

WIRING DIAGRAM

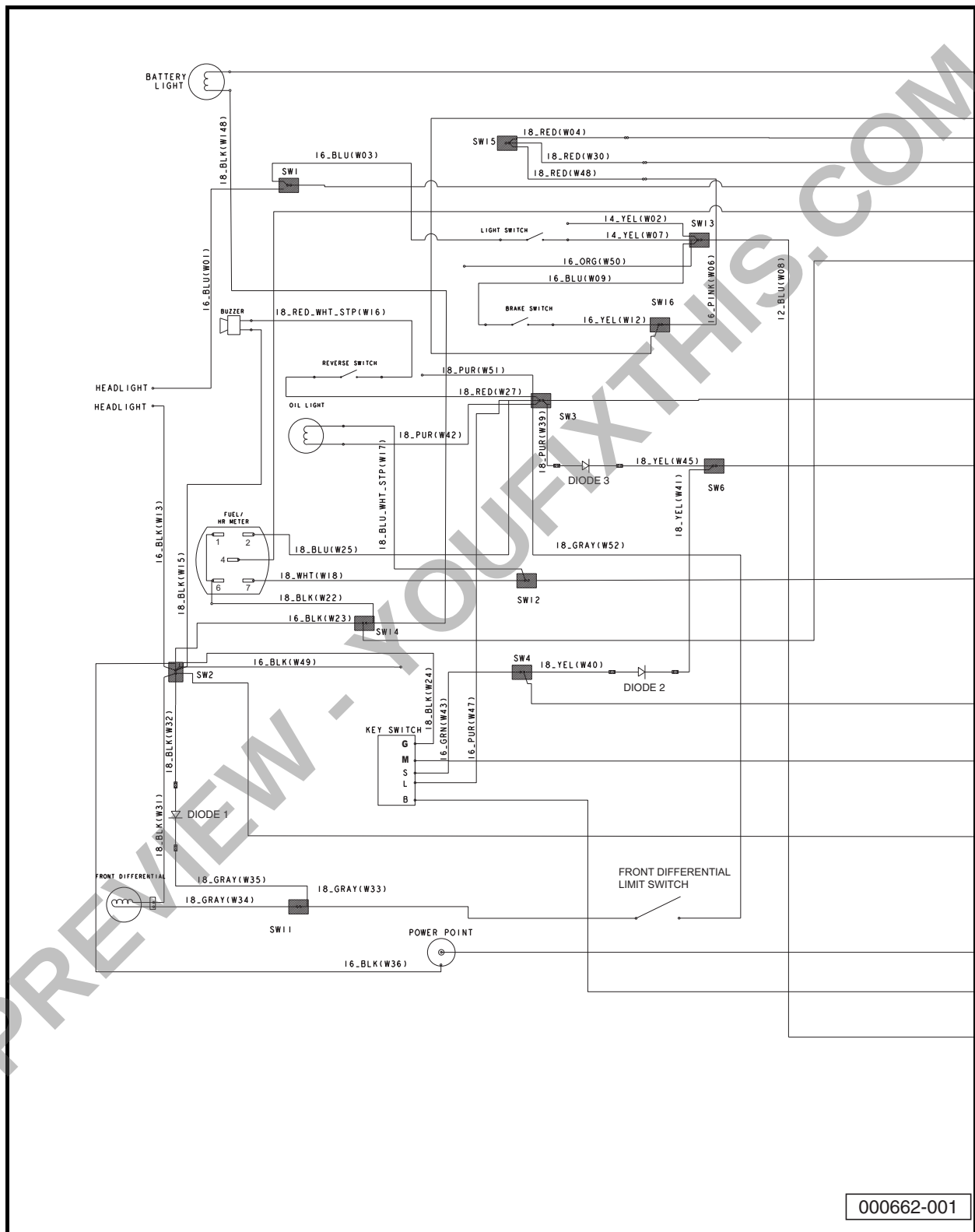


Figure 11a-1 Wiring Diagram – Gasoline Utility Vehicles (Front)

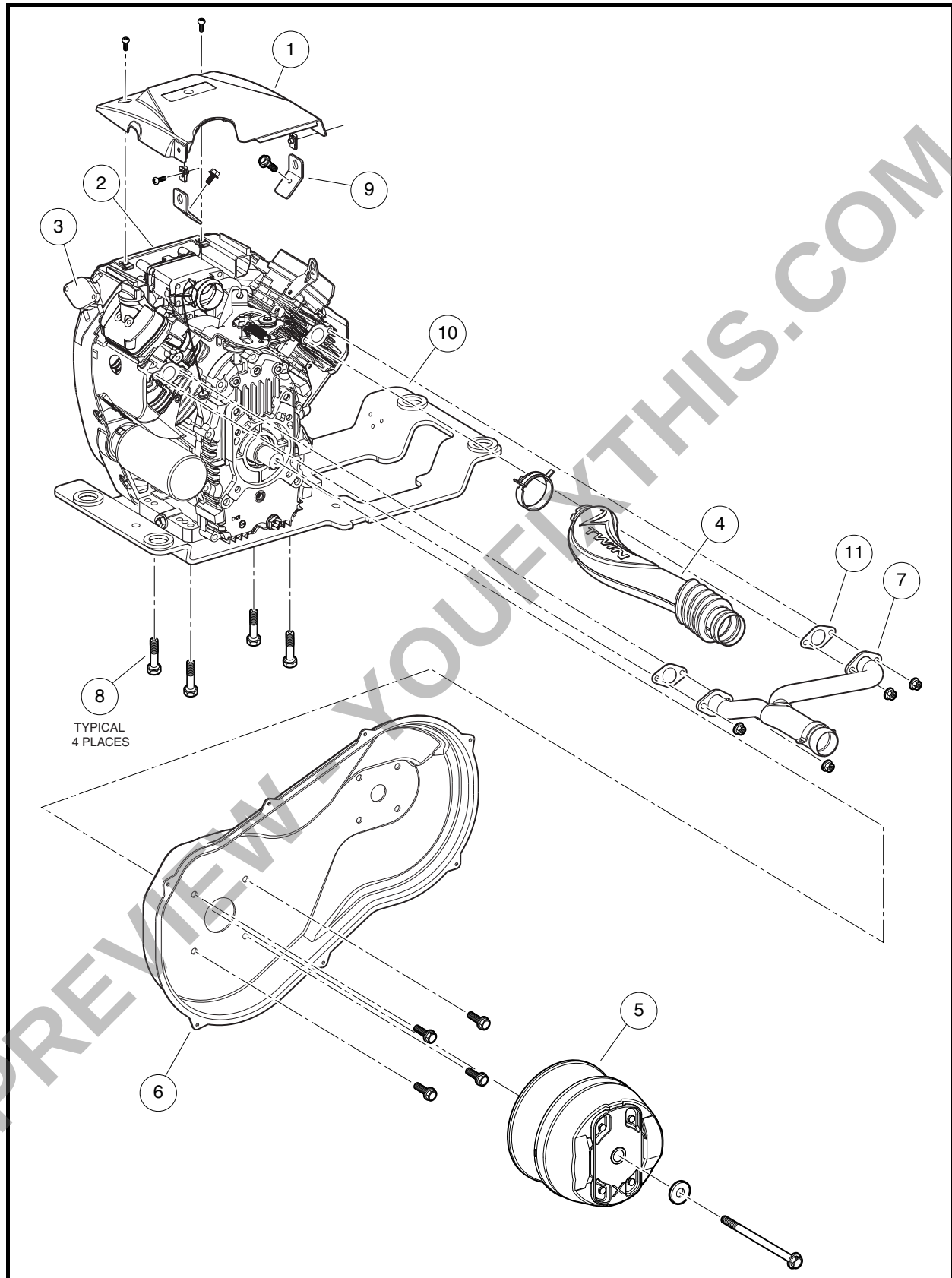


Figure 13a-1 Engine Removal and Installation Components

8. Remove the forward side supports (4).

ROPS INSTALLATION

NOTE: Follow steps 1 through 3 for 2-passenger vehicles and steps 1 through 8 for 4-passenger vehicles. ROPS installation will be easier with the aid of an assistant.

1. Position the side support tubes (4) to the seat support (7) and front cowl supports (8) and secure with hex-head bolts (5), and flanged lock nuts (6). Do not tighten hardware at this time. **See following NOTE.**

NOTE: Make sure the front cowl support bolt heads are oriented to outside of the ROPS and the seat support bolt heads are oriented to the inside of the ROPS.

It may be necessary to tap the side support tubes (4) with a rubber mallet in order for them to align properly with the front and rear support tubes.

2. Position the top structure (3) to the top of the side support tubes (4) and secure with hex-head bolts (1), and flanged lock nuts (2). Do not tighten hardware at this time. **See following NOTE.**

NOTE: Orient the top structure (3) so the grab handle is on the passenger side and the warning decal is visible to the driver.

3. Tighten all hardware to 33 ft-lb (45 N·m). **See following WARNING and NOTE.**

NOTE: If any ROPS joints remain loose, apply additional torque up to 40 ft-lb (54 N·m).

WARNING

- Exceeding the maximum torque value could result in damage to the ROPS tubing and stripped threads on the hardware.
- Ensure that the ROPS is properly installed before operating the vehicle.

4. Position the two rear support tubes (16) loosely to the rear seat support (17). Do not install hardware at this time.
5. Secure the rear support tubes (16) to the forward side support tubes (4) with tube brackets (20), using hex-head bolts (21) and flanged lock nuts (22). Do not tighten hardware at this time. **See following NOTE.**

NOTE: Make sure bolt heads are oriented to the inside of the ROPS.

6. Lower the two rear support tubes (16) fully into position on the rear seat support (17) and secure with hex-head bolts (18) and flanged lock nuts (19). Do not tighten hardware at this time. **See following NOTE.**

NOTE: It may be necessary to tap the side support tubes (4) with a rubber mallet in order for them to align properly with the front and rear support tubes.

7. Position the top brace (23) to the top of the rear side supports (16) and secure with hex-head bolts (24) and flanged lock nuts (25).
8. Tighten all hardware to 33 ft-lb (45 N·m). **See following WARNING and NOTE.**

NOTE: If any ROPS joints remain loose, apply additional torque up to 40 ft-lb (54 N·m).

SECTION 11A – TROUBLESHOOTING AND ELECTRICAL SYSTEM: GASOLINE VEHICLES

⚠ DANGER

- See General Warning, Section 1, Page 1-2.

⚠ WARNING

- See General Warning, Section 1, Page 1-2.

TROUBLESHOOTING GUIDE

The following troubleshooting guide will be helpful in identifying operating difficulties should they occur. The guide includes the symptom, probable cause(s) and suggested checks.

TROUBLESHOOTING GUIDE		
SYMPTOM	POSSIBLE CAUSES	REFER TO
Engine does not start easily.	Spark plug is partially fouled or in poor condition	Spark Plugs on page 10-11
	Spark plug wire is damaged or loose	See the Kawasaki FH680D engine manual (P/N CLC103351201).
	Intermittent ignition coil failure	See the Kawasaki FH680D engine manual (P/N CLC103351201).
	Low cylinder compression	See the Kawasaki FH680D engine manual (P/N CLC103351201).
	Water or dirt in the fuel system and/or carburetor; dirty or clogged fuel filter	Fuel System on page 13a-9
	Carburetor improperly adjusted	See the Kawasaki FH680D engine manual (P/N CLC103351201).
	Starter failure	See the Kawasaki FH680D engine manual (P/N CLC103351201).
	Carburetor solenoid failure	Test Procedure 22 – Carburetor Solenoid Circuit on page 11a-29
	Diode 3 failed open	Test Procedure 9C – Diode 3 on wire 45 and 39 on page 11a-21
	Diode 5 failed open	Test Procedure 9E – Diode 5 on wire 131 and 129 on page 11a-22
Troubleshooting Guide continued on next page...		

SECTION 2 – VEHICLE SPECIFICATIONS

SPECIFICATIONS	Two Passenger	Two Passenger	Four Passenger	Four Passenger
POWER SOURCE	Gasoline	Diesel	Gasoline	Diesel
Engine: (Kawasaki) 4-cycle OHV, 675 cc, 23.0 maximum HP @3600 rpm (per SAE J 1940/1349), twin-cylinder, air-cooled, with pressure lubrication system	.		.	
Engine: 4-cycle OHV, 719 cc, 20.0 maximum HP @3600 rpm (per SAE J 1940/1349), three-cylinder, liquid-cooled, with pressure lubrication system		.		.
Fuel system: Side-draft carburetor with float bowl, fixed jets, fuel filters, and impulse fuel pump	.		.	
Fuel system: Mechanical injection, fuel water separator, fuel filters, and electric or mechanical fuel pump		.		.
Governor (Kawasaki engine): internal to engine, centrifugal ball	.		.	
Governor: internal to engine, mechanical, centrifugal ball		.		.
Ignition: Transistorized magneto	.		.	
Ignition: Compression		.		.
Transmission: Forward and reverse with neutral (5.39:1 forward, 7.79:1 reverse)	.	.	.	.
Electrical system: 12 volt, 500 cca at 0 °F (-17.8 °C), 650 at 32 °F (0 °C). 105-minute reserve capacity and 35-amp charging capacity	.	.	.	.
Torque converter: Automatic, variable-speed, dry type	.	.	.	.
STEERING/SUSPENSION/BRAKES				
Suspension: Front: Independent double A-arms with coil-over shock absorbers Rear: Swing arms with coil-over shock absorbers	.	.	.	.
Steering: Self-adjusting rack and pinion, Ackerman	.	.	.	.
Brakes: Hydraulic brake system – brake pads and discs on each wheel with separate foot-operated park brake	.	.	.	.
BODY/CHASSIS				
Frame/Chassis: Box tube aluminum	.	.	.	.
Side and rear body: Plastic	.	.	.	.
Cargo bed: Powder-coated steel or aluminum	.	.	.	.
Front body: Geloy XTWM206	.	.	.	.
Tires: All Terrain: 25 x 10.5 – 12 front and rear; tubeless, 4-ply rated load range Mud: 25 x 11 – 12 front and rear; tubeless, 4-ply rated load range	.	.	.	.
DIMENSIONS/WEIGHT				
NOTE: Items marked with an asterisk (*) indicate approximate values.				
*Overall length (box bed configuration, without brushguard):	122 in. (309.9 cm)		154 in. (391.2 cm)	
Overall width: without mirror with mirror	58.5 in. (148.5 cm) 63.6 in. (161.5 cm)			
*Overall height (with ROPS): with mud tires with all-terrain tires	82.3 in. (209 cm)		80.3 in. (203.8 cm)	
Specifications continued on next page...				

SECTION 10 – PERIODIC MAINTENANCE

⚠ DANGER

- See General Warning, Section 1, Page 1-2.

⚠ WARNING

- See General Warning, Section 1, Page 1-2.

PERIODIC SERVICE SCHEDULE

See General Warning, Section 1, Page 1-2.

⚠ WARNING

- Service, repairs, and adjustments must be made per instructions in this maintenance and service manual.

NOTE: *If the vehicle is constantly subjected to heavy use or severe operating conditions, the preventive maintenance procedures should be performed more often than recommended in the Periodic Service and Lubrication Schedule.*

Both the Periodic Service Schedule and the Periodic Lubrication Schedule must be followed to keep the vehicle in optimum operating condition.

TEST PROCEDURES

INDEX OF TEST PROCEDURES

1. Battery
2. Fuse
3. Ground Cables
5. Key Switch (Starter Circuit)
6. Starter Control Circuit
7. Start Relay
8. Carburetor Heater Relay
9. Wire Harness Diodes
10. Neutral Switch (Transmission)
11. Wire Continuity
12. Front Differential Limit Switch
13. Front Drive Gearcase Coil
14. Charge Coil
15. Voltage Regulator
16. Ignition Spark
17. Engine Kill Wire
18. Grounded Kill Wire
19. Key Switch (Engine Kill Circuit)
20. Reverse Warning Buzzer Limit Switch (If Equipped)
21. Reverse Warning Buzzer (If Equipped)
22. Carburetor Solenoid Circuit
23. Low Oil Warning Light Circuit
24. 12-Volt Accessory Receptacle
25. Fuel Level Sending Unit
26. Fuel Gauge
27. Hour Meter
28. Light Switch
29. Voltage at Headlight Socket
30. Bed Lift Motor
31. Bed Lift Switch
32. Bed Lift Circuit Breaker

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bed lift switch (gasoline vehicles)

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⚠ WARNING

- Read Section 1 – Safety before attempting any service on this vehicle.
- Before servicing vehicle, read complete section(s) and any referenced information that may be relevant to the service or repair to be performed.

NOTE: *This manual represents the most current information at the time of publication. The manufacturer is continually working to further improve its vehicles and other products. These improvements may affect servicing procedures. Any modification and/or significant change in specifications or procedures will be forwarded to all dealers and will, when applicable, appear in future editions of this manual.*

Damage to a vehicle or component thereof not resulting from a defect or that occurs due to unreasonable or unintended use, overloading, abuse, or neglect (including failure to provide reasonable or necessary maintenance as instructed in the vehicle owner's manual), accident or alteration, including increasing vehicle speed beyond factory specifications or modifications that affect the stability of the vehicle or the operation thereof, will void the warranty.

The manufacturer reserves the right to change specifications and designs at any time without notice and without incurring any obligation or liability whatsoever.

There are no warranties expressed or implied in this manual. See the limited warranty found in the vehicle owner's manual or write to CNH America LLC; 700 State Street; Racine, WI 53402 USA, Attention: Warranty Department.

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CAUTION

- Use wood blocks between the rack and the jaws of the vise to protect the rack from damage.

13.2. Tap the flange out of the notch in the rack (**Figure 7-15, Page 7-7**).

13.3. Remove the ball joint from the rack.

14. Remove the rack (2) from the housing (1) (**Figure 7-16, Page 7-8**).

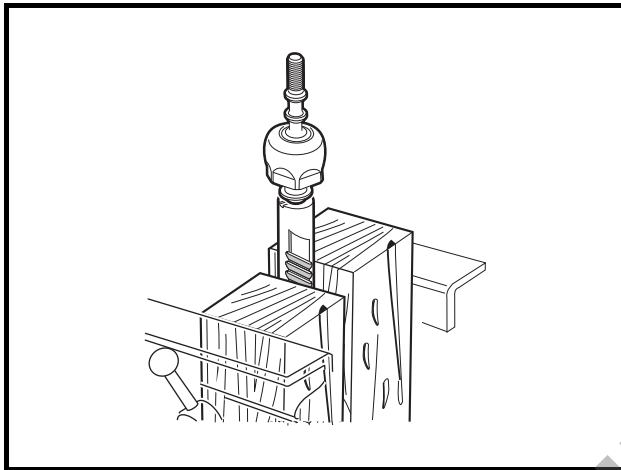


Figure 7-14 Secure Racks

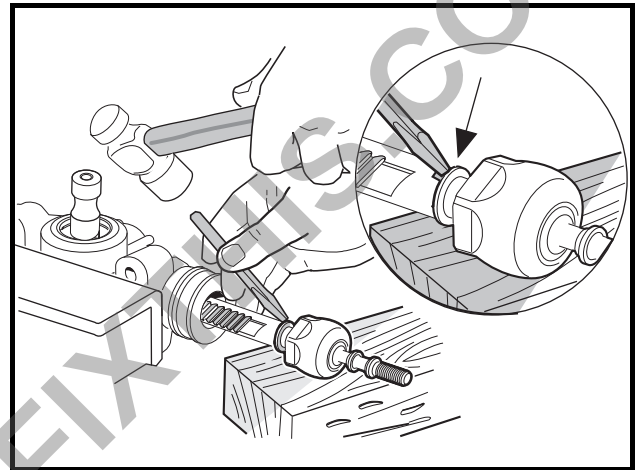


Figure 7-15 Remove Inner Ball Joints

TEST PROCEDURE 1 – BATTERY

See General Warning, Section 1, Page 1-2.

⚠ DANGER

- Due to the danger of an exploding battery, wear a full face shield and rubber gloves when working around a battery.
- Battery – Explosive gases! Do not smoke. Keep sparks and flames away from the vehicle and service area. Ventilate when charging or using in an enclosed space. Wear a full face shield and rubber gloves when working on or near batteries. For added protection, cover top of the battery when servicing the vehicle.
- Battery – Poison! Contains acid! Causes severe burns! Avoid contact with skin, eyes, or clothing.
 - External: Flush with water. Call a physician immediately.
 - Internal: Drink large quantities of milk or water. Follow with milk of magnesia or vegetable oil. Call a physician immediately.
 - Eyes: Flush with water for 15 minutes. Call a physician immediately.

NOTE: The battery must be properly maintained and fully charged in order to perform the following test procedures. Battery maintenance procedures, including watering information and allowable mineral content, can be found in Section 12b of this manual. See **Battery, Section 12b, Page 12b-20**.

Test Procedure 1A – Hydrometer Test

A hydrometer (P/N CLC1011478) measures the specific gravity of battery electrolyte. The higher the specific gravity, the higher the state of charge of the battery. A fully charged battery should read between 1.250 and 1.280 at 80 °F (27 °C). Never add acid to the battery to obtain a higher specific gravity (**Figure 11b-3, Page 11b-10**). See following **CAUTION**.

CAUTION

- Do not allow battery acid from battery caps or hydrometer to drip onto the vehicle body. Battery acid will cause permanent damage. Wash off immediately.
1. Turn the key switch OFF and remove the key. Place the Forward/Reverse handle in NEUTRAL. Chock the wheels.
 2. Check for loose or corroded battery terminal connections. Clean, tighten and replace connections as necessary.
 3. Be sure that the battery has sufficient water to cover the plates by approximately 1/2-inch (13 mm) and is fully charged before the test. If water must be added, recharge the battery before performing the hydrometer test (**Figure 11b-4, Page 11b-10**).
 4. Remove the vent cap.
 5. Use a battery thermometer (P/N CLC1011767), to record the electrolyte temperature of a center cell.
 6. Squeeze the rubber bulb of the hydrometer and insert it into the cell. Slowly release the bulb, drawing electrolyte up into the glass tube of the hydrometer.
 7. Ensure the float rises off the bottom. Adjust the electrolyte level so that the float rides free of the bottom but does not strike the bottom of the rubber bulb. Remove the hydrometer from the cell and release pressure from the bulb.

4. Connect the battery cables, positive (+) cable first, and tighten the terminals to 80 in-lb (9 N·m). Coat terminals with Battery Terminal Protector Spray (P/N CLC1014305).

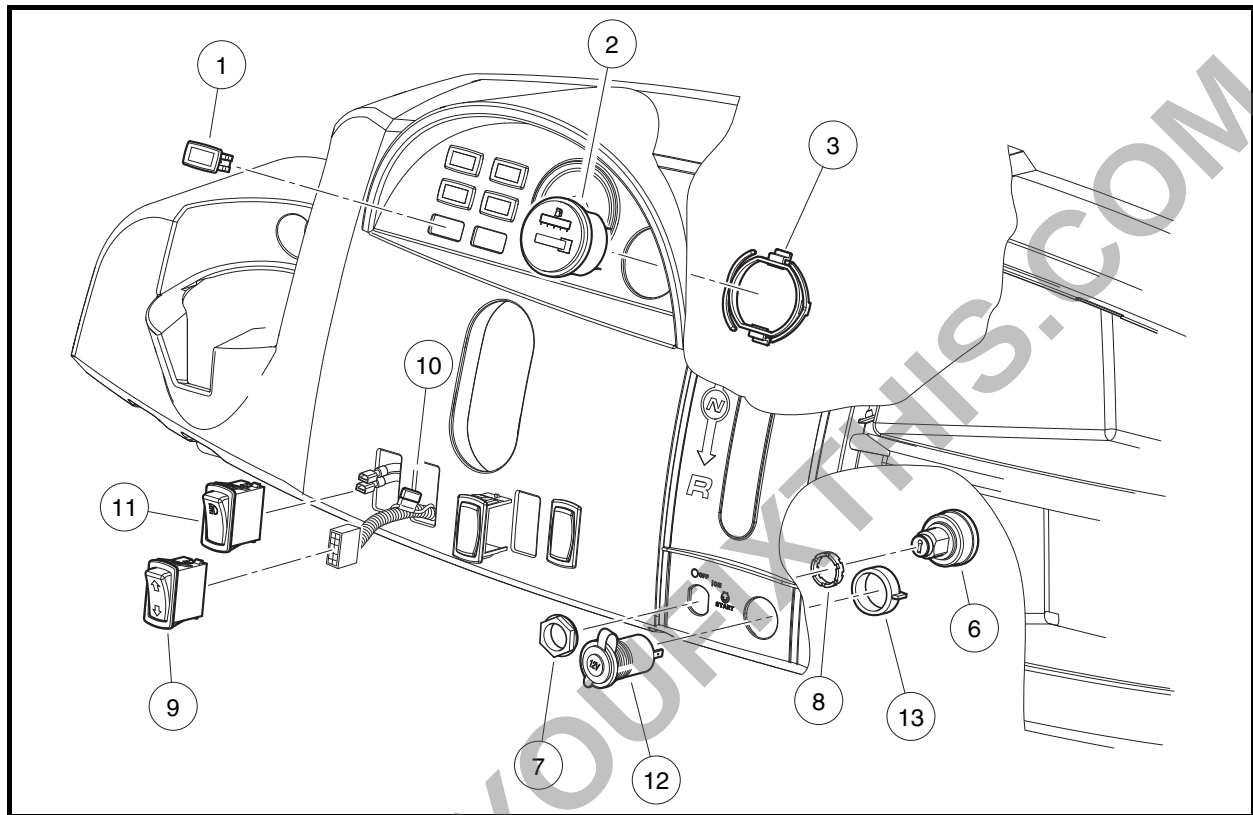


Figure 12a-6 Instrument Panel Electrical Components

FUEL GAUGE/HOUR METER

See General Warning, Section 1, Page 1-2.

Testing the Fuel Gauge/Hour Meter

See Test Procedure 26, Section 11a, Page 11a-33. Also see Test Procedure 27 – Hour Meter on page 11a-34.

With the key switch in the OFF position, the fuel gauge field is blank; however, the hour meter field is always ON. When the key switch is turned to ON, the fuel gauge field activates. The fuel gauge initially registers full before indicating the actual fuel level.

The hour meter displays the number of hours of use in increments of 0.1 (one tenth) hour, but does not record additional time unless the key switch is in the ON position and the engine is on. When recording, the hour-glass icon blinks.

Fuel Gauge/Hour Meter Removal

1. Turn the key switch OFF and remove the key. Place the Forward/Reverse handle in NEUTRAL. Chock the wheels.
2. Disconnect the battery cables as instructed. See **WARNING “To avoid unintentionally starting...”** in General Warning, Section 1, Page 1-3.

⚠ DANGER

- **Gasoline! Flammable! Explosive! Do not smoke. Keep sparks and flames away from the vehicle and service area.**

19. Open the fuel valve on the fuel tank.
20. Install the engine top cover (1) and tighten the four bolts to 35 in-lb (4 N·m).
21. Install the seat frame and lower rear ROPS (Roll Over Protection Structure) bars. **See Seat Support Installation, Section 4, Page 4-10 and ROPS Installation, Section 4, Page 4-8.**
22. Install the upper ROPS frame. **See ROPS Installation, Section 4, Page 4-8.**
23. Install the cargo bed. **See Cargo Bed Installation, Section 4, Page 4-12.**
24. Add engine oil. **See Engine Oil and Filter Change, Section 10, Page 10-7.**
25. Check the engine oil level. **See Engine Oil Level Check, Section 10, Page 10-7.**
26. Connect the battery cables, positive (+) cable first, and tighten the hardware to 80 in-lb (9 N·m). Coat terminals with Battery Terminal Protector Spray (P/N CLC1014305).
27. Adjust the engine RPM setting. **See Engine RPM Adjustment on page 13a-25.**
28. Install the center seat plate (bucket seat vehicles only).
29. Install seat(s).
30. Test-drive the vehicle to ensure all systems are functional and adjusted correctly.

OIL FILTER HOSES**Oil Filter Hose Removal**

1. Drain the engine oil. **See Engine Oil Draining, Section 10, Page 10-8.**
2. Place a pan under the oil filter hose connections on the engine. **See following NOTE.**

NOTE: It's best to disconnect the engine hoses first when removing to allow oil to drain from hoses and engine hose ports.

3. Loosen the clamps on the oil hoses at the engine ports and slide them from the engine port nozzles.
4. Loosen the clamps on the oil hoses at the filter ports and slide them from the filter port nozzles.

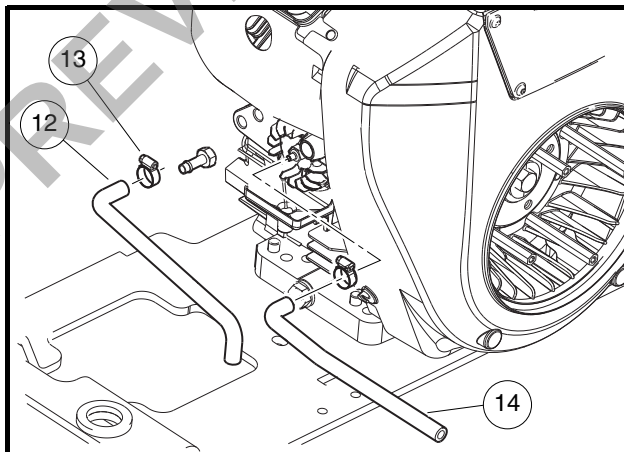


Figure 13a-3 Oil Filter Hose Routing

NOTE: Shift the end of the muffler inlet and intermediate pipe from side to side to relax and disconnect the springs.

3. Remove the springs from the intermediate pipe and manifold pipe and remove the pipe.

MANIFOLD PIPE REMOVAL

1. Remove the three bolts and flange-head locknuts (**Figure 13b-6, Page 13b-6**).
2. Separate the manifold pipe from the engine exhaust manifold.

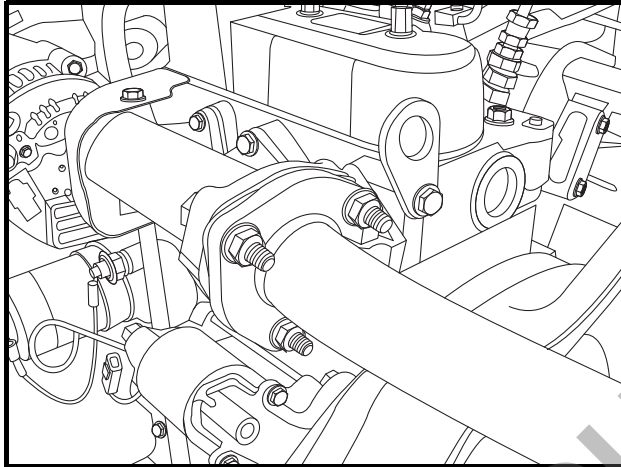


Figure 13b-6 Diesel Manifold Pipe Flange

MANIFOLD PIPE INSTALLATION

1. Clean both the exhaust manifold and the manifold pipe flanges with a scraper or wire brush.
2. Use a new high-temperature flange gasket (P/N CLC102422301) and align the manifold pipe so the bend directs the pipe in and slightly down.
3. Install new bolts and flange-head locknuts. Tighten the hardware to 21 ft-lb (28.5 N·m) (**Figure 13b-6, Page 13b-6**).

INTERMEDIATE PIPE INSTALLATION

1. Secure the intermediate pipe to the manifold pipe with new springs. **See following WARNING and NOTE.**

⚠ WARNING

- Always wear eye protection when springs are removed or installed.

NOTE: Shift the end of the muffler inlet and intermediate pipe from side to side to relax and connect the springs.

2. Secure the intermediate pipe to the muffler inlet with new springs. **See previous NOTE and WARNING.**
3. Align the muffler with the intermediate pipe and tighten the muffler spring suspension bracket bolts to 21 ft-lb (29 N·m).

7. Remove the driven clutch. **See Driven Clutch Removal on page 13a-37 (gasoline vehicles) or Driven Clutch Removal on page 13b-32 (diesel vehicles).**
8. Remove the rear driveshaft. **See Rear Driveshaft Removal on page 14-11.**
9. Remove the clutch inner cover. **See Clutch Inner Cover Removal on page 13a-40 (gasoline vehicles) or Clutch Inner Cover Removal on page 13b-35 (diesel vehicles).**
10. Remove the passenger seat.
11. Remove the transmission Forward/Reverse shifter cable ball socket from the ball stud on the transmission shifter arm (**Figure 14-23, Page 14-17**).
12. Disconnect the neutral sensing connector from the transmission (**Figure 14-18, Page 14-13**).

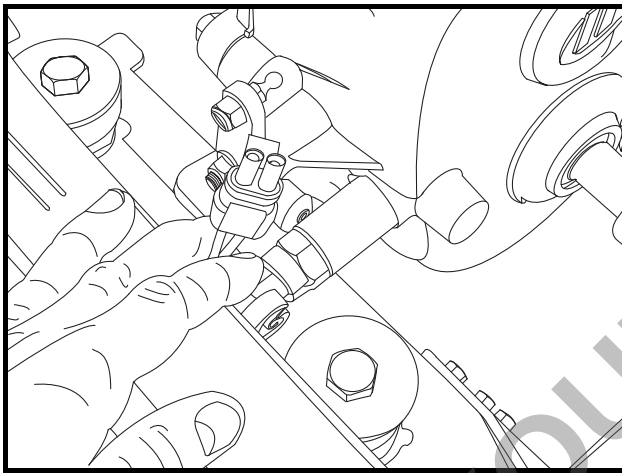


Figure 14-18 Neutral Sensing Connector

13. Remove the two flange-head bolts, washers, and locknuts from the transmission slotted base brackets and engine mounting plate. **See following NOTE.**

NOTE: If the transmission is replaced, remove the base brackets and corresponding hardware. Use new hardware and the existing base brackets to install the new transmission. Tighten the base bracket hardware to 39 ft-lb (53 N·m).

If the transmission is not replaced, leave the base brackets attached to help stabilize the transmission during repair.

14. Lift the transmission body slightly to clear the opening in the engine mounting plate and remove the transmission from the rear of the vehicle sliding the splined shaft out of the front driveshaft.

CAUTION

- Be careful when passing the input and rear output shafts through the shaft seals to not damage or dislodge the seals from the case.

12. Install the neutral limit switch and detent barrel assembly and tighten to 21 ft-lb (28 N·m) (**Figure 16-88, Page 16-26**).

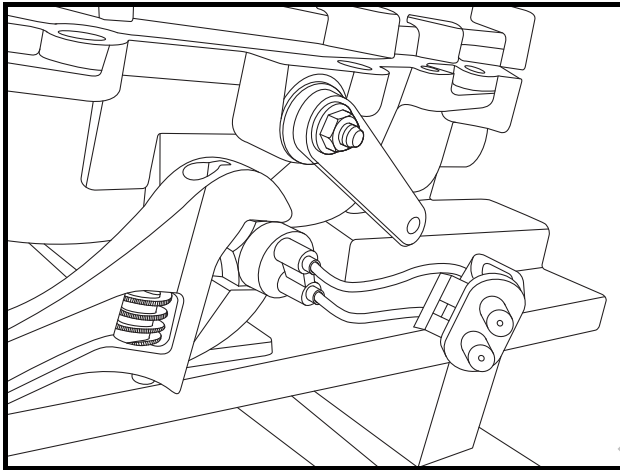


Figure 16-88 Neutral Limit Switch

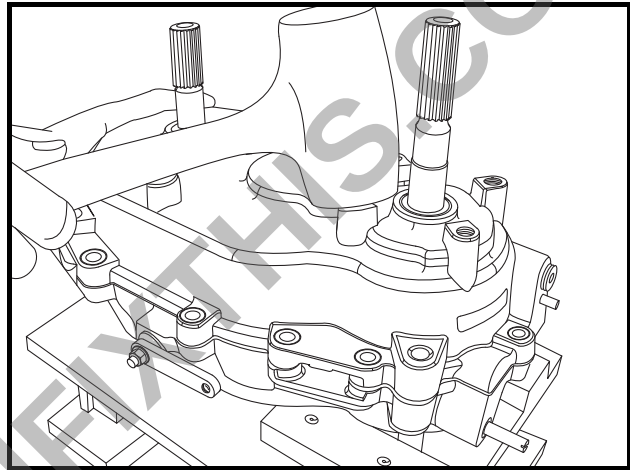


Figure 16-89 Transmission Case Assembly

13. Apply a 1/8-inch (2 mm) wide coat of Three Bond sealant or Loctite 5699 Gasket Eliminator to the bottom half of the case. **See following CAUTION.**

CAUTION

- Apply adjacent to the inside edge of the case only.

14. Gently press on the case and allow the bearings to begin seating in the case. Gently tap on the case at positions close to each shaft area to help seat the bearings and sealant (**Figure 16-89, Page 16-26**).
15. Install the case bolts and tighten, in a criss-cross pattern as shown, to 25 ft-lb (34 N·m) (**Figure 16-90, Page 16-27**).
16. Install the drain plug and washer and tighten to 8 ft-lb (11 N·m).
17. Remove the fill and level plugs and fill the case through the top fill plug with 20 ounces (600 mL) of Mobil 424, Exxon Hydraulic 560, or Esso Hydraulic 56 lubricant. **See following NOTE.**

NOTE: When the proper amount of lubricant has been added, the lubricant should be level with the level plug on the side of the case.

18. Install the level plug using a small amount of Loctite 545 thread sealant on the threads and tighten to 20 ft-lb (27 N·m).
19. Install the fill plug on the top of the case using a small amount of Loctite 545 thread sealant on the threads and tighten to 20 ft-lb (27 N·m).

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