

09916A

Figure 5-197. Directional, Ignition and Hazard Switches Group

- (14) Remove clip (13) and ignition key switch (12).
- (15) Remove screw (15) and engine start switch (14).
- (16) Remove springs (9) and (10) and screws (8); remove wiring harness. Remove directional switches (7).
- b. Cleaning and inspection. Refer to paragraphs 5-4.3 and 5-4.4 for general cleaning and inspection procedures.
- c. Repair and replacement. Replace all worn or damaged parts.
- d. Assembly and installation. Assembly is accomplished during installation. Install directional, ignition and hazard switches group as follows:
 - (1) Install wiring harness and install directional switch using screws (8) and springs (9), (10).
 - (2) Install engine start switch (14) using screws (15).
 - (3) Install ignition key switch (12) and clip (13).
 - (4) Install hazard knob (11).
 - (5) Install lever assembly (5) using screw (6).
 - (6) Install thrust washer and upper bearing preload spring.
 - (7) Install cam (4), spring (3), pin (2) and retainer (1).
 - (8) Align lockplate splines with steering shaft splines and place lockplate in position with cam shaft protruding through dogleg opening in lockplate.
 - (9) Install snap ring and lockplate cover.
 - (10) Install steering wheel. Align mark on steering wheel with previously noted mark on housing.
 - (11) Install washer and nut. Tighten nut to torque specified by table 6-2.
 - (12) Install spring, raised side up.
 - (13) Install receiver and bushing. Receiver must be free to move after bushing screws are tightened.
 - (14) Line up notch on receiver with nib on hour button and push button until it snaps into place.

5-5.10.24 *Ignition Switch Lock Cylinder Group*. Refer to figure 5-198, and perform the following steps to overhaul the ignition switch lock cylinder group.

a. Removal and disassembly. Disassembly is accomplished during removal. Refer to paragraph 5-5.4.2 and remove upper steering column. Remove ignition switch lock cylinder group as follows:

- (1) Bend tab on antitheft ring (7) out.
- (2) Insert key (1) into ignition lock assembly (2) and turn cylinder slightly.
- (3) Depress tab on case (8); withdraw key (1) and cylinder (9) from case (8).
- (4) Remove washer (6) and antitheft ring (7).

NOTE

Remove tumbler retainer carefully to avoid loosening tumbler springs.

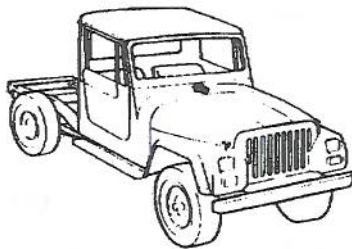
- (5) Remove tumblers retainer (3).
- (6) Remove tumbler spring (4) and tumblers (5) from cylinder (9).

b. Cleaning and inspection. Refer to paragraphs 5-4.3 and 5-4.4 for general cleaning and inspection procedures.

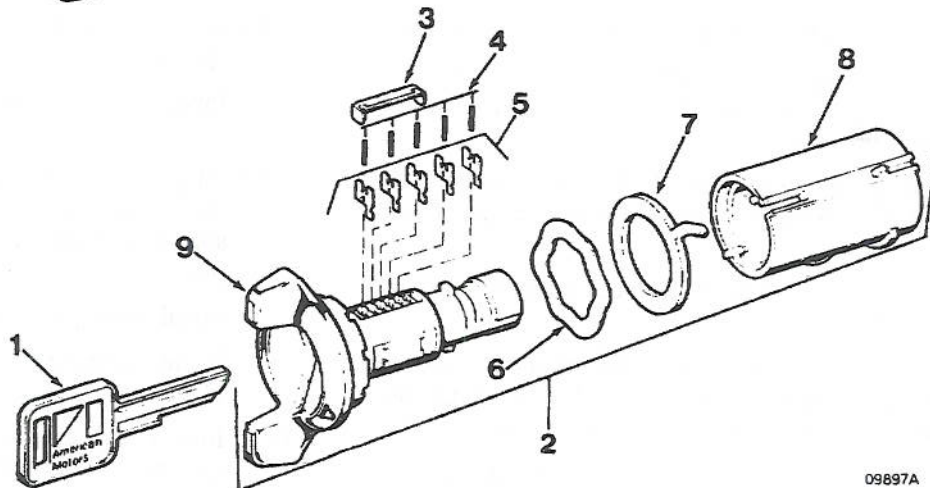
c. Repair and replacement. Replace all worn or damaged parts.

d. Assembly and installation. Assembly is accomplished during installation. Install ignition switch lock cylinder group as follows:

- (1) Insert tumblers (5) and tumbler springs (4) in cylinder (9).
- (2) Install tumblers retainer (3).
- (3) Install antitheft ring (7) and washer (6).
- (4) Depress tab on case (8); insert key (1) and cylinder (9) into case (8).
- (5) Release tab on case (8), turn key (1) and cylinder (9) back slightly and remove key (1) from ignition lock assembly (2).
- (6) Refer to paragraph 5-5.4.2 and install upper steering column.



- | | |
|---------------------------|-------------------|
| 1. Key | 6. Washer |
| 2. Ignition Lock Assembly | 7. Antitheft Ring |
| 3. Tumblers Retainer | 8. Case |
| 4. Tumbler Springs | 9. Cylinder |
| 5. Tumblers | |

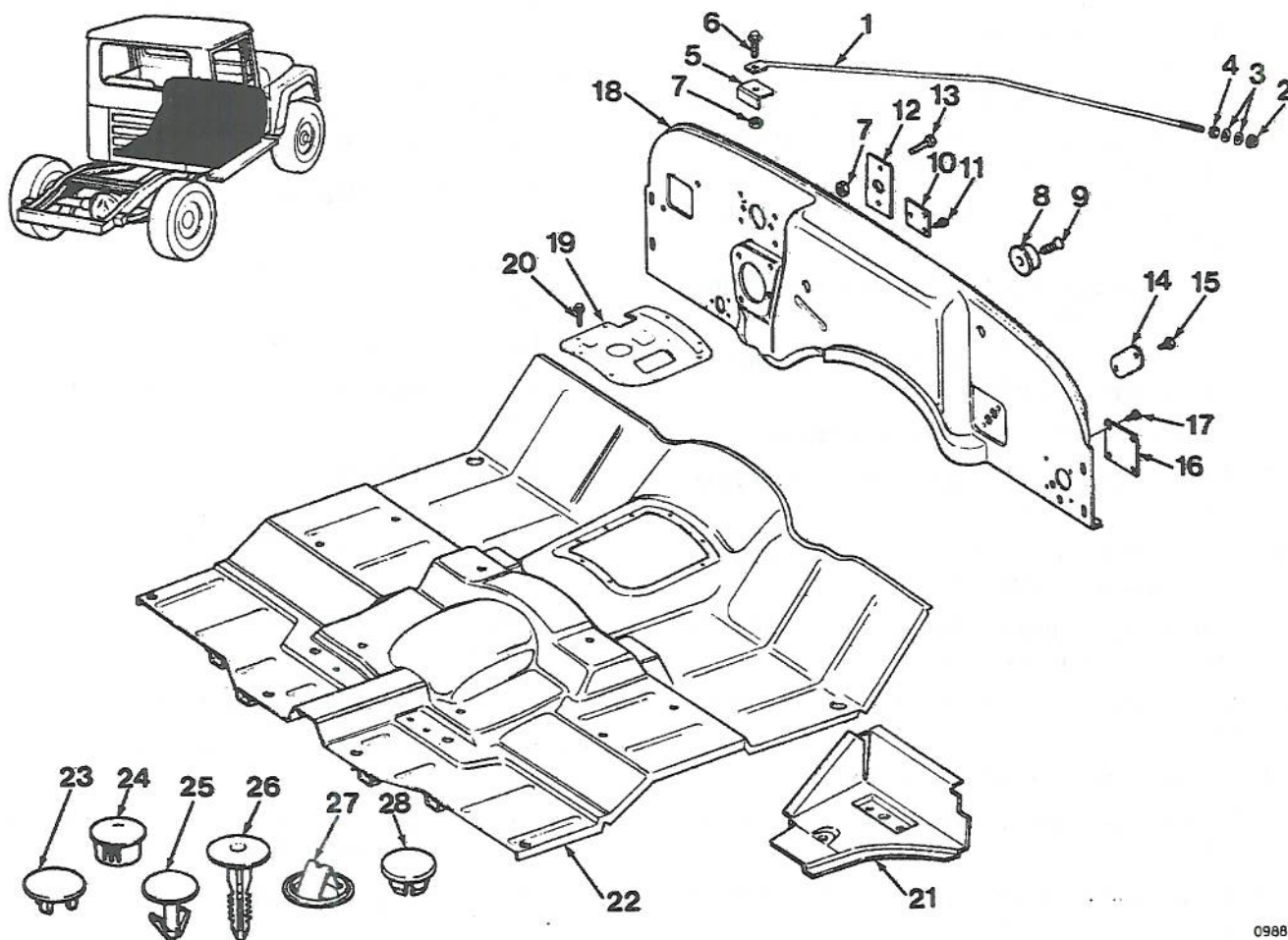


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Figure 5-198. Ignition Switch Lock Cylinder Group

5-5.10.25 *Floor Pan, Cowl and Dash Panel Group*. Refer to figure 5-199, and perform the following steps to overhaul the floor pan, cowl and dash panel group.

- a. Removal and disassembly. Disassembly is accomplished during removal. Remove floor pan, cowl and dash panel group as follows:
 - (1) Refer to paragraph 5-5.10.17 and remove instrument panel.
 - (2) Refer to paragraph 5-5.4.3 and remove steering column assembly.
 - (3) Remove hex nuts (2), flat washers (3) and tie rods (1) from air deflector.
 - (4) Remove flat washers (3) and hex nuts (4).
 - (5) Remove hex nuts (7), screws and lockwashers (6) and tie rods (1).
 - (6) Remove panel assembly (18) and brackets (5) from panel assembly (18).
 - (7) Remove screw and washers (13), hex nuts (7) and stabilizer bumpers (12).
 - (8) Remove pan head screws (11) and cover plate (10).
 - (9) Remove screws (9) and cover plate (8).
 - (10) Remove pan head screws (15) and cover plate (14).
 - (11) Remove screws and washers (17) and cover plate (16).
 - (12) Refer to paragraph 5-5.10.2 and remove front seat track.
 - (13) Remove mat and carpet plugs (26).
 - (14) Refer to paragraph 5-5.10.27 and remove floor covering.
 - (15) Remove pan head screws (20) and cover assembly (19).
 - (16) Refer to paragraph 5-5.2.1 and remove shifting.
 - (17) Refer to paragraph 5-5.9.2 and remove body hold-downs.
 - (18) Remove floor pan assembly (22) and bracket assembly (21).
 - (19) Remove bracket assembly (21) from floor pan assembly (22).
 - (20) Remove button plugs (23), (24), (25), (27) and (28).
- b. Cleaning inspection. Refer to paragraphs 5-4.3 and 5-4.4 for general cleaning and inspection procedures.
- c. Repair and replacement. Replace all worn or damaged parts.
- d. Assembly and installation. Assembly is accomplished during installation. Install floor pan, cowl and dash panel group as follows:
 - (1) Install button plugs (23), (24), (25), (27) and (28).
 - (2) Install bracket assembly (21) on floor pan assembly (22).
 - (3) Install floor pan assembly (22).
 - (4) Refer to paragraph 5-5.9.2 and install body hold-downs.
 - (5) Refer to paragraph 5-5.2.1 and install shifting.
 - (6) Install cover assembly (19) using pan head screw (20).
 - (7) Refer to paragraph 5-5.10.27 and install floor covering.
 - (8) Install mat and carpet plugs (26).
 - (9) Refer to paragraph 5-5.10.2 and install front seat track.
 - (10) Install cover plate (16) on panel assembly (18) using screws and washers (17).
 - (11) Install cover plate (14) using pan head screws (15).
 - (12) Install cover plate (8) using screws (9).
 - (13) Install cover plate (10) using pan head screws (11).
 - (14) Install stabilizer bumpers (12) using screws and washers (13) and hex nuts (7).
 - (15) Install brackets (5) on panel assembly (18).
 - (16) Install panel assembly (18).
 - (17) Install tie rods (1) on panel assembly (18) using screws and lockwashers (6) and hex nuts (7).
 - (18) Install hex nuts (4) and flat washers (3) on tie rods (1) and install tie rods (1) on air deflector.
 - (19) Install flat washers (3) and hex nuts (2) on tie rod (1) to secure it to air deflector.
 - (20) Refer to paragraph 5-5.4.3 and install steering column assembly.
 - (21) Refer to paragraph 5-5.10.17 and install instrument panel.



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- | | | |
|-------------------------|-----------------------|-------------------------|
| 1. Tie Rod | 10. Cover Plate | 19. Cover Assembly |
| 2. Nut and Washer | 11. Pan Head Screw | 20. Pan Head Screw |
| 3. Flat Washer | 12. Stabilizer Bumper | 21. Bracket Assembly |
| 4. Hex Nut | 13. Screw and Washer | 22. Floor Pan Assembly |
| 5. Bracket | 14. Cover Plate | 23. Button Plug |
| 6. Screw and Lockwasher | 15. Pan Head Screw | 24. Button Plug |
| 7. Hex Nut | 16. Cover Plate | 25. Button Plug |
| 8. Cover Plate | 17. Screw and Washer | 26. Mat and Carpet Plug |
| 9. Screw | 18. Panel Assembly | 27. Button Plug |

Figure 5-199. Floor Pan, Cowl and Dash Panel Group

5-5.10.26 Accelerator Pedal and Linkage Group. Refer to figure 5-200, and perform the following steps to overhaul the accelerator pedal and linkage group.

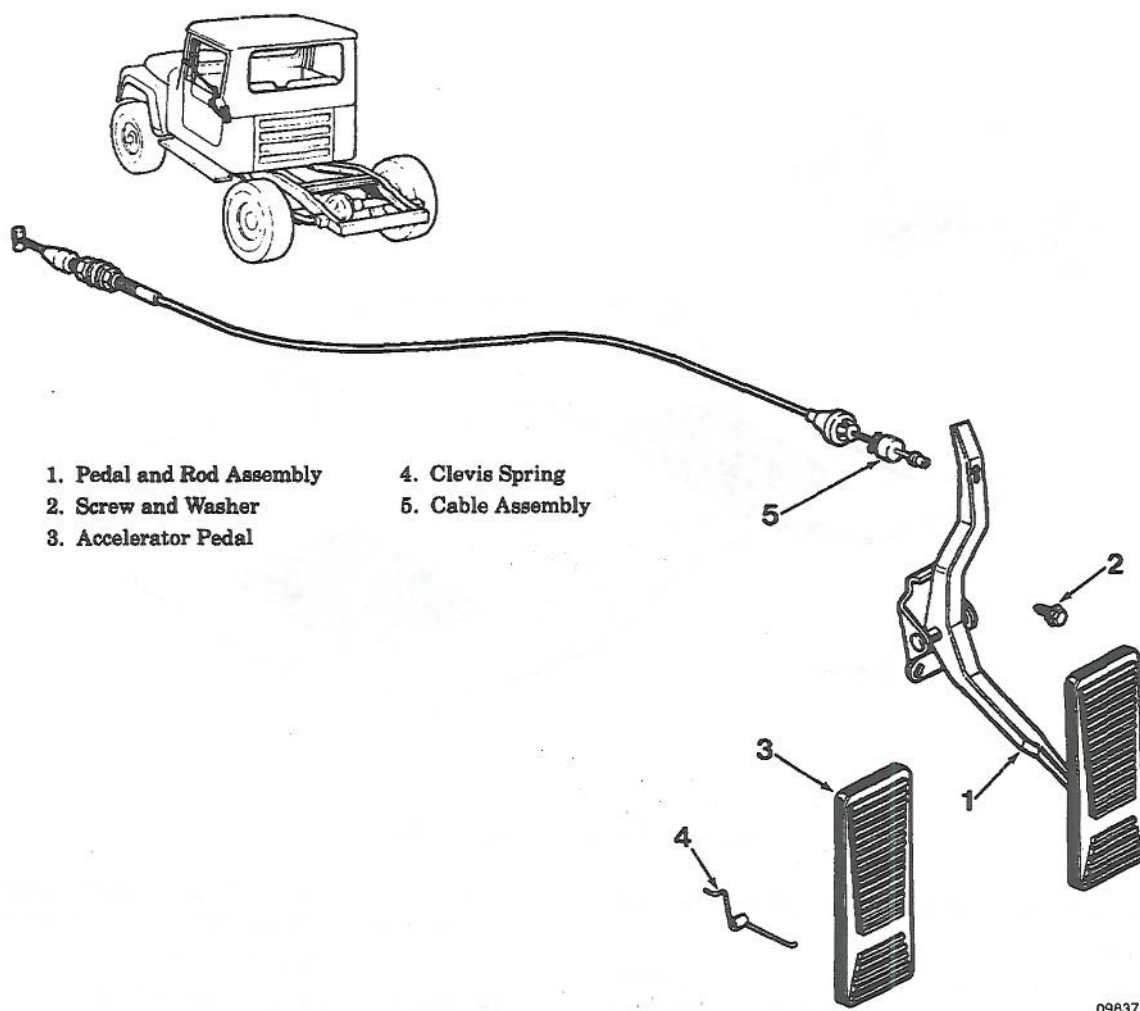
- a. Removal and disassembly. Disassembly is accomplished during removal. Remove accelerator pedal and linkage group as follows:

(1) Remove cable assembly (5) from pedal and rod assembly (1).

(2) Remove other end of cable assembly (5) from accelerator wire bracket on venturi.

(3) Remove screws and washers (2) and remove pedal and rod assembly (1) from floor of vehicle.

(4) Remove accelerator pedal (3) and clevis spring (4).



09837B

Figure 5-200. Accelerator Pedal and Linkage Group

- b. Cleaning and inspection. Refer to paragraphs 5-4.3 and 5-4.4 for general cleaning and inspection procedures.
- c. Repair and replacement. Replace all worn or damaged parts.
- d. Assembly and installation. Assembly is accomplished during installation. Install accelerator pedal and linkage group as follows:
 - (1) Install accelerator pedal (3) and clevis spring (4) on pedal and rod assembly (1).
 - (2) Install pedal and rod assembly (1) on vehicle floor using screws and washers (2).
 - (3) Install cable assembly (5) in accelerator wire bracket on venturi.
 - (4) Install other end of cable assembly in pedal and rod assembly (1).

5-5.10.27 *Floor Mat Group*. Refer to figure 5-201, and perform the following steps to overhaul the floor mat group.

- a. Removal and disassembly. Disassembly is accomplished during removal. Remove floor mat group as follows:
 - (1) Refer to paragraphs 5-5.10.1 and 5-5.10.3 and remove front seat.
 - (2) Refer to paragraph 5-5.10.2 and remove front seat track.
 - (3) Remove trim around shifter, if present.
 - (4) Remove mat assembly (1).
- b. Cleaning and inspection. Refer to paragraphs 5-4.3 and 5-4.4 for general cleaning and inspection procedures.

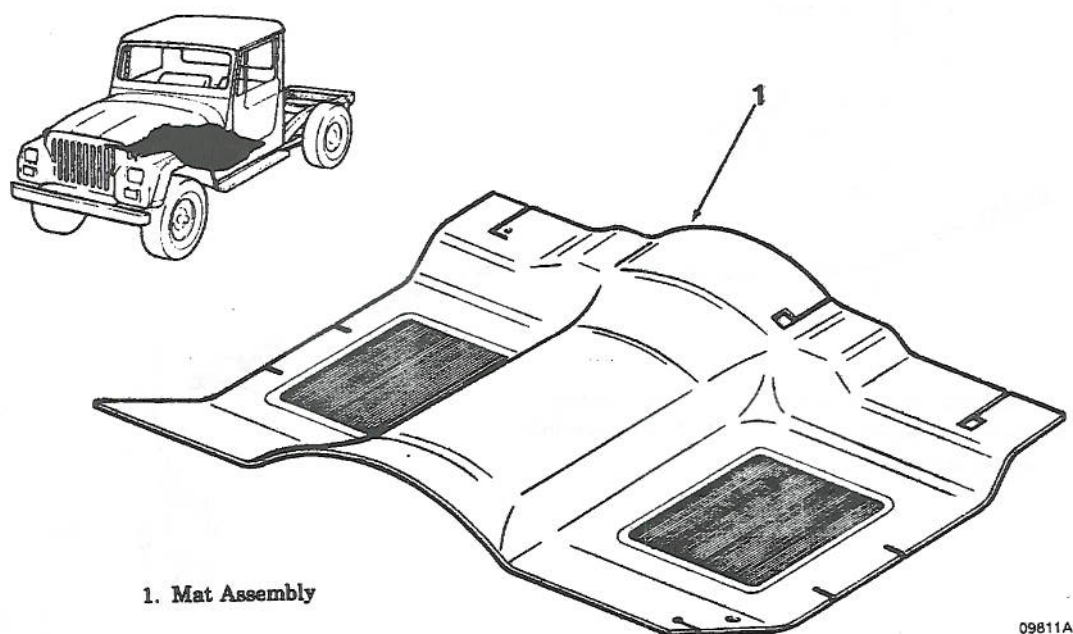


Figure 5-201. Floor Mat Group

c. Repair and replacement. Replace all worn or damaged parts.

d. Assembly and installation. Assembly is accomplished during installation. Install floor mat group as follows:

- (1) Install mat assembly (1).
- (2) Install trim around shifter if removed.
- (3) Refer to paragraph 5-5.10.2 and install front seat track.
- (4) Refer to paragraphs 5-5.10.1 and 5-5.10.3 and install front seat. If new mat is being installed, it may be necessary to cut holes for certain components.

5-5.10.28 *Electrical Assembly*. Refer to figure 5-202, and perform the following steps to overhaul the electrical assembly.

a. Removal and disassembly. Disassembly is accomplished during removal. Remove electrical assembly as follows:

- (1) Remove light assembly (1) by removing machine screws (3) and inserts (4) and remove mounting base (5), gasket (6) and light assembly (2) from vehicle.
- (2) Remove connector (7) and terminal (8).

(3) Remove nut from threaded nipple at base of light assembly (2) and remove light assembly (2) from mounting base (5).

(4) Remove light assembly (11) by removing machine screws (13) and inserts (14) and remove mounting plate (15), mounting gasket (16) and light assembly (12) from vehicle.

(5) Remove connector (17) and terminal (18).

(6) Remove nut and hollow bolt and remove light assembly (12) from mounting plate (15).

(7) Remove terminals (31). Tag wires for assembly reference.

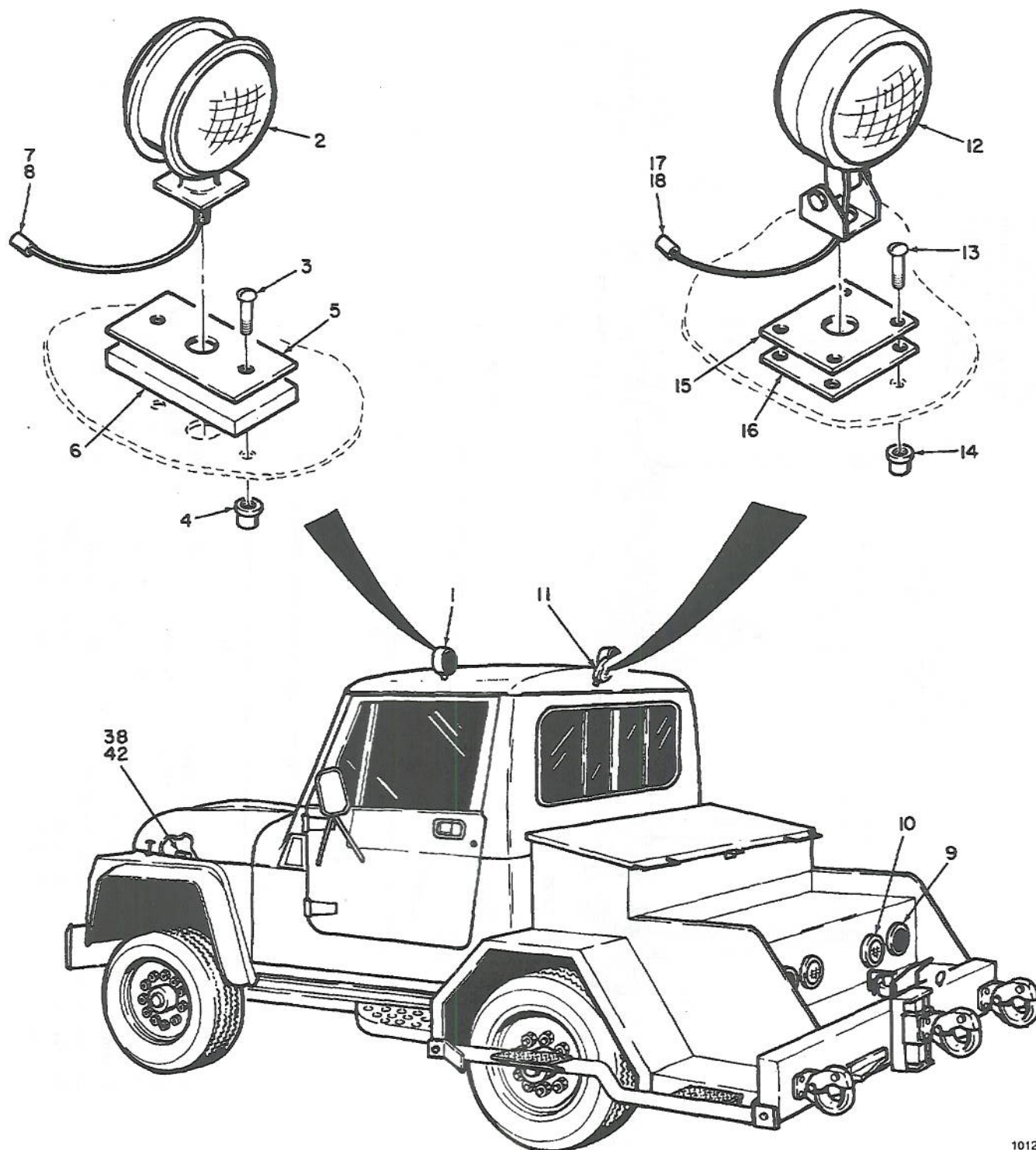
(8) Remove connector (19) and terminal (32).

(9) Remove capscrews (21), flat washers (22), lockwashers (23), hex nuts (24), and terminal stud (37). Remove receptacle (20) and receptacle boot (25).

(10) Remove connector plugs (26) and (27) from light assemblies (9) and (10). Tag wires for assembly reference.

(11) Remove light assemblies (9) and (10).

(12) Remove wire splices (28) and male connectors (29). Tag wires for assembly reference.



- 1. Light Assembly
- 2. Light Assembly
- 3. Machine Screw
- 4. Insert
- 5. Mounting Base

- 6. Gasket
- 7. Connector
- 8. Terminal
- 9. Light Assembly
- 10. Light Assembly

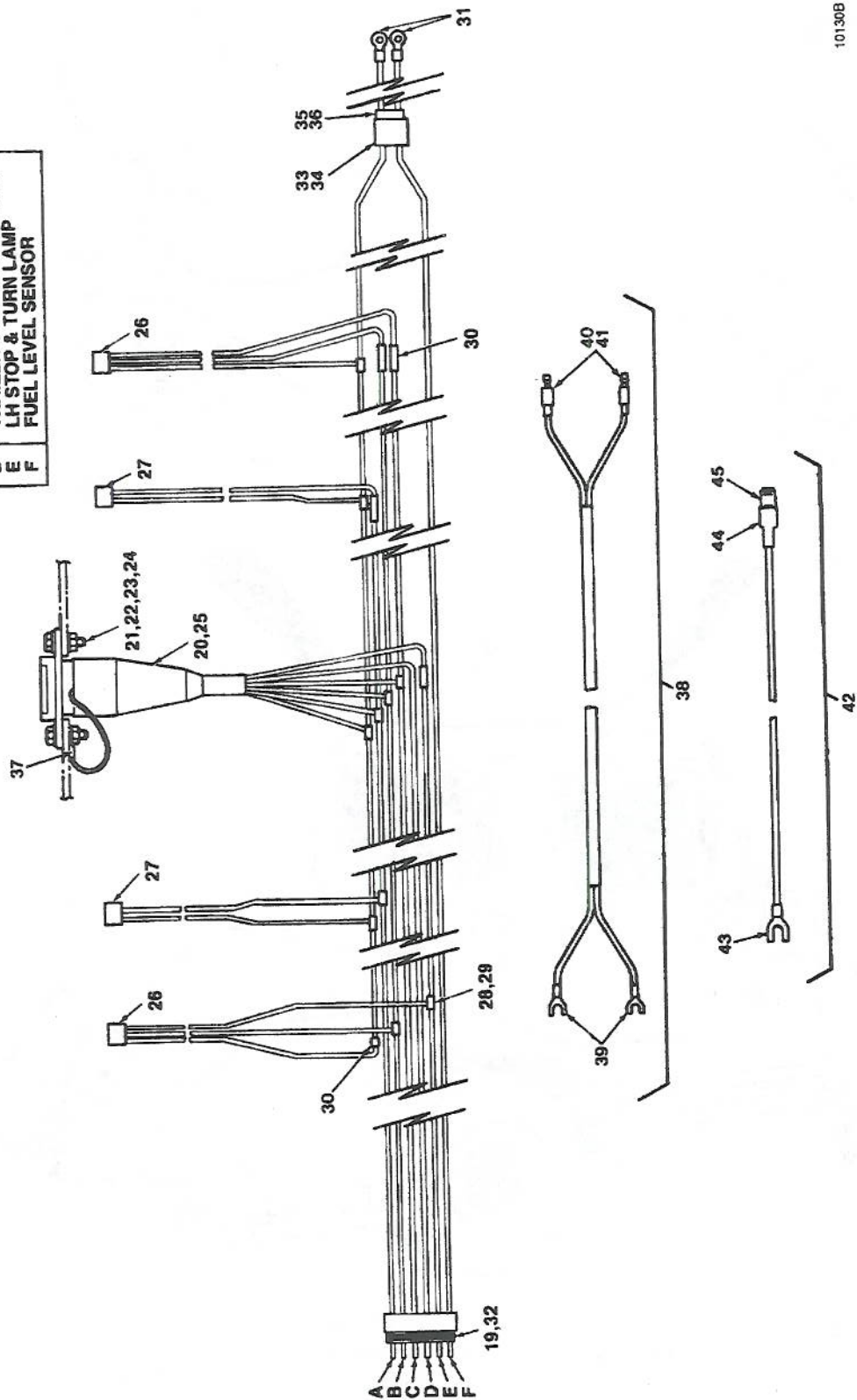
- 11. Light Assembly
- 12. Light Assembly
- 13. Machine Screw
- 14. Insert
- 15. Mounting Plate

- 16. Gasket
- 17. Connector
- 18. Terminal

Figure 5-202. Electrical Assembly (Sheet 1 of 2)

10120B

A	LH & RH BACK UP LAMP
B	LH & RH TAIL LAMP
C	RH STOP & TURN LAMP
D	TRAILER STOP CONNECTION
E	LH STOP & TURN LAMP
F	FUEL LEVEL SENSOR



- | | | | |
|-----------------|--------------------|----------------------|-----------------------|
| 19. Connector | 26. Connector Plug | 33. Connector Body | 40. Bullet Connector |
| 20. Receptacle | 27. Connector Plug | 34. Terminal | 41. Bullet Receptacle |
| 21. Capscrew | 28. Splice | 35. Connector Body | 42. Wire Harness |
| 22. Flat Washer | 29. Connector | 36. Terminal | 43. Tongue Terminal |
| 23. Lockwasher | 30. Butt Connector | 37. Stud Terminal | 44. Connector |
| 24. Hex Nut | 31. Terminal | 38. Harness Assembly | 45. Splice |
| 25. Boot | 32. Terminal | 39. Tongue Terminal | |

Figure 5-202. Electrical Assembly (Sheet 2 of 2)

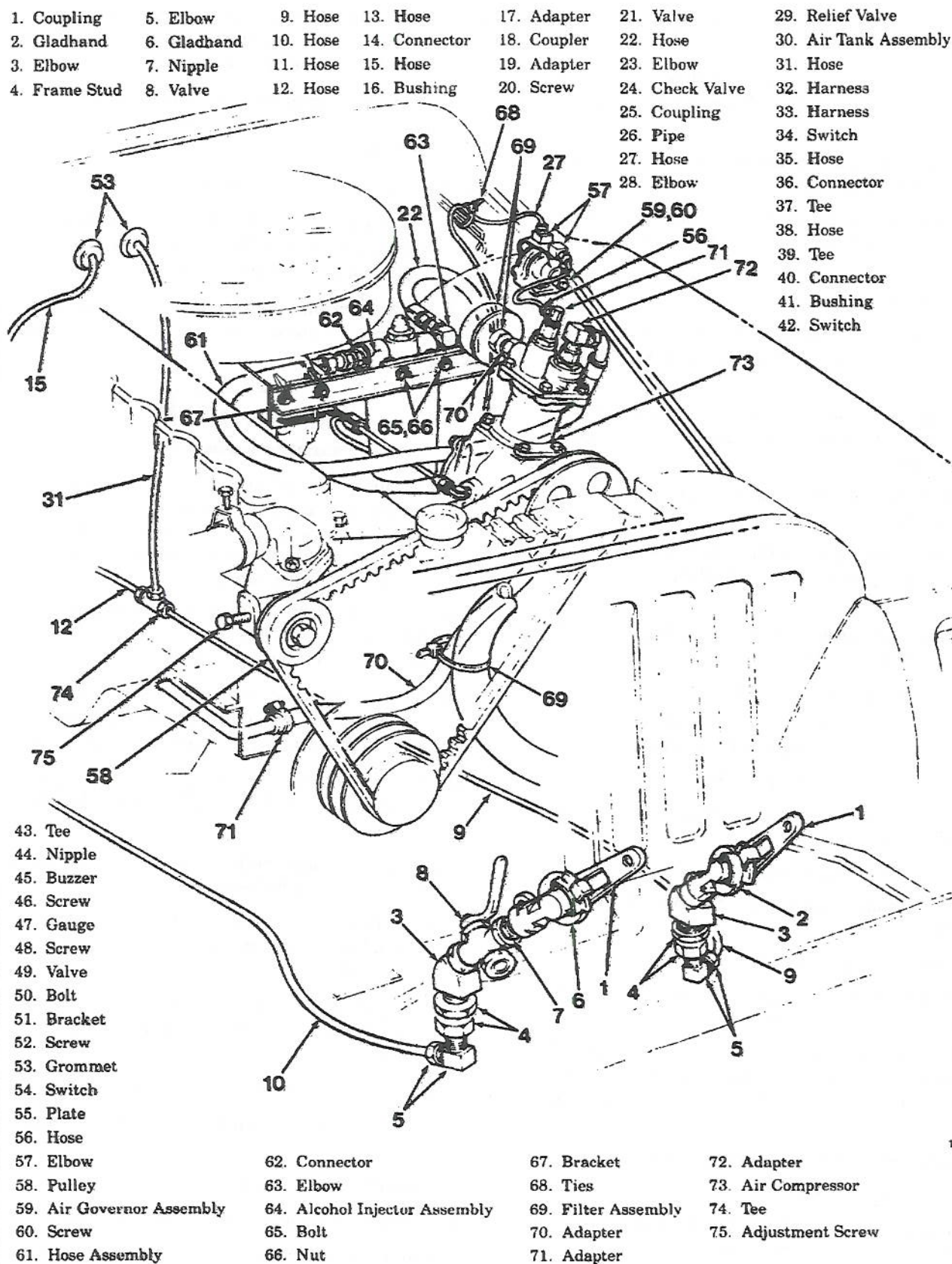
- (13) Remove butt connectors (30). Tag wires for assembly reference.
 - (14) Remove connector bodies (33) and (35) from terminals (34) and (36). Tag wires for assembly reference.
 - (15) Remove tongue terminals (39). Tag wires for assembly reference.
 - (16) Remove bullet connector (40) and bullet receptacle (41) and tag for assembly reference.
 - (17) Remove tongue terminal (43) and tag wire for assembly reference.
 - (18) Remove connector (44) and splice (45) and tag wires for assembly reference. Remove wire harness (42).
- b. Cleaning and inspection. Refer to paragraphs 5-4.3 and 5-4.4 for general cleaning and inspection procedures.
- c. Repair and replacement. Replace any worn or damaged parts.
- d. Assembly and installation. Assembly is accomplished during installation. Install electrical assembly as follows:
- (1) Install wire harness (42), connecting splice (45) and connector (44).
 - (2) Install tongue terminal (43).
 - (3) Install harness assembly (38) and connect bullet receptacle (41) and bullet connector (40).
 - (4) Connect tongue terminal (39).
 - (5) Install connector bodies (33) and (35) to terminals (34) and (36).
 - (6) Install butt connectors (30).
 - (7) Install male connectors (29) and wire splices (28).
 - (8) Install light assemblies (9) and (10).
 - (9) Install connector plugs (26) and (27) on light assemblies (9) and (10).
 - (10) Install receptacle (20) and receptacle book (25) using capscrews (21), flat washers (22), lockwashers (23) and hex nuts (24). Install terminal stud (37).
 - (11) Install terminal (32) and connector (19).
 - (12) Install terminals (31).
 - (13) Install light assembly (12) on mounting plate (15) using hollow bolt and nut.
 - (14) Install connector (17) and terminal (18).
 - (15) Install light assembly (11) by installing mounting gasket (16), mounting plate (15) and light assembly (12) using screws (13) and inserts (14).
 - (16) Install light assembly (2) on mounting base (5) and install nut on threaded nipple at base of light assembly (2).
 - (17) Install connector (7) and terminal (8).
 - (18) Install light assembly (1) by installing gasket (6), mounting base (5) and light assembly (2) using machine screws (3) and inserts (4).
- 5-5.11 *Air System Installation*. Refer to figures 5-203 through 5-208 for removal, assembly, and installation procedures.

WARNING

Depressurize system before attempting any service or repair that requires disassembly of any pressurized components. Severe injury or death can result if system remains pressurized during any component removal.

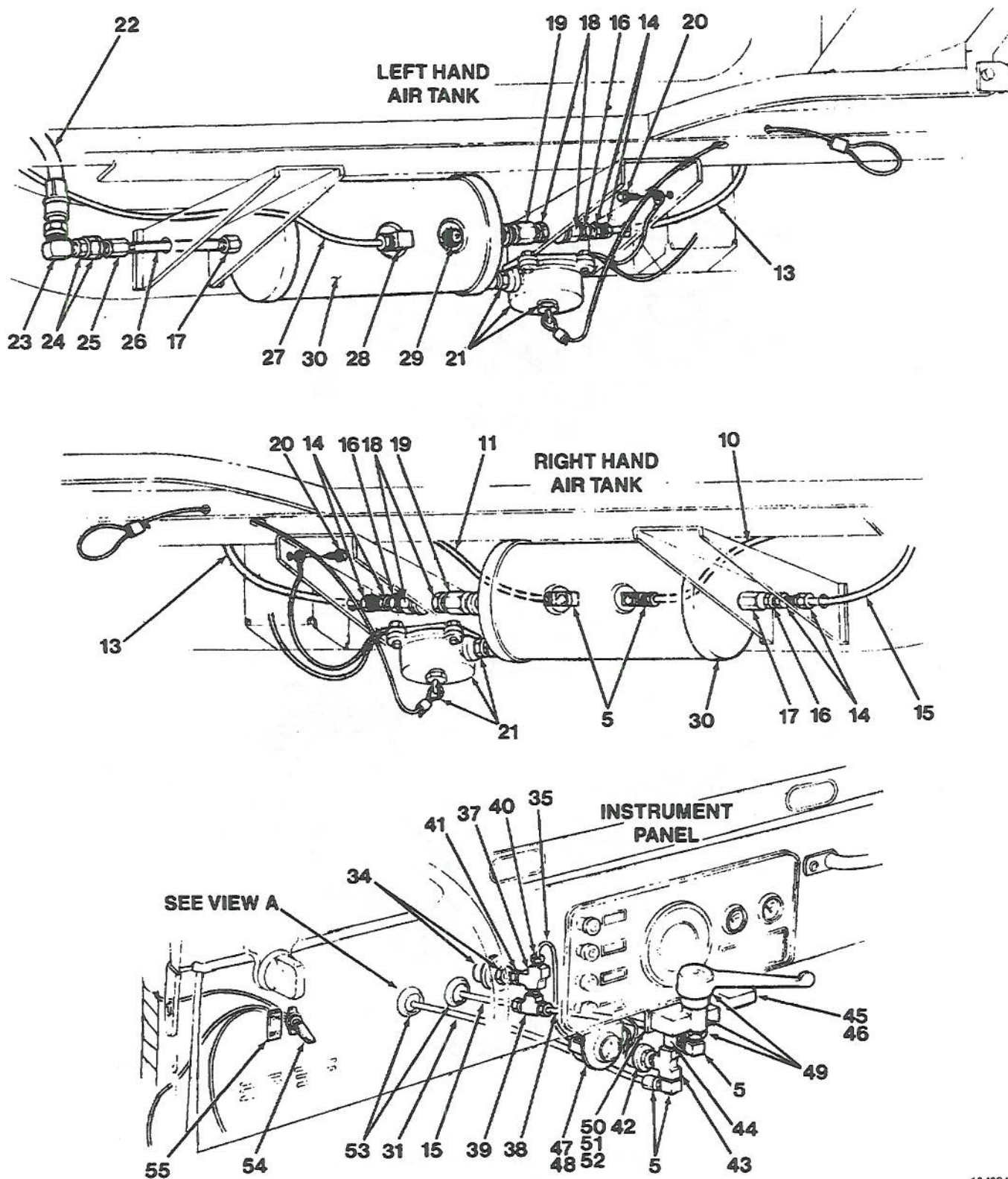
Do not work under raised vehicle without first supporting vehicle with safety jack stands or injury to personnel may result.

- a. Removal. Raise and secure vehicle as necessary to facilitate removal of component parts under chassis. Remove air system components as follows:
- (1) Loosen belt tension to air compressor pulley using screw (75, fig. 5-203). Remove belt from vehicle.
 - (2) Remove the idler pulley assembly (figure 5-204) if necessary as follows:
 - (a) Remove screws (2), outlet (1), gasket (3), bracket (9), and gasket (3) from water pump assembly.
 - (b) Rotate pulley (4) counterclockwise, removing pulley (4), shield (5), and spacer (6) from bolt (7).
 - (c) Remove screw (8) from bolt (7).
 - (3) Remove filter assembly (69, fig. 5-203) and element.
 - (4) Remove hose (56) from adaptor (71).
 - (5) Remove hose assembly (61) from adapter (72).
 - (6) Remove tube (4, figure 5-205) from connector (5).



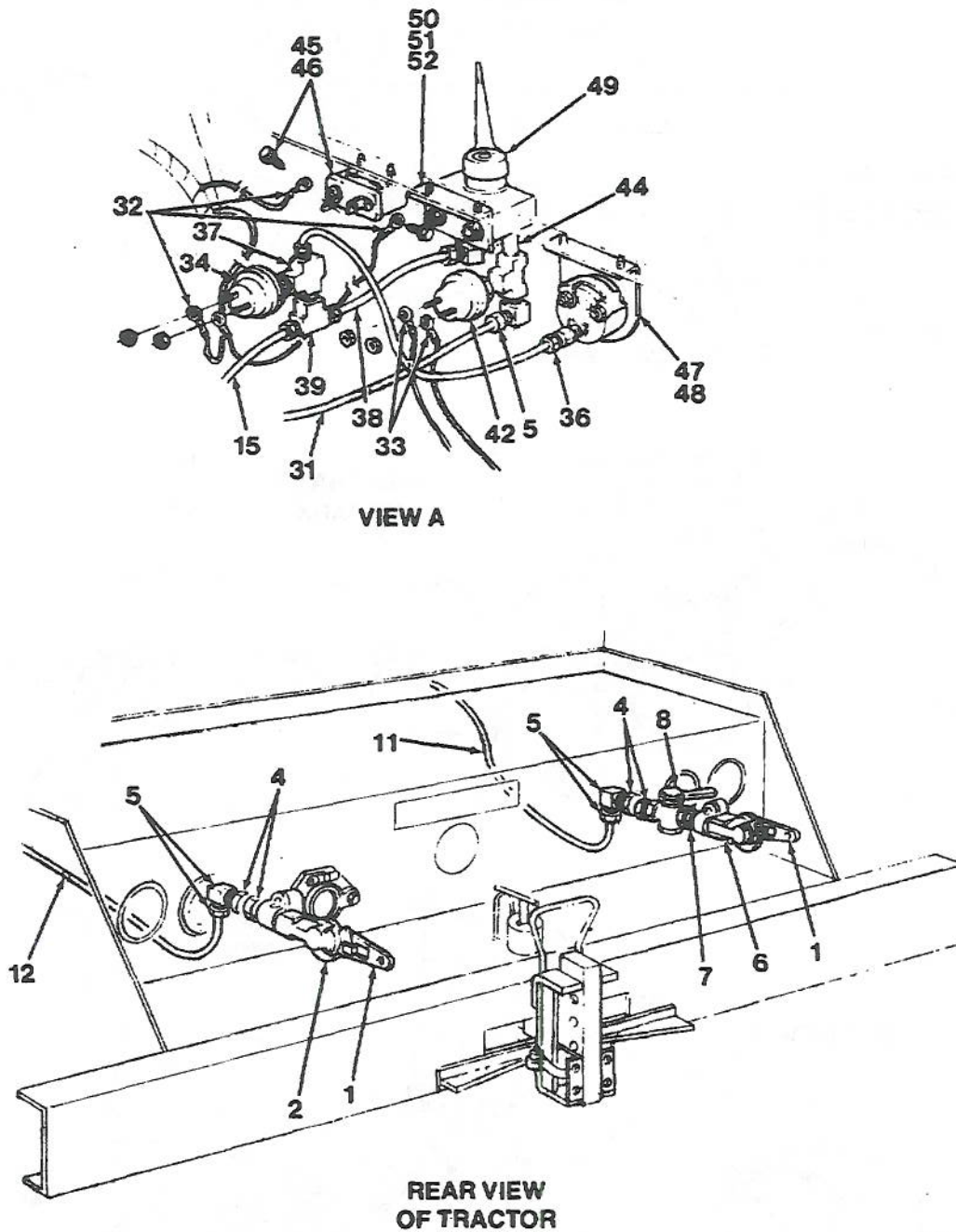
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Figure 5-203. Air System Installation (Sheet 1 of 3)



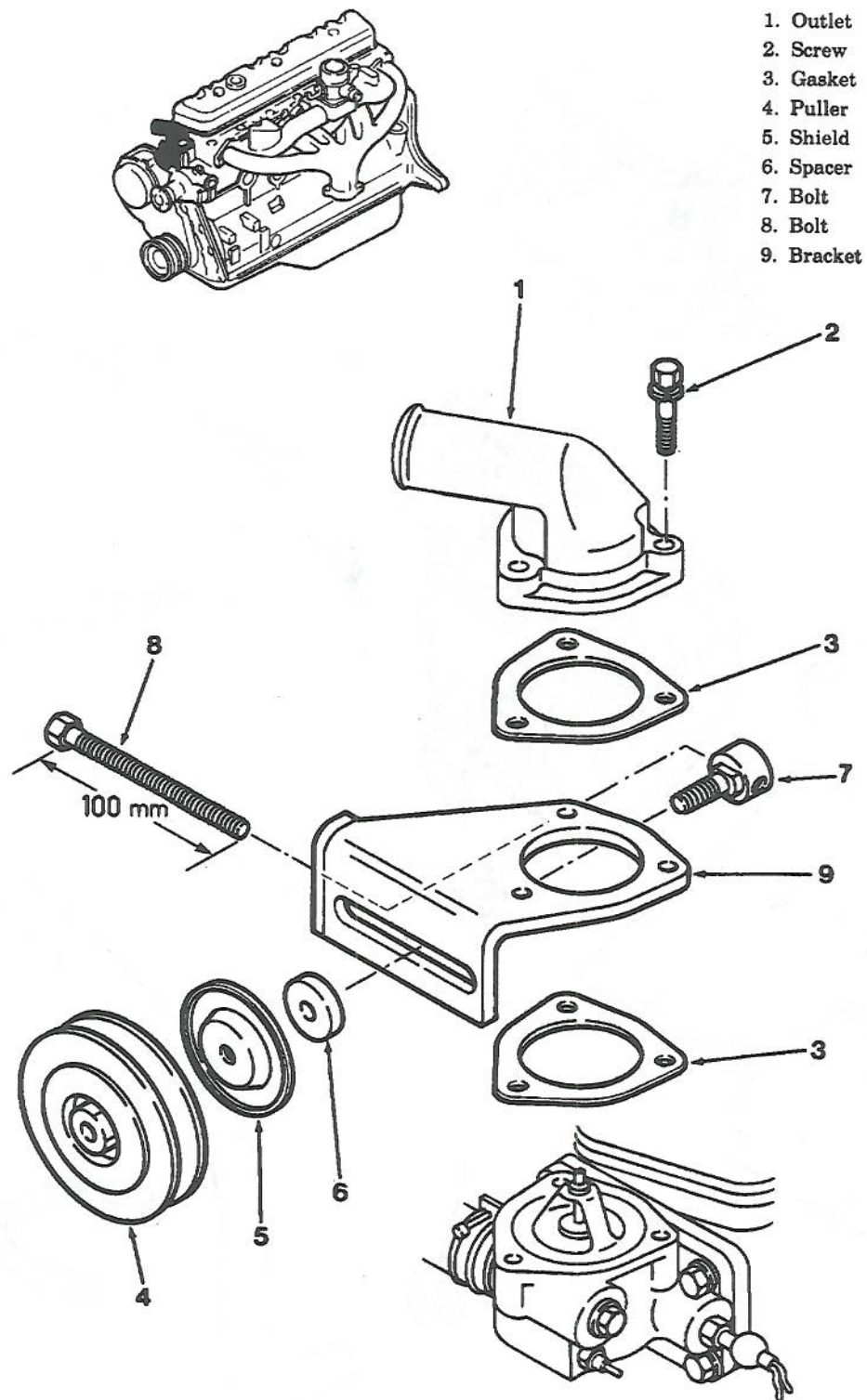
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Figure 5-203. Air System Installation (Sheet 2 of 3)



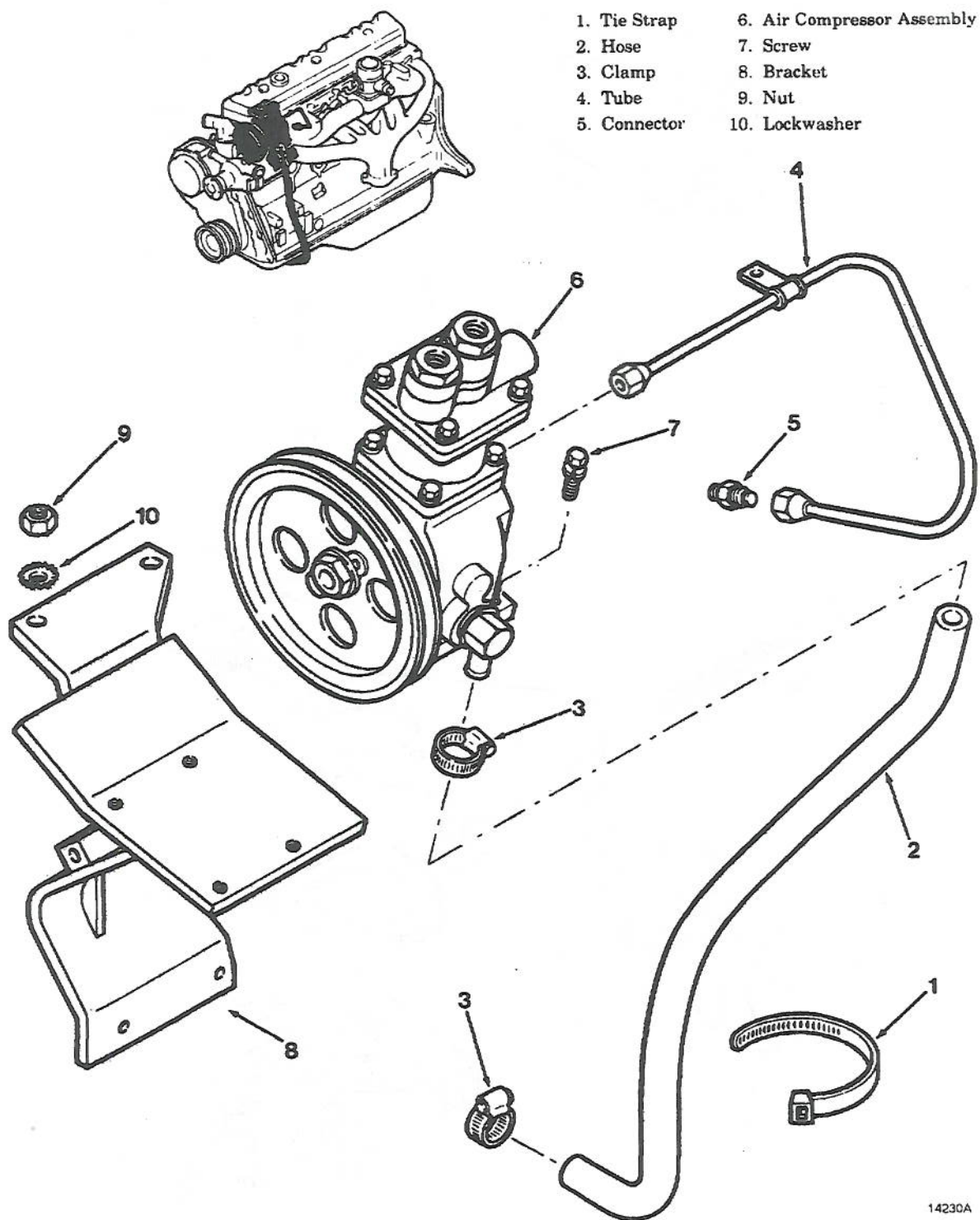
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Figure 5-203. Air System Installation
(Sheet 3 of 3)



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Figure 5-204. Idler Pulley Mounting



14230A

Figure 5-205. Air Compressor Installation

- (7) Drain engine oil as necessary per paragraph 4-4.1. Loosen clamps (3), and remove hose (2).
- (8) Remove screws (7) and compressor from vehicle. Refer to step b(1) for compressor disassembly procedures.
- (9) Remove nuts (9), lockwashers (10), and bracket (8).
- (10) Remove hoses (61 and 22, fig. 5-203) from connector (62) and elbow (63).

WARNING

Methanol alcohol is flammable. Ensure ignition is off and engine is cool before draining and/or adding alcohol to the alcohol injector. Severe burns can result if engine is hot or the engine is left running.

- (11) Open drain cock on bottom of alcohol injector (64) draining all fluid into an approved container.
- (12) Remove bolts (65), nuts (66), and alcohol injector assembly (64) from mounting bracket (67). Refer to step b(2) for alcohol injector disassembly procedures.
- (13) Remove hoses (27 and 71) from governor assembly (59).
- (14) Remove screws (60) and governor assembly (59). Refer to step b(3) for governor disassembly procedures.
- (15) Remove front gladhand assembly as follows:
 - (a) Remove coupling (1) from gladhand (2).
 - (b) Remove gladhand (2) and elbow (3) from frame stud (4).
 - (c) Remove hose (9) from elbow (5).
 - (d) Remove elbow (5) from frame stud (4).
 - (e) Remove frame stud (4) from frame.
- (16) Remove front gladhand and valve assembly as follows:
 - (a) Remove coupling (1) from gladhand (6).
 - (b) Remove gladhand (6), nipple (7), valve (8), and elbow (3) from frame stud (4).
 - (c) Remove hose (1) from elbow (5).
 - (d) Remove elbow (5) from frame stud (4).
 - (e) Remove frame stud (4) from frame.
- (17) Remove rear gladhand assembly as follows:

- (a) Remove coupling (1) from gladhand (2).
 - (b) Remove gladhand (2) from frame stud (4).
 - (c) Remove hose (12) from elbow (5).
 - (d) Remove elbow (5) from frame stud (4).
 - (e) Remove frame stud (4) from frame.
- (18) Remove rear gladhand and valve assembly as follows:
 - (a) Remove coupling (1) from gladhand (6).
 - (b) Remove gladhand (6), nipple (7), and valve (8) from frame stud (4).
 - (c) Remove hose (11) from elbow (5).
 - (d) Remove elbow (5) from frame stud (4).
 - (e) Remove frame stud (4) from frame.
 - (19) Remove hoses (19, 12, and 31) from tee (74).
 - (20) Remove component parts located under and on dashboard as follows:
 - (a) Remove nuts from switch (34). Tag and remove wires (32).
 - (b) Remove switch (34) from elbow (37).
 - (c) Remove hose (35) from elbow (37).
 - (d) Remove elbow (37) from elbow (39).
 - (e) Remove hoses (15 and 38) and elbow (39).
 - (f) Remove hose (38) from elbow (5).
 - (g) Remove elbow (5) from valve (49).
 - (h) Remove nuts from switch (42). Tag and remove wires (33).
 - (i) Remove switch (42) from tee (43).
 - (j) Remove hose (31) from elbow (5).
 - (k) Remove elbow (5), tee (43), and nipple (44) from valve (49).
 - (l) Remove bolts (50) and valve (49) from bracket (51).
 - (m) Remove screws (52) and bracket (51) from dashboard.
 - (n) Remove hose (35) from connector (36).
 - (o) Remove screws (48) and gauge (47) from dashboard.
 - (p) Remove connector (36) from gauge (47).
 - (q) Remove screws (46) and buzzer (45) from dashboard. Tag wires (32), and remove screws and wires (32) from buzzer (45).
 - (r) Remove switch (54) from dashboard. Tag and remove wires from switch (54).

(21) Remove components from left-hand air tank as follows:

- (a) Remove hose (28) from air tank assembly (30).
- (b) Remove screw (20). Tag and remove wires connected to heater and drain valve assembly (21).
- (c) Remove plug from heater and drain valve assembly (21).
- (d) Loosen adapter on heater and drain valve assembly (21), and remove heater and drain valve assembly (21) from air tank assembly (3).
- (e) Remove hose (22), elbow (23), check valve (24), coupling (25), and pipe (26) from adapter (17).

WARNING

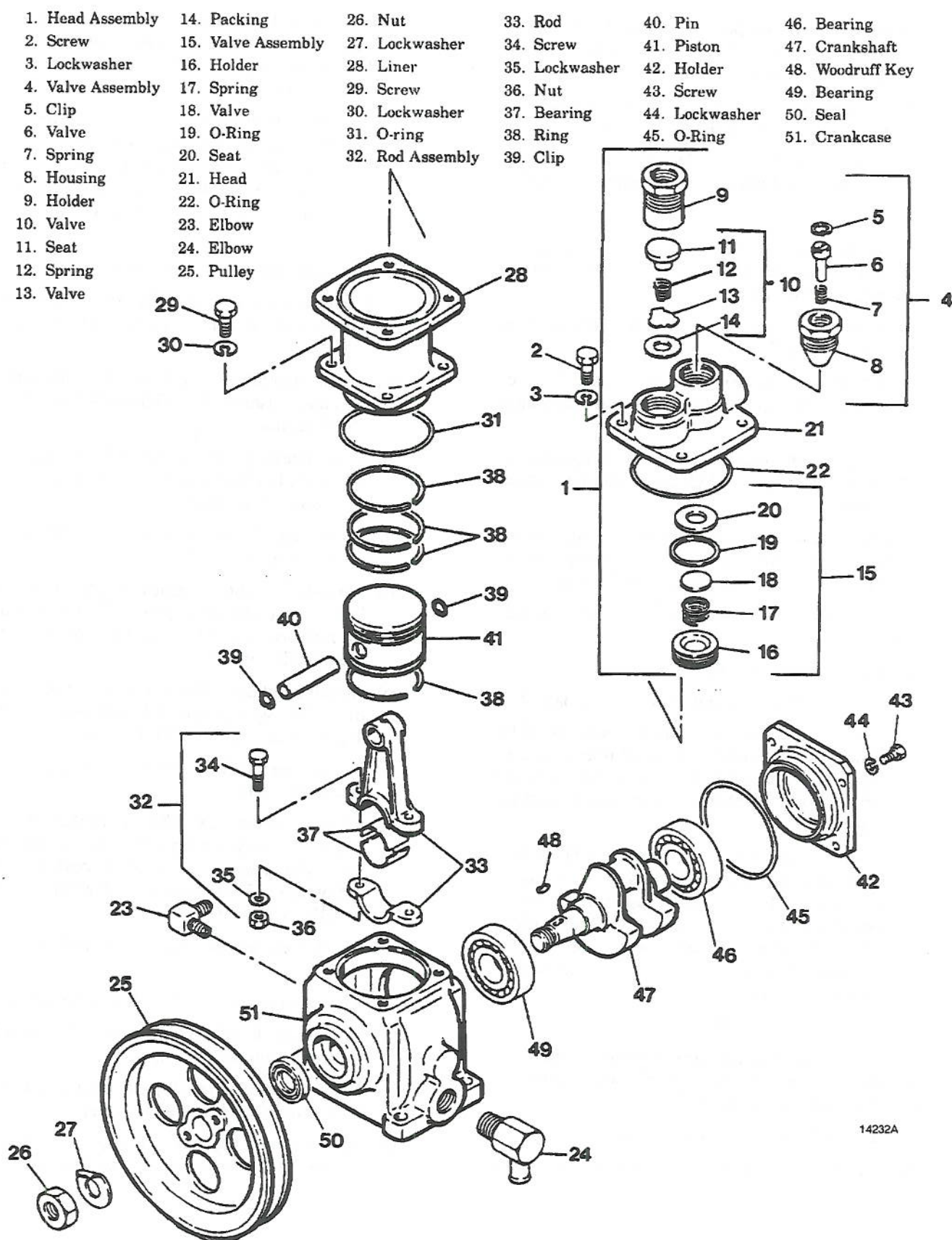
Before attempting removal of the air tank assembly, it must be safely supported. The support is used to protect maintenance personnel from severe injury if the tank would drop suddenly during removal procedures.

- (f) Remove adapter (17) from air tank assembly (30).
 - (g) With air tank assembly (30) securely supported, loosen adapter (19) and carefully remove air tank assembly (30).
 - (h) Remove elbow (28) and relief valve (29) from air tank assembly (30).
 - (i) Remove hose (13), connector (14), and bushing (16) from frame coupler (18).
 - (j) Remove adapter (19) and frame coupler (18).
- (22) Remove components from the right-hand air tank assembly (30) as follows:
- (a) Remove hoses (11 and 10) from elbows (5).
 - (b) Remove screw (20). Tag and remove wires connected to heater and valve assembly (21).
 - (c) Remove plug from heater and valve assembly (21).
 - (d) Loosen adapter connected to air tank assembly (30) to heater and drain valve assembly (21), and remove heater and drain valve assembly.
 - (e) Remove hose (15), connector (14), and bushing (16) from adapter (17).

WARNING

Before attempting removal of the air tank assembly, it must be safely supported. The support is used to protect maintenance personnel from severe injury if the tank would drop suddenly during removal procedures.

- (f) Remove adapter (17) from tank (30).
 - (g) With air tank assembly (3) securely supported, loosen adapter (19) and carefully remove air tank assembly (30).
 - (h) Remove elbows (5) from air tank assembly (30).
 - (i) Remove hose (30), connector (14), and bushing (16) from frame coupler (18).
 - (j) Remove adapter (19) and frame coupler (18).
- b. Disassembly. Disassemble the air compressor, alcohol injector, and air governor assemblies as follows:
- (1) Complete removal procedures per paragraph 5-5.11a before disassembling the air compressor assembly as follows:
 - (a) Remove valve holder (9, fig. 5-206), and valve assembly (10).
 - (b) Remove valve assembly (4).
 - (c) Remove screws (2), lockwashers (3), head (21), o-ring (22), and valve assembly (15).
 - (d) Remove screws (29), lockwashers (30), liner (28), and o-ring (31).
 - (e) Remove clips (39), pin (4), and piston (41).
 - (f) Remove rings (38).
 - (g) Position crankshaft (47) to facilitate removal of rod assembly (32). Remove screws (34), washers (35), nuts (36), and rod assembly (32).
 - (h) Remove cap (33), and rod bearing (37).
 - (i) Remove nut (26), lockwasher (37), pulley (25), and key (48).
 - (j) Remove screws (43), lockwashers (44), bolt (42), bearing (46), crankshaft (47), and bearings (49 and 50).
 - (k) Remove elbows (23 and 24) from crankcase (51).



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Figure 5-206. Air Compressor Assembly

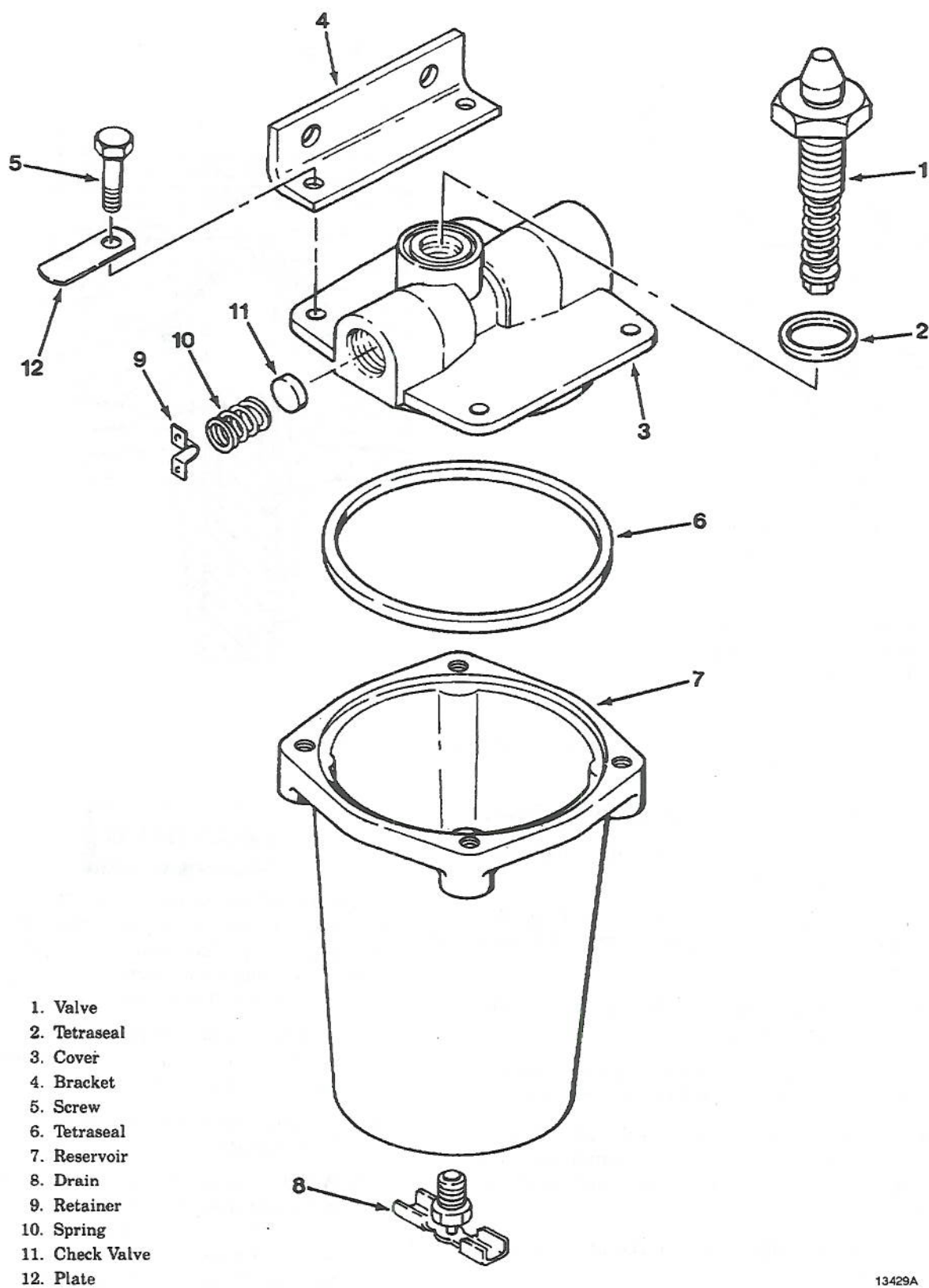
- (2) Complete removal procedures per paragraph 5-5.11a before disassembling the alcohol injector assembly as follows:
 - (a) Remove valve (1, fig. 5-207), tetraseal (2), retainer (9), spring (8), and check valve (11).
 - (b) Remove screws (5), plate (12), bracket (4), cover (3), and tetraseal (6) from reservoir (7).
 - (c) Remove drain cock (8).
- (3) Complete removal procedures per paragraph 5-5.11a before disassembling the air governor assembly as follows:
 - (a) Remove screws (4 fig. 5-208), filter (1), o-rings (2 and 5).
 - (b) Remove screw (6), springs (11 and 12), retainer (10), cap (9), spring (8), and diaphragm (7) from housing (13).
- c. Cleaning and inspection. Refer to paragraphs 5-4.3 and 5-4.4 for general cleaning and inspection procedures.
- d. Assembly. Assemble air compressor, alcohol injector, and air governor before attempting any installation procedure per paragraph 5-5.11e.
 - (1) Assemble the air compressor assembly as follows:
 - (a) Install oil seal (5, fig. 5-206).
 - (b) Press bearings (46 and 49) on crankshaft (47).
 - (c) Insert crankshaft (47) into crankcase (51). Align bearing (149) to bearing bore in crankcase (51). Carefully press in bearings (49 and 46). Ensure crankshaft turns freely with no end play.
 - (d) Install o-ring (45) in crankcase (51). Place bearing holder (42) to crankcase (51), ensure bearing (46) mates with machined bore in bearing holder (42). Attach bearing holder (42) with screws (43) and washers (44). Tighten screws (43) to 16-19 in.-lb and ensure crankshaft turns freely.

NOTE

When installing piston rings remember to stagger ring slots preventing loss of compression and or damage to the liner.

- (e) Install rings (38) to piston (41).
- (f) Install clip (391) into one end of piston (41).

- (g) Insert rod (33) into piston (41) and align holes. Insert pin (40) through piston and rod (33). Install remaining clip (39) into other end of piston (41).
- (h) Lubricate bearing (37). Install bearing (37) and rod (33) to crankshaft (47) with screws (34), washers (35), and nuts (36). Tighten screws to 185-200 in.-lb. Ensure no end play exists between the crankshaft (47) and rod (33).
- (i) Lubricate piston (41) and rings (38).
- (j) Compress piston rings (38) using a ring compressor tool, and insert piston (41) into liner (28).
- (k) Attach liner (28) to crankcase (51) with screws (29) and washers (30). Tighten screws (29) to 25-30 ft.-lbs.
- (l) Insert packing (14), valve (13), spring (12), and seal (11) into head (21). Thread and tighten holder (9) to head (21).
- (m) Insert seat (2), o-ring (19), valve (18), spring (17), and holder (16).
- (n) Thread and tighten housing (8) into head (21). Insert valve (6) onto spring (7). Insert valve (6) into housing (8). Press down on valve (8) and install clip (5).
- (o) Attach head assembly (1), and o-ring (22) to liner (28) with screws (2) and washers (3). Tighten screws (2) to 35-48 in.-lbs.
- (p) Thread and tighten elbows (23 and 24) to crankcase (51).
- (q) Place woodruff key (48) on crankshaft (47). Carefully press pulley (25) onto crankshaft (47). Attach pulley (25) to crankshaft (47) with lockwasher (27) and nut (26). Tighten nut (26) to 185-210 in.-lb.
- (2) Assemble the alcohol injector assembly as follows:
 - (a) Thread drain (8, fig. 5-207) to reservoir (7).
 - (b) Install check valve (11), spring (10), and retainer (9) into cover (3).
 - (c) Place tetraseal (2) on top of cover (3). Thread and tighten safety valve to cover (3).
 - (d) Attach plate (12), bracket (4), cover (3), and tetraseal (6) to reservoir (7) with screws (5).



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Figure 5-207. Alcohol Injector Assembly

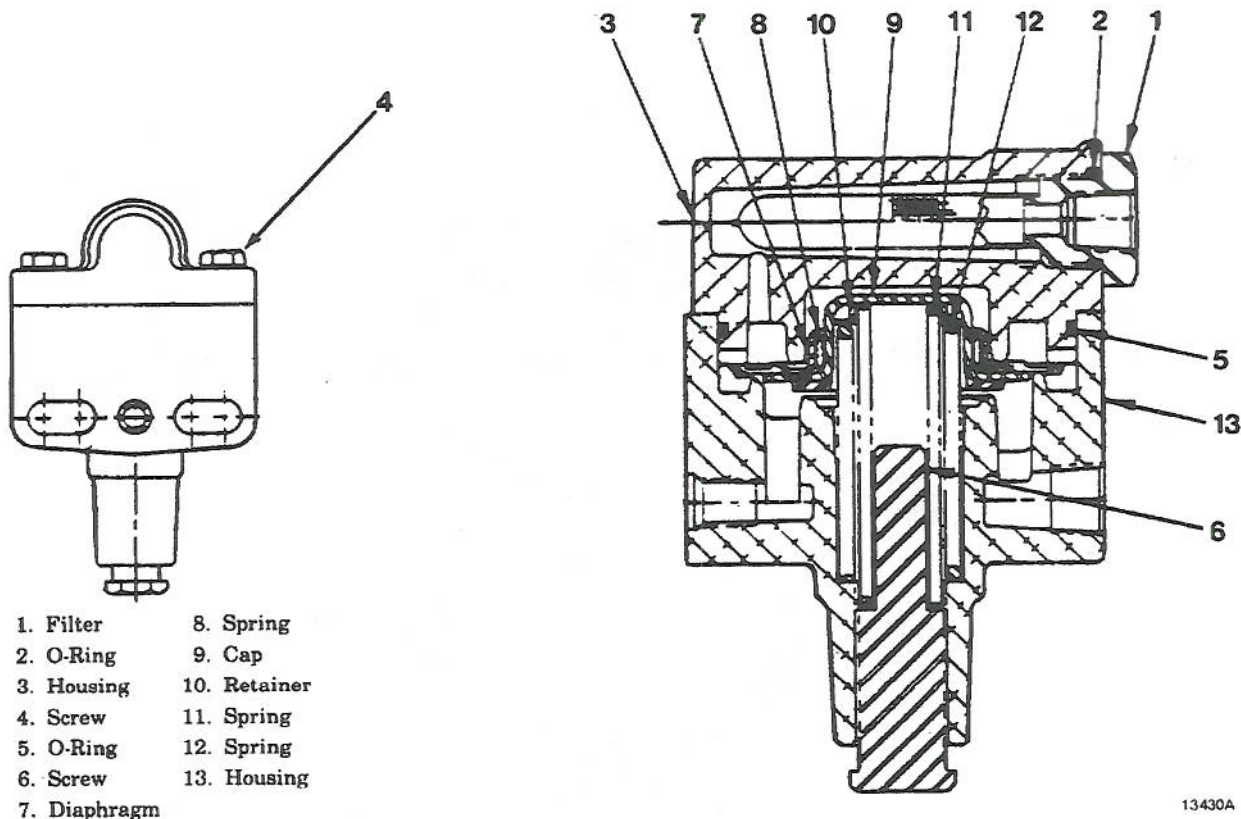


Figure 5-208. Governor Assembly

(3) Assemble the air governor assembly as follows:

- (a) Thread screw (6, fig. 5-208) fully clockwise into housing (13).
 - (b) Insert diaphragm (7), cap (9), spring (8), springs (11 and 12), and retainer (10) into housing (13).
 - (c) Place o-ring (2) into housing (3). Thread filter (1) into housing (3).
 - (d) Place o-ring (5) into housing (13). Attach housing (3) to housing (13) with screws (4).
- e. Installation. Raise and secure vehicle as necessary to facilitate installation of component parts under chassis. Install air system components as follows:
- (1) Install right-hand air tank and component parts as follows:
 - (a) Attach bushing (16, fig. 5-203), connector (14), and hose (30) to frame coupler (18).
 - (b) Attach elbows (5) to air tank assembly (30).

WARNING

Before attempting installation of the air tank assembly, it must be safely supported. The support is used to protect maintenance personnel from severe injury if the tank would drop suddenly during installation procedures.

- (c) Slowly raise tank to position for installation. Once tank is in position, thread and tighten adapters (19 and 17).
 - (d) Attach bushing (16), connector (14), and hose (15) to adapter (17).
 - (e) Attach heater and drain valve assembly (21) to air tank assembly (30) and tighten adapter. Attach all electrical wiring. Attach ground wire to chassis with screw (20). Thread drain plug into heater and drain valve assembly.
 - (f) Attach hoses (10 and 11) to elbows (5).
- (2) Install left-hand air tank and component parts as follows:

- (a) Attach bushing (16), connector (14), and hose (13) to frame coupler (18).
- (b) Attach relief valve (29) and elbow (28) to air tank (30). Connect hose (27) to elbow (28).

WARNING

Before attempting installation of the air tank assembly, it must be safely supported. The support is used to protect maintenance personnel from severe injury if the tank would drop suddenly during installation procedures.

- (c) Slowly raise tank to position for installation. Once tank is in position, thread and tighten adapters (19 and 17).
 - (d) Thread coupling (25), check valve (24), and elbow (23) to pipe (26).
 - (e) Thread pipe (26) into adapter (17).
 - (f) Attach hose (22) to elbow (23).
 - (g) Attach heater and drain valve assembly (21) to air tank assembly (30) and tighten adapter. Attach all electrical wiring. Attach ground wire to chassis with screw (20). Thread drain plug into heater and drain valve assembly.
- (3) Install component parts located under and on dashboard as follows:
- (a) Attach wires and switch (54) to dashboard.
 - (b) Attach wires (32) to buzzer (45). Attach buzzer (45) to dashboard with screws (46).
 - (c) Attach connector (36) to gauge (47). Attach gauge (47) to dashboard with screws (48).
 - (d) Attach switch (34) to elbow (37). Attach elbow (39) to elbow (37).
 - (e) Attach wires (32) to switch (34). Attach hoses (15 and 38) to elbow (39). Attach hose (35) to elbow (37).
 - (f) Thread elbow (5) and switch (42) to tee (43).
 - (g) Thread nipple (44) into valve (49).
 - (h) Thread tee (43) to nipple (44).
 - (i) Thread elbow (5) to valve (49).
 - (j) Attach bracket (51) to dashboard with screws (52).
 - (k) Attach valve (49) to bracket (51) with bolts (50).
 - (l) Attach wires (33) to switch (42).
 - (m) Attach hoses (36 and 38) to elbows (5).
- (4) Install rear gladhand and valve assembly as follows:
- (a) Attach frame stud (4) to frame.
 - (b) Thread elbow (5) to frame stud (4).
 - (c) Attach hose (11) to elbow (5).
 - (d) Thread valve (8), nipple (7), and gladhand (6) to frame stud (4).
 - (e) Attach coupling (1) to gladhand (6).
- (5) Install rear gladhand assembly as follows:
- (a) Attach frame stud (4) to frame.
 - (b) Thread elbow (5) to frame stud (4).
 - (c) Attach hose (12) to elbow (5).
 - (d) Thread gladhand (2) to frame stud (4).
 - (e) Attach coupling (1) to gladhand (2).
- (6) Install front gladhand and valve assembly as follows:
- (a) Attach frame stud (4) to frame.
 - (b) Thread elbow (5) to frame stud (4).
 - (c) Attach hose (1) to elbow (5).
 - (d) Thread elbow (3), valve (8), nipple (7), and gladhand (2) to frame stud (4).
 - (e) Attach coupling (1) to gladhand (2).
- (7) Attach front gladhand assembly as follows:
- (a) Attach frame stud (4) to frame.
 - (b) Thread elbow (5) to frame stud (4).
 - (c) Attach hose (9) to elbow (5).
 - (d) Thread elbow (3) and gladhand (2) to frame stud (4).
 - (e) Attach coupling (1) to gladhand (2).
- (8) Attach hoses (9, 12, and 31) to tee (74).
 - (9) Attach governor assembly (59) with screws (60).
 - (10) Attach hoses (27 and 56) to governor assembly (59).
 - (11) Attach alcohol injector assembly (64) to mounting bracket (67) with bolts (65) and nuts (66).
 - (12) Attach hoses (61 and 22) to connector (62) and elbow (63).
 - (13) Attach bracket (8, fig. 5-205) with lockwashers (10) and nuts (9).

- (14) Attach compressor (6) to bracket (8) with screws (7).
 - (15) Attach both ends of hose (2) and tighten clamps (3).
 - (16) Clamp tube (4), and attach to connector (5) and compressor (6).
 - (17) Install the idler pulley assembly as follows:
 - (a) Thread screw (8, fig. 5-204) through bolt (7) until threads from screw (8) just appear through bolt (7).
 - (b) Insert bolt (7) through bracket (9).
 - (c) Place spacer (6) and shield (5) on bolt (7).
 - (d) Thread pulley (41) on bolt (7) by turning pulley clockwise.
 - (e) Place gasket (3) on top of thermostat assembly.
 - (f) Attach bracket (9), gasket (3), and outlet (1) with screws (2).
 - (18) Place belt (58, fig. 5-203) around pulleys. Tighten belt (58) by turning bolt (8) clockwise until not more than 1 inch of play is attained.
- f. Testing. Perform testing procedures as follows:

WARNING

Depressurize system before attempting any service or repair that requires disassembly of any pressurized components. Severe injury or death can result if system remains pressurized during any component removal.

Do not work under raised vehicle without first supporting vehicle with safety jack stands or injury to personnel could result.

CAUTION

Check engine oil level fill and change oil as required. Severe damage to air compressor can result from insufficient oil flow.

- (1) Remove hose (61, fig 5-203), and elbow (72).
- (2) Attach a pressure gauge (0-200 psi) and tee to air outlet of air compressor. Attach hose (61) to other end of tee.
- (3) Start engine and allow to idle. Check for oil leakage, noise (bearing whine or knocking) from air compressor or belt noise. Ensure any problems are corrected before proceeding with testing.

- (4) Ensure drain plugs (21) are correctly installed.
- (5) Start engine and set idle to specifications as necessary. At pressures below 60 psi air compressor will fill tanks. At 100 psi air governor will unload (vent) air flow.
- (6) Observe attached pressure gauge, the air governor should unload pressure between 100-125 psi. If governor unloads between the min-max values the system is functioning correctly. If not adjust the air governor by turning adjusting screw (6, fig 5-208) in to increase and out to decrease unload pressure.
- (7) After all adjustments are completed depressurize system.
- (8) Remove hose (61, fig 5-203), tee, and valve from air compressor air outlet.
- (9) Thread elbow (72) and attach hose (61).
- (10) Start engine and let idle. Air compressor should fill system in 5-7 minutes and then unload (vent) air. Time the fill cycle. If over 7 minutes check system for air leaks. If no leaks are found this indicates an internal problem with air compressor that must be corrected.

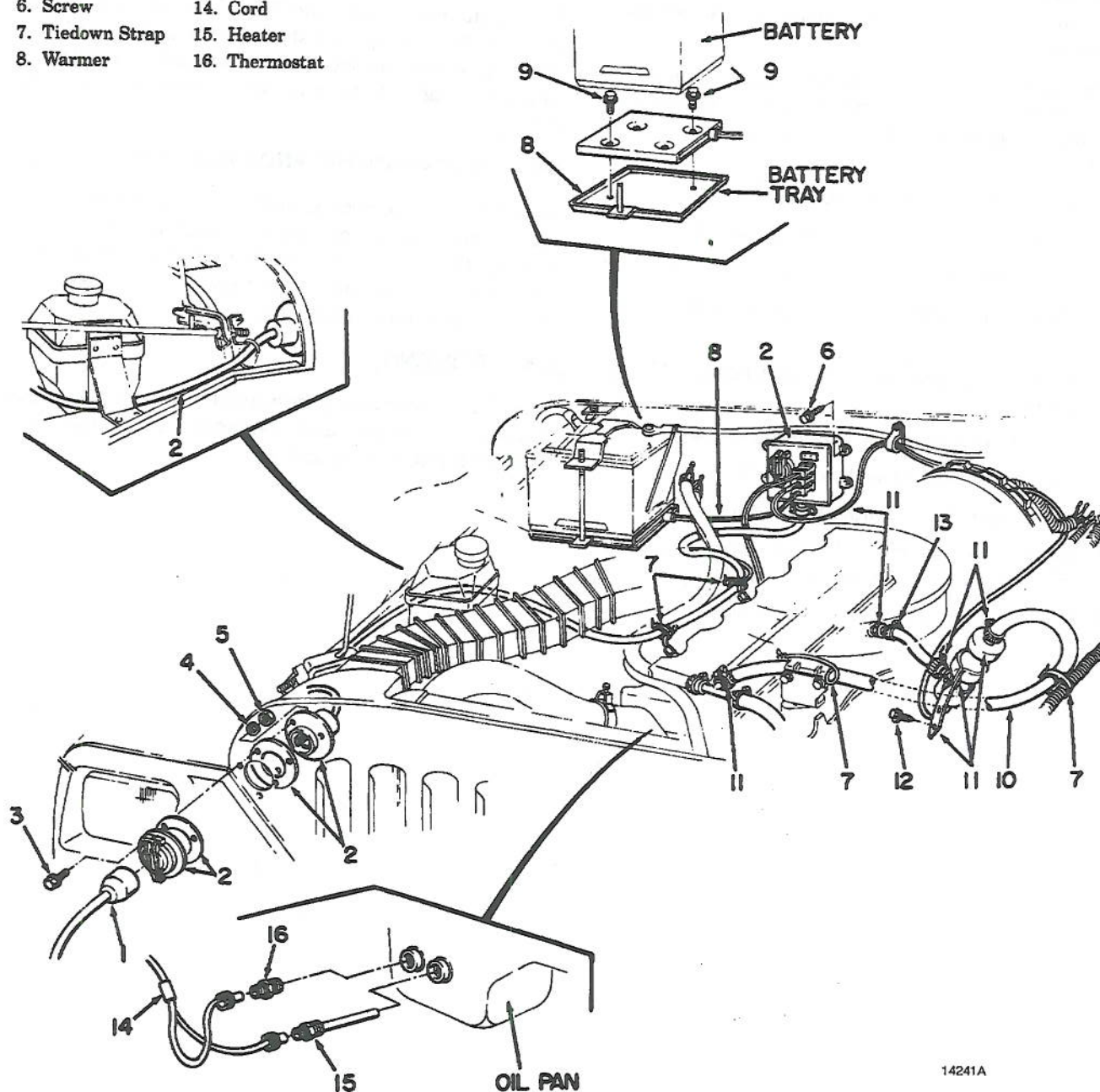
5-5.12 **Winterization Kit.** Disassembly procedures are preformed during removal procedures.

WARNING

Do not work under raised vehicle without first supporting vehicle with safety jack stands or injury to personnel may result.

- a. Removal. Remove any tiedown straps to facilitate removal of any component. Remove component parts from the winterization kit as follows:
 - (1) Disconnect power cable (1, fig 5-209), and plugs from box assembly (2).
 - (2) Remove screws (3), lockwashers (4), nuts (5), screws (6) and box assembly (2).
 - (3) Remove battery per paragraph 4-4.6.
 - (4) Remove screws (9) and warmer (8).
 - (5) Drain oil from vehicle per paragraph 4-4.4.
 - (6) Remove cord assembly (14) from heater (15) and thermostat (16).
 - (7) Remove heater (15) and thermostat (16).

- | | |
|------------------|----------------|
| 1. Cable | 9. Screw |
| 2. Box Assembly | 10. Hose |
| 3. Screw | 11. Heater |
| 4. Lockwasher | 12. Screw |
| 5. Nut | 13. Clamp |
| 6. Screw | 14. Cord |
| 7. Tiedown Strap | 15. Heater |
| 8. Warmer | 16. Thermostat |



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Figure 5-209. Winterization Kit

- (8) Drain coolant from vehicle per paragraph 4-4.2.
- (9) Loosen clamps (13) and remove hose (10).
- (10) Remove screws (2) and heater (11).
- b. Cleaning and Inspection. Refer to paragraphs 5-4.3 and 5-4.4 for general cleaning and inspection procedures.
- c. Installation. Install all tiedown straps during installation of component parts removed during removal procedures. Install winterization kit as follows:
 - (1) Attach heater (11) with screws (2).
 - (2) Attach hoses (1) and tighten clamps (13).
 - (3) Add coolant to vehicle per paragraph 4-4.2.
 - (4) Thread thermostat (16) and heater (15) to oil pan.
 - (5) Attach cord assembly (16) and heater (15) to oil pan.
 - (6) Add oil to vehicle per paragraph 4-4.4.
 - (7) Attach warmer (8) with screws (9).
 - (8) Install battery per paragraph 4-4.6.
 - (9) Attach box assembly (2) with screws (6), nuts (5), lockwashers (4), and screws (3).
 - (10) Connect power cable (1) as necessary.

5-6. STORAGE.

Assemblies or components which will be stored before reinstallation must be preserved according to approved procedures. Bare steel parts should be sprayed or dipped in corrosion preventive compound (13, table 5-1) Type II, or a mixture of one part Type I and three parts engine oil. All components should be wrapped in plastic sheeting or moistureproof paper, with all exposed ports plugged or taped to keep out dust, moisture or foreign material.

5-7. WORKMANSHIP AND HANDLING.

Maintenance practices should be of the highest standard. Obtain the proper tools for each task before beginning the work. Keep work area clean. New parts should not be laid out where they will be exposed to dirt or dust before installation.

5-8. PAINTING.

Procedures for painting are limited to touch-up and spot painting. Use green paint (34, table 5-1) and use standard shop practices to apply.