

OPERATION MANUAL



MODEL AR14H **RIDE-ON TANDEM DRUM ROLLER** **(HONDA GX630RHKAF GASOLINE ENGINE)**

Revision #4 (09/08/20)



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

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PROPOSITION 65 WARNING



**AR14H Ride-On Tandem
Drum Roller**

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NOTICE

Specifications are subject to change without notice.

SAFETY INFORMATION

Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.



SAFETY MESSAGES

The four safety messages shown below will inform you about potential hazards that could injure you or others. The safety messages specifically address the level of exposure to the operator and are preceded by one of four words: **DANGER**, **WARNING**, **CAUTION** or **NOTICE**.

SAFETY SYMBOLS

! DANGER

Indicates a hazardous situation which, if not avoided, **WILL** result in **DEATH** or **SERIOUS INJURY**.

! WARNING

Indicates a hazardous situation which, if not avoided, **COULD** result in **DEATH** or **SERIOUS INJURY**.

! CAUTION

Indicates a hazardous situation which, if not avoided, **COULD** result in **MINOR** or **MODERATE INJURY**.

NOTICE

Addresses practices not related to personal injury.

The following table shows the potential hazards associated with the operation of this equipment.

| Symbol | Safety Hazard |
|--------|----------------------------|
| | Lethal exhaust gas hazards |
| | Explosive fuel hazards |
| | Burn hazards |
| | Respiratory hazards |
| | Rotating parts hazards |
| | Pressurized fluid hazards |
| | Electric shock hazards |
| | Runover hazards |

SAFETY INFORMATION

GENERAL SAFETY

CAUTION

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.



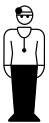
- **NEVER** operate this equipment under the influence of drugs or alcohol.



- **ALWAYS** check the equipment for loosened threads or bolts before starting.
- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.
- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.

NOTICE

- This equipment should only be operated by trained and qualified personnel 18 years of age and older.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
- **ALWAYS** know the location of the nearest **fire extinguisher**.
- **ALWAYS** know the location of the nearest **first aid kit**.
- **ALWAYS** know the location of the nearest phone or **keep a phone on the job site**. Also, know the phone numbers of the nearest **ambulance, doctor and fire department**. This information will be invaluable in the case of an emergency.



SAFETY INFORMATION

ROLLER SAFETY

DANGER

- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death.**



WARNING

- **NEVER** disconnect any **emergency or safety devices.** These devices are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these devices will void all warranties.

CAUTION

- **NEVER** lubricate components or attempt service on a running machine.
- Never leave the roller unattended with the engine running. Turn off engine.
- Use chock blocks when parking roller on a grade.
- Use extreme care when operating near obstructions, on slippery surfaces, grades, and slide slopes.
- When reversing, particularly on the edges and banks of ditches, as well as in front of obstacles, the operator must stay in a standing position at a safe distance from the machine.
- When operating near any house/building or pipelines, always check the effect of machine vibration. Stop work if necessary.
- **DO NOT** operate the roller with the covers open.
- **ALWAYS** keep the machine away from other personnel and obstacles. Always keep immediate area free of bystanders.

NOTICE

- **ALWAYS** keep the machine in proper running condition.
- Fix damage to machine and replace any broken parts immediately.

- **DO NOT** use worn-out hoses or fittings. Inspect daily.
- **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.

ENGINE SAFETY

DANGER

- The engine fuel exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled.
- The engine of this equipment requires an adequate free flow of cooling air. **NEVER** operate this equipment in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause injury to people and property and serious damage to the equipment or engine.



WARNING

- **DO NOT** place hands or fingers inside engine compartment when engine is running.
- **NEVER** operate the engine with heat shields or guards removed.
- Keep fingers, hands hair and clothing away from all moving parts to prevent injury.
- **DO NOT** remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the oil tank and severely scald any persons in the general area of the roller.




CAUTION

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing equipment.
- Always turn the engine off before performing maintenance.




SAFETY INFORMATION

NOTICE

- **NEVER** run engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service air filter frequently to prevent engine malfunction.
- **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating in speed ranges above the maximum allowable. 
- **NEVER** tip the engine to extreme angles during lifting as it may cause oil to gravitate into the cylinder head, making the engine start difficult.


FUEL SAFETY

DANGER


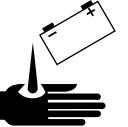
- **DO NOT** start the engine near spilled fuel or combustible fluids. Gasoline is extremely flammable and its vapors can cause an explosion if ignited.
- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
- **ALWAYS** use extreme caution when working with **flammable** liquids.
- **DO NOT** fill the fuel tank while the engine is running or hot.
- **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.
- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.
- **NEVER** use fuel as a cleaning agent.
- **DO NOT** smoke around or near the equipment. Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine. 

BATTERY SAFETY (ELECTRIC START ONLY)

DANGER

- **DO NOT** drop the battery. There is a possibility that the battery will explode.
- **DO NOT** expose the battery to open flames, sparks, cigarettes, etc. The battery contains combustible gases and liquids. If these gases and liquids come into contact with a flame or spark, an explosion could occur. 

WARNING

- **ALWAYS** wear safety glasses when handling the battery to avoid eye irritation. The battery contains acids that can cause injury to the eyes and skin. 
- Use well-insulated gloves when picking up the battery.
- **ALWAYS** keep the battery charged. If the battery is not charged, combustible gas will build up.
- **DO NOT** charge battery if frozen. Battery can explode. When frozen, warm the battery to at least 61°F (16°C).
- **ALWAYS** recharge the battery in a well-ventilated environment to avoid the risk of a dangerous concentration of combustible gases.
- If the battery liquid (dilute sulfuric acid) comes into contact with **clothing or skin**, rinse skin or clothing immediately with plenty of water. 
- If the battery liquid (dilute sulfuric acid) comes into contact with **eyes**, rinse eyes immediately with plenty of water and contact the nearest doctor or hospital to seek medical attention.

CAUTION

- **ALWAYS** disconnect the **NEGATIVE battery terminal** before performing service on the equipment.
- **ALWAYS** keep battery cables in good working condition. Repair or replace all worn cables.

SAFETY INFORMATION

TRANSPORTING SAFETY

CAUTION


- NEVER allow any person or animal to stand underneath the equipment while lifting.

NOTICE

- Before lifting, make sure that the equipment parts are not damaged and screws are not loose or missing.
- Always secure the articulation locking latch prior to lifting the machine.
- Use lifting equipment capable of lifting the weight of the roller.
- Always make sure crane or lifting device has been properly secured to the lifting bail (hook) of the equipment.
- **ALWAYS** shutdown engine before transporting.
- **NEVER** lift the equipment while the engine is running.
- Tighten fuel tank cap until audible click and securely close fuel cock to prevent fuel from spilling.
- Use adequate lifting cable (wire or nylon rope) of sufficient strength.
- Use one point suspension hook and lift straight upwards with sufficient bearing capacity to prevent machine from tilting or slipping.
- **DO NOT** lift machine to unnecessary heights.
- **ALWAYS** make sure that roller is secured correctly when transporting on a trailer. Make sure all supports attaching the roller to the trailer are tight.

ENVIRONMENTAL SAFETY

NOTICE

- Dispose of hazardous waste properly. Examples of potentially hazardous waste are used motor oil, fuel and fuel filters. 
- **DO NOT** use food or plastic containers to dispose of hazardous waste.
- **DO NOT** pour waste, oil or fuel directly onto the ground, down a drain or into any water source.

EMISSIONS INFORMATION

NOTICE

This equipment conforms with applicable Environmental Protection Agency (EPA) and California Air Resources Board (CARB) emission regulations.

The gasoline engine used in this equipment has been designed to reduce harmful levels of carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxides (NOx) contained in gasoline exhaust emissions.

Mandated Emission Components:

- Honda GX630 engine, EPA certified
- Fuel cap, EPA certified
- Fuel and vapor recovery hoses, EPA certified SAE J30R7 or SAE J30R14T2
- Charcoal canister, EPA certified

Miscellaneous Parts Associated with Emission System:

- Hose clamps and retainer brackets
- Roll over valve vapor recovery valve
- Steel fuel tank

Tampering with or altering the emission control system may increase emissions beyond the legal limit. Do not remove or alter any part of the system.

Additionally, modifying the fuel system may adversely affect evaporative emissions, resulting in fines or other penalties.

The Emission control system is valid only for the United States, its territories and commonwealths to include Canada.

Emission Control Label

The emission control label is an integral part of the emission system and is strictly controlled by regulation(s).

The label must remain with the engine for its entire life.

If a replacement emission label is needed, please contact Discount-equipment.

SPECIFICATIONS

| Table 1. Specifications (Roller) | |
|--|----------------------------|
| Shipping Weight | 2,840 lbs. (1,288.20 Kg.) |
| Operating Weight w/ Water | 2,980 lbs. (1,351.70 Kg.) |
| Operating Weight w/out Water | 2,688 lbs. (1,219 Kg.) |
| Centrifugal Force (Front Drum) | 3,400 lbf. (15.1 kN) |
| Frequency | 4,200 VPM (70 Hz) |
| Dynamic Linear Force Per Drum 2,400 - 2,700 rpm | 95.5 lbs./in (17.05 Kg/cm) |
| Oscillating Angle | 11 degrees |
| Travel Speed (Forward/Reverse) | 4.8 mph (7.7 kph) |
| Gradeability (Maximum) | 25 % |
| Outside Turning Radius | 223 in. (5,664.2 mm) |
| Inside Turning Radius | 149.5 in. (3,797.3 mm) |
| Water Tank Capacity | 34 Gallons (130 Liters) |
| Water Delivery | Pressurized |
| Water Tank Construction | Plastic |
| Battery | 12V System |
| Hood Construction | Fiberglass |
| Drum Water Ballast | Rear Drum |

| Table 2. Specifications (Engine) | |
|---|--|
| Model | Honda GX630RHKAF Engine |
| Type | Air-Cooled 4 Stroke, Overhead Valve, 2 cylinders (90 degree V-Twin), Gasoline Engine. |
| Piston Displacement | 41.98 cu. in. (688 cc) |
| Bore x Stroke | 3.07 in. x 2.83 in. (78 mm x 72 mm) |
| Max. Torque | 35.62 lbf ft (48.3 Nm) at 2,500 rpm |
| Starting System | Electric Start |
| Engine Oil Capacity | 2.0 qts. (1.90 liters) |
| Horsepower Rating | 20.8 hp (15.5 kW) |
| Fuel | Unleaded gasoline |
| Fuel Tank Capacity | 9.5 gal (15.5 liters) |
| Operating Speed | 3,250 ±50 rpm |

DIMENSIONS

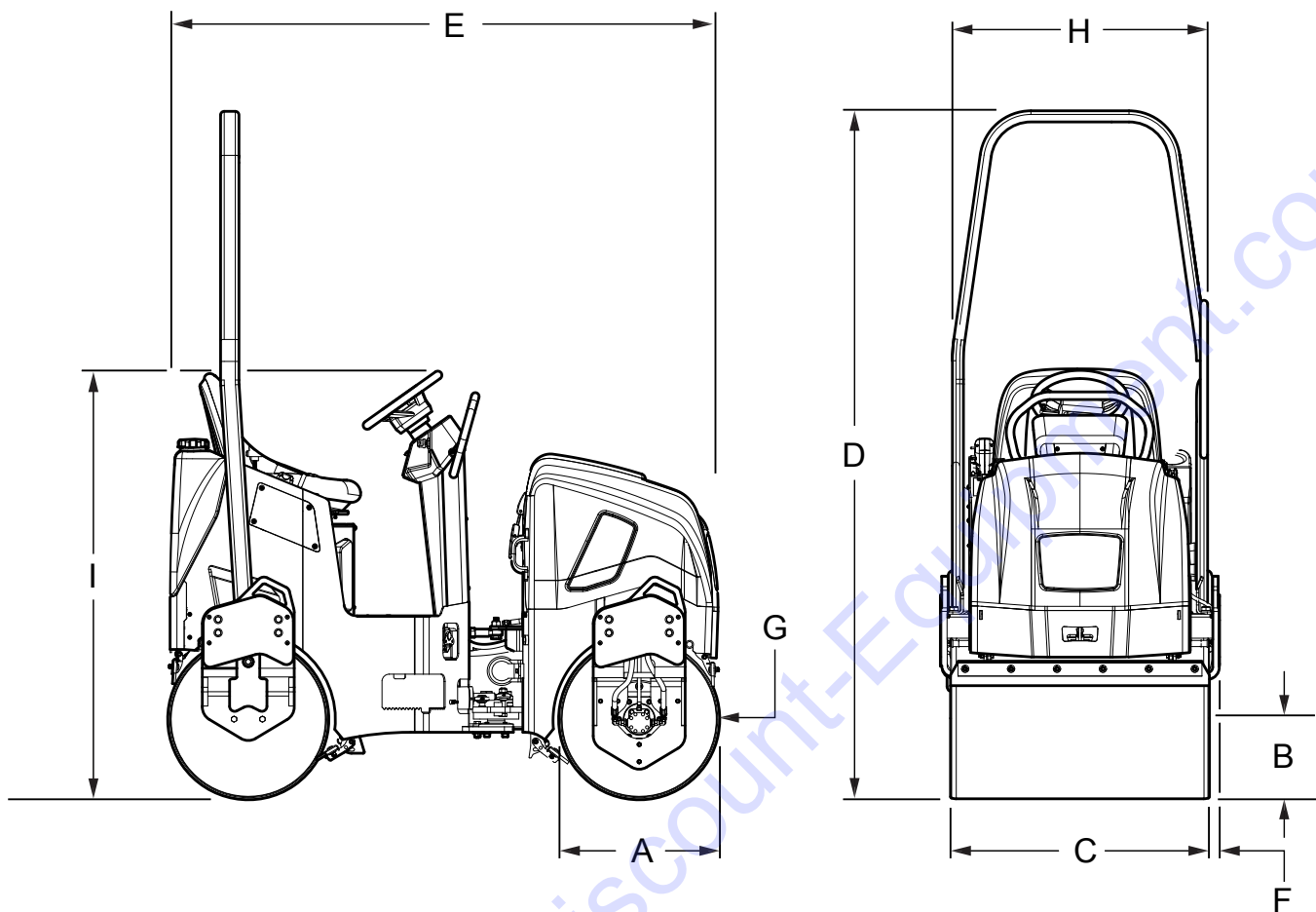


Figure 1. Roller Dimensions

| Table 3. Dimensions (Roller) | | |
|------------------------------|---|----------------------|
| Drum Diameter | A | 22.0 in. (559 mm.) |
| Curb Clearance (R and L) | B | 16.5 in. (419 mm.) |
| Drum Width | C | 35.6 in. (904 mm.) |
| Overall Height (with ROPS) | D | 95 in. (2,413 mm.) |
| Overall Length | E | 73.5 in. (1,867 mm.) |
| Wall Clearance (R and L) | F | 1.375 in. (35 mm.) |
| Drum Thickness | G | .38 in. (10 mm.) |
| Overall Width | H | 37 in. (940 mm.) |
| Steering Wheel | I | 58 in. (1,473.2 mm.) |

GENERAL INFORMATION

The AR14H roller has been designed for asphalt application and compaction of granular soils used in site preparation. Machine should only be used for the purpose intended and by experienced personnel who understand this operation manual and all safety decals. Typical applications for this roller are compaction of base material, asphalt patching and roadway construction.

Standard features included with this roller are compact design, recessed drive motors, maintenance-free articulation joint and vibrator assembly, easy-to-use controls, 34-gallon (130 liters) water tank, and hour/tachometer.

POWER PLANT

The AR14H roller is powered by a Honda GX630, air-cooled, gasoline engine rated at 20.8 hp @3,600 rpm. The engine features a side-mounted muffler designed to direct engine exhaust away from the operator. In the event of low oil, this engine has a built in "oil alert system" that will shut down if the engine oil level reaches an unsafe operating level.

HYDRAULIC SYSTEM

The Honda GX630 engine drives an axial hydraulics, variable displacement pump which is manually controlled via a cable control system. Pump flow is directed through an aluminum block manifold which provides the control for the 3 hydraulic motors.

The hydraulic drum drive system incorporates a series closed loop configuration operating at a maximum pressure of 2,900 psi. In addition this hydraulic system offers a "free wheel valve" which allows the roller to be towed in the event of an emergency.

The forward-reverse control lever operates the hydrostatic pump which governs the roller speed and direction of travel. The speed in which movement of this lever is made is directly related to the amount of pressure that is applied to the travel lever in each direction. Travel speed is infinitely variable from 0 to 4.8 mph. The neutral position of this lever will cause the roller to stop.

COMPACTION SYSTEM

The compaction force is delivered by a 35.6-inch wide steel drum with beveled edges to help prevent asphalt marring. A fully enclosed hydraulic drive system offers a variable speed control as well as smooth acceleration and braking.

Connected to the axial hydraulic pump is a gear pump that provides power for the drum vibratory system and the articulating steering system. Oil from this pump flows to the manifold control valve block and then to a hydraulic motor which rotates the eccentric weights inside a sealed housing containing grease to lubricate the bearings.

A toggle switch located on the side of the travel lever, activates a valve that engages or disengages the vibratory action. The drum's vibratory action generates 3,400 lbf (15.1 kN) of centrifugal force at a frequency of 4,200 vpm (vibrations per minute). If the vibration appears to be weak or slow, allow the machine to warm up thoroughly, and check the hydraulic oil level. Add hydraulic oil if necessary.

The vibrator housing and drum are shock mounted to isolate the engine compartment and operator from vibration.

The roller nominally has an operating weight of 2,688 lb. (1,219 Kg) but can be increased to 2,980 lb. (1,352 Kg) by adding a water ballast to the rear drum.

HYDRAULIC OIL FILTER SYSTEM

The hydraulic system oil is filtered by a screen type filter located in the reservoir filler neck, then doubled filtered within the system first by a 40 micron mesh-type suction filter located in the tank and the by a Zinga 10-micron, cartridge style, spin-on return line filter.

ARTICULATED STEERING SYSTEM

Power for the articulated steering system, which uses a single hydraulic cylinder, is provided by the gear pump. This steering system can produce an inside turning radius of 150 inches (3.81 meters).

SPRINKLER SYSTEM

A 34-gallon (130 liters) water tank, with a pressurized feed spray bar, is provided for wetting the roller for asphalt pavement rolling.

The water system is fully adjustable from the operator's position with a single volume control.

LIFTING THE ROLLER

When lifting of the roller is required, attach a suitable hook or shackle to the lifting eyes of the roller. These four lifting points are marked by a lifting hook decal. Make sure the lifting device is capable of lifting 4,000 lb. (1,814 Kg).



GENERAL INFORMATION

DANGER

DO NOT allow personnel to stand under or near any suspended machine. Before operating the roller, make sure that personnel and obstacles are free from the roller's path. Serious injury or death may result.

CAUTION

ONLY use approved certified lifting devices capable of lifting at least 4,000 lb. (1,814 Kg.).

CAUTION

When lifting of the roller is required, only use the provided lifting eyes to lift the roller. Using other sections of the roller for lifting purposes may cause severe damage to the roller.

OPERATING ON SLOPES

Special care must be taken when operating the roller on hills or slopes. There exists the possibility of serious injury to the operator and severe damage to the roller in the event of a roll over. **ALWAYS** operate the roller up and down hills rather than from side to side. For safe operation, hillside slopes should not exceed 14 degree (25 % grade). See Figure 2. Always wear seat belt when operating the roller.

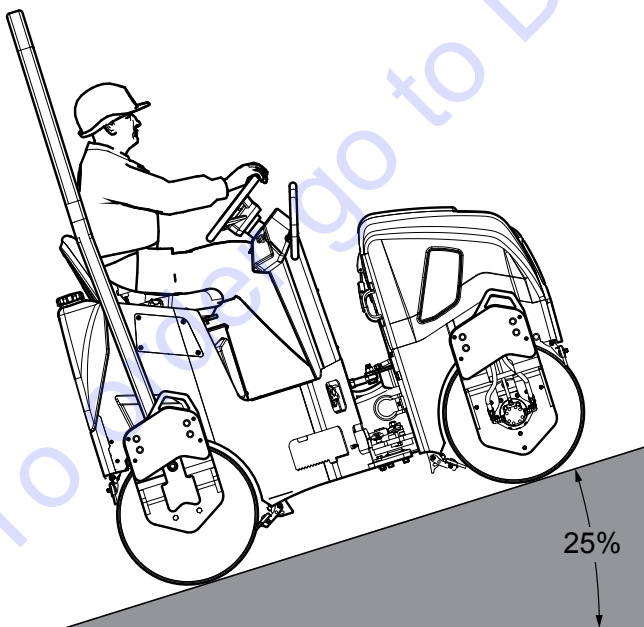


Figure 2. Recommended Slope

IMPROPER OPERATION ON SLOPES

CAUTION

NEVER operate the roller on side slopes (Figure 3). The possibility exists that the roller could tip over (roll over), thus causing bodily harm, even death, and serious damage to the equipment.

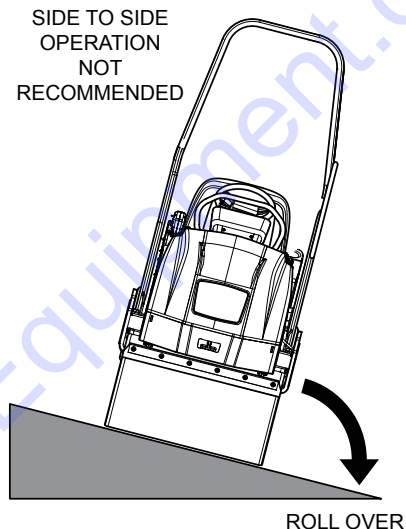


Figure 3. Improper Operation on Slope

In the event the roller does tip over, if at all possible, try to shut down the engine by turning the ignition key to the **OFF** position. Extreme care must be taken to prevent damage to the engine. When the roller has been tipped over, oil from the engine crankcase can flow into the combustion chamber, which can severely damage the engine the next time it is started.

IMMEDIATELY after a unit has tipped over, upright the unit as soon as possible to prevent oil from leaking into the combustion chamber.

NOTICE

To prevent damage to the engine after a rollover, the roller must not be started. **NEVER** start a roller after a rollover. Contact Discount-equipment for instructions or servicing.

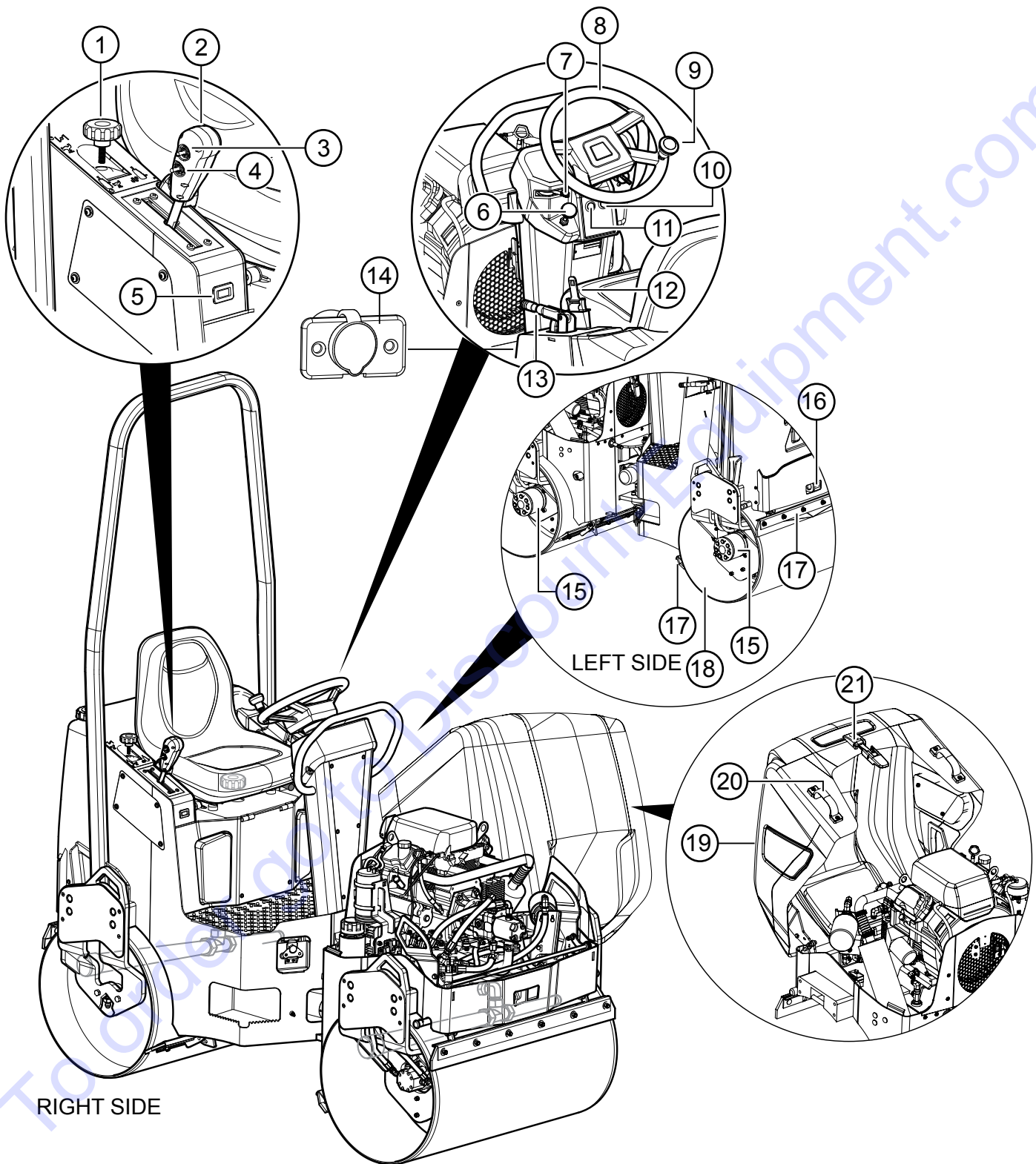


Figure 4. Roller Components (1 of 3)

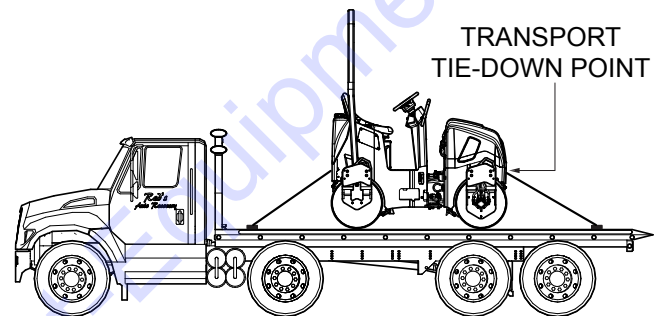
COMPONENTS

Figure 4 shows the location of the components and controls (1 of 3) for the AR14H compaction roller. The function of each component or control is described below:

1. **Water Volume Control Valve** — This valve controls the volume flow of water to the front and rear spray bars. Turn the valve to the counterclockwise to increase water flow and clockwise to decrease water flow.
2. **Travel Lever** — Push the lever forward to make the roller travel in a forward direction. Pull the lever backward to make the roller travel in a reverse direction. Maximum travel speed is 4.8 MPH (7.7 KPH). Center position is neutral; no travel.
3. **Vibration Control Switch** — Toggle switch to activate the eccentric that will produce a vibration frequency of 4,200 vpm (vibrations per minute). Toggle switch again to stop vibration.
4. **Water Pump Switch** — Activates the water pump. The water pump indicator turns on.
5. **Hour/Tachometer** — Indicates the number hours the unit has been in use when engine is off and RPM when engine is running.
6. **Choke Knob** — Used in the starting of a cold engine, or in cold weather conditions. The choke enriches the fuel mixture.
7. **Throttle Control** — Slide control to the left to increase engine rpm. Slide to the right to decrease engine rpm. Slide all the way to the left to achieve maximum engine rpm.
8. **Steering Wheel** — Use this wheel to steer the roller.
9. **Steering Wheel Knob** — Use this knob to move the steering wheel with one hand.
10. **Engine Oil Indicator** — Lights to indicate low engine oil level. The engine will automatically turn off. Add oil as necessary.
11. **Water Pump Indicator** — Lights when the water pump is on.
12. **Seat Belt** — When operating the roller, always have the operator wear the seat belt. **NEVER** use the roller without wearing a seat belt. If the seat belt becomes worn or damaged, replace it immediately.
13. **Parking Brake Lever** — Pull the lever upward to

engage the parking brake. To release the parking brake, push lever downward.

14. **12V Power Outlet** — Charges small portable electronic devices.
15. **Hydraulic Motors** — These hydraulic motors provide forward/reverse drive for drums.
16. **Tie-Down Transport Points (Front and Rear)** — Attach a chain or suitable tie-down device to these when transporting of the roller is required.



17. **Rear Drum Roller Scraper Bars (2)** — Helps prevent the buildup of material between the drum and frame. The scraper bar is spring-loaded for easy change and clean up. No tools are required.
18. **Rear Drum** — This is a 35.6-inch wide steel drum with a diameter of 22 inches. It has beveled edges to help prevent asphalt marring. The rear drum has a water ballast allowing 34 gallons of water to add 292 of static force.
19. **Compartment Hood** — Houses the engine, hydraulic manifold, accessory relay, hydraulic oil filter, hoses, and hydraulic pump. To lift the compartment hood, release the rubber bungee latch located on the front of the hood.
20. **Compartment Hood Lift Point** — Place hand here on either side of the roller then lift compartment hood.
21. **Bungee Latch** — Pull this rubber latch upward and back to gain access to the engine/pump compartment.

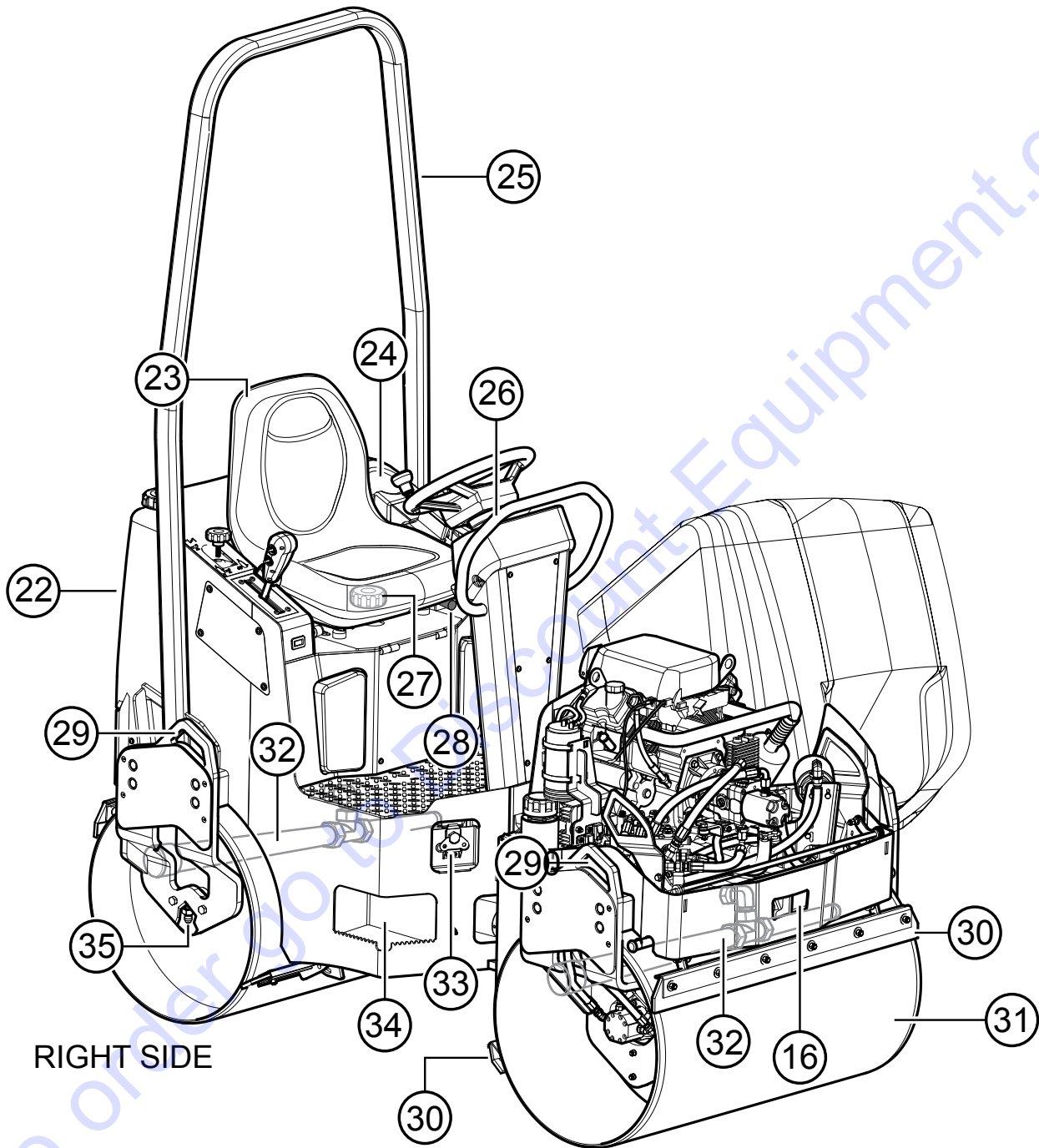


Figure 5. Roller Components (2 of 3)

COMPONENTS

Figure 5 shows the location of components and controls (2 of 3) for the AR14H compaction roller. The function of each component or control is described below:

22. **Water Tank** — Unscrew tethered cap and fill tank with water. Water tank capacity is 34 gallons (130 liters).
23. **Operator's Seat** — A contoured seat that provides visibility of both front and rear drum edges during operation. **NEVER** start the roller unless seated in the operator's seat. The seat has a detent that holds it in place when lifted for refueling.
24. **Cup Holder** — Holds standard travel mugs.
25. **Roll-Over Bar** — This unit is equipped with a Roll Over Protection System (ROPS) to protect the operator when the roller is used on slopes.
26. **Hand Rail** — Grab hold of this hand rail when lifting yourself onto the operator's platform.
27. **Fuel Tank/Fuel Gauge** — The fuel capacity of the fuel tank is 9.5 gallons (36 liters). Fill with unleaded-type gasoline. There is a gauge on top of the fuel cap to indicate if fuel level is low. To gain access to the fuel tank, tilt the front seat forward. Fuel tank has a spill containment feature.
28. **Seat Adjustment Knob** — Allows operator's seat to be adjusted (slide seat forward or backward).
29. **Lifting Points (4)** — Attach a crane or suitable lifting device to these points when lifting of the roller is required.
30. **Front Drum Roller Scraper Bars (2)** — Helps prevent the buildup of material between the drum and frame. The scraper bar is spring-loaded for easy change and clean up. No tools are required.
31. **Front Drum** — This is a 35.6-inch wide steel drum with a diameter of 22 inches. It has beveled edges to help prevent asphalt marring. The vibratory assembly is built into the front drum.
32. **Front and Rear Sprinkler System** — Pressurized spray bars are provided for wetting the roll for asphalt pavement.
33. **Platform Latch** — Used to release platform to gain access to the battery, water pump, water filter, and fuel shut-off valve.
34. **Foot Step** — To lift yourself onto the roller's platform, place foot into foot step, then grab hold of hand rail.
35. **Rear Drum Grease Zerk Fitting** — Grease this fitting biweekly. See maintenance section of this manual.

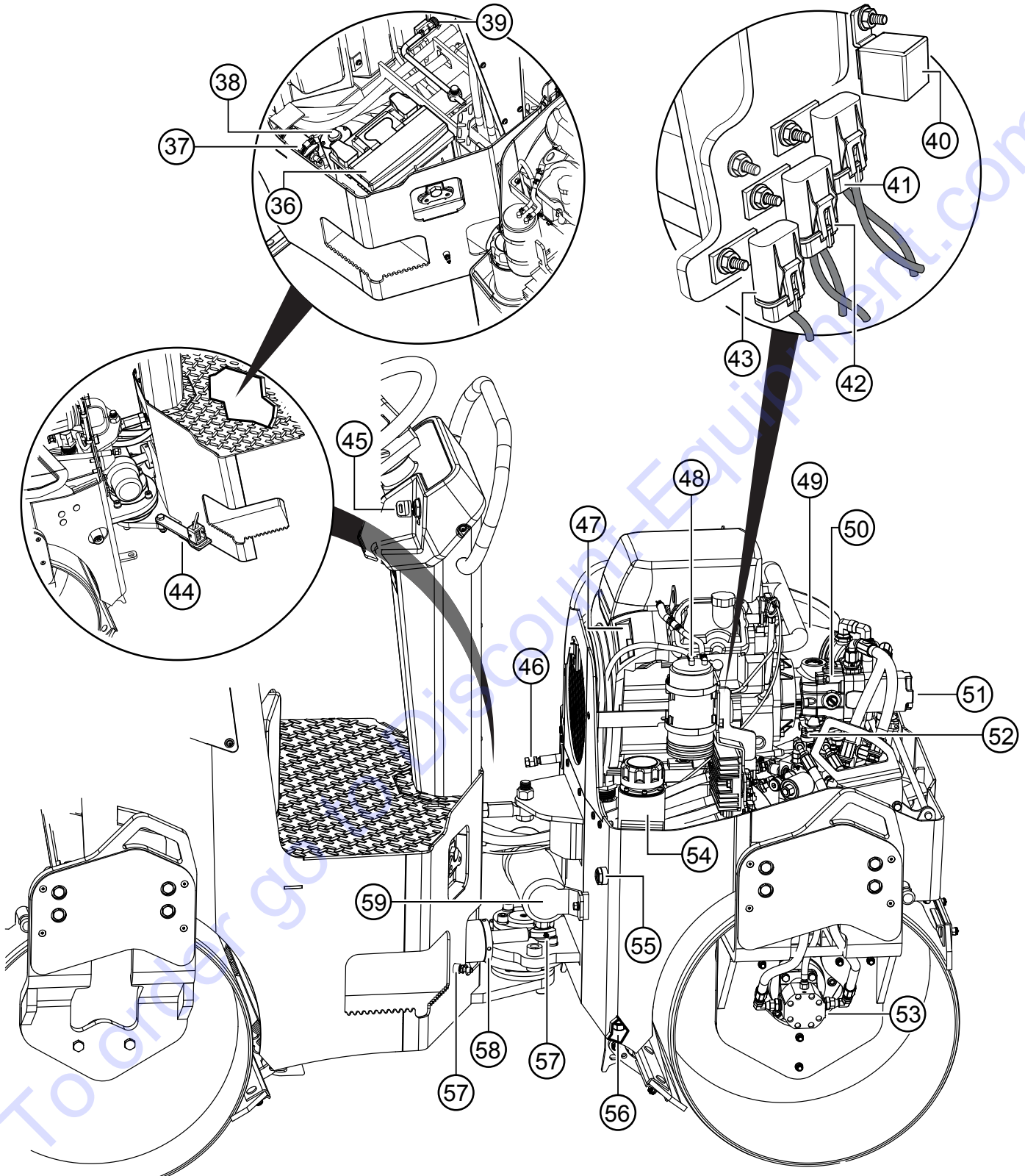


Figure 6. Roller Components (3 of 3)

COMPONENTS

Figure 6 shows the location of components and controls (3 of 3) for the AR14H compaction roller. The function of each component or control is described below:

36. **Battery** — Provides +12VDC to the electrical system, and is located underneath foot plate. Replace only with recommended type battery.
37. **Water Filter** — Filters the water in the water pump.
38. **Water Pump** — Provides pressure to the water sprinklers to allow even distribution of water on the drums.
39. **Fuel Shut-Off Valve** — Stops the flow of fuel.
40. **Accessory Relay** — Provides the +12VDC necessary to run the electrical accessories.
41. **Fuse (10 Amp)** — Provides overcurrent protection for the water pump.
42. **Fuse (30 Amp)** — Provides overcurrent protection for the starter.
43. **Fuse (20 Amp)** — Provides overcurrent protection for the 12V outlet.
44. **Articulating Locking Latch** — Secures the front and rear sections of the roller when lifted during transport and maintenance.
45. **Ignition Switch** — With key inserted, turn clockwise to start the engine.
46. **Engine Oil Drain** — Used to drain oil from the engine.
47. **Engine** — This unit incorporates a HONDA GX630RHKAF, air-cooled engine rated at 20 hp at 3,200 rpm.
48. **Charcoal Canister** — Keeps gasoline from evaporating into the atmosphere. The carbon in the canister absorbs the fuel vapor.
49. **Hydraulic Oil Filter** — Filters return oil from the front and rear hydraulic motors.
50. **Hydraulic Pump** — This unit incorporates an axial variable displacement hydraulic piston pump.
51. **Gear Pump** — Controls vibration and steering.
52. **Hydraulic Manifold** — Aluminum block that controls the flow of hydraulic pressure to the various hydraulic motors and other components required to control the roller.
53. **Hydraulic Motor** — This hydraulic motor controls the rotation of the vibratory system.
54. **Hydraulic Fluid Filler Port** — Remove this cap to add hydraulic fluid. Fill with type ISO 46 anti-wear hydraulic fluid.
55. **Hydraulic Oil Level Indicator** — Indicates the amount of hydraulic oil present.
56. **Hydraulic Oil Drain** — Used to drain used hydraulic oil when oil replacement is necessary.
57. **Steering Cylinder Grease Zerk Fitting** — Grease this fitting biweekly. See maintenance section of this manual.
58. **Steering Cylinder** — Controls direction of roller.
59. **Documentation Canister** — Store and maintain Operation, Parts, and Engine manuals in this container at all times.

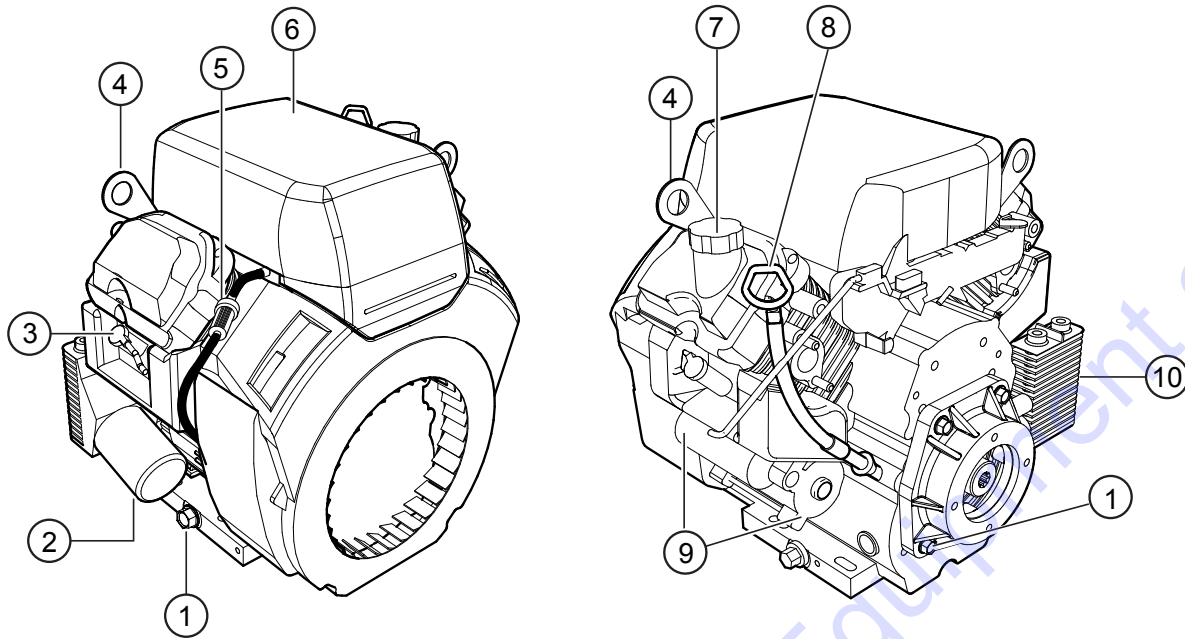


Figure 7. Engine Components

The engine (Figure 7) must be checked for proper lubrication and filled with fuel prior to operation. Refer to the manufacturer's engine manual for operation and servicing information.

1. **Oil Drain Plug** — Remove to drain crankcase oil. Fill with recommended type oil as listed in Table 4.
2. **Oil Filter** — Spin-on type, filters oil for contaminants.
3. **Spark Plug** — Provides spark to the ignition system. Set spark plug gap to 0.6 - 0.7 mm (0.028 - 0.031 inch) Clean spark plug once a week.
4. **Lifting Hook Eye** — Attach a lifting device of adequate lifting capacity at this lifting point whenever lifting of the engine is required.
5. **Fuel Filter** — Prevents dirt and other debris from entering the fuel system.
6. **Air Filter** — Prevents dirt and other debris from entering the fuel system. Unsnap air filter cover to gain access to filter element.
7. **Oil Filler Cap** — Remove to add engine oil.
8. **Oil Dipstick** — Remove to check amount and condition of oil in crankcase. Refill or replace with recommended type oil as listed in Table 4.
9. **Starter/Solenoid** — Starts engine when ignition key is rotated to the **ON** position.
10. **Oil Cooler** — Helps keep engine oil cooler for longer engine life.

BEFORE STARTING

1. Read safety instructions at beginning of manual.
2. Clean the roller, removing dirt and dust, particularly the engine cooling air inlet, carburetor and air cleaner.
3. Check the air filter for dirt and dust. If air filter is dirty, replace air filter with a new one.
4. Check carburetor for external dirt and dust. Clean with dry compressed air.
5. Check fastening nuts and bolts for tightness.

ENGINE OIL CHECK

1. To check the engine oil level, place the roller on secure level ground with the engine stopped.
2. Remove the dipstick from its holder (Figure 8) and wipe it clean.

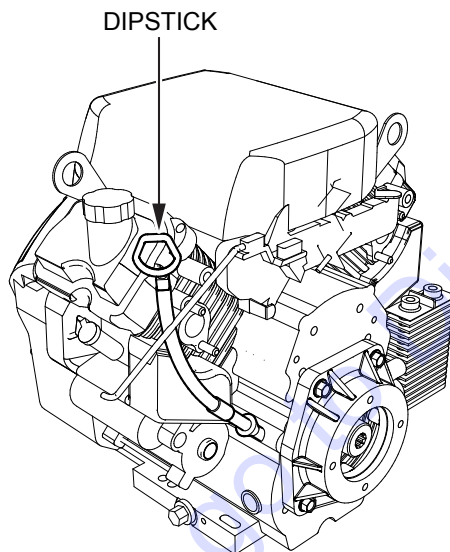


Figure 8. Engine Oil Dipstick (Removal)

| Table 4. Oil Type | | |
|-------------------|----------------|---------------|
| Season | Temperature | Oil Type |
| Summer | 25°C or Higher | SAE 10W-30 |
| Spring/Fall | 25°C~10°C | SAE 10W-30/20 |
| Winter | 0°C or Lower | SAE 10W-10 |

3. Check the oil level shown on the dipstick (Figure 9).

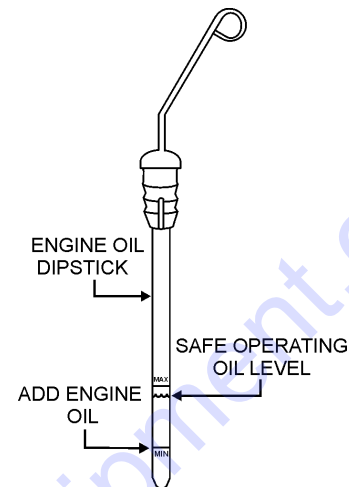


Figure 9. Engine Oil Dipstick Level

4. If the oil level is low, remove the oil filler cap (Figure 10) and fill to the safe operating level (max) as indicated by the dipstick. Fill with recommended type oil as listed in Table 4. Maximum oil capacity is 1.9 quarts (1.8 liters).

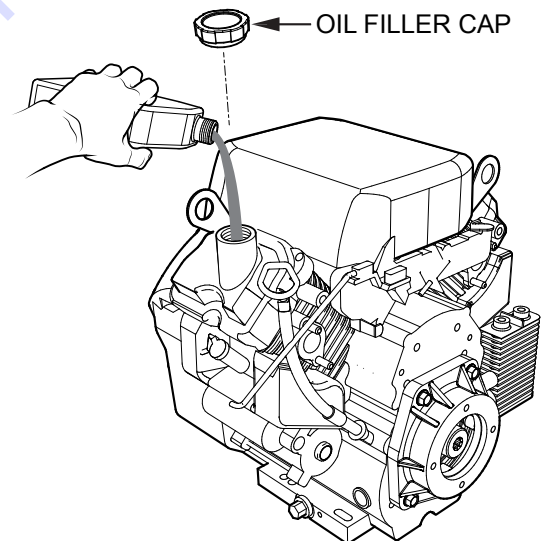


Figure 10. Engine Oil Filler Port

NOTICE

The HONDA GX630 engine used on this roller has an "Oil Alert System". This system will automatically stop the engine in the event of low oil level. **ALWAYS** check the engine oil level prior to starting the engine.

FUEL CHECK

DANGER



Motor fuels are highly flammable and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the machine if the engine is *hot* or *running*.

1. To check the engine fuel level, place the roller on secure level ground with the engine stopped.
2. Tilt the operator's seat (Figure 11) forward to gain access to the fuel tank. The seat is equipped with a latch that keeps the seat locked in place when tilted forward.

TILT DRIVER'S SEAT FORWARD

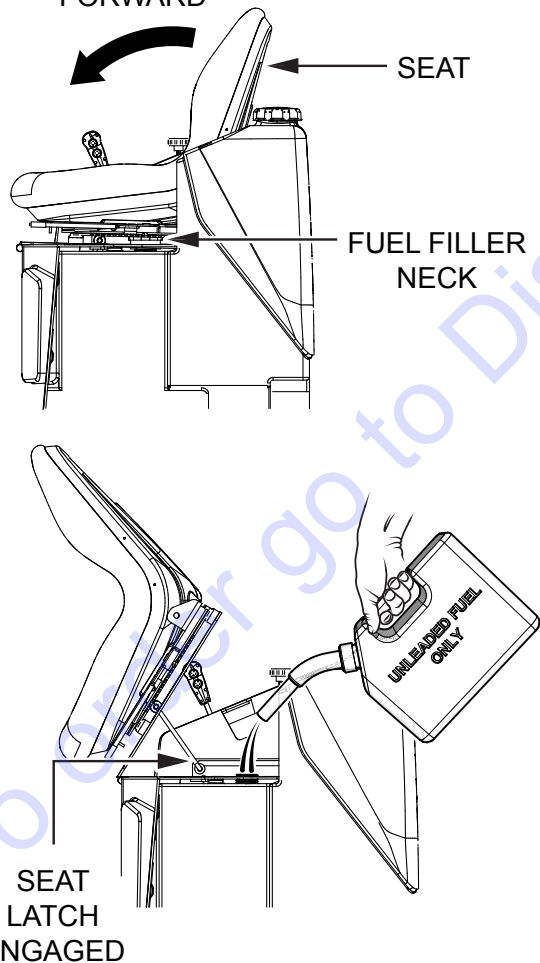


Figure 11. Fuel Tank Access

3. Read the fuel gauge (Figure 12) located on top of the filler cap to determine if fuel level is low.

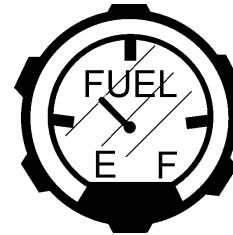


Figure 12. Fuel Gauge

4. If the fuel level is low, remove the fuel filler cap and fill with unleaded gasoline. Wipe up any spilled fuel immediately.
5. Pay attention to the fuel tank capacity when replenishing fuel. Refer to the fuel tank capacity listed on the specifications table.
6. After replenishing fuel, make sure filler cap is securely tightened to fuel tank. Return operator's seat to normal operating position.

HYDRAULIC OIL CHECK

1. To check the hydraulic oil level, place the roller on secure level ground with the engine stopped.
2. Visually inspect the hydraulic oil sight glass (Figure 13) located on the right rear of the front drum. For normal operation the hydraulic oil level must be below the top and above the bottom of the sight glass. **DO NOT OVERFILL!**

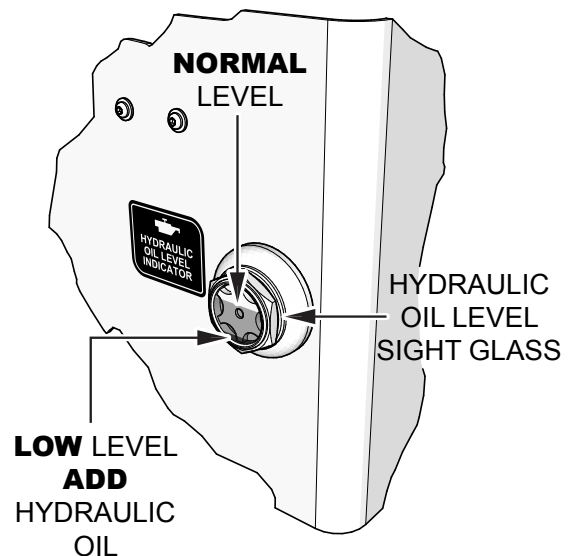


Figure 13. Hydraulic Oil Sightglass

3. If the hydraulic oil level is low, remove the hydraulic oil cap (Figure 14) and fill with type ISO 46 anti-wear type hydraulic oil to the recommended operating level.

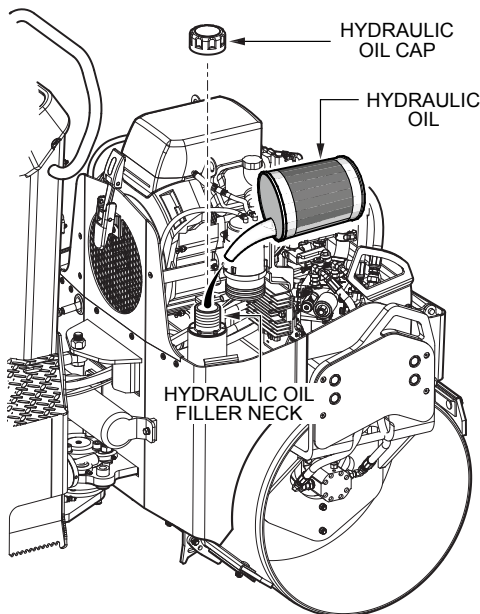


Figure 14. Hydraulic Oil Reservoir Filler Port

WATER TANK CHECK

1. Visually inspect the water level in the water tank. When the water level is low, water needs to be added to the water tank (Figure 15). Total tank capacity is 34 gallons (130 liters.)

NOTICE

During freezing weather conditions, drain water from system to prevent component damage.

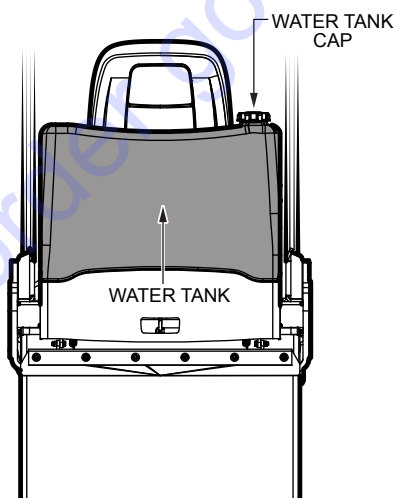


Figure 15. Water Tank

BATTERY CHECK

ALWAYS be sure that the battery cables are properly connected to the battery terminals as shown in Figure 16. Generally the **RED** cable will be connected to the positive terminal of the battery, and the **BLACK** cable will be connected to the negative terminal of the battery.

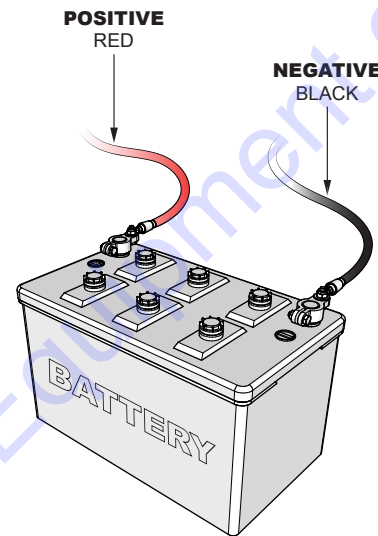


Figure 16. Battery

NOTICE

If the battery cables are connected incorrectly, electrical damage will occur causing damage to the roller's electrical circuits. Pay close attention to the polarity of the battery when connecting the battery.

STARTUP

NOTICE

DO NOT attempt to operate the roller until the Safety, General Information and Inspection sections have been read and understood.

1. Place your foot into the roller's foot step, grab hold of the hand rail located on the steering console, and lift yourself onto the platform.
2. Sit down in the operator's seat and adjust the seat for a comfortable position, then fasten the seat belt (Figure 17) around your waist. **NEVER** operate the roller without the seat belt being fastened. Serious injury could occur if the seat belt is not used.

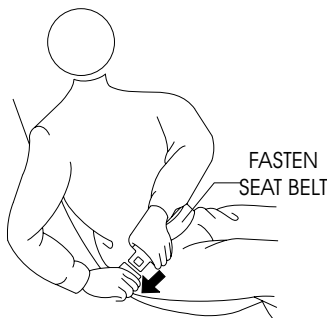


Figure 17. Securing Seat Belt

3. Before starting engine, make sure the immediate area is free of obstructions and debris that may lay in the roller's path.
4. Make sure that the roller's travel lever (Figure 18) is placed in the neutral position.

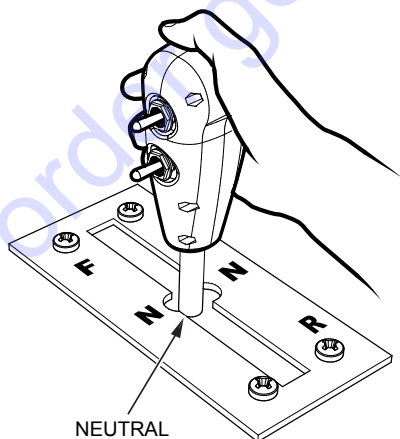


Figure 18. Travel Lever (Neutral)

5. In cold weather, start the roller with the choke fully closed. In warm weather or when the engine is warm, the roller can be started with choke halfway or completely open.

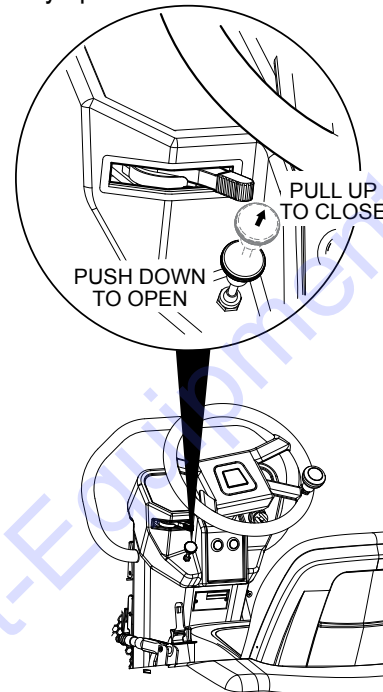


Figure 19. Choke Knob

6. Slide the throttle control (Figure 20) all the way to the left for maximum rpm.

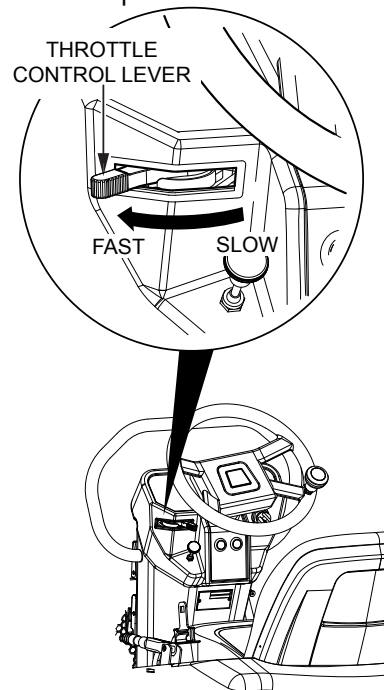


Figure 20. Throttle Control

7. Insert the ignition key into the ignition (Figure 21), then turn and hold the key in the clockwise position until the engine starts, release key.

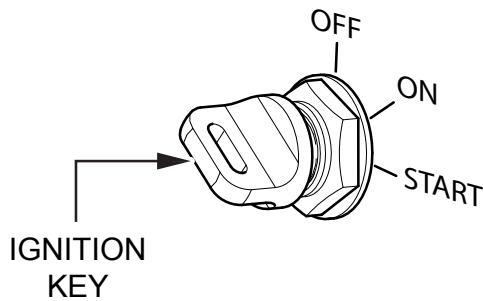


Figure 21. Ignition Switch

8. If the engine does not start, repeat steps 1 through 7 or consult the troubleshooting guide contained in this manual.
9. Depending on weather conditions, let the engine warm for 3 to 5 minutes before using roller. Check for fuel and oil leaks, and noises that would associate with a loose guard and/or covers.
10. If necessary, return the choke knob to the full **OPEN** position.

NOTICE

The **CLOSED** position of the choke knob enriches the fuel mixture for starting a **COLD** engine. The **OPEN** position provides the correct fuel mixture for normal operation after starting, and for restarting a warm engine.

PARKING BRAKE

1. To release the parking brake, push the parking brake lever all the way down (Figure 22).

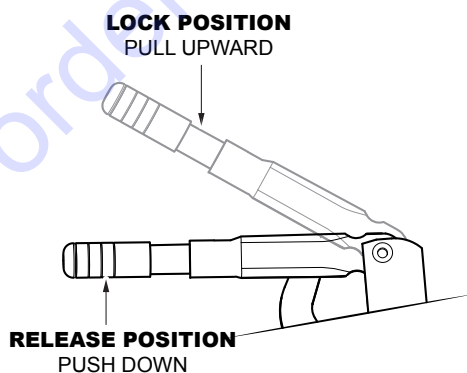


Figure 22. Parking Brake

TRAVEL LEVER

1. To make the roller move in a forward direction, move the travel lever forward as shown in Figure 23.

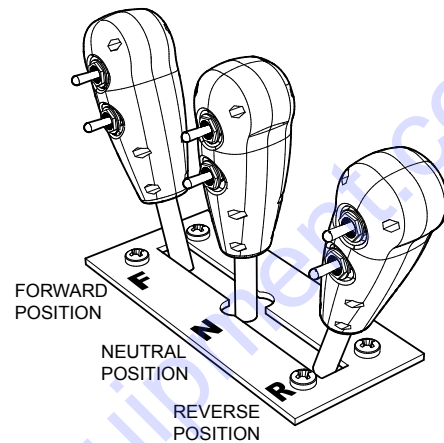


Figure 23. Travel Lever (Moving)

2. Remember the speed of the roller is directly proportional to the amount of pressure being applied to the lever in each direction. Travel speed is between 0 and 4.8 mph (7.2 kph).

NOTICE

ALWAYS allow the roller to come to a complete stop before changing the direction of travel. Changing directions before the roller comes to a complete stop will result in excessive force being applied to the transmission and drive system, which will reduce the service life of the system.

3. Try maneuvering the roller a few times to get familiar with the handling. Also place the travel lever in the opposite direction to get acquainted with driving in reverse.
4. Make sure that the roller comes to a complete stop (neutral) before placing the travel lever in either a forward or reverse position.

VIBRATION BUTTON

1. To begin the vibratory action, toggle the vibratory switch located on the right side of the travel lever as shown in Figure 24. This will generate 3,400 lbf. (15.1 kN) of centrifugal force at a frequency of 4200 vpm (vibrations per minute) to the front drum.

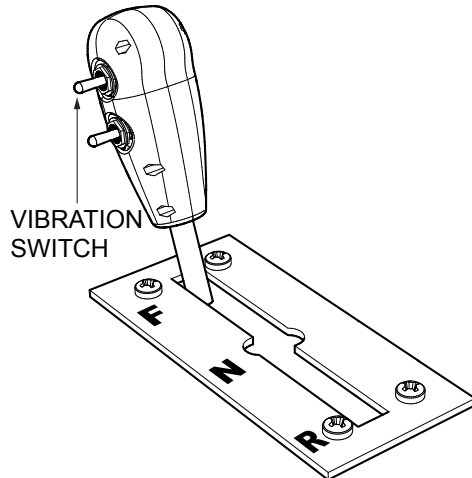


Figure 24. Vibration Toggle Switch

2. To stop the vibratory action, toggle the vibratory switch again.

WATER PUMP AND VOLUME CONTROL VALVE

When wetting of a surface is required, perform the following procedure.

1. Turn on the water pump switch (Figure 25) to activate the water pump. The water pump indicator will light.

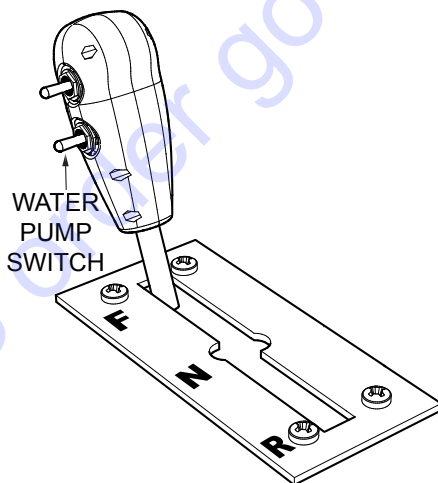
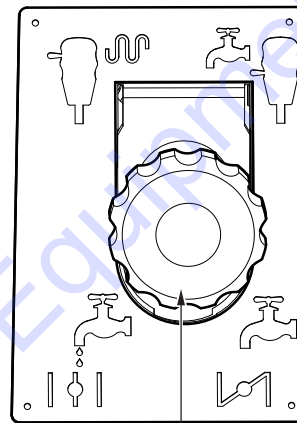


Figure 25. Water Pump Switch

2. A water volume control valve for the sprinklers is provided. This control valve (Figure 26) is located right below the travel lever. The valve controls the water supply simultaneously to the front and rear drum spray bars.

- a. To increase water volume, turn the control valve counterclockwise.
- b. To decrease water volume, turn the control valve clockwise.



WATER VOLUME CONTROL VALVE

Figure 26. Water Volume Control Valve

Perform roller maintenance as indicated by Figure 27 and Table 5.

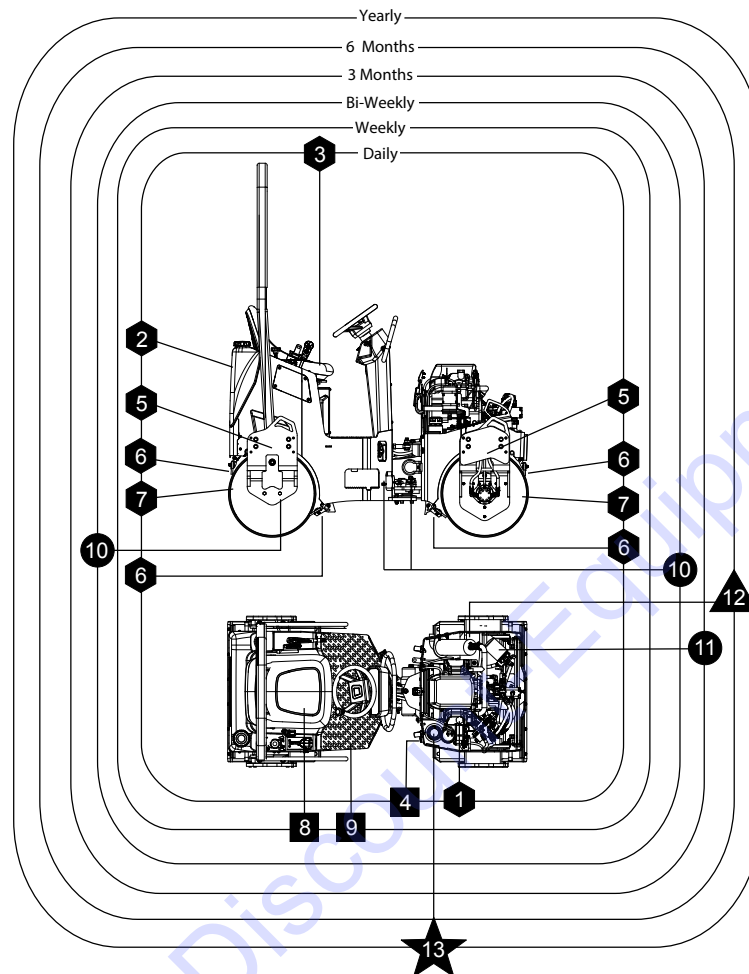


Figure 27. Roller Maintenance Schedule

Table 5. Roller Maintenance Schedule

| | Daily | Notes |
|----|-------------------------------|---|
| 1 | Engine Oil Level | See Table 4 |
| 2 | Water Tank Level | |
| 3 | Fuel Level | |
| 4 | Hydraulic Oil Level | Use ISO 46 Type Hydraulic Oil |
| 5 | Sprinkler System | |
| 6 | Scraper | Replace when badly worn |
| 7 | Drums (Front/Rear) | |
| | Weekly | |
| 8 | Air Filter | Replace paper element once a year. |
| 9 | Battery Electrolyte Level | |
| | Bi Weekly | |
| 10 | Grease Zerk Fittings | Use Type Alvania #2 or equivalent -3 shots max. DO NOT overgrease |
| | 3 Months | |
| 11 | Hydraulic Oil Filter (Return) | Replace with same type filter. |
| | 6 Months | |
| 12 | Engine Oil Filter | After first 20 hrs, change oil filter every 6 months or 100 hrs. |
| | Yearly | |
| 13 | Hydraulic Oil | Use ISO 46 Type Hydraulic Oil |

HYDRAULIC OIL SYSTEM

The hydraulic system consists of a two-pump stack directly coupled to the engine. A hydraulic valve block (manifold) is provided for quick and easy testing and troubleshooting.

Hydraulic oil is filtered by a screen filter located in the tank filler neck, a 40 micron suction filter located in the tank, and a 10 micron return filter, with cold oil bypass valve located in the return circuit.

It is recommended that ISO 46 type hydraulic oil or equivalent be used when adding or replacing the hydraulic oil is required.

DO NOT USE MULTI-VISCOSITY OIL. Clean oil is a very important part of proper hydraulic system operation. Hydraulic oil is not only used to transfer power; it also lubricates and cools the system components. Keeping the hydraulic system clean can help reduce costly repairs.

The hydraulic oil level sight glass is located on the right rear of the front drum, below the engine compartment. This level should be checked daily. Oil must be below the top and above the bottom of the sight glass. **DO NOT OVERFILL!** Care should be taken to clean the filler cap before adding oil to the system. If hydraulic oil has to be added, the machine should be inspected for leaks.

The suction filter (Figure 28) is located inside the hydraulic tank. This filter is attached to the fitting connected to the hydraulic pump suction hose.

The return filter (Figure 28) is located at the front of the engine compartment. Replace both filters according to the Table 5.

CAUTION

DO NOT open hydraulic lines or loosen hydraulic fittings while engine is running! Hydraulic fluid under pressure can penetrate the skin, blind, cause burns or create other potentially dangerous hazards follow all safety instructions as described throughout this manual.

CHANGING HYDRAULIC OIL AND FILTERS

1. Park the roller on a clean flat work area and set the parking brake.

2. Remove the hydraulic oil drain plug (Figure 28) and drain the hydraulic oil. Dispose of the used oil in an environmentally friendly manner. Replace the drain plug and tighten.

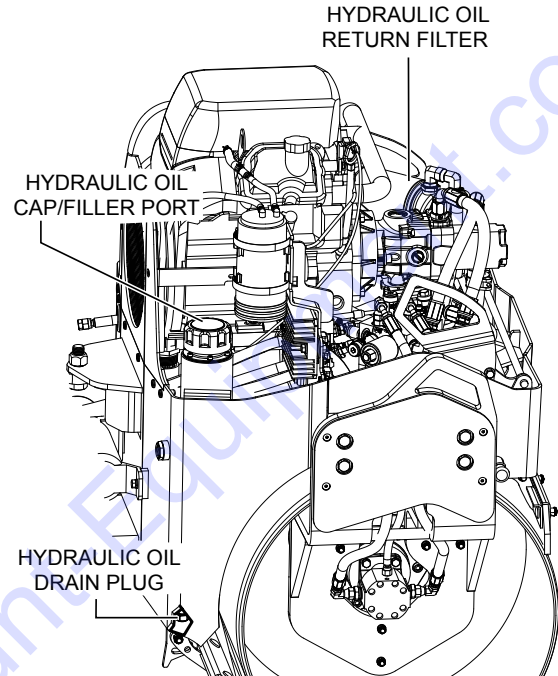


Figure 28. Hydraulic Filter Locations

3. Remove the return filter and install a new filter. Dispose of the used filter in an environmentally friendly manner.
4. Disconnect the suction hose and remove the fitting from the tank. Replace the suction filter. Dispose of the used filter in an environmentally friendly manner. Replace the fitting and reconnect the suction hose.

FREEWHEEL ENGAGEMENT VALVE

NOTICE

The freewheel engagement valve (towing) is only for emergency use. **DO NOT** move roller over 2 MPH or long distances as hydraulic system component failure could result.

This hydraulic system has a freewheel engagement valve allowing hydraulic oil to be bypassed. Open (turn allen wrench counterclockwise) this valve (Figure 29) to engage the freewheel capability of the roller. When the valve is fully opened, ports A and B are allowed to connect, bypassing the oil to and from the drum drive motors.

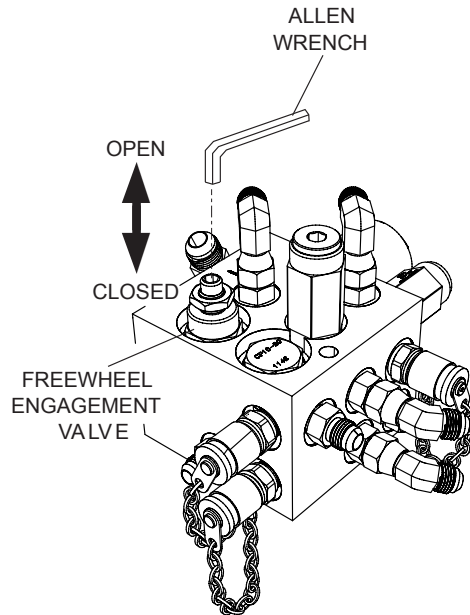


Figure 29. Freewheel Engagement Valve

Remember the freewheel engagement valve should only be used in emergencies when the roller cannot be driven due to engine or hydraulic system problems.

When towing of the roller has been completed, this valve must be closed (turn allen wrench fully clockwise) completely and the lock nut set. Failure to close this valve completely will result in low power, improper speed, and excessive hydraulic oil temperature.

DRUM DRIVE

The drum drive circuit is a series, closed loop system consisting of a hydrostatic pump, two relief valves, a freewheel engagement valve, and front and rear drum drive motors.

The hydrostatic pump is manually controlled by a cable connected to the forward/reverse travel lever located on the right side of the operator seat. When the travel lever is placed in forward, high-pressure oil is supplied by the hydrostatic pump to the valve block (port A). The valve block (manifold) directs this high-pressure oil to the front and rear drum drive motors. Return oil from the motors is returned to the valve block (port B) and is returned to the suction side of the hydrostatic pump.

With the travel lever in reverse position, oil will flow in the opposite direction (port B becomes high-pressure and port A becomes suction).

VIBRATION AND STEERING

The vibration and steering system is an open loop circuit operated by a gear type pump. Separate relief valves control each circuit. This system consist of the gear pump, relief valves, electric vibration control valve, vibration drive motor, steering valve, and steering cylinder.

The vibration circuit is controlled by an electric control valve located on the valve block (manifold). This valve is controlled by the toggle switch mounted on the travel lever.

High-pressure oil is supplied by the pump to the valve block (port P) and is directed to the electric control valve. When the switch is in the "OFF" position, this valve is open allowing oil to go to the steering valve, without driving the vibration motor.

When the switch is in the "ON" position, the electric control valve closes and oil is directed out of port 1 to the vibration motor. Return oil from the motor returns to the valve block via port 2 and is directed to the steering valve.

Steering is controlled by a steering valve and cylinder. The steering wheel is direct coupled to the steering valve controlling the oil flow to the cylinder. Oil supplied from the vibration circuit is directed to port 3 which connects to port P of the steering valve. When steering is not being used, oil passes out of port T of the valve block and returns to the hydraulic tank. When the steering wheel is operated, the steering valve closes and oil is directed to ports L or R to extend or retract the steering cylinder.

RUBBER SCRAPER MAT

Rubber scraper mats have been provided for the cleaning of the front and rear drums. Adjust the scraper mats as close as possible to the drums, using the slotted holes (Figure 30) provided. Replace these rubber mats when they become badly worn. The scraper bars are spring-loaded for easy change-out of rubber mats.

NOTICE

In order for the front scraper bar to lock in place, for easy scraper change, the springs on the inside of the engine cover must be removed.

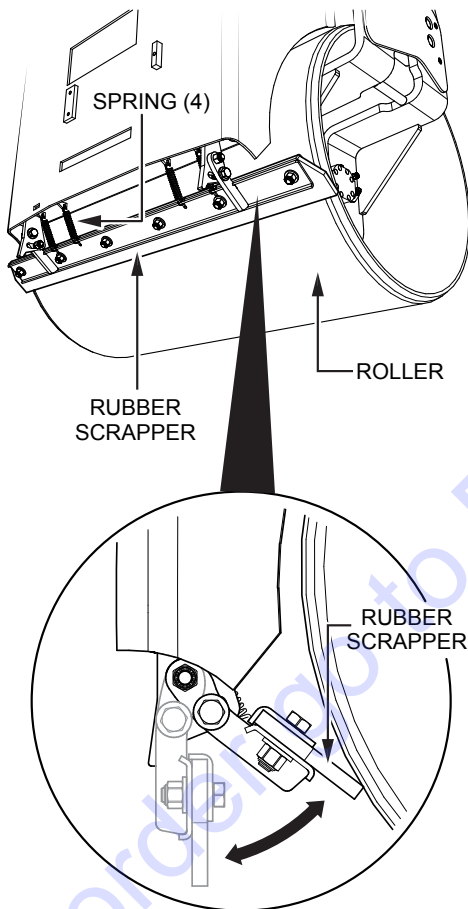


Figure 30. Scrapper Bar Adjustment

FORWARD/REVERSE HYDRAULIC PRESSURE TEST

1. Park the machine on a solid flat surface and stop the engine. Set the parking brake and block the front drum securely.

2. Check hydraulic oil level by viewing the hydraulic oil sight glass. The hydraulic oil level must be below the top and above the bottom of the sight glass. **DO NOT OVERFILL!**
3. Adjust engine RPM ($3,250 \pm 50$ RPM).
4. Let engine run for 5 to 10 minutes, this will bring the hydraulic oil operating temperature to a minimum of 135° F.
5. Check and repair all hydraulic leaks.
6. On the manifold block, install a 5,000 psi pressure gauge (Figure 31) to the forward pressure quick disconnect test port 2.
7. Run engine at full throttle.
8. Move the travel lever to the forward position. **MAKE SURE FRONT AND REAR DRUMS DO NOT SPIN.**
9. Read the pressure gauge. The relief pressure (roller drums blocked) will read $2,900 \pm 145$ psi. Under normal operating conditions this pressure will read 400-600 psi.
10. Return the travel lever to the neutral position and stop the engine.
11. Install the pressure gauge into the reverse quick disconnect port 3 and repeat the above procedures. The relief pressure reading for the reverse test port 3 will be the same (2,900 psi). Again normal operation pressure for the reverse port will be 400-600 psi.
12. Normal operating pressures are based on the machine traveling on level, firm surface. The operating pressures will increase significantly when traveling uphill.

VIBRATION CIRCUIT PRESSURE TEST

1. Place the front drum on soil, gravel, or a heavy rubber mat. **DO NOT ACTIVATE VIBRATION FEATURE ON CONCRETE OR HARD SURFACE!**
2. On the manifold block install a 5,000 psi pressure gauge to quick disconnect test port 1.
3. Start the engine and run at full throttle.
4. To start the vibration, toggle the vibration switch on the travel lever. Under normal operating conditions this pressure will range between 900-1,500 psi.

NOTICE

Vibration relief pressure is hard to read accurately using this test. It may be necessary to disconnect the pressure line to the vibration drive motor. Plug this line and retest, pressure will be exact relief pressure. **DO NOT** perform this test for a long period of time — damage could occur.

STEERING PRESSURE TEST

1. On the manifold block, install a 5,000 psi pressure gauge into quick disconnect test port 1 (Figure 31).
2. Start the engine and run at full throttle.
3. Turn the steering wheel to the left or right (maximum) and hold. Read the steering relief pressure. The relief pressure reading for the steering test port 1 will be 1,000 psi. Again, under normal operating conditions, pressure for the steering port will be between 200-400 psi.
4. If maximum pressure cannot be reached, plug the steering cylinder pressure hoses and retest. If pressure is correct, the steering cylinder is leaking. **DO NOT ACTIVATE THE VIBRATION FUNCTION WHILE PERFORMING THIS TEST!**

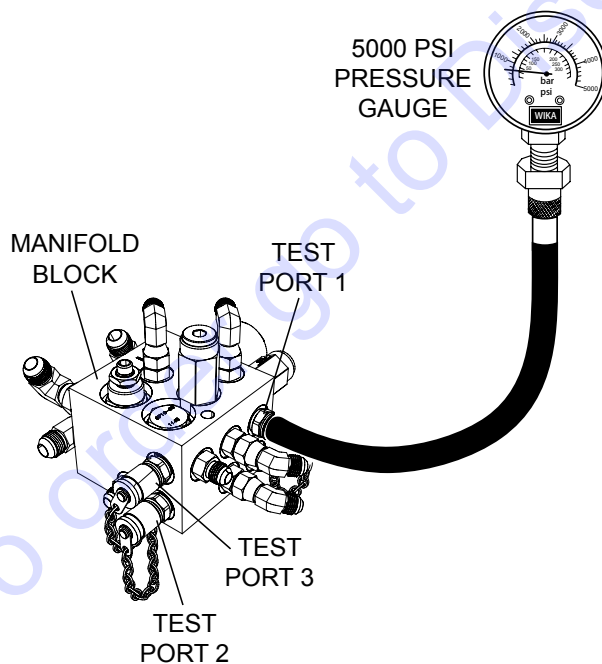


Figure 31. Manifold Test Ports

STEERING RELIEF VALVE PRESSURE ADJUSTMENT

To adjust the relief valve steering pressure perform the following:

1. Insert an 8 mm allen wrench into steering relief port 4 (Figure 36) on the manifold block.

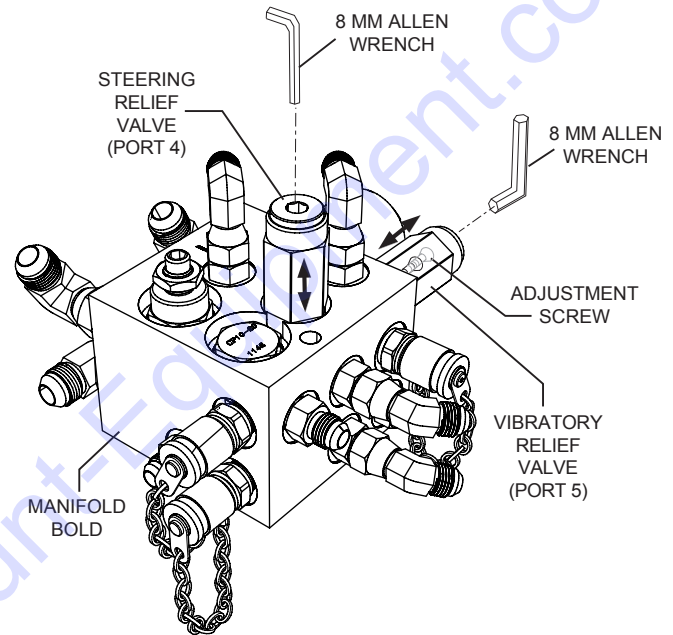


Figure 32. Steering and Vibration Relief Valves

2. On the manifold, connect at 5,000 psi pressure gauge into quick disconnect test port 1.
3. Start the engine and run at full throttle.
4. Turn the steering wheel to the left or right (maximum) and hold. Read the steering relief pressure. The relief pressure reading for the steering test port 1 will should be 1,000 psi.
5. If the steering relief pressure is not 1,000 psi, using the allen wrench adjust the pressure at port 4 until the pressure gauge reads 1,000 psi.

VIBRATION RELIEF VALVE PRESSURE ADJUSTMENT

1. Insert an 8 mm allen wrench into steering relief port 5 (Figure 32) on the manifold block.
2. On the manifold block, insert a 5,000 psi pressure gauge into quick disconnect test port 1.
3. Start the engine and run at full throttle.
4. To start the vibration, toggle the vibration switch located on the travel lever. The relief pressure should read 900 - 1,500 psi.
5. If the vibration relief pressure is not 900 - 1,500 psi, using the allen wrench, adjust the pressure at port 5 until the pressure gauge reads correctly.

REMOVING AND REPLACING HYDROSTATIC PUMP

1. Set the parking brake.
2. Disconnect the battery.
3. Clean the pump and all connections.
4. Mark and disconnect all hoses and lines from the pump.
5. Disconnect the forward / reverse control cable.
6. Disconnect the pump support bracket.
7. Remove the engine mounting bolts.
8. Elevate the pump and engine assembly using a proper lifting device.
9. Disconnect and remove the hydrostatic pump assembly.
10. Repair or replace the hydrostatic pump as required.
11. Install the hydrostatic pump in the reverse order of removal, using Locktite 271 on all mounting bolts and nuts.
12. Test operation. Test and adjust the forward and reverse relief pressures as required. Adjust the forward/reverse control cable.

REMOVING AND REPLACING VIBRATION/STEERING PUMP

1. Remove the hydrostatic pump as per preceding instructions.
2. Remove all hoses and lines.
3. Disconnect the vibration / steering pump and remove.
4. Repair or replace pump as required.
5. Install the pump in the reverse order of removal, using Locktite 271 on all mounting bolts and nuts.
6. Test operation. Test and adjust the forward and reverse pressure relief valves as required. Adjust the forward/reverse control cable. Test and adjust the vibration and steering pressure relief valves as required.

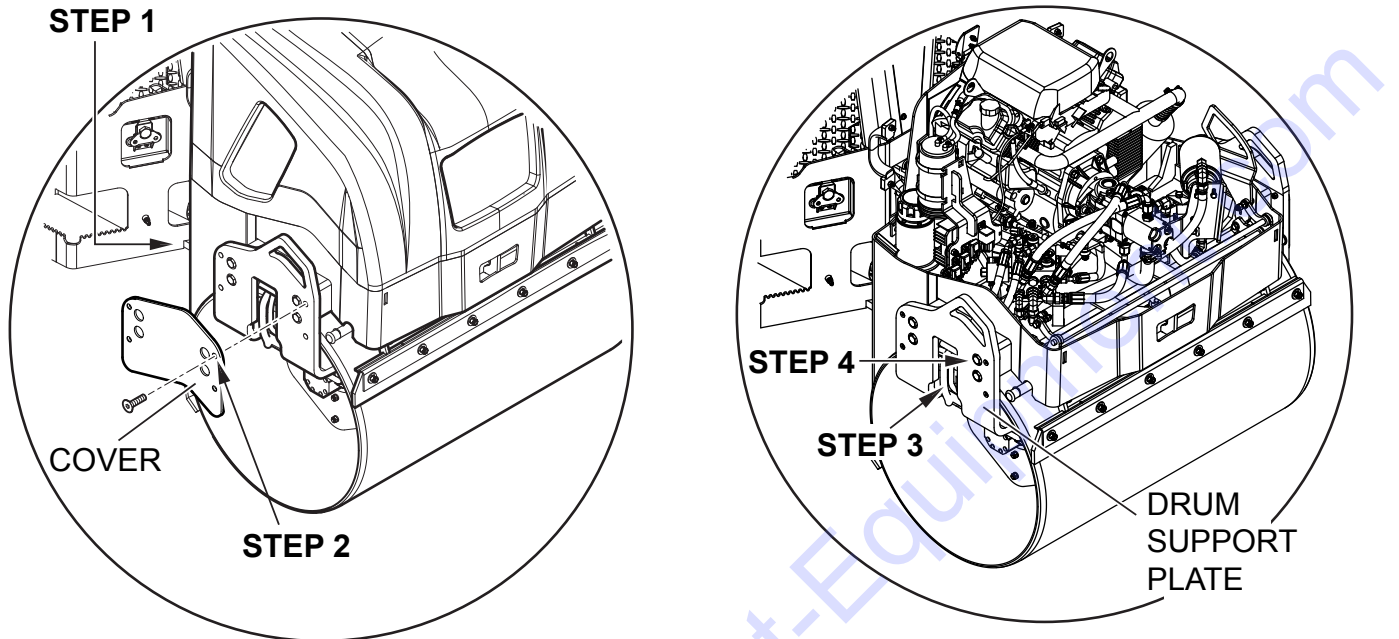
DRUMS AND MAIN FRAME

1. The front drum is designed to apply vibration and compaction force to the operating surface for compaction. This vibration and compaction force is produced when the vibrator shaft is rotated. Maximum efficiency is achieved only when the engine is operated at full throttle.
2. A single drive motor is mounted on the left side of the drum and is shock mounted. This type of drive motor is designed for maximum torque and power.
3. The vibrator is driven by a gear motor coupled to the vibrator shaft. The vibrator assembly rotates inside of a sealed housing containing oil to lubricate the bearings. This side of the drum is also shock mounted.

FRONT AND REAR DRUM DISASSEMBLY

Refer to Figure 33, Figure 34, Figure 35, and Figure 36 for the disassembly of the front and rear drums to access different components that may need to be replaced.

Figure 33 shows the removal of the exciter assembly from the right side of the front drum.



1. JACK FRAME UP SLIGHTLY AT ARTICULATION JOINT.
2. REMOVE 4 ALLEN HEAD SCREWS HOLDING THE COVER OF THE DRUM SUPPORT PLATE AND REMOVE COVER.
3. MARK AND DISCONNECT HOSES FROM MOTOR AND MANIFOLD.
4. REMOVE FOUR BOLTS FROM DRUM SUPPORT PLATE. (BOLTS MAY NEED TO BE HEATED TO REMOVE).

5. REMOVE 6 NUTS SECURING THE 3 SHOCK MOUNTS TO THE SUPPORT PLATE. REMOVE THE SUPPORT PLATE.

NOTE: MOTOR OR SHOCK MOUNTS CAN BE REMOVED AND REPLACED AT THIS POINT.

6. REMOVE THE 6 BOLTS SECURING THE EXCITER PLATE TO THE DRUM WALL.
7. PULL EXCITER ASSEMBLY TO REMOVE FROM DRUM INTERIOR.
8. REVERSE PROCEDURE TO INSTALL EXCITER ASSEMBLY AND REASSEMBLE DRUM. USE LOCKTITE 271 ON ALL BOLT THREADS.

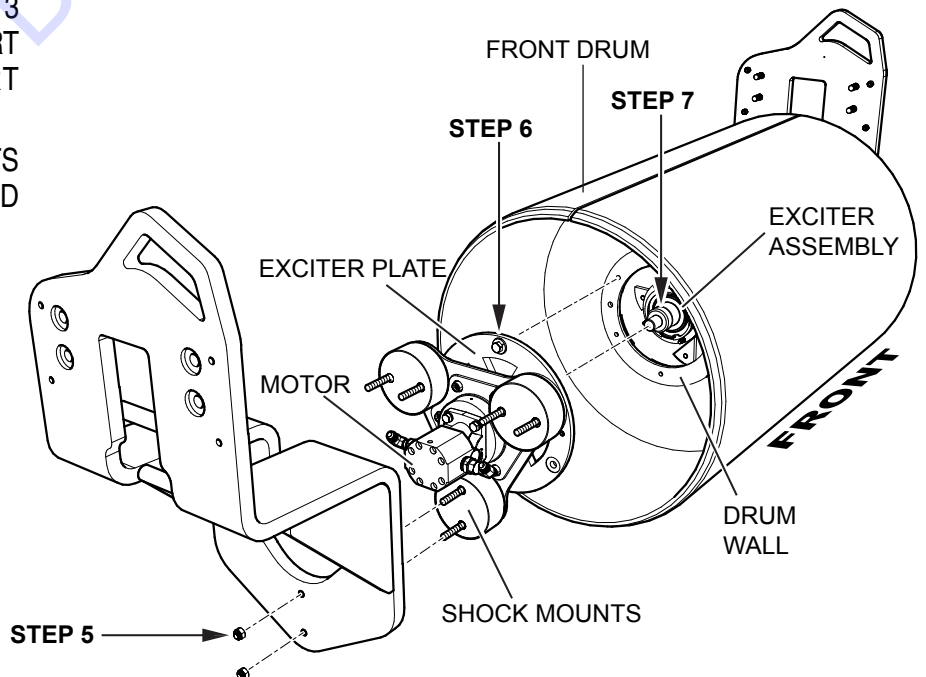


Figure 33. Exciter Assembly Removal/Installation (Front Drum - Right Side)

MAINTENANCE

Figure 34 shows the removal of the motor and shock mounts from the left side of the front drum.

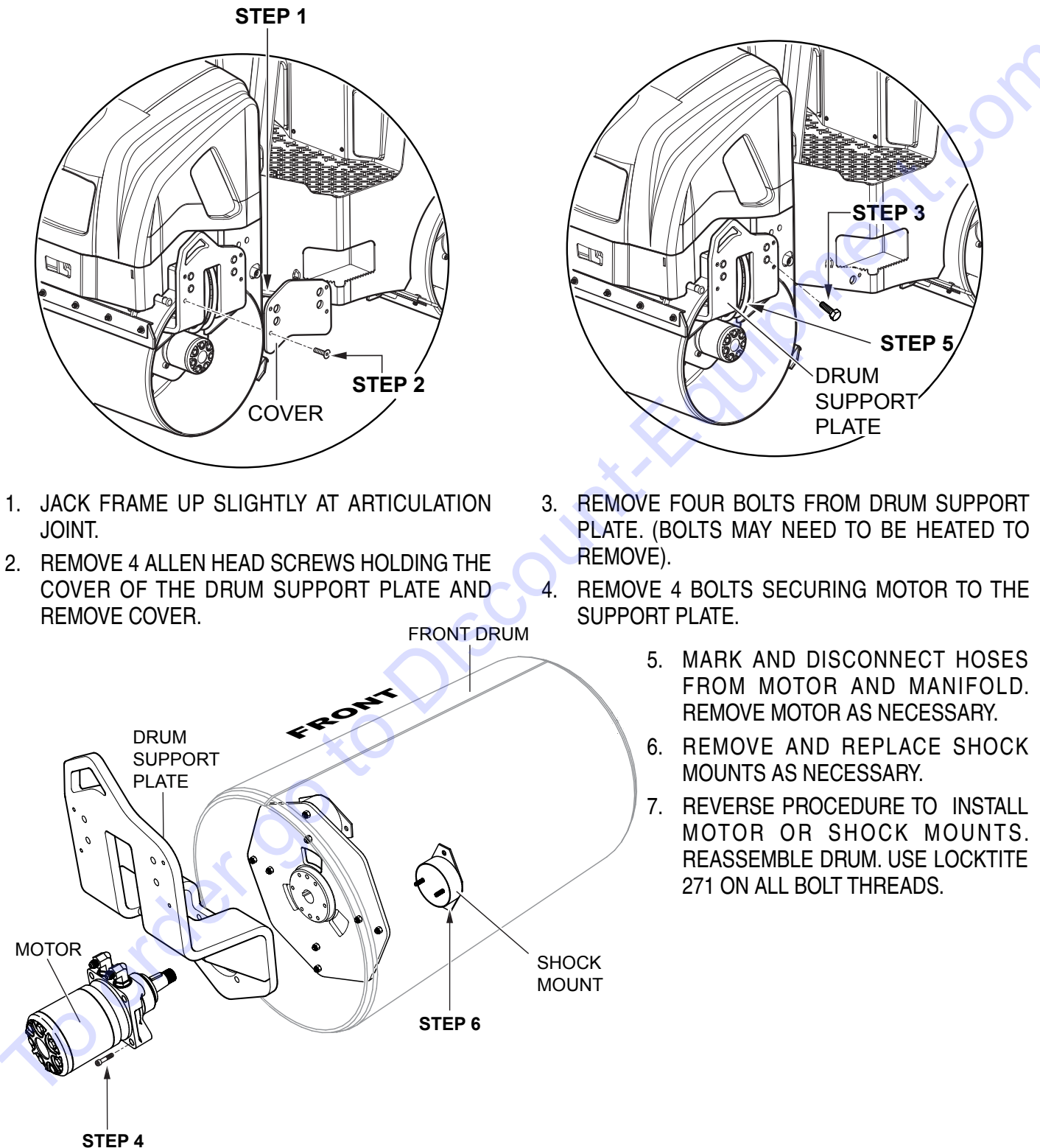
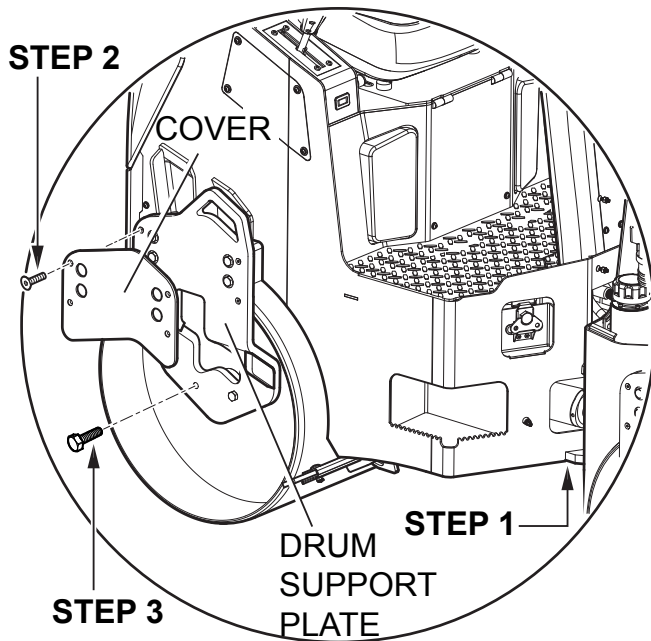


Figure 34. Motor and Shock Mounts Removal/Installation (Front Drum - Left Side)

Figure 35 shows the removal of the bearing from the right side of the rear drum.



1. JACK FRAME UP SLIGHTLY AT ARTICULATION JOINT.
2. REMOVE 4 ALLEN HEAD SCREWS HOLDING THE COVER OF THE DRUM SUPPORT PLATE AND REMOVE COVER.
3. REMOVE FOUR BOLTS FROM DRUM SUPPORT PLATE. (BOLTS MAY NEED TO BE HEATED TO REMOVE).

4. REMOVE THE BEARING.
5. REVERSE PROCEDURE TO INSTALL BEARING AND REASSEMBLE DRUM. USE LOCKTITE 271 ON ALL BOLT THREADS.

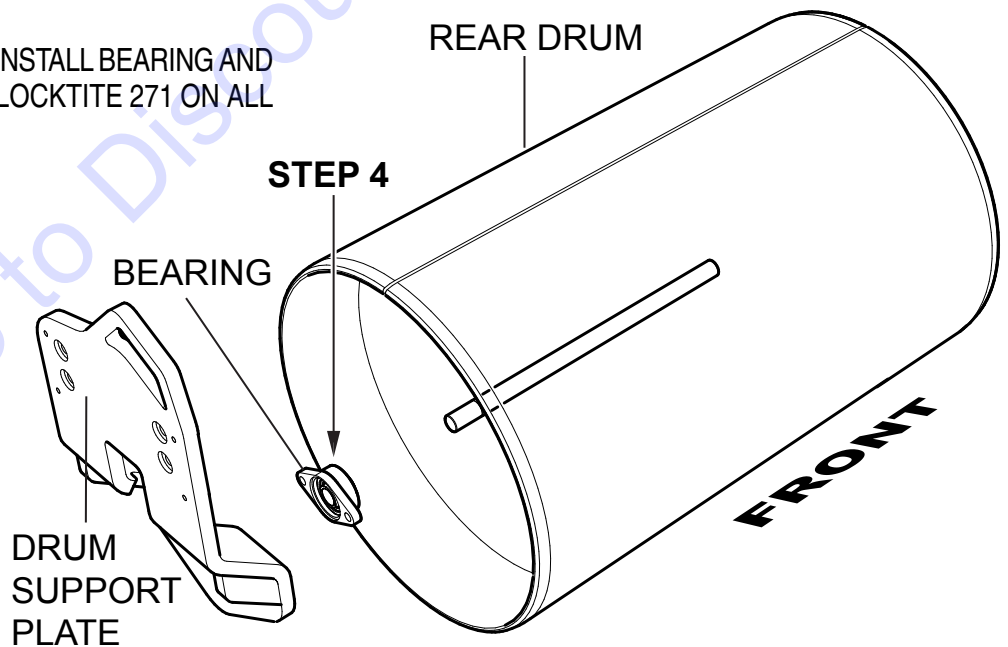
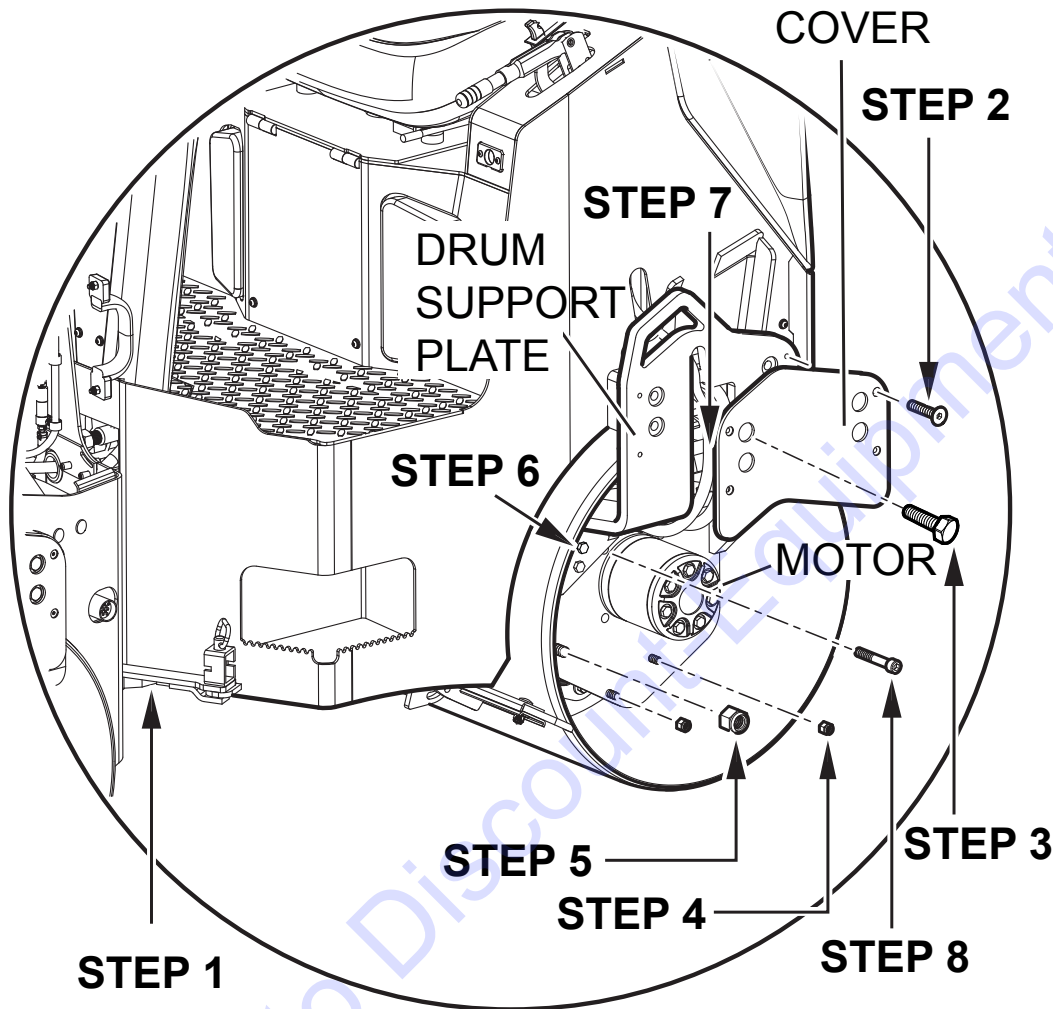


Figure 35. Bearing Removal/Installation (Rear Drum - Right Side)

Figure 36 shows the removal of the motor from the left side of the rear drum.



1. JACK FRAME UP SLIGHTLY AT ARTICULATION JOINT.
2. REMOVE 4 ALLEN HEAD SCREWS HOLDING THE COVER OF THE DRUM SUPPORT PLATE AND REMOVE COVER.
3. REMOVE FOUR BOLTS FROM DRUM SUPPORT PLATE. (BOLTS MAY NEED TO BE HEATED TO REMOVE).
4. REMOVE 2 SMALL NUTS FROM THE LOWER PART OF THE DRUM SUPPORT PLATE.
5. REMOVE LARGE NUT FROM THE LOWER PART OF THE DRUM SUPPORT PLATE.
6. REMOVE 2 BOLTS FROM THE LOWER PART OF THE DRUM SUPPORT PLATE. REMOVE DRUM SUPPORT PLATE.
7. MARK AND DISCONNECT HOSES FROM MOTOR AND MANIFOLD.
8. REMOVE FOUR BOLTS SECURING MOTOR TO THE DRUM SUPPORT PLATE. REMOVE MOTOR.
9. REVERSE PROCEDURE TO INSTALL MOTOR AND REASSEMBLE DRUM. USE LOCKTITE 271 ON ALL BOLT THREADS.

Figure 36. Motor Removal/Installation (Rear Drum - Left Side)

ALTERNATOR/REGULATOR

This roller is equipped with a 20-amp charging system. This system uses three charge coils connected in parallel. The windings of each coil are wound with heavy-duty insulated wire and are further protected by insulating material for long life. A voltage regulator is provided to control the amount of charge voltage being delivered to the 12 volt electrical system. For servicing this charging system, contact Discount-equipment.

NEUTRAL SAFETY SWITCH

The travel lever is provided with a neutral safety switch (Figure 37) that prevents the engine from starting when the lever is in the forward or reverse drive position. Lever must be placed in the neutral position in order for the starter to function.

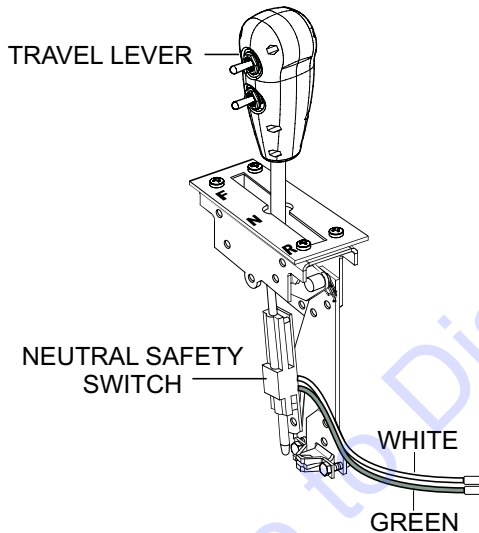


Figure 37. Safety Switch

To check this switch, remove the panel located below and to the rear of the floor. This switch is mounted to the lower forward/ reverse lever mechanism. Disconnect the white and green wires. Place the lever in neutral and test for continuity. Place the lever in forward or reverse; no continuity should be present. Repair or replace as required.

VIBRATOR SOLENOID

The vibrator solenoid (Figure 38) is located in the manifold valve block and is controlled by the vibration switch located on top of the travel lever. This solenoid controls the vibration control valve which supplies hydraulic oil to the vibration drive motor.

To test the vibration solenoid, turn the ignition switch on. Check for proper supply voltage and ground. If proper voltage and ground are present, check the solenoid for continuity. If no continuity, replace the solenoid coil. If continuity is present, place your hand on the solenoid and turn the switch to the ON position; movement should be felt. **DO NOT START THE ENGINE FOR THIS TEST.**

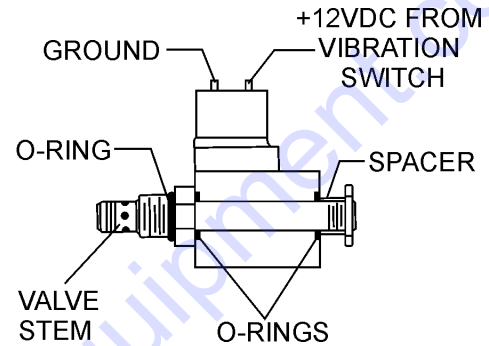


Figure 38. Vibration Solenoid

BATTERY

Mishandling of the battery shortens the service life of the battery and adds to maintenance cost. When handling the battery do the following:

- Be careful not to let the battery electrolyte come in contact with your body or clothing.
- Always wear eye protection and rubber gloves, since the battery contains sulfuric acid which burns skin and eats through clothing.
- Check the battery regularly and make sure that each electrolyte level is to the bottom of the vent well (Figure 42). If necessary, add only distilled water in a well-ventilated area.

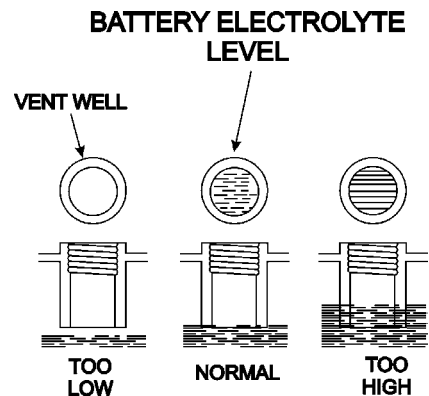


Figure 39. Battery Fluid Levels

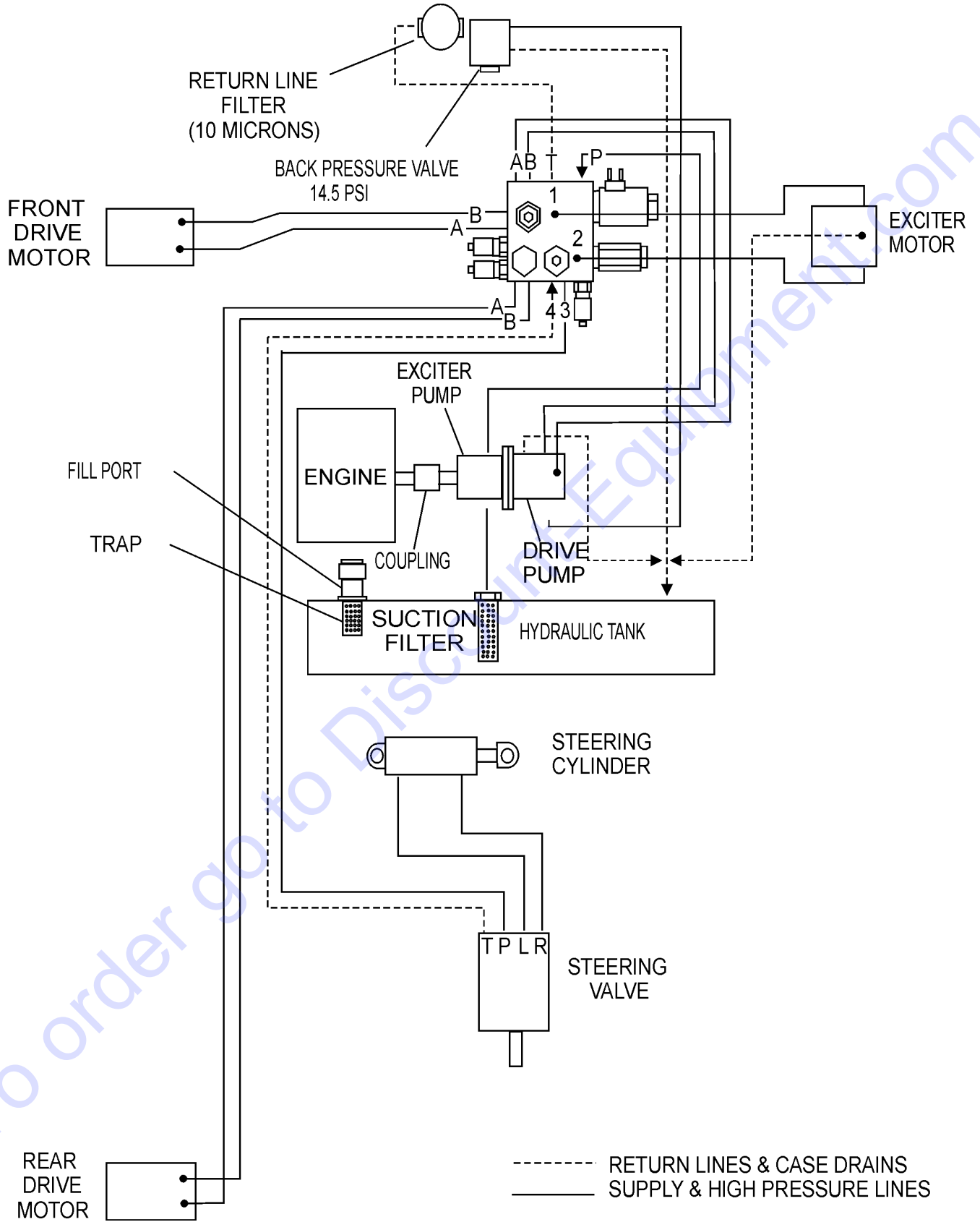
PREPARATION FOR LONG-TERM STORAGE

ROLLER STORAGE

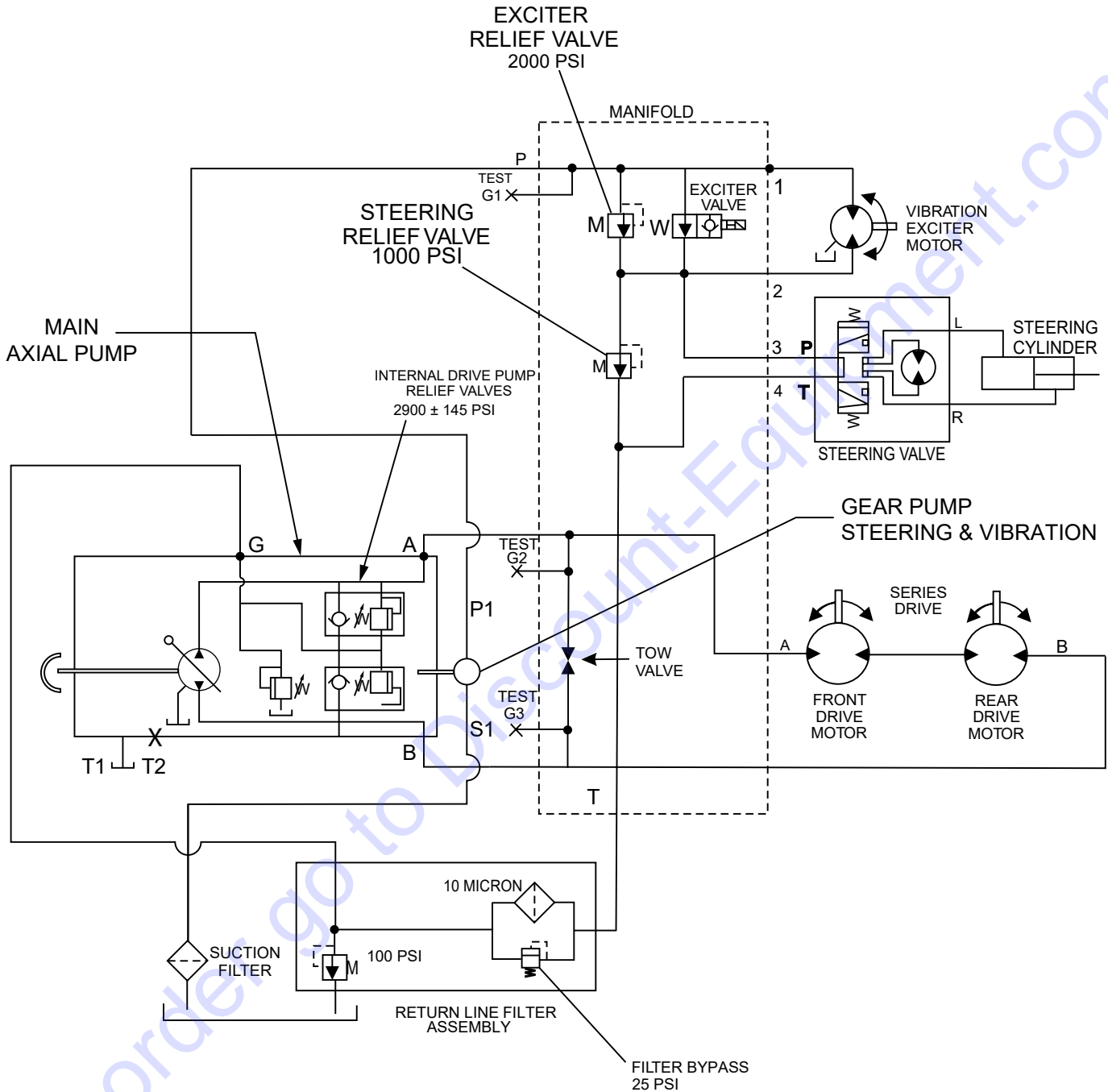
For storage of the roller for over 30 days, the following is recommended:

1. Drain the fuel tank completely, or add STA-BIL to the fuel.
2. Run the engine until the fuel in the injection system is completely consumed.
3. Completely drain used oil from the engine crankcase and fill with fresh clean oil, then follow the procedures described in the engine manual for engine storage.
4. Drain water tank.
5. Clean the entire roller and engine compartment.
6. Remove battery and store it in cool dry place.
7. Cover the roller and place it a clean dry area, that is protected from harsh elements.
8. Remove ignition key, and store in a safe place.

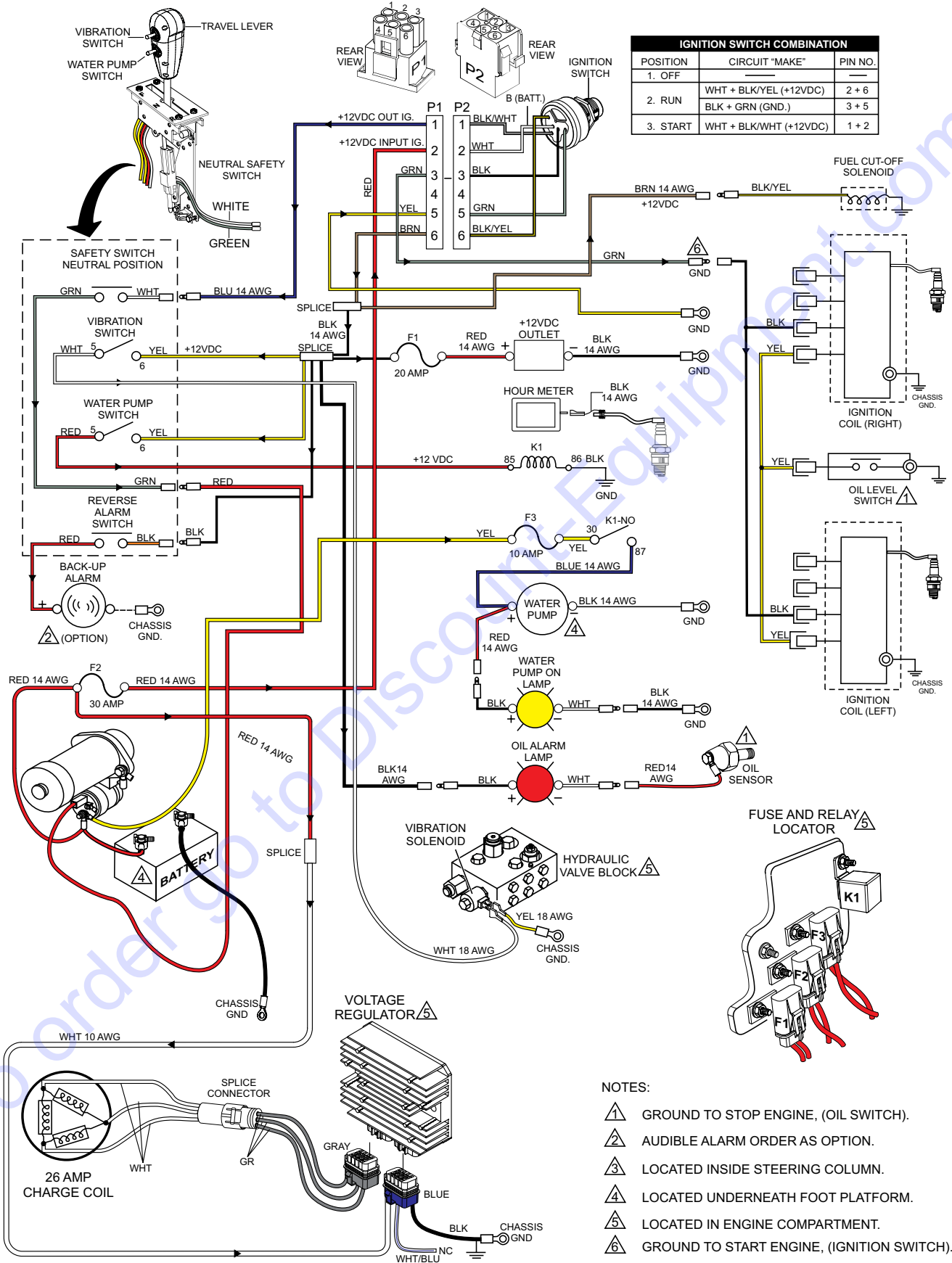
MANIFOLD TEST PORTS



HYDRAULIC SYSTEM DIAGRAM



WIRING DIAGRAM



TROUBLESHOOTING

| Troubleshooting (Roller) | | |
|---------------------------------|--|--|
| SYMPTOM | POSSIBLE PROBLEM | SOLUTION |
| Low Vibration | Low engine RPM? | Check and adjust engine speed. |
| | Low hydraulic pressure? | Check and adjust hydraulic pressure. |
| No Vibration | No voltage to 12 volt solenoid? | Check vibration switch, check coil for continuity. |
| | No oil pressure? | Check for proper oil pressure or defective relief valve. |
| | Broken motor coupler? | Replace coupler. |
| Slow Steering | Low hydraulic pressure? | Check pressure for possible contaminated or defective relief cartridge. |
| | Steering column connector? | Inspect bearings and grease if necessary. |
| | Defective steering cylinder? | Check seals, replace if necessary. |
| Steers Slow in One Direction | Defective steering cylinder? | Inspect cylinder for contamination or cut seals. Replace if necessary. |
| Slow Forward/Reverse Speed | Low hydraulic pressure? | Check pressure, low oil, or contaminated/defective relief valve cartridge. |
| | Rubber scrapper adjustment incorrect? | Check for proper adjustment against drum. |
| | Rubber shock mount loose? | Inspect for broken mount, replace if necessary. |
| | Free wheel valve "open"? | Close valve. |
| | Speed control cable out of adjustment? | Inspect cable and adjust if necessary. |
| Main Hydraulic Pressure Low | Incorrect engine speed? | Adjust engine speed to correct speed. |
| | Rubber shock mounts defective? | Inspect for sheared rubber mounts. |

TROUBLESHOOTING

| Troubleshooting (Engine) | | |
|--|---|---|
| Symptom | Possible Problem | Solution |
| Difficult to start, fuel is available, but no spark at spark plug. | Spark plug bridging? | Check gap, insulation or replace spark plug. |
| | Carbon deposit on spark plug? | Clean or replace spark plug. |
| | Short circuit due to deficient spark plug insulation? | Check spark plug insulation, replace if worn. |
| | Improper spark plug gap? | Set to proper gap. |
| | Spark plug is red? | Check transistor ignition unit. |
| | Spark plug is bluish white? | If insufficient compression, repair or replace engine. If injected air leaking, correct leak. If carburetor jets clogged, clean carburetor. |
| | No spark present at tip of spark plug? | Check transistor ignition unit is broken, and replace defective unit. Check if voltage cord cracked or broken and replace. Check if spark plug if fouled and replace. |
| | No oil? | Add oil as required. |
| | Oil pressure alarm lamp blinks upon starting? (if applicable) | Check automatic shutdown circuit, "oil sensor". (if applicable) |
| Difficult to start, fuel is available, and spark is present at the spark plug. | ON/OFF switch is shorted? | Check switch wiring, replace switch. |
| | Ignition coil defective? | Replace ignition coil. |
| | Improper spark gap, points dirty? | Set correct spark gap and clean points. |
| | Condenser insulation worn or short circuiting? | Replace condenser. |
| | Spark plug wire broken or short circuiting? | Replace defective spark plug wiring. |
| Difficult to start, fuel is available, spark is present and compression is normal. | Wrong fuel type? | Flush fuel system, replace with correct type of fuel. |
| | Water or dust in fuel system? | Flush fuel system. |
| | Air cleaner dirty? | Clean or replace air cleaner. |
| | Choke open? | Close choke. |
| Difficult to start, fuel is available, spark is present and compression is low. | Suction/exhaust valve stuck or protruded? | Reseat valves. |
| | Piston ring and/or cylinder worn? | Replace piston rings and/or piston. |
| | Cylinder head and/or spark plug not tightened properly? | Torque cylinder head bolts and spark plug. |
| | Head gasket and/or spark plug gasket damaged? | Replace head and spark plug gaskets. |
| No fuel present at carburetor. | No fuel in fuel tank? | Fill with correct type of fuel. |
| | Fuel cock does not open properly? | Apply lubricant to loosen fuel cock lever, replace if necessary. |
| | Fuel filter/lines clogged? | Replace fuel filter. |
| | Fuel tank cap breather hole clogged? | Clean or replace fuel tank cap. |
| | Air in fuel line? | Bleed fuel line. |

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