Workshop Service Manual

Applicator Chassis

RG900B
RG1100B
RG1300B

North America
4205 River Green Parkway, Duluth GA 30096 USA

April 2017
79035868B
NA
English

Rapid release of fluids from pressurized cooling systems can cause serious burns.

Shut off the engine. Remove the filler cap only when the filler cap is cool enough to touch with bare hands. Slowly, loosen the filler cap to the first stop to relieve any pressure before removing the cap completely.

Fig. 27

Electrical storage batteries give off highly flammable hydrogen gas. Keep sparks and flames away from the battery.

Do not lay tools or other conductive materials on a battery.

Be careful when connecting booster cables to the machine. Electrical component damage or battery explosion can result if booster cables are not installed correctly.

Sulfuric acid in battery electrolyte is poisonous. The acid is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

If acid contacts eyes, skin or clothing, flush with water immediately. If eye contact occurs, flush with water for 15 minutes and seek medical attention immediately.

If swallowed, drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Battery posts, terminals and other battery parts contain lead and lead compounds. Wash hands carefully after handling a battery.

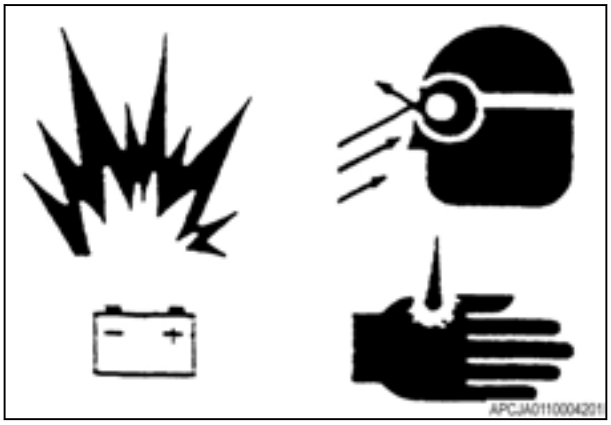


Fig. 28

Never weld on a wheel or rim that has a tire on it.

Never try to mount or remove a tire unless using the correct equipment. A tire safety cage, instructions, and training are necessary to do the work safely. Failure to follow the correct procedures when mounting a tire on a wheel or rim can cause an explosion and serious injury.

Tire repair procedures must be done by trained and approved personnel.

Before adding air to a tire, inspect the tire and wheel for any signs of damage. Do not attempt to fill if damage is noticed. Have trained and approved personnel make repairs immediately.

See additional instruction in the tire safety section.

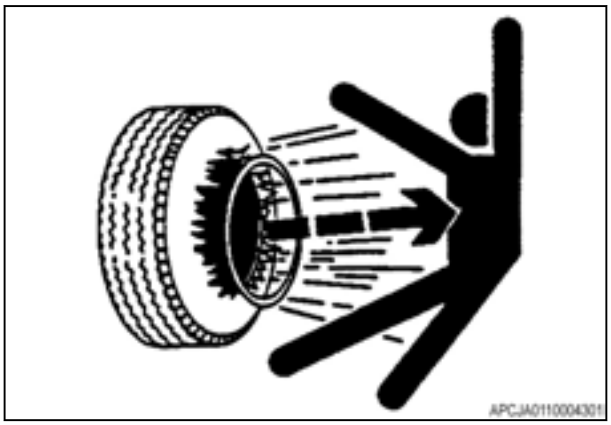
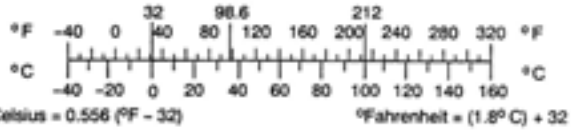


Fig. 29

1.5.5 Conversion table

	MULTIPLY:	BY:		To Get: MULTIPLY	BY:		To Get:
LINEAR	inches	x 25.4	=	millimeters (mm)	x 0.03937	=	inches
	feet	x 0.3048	=	meters (m)	x 3.281	=	feet
	yards	x 0.9144	=	meters (m)	x 1.0936	=	yards
	miles	x 1.6093	=	kilometers (km)	x 0.6214	=	miles
	inches	x 2.54	=	centimeters (cm)	x 0.3937	=	inches
	microinches	x 0.0254	=	micrometers (um)	x 39.37	=	microinches
AREA	inches²	x 645.16	=	millimeters² (mm^2)	x 0.00155	=	inches²
	inches²	x 6.4516	=	centimeters² (cm^2)	x 0.155	=	inches²
	feet²	x 0.0929	=	meters² (m^2)	x 10.764	=	feet²
	yards²	x 0.8361	=	meters² (m^2)	x 1.196	=	yards²
	acres	x 0.4047	=	hectometers² (hm^2)	x 2.471	=	acres
			=	hectares (ha)			
VOLUME	inches³	x 16387	=	millimeters³ (mm^3)	x 0.000061	=	inches³
	inches³	x 16.387	=	centimeters³ (cm^3)	x 0.06102	=	inches³
	inches³	x 0.01639	=	liters	x 61.024	=	inches³
	quarts	x 0.94635	=	liters	x 1.0567	=	quarts
	gallons	x 3.7854	=	liters	x 0.2642	=	gallons
	feet³	x 28.317	=	liters	x 0.03531	=	feet³
	feet³	x 0.02832	=	meters³ (m^3)	x 35.315	=	feet³
	fluid oz.	x 29.57	=	milliliters (ml)	x 0.03381	=	fluid oz.
	yards³	x 0.7646	=	meters³ (m^3)	x 1.3080	=	yards³
	teaspoons	x 4.929	=	milliliters (ml)	x 0.2029	=	teaspoons
	cups	x 0.2366	=	liters	x 4.227	=	cups
	bushel	x 35.239	=	liters	x 0.02838	=	bushels
	bushel	x 0.03524	=	meters³ (m^3)	x 28.378	=	bushels
MASS	ounces (av)	x 28.35	=	grams (g)	x 0.03527	=	ounces (av)
	pounds (av)	x 0.4536	=	kilograms (kg)	x 2.2046	=	pounds (av)
	tons (2000 lbs)	x 907.18	=	kilograms (kg)	x 0.001102	=	tons (2000 lbs)
	tons (2000 lbs)	x .90718	=	metric tons(t)	x 1.1023	=	tons(2000 lbs)
	tons (long) (2240 lbs)	x 1016.05	=	kilograms (kg)	x .000984	=	tons (long) (2240 lbs)
FORCE	ounces - f (av)	x 0.278	=	newtons (N)	x 3.597	=	ounces - f (av)
	pounds - f (av)	x 4.488	=	newtons (N)	x 0.2248	=	pounds - f (av)
	kilograms - f	x 9.807	=	newtons (N)	x 0.10197	=	kilograms - f
PRESSURE OR STRESS	pounds/sq.in.	x 6.895	=	kilopascals (kPa)	x 0.145	=	pounds/sq. in.
	pounds/sq.in.	x 0.0689	=	bar	x 14.503	=	pounds/sq. in.
POWER	horsepower	x 0.746	=	kilowatts (kW)	x 1.34	=	horsepower
	ft-lbf/min.	x 0.0226	=	watts (W)	x 44.25	=	ft - lbf/min.
TORQUE	pound - inches	x 0.11298	=	newton-meters (N.m)	x 8.851	=	pound-inches
	pound - feet	x 1.3558	=	newton-meters (N.m)	x 0.7376	=	pound-feet
VELOCITY	miles/hour	x 1.6093	=	kilometers/hour (km/h)	x 0.6214	=	miles/hour
	feet/sec.	x 0.3048	=	meters/sec. (m/s)	x 3.281	=	feet/sec.
	kilometers/hr.	x 0.27778	=	meters/sec. (m/s)	x 3.600	=	kilometers/hr.
	miles/hours	x 0.4470	=	meters/sec. (m/s)	x 2.237	=	miles/hour

TEMPERATURE



°Celsius = 0.556 (°F – 32) °Fahrenheit = (1.8° C) + 32

MetConv.doc

CMCHE021003580

Fig. 61

13. Install the foam seals (1) to the top and the bottom of the cooling package (2).

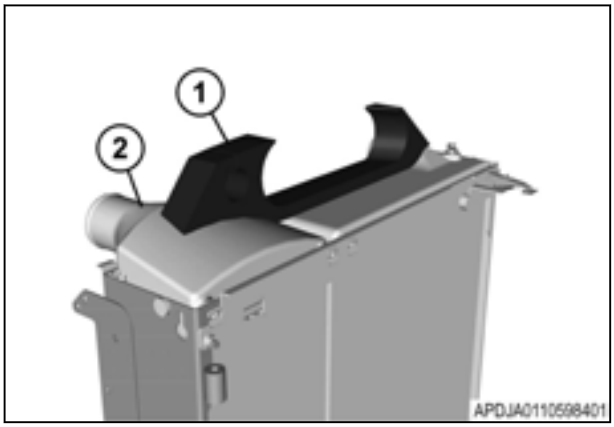


Fig. 30

14. Fasten the right-hand side channel (3) to the cooling package with two pins (2), and two pin clips (1).

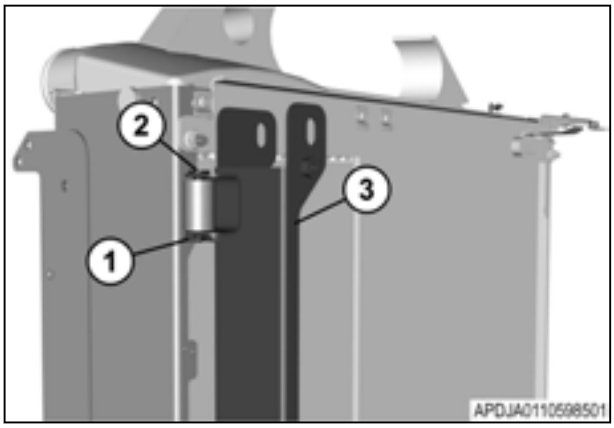


Fig. 31

15. Fasten the hydraulic oil cooler (2) to the oil cooler mount (3) with the hardware (1).

IMPORTANT:
The weight of the hydraulic oil cooler is approximately 36 kg (79.37 lb).

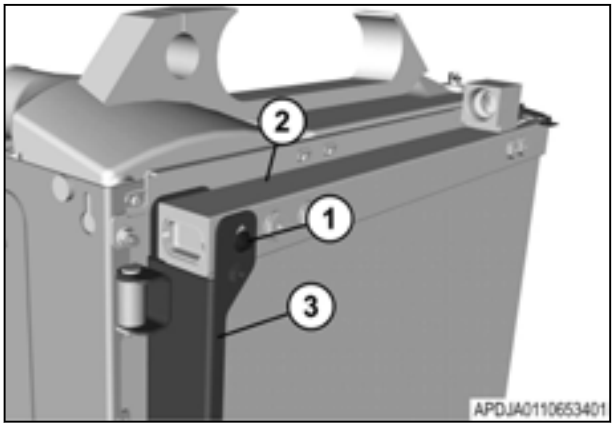


Fig. 32

7. Fasten the condenser (1) to the mounting brackets with the hardware (2). Lock the top and bottom spring plungers (3) and latches (4).

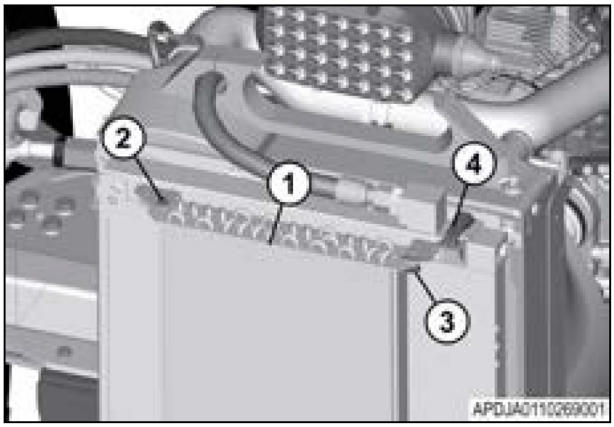


Fig. 91

8. Move the fan shroud (1) forward to the normal operating position and fasten to the brackets with the hardware (1).

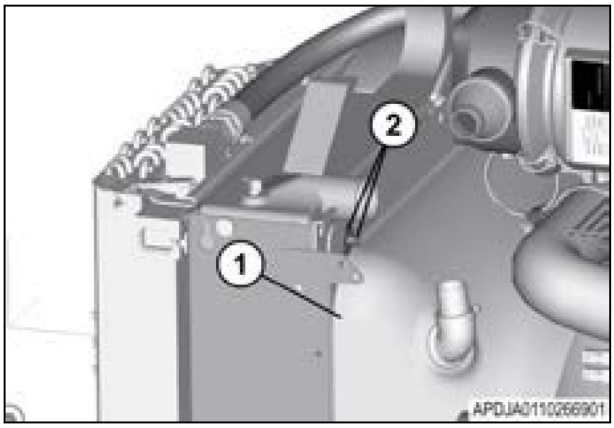


Fig. 92

9. Remove the plugs and caps. Connect the bottom radiator hose (2) to the radiator with the hose clamp (1). Tighten the clamp to 11 Nm (8 lbf ft).

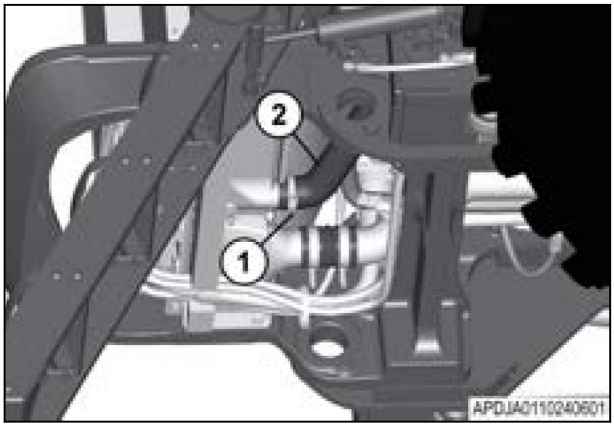


Fig. 93

18. Loosen the hose clamps (1) and disconnect the hoses (4). Remove the hardware (2), the two support cover brackets (3) and the expansion tank (5).

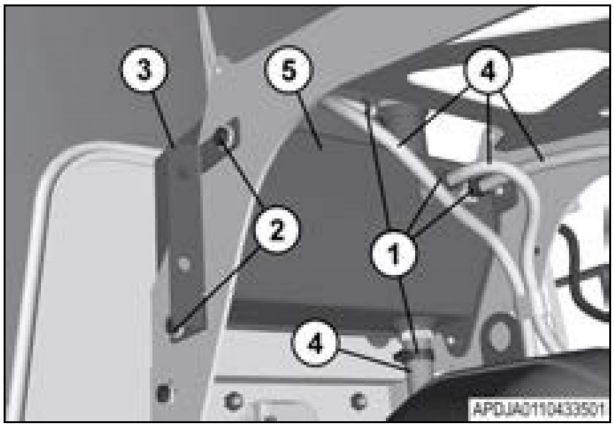


Fig. 152

19. Loosen the hose clamps (1) and disconnect the top radiator hose (2).

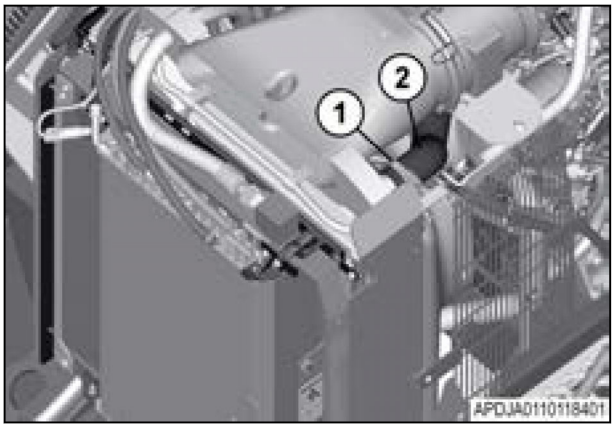


Fig. 153

20. Loosen the hose clamp (1), remove the cable tie (2) and the top charge air tube (3).

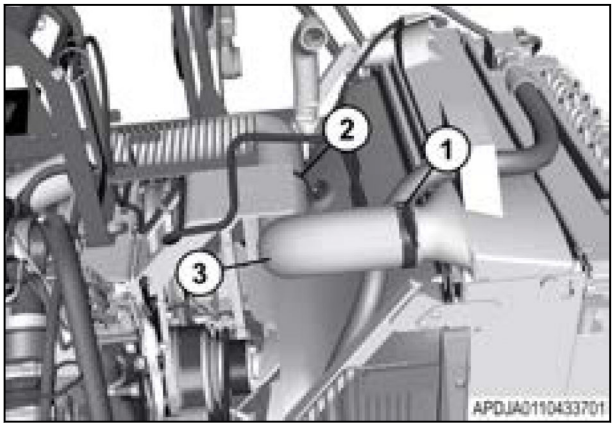


Fig. 154

15. Support the tandem hydrostatic pumps (1).

    IMPORTANT: *The weight of the pumps is approximately 190 kg (419 lb) (419 lb).*

16. Slide the pumps forward to engage the spline shaft. Attach the pumps to the pump mounting plate with the hardware (2).

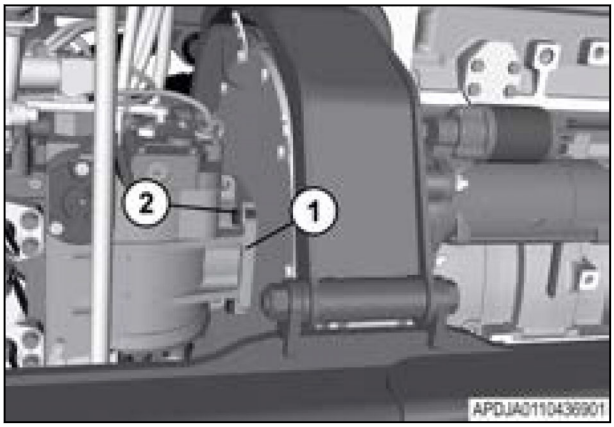


Fig. 213

17. Connect the ground cable (1).

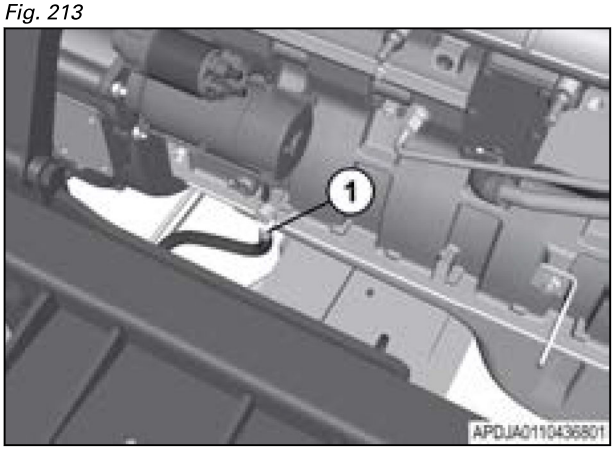


Fig. 214

18. Install the bottom alternator (1).

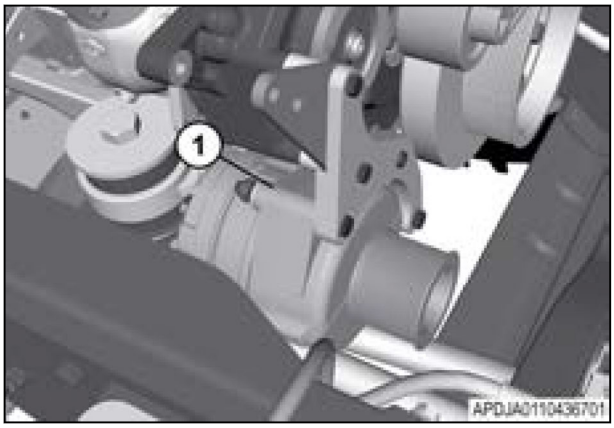


Fig. 215

19. Install the top alternator (1).

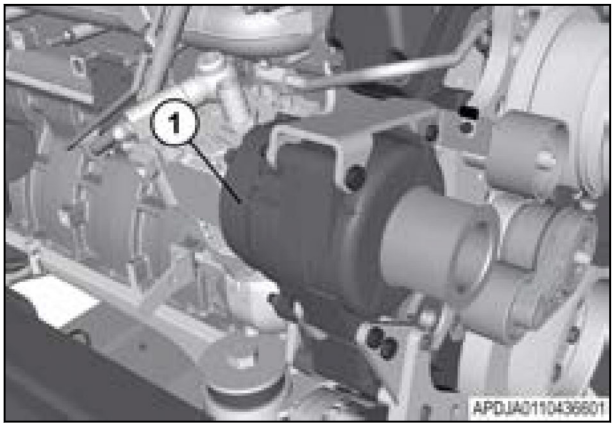


Fig. 216

7. Remove the plug (1) from the diesel exhaust fluid (DEF) tank, and drain the contents into a correct container. Install the plug when empty.

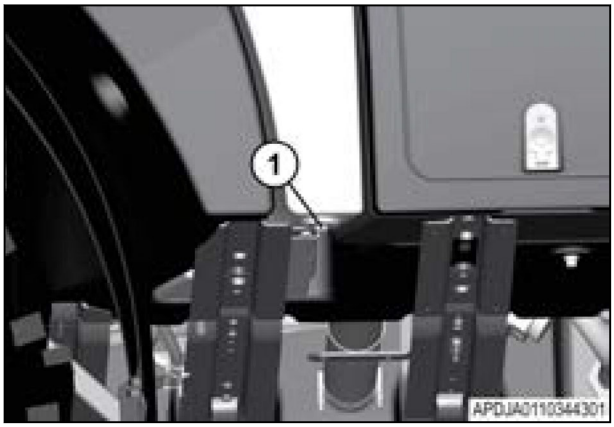


Fig. 279

8. Remove the hardware (1) and the bottom front frame cover (2).

IMPORTANT:
The weight of the bottom front frame cover is approximately 32 kg (71 lb).

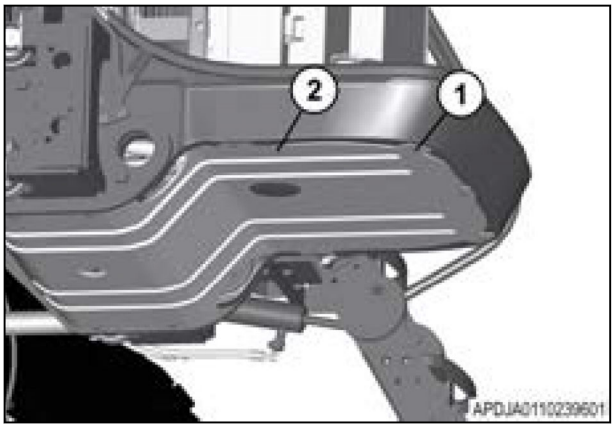


Fig. 280

9. Loosen the drain valve (1), and drain the engine coolant into a correct container.

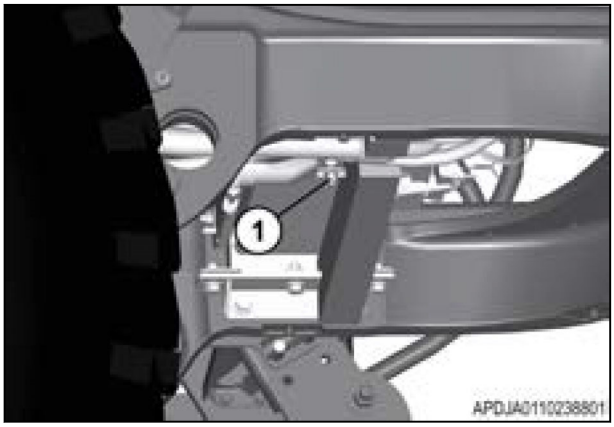


Fig. 281

6. Set a correct container under the radiator drain valve (1). Loosen the radiator drain valve, and drain the engine coolant.

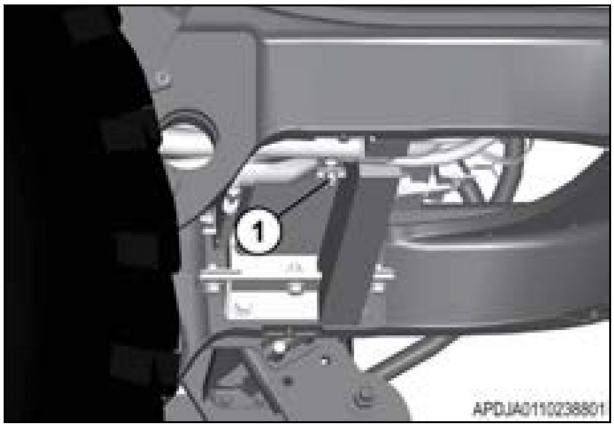


Fig. 338

7. Remove the hardware and guide (1), and the left-hand fan guard (2).

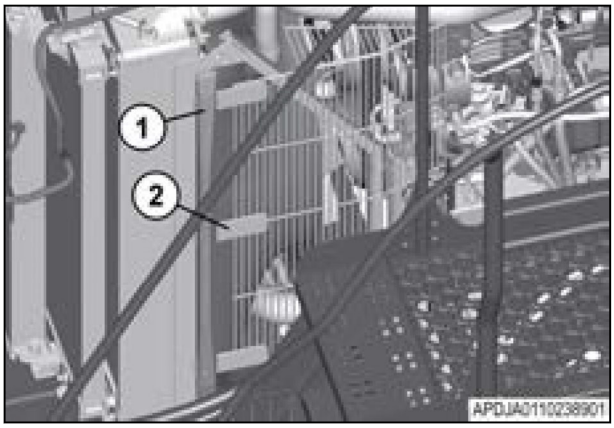


Fig. 339

8. Remove the hardware and guide (1), and the right-hand fan guard (2).

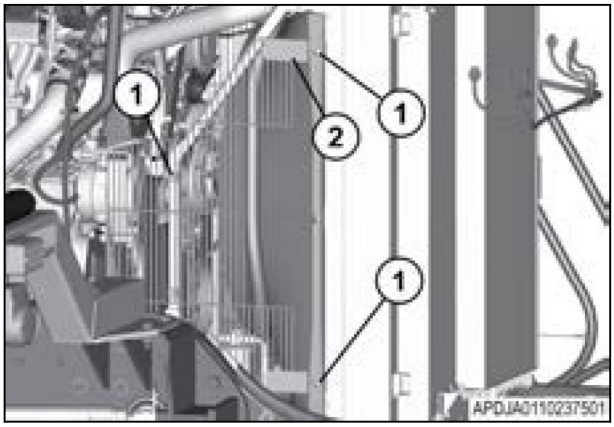


Fig. 340

19. Remove the hardware (1), the pins (2), and the two rear crossmembers (3).

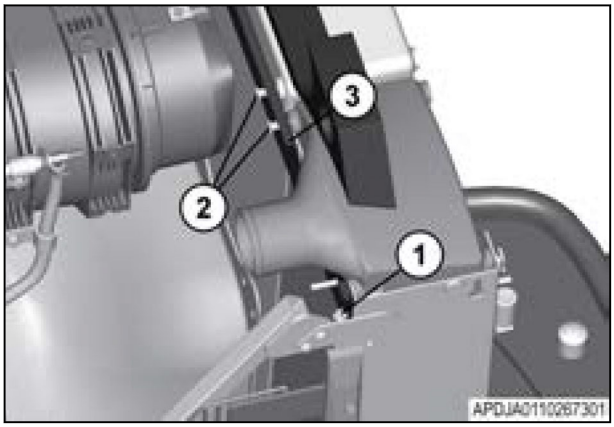


Fig. 398

20. Remove the top foam seal (1) and the rear seal (2).

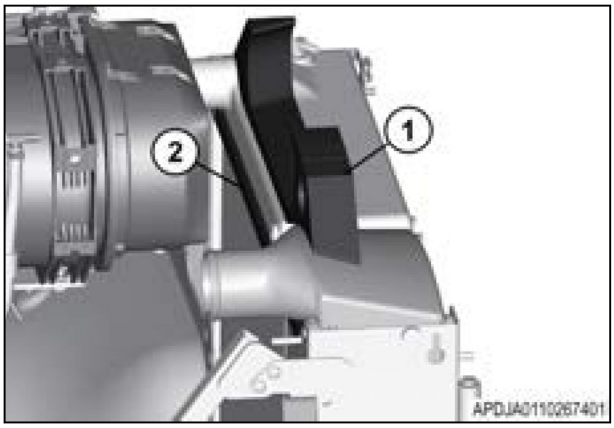


Fig. 399

21. Use the correct lifting equipment and remove the charge air cooler (1).

IMPORTANT:
The weight of the charge air cooler is approximately 19 kg (42 lb).

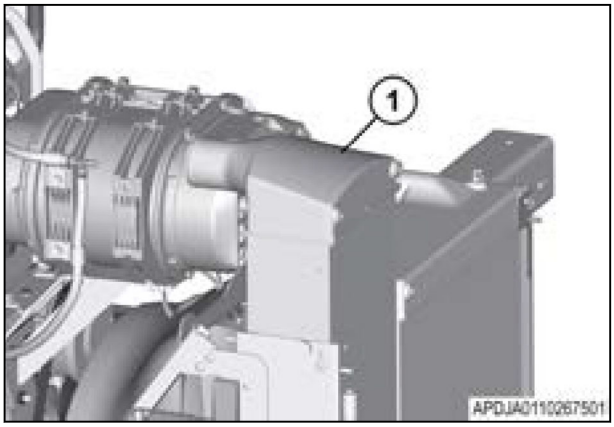


Fig. 400

13. Remove the air filter service indicator (1) from the air filter housing (2).

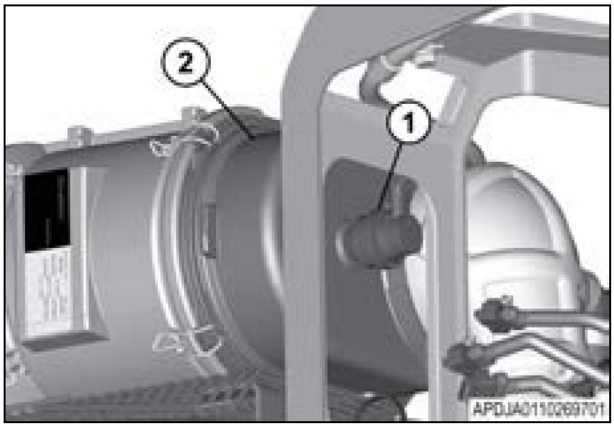


Fig. 460

14. Remove the hardware (1) and the air filter housing (2).

IMPORTANT:
The weight of the air filter housing is approximately 9 kg (20 lb).

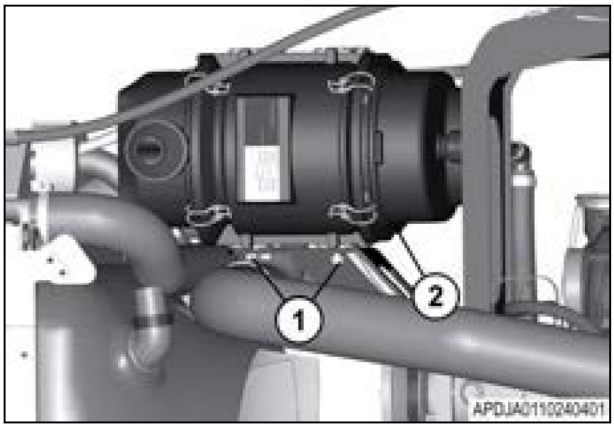


Fig. 461

15. Remove the hardware (1) and the air filter housing bracket (2).

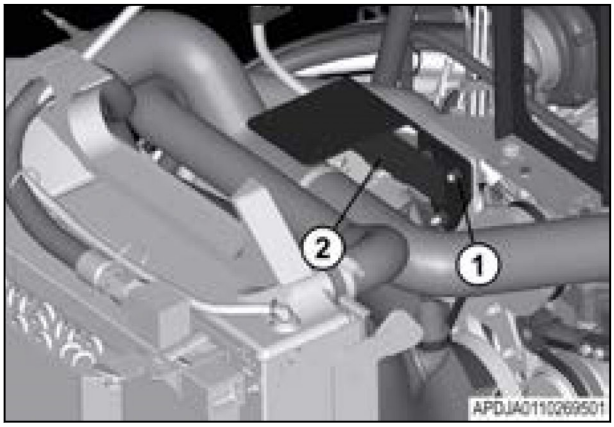


Fig. 462

6. Remove the cable tie. Disconnect the four hose clamps (1) and remove the fuel crossover hose (2).

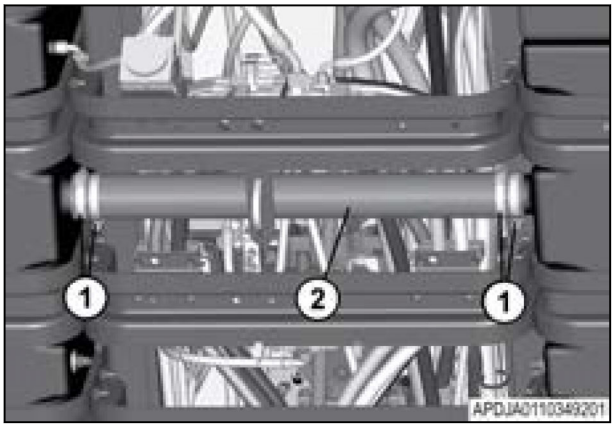


Fig. 515

7. Push the latch button (1) on the two latches and open the tool box door.

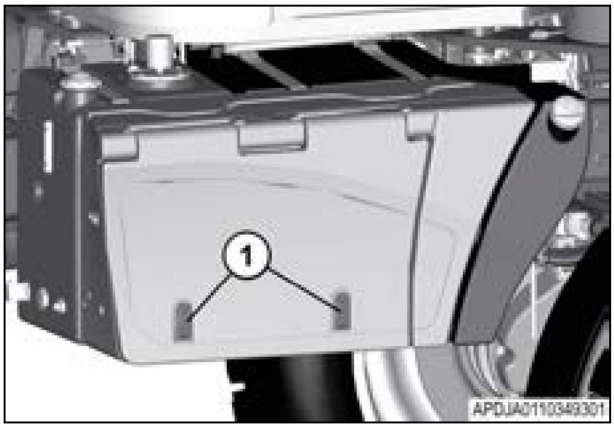


Fig. 516

8. Disconnect the pressure washer hydraulic hoses (1) from the tool box (2). (If equipped). Plug the hoses and the ports.

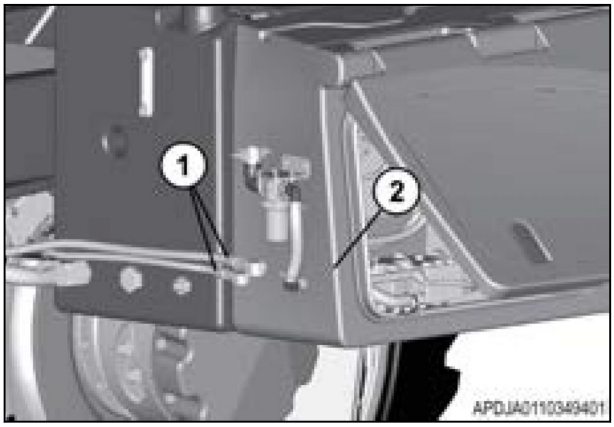


Fig. 517

7. Fasten the fuel tank support bracket to the fuel tank with the hardware (4). Fasten the support rod (2) and the spacer tube (3) to the fuel tank with the hardware (1).

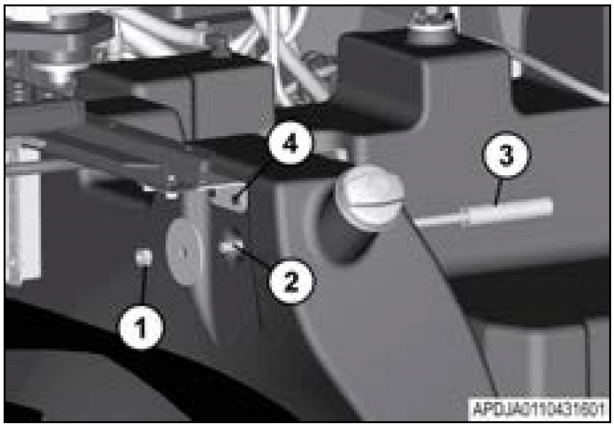


Fig. 575

8. Install the battery box assembly (1).

IMPORTANT:
The weight of the battery box assembly is approximately 102 kg (225 lb).

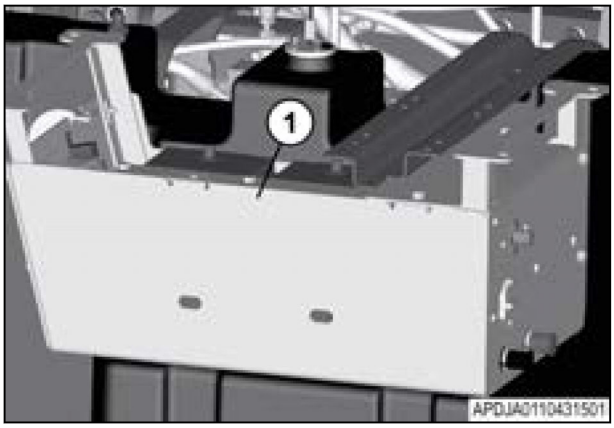


Fig. 576

9. Connect the power cable (1) to the relay.

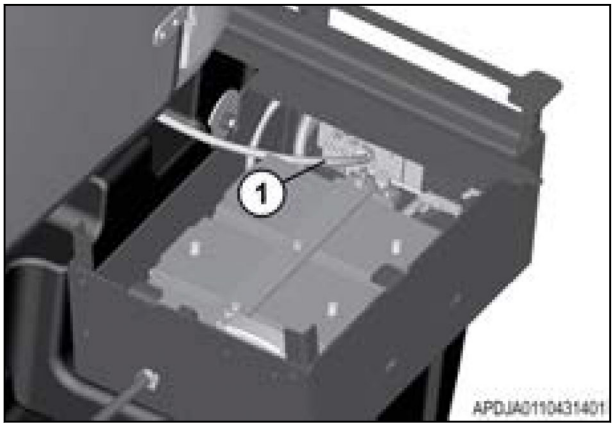


Fig. 577

7. Remove the clamp (1) and the exhaust pipe (2).

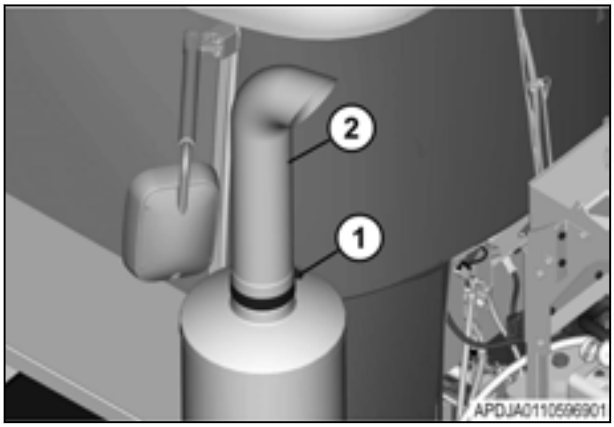


Fig. 632

8. Remove the hardware (1) and the muffler (2).

   IMPORTANT: *The weight of the muffler is approximately 26 kg (57.32 lb).*

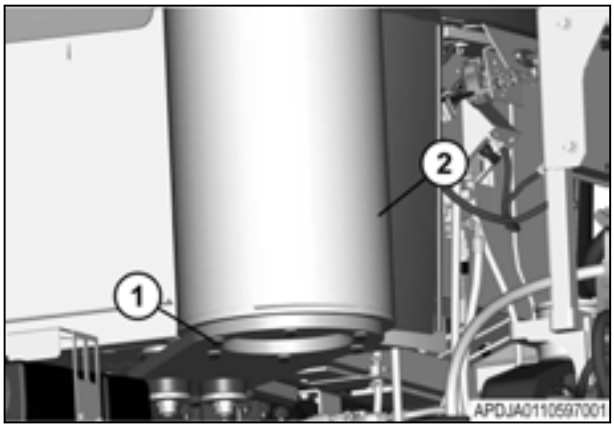


Fig. 633

2.3.2 Installing the exhaust system without diesel exhaust fluid

Procedure

1. Fasten the muffler (2) to the frame bracket with the hardware (1).

   IMPORTANT:
   The weight of the muffler is approximately 26 kg (57.32 lb).

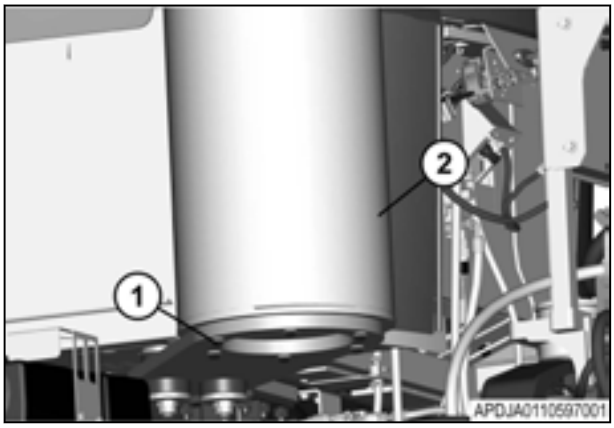


Fig. 634

2.5.3 Marking of the electronic control unit

The specification of the application is indicated on the type plate of the electronic control unit (ECU). This specification must always be stated when ordering an electronic control unit or asking for adjusting settings.

NOTE: *Engine with aftertreatment system meets EU97/68/EC Stage IV and EPA 40 CFR 1039 Tier 4 final emission requirements.*

Do not fit any components on the engine other than those originally intended for it. The use of other than original AGCO Parts spare parts invalidates the responsibility of AGCO Power Inc. on the meeting of the emission requirements.

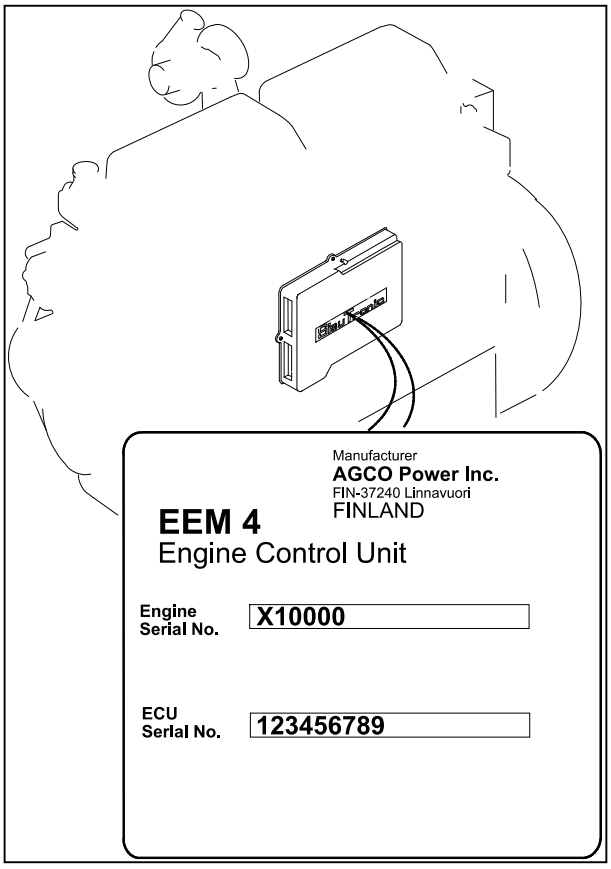


Fig. 683

2.5.4 Engine lifting

DANGER:

Safe lifting of the engine is done with a lifting device where the lifting force affects the lifting eyes vertically.

Cylinder liners	
Height of cylinder liner flange, 2nd oversize	9.13 - 9.15 mm
Height of cylinder liner flange, 3rd oversize	9.23 - 9.25 mm
Outer diameter of cylinder liner flange	131.700 - 131.800 mm

74 engines	
Outer diameter of cylinder liner guide:	
• at upper end of liner	• 124.475 - 124.500 mm
• at lower end of liner	• 122.961 - 122.986 mm
Liner bore	108.010 - 108.032 mm

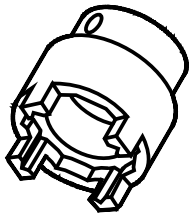
84 engines	
Outer diameter of cylinder liner guide:	
• at upper end of liner	• 124.975 - 125.000 mm
• at lower end of liner	• 120.966 - 120.991 mm
Liner bore	111.000 - 111.022 mm

2.7.3 Cylinder head

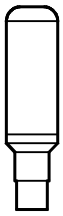
Cylinder head	
Height of cylinder head	109.900 - 110.000 mm
Height of cylinder head after repair grinding (minimum)	109.500 mm
Length of cylinder head bolts	148 mm (maximum 150 mm)
Length of cylinder head studs (overall length)	186 + 1 mm (maximum 188.5 mm)
Inside diameter of valve guide	8.000 - 8.015 mm
Outside diameter of valve guide	16.028 - 16.039 mm
Diameter of valve guide bore in cylinder head	16.000 - 16.018 mm
Position of valve guide top above cylinder head surface	13 mm
Depth of valve head face below cylinder head surface:	
• inlet valve	• 0.65 - 0.85 mm (maximum 2.20 mm)
• exhaust valve	• 0.45 - 0.65 mm (maximum 2.20 mm)
Angle of valve seat:	

2.9.3 Cylinder head and valve mechanism tools

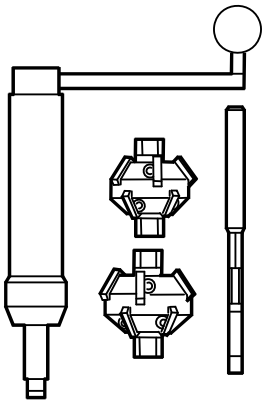
Reference	V920179670
Description	Socket for injector wiring



Reference	V920185580
Description	Fitting tool for valve stem gasket



Reference	V837062635
Description	Milling cutter kit for valve seat



33-74, 2V Citius engines

2.12 Cylinder block

2.12.1 Measuring cylinder liner wear

Procedure

1. Using a micrometer, set the dial gauge to zero using a new cylinder liner indicating the initial dimension of the bore. See Technical data, Cylinder liners.
2. Clean the inner surface of the cylinder liner thoroughly before measurement.
3. Perform the measurement crosswise at the top end, lower end and middle of the liner.
4. Check the gauge reading for maximum wear and ovalness (compare with rated).

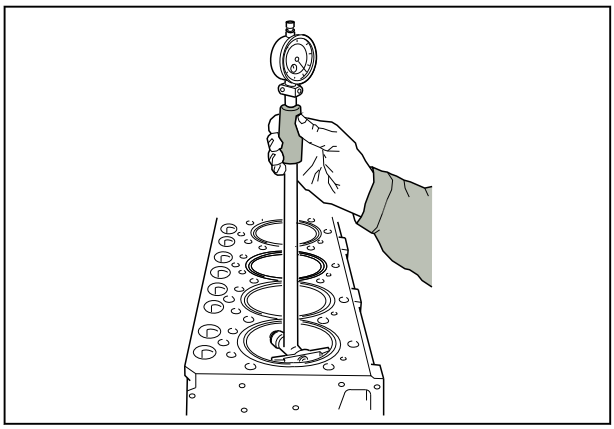


Fig. 712

2.12.2 Removing cylinder liner

Procedure

1. Mark the cylinder liners, if the cylinder liners are to be used again.

   The cylinder liners must be fitted in the same position.
2. Remove the cylinder liners using cylinder liner puller.

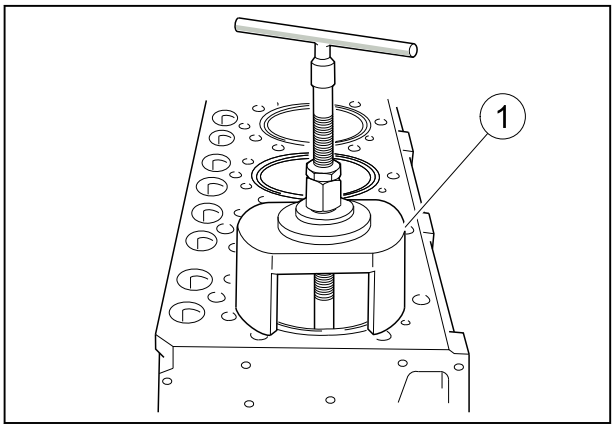


Fig. 713

(1) Cylinder liner puller V905173100
(1) Cylinder liner puller V910451500 (84 engines)

2.12.3 Checking cylinder block

Procedure

1. Clean the cylinder block and all oil galleries.
2. Check the cooling channels and remove the scale and sediment to ensure engine cooling.
3. Check the tightness of the cup plugs and threaded plugs in the cylinder block as well as the condition of the cylinder block and sealing faces.
4. Measure the wear of the camshaft bearing points (compare with rated).

   NOTE: *If it is necessary to machine the upper face of the cylinder block, the pistons must be shortened by the same dimension. Observe the valve disc spaces on the piston upper face.*

2.15.8 Changing camshaft or camshaft gear

Procedure

1. Remove the valve cover.
2. Remove the rocker shaft assembly.
3. Remove the radiator, cooling fan, alternator and belt.
4. Remove the belt pulley and damper.
5. Loosen the crankshaft nut.

   Do not remove it!
6. Remove the hub using puller V920182390.
7. Take off the puller, open the nut and remove the hub.
8. Remove the timing gear casing cover (engine front cover).
9. Lock the hydraulic lash adjusters up.

   Locking removes the risk of the hydraulic lash adjusters falling down when removing the camshaft, preventing the installation of the camshaft.
10. Prevent the push rods from falling through.
    a) Lift two next to another push rods up, extending the push rods a little toward each other.
    b) Connect the push rods in pairs, using O-rings or elastic bands.

    NOTE: *Do not connect the push rods too tightly as this can cause the push rods to bend or break.*

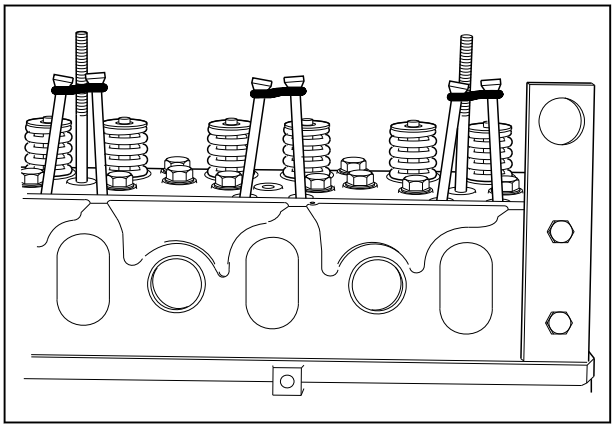


Fig. 749

11. Crank the engine until the aligning marks on the idler gear and camshaft gear are facing each other. Pull out the camshaft.
12. Separate the camshaft from the gear wheel.
13. Clean the parts which are to be used again.
14. Fit the key in its groove and fit the gear on the camshaft. Tighten the nut to 200 Nm.
15. Lubricate bearing surfaces and lobes and insert the shaft in the cylinder block.

    Make sure that the aligning marks on the gears match.
16. Fit the timing gear casing cover, the hub, damper and crankshaft belt pulley.
17. Free the push rods and fit the rocker shaft assembly.
18. Adjust the hydraulic lash adjusters.
19. Fit the valve cover.
20. Fit the other removed parts.

5. Check the tooth backlash against the crankshaft gear.

   NOTE: *When measuring the tooth backlash, the engine should be the correct way up as the crankshaft bearing clearance affects the tooth backlash.*

   The clearance is adjusted with shims between the pump body and the cylinder block. One shim increases/decreases the backlash by about 0.07 mm.

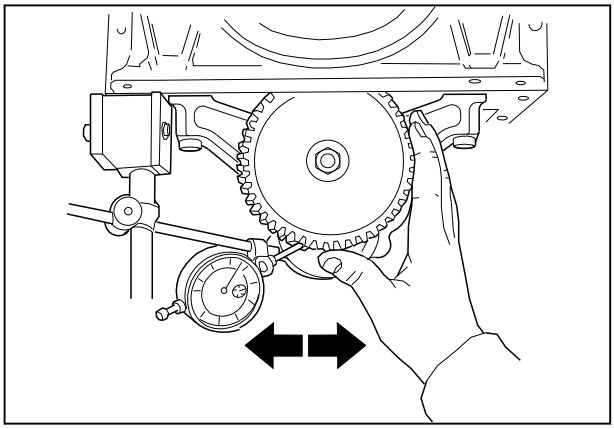


Fig. 783

6. Connect the suction and pressure pipes together with new seals.
7. Apply thread sealer Loctite 242 to oil sump bolts (engines with steel sump). Fit the oil sump and fill in the lubrication oil.

2.20.7 Install the oil sump gasket

2.20.7.1 Install the oil sump gasket, metal gasket

NOTE: *Do not bend the oil sump gasket.*

Procedure

1. Clean the sealing surface of the oil sump.
2. Make sure that there are not dirt and scratches on the sealing surface of the oil sump.
3. If it is necessary, install the oil sump tension pins to the rear end of the oil sump.
4. Apply sealing compound (Loctite 5970 or similar) to the t-joints of the cylinder block.
5. Install the oil sump gasket.
   a) The tape which attaches the rubber stripe must always be on the top.
   b) Make sure that there are not bends on the rubber stripe of the gasket.

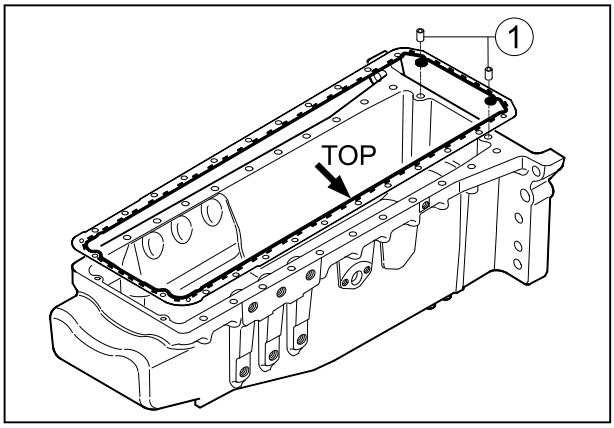


Fig. 784

(1) Oil sump tension pins

2.20.7.2 Install the oil sump gasket, paper gasket

NOTE: *Do not bend the oil sump gasket.*

Procedure

1. Clean the sealing surface of the oil sump.
2. Make sure that there is not dirt and scratches on the sealing surface of the oil sump.

CAUTION:

Heavy parts.Careless work may cause an injury or damage the machine.Use proper lifting devices.

1. Remove the boost pipe between the high-pressure turbocharger and the ICAC.
2. Remove the pressure oil pipe of the low-pressure turbocharger and the cooling pipe of the EGR actuator together.
3. Remove the heat shield of the exhaust manifold and the bracket of the heat shield.
4. Disconnect the actuator of the high-pressure turbocharger.
   a) Disconnect the fuel pipe from the actuator of the high-pressure turbocharger.
   b) Disconnect the cooling pipe of the high-pressure turbocharger actuator from the thermostat housing.
   c) Disconnect the actuator wiring of the high-pressure turbocharger.
5. Disconnect the boost pipe between the low-pressure turbochager and the ICAC.
6. Disconnect the return oil pipe of the low-pressure turbocharger from the valve cover.

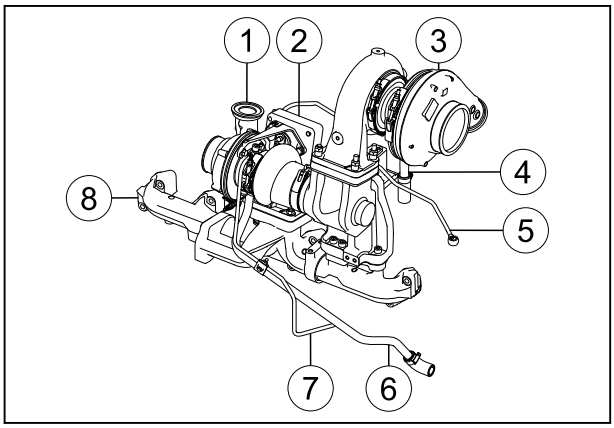


Fig. 813

(1) High-pressure turbocharger
(2) Actuator of the high-pressure turbocharger
(3) Low-pressure turbocharger
(4) Return oil pipe
(5) Cooling pipe of the high-pressure turbocharger actuator
(6) Return oil pipe
(7) Pressure oil pipe
(8) Exhaust manifold

7. Disconnect the pressure oil pipe of the high-pressure turbocharger from the oil filter adapter.
8. Disconnect the return oil pipe of the high-pressure turbocharger behind the timing gear housing.
9. Remove the screws from the bracket of the ICAC and the low-pressure turbocharger.
10. Attach the exhaust manifold, the turbochargers and the pipes to a lifting device as one assembly.
11. Make sure that the assembly is safe to lift.
12. Remove the nuts and the spacer pieces of the exhaust manifold.

    NOTE: *Do not mix the spacer pieces, they are different lengths.*
13. Remove the heat shield of the EGR.
14. Remove the bracket of the exhaust manifold from the cylinder head.
15. Remove the exhaust manifold, the turbochargers and the pipes as one assembly.
16. Remove the stud bolts of the exhaust manifold.

    NOTE: *Do not mix the stud bolts, they are different lengths.*

2.22.6 Removing the turbocharger

Procedure

1. Remove the inlet and exhaust pipes and pressure and return oil pipes from the turbocharger.
2. 84-98 engines: Untighten the clamp between the high pressure turbocharger and the intermediate piece of the turbochargers.
3. Remove the cooling pipes of the actuator and the actuator wire.
4. Remove the fixing nuts and remove the turbocharger.

2.23.6.6 Testing the return quantity from the injectors

The return quantity needs to be tested if any fault code of high pressure leakage is active, for example:

- SPN 1239, FMI 14
- SPN 1240, FMI 14
- SPN 157, FMI 15
- SPN 157, FMI 17
- SPN 157, FMI 21

The return quantity needs to be tested if the engine does not give full power, the engine does not run smoothly or the engine smokes. This test is done to make sure which injector leaks.

Before starting the procedure

The needed parts for testing can be found in the diesel kit.

NOTE: *Use eye protection, safety clothing and safety gloves during the work.*

DANGER:

Risk of fire!Leaking fuel can result in fire in a hot engine.Prevent fuel from leaking. Insert plugs where fuel connectors have been removed.

CAUTION:

Cleanliness needed.Any impurities can cause system malfunction. Clean carefully surroundings and maintenance related parts before maintenance work.

WARNING:

Do not make any work at the common rail high pressure fuel system when the engine is running. Wait at least 30 seconds after stopping the engine. The first high pressure component has to be loosened slowly, so that the pressure inside the fuel system can adjust to ambient pressure.If the jet of high pressure fuel contacts your skin, fuel penetrates the skin causing severe injuries. Get medical help immediately!

Procedure

1. Remove the bleeding pipe between the common rail and the main fuel filter.

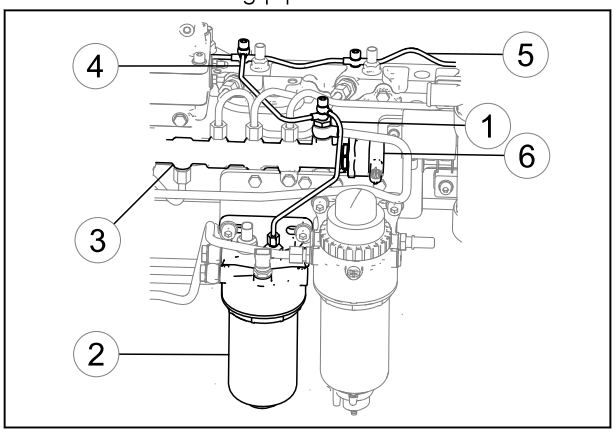


Fig. 838

(1) Bleeding pipe
(2) Main fuel filter
(3) Common rail
(4) Fuel pipe from the overflow pipe of the injectors
(5) Overflow pipe of the injectors
(6) Pressure control valve (PCV)

2.25 Engine control system

2.25.1 Remove the bracket of the electronic control unit

Procedure

1. Remove the fixing screws of the electronic control unit (ECU) bracket.
2. Remove the ECU with the bracket.

2.25.2 Install the bracket of the electronic control unit

Procedure

1. Install the electronic control unit (ECU) with the bracket.
2. Tighten the screws of the bracket.

2.25.3 Remove the electronic control unit

Procedure

1. Turn the main switch to the OFF position or disconnect the battery connectors.
2. Remove the plastic cover and disconnect the multipole connectors.

   Do not touch the connector poles.

   Note the position of the earth wire.
3. Remove the control unit from the bracket.

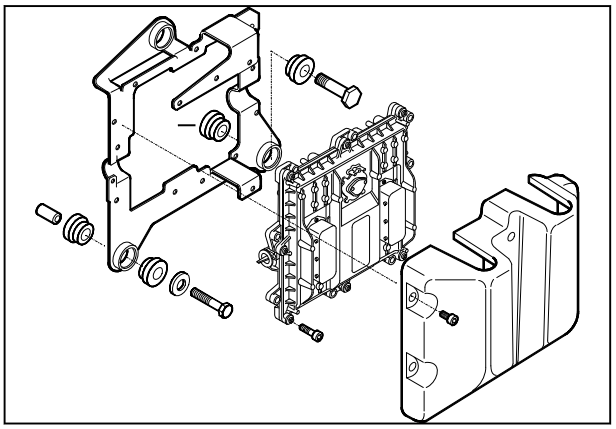


Fig. 873

2.25.4 Install the electronic control unit

Procedure

1. Attach the new control unit to the bracket.
   a) Tighten the screws to 10 Nm in the order shown in the figure.
   b) Note the position of the earth wire.

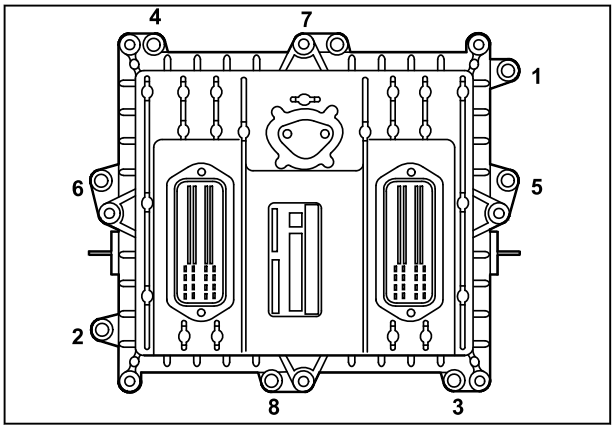


Fig. 874

10. Use a 3/4 inch drive breaker bar to remove the wear pad adjuster (1) and the wear pad (2).

NOTE:
Replace the wear pad when the retaining bolt can no longer secure the wear pad adjuster.

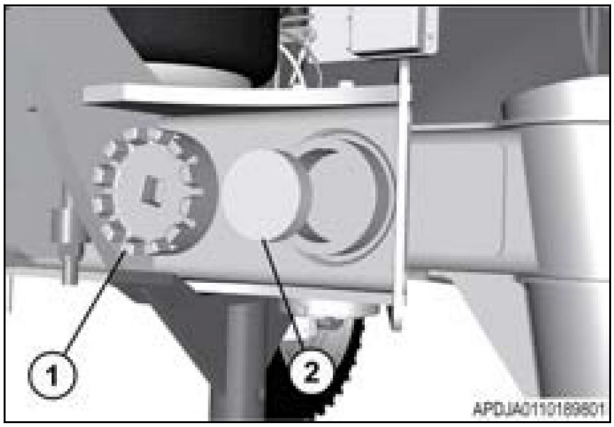


Fig. 28

11. Remove the mounting hardware (1) that fastens the wear pad adjuster (2) on the bottom of the steerable axle weldment.

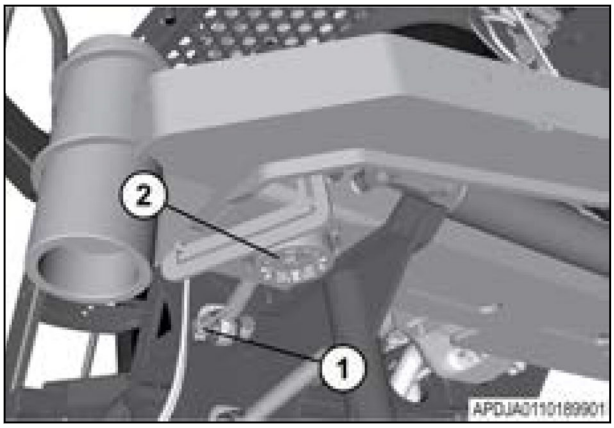


Fig. 29

12. Use a 3/4 inch drive breaker bar to remove the wear pad adjuster (1) and the wear pad (2).

NOTE:
Replace the wear pad when the retaining bolt can no longer secure the wear pad adjuster.

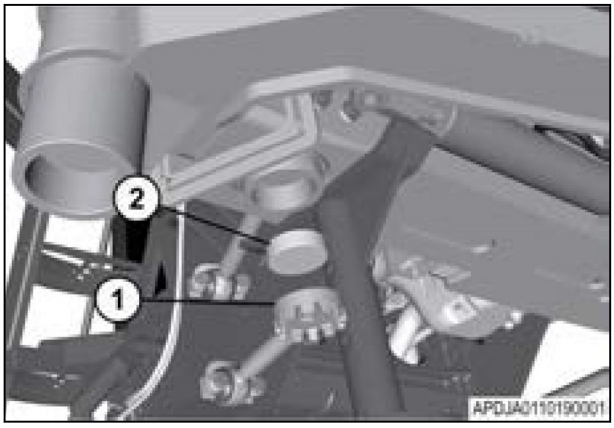


Fig. 30

32. Fasten the clamp with the hydraulic lines (2) to the steerable axle weldment with the mounting hardware (1).

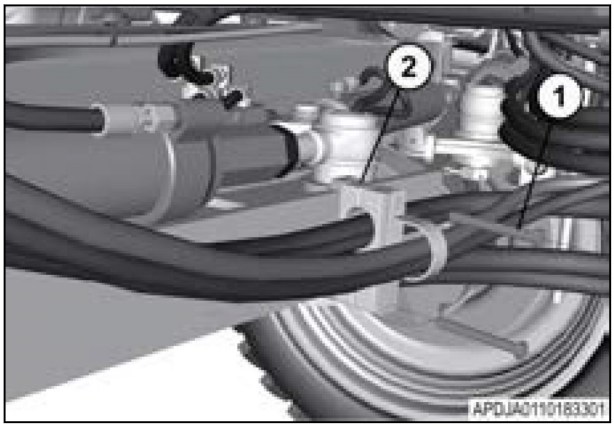


Fig. 93

33. Fasten the hydraulic line bracket (2) to the steerable axle weldment with the mounting hardware (1).

34. Repeat this procedure for the opposite side of the machine.

35. Install the front wheel legs on the machine.

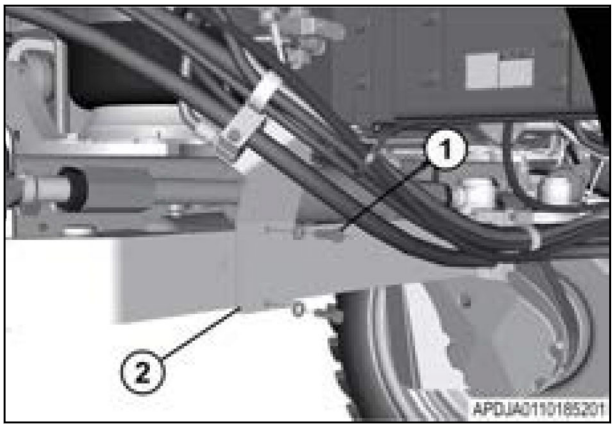


Fig. 94

3.3.3 Installing the front wheel leg

Torque specifications

Description	Torque
Front wheel leg bolts see step 13, page 3-33	640 Nm Wet
Steering cylinder slotted nut see step 20, page 3-35	342 Nm (252 lbf ft)
Brake caliper bolts see step 32, page 3-37	265 Nm (195 lbf ft) Wet

Procedure

1. Use the following procedure for installing both the left-hand side and right-hand side wheel leg.

27. Remove the bushings (1) from the steerable axle weldment.

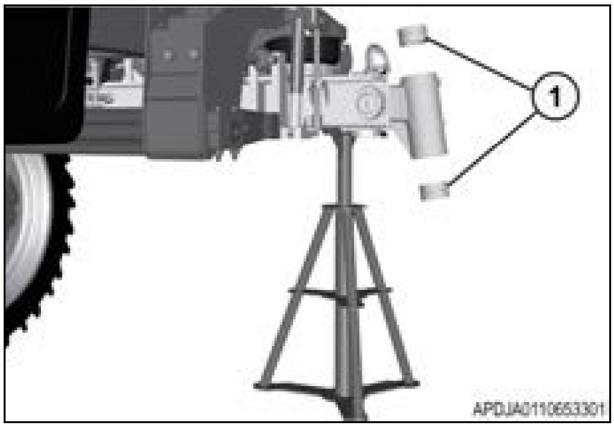


Fig. 153

3.5.3 Removing the rear steerable axle weldment

Before starting the procedure

Set the axles to the maximum track width before starting the procedure.

Stop the engine, apply the park brake, and take the key with you.

Procedure

1. Use the following procedure for removing both the left-hand side and the right-hand side rear steerable axle weldment.

2. Remove the rear wheel leg from the machine.

3. Remove the mounting hardware (1) and the hydraulic line bracket (2) from the steerable axle weldment.

NOTE:
Remove the line bracket with the hydraulic lines still fastened.

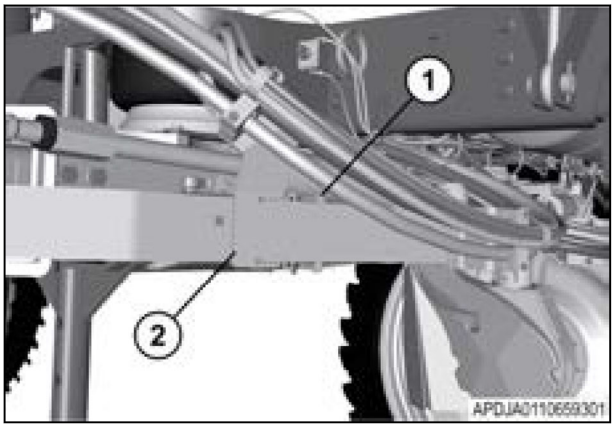


Fig. 154

4. Remove the mounting hardware (1) and the hydraulic line bracket (2) from the steerable axle weldment.

NOTE:
Remove the line bracket with the hydraulic lines still fastened.

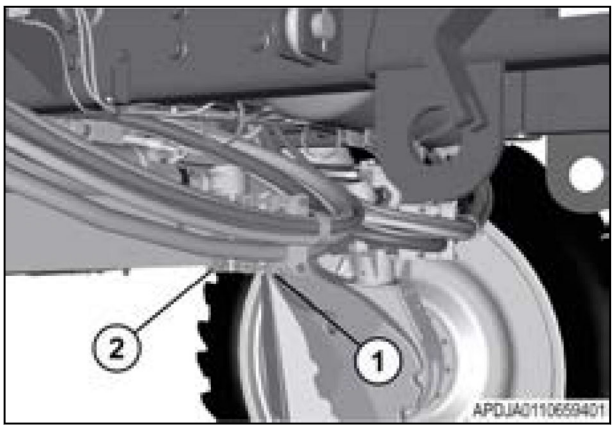


Fig. 155

46. Install the bracket (1) on the mounting hardware.

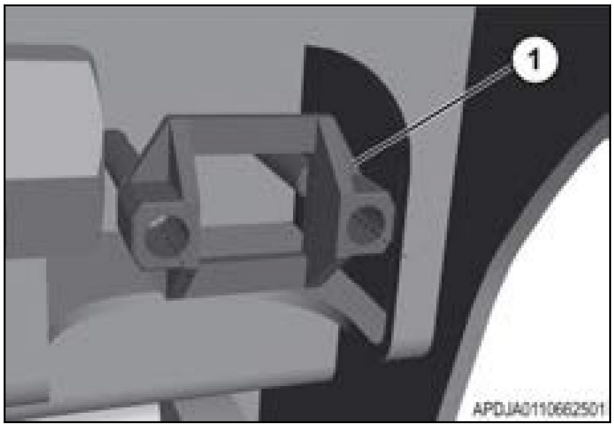


Fig. 222

47. Put the opposite end of the adjustable torque rod (2) with the lubrication fittings toward the ground on the frame.

48. Fasten the adjustable torque rod with the mounting hardware (1).

49. After all the torque rods have been installed tighten the mounting hardware to 739 Nm (545 lbf ft).

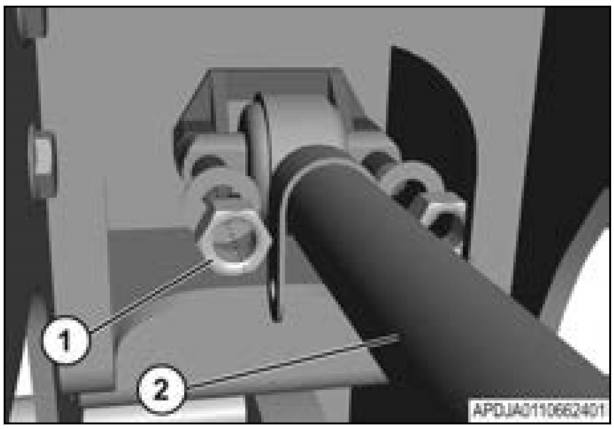


Fig. 223

50. Put the adjustable torque rod (2) on the frame with the lubrication fittings toward the ground.

51. Fasten the adjustable torque rod with the mounting hardware (1).

52. After all the torque rods have been installed tighten the mounting hardware to 739 Nm (545 lbf ft).

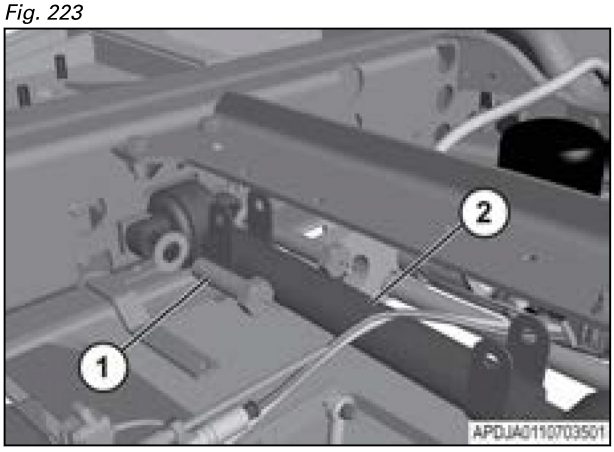


Fig. 224

53. Put the adjustable torque rod (2) on the axle weldment with the lubrication fittings toward the ground.

54. Fasten the adjustable torque rod with the mounting hardware (1).

55. After all the torque rods have been installed tighten the mounting hardware to 739 Nm (545 lbf ft).

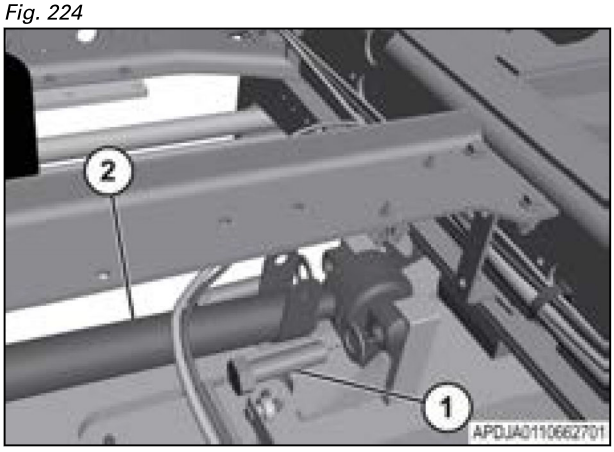


Fig. 225

IMPORTANT:
Contain all fluids during the performance of inspection, maintenance, doing tests, adjusting, and repair of the machine. Prepare to collect fluids with correct containers before opening any compartment or disassembling any component containing fluids.
Discard all fluids according to local regulations and laws.

Procedure

1. Completely clean all components to prevent contamination from entering the system.
2. Park the machine on a solid level surface.
3. Stop the engine, apply the park brake, and take the key with you.
4. Wait for about five minutes for the hydraulic pressure to bleed off.
5. Before removal, fasten identification tags on components for correct installation at assembly. Put caps and plugs on all hoses, fittings, ports, and openings to prevent contamination from entering the system.
6. Disconnect the harness (1) from the steering unit.

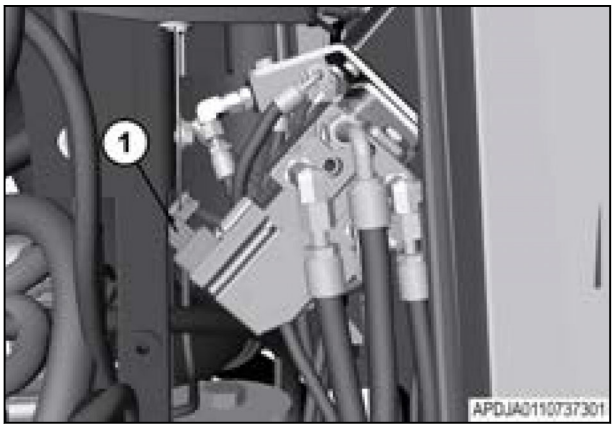


Fig. 21

7. Disconnect the harness from the steering angle sensor (1).

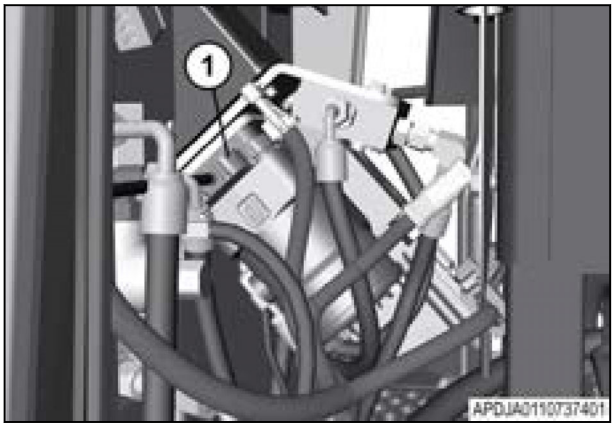


Fig. 22

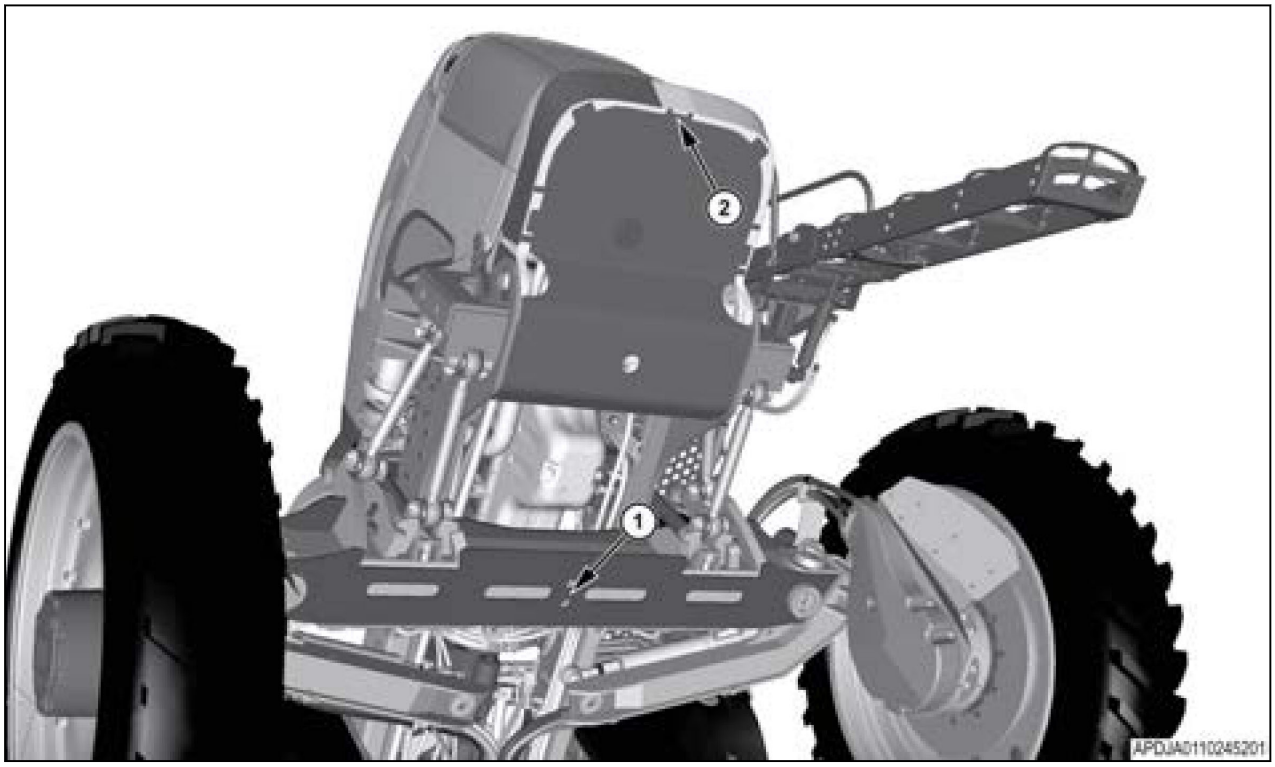


Fig. 83

4. A plumb-bob must be attached from the top of each axle. Use a piece of tape to hold the plumb-bobs inline with the two bottom holes (1). An M6 threaded rod needs to be placed in the center hole (2) of the front casting with the length of 1054.1 mm (41.5 in). The M6 threaded rod must extend below the machine with a magnetic base, with a 1206.5 mm (47.5 in) steel rod attached. This needs to be placed behind the rear wheels on the underside of the liquid boom frame. The magnetic base that comes with light bar kit works well. The rear magnetic base may need to be clamped to machine to help hold in place. Attach a third string between the front threaded rod and rear magnetic base rod and tighten. Reposition the rear magnetic base. The plumb-bobs hanging from center of the front and rear axles are directly above your taut string line.

5. The machine center has now been determined. The next step is to make sure the wheels are parallel with the centerline of the machine. The wheels are probably out of adjustment, and are difficult to determine by eye. The stroke of front steering cylinders must be measured to correctly align the wheels. The inner ball joints on steering cylinders are preset and will not normally must be adjusted. Make sure the steering cylinders are set to approximately the same dimension when comparing the left-hand cylinder to the right-hand cylinder. Next, start the engine and turn the steering wheel lock to lock several times to rephase steering cylinders.

6. Measure the stroke of the front steering cylinders. Put the end of a tape measure against the face on the rod end, of the left-hand steering cylinder and measure the distance (1) to the cylinder rod. Do not measure to the lock nut or the center of the ball joint. That measurement will change during toe-in adjustment. Take the measurement of the right-hand steering cylinder, turning the steering wheel until both dimensions are equal. When the measurement is equal on both cylinders, record the measurement. Stop the engine and take the key with you.

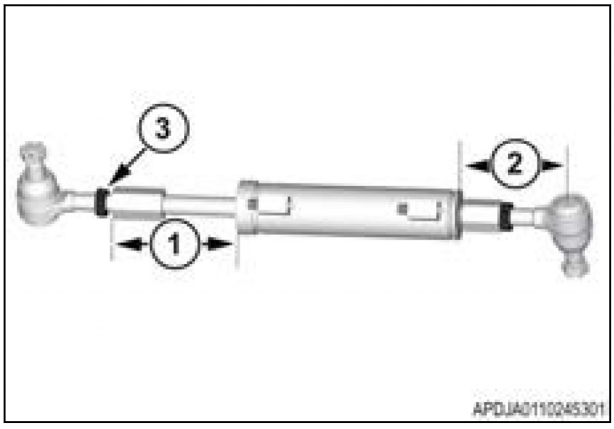


Fig. 84

6. Relieve the pressure in the accumulator (1) by pressing the brake pedal several times with the engine off.

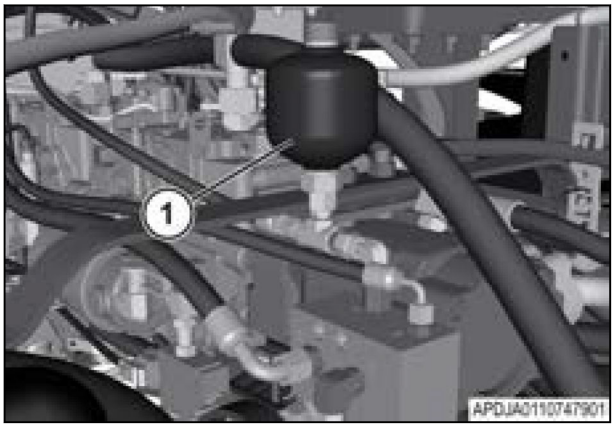


Fig. 52

7. Disconnect the hose (1) from the adapter fitting in the tee-fitting. Disconnect the 90degree fitting (2) from the check valve in the tee-fitting and then remove the accumulator assembly.

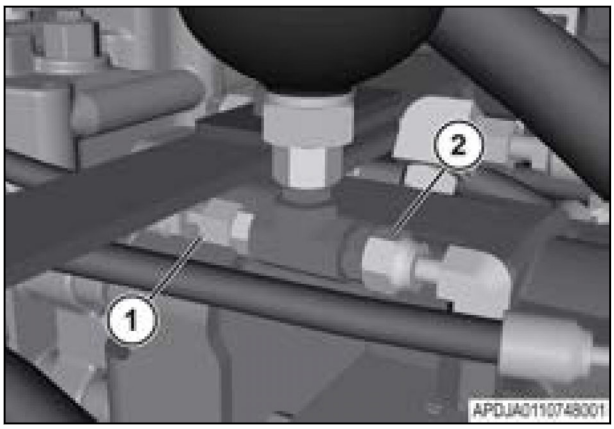


Fig. 53

7.1.13 Disassembling the brake accumulator

Procedure

Remove the adapter fitting (1) from the tee-fitting (2). Remove the6.9 kPa (1 psi) check valve (3) from the tee-fitting. Remove the tee-fitting from the adapter fitting (4). Remove the adapter fitting from the accumulator (5).

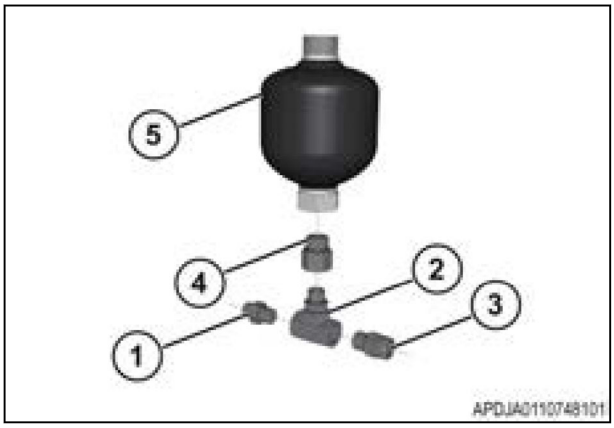


Fig. 54

7.1.14 Assembling the brake accumulator

Procedure

1. Completely clean all components to prevent contamination from entering the system.

6. Disconnect the harness from the pressure switch (1).
7. Disconnect the inlet hose (2).
8. Disconnect the outlet hoses (3).

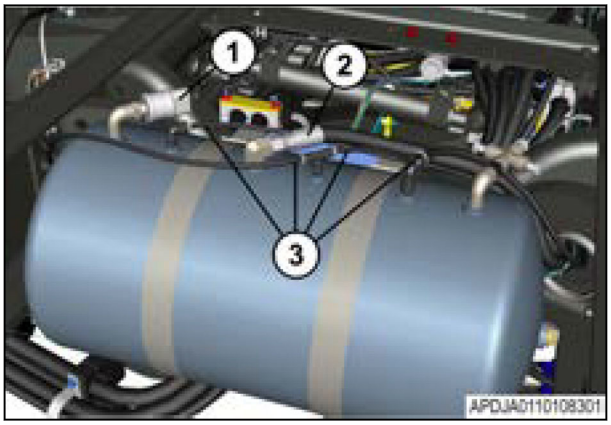


Fig. 35

9. Remove the bolts (1) in the clamps.
10. Separate the clamps and remove the air reservoir.

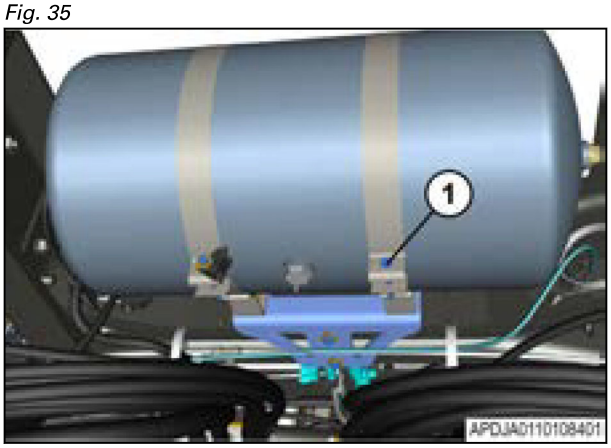


Fig. 36

8.2.6 Installing the air reservoir

Procedure

1. Completely clean all components to prevent contamination from entering the system.
2. Install the drain valve in the bottom of the air reservoir.
3. Install a plug in the end of the air reservoir.

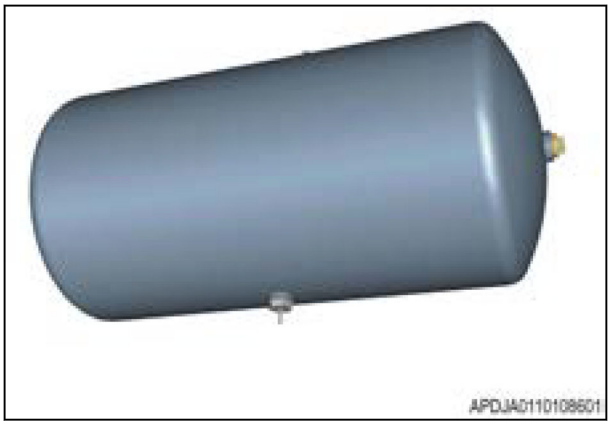


Fig. 37

8. Install the battery disconnect switch key (1).

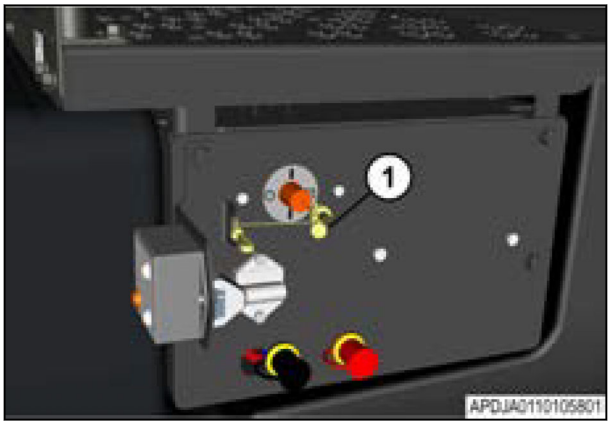


Fig. 98

9. Turn the battery disconnect switch key (1) clockwise to connect the battery power.

   NOTE: *The battery disconnect switch shown in the off position.*

10. Start the engine.
11. Let the air pressure increase.
12. Check the system for leaks.

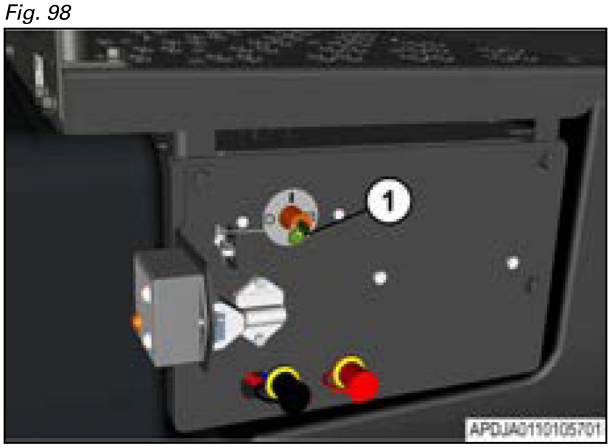


Fig. 99

8.2.18 Removing the air dump valve

Before starting the procedure

WARNING:

Hot components can burn. Severe personal injury can result. Let the engine and components cool before doing maintenance.

WARNING:

Pressurized gases or fluids can be hazards. Personal injury can result. Relieve the pressure from the system or component before disconnecting components.

NOTE: *Before removal, fasten identification tags on the components for correct installation at assembly. Put caps and plugs on all hoses, fittings, and ports to prevent contamination from entering the system.*

NOTE: *Contain all fluids during the performance of inspection, maintenance, doing tests, adjusting, and repair of the machine. Prepare to contain fluids with the correct container before opening any compartment or disassembling any component containing fluids. Discard fluids according to the local regulations and the laws.*

NOTE: *Keeping the components clean is important. Fully clean the components before disassembly to prevent dirt from entering internal mechanisms. Contamination can damage the precision components. Complete disassembly procedures on a clean work surface. To prevent damage, put a clean cloth over the components.*

Procedure

1. Park the machine on a solid, level surface.
2. Stop the engine, apply the park brake, and take the key with you.

Pressure washer control block.

Port	Connection
P (1)	Pressure in from port EF of the priority valve
FR (2)	Flow regulator 19.9 l/ min (5.26 gal/min (US))
MV (3)	Manual valve - Pull out to operate the pressure washer
P-PW (4)	Pressure out to pressure washer
T-PW (5)	Return from pressure washer
T (6)	Return out to return manifold

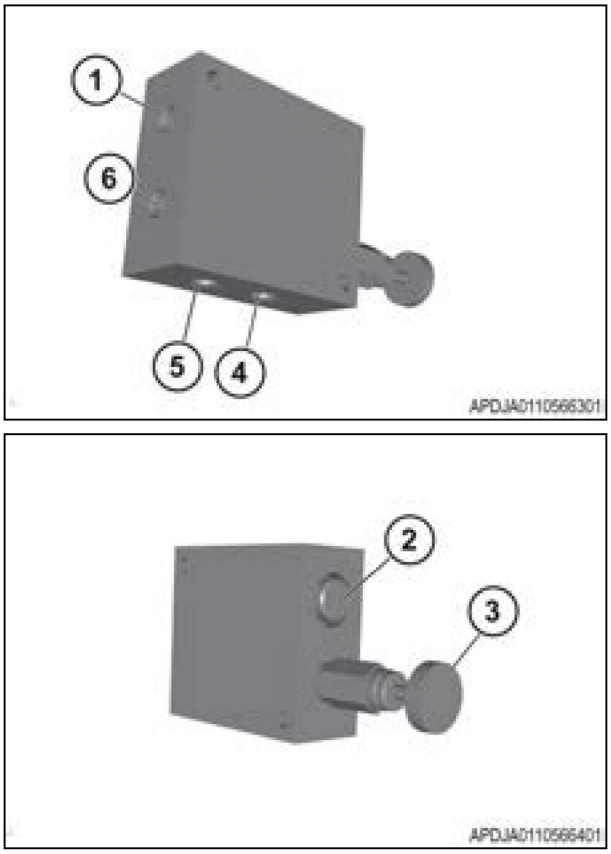


Fig. 30

9.1.11 Pressure washer pump/motor, if equipped

The pressure washer pump/motor (1) is mounted to the floor of the cabinet on the right-hand side of the machine. The motor drives the pump to start and keep sufficient water pressure for washing.

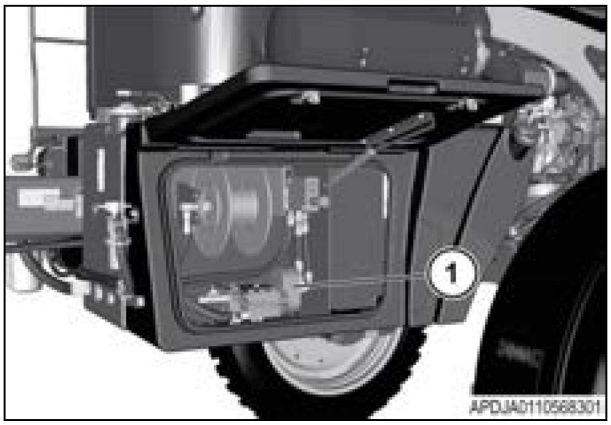


Fig. 31

24. Inspect the machine for leaks.

WARNING:

Hydraulic fluid under pressure can penetrate the skin or eyes. Serious personal injury, blindness, or death can occur. Relieve the pressure from the system or component before disconnecting components. Wear personal protective gear while working on the machine or equipment. Use a piece of cardboard to check for leaks. Never use your hand.

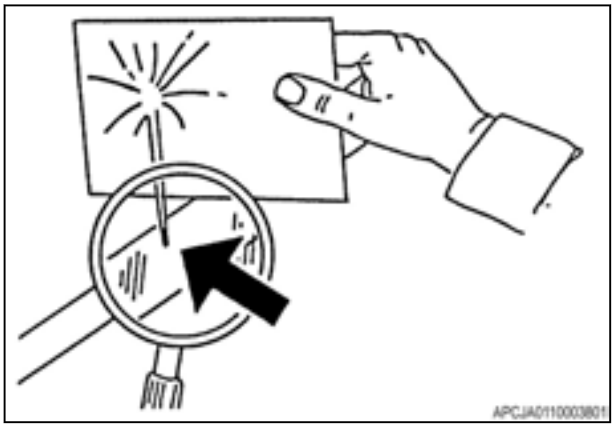


Fig. 88

9.2.5 Removing the product pump

Before starting the procedure

WARNING:

Pressurized gases or fluids can be hazards. Personal injury can result. Relieve the pressure from the system or component before disconnecting components.

WARNING:

Hydraulic fluid under pressure can penetrate the skin or eyes. Serious personal injury, blindness, or death can occur. Relieve the pressure from the system or component before disconnecting components. Wear personal protective gear while working on the machine or equipment. Use a piece of cardboard to check for leaks. Never use your hand.

IMPORTANT:
Contain all fluids during the performance of inspection, maintenance, doing tests, adjusting, and repair of the machine. Prepare to collect fluids with correct containers before opening any compartment or disassembling any component containing fluids.
Discard all fluids according to local regulations and laws.

Procedure

1. Completely clean all components to prevent contamination from entering the system.

2. Park the machine on a solid level surface.

3. Stop the engine, apply the park brake, and take the key with you.

4. Wait for about five minutes for the hydraulic pressure to bleed off.

5. Disconnect the supply line (1) and the pressure line (2).

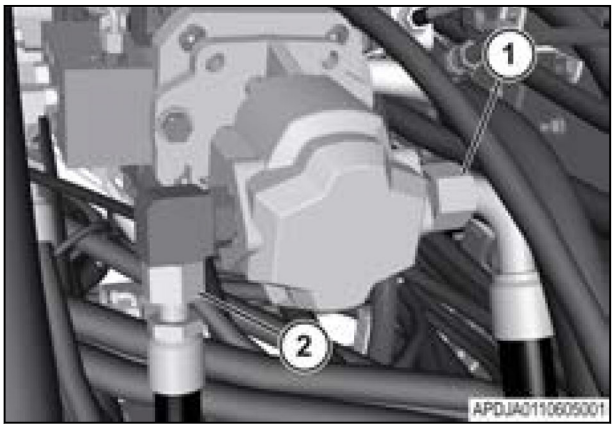


Fig. 89

9.2.13 Removing the RG1300B hydrostatic drive pump

Before starting the procedure

WARNING:

Hot components can burn. Severe personal injury can result. Let the engine and components cool before doing maintenance.

WARNING:

Pressurized gases or fluids can be hazards. Personal injury can result. Relieve the pressure from the system or component before disconnecting components.

IMPORTANT:
Contain all fluids during the performance of inspection, maintenance, doing tests, adjusting, and repair of the machine. Prepare to contain fluids with correct containers before opening any compartment or disassembling any component containing fluids.
Discard all fluids according to local regulations and laws.

NOTE:
It is not necessary to remove the cab to remove the hydrostatic drive pumps.

Procedure

1. Completely clean all components to prevent contamination from entering the system.
2. Track the front wheel legs to maximum width to move the hoses and the steer arms out of the way.
3. Park the machine on a solid level surface.
4. Stop the engine, apply the park brake, and take the key with you.
5. Wait for about five minutes for the hydraulic pressure to bleed off.
6. Before removal, fasten identification tags on components for correct installation at assembly. Put caps and plugs on all hoses, fittings, ports, and openings to prevent contamination from entering the system.
7. Support the product pump (1) and remove two bolts (2) holding the product pump to the rear of the steering pump.
8. Move the product pump and the hoses off to the side and secure.
9. Support the hydrostatic drive pumps and remove the steering pump.
10. Move the steering pump and the hoses off to the side and secure.

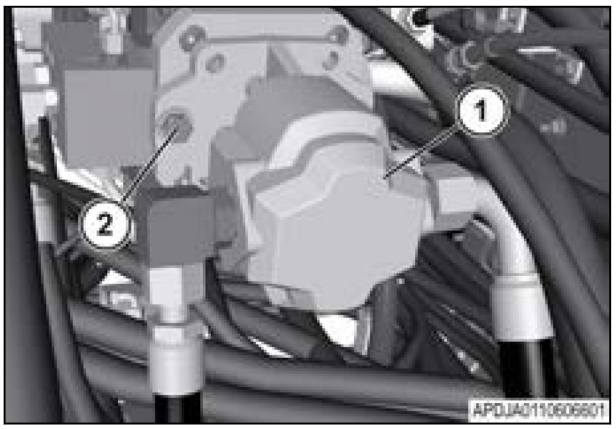


Fig. 150

14. Inspect the machine for leaks.

WARNING:

Hydraulic fluid under pressure can penetrate the skin or eyes. Serious personal injury, blindness, or death can occur. Relieve the pressure from the system or component before disconnecting components. Wear personal protective gear while working on the machine or equipment. Use a piece of cardboard to check for leaks. Never use your hand.

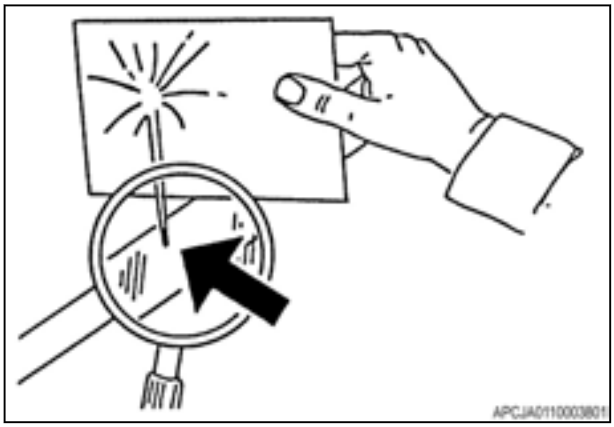


Fig. 209

15. Install the handrails (1).

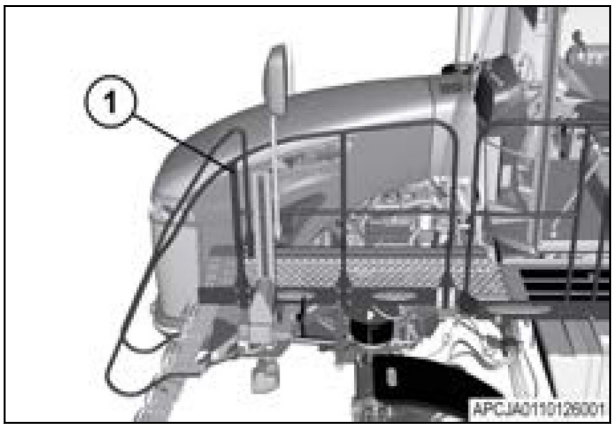


Fig. 210

9.2.18 Removing the ladder cylinder

Before starting the procedure

WARNING:

Hot components can burn. Severe personal injury can result. Let the engine and components cool before doing maintenance.

WARNING:

Pressurized gases or fluids can be hazards. Personal injury can result. Relieve the pressure from the system or component before disconnecting components.

IMPORTANT:
Contain all fluids during the performance of inspection, maintenance, doing tests, adjusting, and repair of the machine. Prepare to collect fluids with correct containers before opening any compartment or disassembling any component containing fluids.
Discard all fluids according to local regulations and laws.

Procedure

1. Completely clean all components to prevent contamination from entering the system.
2. Park the machine on a solid level surface.
3. Stop the engine, apply the park brake, and take the key with you.
4. Wait for about five minutes for the hydraulic pressure to bleed off.
5. Before removal, fasten identification tags on components for correct installation at assembly. Put caps and plugs on all hoses, fittings, ports, and openings to prevent contamination from entering the system.

16. Inspect the machine for leaks.

WARNING:

Hydraulic fluid under pressure can penetrate the skin or eyes. Serious personal injury, blindness, or death can occur. Relieve the pressure from the system or component before disconnecting components. Wear personal protective gear while working on the machine or equipment. Use a piece of cardboard to check for leaks. Never use your hand.

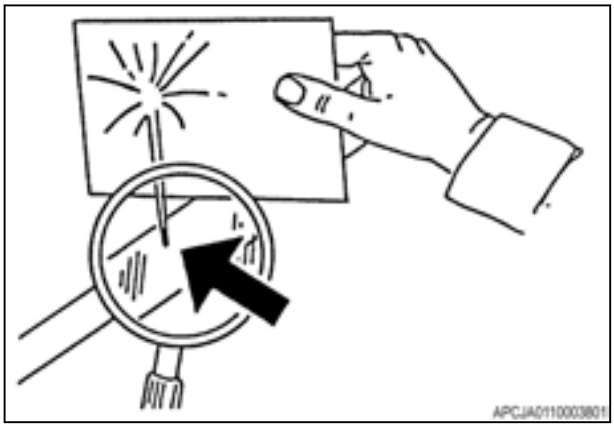


Fig. 272

9.2.30 Removing the steering unit assembly

Before starting the procedure

WARNING:

Hot components can burn. Severe personal injury can result. Let the engine and components cool before doing maintenance.

WARNING:

Pressurized gases or fluids can be hazards. Personal injury can result. Relieve the pressure from the system or component before disconnecting components.

IMPORTANT:
Contain all fluids during the performance of inspection, maintenance, doing tests, adjusting, and repair of the machine. Prepare to collect fluids with correct containers before opening any compartment or disassembling any component containing fluids.
Discard all fluids according to local regulations and laws.

Procedure

1. Completely clean all components to prevent contamination from entering the system.
2. Park the machine on a solid level surface.
3. Stop the engine, apply the park brake, and take the key with you.
4. Wait for about five minutes for the hydraulic pressure to bleed off.
5. Before removal, fasten identification tags on components for correct installation at assembly. Put caps and plugs on all hoses, fittings, ports, and openings to prevent contamination from entering the system.

Before starting the procedure

IMPORTANT:
Contain all fluids during the performance of inspection, maintenance, doing tests, adjusting, and repair of the machine. Prepare to collect fluids with correct containers before opening any compartment or disassembling any component containing fluids.
Discard all fluids according to local regulations and laws.

Procedure

1. Completely clean all components to prevent contamination from entering the system.
2. Extend and retract the cylinder rod with the ports open to remove hydraulic oil from the cylinder. Some oil will remain in the cylinder.
3. Pull the rod out to the end of travel.

   NOTE:
   Some oil can spill out of the ports.

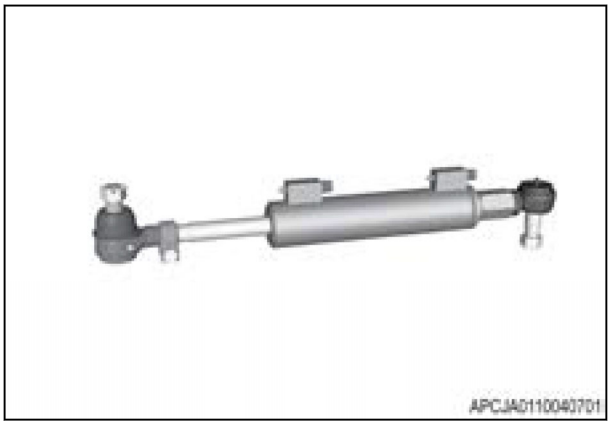


Fig. 334

4. Find the slot on the side of the cylinder tube where the wire is.

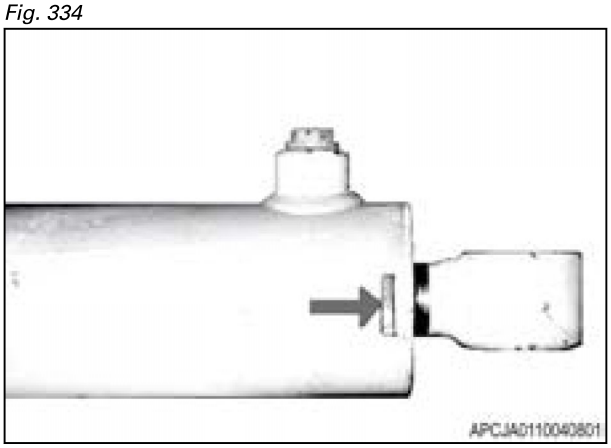


Fig. 335

5. Use an adjustable spanner-wrench or chain vise-grip to turn the head gland until the wire is all the way out.

   One revolution is enough to remove the wire.

   NOTE:
   Use a needle-nose pliers to pull on the wire while turning the head gland if the wire does not come out.

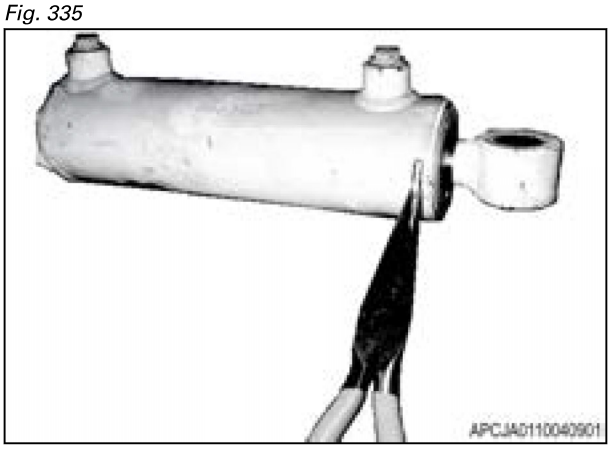


Fig. 336

8. Use a torque wrench to tighten the piston.

Fig. 385

9. Remove the wear band to check for set screw holes.

Fig. 386

10. Apply thread locking compound and install the set screws, if equipped.

Fig. 387

3. Install the check valves with pilots (1) into port CV2 and port CV4.

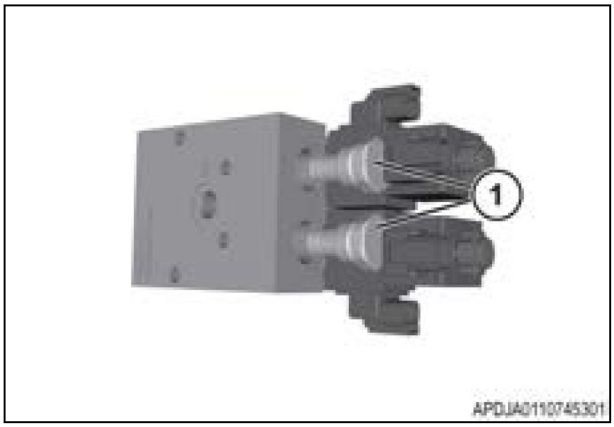


Fig. 447

4. Install the plug (1) into port OR. The orifice is 1.2 mm (0.047 in).
5. Install the check valves (2) into port CV1 and port CV3.

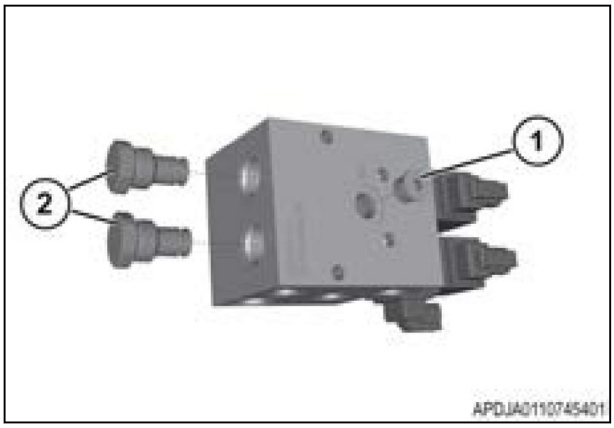


Fig. 448

6. Install the tall 90° fitting (1) into port P1.
7. Install the short 90° fitting (2) in port T1.

NOTE:
Index all fittings until the hoses clear the steering arms.

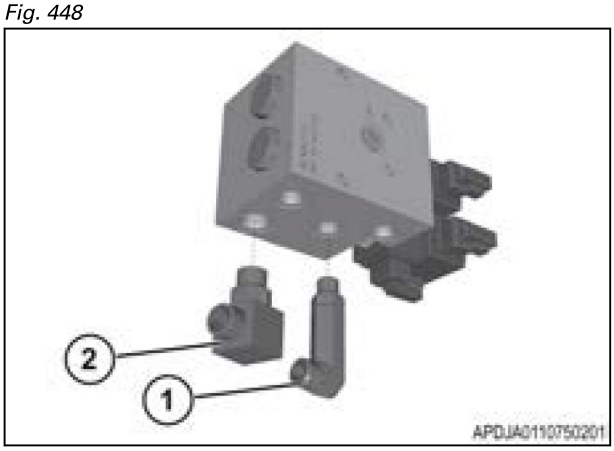


Fig. 449

8. Install the 90° fittings in port RB (1) and port RR (2).

NOTE:
Index all fittings until the hoses clear the steering arms.

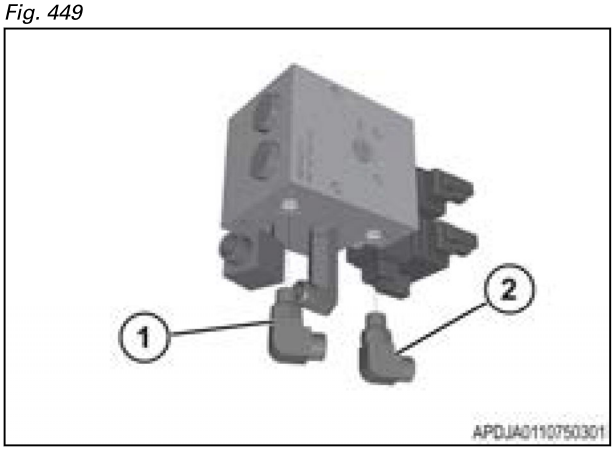


Fig. 450

12. Turn the battery disconnect switch key (1) clockwise to connect power.

NOTE:
The battery disconnect switch is shown in the on position.

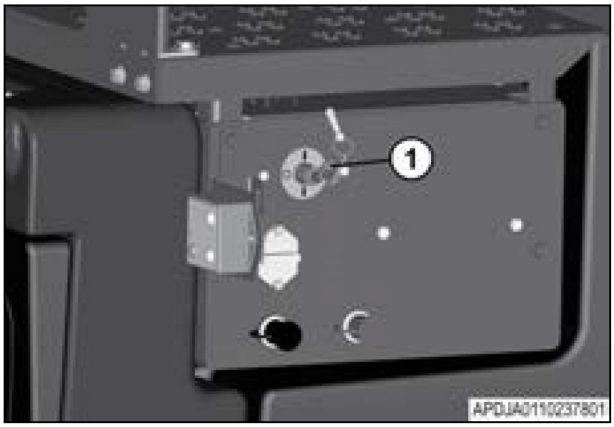


Fig. 511

13. Close the engine cover (2) and connect the two latches (1).

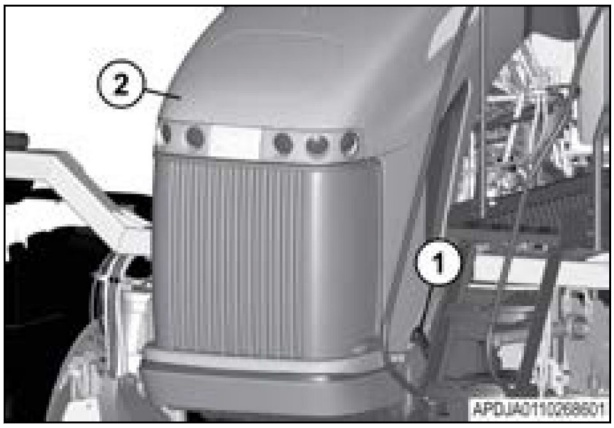


Fig. 512

10.3.4.1 DEF tank sensor electrical schematic

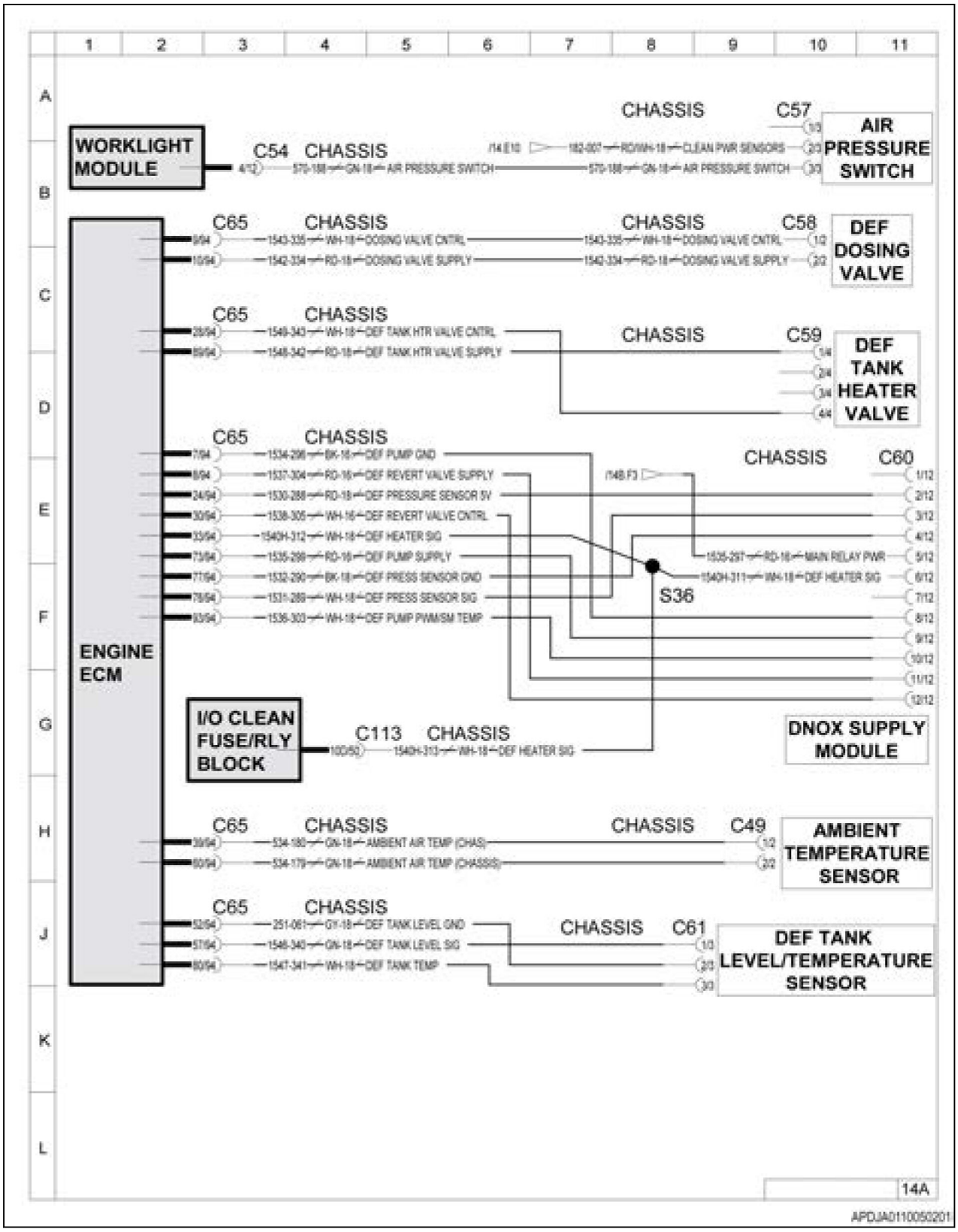


Fig. 6

Common failures

- The DEF supply module wire is bad
- The DEF supply module is bad

A CAN message indicates active fault code.

The fault code is stored and warning lamp is activated.

NOTE:
Present fault is classified for emission related fault. Reduced engine power occurs after a specific amount of time defined by authorities.

Diagnosis and Solution

1. Check DEF supply module wire, the DEF supply module connector and the connector pins for dirt or corrosion.
2. Check DEF supply module operation with another DEF supply module. If system is functional and fault is not active with a replacement DEF supply module, the DEF supply module is bad.

10.3.17.1 Diesel exhaust fluid power electrical schematic

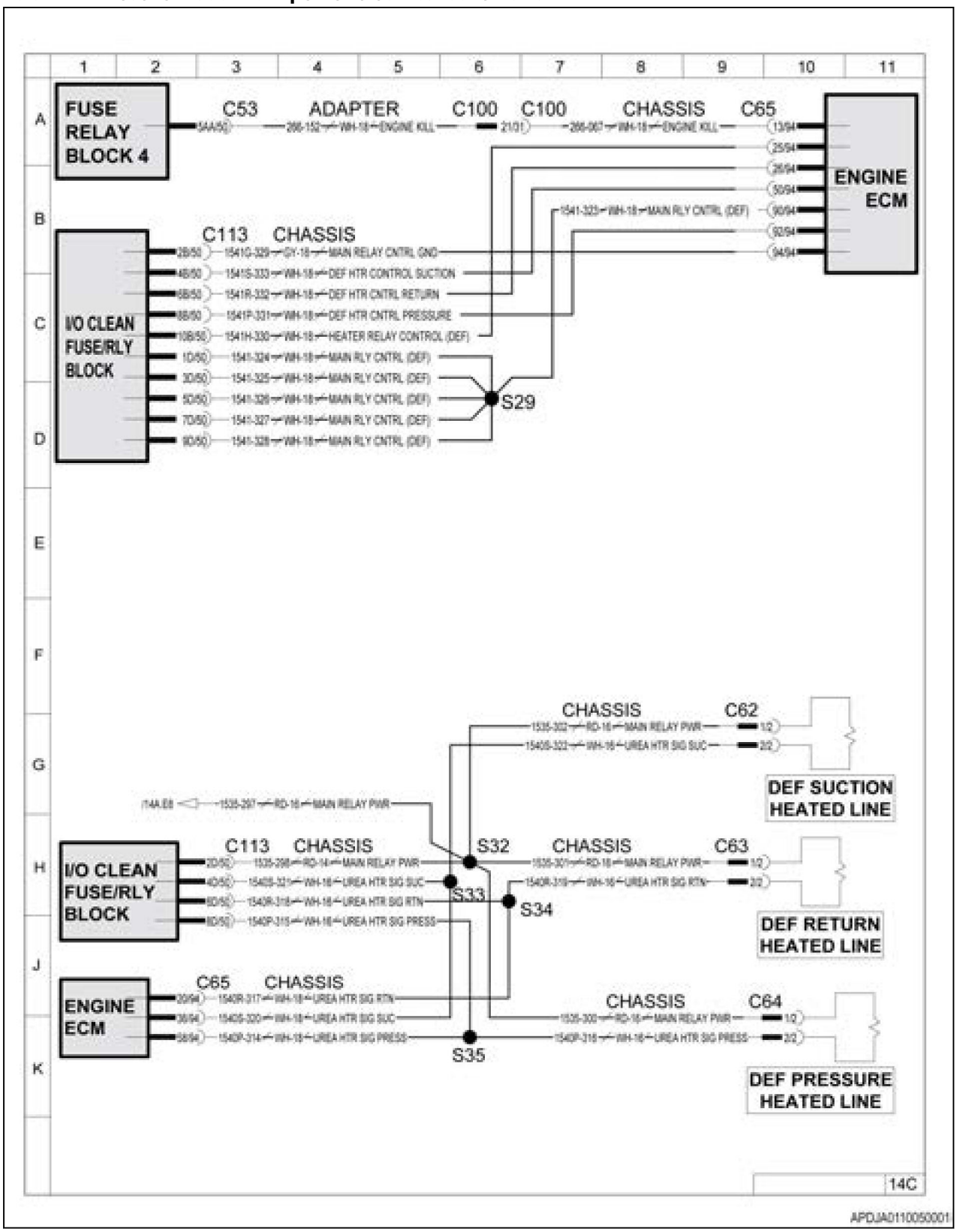


Fig. 21

10.3.27.1 Diesel exhaust fluid power electrical schematic

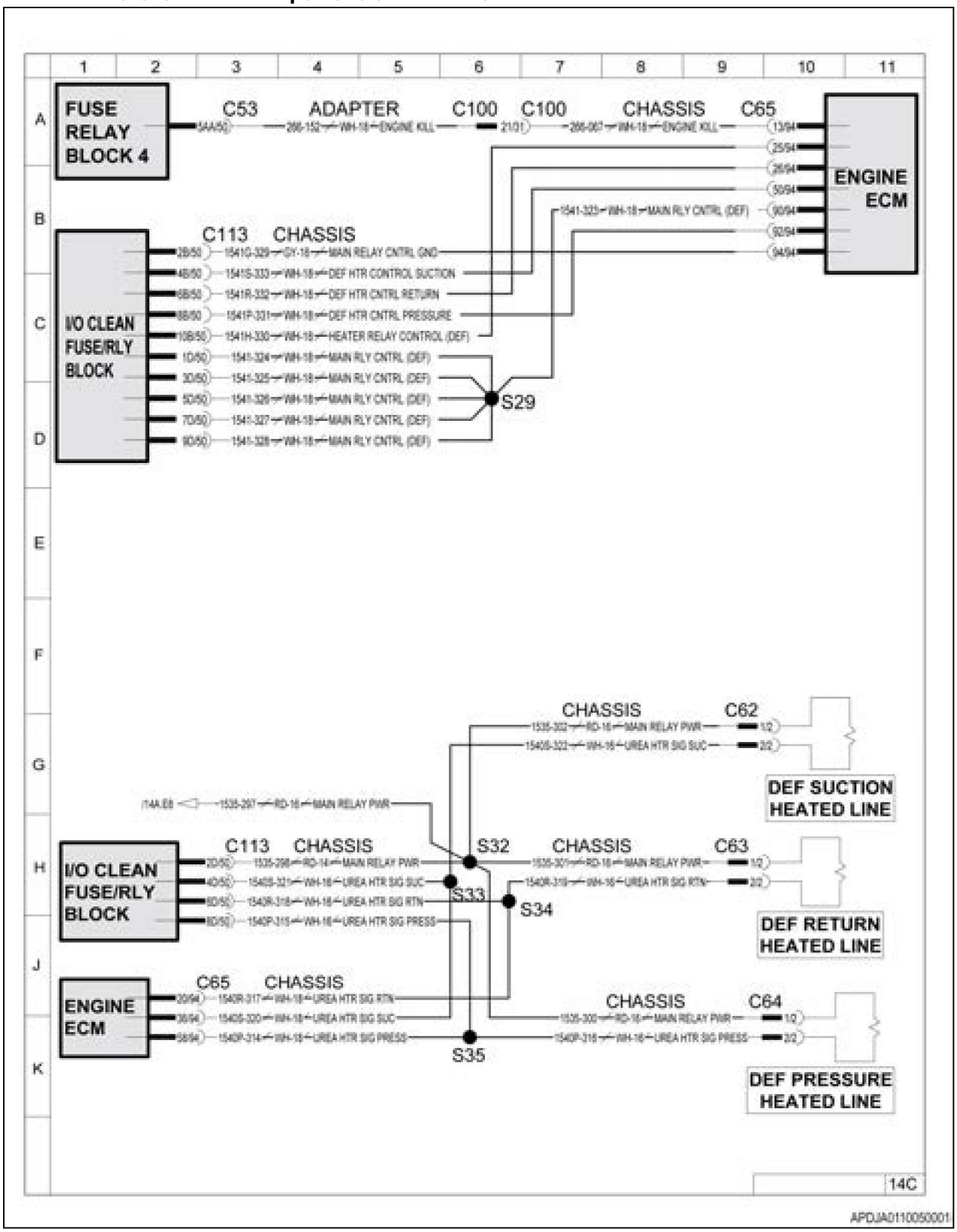


Fig. 31

10.3.37.1 Diesel exhaust fluid power electrical schematic

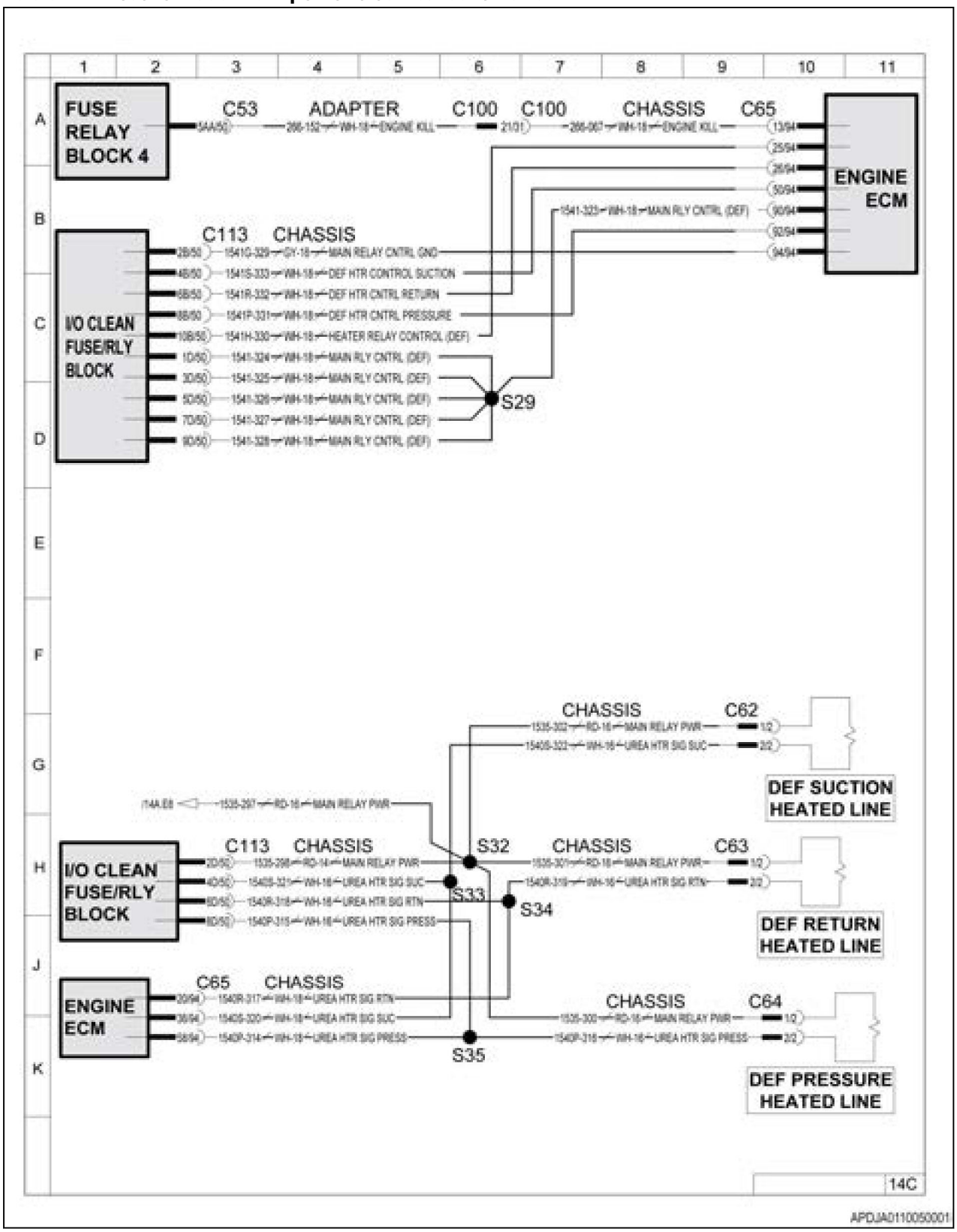


Fig. 41

10.3.47.1 Diesel exhaust fluid power electrical schematic

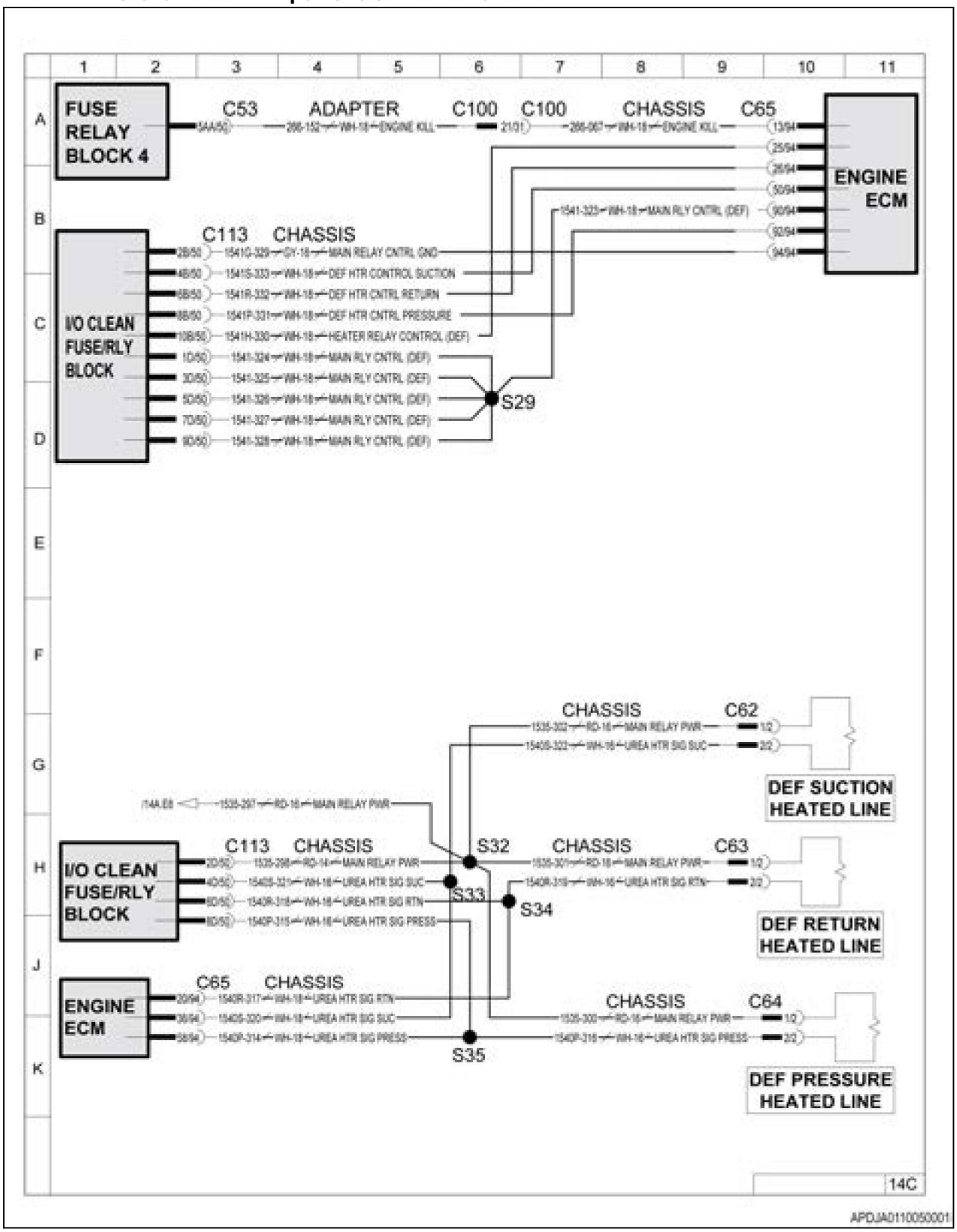


Fig. 51

10.3.57.1 Diesel exhaust fluid NOX sensor electrical schematic

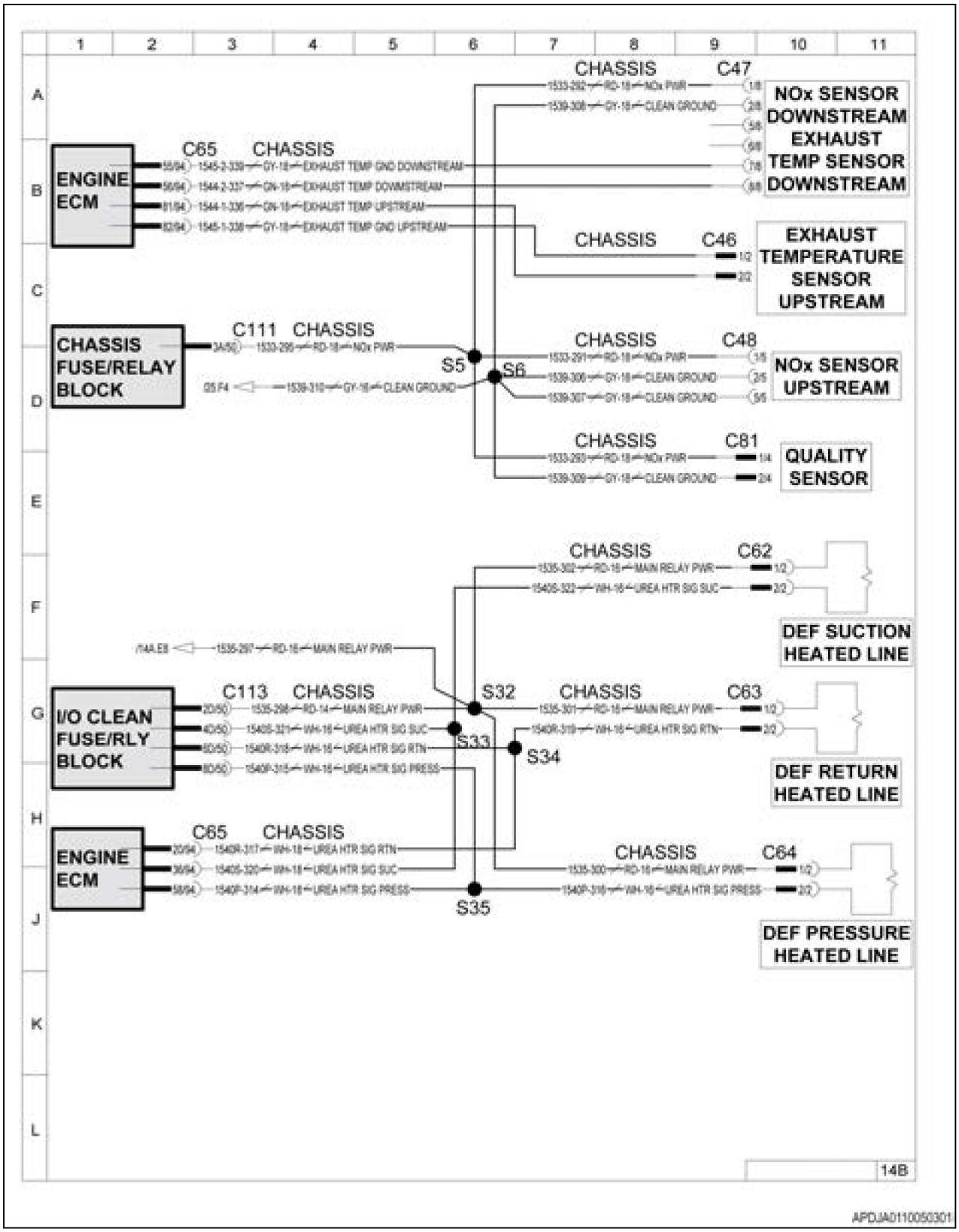


Fig. 61

10.4 03 Transmission module

10.4.1 Code SA 03 SPN 3509 FMI 01

The measured supply 1 (5 volt) voltage is below normal operating range - most serious.

Diagnosis and solution

1. Check the 5 volt power to the wheel motor.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the front and the rear wheel leg connectors.
e) Turn the battery disconnect switch to the on position.
f) Turn the key start switch to the on position.
g) Check the voltage from contact 3 to contact 4 on each of the wheel leg connectors.

Result

Expected result - the voltage is 5 volts.

Results:

- Yes - the voltage is 5 volts.

  Stop.
- No - the voltage is not 5 volts.

  see step 2, page 10-172 .

2. Check the 5 volt power from the controller.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the front and the rear wheel leg connectors.
e) Disconnect Rexroth/Sauer controller.
f) Turn the battery disconnect switch to the on position.
g) Turn the key start switch to the on position.
h) Check the voltage from the Rexroth/Sauer controller connector contacts 4, 9, 14, and 19 to the frame ground.

Result

Expected result - the voltage is 5 volts.

Results:

- Yes - the voltage is 5 volts.

  Stop.
- No - the voltage is not 5 volts.

  see step 3, page 10-172 .

3. Check the harness for short circuit.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the front and the rear wheel leg connectors.
e) Disconnect Rexroth/Sauer controller.
f) Turn the battery disconnect switch to the on position.
g) Turn the key start switch to the on position.

10.4.5.2 Wheel leg bulkhead electrical circuits

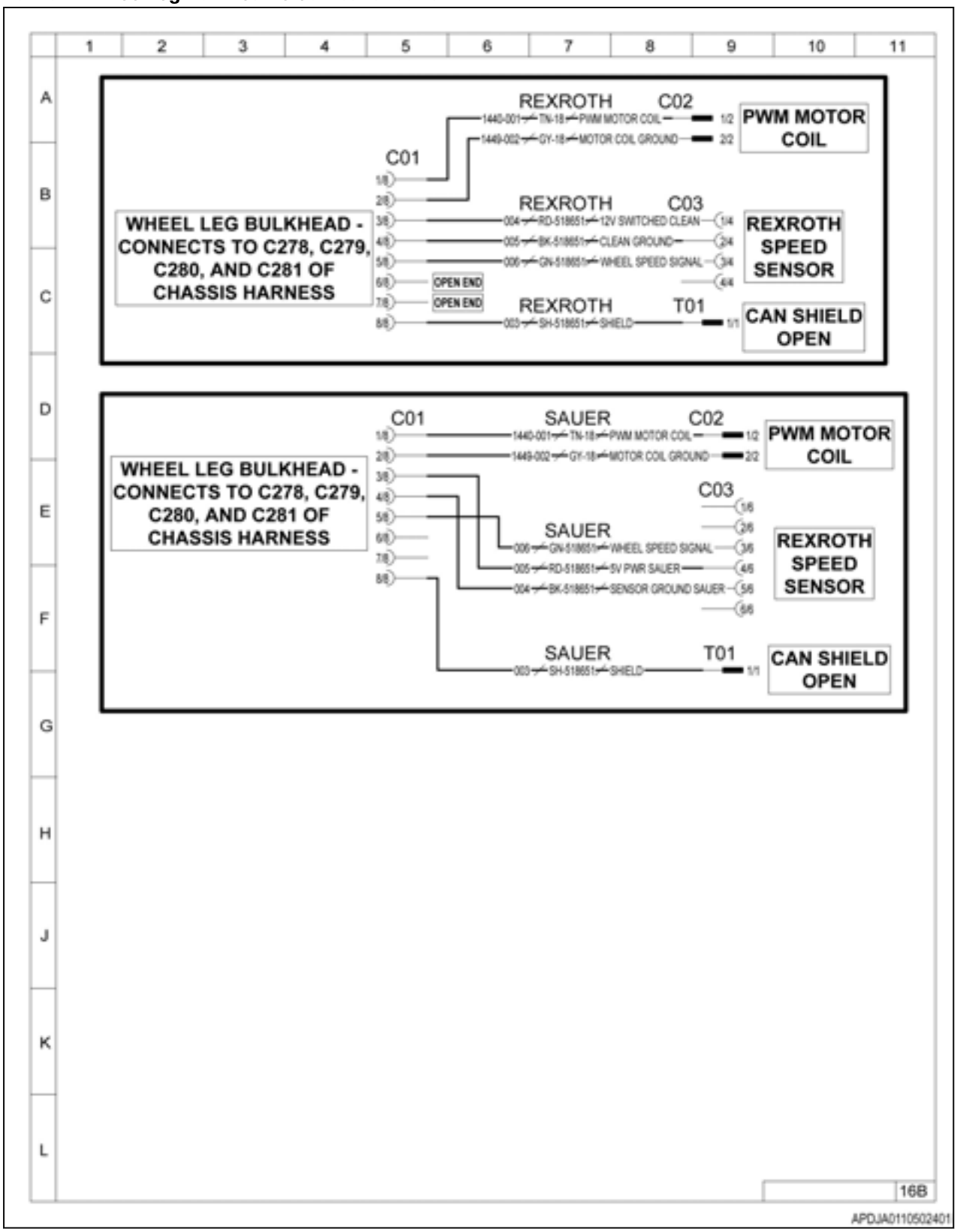


Fig. 76

10.4.9.2 Wheel leg bulkhead electrical circuits

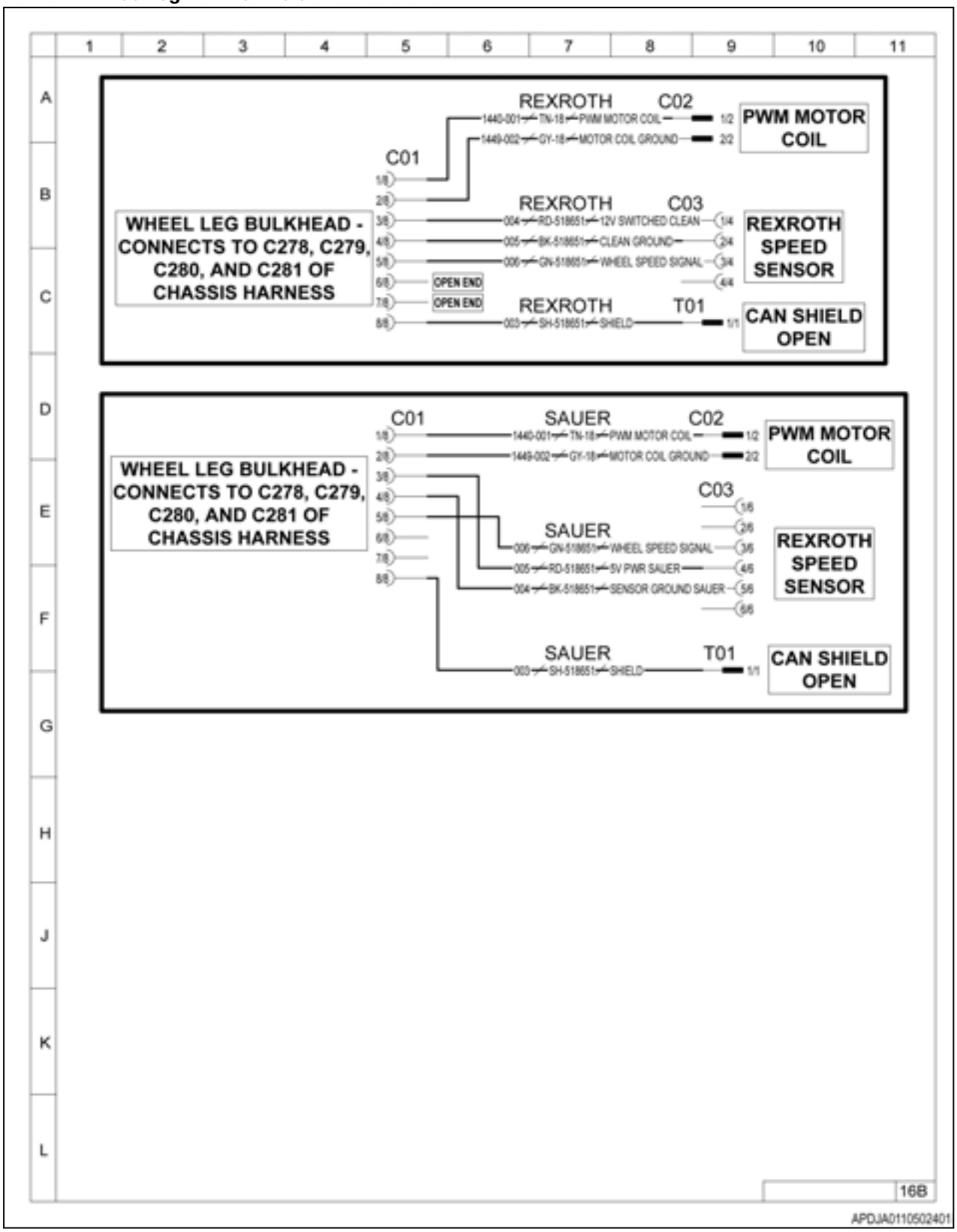


Fig. 84

Schematic legend		
Item	Schematic term	Description
--	LT TURN	Left-hand turn
--	RT TURN	Right-hand turn
--	ROAD LIGHT	Roading light
--	HIGH BEAM	High beam
--	LOW BEAM	Low beam

10.5.7 Code SA 05 SPN 2369 FMI 02

The right-hand turn signal data is erratic, intermittent, or incorrect.

Diagnosis and solution

1. Check the right-hand turn signal.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the steering column switch and the armrest control module connectors.
e) Check the resistance from the steering column switch connector contact 8 to the armrest control module connector contact 64.

Result

Expected result - the resistance is less than 5 ohms.

Results:

- Yes - the resistance is less than 5 ohms.

  see step 2, page 10-232 .
- No - the resistance is not less than 5 ohms.

  Repair or replace the wiring harness.

  see step 3, page 10-232

2. Check the right-hand turn signal voltage.

a) Turn the battery disconnect switch to the on position.
b) Turn the key start switch to the on position.
c) Disconnect the steering column switch.
d) Connect the armrest control module connectors.
e) Check the voltage from the steering column switch contact 1 to the frame ground.

Result

Expected result - the voltage is 5 volts.

Results:

- Yes - the voltage is 5 volts.

  see step 3, page 10-232 .
- No - the voltage is not 5 volts.

  Repair or replace the wiring harness.

  see step 3, page 10-232

3. Replace the steering column switch.

- Yes - the resistance is less than 5 ohms.

  see step 2, page 10-252 .
- No - the resistance is not less than 5 ohms.

  Repair or replace the wiring harness.

  see step 7, page 10-253

2. Check the park brake switch circuit.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the park brake diode pack and the park brake switch connectors.
e) Check the resistance from the park brake diode pack contact 2 and the park brake switch connector contact 5.

Result

Expected result - the resistance is less than 5 ohms.

Results:

- Yes - the resistance is less than 5 ohms.

  see step 3, page 10-252 .
- No - the resistance is not less than 5 ohms.

  Repair or replace the wiring harness.

  see step 7, page 10-253

3. Check the park brake switch circuit.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the relay pack and the park brake switch connectors.
e) Check the resistance from the relay pack connector contact 2 and the park brake switch connector contact 5.

Result

Expected result - the resistance is less than 5 ohms.

Results:

- Yes - the resistance is less than 5 ohms.

  see step 4, page 10-252 .
- No - the resistance is not less than 5 ohms.

  Repair or replace the wiring harness.

  see step 7, page 10-253

4. Check the park brake switch circuit.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the adapter harness connector and the park brake switch connectors.
e) Check the resistance from the adapter harness connector contact 7 and the park brake switch connector contact 5 .

Result

Expected result - the resistance is less than 5 ohms.

10.5.20.2 Spray handle connector electrical circuits

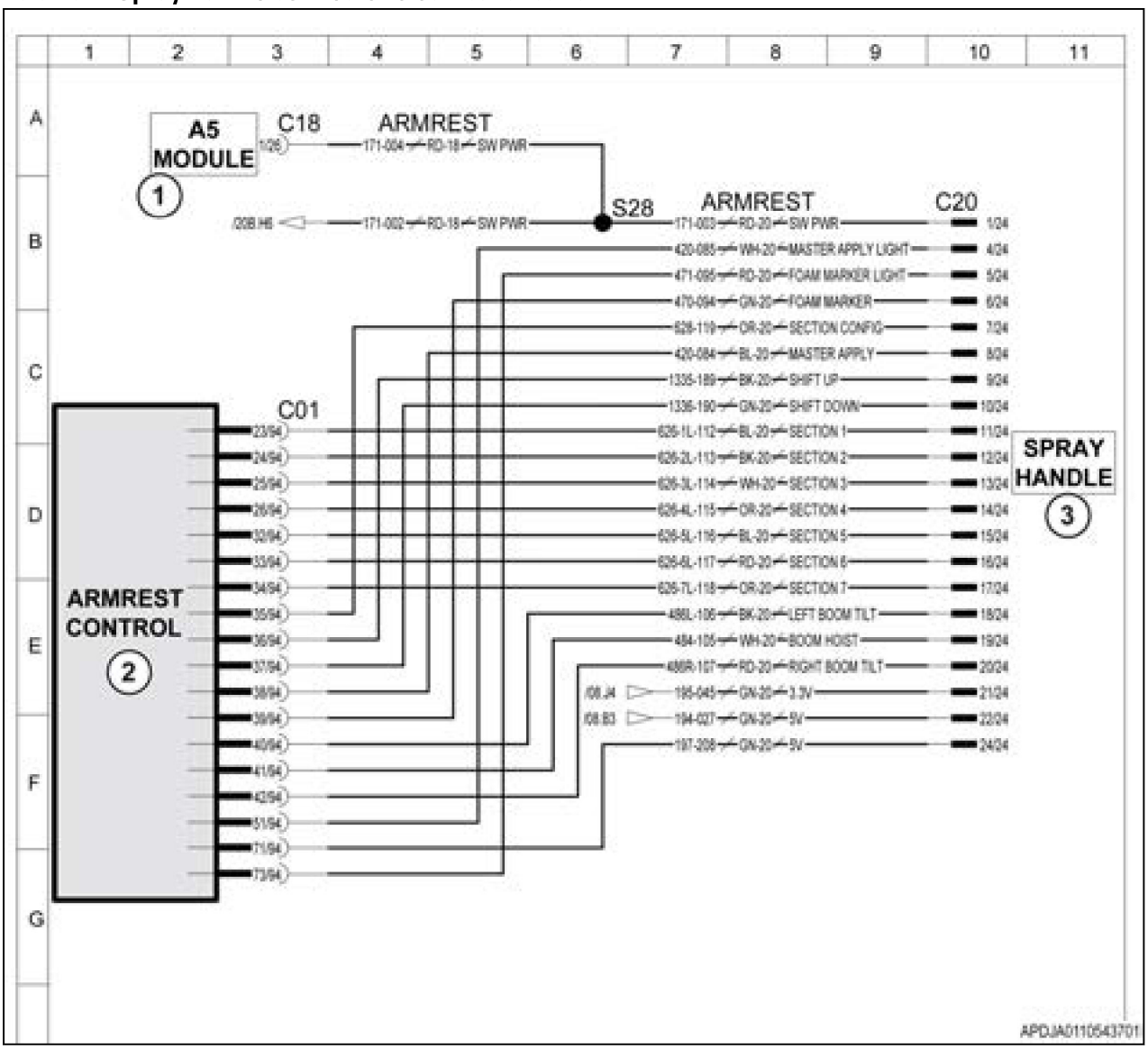


Fig. 114

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.25.2 Spray handle connector electrical circuits

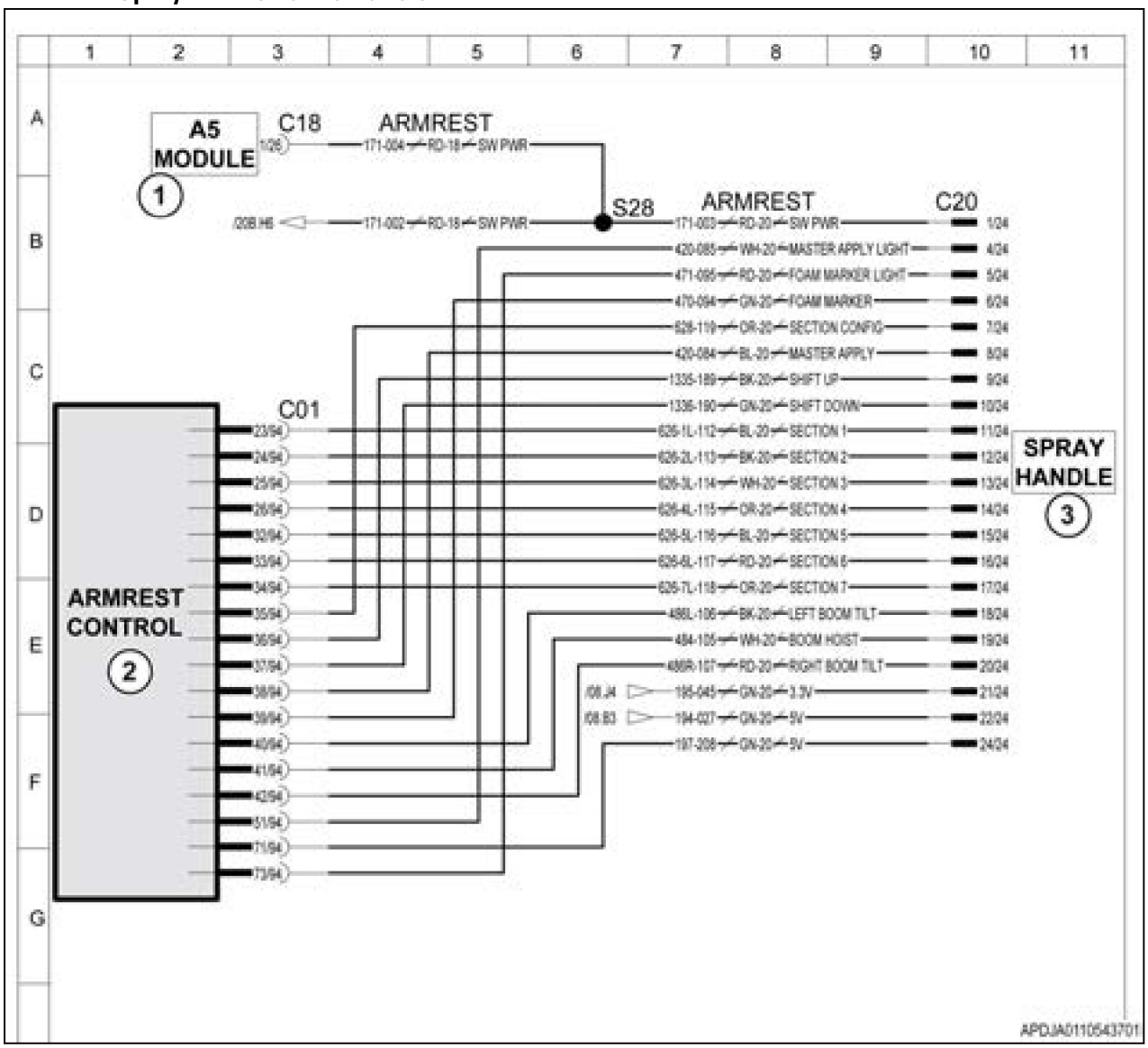


Fig. 124

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.31.2 Spray handle connector electrical circuits

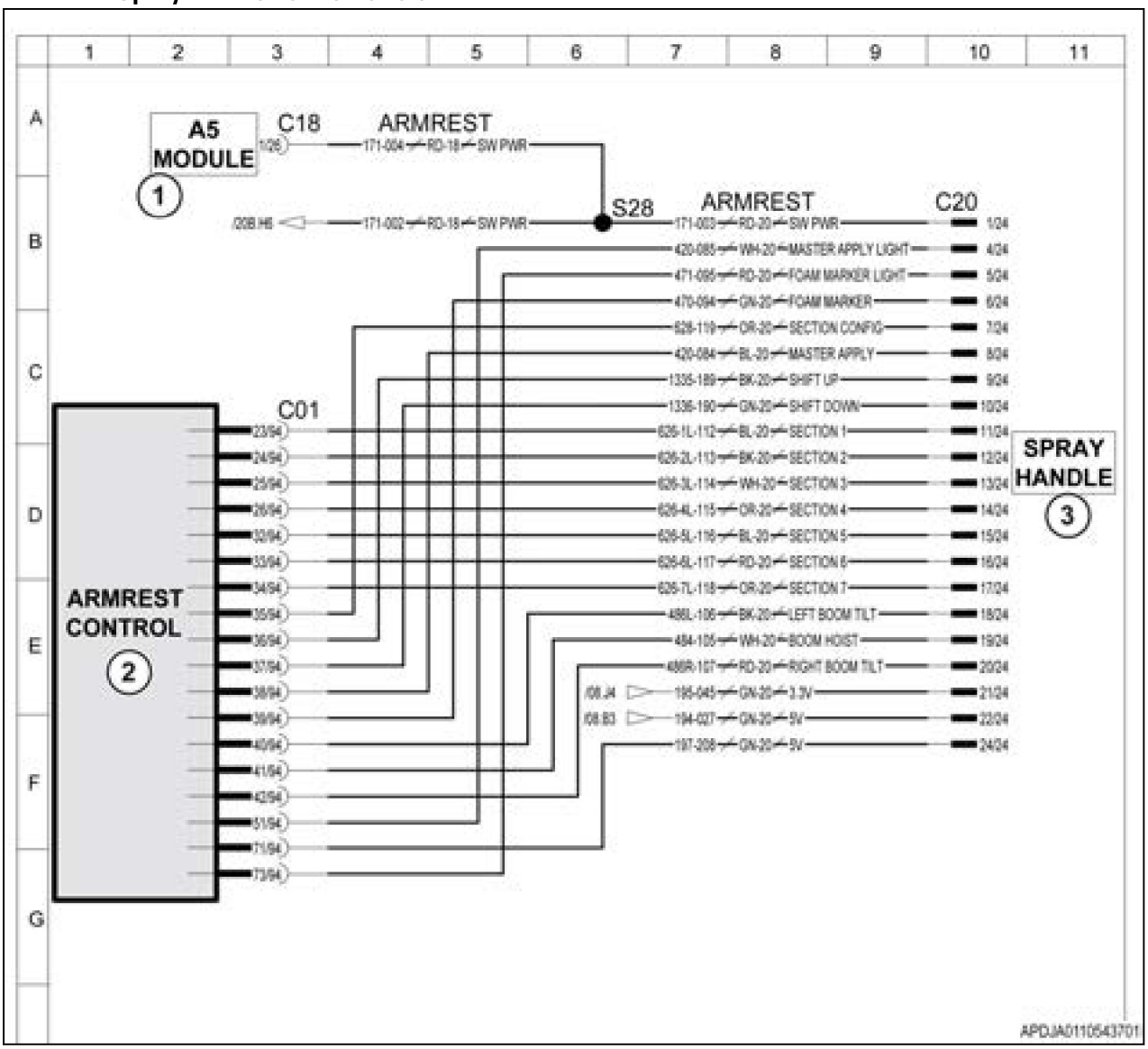


Fig. 132

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.36.2 Spray handle connector electrical circuits

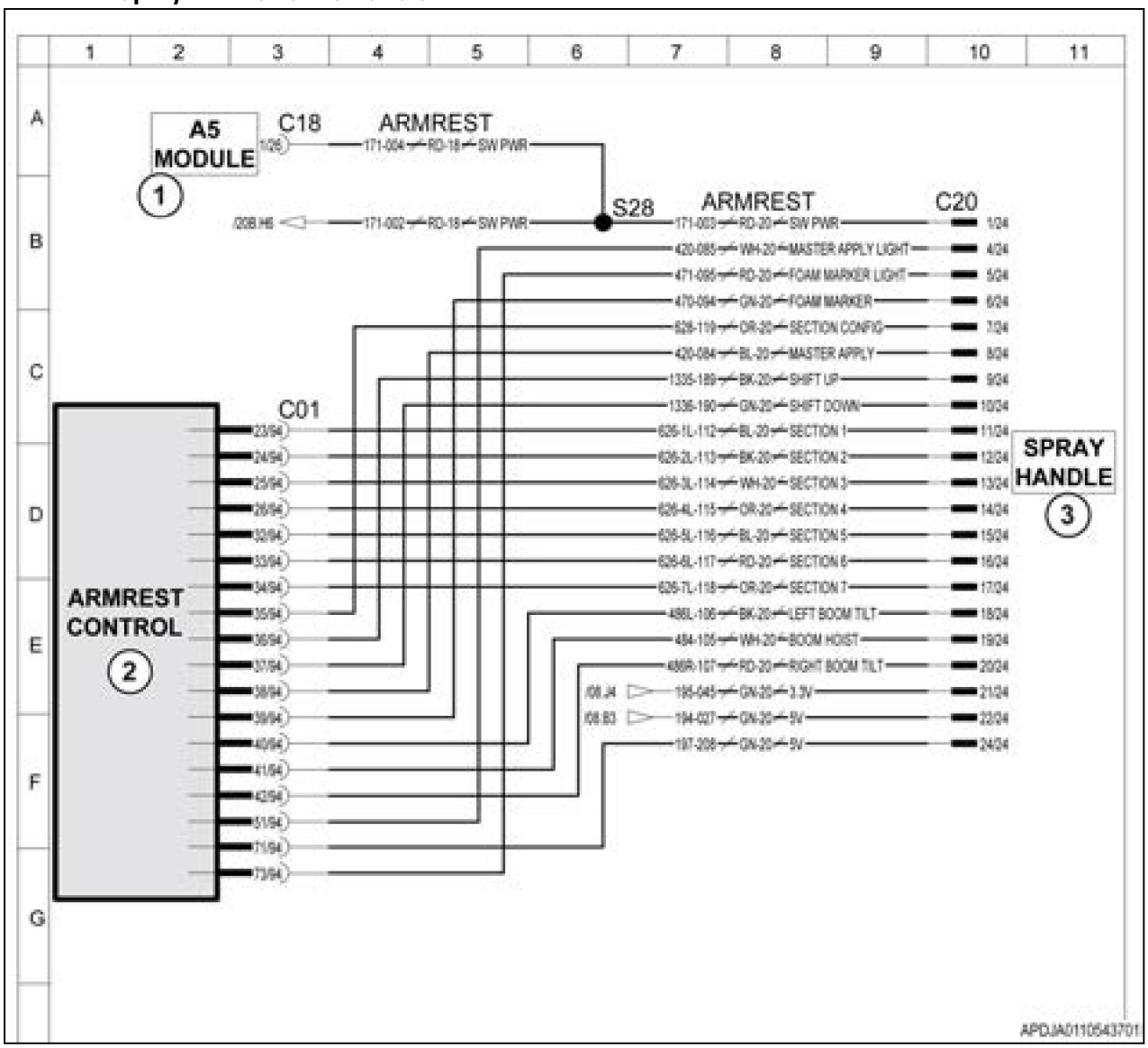


Fig. 142

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.41.2 Spray handle connector electrical circuits

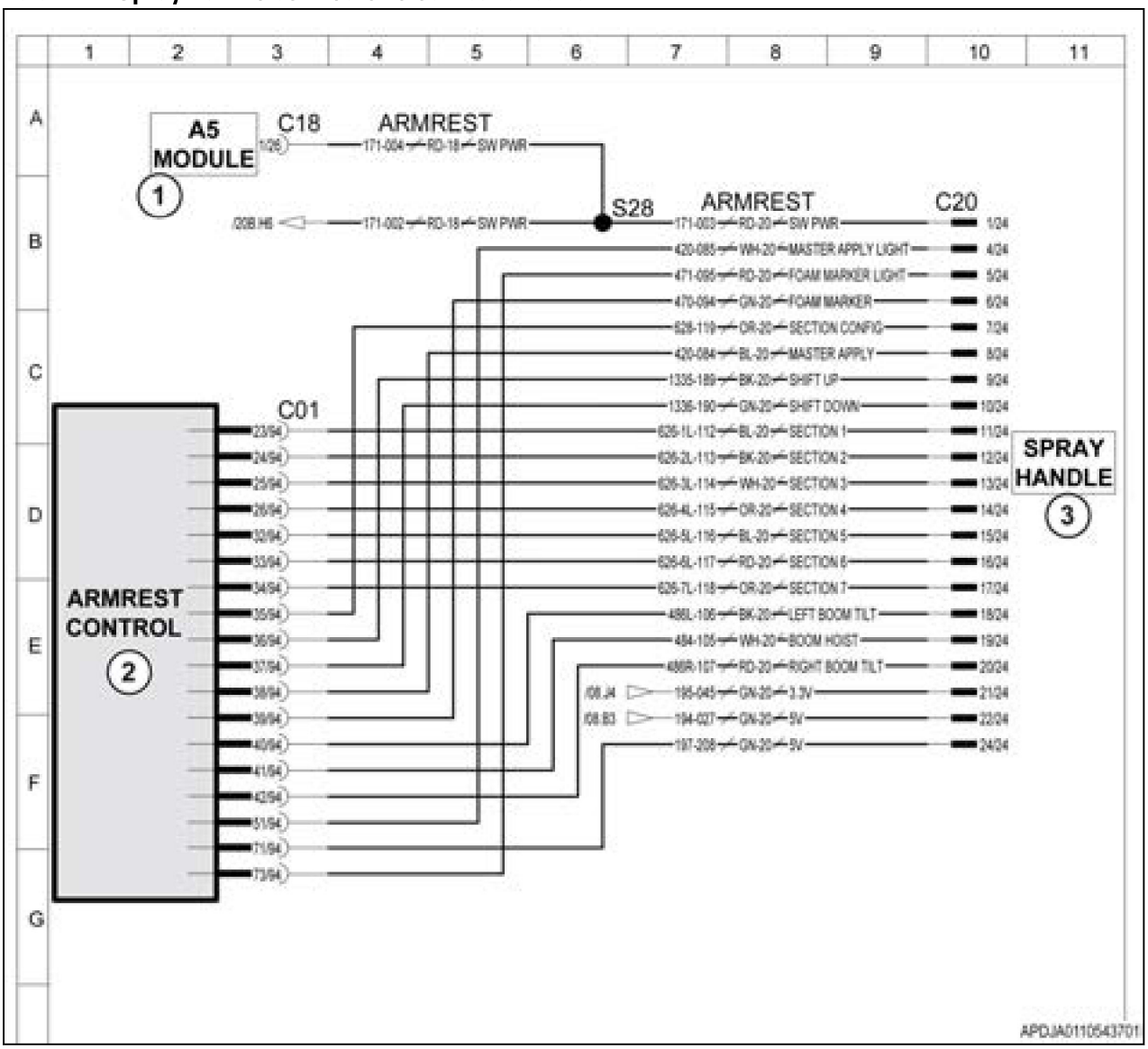


Fig. 152

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.46.2 Spray handle connector electrical circuits

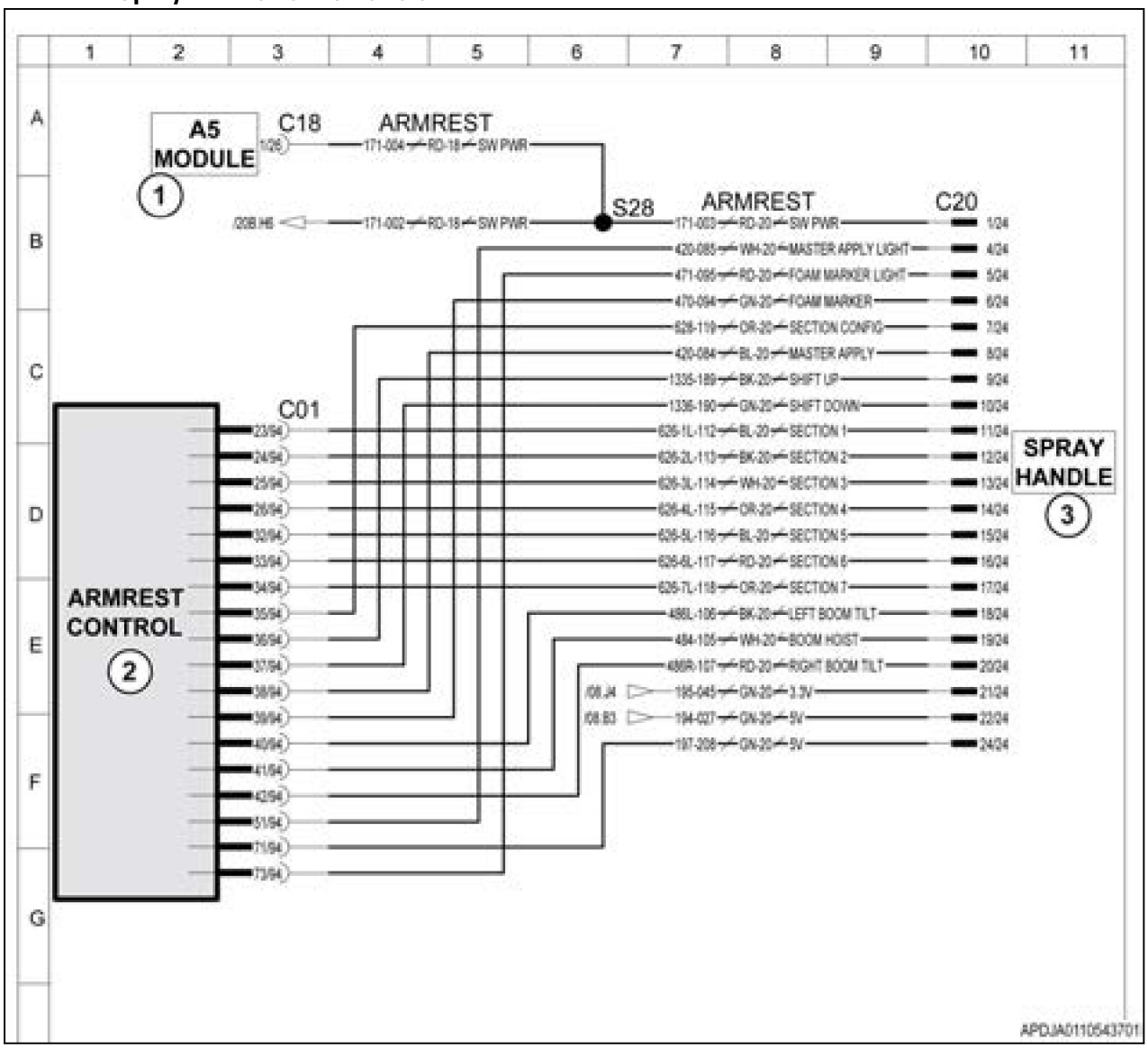


Fig. 162

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.51.2 Spray handle connector electrical circuits

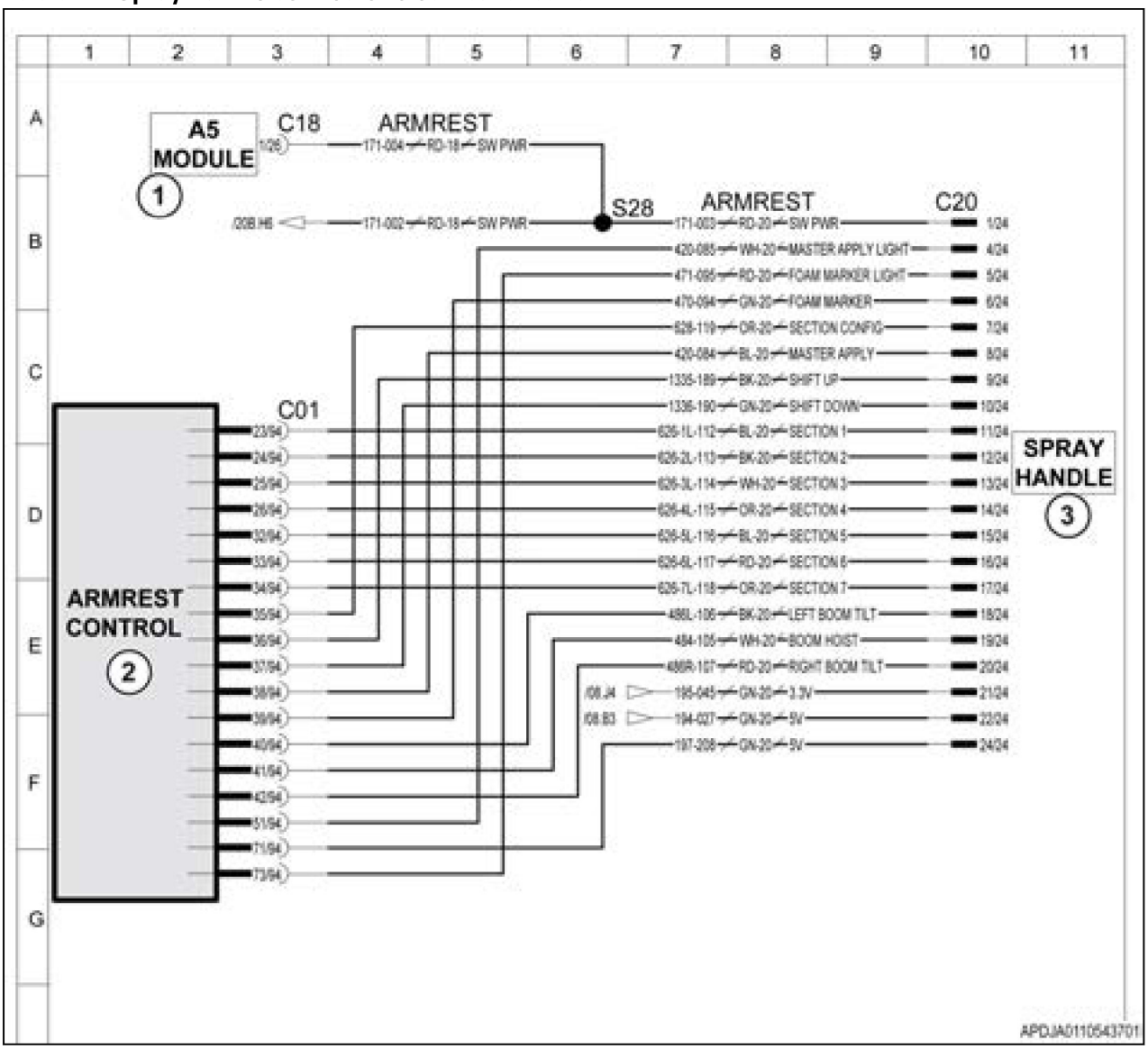


Fig. 172

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.56.2 Spray handle connector electrical circuits

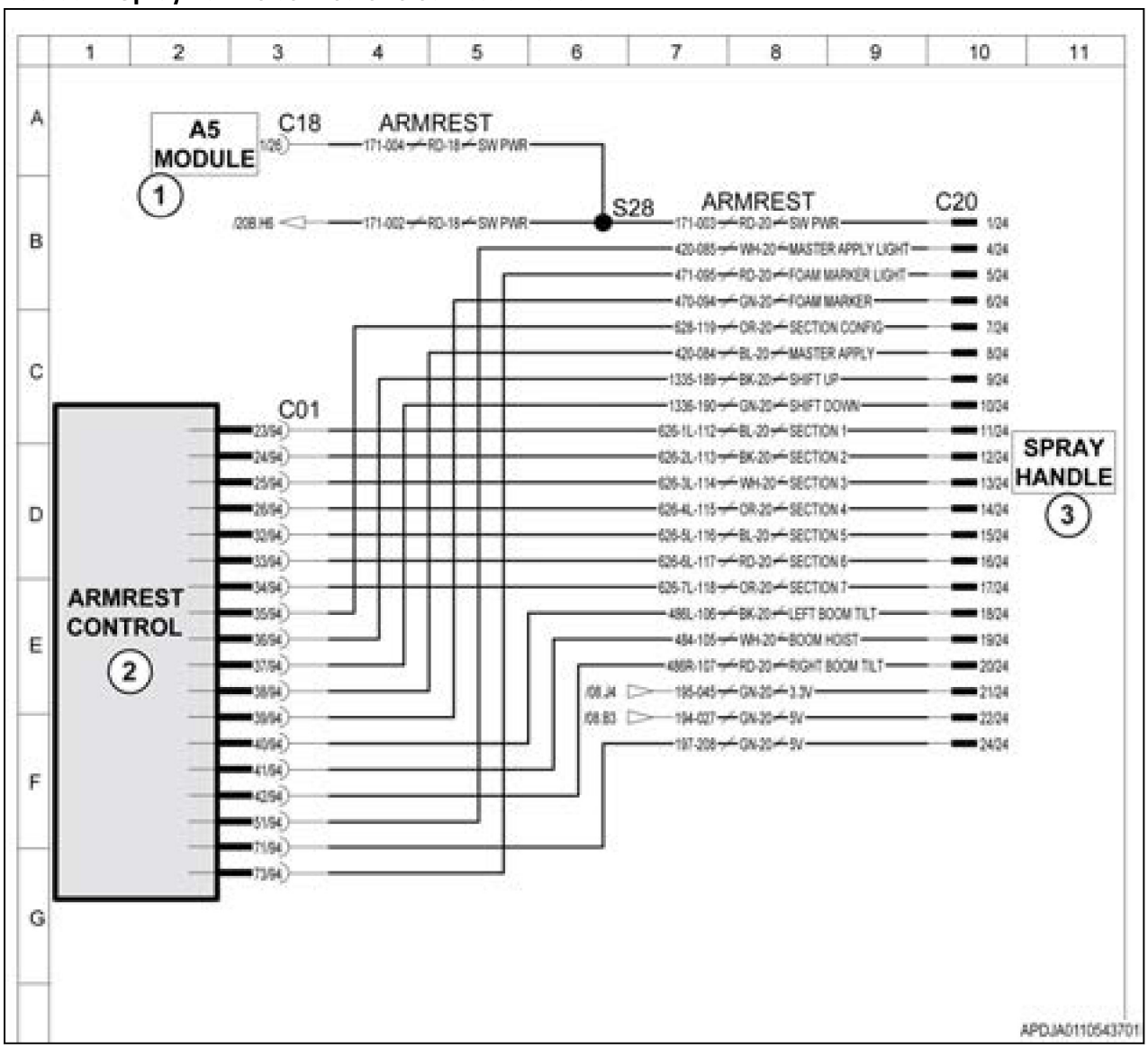


Fig. 182

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.61.2 Spray handle connector electrical circuits

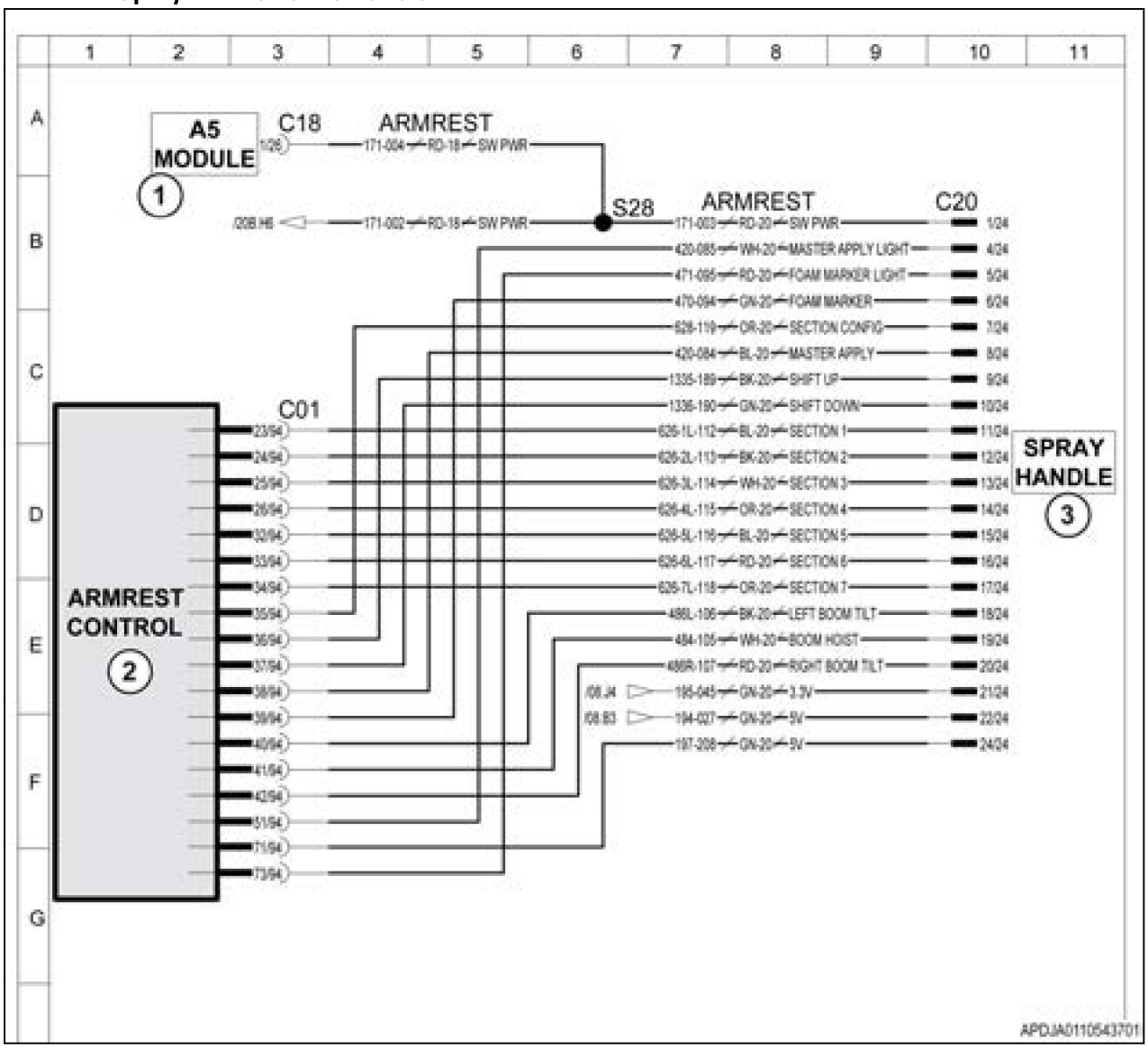


Fig. 192

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.66.2 Spray handle connector electrical circuits

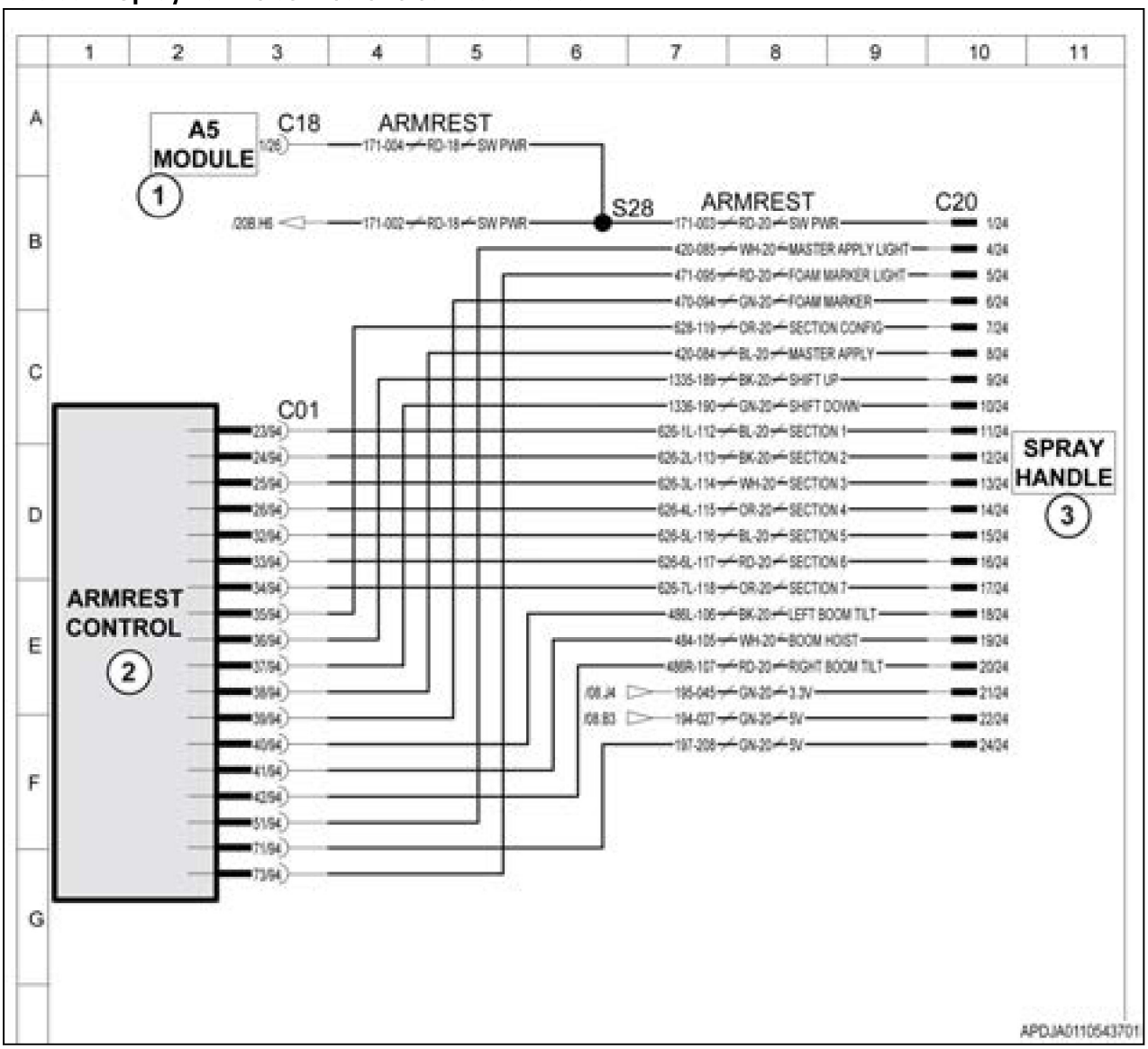


Fig. 202

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.71.2 Spray handle connector electrical circuits

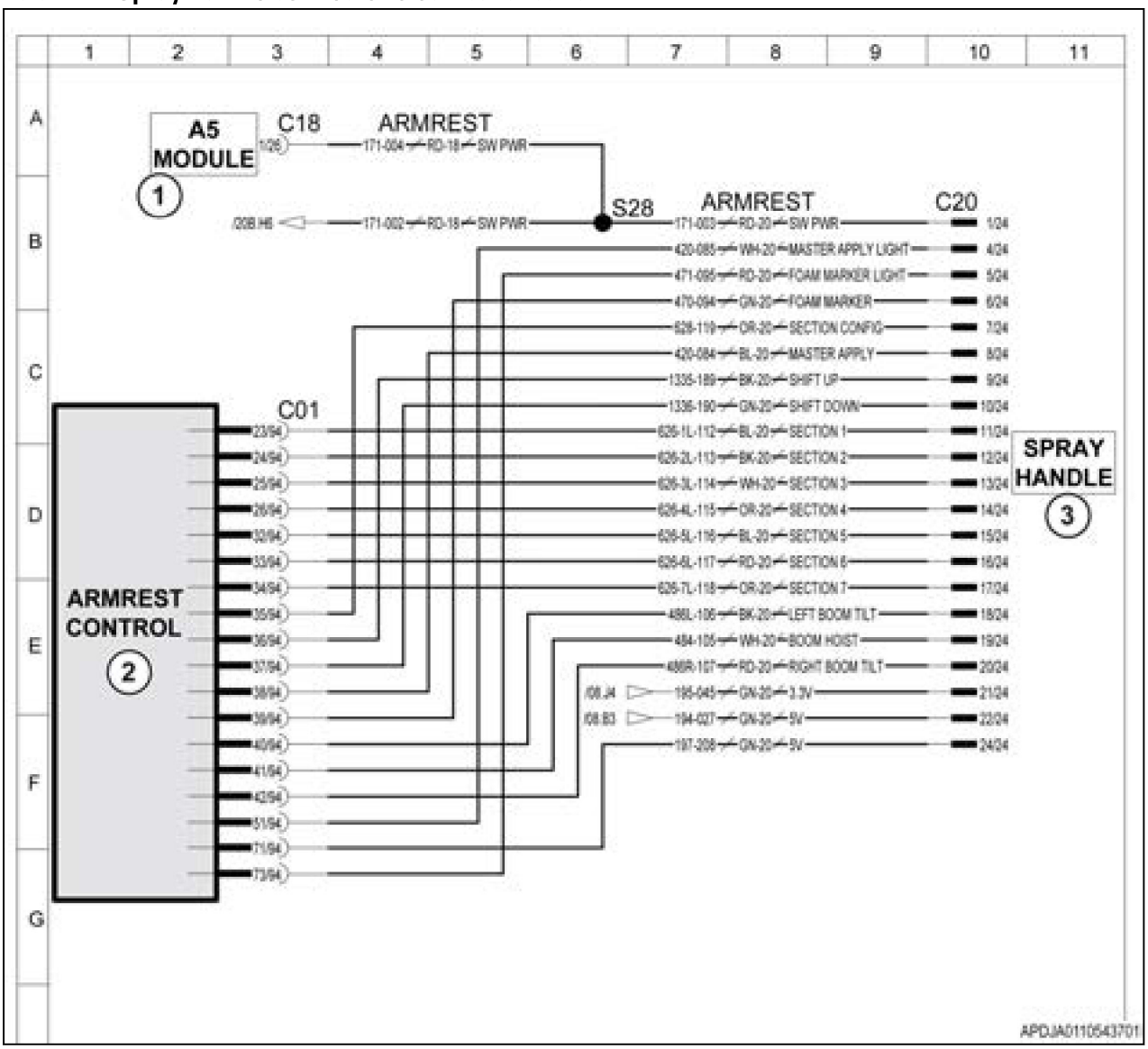


Fig. 212

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.76.2 Spray handle connector electrical circuits

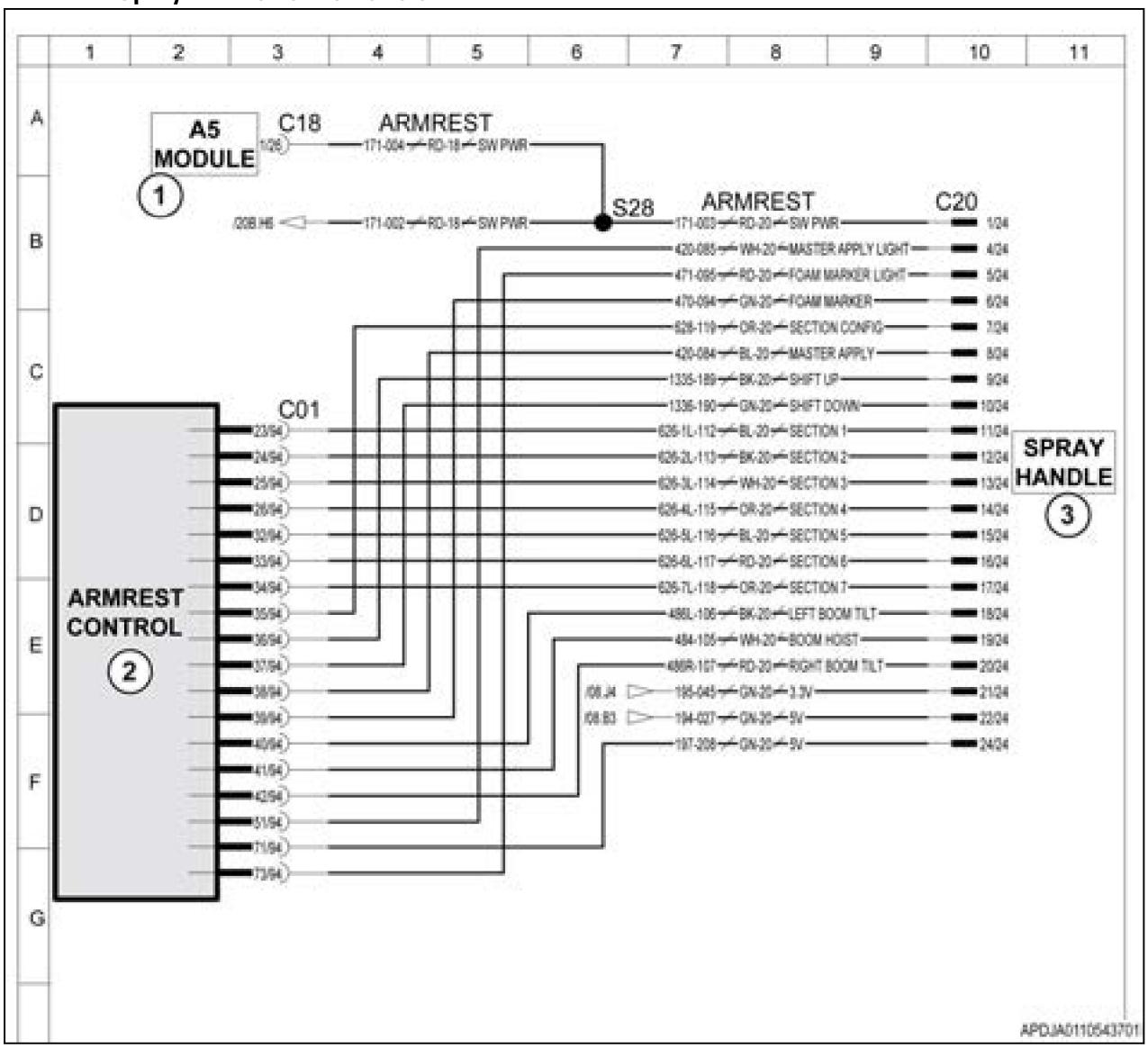


Fig. 222

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.81.2 Spray handle connector electrical circuits

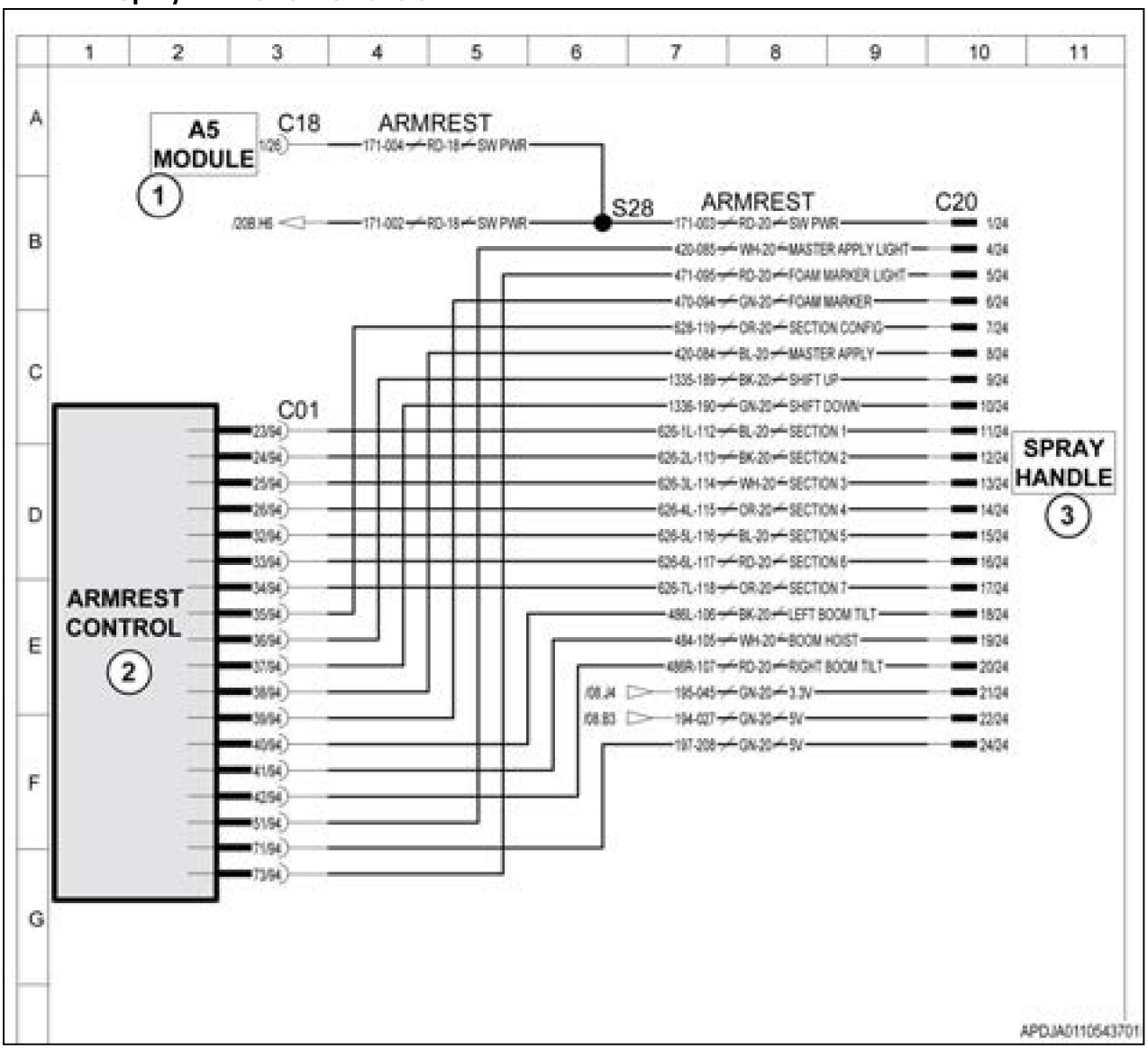


Fig. 232

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

10.5.86.2 Spray handle connector electrical circuits

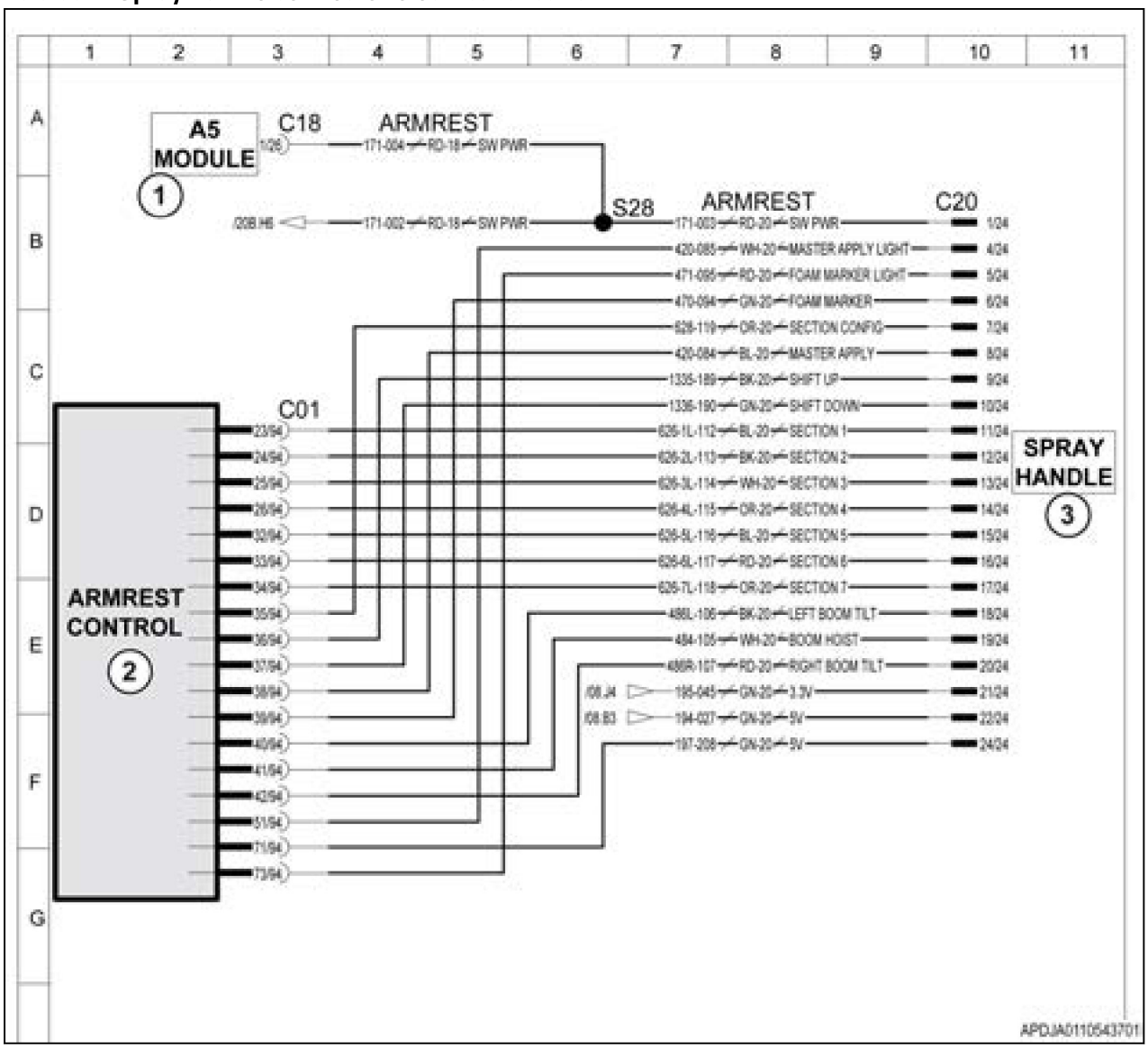


Fig. 242

Schematic legend		
Item	**Schematic term**	**Description**
1	A5 MODULE	Armrest display module
2	ARMREST CONTROL	Armrest control module
3	SPRAY HANDLE	Spray handle
--	ARMREST	Armrest
--	SW PWR	Switch power
--	MASTER APPLY LIGHT	Master apply lamp
--	FOAM MARKER LIGHT	Foam marker lamp
--	FOAM MARKER	Foam marker
--	SECTION CONFIG	Section configuration
--	MASTER APPLY	Master apply

Schematic legend		
Item	**Schematic term**	**Description**
1	ARMREST CONTROL	Armrest control module
2	LEFT END ROW SWITCH	Left-hand end row switch
3	RIGHT END ROW SWITCH	Right-hand end row switch
--	ARMREST	Armrest
--	5V	5 volt
--	3.3V	3.3 volt
--	END ROW LH	End row left-hand
--	GND CAB	Ground cab
--	RH END ROW LIGHT	Right-hand end row lamp

10.5.92 Code SA 05 SPN 522079 FMI 01

Data valid but below normal operating range - most severe level in the left-hand end row power circuit.

Diagnosis and solution

1. Check the left-hand end row switch circuit.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the armrest control module and the left-hand end row switch connectors.
e) Check the resistance from the armrest control module connector contact 43 to all the other connector contacts and the frame ground.

Result

Expected result - the resistance is more than 5000 ohms.

Results:

- Yes - the resistance is more than 5000 ohms.

  see step 2, page 10-552
- No - the resistance is not more than 5000 ohms.

  Repair or replace the wiring harness.

  see step 3, page 10-553

2. Check the left-hand end row switch.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the armrest control module and the left-hand end row switch connectors.
e) Check the resistance from the left-hand end row switch contact 2 to all the other contacts.

Result

Expected result - the resistance is more than 5000 ohms.

Results:

- Yes - the resistance is more than 5000 ohms.

  see step 3, page 10-553

10.5.98.1 End row switches electrical circuits

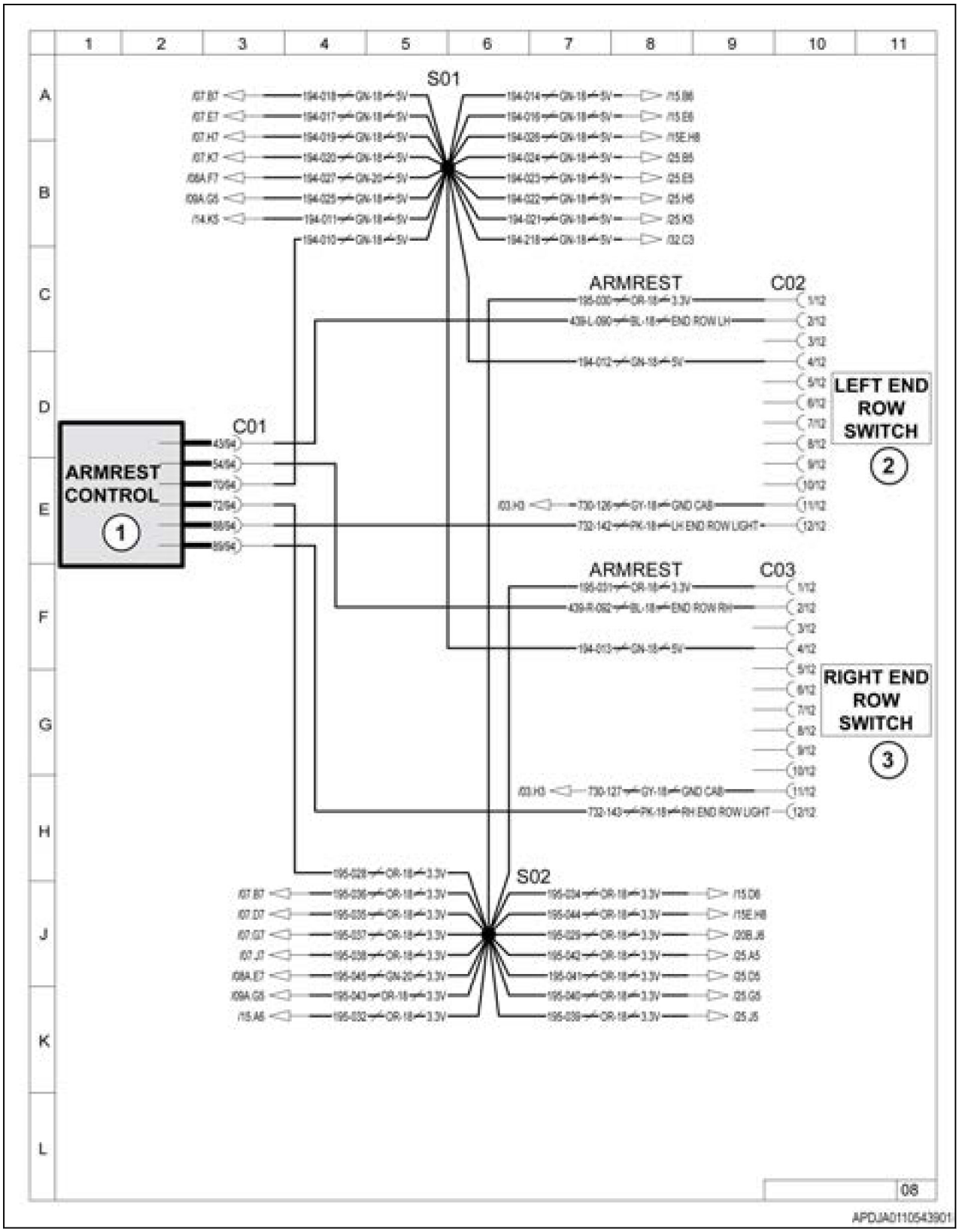


Fig. 258

b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the armrest control module and the right-hand boom tip fold switch connectors.
e) Check the resistance from the right-hand boom tip fold switch contact 7 to all the other contacts.

Result

Expected result - the resistance is more than 5000 ohms.

Results:

- Yes - the resistance is more than 5000 ohms.

  see step 3, page 10-592
- No - the resistance is not more than 5000 ohms.

  Replace the switch.

  see step 3, page 10-592

3. Check if the diagnostic code remains.
a) Inspect and clean the wiring harness connector contacts.
b) Connect all the connectors.
c) Turn the battery disconnect switch to the on position.
d) Turn the key start switch to the on position.
e) Operate the machine at low idle.
f) Check if SPN 522084 FMI 03 is active.

Result

Expected result - the diagnostic code is not active.

Results:

- Yes - the diagnostic code is not active.

  Stop.
- No - the diagnostic code is active.

  Failure of the armrest control module is possible but not common. Exit the procedure and do the procedure again. If the diagnostic code remains active, replace the armrest control module.

  Stop.

Schematic legend		
Item	**Schematic term**	**Description**
--	SHIFT UP	Shift up
--	SHIFT DOWN	Shift down
--	SECTION 1	Section 1
--	SECTION 2	Section 2
--	SECTION 3	Section 3
--	SECTION 4	Section 4
--	SECTION 5	Section 5
--	SECTION 6	Section 6
--	SECTION 7	Section 7
--	LEFT BOOM TILT	Left-hand boom tilt
--	BOOM HOIST	Boom hoist
--	RIGHT BOOM TILT	Right-hand boom tilt
--	3.3V	3.3 volt
--	5V	5 volt

10.5.112 Code SA 05 SPN 522088 FMI 01

Data valid but below normal operating range - most severe level in boom hoist power or ground circuit.

Diagnosis and solution

1. Diagnosis and solution
- a) Turn the key start switch to the off position.
- b) Turn the battery disconnect switch to the off position.
- c) Remove the key from the battery disconnect switch.
- d) Disconnect the armrest control module and the spray handle connectors.
- e) Check the resistance from the armrest control module connector contact 41 to the frame ground and all the other contacts.

Result

Expected result - the resistance is more than 5000 ohms.

Results:

- Yes - the resistance is more than 5000 ohms.

  see step 2, page 10-612
- No - the resistance is less than 5000 ohms.

  The harness is bad.

  Repair: Repair or replace the harness.

  see step 3, page 10-613

2. Check the spray handle for short circuit.
- a) Turn the key start switch to the off position.
- b) Turn the battery disconnect switch to the off position.
- c) Remove the key from the battery disconnect switch.
- d) The spray handle stays disconnected.

10.5.118.1 Auxilliary output electrical circuits

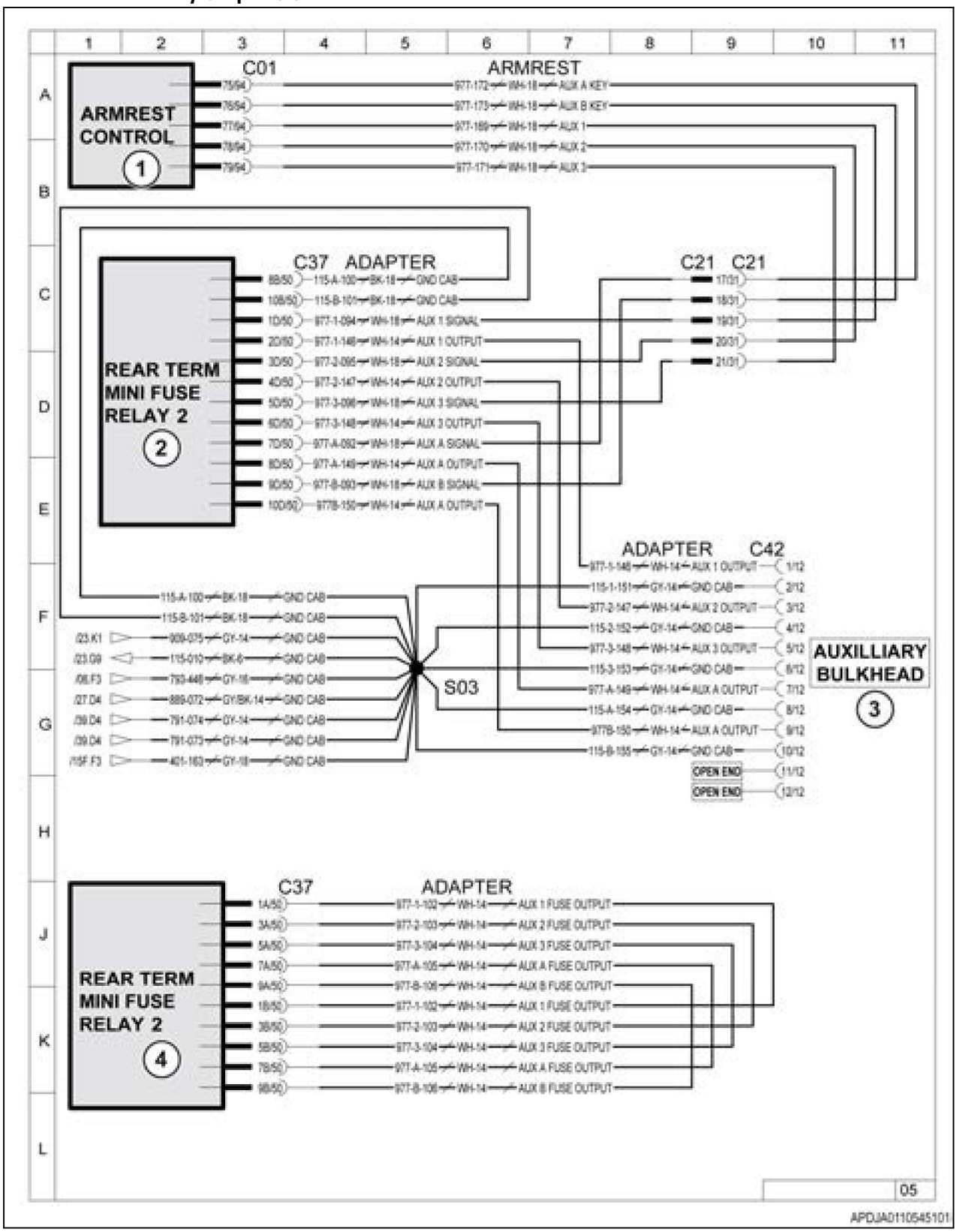


Fig. 278

10.5.124.1 Track adjust coil electrical circuits

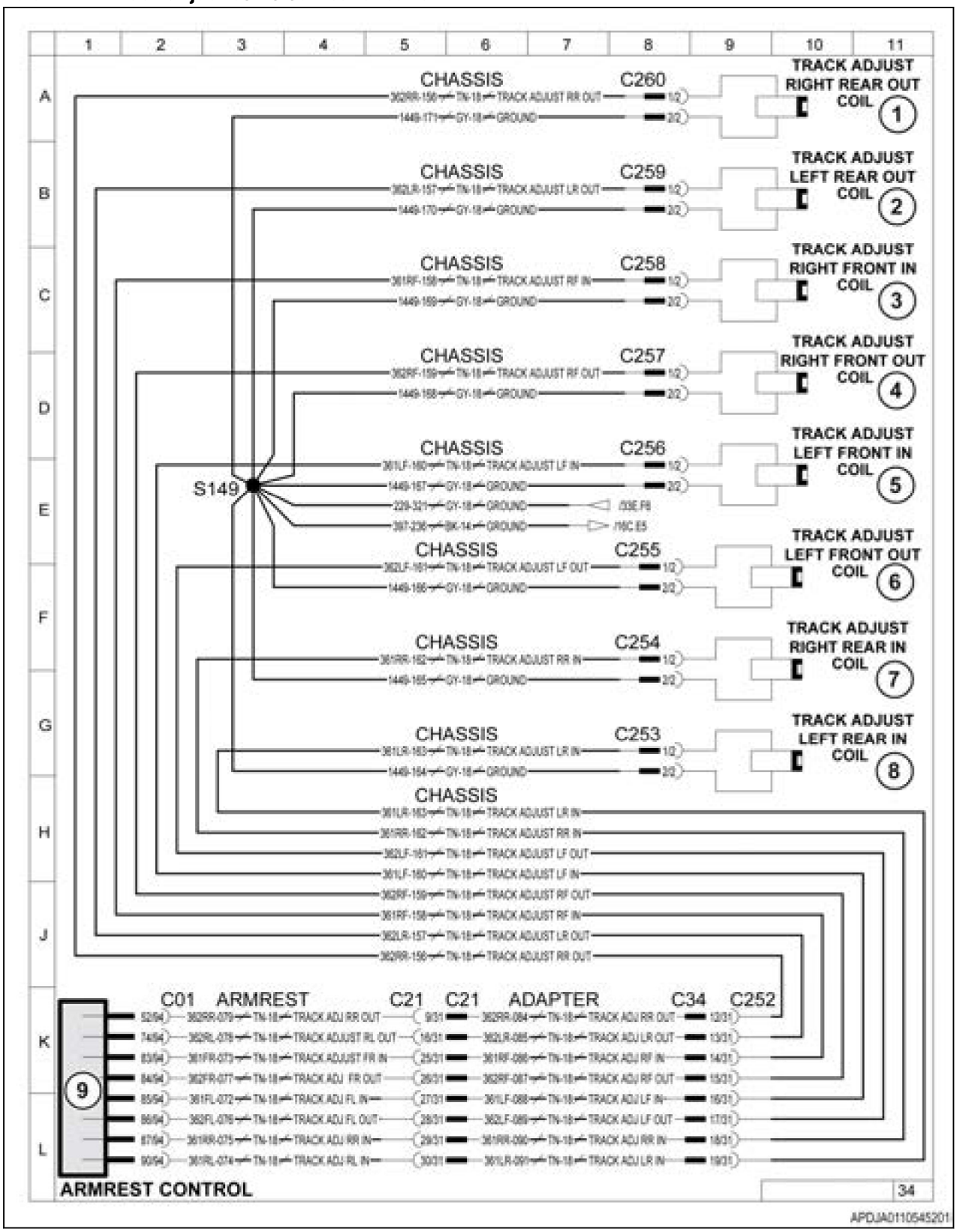


Fig. 284

b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the rear right-hand track adjustment coil connectors and the armrest control module.
e) Check the resistance from the armrest control module connector contact 52 to all the other contacts and the frame ground.

Result

Expected result - the resistance is more than 5000 ohms.

Results:

- Yes - the resistance is more than 5000 ohms.

  see step 2, page 10-672
- No - the resistance is less than 5000 ohms.

  The harness is bad.

  see step 2, page 10-672

2. Check if the diagnostic code remains.
a) Inspect and clean the wiring harness connector contacts.
b) Connect all the connectors.
c) Turn the battery disconnect switch to the on position.
d) Turn the key start switch to the on position.
e) Operate the machine at low idle.
f) Check if SPN 522099 FMI 06 is active.

Result

Expected result - the diagnostic code is not active.

Results:

- Yes - the diagnostic code is not active.

  Stop.
- No - the diagnostic code is active.

  Failure of the armrest control module is possible but not common. Exit the procedure and do the procedure again. If the diagnostic code remains active, replace the armrest control module.

  Stop.

Schematic legend		
Item	**Schematic term**	**Description**
1	DOME LIGHT SWITCH	Dome light switch
2	PROJECTION LAMP	Projection lamp
3	PROJECTION LAMP	Projection lamp
4	POWER DISTRIBUTION MODULE	Power distribution module
--	ON	On
--	OFF	Off
--	DOOR	Door
--	FRONT ROOF	Front roof
--	MAIN ROOF	Main roof
--	ARMREST	Armrest
--	ADAPTER	Adapter
--	DOOR SWITCH SIGNAL	Door switch signal
--	DOME LIGHT	Dome lamp
--	GROUND ROOF	Ground roof
--	BACKLIGHT	Back lamp
--	GND ROOF	Ground roof

10.5.136 Code SA 05 SPN 522104 FMI 06

Current below normal or open circuit in projection lamps circuit.

Diagnosis and solution

1. Check the projection lamps circuit for open circuit.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the armrest control connector and the rear terminal miniature fuse relay.
e) Check the resistance from the armrest control connector contact 76 to the rear terminal miniature fuse relay contact 9D.

Result

Expected result - the resistance is less than 5 ohms.

Results:

- Yes - the resistance is less than 5 ohms.

  see step 2, page 10-692 .
- No - the resistance is more than 5 ohms.

  The harness is bad.

  Repair: Repair or replace the harness.

  see step 3, page 10-693

2. Check the projection lamps circuit for open circuit.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.

10.5.151.2 Oiler and throttle switch electrical circuits

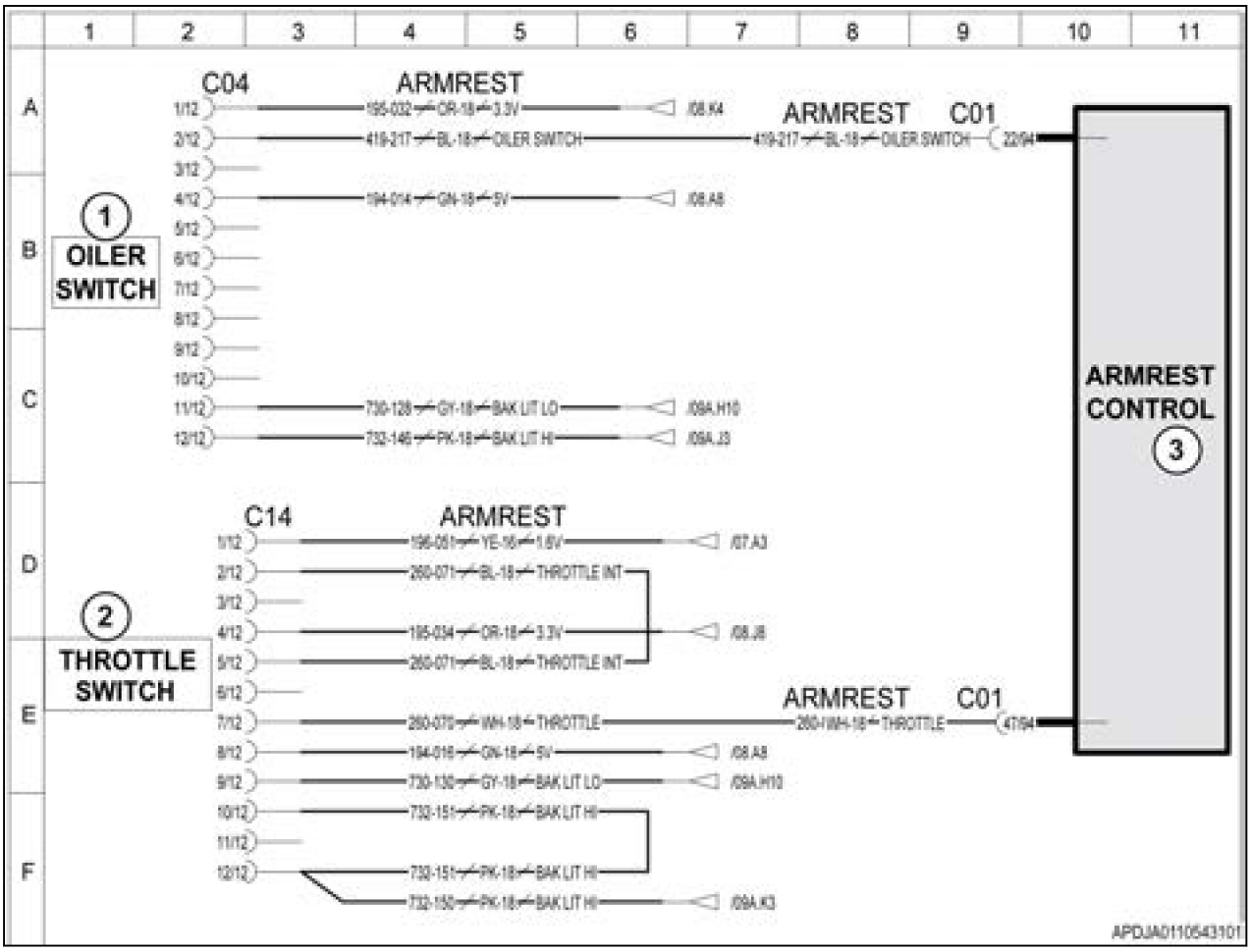


Fig. 308

Schematic legend		
Item	**Schematic term**	**Description**
1	OILER SWITCH	Oiler switch
2	THROTTLE SWITCH	Throttle switch
3	ARMREST CONTROL	Armrest control
--	ARMREST	Armrest
--	3.3V	3.3 volt
--	OILER SWITCH	Oiler switch
--	5V	5 volt
--	BAK LIT LO	Back lamp low
--	BAK LIT HI	Back lamp high
--	1.6V	1.6 volt
--	THROTTLE	Throttle

10.5.152 Code SA 05 SPN 898 FMI 01

Data valid but below normal operating range - most severe level in the hand throttle sensor circuit.

Schematic legend		
Item	**Schematic term**	**Description**
1	SMARTRAX NODE	Smartrax node
2	FRONT WHEEL ANGLE SENSOR	Front wheel angle sensor
3	REAR WHEEL ANGLE SENSOR	Rear wheel angle sensor
4	POWER DISTRIBUTION MODULE	Power distribution module
5	ARMREST CONTROL	Armrest control
--	CHASSIS	Chassis
--	SMARTRAX HYD	Smartrax hydraulics
--	SMARTRAX	Smartrax
--	ADAPTER	Adapter
--	ARMREST	Armrest
--	CONNECTS TO 4WS HARNESS OR NO 4WS HARNESS	Connects to four wheel steer harness or no four wheel steer harness
--	FRONT SENSOR LOW	Front sensor low
--	FRONT SENSOR SIGNAL	Front sensor signal
--	FRONT SENSOR HIGH	Front sensor high
--	FRONT SENSOR SIGNAL	Front sensor signal
--	STEER SENSE SIG	Steering sensor signal
--	REAR SENSOR LOW	Rear sensor low
--	REAR SENSOR SIGNAL	Rear sensor signal
--	REAR SENSOR HIGH	Rear sensor high
--	4WS CNTRL PWR	Four wheel steer controller power
--	4WS ENABLE	Four wheel steer enable
--	CAB GROUND	Cab ground

Schematic legend		
Item	**Schematic term**	**Description**
1	SMARTRAX NODE	Smartrax node
2	FRONT WHEEL ANGLE SENSOR	Front wheel angle sensor
3	REAR WHEEL ANGLE SENSOR	Rear wheel angle sensor
4	POWER DISTRIBUTION MODULE	Power distribution module
5	ARMREST CONTROL	Armrest control
--	CHASSIS	Chassis
--	SMARTRAX HYD	Smartrax hydraulics
--	SMARTRAX	Smartrax
--	ADAPTER	Adapter
--	ARMREST	Armrest
--	CONNECTS TO 4WS HARNESS OR NO 4WS HARNESS	Connects to four wheel steer harness or no four wheel steer harness
--	FRONT SENSOR LOW	Front sensor low
--	FRONT SENSOR SIGNAL	Front sensor signal
--	FRONT SENSOR HIGH	Front sensor high
--	FRONT SENSOR SIGNAL	Front sensor signal
--	STEER SENSE SIG	Steering sensor signal
--	REAR SENSOR LOW	Rear sensor low
--	REAR SENSOR SIGNAL	Rear sensor signal
--	REAR SENSOR HIGH	Rear sensor high
--	4WS CNTRL PWR	Four wheel steer controller power
--	4WS ENABLE	Four wheel steer enable
--	CAB GROUND	Cab ground

10.7.3 Code SA 224 SPN 522003 FMI 02

Right-hand front track adjustment-out switch, data erratic, intermittent, or not correct.

Diagnosis and solution

Do the battery disconnect procedure.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Wait 60 seconds.
d) Turn the battery disconnect switch to the on position.
e) Turn the key start switch to the on position.
f) Check if the fault code is active.

Result

Expected result - the code is not active.

Results:

- Yes - the code is not active.

  Stop.
- No - the code is active.

  The chassis key pad is bad.

  Repair: Replace the chassis key pad.

  Stop.

10.7.4 Code SA 224 SPN 522004 FMI 02

Left-hand front track adjustment-in switch, data erratic, intermittent, or not correct.

Diagnosis and solution

Do the battery disconnect procedure.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Wait 60 seconds.
d) Turn the battery disconnect switch to the on position.
e) Turn the key start switch to the on position.
f) Check if the fault code is active.

Result

Expected result - the code is not active.

Results:

- Yes - the code is not active.

  Stop.
- No - the code is active.

  The chassis key pad is bad.

  Repair: Replace the chassis key pad.

  Stop.

10.7.5 Code SA 224 SPN 522005 FMI 02

Left-hand front track adjustment-out switch, data erratic, intermittent, or incorrect.

10.10.1.2 Hydraulic oil electrical circuits

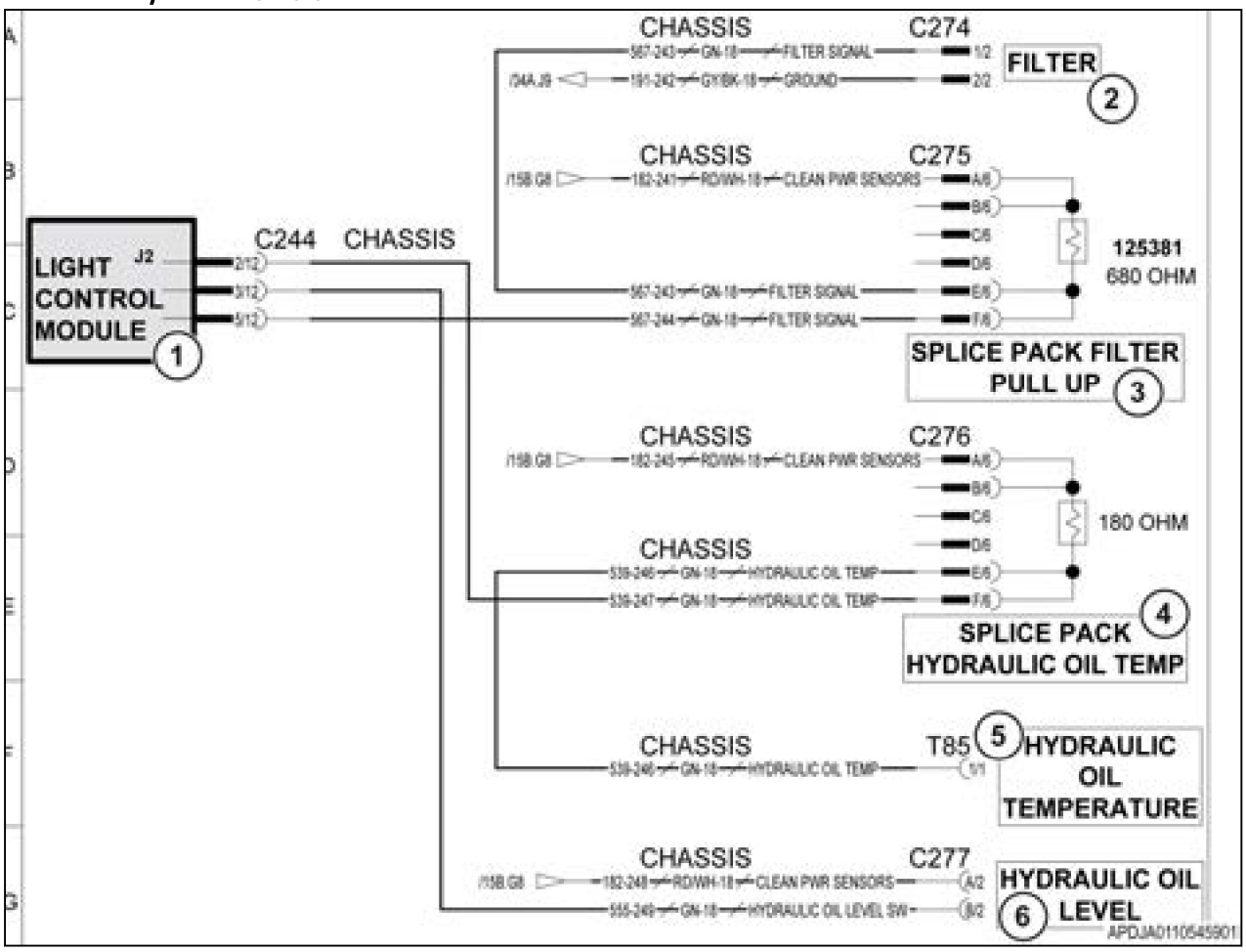


Fig. 338

Schematic legend		
Item	**Schematic term**	**Description**
1	LIGHT CONTROL MODULE	Lamp control module
2	FILTER	Filter
3	SPLICE PACK FILTER PULL UP	Splice pack filter pull up
4	SPLICE PACK HYDRAULIC OIL TEMP	Splice pack hydraulic oil temperature
5	HYDRAULIC OIL TEMPERATURE	Hydraulic oil temperature
6	HYDRAULIC OIL LEVEL	Hydraulic oil level
--	CHASSIS	Chassis
--	FILTER SIGNAL	Filter signal
--	GROUND	Ground
--	CLEAN PWR SENSORS	Clean power sensors
--	HYDRAULIC OIL LEVEL SW	Hydraulic oil level switch

10.10.2 Code SA 234 SPN 1713 FMI 31

Indicates a plugged hydraulic oil filter element. Replace the hydraulic oil filters and clear the code.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the lamp control module, the work lamp four spare and the work lamp four connectors.
e) Check the resistance from the work lamp four connector contact 1 to the frame ground.

Result

Expected result - the resistance is more than 5000 ohms.

Results:

- Yes - the resistance is more than 5000 ohms.

  see step 3, page 10-812
- No - the resistance is less than 5000 ohms.

  The harness is bad.

  Repair: Repair or replace contacts or harness.

  Stop.

3. Check if the diagnostic code remains.
a) Inspect and clean the wiring harness connector contacts.
b) Connect all the connectors.
c) Turn the battery disconnect switch to the on position.
d) Turn the key start switch to the on position.
e) Operate the machine at low idle.
f) Check if SPN 522112 FMI 06 is active.

Result

Expected results - the diagnostic code is not active.

Results:

- Yes - the diagnostic code is not active.

  Stop.
- No - the diagnostic code is active.

  Failure of the lamp control module is possible but not common. Exit the procedure and do the procedure again. If the diagnostic code remains active, replace the lamp control module.

10.10.15.1 Future option lamp electrical circuits

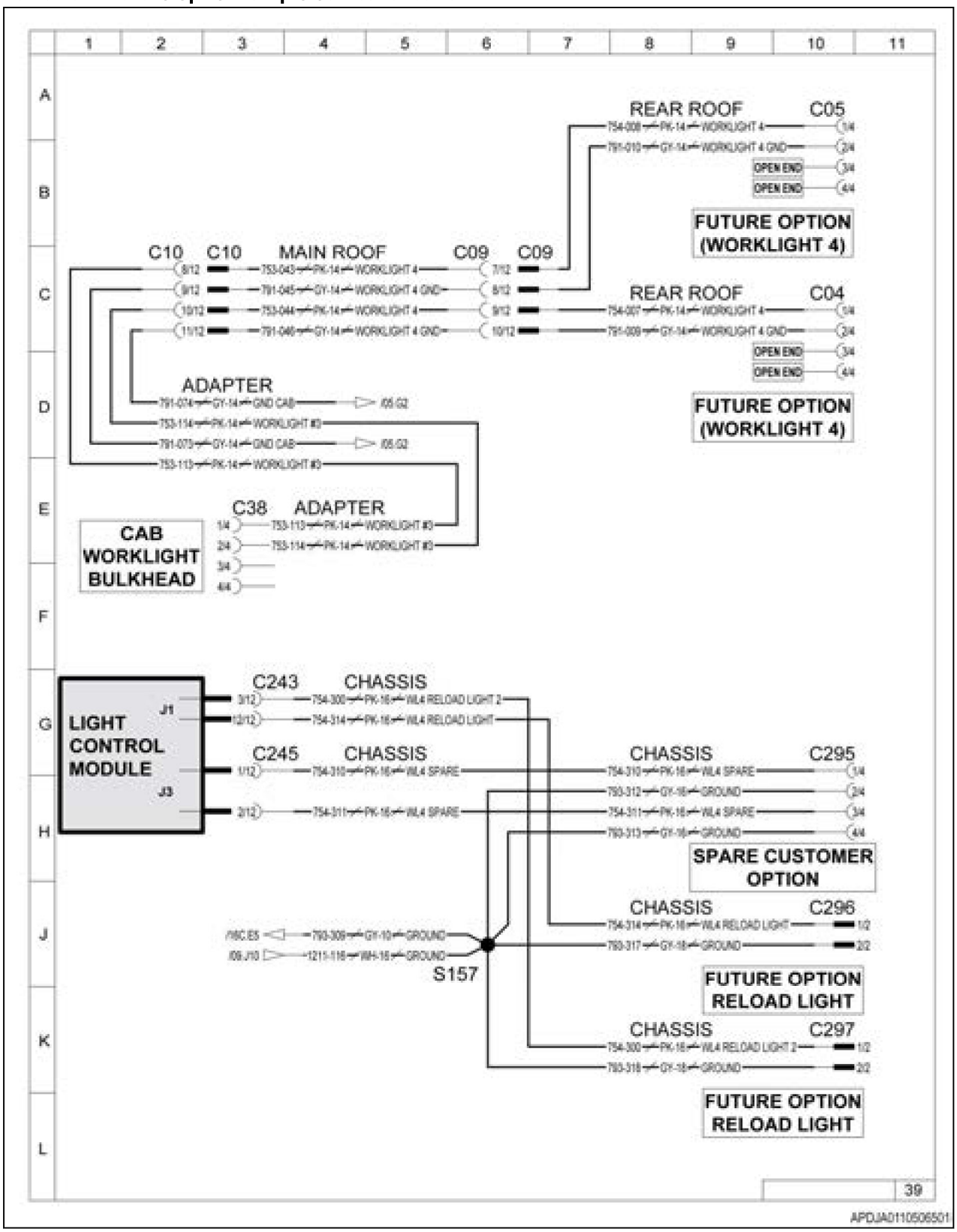


Fig. 356

f) Check if SPN 181 FMI 03 is active.

Result

Expected results - the diagnostic code is not active.

Results:

- Yes - the diagnostic code is not active.

  Stop.
- No - the diagnostic code is active.

  Failure of the lamp control module is possible but not common. Exit the procedure and do the procedure again. If the diagnostic code remains active, replace the lamp control module.

10.11.1.1 Drive pressure electrical circuits

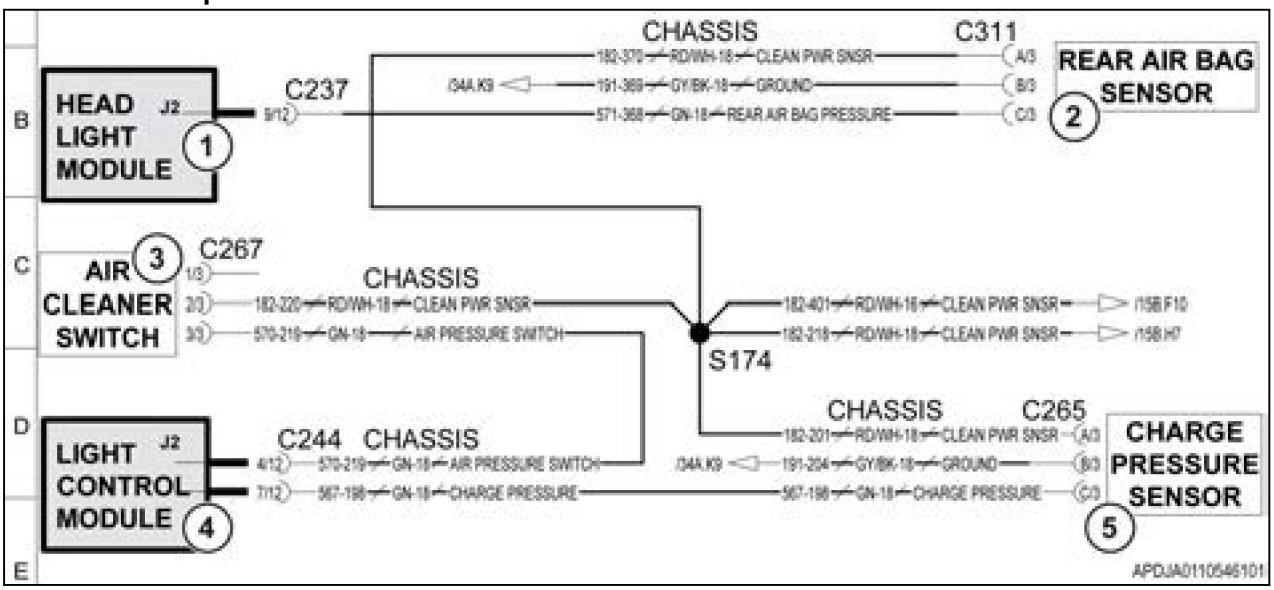


Fig. 365

Schematic legend		
Item	**Schematic term**	**Description**
1	HEAD LIGHT MODULE	Head lamp module
2	REAR AIR BAG SENSOR	Rear air bag sensor
3	AIR CLEANER SWITCH	Air cleaner switch
4	LIGHT CONTROL MODULE	Lamp control module
5	CHARGE PRESSURE SENSOR	Charge pressure sensor
--	CHASSIS	Chassis
--	CLEAN PWR SNSR	Clean power sensor
--	GROUND	Ground
--	REAR AIR BAG PRESSURE	Rear air bag pressure
--	AIR PRESSURE SWITCH	Air pressure switch
--	CHARGE PRESSURE	Charge pressure

10.11.2 Code SA 235 SPN 181 FMI 04

The air bag pressure sensor signal voltage below normal or short-circuit to ground or low source.

e) Check the right-hand low beam and the head lamp control module connector contacts.

Result

Expected result - the contacts are clean.

Results:

- Yes - the contacts are clean.

  see step 3, page 10-872
- No - the contacts are not clean.

  Repair: Repair or replace the contacts or the harness.

  Stop.

3. Check the ground circuit for open.

a) Turn the key start switch to the off position.
b) Turn the battery disconnect switch to the off position.
c) Remove the key from the battery disconnect switch.
d) Disconnect the head lamp module and the right-hand low beam connectors.
e) Check the resistance from contact B at the right-hand low beam to the frame ground.

Result

Expected result - the resistance is less than 5 ohms.

Results:

- Yes - the resistance is less than 5 ohms.

  see step 4, page 10-872
- No - the resistance is more than 5 ohms.

  Repair: Repair or replace the harness.

  Stop.

4. Check if the diagnostic code remains.

a) Inspect and clean the wiring harness connector contacts.
b) Connect all the connectors.
c) Turn the battery disconnect switch to the on position.
d) Turn the key start switch to the on position.
e) Operate the machine at low idle.
f) Check if SPN 2655 FMI 05 is active.

Result

Expected results - the diagnostic code is not active.

Results:

- Yes - the diagnostic code is not active.

  Stop.
- No - the diagnostic code is active.

  Failure of the lamp control module is possible but not common. Exit the procedure and do the procedure again. If the diagnostic code remains active, replace the lamp control module.

Result

Expected results - the diagnostic code is not active.

Results:

- Yes - the diagnostic code is not active.

  Stop.
- No - the diagnostic code is active.

  Failure of the lamp control module is possible but not common. Exit the procedure and do the procedure again. If the diagnostic code remains active, replace the lamp control module.

10.11.18.1 Work lamp 1 electrical circuits

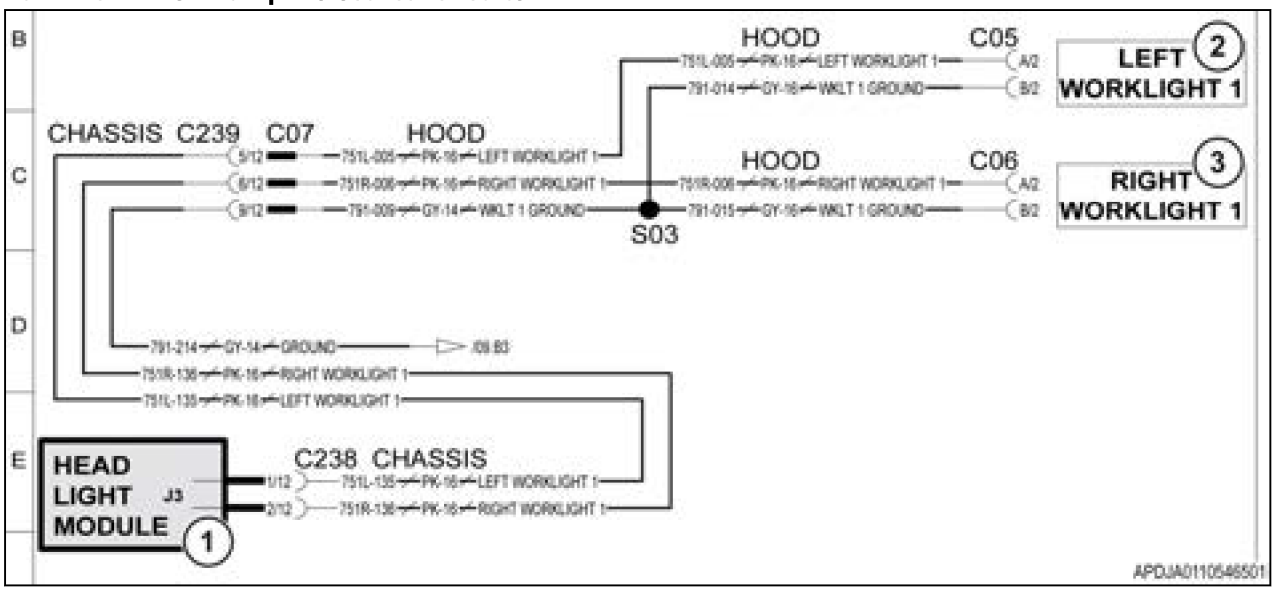


Fig. 381

Schematic legend		
Item	**Schematic term**	**Description**
1	HEAD LIGHT MODULE	Head lamp module
2	LEFT WORKLIGHT 1	Left-hand work lamp 1
3	RIGHT WORKLIGHT 1	Right-hand work lamp 1
--	ENGINE COVER	Engine cover
--	CHASSIS	Chassis
--	LEFT WORKLIGHT 1	Left-hand work lamp 1
--	RIGHT WORKLIGHT 1	Right-hand work lamp 1
--	WKLT 1 GROUND	Work lamp 1 ground
--	GROUND	Ground

10.11.19 Code SA 235 SPN 522106 FMI 06

Short-circuit to ground in the right-hand work lamp number one power circuit.

Diagnosis and solution

1. Check the work lamp one circuit for open.

a) Turn the key start switch to the off position.

b) Turn the battery disconnect switch to the off position.

- No - the diagnostic code is active.

  Failure of the head lamp module is possible but not common. Exit the procedure and do the procedure again. If the diagnostic code remains active, replace the head lamp module.

10.11.26.1 Track adjustment sensor locations

(1) The track adjustment sensors are located on the end of the hydraulic cylinders at the front and rear axles.

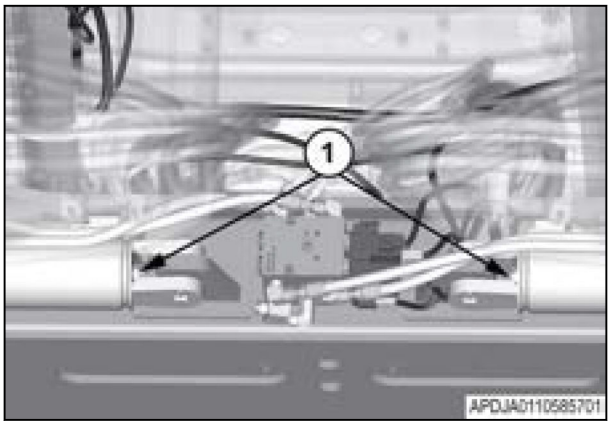


Fig. 391

d) Turn the key start switch to the on position.
e) Operate the machine at low idle.
f) Check if SPN 522123 FMI 04 is active.

Result

Expected results - the diagnostic code is not active.

Results:

- Yes - the diagnostic code is not active.

  Stop.
- No - the diagnostic code is active.

  Failure of the head lamp module is possible but not common. Exit the procedure and do the procedure again. If the diagnostic code remains active, replace the head lamp module.

10.11.31.1 Track adjustment sensor locations

(1) The track adjustment sensors are located on the end of the hydraulic cylinders at the front and rear axles.

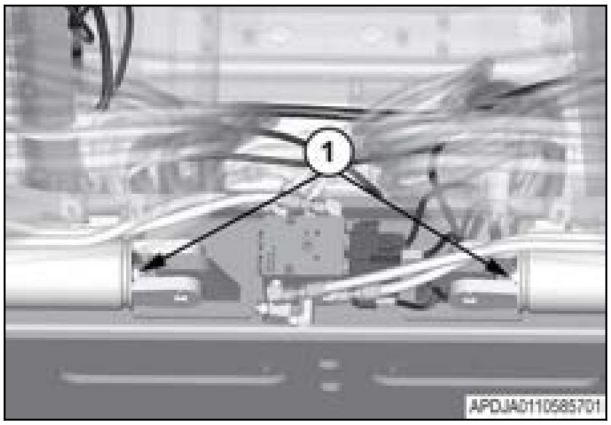


Fig. 401

Procedure

1. Fasten the two light modules (4) to the light module panel with the hardware (3). Fasten the light module panel (2) to the frame with the hardware (1).

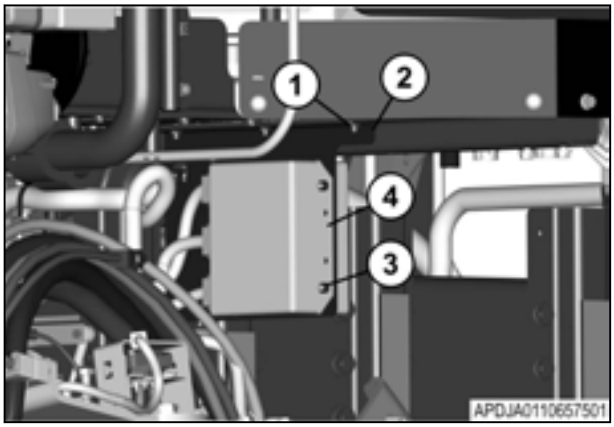


Fig. 411

2. Connect the six wire harnesses (1) to the rear of the two light modules (2).

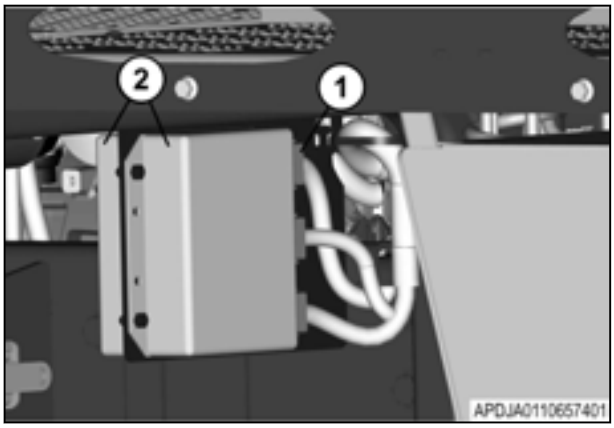


Fig. 412

10.14.3 Removing the horn

IMPORTANT:
Before removal, fasten identification tags on the components for correct installation at assembly.

Procedure

1. Park the machine on a solid, level surface. Stop the engine, apply the park brake, and take the key with you.
2. Turn the battery disconnect switch key (1) counterclockwise to disconnect the battery power.

   NOTE:
   The battery disconnect switch is shown in the off position.

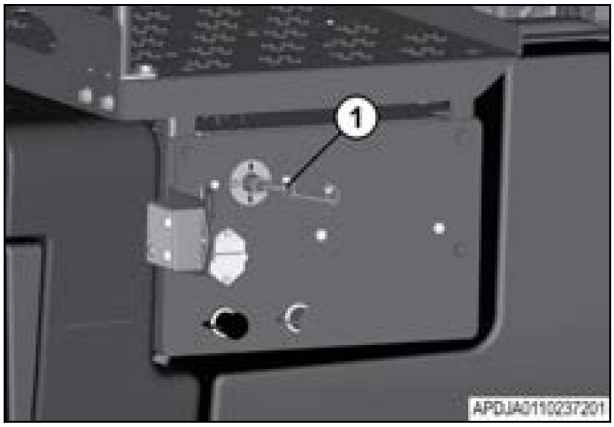


Fig. 413

4. Remove the lifting brackets from the rear (1) and the front (2) of the cab.

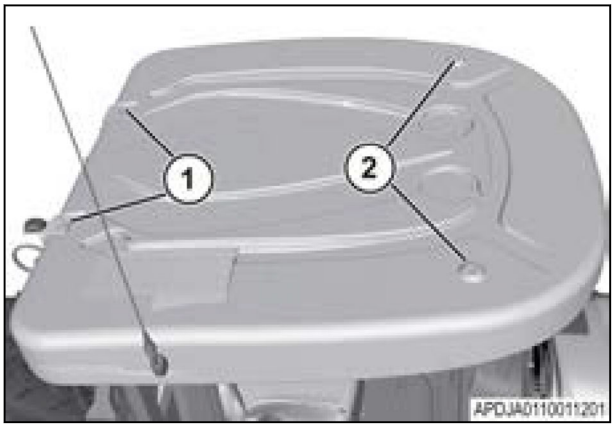


Fig. 15

5. Connect the electrical connectors (1) to the cab.

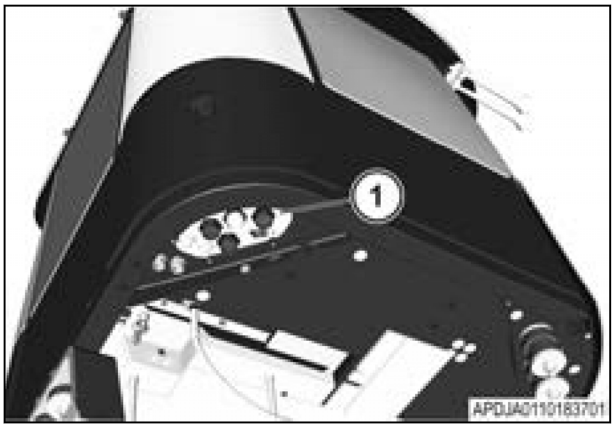


Fig. 16

6. Replace the cover and tighten the large black hand nut (1).

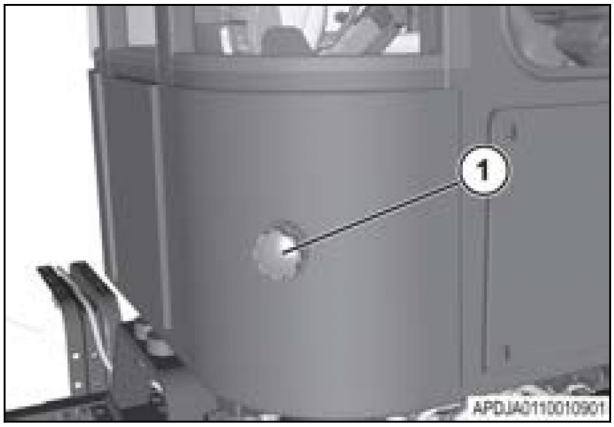


Fig. 17

7. Connect the coolant hoses (1) to the inlet and the outlet of the heater core.
8. Fill the engine coolant system.
9. Connect the air conditioning hoses (2) to the expansion valve.
10. Charge the HVAC system as described in the HVAC section.

CAUTION:
The Clean Air Act of 1992 requires all air conditioning repair to be performed by trained and certified personnel.

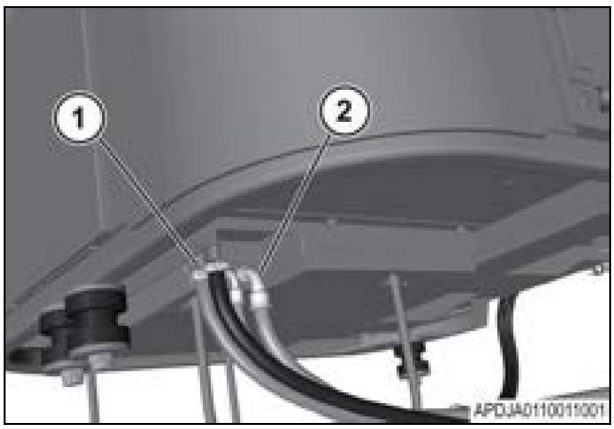


Fig. 18

4. Remove the bolt (1) on each side of the console.

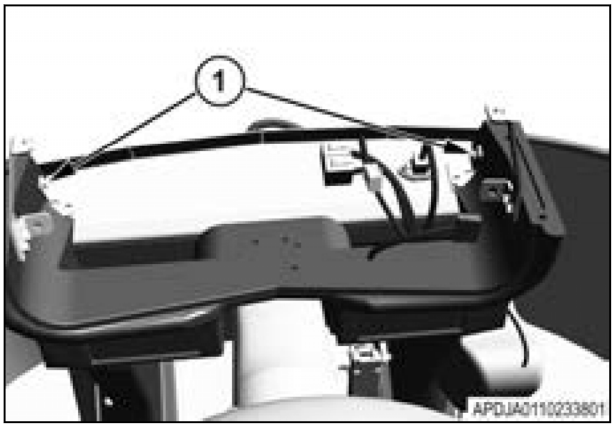


Fig. 69

5. Remove the bolts (1)on each side of the console.
6. Remove the front console.

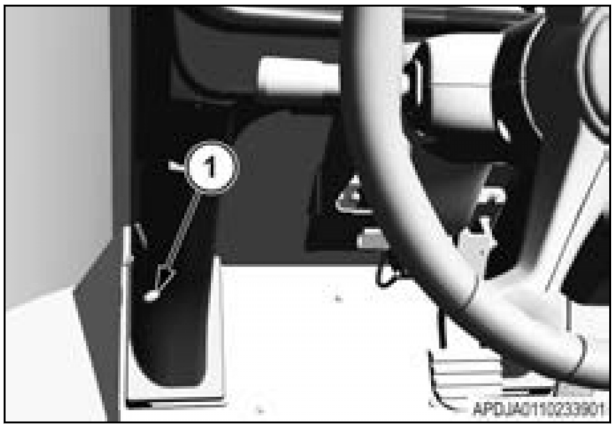


Fig. 70

7. Disconnect the electrical connection(2) from the steering column. Remove the four bolts (1) from the steering column.

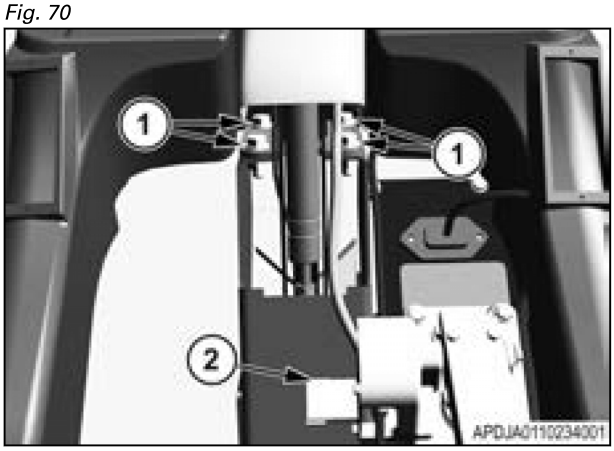


Fig. 71

12.1.6 Installing the air conditioning compressor

WARNING:
Personal injury can result from contact with refrigerant.
Contact with refrigerant can cause frostbite. Keep face and hands away to help prevent injury.
Protective goggles must be worn when refrigerant lines are opened, even if gauges indicate system is empty of refrigerant.
Use precaution when fitting is removed. If system is still under pressure, release fitting slowly in well ventilated area.
Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.
Inhaling air conditioner refrigerant gas through a lit cigarette, other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.
Use certified recovery and recycling cart to remove refrigerant from air conditioning system.

IMPORTANT:
Use only certified technicians with certified equipment to repair air conditioning systems.

IMPORTANT:
Certified technicians must evacuate and fill refrigerant, and remove and install air conditioning lines.

Discard all fluids according to local regulations and laws.

NOTE:
Any time the air conditioning system is opened, replace the air conditioning receiver-dryer. See information for air conditioning receiver-dryer replacement.

Procedure

1. Fasten the air conditioning compressor bracket (2) to the engine mounts with the hardware (1).

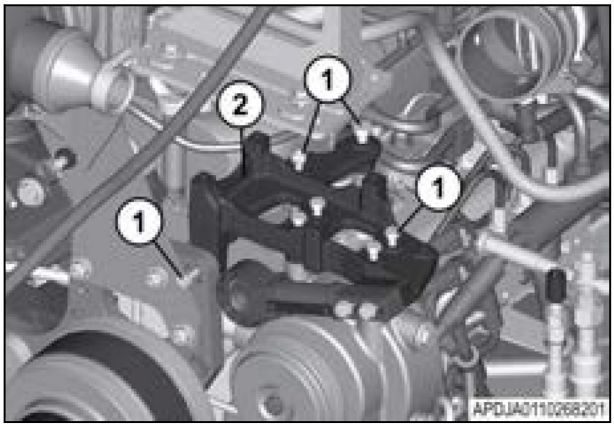


Fig. 41

12.5.13 Boiling temperature of water at converted pressures

Temperature C (F)	Inches of vacuum	Microns	kPa (psi)
100 degrees C (212 degrees F)	0 mm Hg (0.00 in Hg)	759968 microns	101.3 kPa (14.692 psi)
96.1 degrees C (205 degrees F)	125 mm Hg (4.921245 in Hg)	535000 microns	84.6 kPa (12.27019 psi)
90 degrees C (194 degrees F)	234.4 mm Hg (9.228319 in Hg)	525526 microns	70.1 kPa (10.16715 psi)
80 degrees C (176 degrees F)	404.9 mm Hg (15.9409 in Hg)	355092 microns	47.3 kPa (6.860285 psi)
70 degrees C (158 degrees F)	526.3 mm Hg (20.72041 in Hg)526.3	233680 microns	31.2 kPa (4.525177 psi)
60 degrees C (140 degrees F)	610.6 mm Hg (24.0393 in Hg)	149352 microns	19.9 kPa (2.886251 psi)
50 degrees C (122 degrees F)	667.5 mm Hg (26.27945 in Hg)	92456 microns	12.3 kPa (1.783964 psi)
40 degrees C (104 degrees F)	704.9 mm Hg (27.75188 in Hg)	55118 microns	7.3 kPa (1.058775 psi)
30 degrees C (86 degrees F)	728.2 mm Hg (28.6692 in Hg)	31750 microns	4.2 kPa (.6091585 psi)
26.7 degrees C (80 degrees F)	734.6 mm Hg (28.92117 in Hg)	25400 microns	3.4 kPa (.4931283 psi)
24.4 degrees C (76 degrees F)	737.1 mm Hg (29.0196 in Hg)	22860 microns	3.0 kPa (.4361132 psi)
22.2 degrees C (72 degrees F)	739.6 mm Hg (29.11802 in Hg)	20320 microns	2.7 kPa (.3916019 psi)
20.6 degrees C (69 degrees F)	742.2 mm Hg (29.22038 in Hg)	17780 microns	2.4 kPa (.3480906 psi)
17.8 degrees C (64 degrees F)	744.7 mm Hg (29.31881 in Hg)	15240 microns	2.0 kPa (.2900755 psi)
15 degrees C (59 degrees F)	747.3 mm Hg (29.42117 in Hg)	12700 microns	1.7 kPa (.2465642 psi)
11.7 degrees C (53 degrees F)	749.8 mm Hg (29.5196 in Hg)	10160 microns	1.4 kPa (.2030528 psi)
7.2 degrees C (45 degrees F)	752.3 mm Hg (29.61802 in Hg)	7620 microns	1.0 kPa (.1450377 psi)
0 degrees C (32 degrees F)	755.4 mm Hg (29.74007 in Hg)	4572 microns	.6 kPa (.08702264 psi)
-6.1 degrees C (21 degrees F)	757.4 mm Hg (29.81881 in Hg)	2540 microns	.3 kPa (.04351132 psi)
-14.4 degrees C (6 degrees F)	758.7 mm Hg (29.86999 in Hg)	1270 microns	.2 kPa (.02900755 psi)
-31.1 degrees C (-24 degrees F)	759.7 mm Hg (29.90936 in Hg)	254 microns	.03 kPa (.004351132 psi)

6. Remove the shock clips (1), and both shocks (2). Remove the hardware and both ball studs.

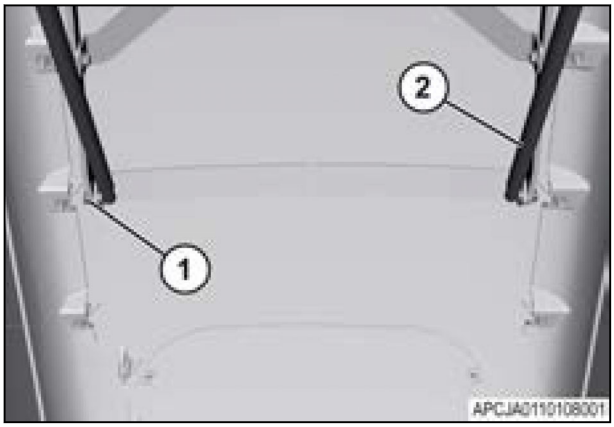


Fig. 16

7. Remove the hardware (1) and the three support brackets (2).

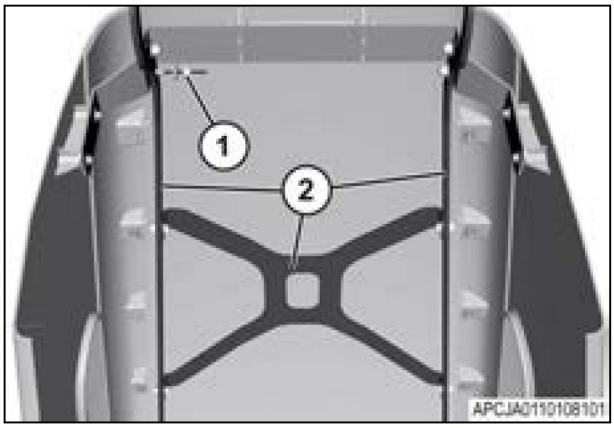


Fig. 17

8. Remove the hardware (1) and the mounting bracket (2).

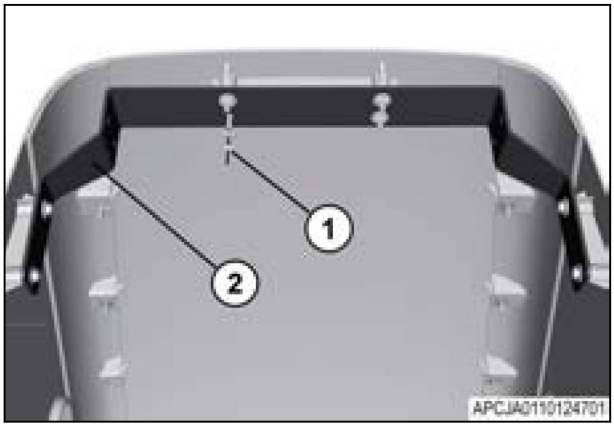


Fig. 18

10. Fasten the bottom step (2) to the bracket with the hardware (1).

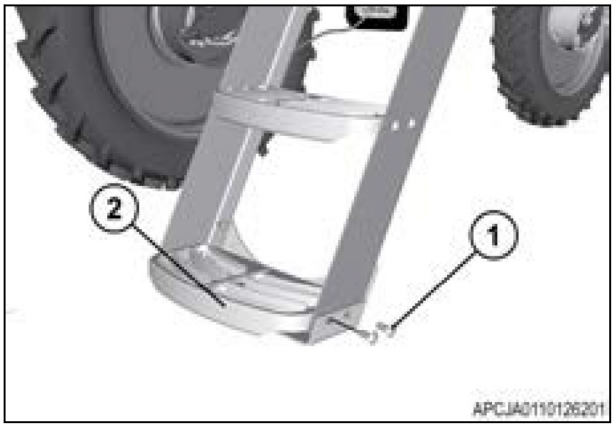


Fig. 78

11. Tighten the bolt (1) on the hydraulic cylinder (2).

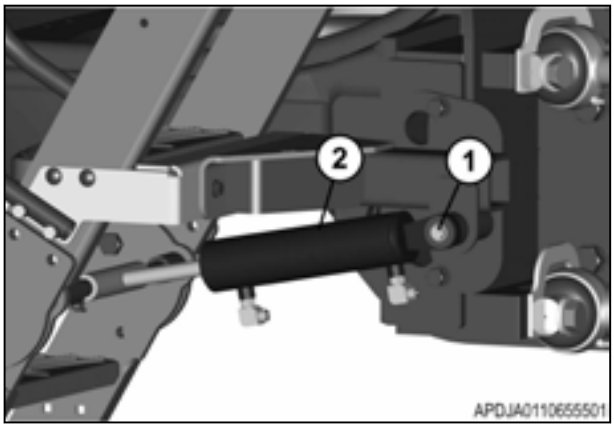


Fig. 79

12. Install the handrails (1).

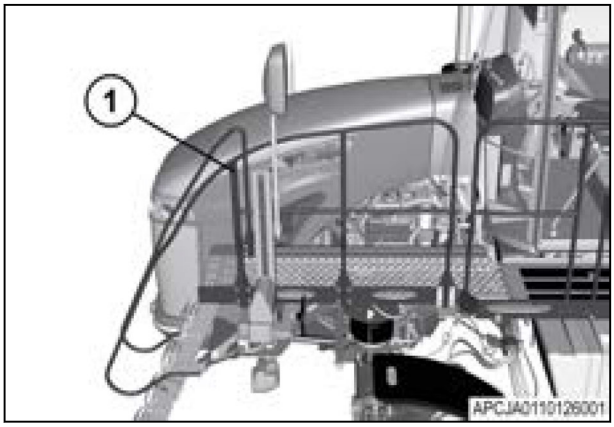


Fig. 80

17.2 Electrical schematics

17.2.1 Cab and chassis subsystem schematics

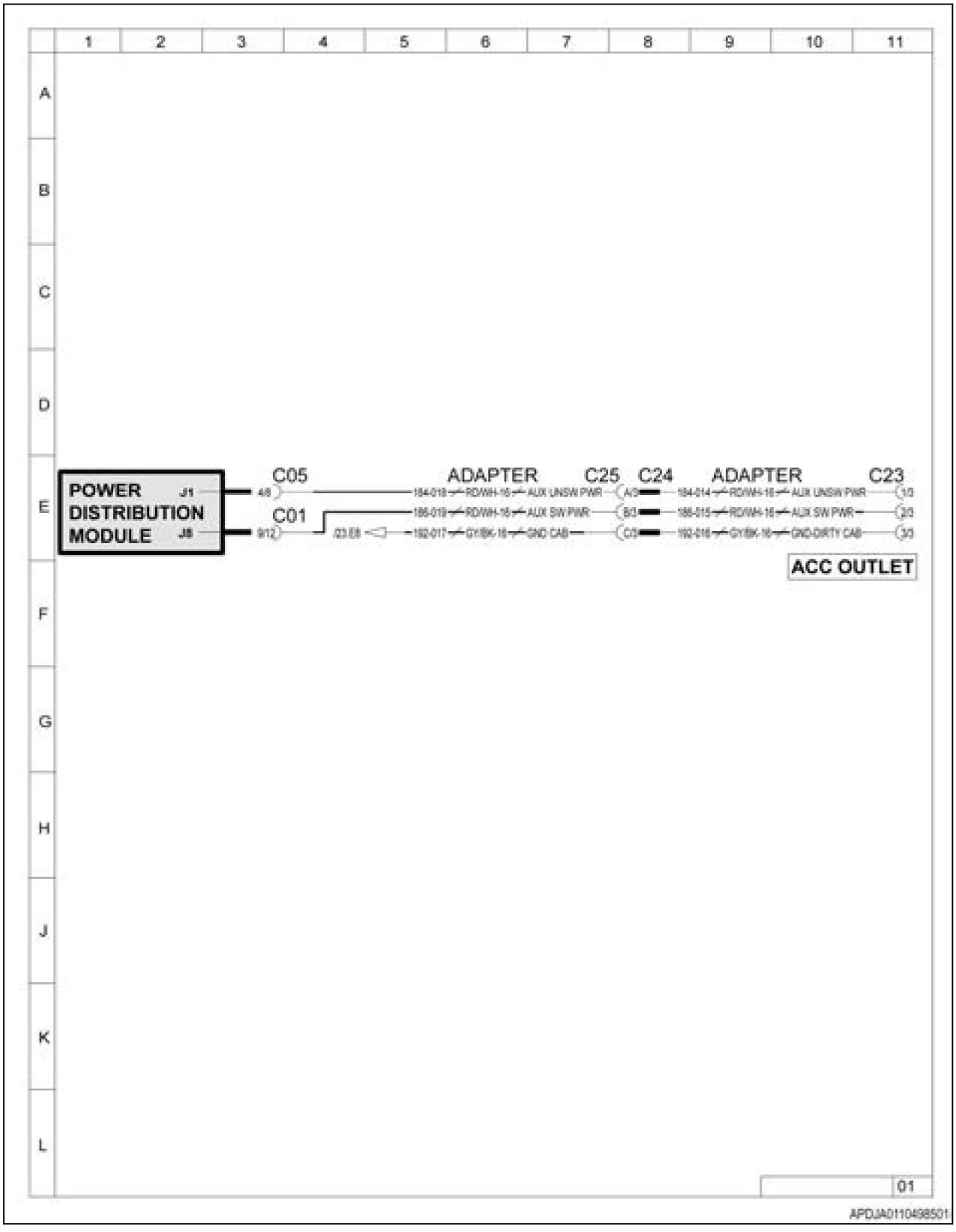


Fig. 8