned out lamp unit. Inspect terminal and ground bar for corrosion, clean if required. Inspect all parts for damage and replace non-repairable parts. Inspect all hardware before installation.

7-14. INSTALLATION.

a. Place wire lead through housing (7) and secure housing to bracket (8) with washer (9) and nut (10).

CAUTION

When replacing lamp unit, always select proper voltage lamp.

b. Attach grounding bar (12) to lamp (3) and secure with screw (11). Attach terminal (5) to lamp (3) and tighten screw (4).

c. Install lamp (3) in housing (7) and secure with three clips (6). Install ring (2) and secure with screw (1).

7-15. TAILLIGHT/STOPLIGHT.

7-16. REMOVAL. (See figure 7-4). The tractor is

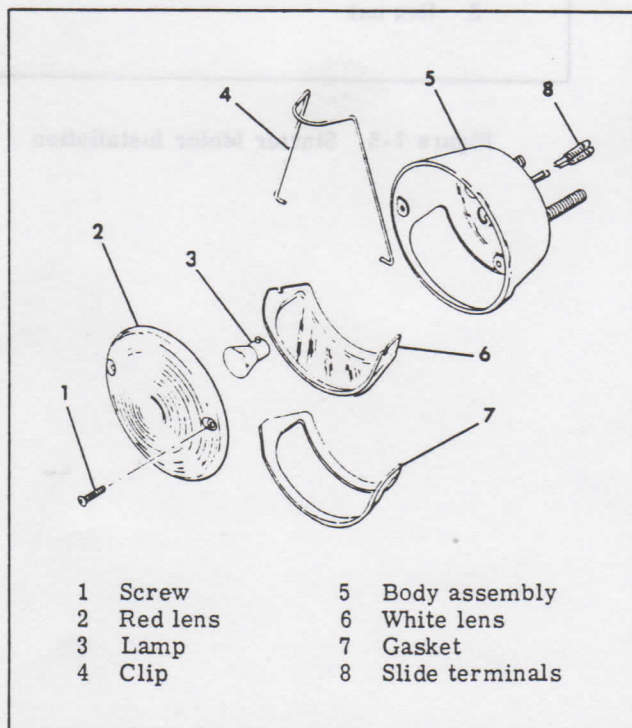


Figure 7-4. Taillight/Stoplight

equipped with one tailland stoplight assembly. Remove the components as follows:

a. Remove two screws (1) and red lens (2) from body assembly (5). Remove lamp (3).

b. Remove clip (4) and remove white lens (6) and gasket (7) from body assembly (5).

7-17. MINOR REPAIR. Replace all cracked or broken lenses. Replace broken or burned out lamp. Inspect gasket for deterioration and replace if necessary. Inspect all screw threads before installation.

7-18. INSTALLATION.

a. Install gasket (7) and white lens (6) in body assembly (5) and secure with clip (4).

CAUTION

When replacing lamp, always use a 12-volt lamp.

b. Install lamp (3). Install red lens (2) and secure with two screws (1).

7-18A. BEACON. (G-40-F and G-40-G models only)

7-18B. REMOVAL. (See figure 7-4A)

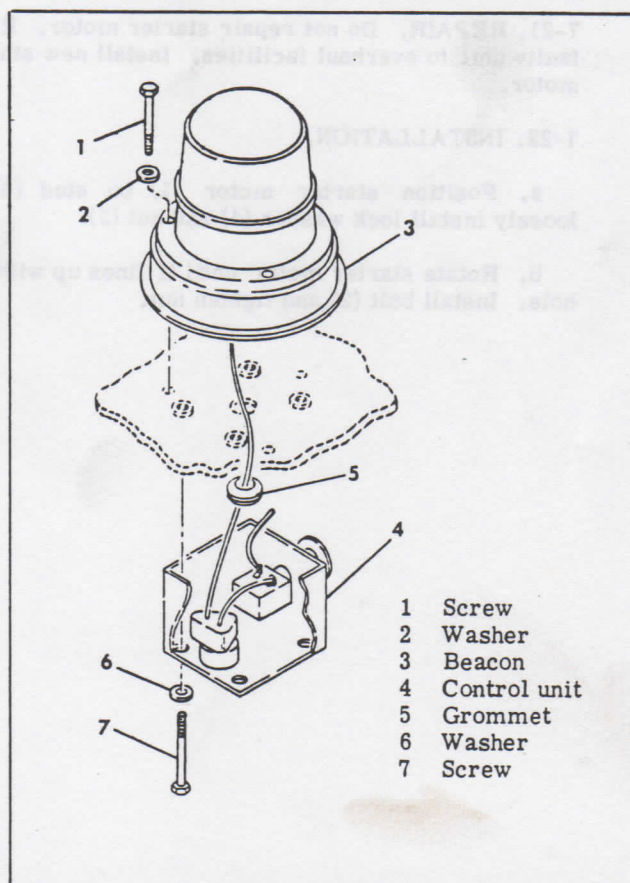


Figure 7-4A. Beacon

a. Remove attaching parts (1, 2, 6 and 7) and disconnect wiring.

b. Remove beacon (3) from top of cab, and control unit (4) from inside.

7-18C. MINOR REPAIR. Replace broken, cracked, or burned out lamp unit. Inspect all parts for damage and corrosion. Replace flasher or switch if required.

7-18D. INSTALLATION.

a. Place wiring through roof grommet (5), connect to control unit.

b. Install with attaching hardware (1, 2, 6 and 7).

7-19. STARTER MOTOR.

7-20. REMOVAL. (See figure 7-5)

a. Disconnect battery cables.

b. Disconnect cable and wire to starter solenoid.

c. Remove bolt (2), nut (3) and lock washer (4) to detach starter motor (1) from transmission drive plate housing.

d. Carefully withdraw starter motor.

7-21. REPAIR. Do not repair starter motor. Refer faulty unit to overhaul facilities. Install new starter motor.

7-22. INSTALLATION.

a. Position starter motor (1) on stud (5) and loosely install lock washer (4) and nut (3).

b. Rotate starter motor until it lines up with bolt hole. Install bolt (2) and tighten nut.

c. Connect cable and leadwire to starter solenoid.

d. Connect battery cables.

e. Start engine to check operation of starter motor.

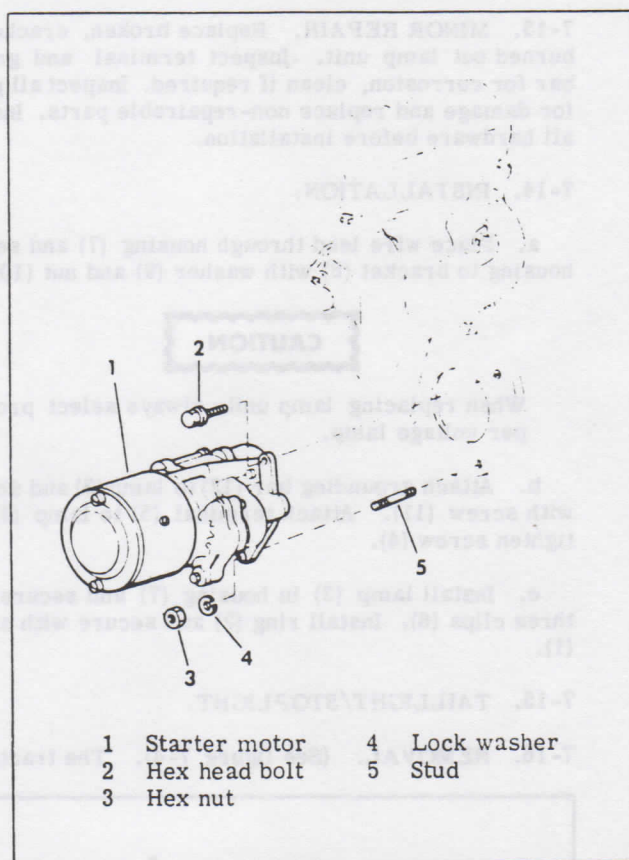


Figure 7-5. Starter Motor Installation

7-23. ALTERNATOR.

a. Make sure ignition switch is off. Disconnect battery cables.

7-24. REMOVAL. (See figure 7-6 for G-40-E models and figure 7-6A for G-40-F and G-40-G models)

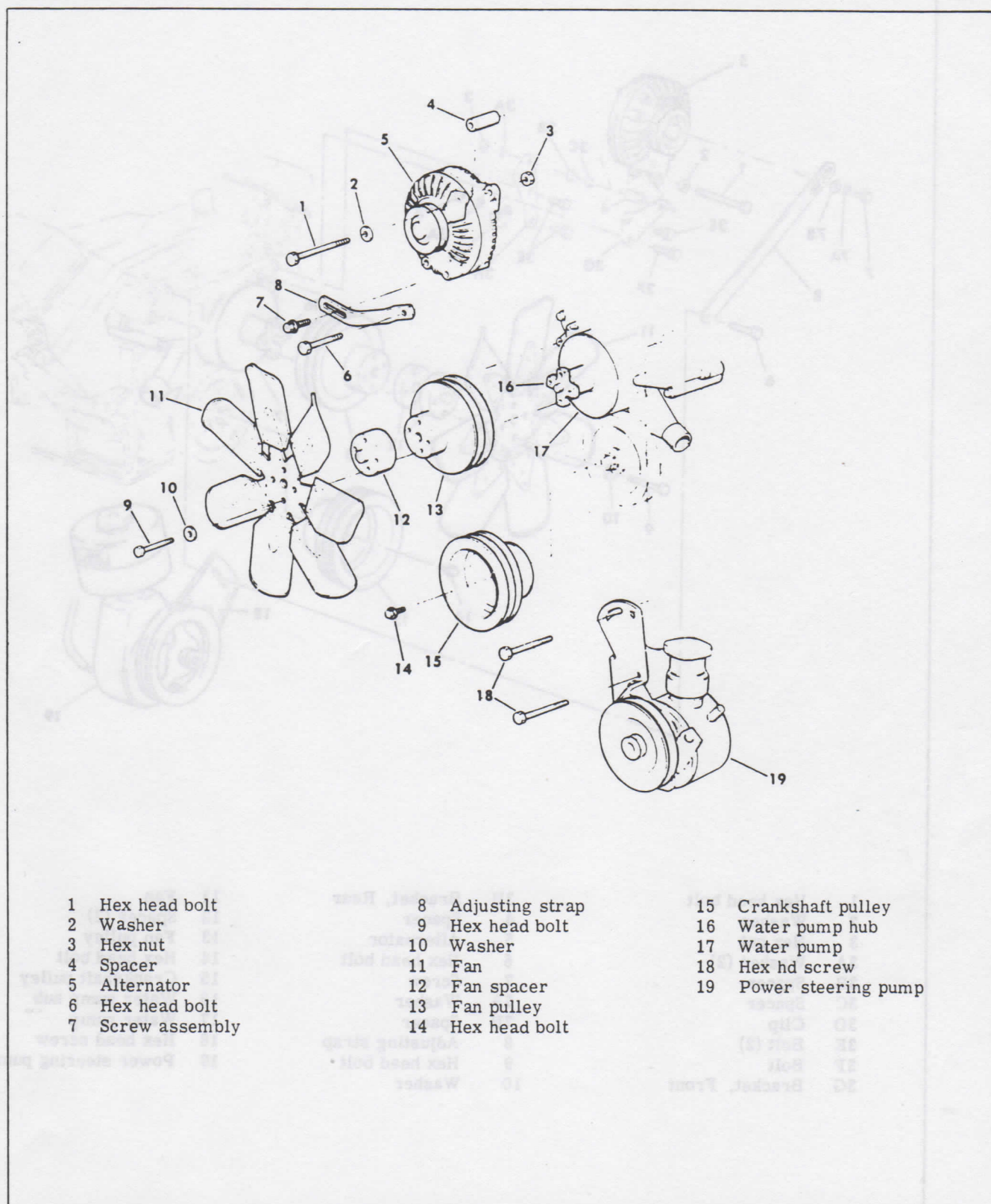
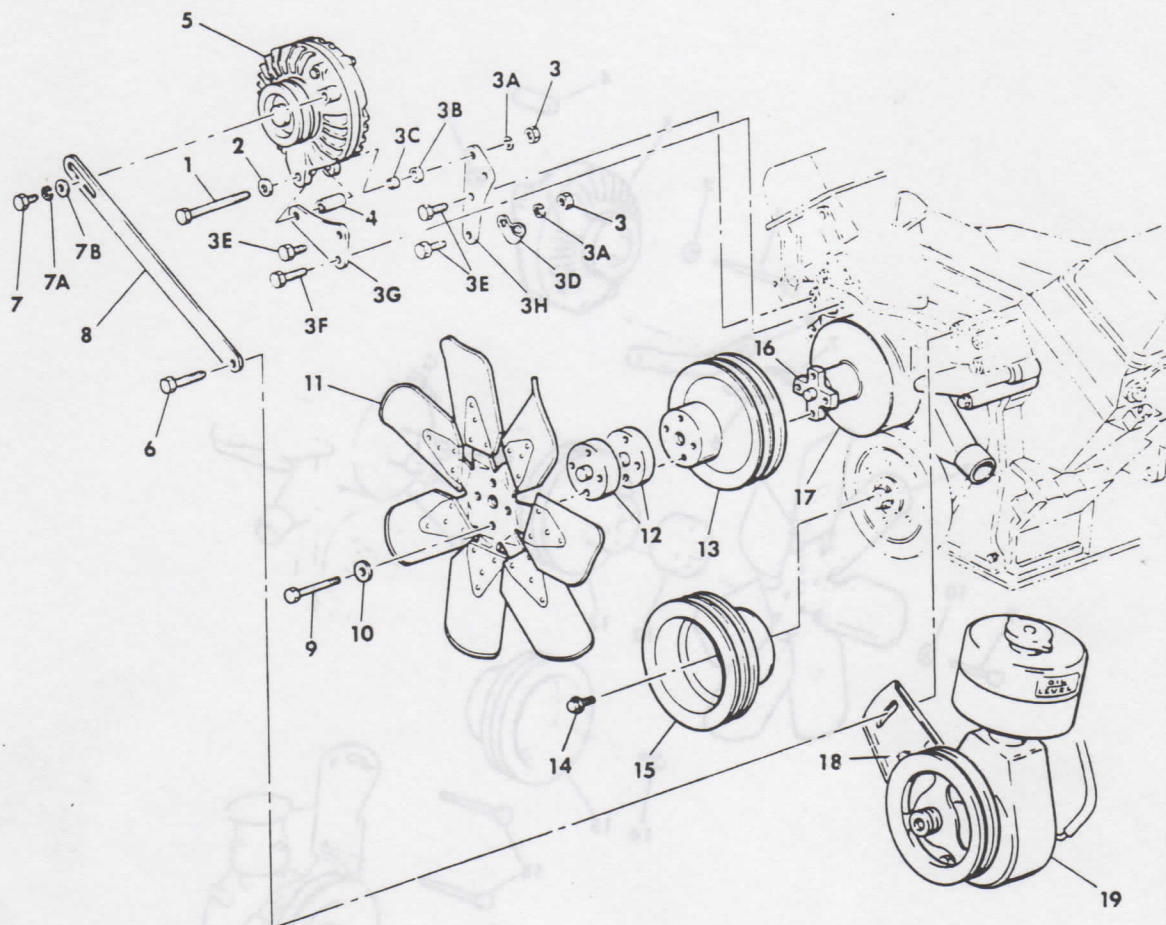


Figure 7-6. Alternator and Pump Installation



1 Hex head bolt
2 Washer
3 Hex nut
3A Washer (2)
3B Spacer
3C Spacer
3D Clip
3E Bolt (2)
3F Bolt
3G Bracket, Front

3H Bracket, Rear
4 Spacer
5 Alternator
6 Hex head bolt
7 Screw
7A Washer
7B Spacer
8 Adjusting strap
9 Hex head bolt
10 Washer

11 Fan
12 Spacer (2)
13 Fan pulley
14 Hex head bolt
15 Crankshaft pulley
16 Water pump hub
17 Water pump
18 Hex head screw
19 Power steering pump

Figure 7-6A. Alternator and Pump Installation

b. Disconnect the lead at the alternator output terminal (the lead to the battery).

c. Disconnect the lead at the alternator field terminal.

d. Loosen bolts (1 and 7) and move alternator toward drive shaft.

e. Remove alternator drive belt.

f. Remove bolts (1 and 7), washer (2), spacer (4), hex nut (3) and alternator (5).

7-25. REPAIR. Replace brushes as follows (see figure 7-7):

a. Remove retainer screw (1), washer (2), axial brush assembly (3) and holder (4).

b. Remove second retainer screw, washer and radial brush assembly (6).

c. Check the brushes. Brushes should move up and down easily in the holders. Brush and spring should indicate no evidence of binding or scraping. Replace parts as necessary. If brushes are worn more than half their length, replace brushes as a set.

d. Insert axial brush assembly (3) in holder (4) with insulated washer (2) and retainer screw (1). Install this unit (5) in alternator.

e. Install radial brush assembly (6) and secure with second retainer screw.

7-26. INSTALLATION. (See figure 7-6.) Before installing alternator, make sure alternator and mounting surfaces are free of dirt and oil to insure a good electrical contact, and make sure ignition switch is off.

a. Position alternator (5) and install bolt (1) and spacer (4), washer (2) and nut (3).

b. Install bolt (7).

c. Install drive belt.

d. Adjust belt tension by moving alternator toward or away from drive shaft. Deflection of the belt at the center should not exceed 3/4 inch. Secure alternator by tightening attaching bolts (1 and 7).

e. Connect the lead to alternator field terminal (comes from regulator).

f. Connect the lead to alternator output terminal.

g. Connect battery cables.

CAUTION

Take care in connecting cables. If cables are reversed, alternator may be damaged.

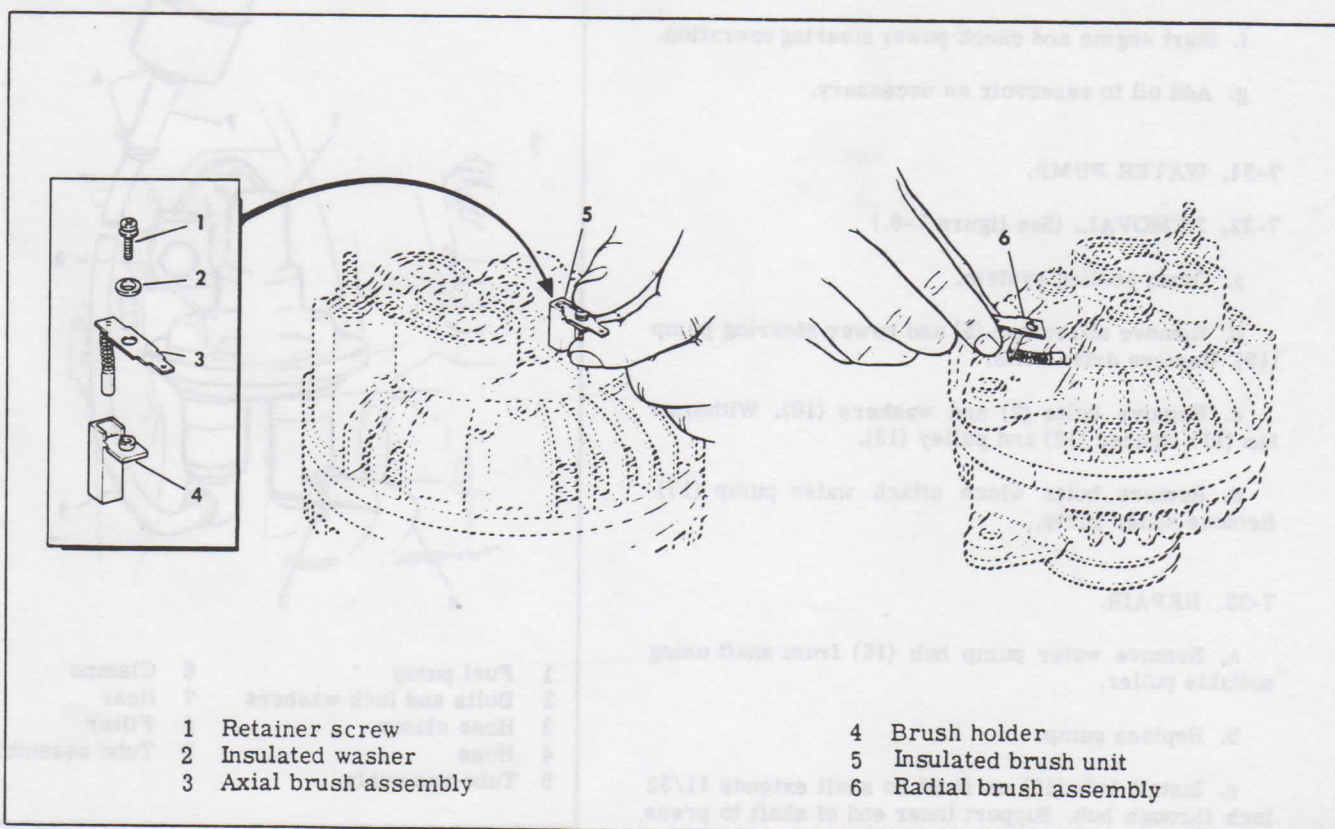


Figure 7-7. Alternator Brushes

h. Start engine and see that ammeter registers a charge condition.

7-27. POWER STEERING PUMP.

7-28. REMOVAL.

a. Disconnect hydraulic hoses to steering pump and drain oil into suitable container.

b. Remove two mounting bolts which attach pump and brackets to engine.

c. Remove three screws which attach bracket to steering pump.

7-29. REPAIR. Do not repair pump. Refer faulty unit to overhaul facilities. Install new pump.

7-30. INSTALLATION.

a. Fasten pump mounting bracket to steering pump with three screws.

b. Mount pump and bracket on engine with two bolts.

c. Position drive belt and adjust tension. Tighten mounting bolts.

d. Connect hydraulic hoses to pump.

e. Refill reservoir with oil.

f. Start engine and check power steering operation.

g. Add oil to reservoir as necessary.

7-31. WATER PUMP.

7-32. REMOVAL. (See figure 7-6.)

a. Drain cooling system.

b. Remove alternator (5) and power steering pump (19). Remove drive belts.

c. Remove bolts (9) and washers (10). Withdraw fan (11), spacer (12) and pulley (13).

d. Remove bolts which attach water pump (17). Remove water pump.

7-33. REPAIR.

a. Remove water pump hub (16) from shaft using suitable puller.

b. Replace pump.

c. Install hub (16) on shaft so shaft extends 11/32 inch through hub. Support inner end of shaft to press hub into place. Take care not to damage inner water pump seal.

7-34. INSTALLATION.

a. Position water pump (17) with new gasket and attach with bolts. Torque bolts to 30 pound-feet.

b. Rotate water pump by hand to be sure it rotates freely.

c. Position pulley (13), spacer (12) and fan (11) on hub (16). Install bolts (9) and washers (10) to secure.

d. Install alternator, steering pump and drive belts. Position alternator and steering pump to adjust belt tension. Tighten mounting bolts.

e. Service cooling system.

7-35. FUEL PUMP AND FILTER.

7-36. REMOVAL. (See figure 7-8.)

a. Disconnect tube assembly (5) from fuel pump (1). Allow fuel to drain into suitable container.

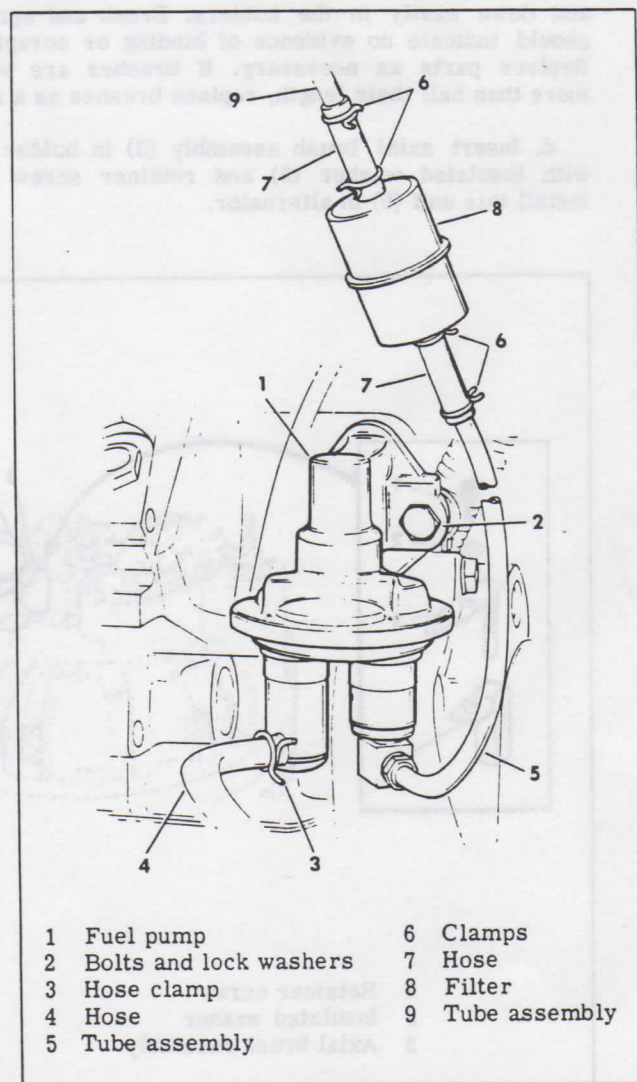


Figure 7-8. Fuel Pump Installation

b. Remove hose clamps (6) and take off hoses (7) and fuel filter (8).

c. Disconnect hose clamp (3) and fuel line hose (4).

d. Remove hardware (2) to detach fuel pump (1).

7-37. REPAIR. Do not repair fuel pump. Install new unit. Discard fuel filter.

7-38. INSTALLATION.

a. Install inlet and outlet fittings on fuel pump.

b. Mount new fuel pump (1) on engine with two bolts and washers (2).

c. Connect fuel line hose (4) with clamp (3).

d. Install new fuel filter (8) between tube assemblies (5 and 9) using hoses (7) and clamps (6).

e. Connect tube assembly (5) to fuel pump.

f. Start engine and run until pump fills fuel lines and engine runs smoothly.

NOTE

If engine stops, prime carburetor. If engine fails to continue running, check all hoses, lines and connections for leaks and improper installation.

7-39. TIRES AND WHEELS.

7-40. REMOVAL. Set the parking brake and remove the tire and wheel assembly as follows:

WARNING

Assure wheels are properly chocked to avoid injury to personnel. Since tractor gross weight is 10,700 pounds (18,000 pounds for G-40-G309), use proper capacity jack.

a. Place jack under axle and raise the tractor until the tire just clears ground.

b. Remove six nuts and rim clamps and remove tire and wheel assembly.

7-41. INSTALLATION.

a. With tractor jacked up, mount tire and wheel assembly.

CAUTION

Care shall be taken to prevent thread damage and keep rim clamps in position while tightening nuts.

b. Install six nuts and rim clamps.

CAUTION

Tighten nuts alternately.

c. Lower tractor and remove jack.

7-42. AIR COMPRESSOR.

7-43. REMOVAL. (See figure 7-9.)

WARNING

Relieve pressure in air system before any disassembly.

a. Disconnect discharge line (1) and governor return line (2) at air compressor.

NOTE

Drain engine cooling system before removing air compressor or cooling lines.

b. Remove hose clamps (3) and hoses (4 and 5).

c. Remove connectors (6), elbows (7), bushings (8 and 11), pipe plugs (9), tee (10) and nipple (12) as required.

d. Remove elbow (13). Do not remove discharge fitting (14) at this time.

e. Remove cap screws (18), lock washers (19), and hex nuts (20). Slide air compressor (17) toward engine to relieve tension on belt (15). Remove drive belt (15) and air compressor (17).

f. Remove cotter pin and castellated nut from end of air compressor shaft and pull off pulley (16).

g. Remove cap screws (22), lock washers (23) and hex nuts (24) to detach bracket (21) as required.

h. Disconnect tube assembly (26) from water bleed fitting (31) and bushing (33) as required.

i. Remove hose clamps (28), hoses (29 and 30) and water bleed fitting (31) between radiator and engine as required.

j. Remove bushing (33), elbows (34) and valve (25) from water pump as required.

7-44. REPAIR. Do not repair air compressor. Return faulty air compressor to overhaul facilities. Install new or reconditioned air compressor.

7-45. INSTALLATION. (See figure 7-9.)

a. Install pipe tees (34), bushing (33) and elbow (32) on water pump. Install elbow (27) on water bleed fitting (31).

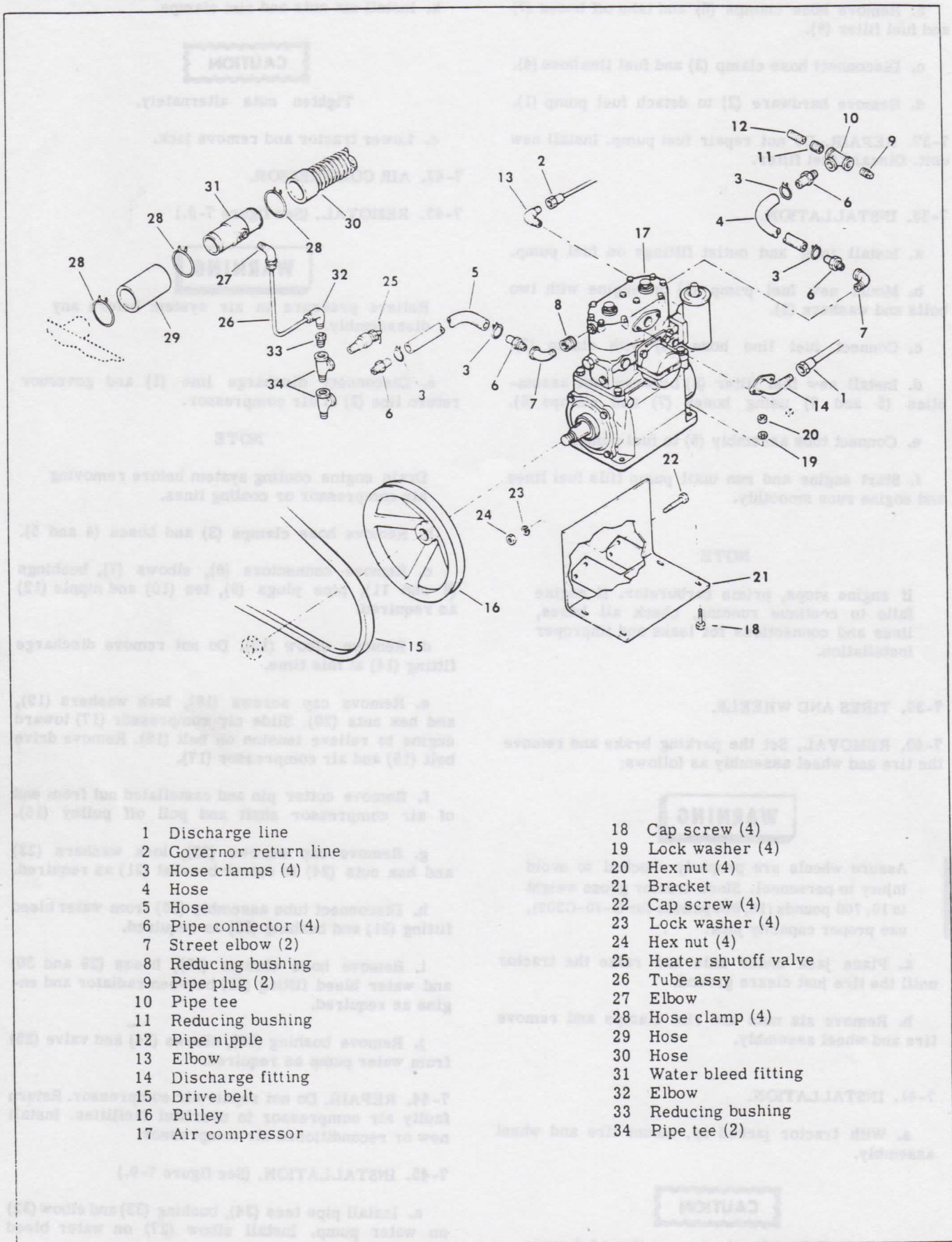


Figure 7-9. Air Compressor Installation

b. Install hoses (29 and 30) and water bleed fitting (31) between radiator and engine with hose clamps (28). Connect tube assembly (26) between elbows (27 and 32).

c. Install shutoff valve (25) in tee (34).

d. Install bracket (21) with four cap screws (22), lock washers (23) and hex nuts (24).

e. Fasten pulley (16) on air compressor shaft with castellated nut on compressor. Secure nut with cotter pin. Install elbow (13) and discharge fitting (14) on compressor if necessary.

f. Mount air compressor (17) on bracket (21) loosely with four cap screws (18), lock washers (19) and hex nuts (20). Install drive belt (15) over engine crankshaft pulley and compressor pulley. Position air compressor to obtain 1/2 inch belt deflection and secure compressor. Be sure air compressor is aligned.

g. Install nipple (12), bushings (8 and 11), tee (10), elbows (7), pipe plugs (9) and connectors (6). Install hoses (4 and 5) with hose clamps (3).

h. Connect discharge line (1) and governor return line (2) to air compressor fittings.

CAUTION

Be sure to install insert with return line fitting. This line is synflex material and requires the use of proper insert.

7-46. TEST.

a. After installation inspect all air lines and fittings for tightness. Check all pipe fittings and mounting hardware for tightness.

b. Examine all cooling lines and fittings for tightness. Be sure tractor cooling system is full.

c. Check and lubricate air compressor.

d. Be sure cut-out cocks are closed. Start tractor engine and observe operation of air compressor. Check operation of low pressure warning light. Initially the warning light should be "on" until the pressure builds up to 60 ± 6 psi when the light should go "out".

e. Allow engine and compressor to run and check air pressure on pressure gage. System air pressure should stabilize at 90 to 105 psi.

f. With air pressure in the system, pull the exposed release pin on safety relief valve and check for air exhaust from valve exhaust port. Release valve pin; exhaust air flow should stop.

g. Test entire system for leaks using soap solution.

NOTE

If compressor governor or auxiliary brake valve must be adjusted, refer to maintenance personnel.

7-47. BALLAST WEIGHTS (OPTIONAL).

7-48. REMOVAL (figure 7-10).

a. Raise tractor at least 12 inches to provide adequate clearance for main weight removal.

CAUTION

Each main weight weighs 2,800 pounds. Make sure the main weights are adequately supported when they are removed.

b. Stamp match marks on support plate (1) and main weight assembly (2).

c. Place transmission jack or forklift of sufficient capacity under main weight (2).

CAUTION

Do not remove nuts (8) that attach support plate (1) to axle, or nuts (9) that clamp main weight plates together.

d. Remove eight nuts and washers (3 and 4).

e. FRONT AXLE ONLY: Remove ten front plates (6) and eight rear plates (7).

f. Use transmission jack or forklift to lower main weights (2) so studs (5) clear support plate (1), then remove main weights from under tractor.

7-49. INSTALLATION (figure 7-10).

a. Raise tractor at least 12 inches to provide adequate clearance for main weight installation.

CAUTION

Each main weight weighs 2,800 pounds. Make sure the main weights are adequately supported when they are removed.

b. Use a transmission jack or forklift to position main weights (2) under tractor, then raise main weights to proximity of support plate (1). Make sure the previously stamped match marks are in alignment.

c. Insert a 3/4 inch drift punch downward through a corner hole in the support plate and into the corresponding hole in the main weights.

d. Insert stud (5), with bottom nut and washer installed, into bottom hole of main weights. Push stud upward

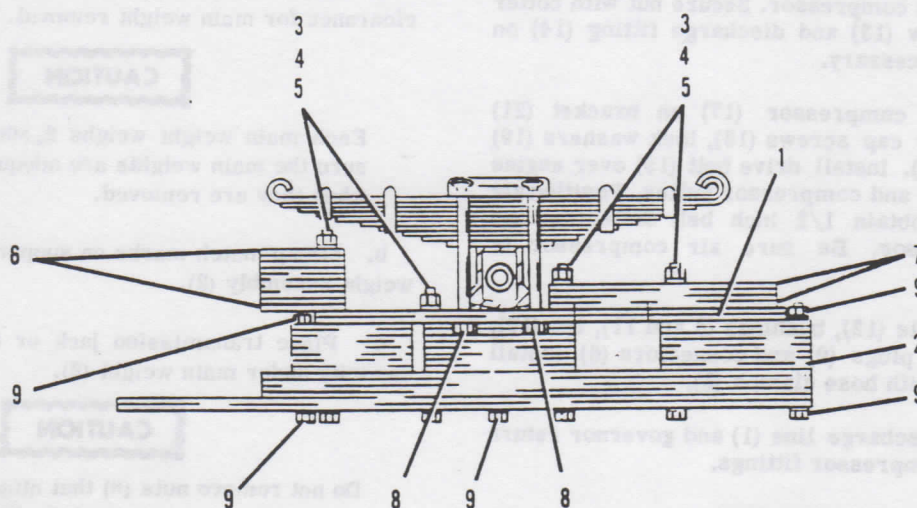
through main weights and support plate and push drift punch out of support plate.

e. Use drift punch to align remaining holes in main weights and support plate. Insert remaining studs, with nuts and washers installed, upward through main weights and support plate.

f. FRONT AXLE ONLY: Install ten front plates (6) and eight rear plates (7).

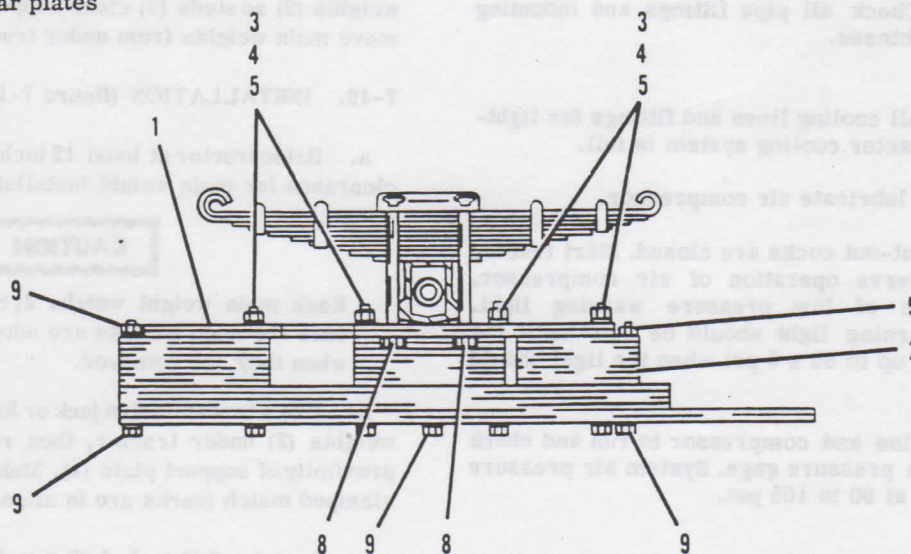
g. Install top washers (3) and nuts (4) on eight studs (5). Make sure nuts on bottom of studs are flush with ends of studs and torque nuts on top of studs to 200 foot pounds lubricated.

h. Remove transmission jack or forklift and lower tractor.



FRONT AXLE WEIGHTS

- 1 Support plate
- 2 Main weights
- 3 Nut
- 4 Washer
- 5 Stud
- 6 Upper front plates
- 7 Upper rear plates
- 8 Nut
- 9 Nut



REAR AXLE WEIGHTS

7-10. Ballast Weights Installation.

