OPERATION MANUAL

MULTIQUIP®

MODELS
AR13HA
AR13HAR
RIDE-ON TANDEM DRUM ROLLER SERIES DRIVE SYSTEM
(HONDA GX630RQZB2 GASOLINE ENGINE)
Serial No. 110301 and ABOVE

Revision #1 (06/18/21)

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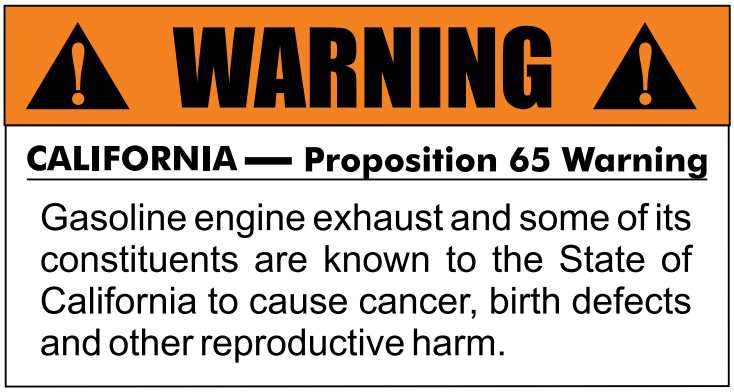
THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.


WARNING
CALIFORNIA — Proposition 65 Warning
Gasoline engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

AR13HA/HAR
Ride-On Tandem Roller

NOTICE

Specifications are subject to change without notice.

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

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.

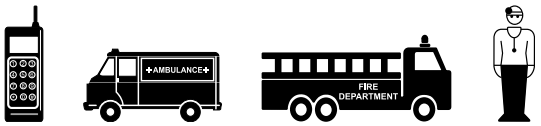
- **ALWAYS** check the equipment for loosened threads or bolts before starting.
- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.
- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.

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.



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 obstaces, 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 are free of bystanders.

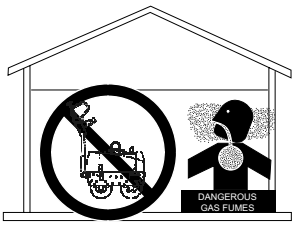
NOTICE

- **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 couplings. 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.

NOTICE

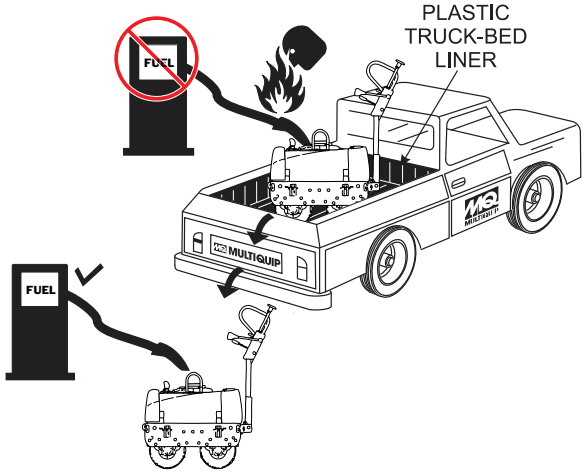
- **NEVER** run engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service air filter frequently to prevent engine malfunction.
- **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating 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 add fuel to equipment if it is placed inside truck bed with plastic liner. Possibility exists of explosion or fire due to static electricity.



- **DO NOT** start the engine near spilled fuel or combustible fluids. Diesel fuel 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.

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.
- Use lifting equipment capable of lifting the weight of the roller.
- Always make sure crane or lifitng 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 securely and close fuel cock to prevent fuel from spilling.
- Use adequate lifting cable (wire or 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.

Table 1. Specifications (Roller)	
Shipping Weight	2,572 lbs. (1,167 Kg.)
Dry Weight	2,428 lbs. (1101 Kg.)
Operating Weight	3,088 lbs. (1,400 Kg.)
Operating Weight w/ Drum Ballast	3173 lbs. (1,439 Kg.)
Overall Length	85 in. (2,159 mm.)
Overall Width	38.25 in. (972 mm.)
Overall Height-ROPS (up)	88 in.(2235 mm.)
Maximum Rolling Width	35.7 in. (907 cm.)
Turning Radius-Inside	109 in. (2,768 mm.)
Ground Clearance	11.5 in. (292 mm.)
Curb Clearance	7.75L, 19.0R (197 mm., 483 mm.)
Wall Clearance	1.75L, 1.25R (45 mm., 32 mm.)
Wheelbase	45 in. (1,143 mm.)
Drum Width	35.7 in. (907 mm.)
Drum Diameter	22.6 in. (574 mm.)
Drum Thickness	0.38 in. (10.0 mm.)
Centrifugal Force 2,400 - 2,700 rpm	3,100 Lbs. (1,406 Kg.)
Vibrations per minute 2,400 - 2,700 rpm	4,000 VPM
Dynamic Linear Force per Drum 2,400 - 2,700 rpm	87.5 Lbs./in. (39.6 Kg./cm.) (front only)
Oscillating Angle	11 degrees
Hydraulic Oil Tank Capacity	5.7 U.S. Gallons (21.6 Liters)
Cooling System	Air
Fuel	Gasoline
Fuel Tank Capacity	9.5 U.S. Gallons (36 Liters)
Water Tank Capacity	40 Gallons (181 Liters)
Battery	12 Volt Group Type U1
Travel Speed -variable-	0-4.8 MPH (0-7.7 KPH)
Grade Ability w-w/o Vibration	15 degrees (27%)

Table 2. Specifications (Engine)	
Model	Honda GX630RQZB2 Engine
Type	Air-Cooled 4 Stroke, Overhead Valve, 2 cylinders (90 degree V-Twin), Gasoline Engine.
Piston Displacement	37.5 cu. in. (614 cc)
[Bore x Stroke]	[3.03 in. x 2.60 in. (77 mm x 66 mm)]
Max. Output	20 hp (13.4 KW, 18.3 PS) at 3,600 rpm
Max. Governed Speed, No Load	3,500 rpm
Max. Torque	31.8 lbf-ft. at 2,500 rpm
Cooling System	Forced Air
Engine Oil	SAE-10W-30 for general use
Engine Oil Capacity (with oil filter replacement)	1.90 qts. (1.80 liters)
Engine Oil Capacity (without oil filter replacement)	1.59 qts. (1.50 liters)
Fuel	Unleaded gasoline
Fuel Consumption	0.51 lb/hph (313 g/kWh, 230 g/PSh)
Spark Plug Type	NGK: ZGR5A
DENSO: J16CR-U	22.6 in. (574 mm.)
Idle Speed	1,400 +/- 150 rpm
PTO Shaft Rotation	Counterclockwise

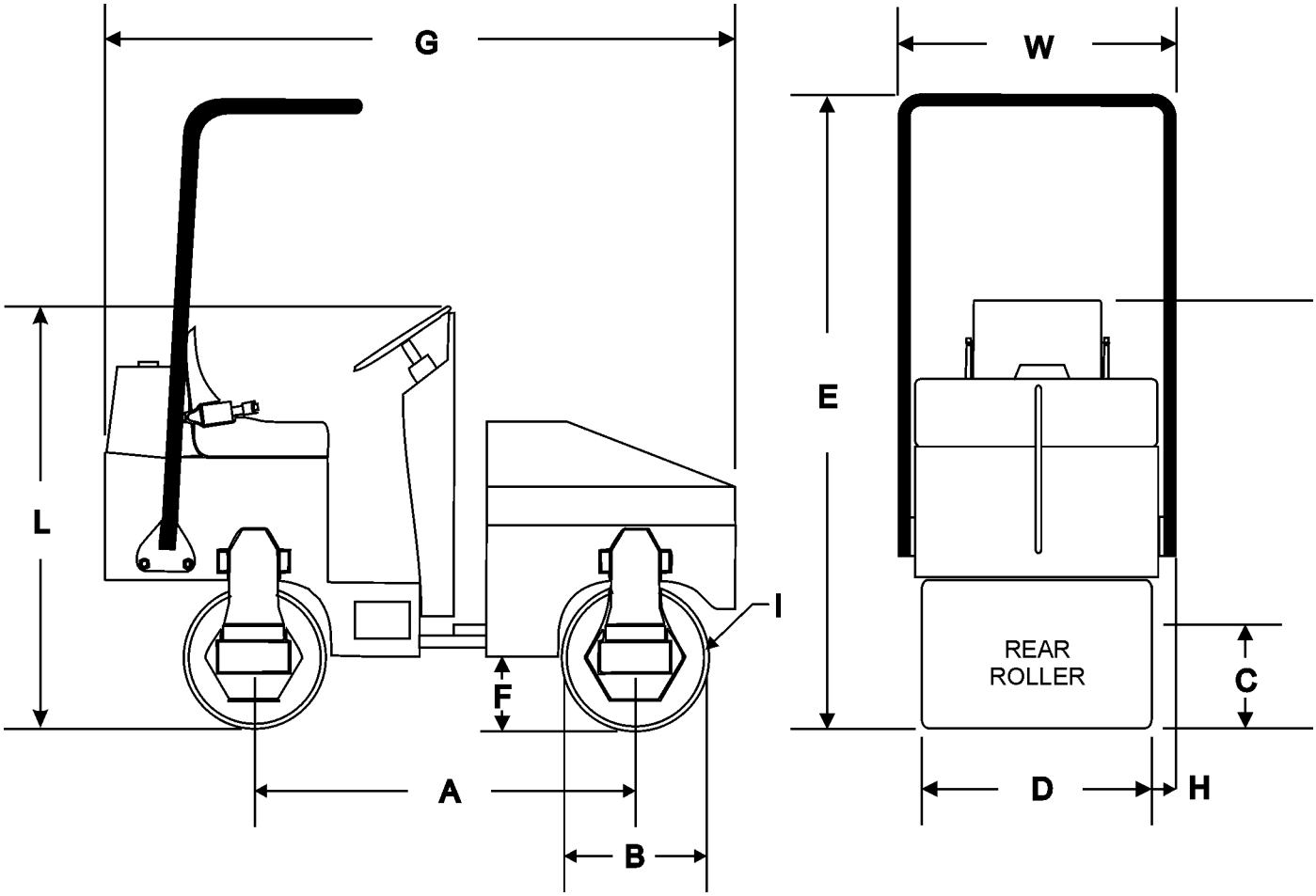


Figure 1. Roller Dimensions

Table 3. Dimensions (Roller)		
Wheelbase	A	45.0 in. (1,143 mm.)
Drum Diameter	B	22.6 in. (574 mm.)
Curb Clearance	C	7.75 in. Left, 19.0 in. Right (197 mm., 483 mm.)
Drum Width	D	35.7 in. (907 mm.)
Overall Height (with ROPS)	E	88 in. (2,235 mm.)
Ground Clearance	F	11.5 in. (292 mm.)
Overall Length	G	85 in. (2,159 mm.)
Wall Clearance	H	1.75 in. Left, 1.25 in. Right (45 mm., 32 mm.)
Drum Thickness	I	.38 in. (10 mm.)
Overall Width	J	38.25 in. (972 mm.)
Seat Height	K	63 in. (1,600 mm.)
Steering Wheel	L	60 in. (1,524 mm.)

The AR13HA/HAR roller has been designed for asphalt application and compaction of granular soils used in site preparation. Use the machine only for the purpose intended and by experienced personnel who understand this operation manual and all safety decals. Typical applications for this roller are driveways, patch work and road repairs. Standard features included with this roller are articulated steering, double drum hydrostatic drive, front drum vibration, high curb clearance and on-board water capability.

POWER PLANT

The AR13HA/HAR roller is powered by a Honda GX630, air-cooled, gasoline engine rated at 20 hp @3,500 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 parallel 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.

COMPACTION SYSTEM

The compaction force is delivered by a 36-inch wide steel drum with beveled edges to help prevent asphalt marring. A fully enclosed hydrostatic 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 oil to lubricate the bearings.

A pushbutton switch located on top of the gearshift lever, when pressed, activates a hydraforce valve that engages or disengages the vibratory action. The drum's vibratory action generates 3,100 lbs. (1,406 Kg.) of centrifugal force at a frequency of 4,000 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 3,088 lbs (1,400 Kg.), but can be increased to 3,309 lbs (1,500 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 109 inches (2.77 meters).

SPRINKLER SYSTEM

A 40-gallon (181 liters) water tank with a gravity feed spray bar is provided for wetting the roll for asphaltic pavement rolling.

The water system is fully adjustable from the operator's position by adjusting the two water valves. The front valve controls the water supply to the front drum, and the rear valve controls water to the rear drum.

Before starting an asphalt rolling job, be sure all spray bar holes are clear of dirt or foreign matter and are working. Always use clean fresh water in the water tank. To prevent rust and foreign debris from clogging the spray bar holes, drain and flush water tank and spray bars every 30 days.

LIFTING THE ROLLER

When lifting of the roller is required, attach a suitable hook or shackle to the lifting eye 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 lbs. (1,814 Kg).

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.

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.

CAUTION

ONLY use approved certified lifting devices capable of lifting at least 4,000 lbs. (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 exist 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 rater than from side to side. For safe operation hillside slopes should not exceed 12 degree (27 % grade). See Figure 2.

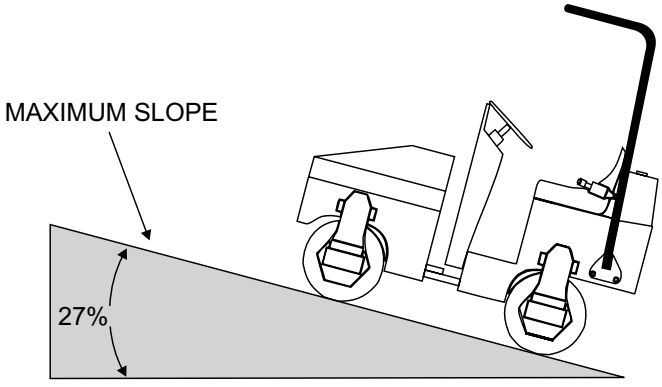


Figure 2. Recommended Slope

TIPPING (ROLLOVERS)

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.

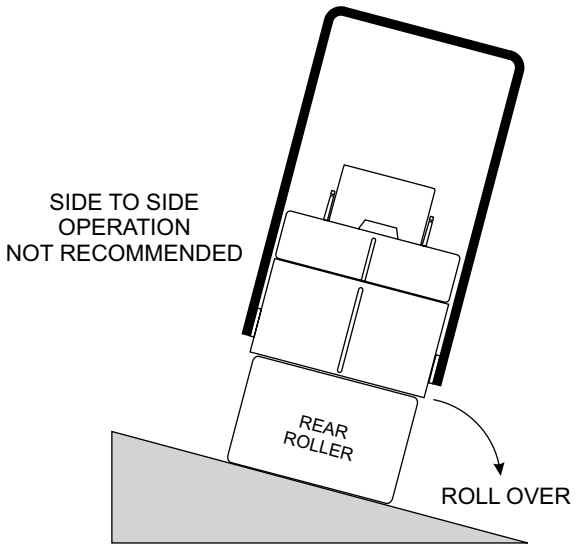


Figure 3. Tipping (Rollover)

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 your nearest authorized Multiquip dealer for instructions or servicing.

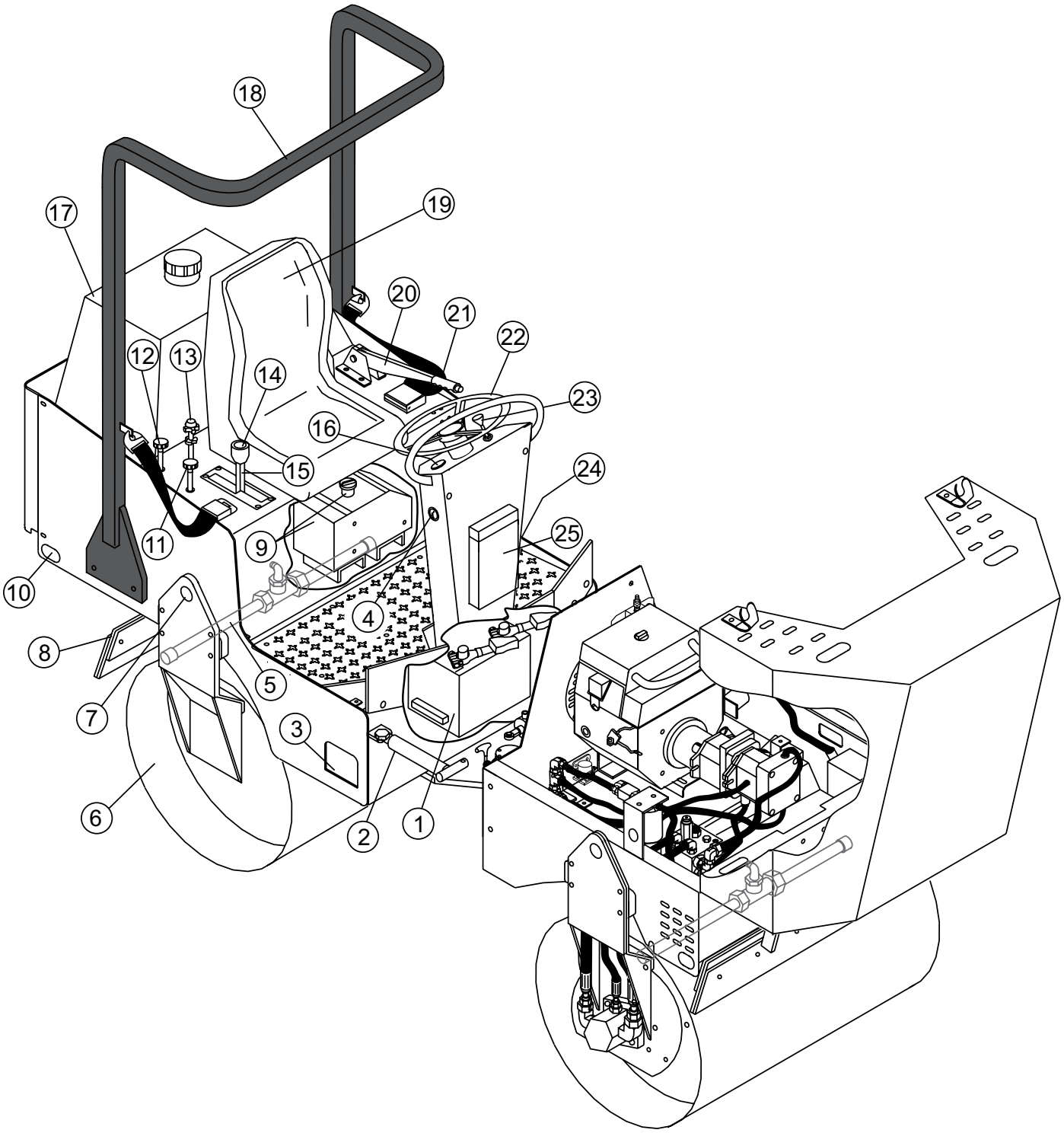
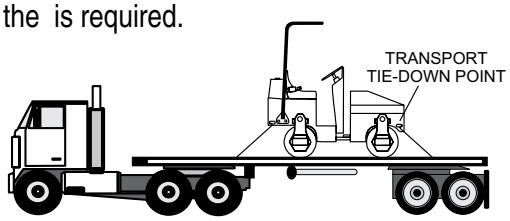


Figure 4. Roller Components

Figure 4 shows the location of the components and basic components for the AR13HA compaction roller. The function of each component or control is described below:

1. **Battery** — Provides +12VDC to the electrical system, and is located underneath foot plate. Replace only with recommended type battery, see specification Table 1.
2. **Articulating Locking Bar** — Always make sure that the articulating locking bar is engaged during lifting, transport and maintenance.
3. **Foot Step** — To lift yourself onto the roller's platform, place foot into foot step, then grab hold of hand rail.
4. **Ignition Switch** — With key inserted, turn clockwise to start the engine.
5. **Rear Sprinkler System** — A gravity feed spray bar is provided for the wetting the roll for asphalt pavement.
6. **Rear Roller** — This roller is a 30 inch wide steel drum with beveled edges (no vibration). The beveled edges help prevent asphalt marring.
7. **Lifting Point** — Attach a crane or suitable lifting device to this point when lifting of the roller is required.
8. **Rear Scrapper** — This adjustable rear scrapper blade helps prevent the buildup of material between the drum and frame.
9. **Fuel Tank/Fuel Gauge** — The fuel capacity of the fuel tank is 9.5 gallons (36 liters). Read the gauge on top of the fuel cap to determine if fuel level is low. Fill with unleaded type gasoline. To gain access to the fuel tank, tilt the front seat forward. Fuel tank has a spill containment feature.
10. **Tie-Down Transport Point** — Attach a chain or suitable tie-down device to this point when transporting of the is required.



11. **Front Spray Control Valve** — This valve controls the flow of water to the front spray bar. Turn the water valve to the open position (counterclockwise) to let water flow, return this valve to the closed position (clockwise) when water is not required.
12. **Rear Spray Control Valve** — This valve controls the flow of water to the rear spray bar. Turn the water valve to the open position (counterclockwise) to let water flow, return this valve to the closed position (clockwise) when water is not required.
13. **Throttle Control** — Pull all the way out to achieved maximum engine RPM's. To idle the engine, push the RED stop button inwards all the way.
14. **Vibration Control Button** — Press this button to activate the eccentric that will produce a vibration frequency of 4,400 vpm (vibrations per minute). Pressing the button again will stop the vibrations.
15. **Shift 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.
16. **Hourmeter** — Indicates the number hours the unit has been in use.
17. **Water Tank** — Remove filler cap and fill with water. Water tank capacity is 40 gallons (181 liters). To determine if water level is low, visually inspect water level gauge (tube) at rear of roller. Add water as necessary.
18. **Roll-Over Bar** — This unit may be equipped with a Roll Over Protection System (ROPS option) to protect the operator when the roller is used on slopes, open trenches, sharp turns, slippery surfaces or objects in the rollers's path of travel.
19. **Operator's Seat** — A contoured seat that provides visibility of both front rear drum edges during operation. NEVER start the roller unless seated in the operator's seat.
20. **Parking Break Lever** — Pull the lever upward to set the parking break. To release the parking break, press and hold the button on top of the lever and push lever downward.
21. **Seat Belt** — When using the roller in working conditions always have the operator wear the seat belt. NEVER use the roller without a seat belt. If the seat belt becomes worn or damaged, have it replaced immediately.
22. **Steering Wheel** — Use this wheel to steer the roller.
23. **Choke Knob** — Used in the starting of a cold engine, or in cold weather conditions. The choke enriches the fuel mixture.
24. **Hydraulic Motor** — This hydraulic motor provides control for the rear of the roller
25. **Documentation Box** — Store and maintain Operation, Parts, and Engine manuals in this box at all times.

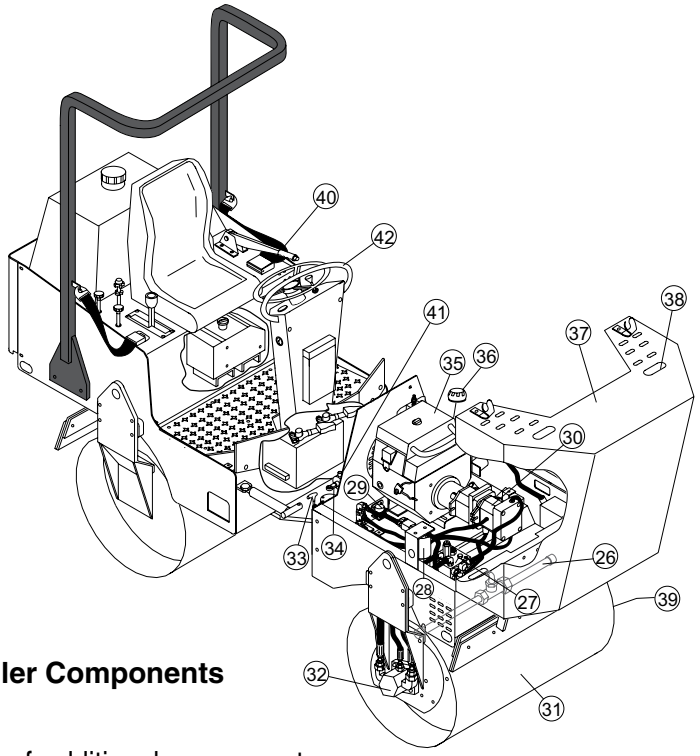


Figure 5. Additional Roller Components

Figure 5 shows the location of additional components for the AR13HA compaction roller. The function of each component or control is described below:

26. **Front Sprinkler System** — A gravity feed spray bar is provided for the wetting the roll for asphalt pavement.
27. **Hydraulic Manifold** — Aluminum block that controls the flow of hydraulic pressure to the various hydraulic motors and other components required to control the roller.
28. **Hydraulic Oil Filter** — Filters return oil from the front and rear hydrostatic motors.
29. **Accessory Relay** — Provides the +12VDC necessary to run the roller's electrical accessories.
30. **Hydraulic Pump** — This unit incorporates an axial variable displacement hydraulic piston pump.
31. **Front Ride-on Tandem Drum Roller** — This roller is a 30 -inch wide steel drum with beveled edges. The beveled edges help prevent asphalt marring.
32. **Hydraulic Motor** — This hydraulic motor controls the rotation of the vibratory system.
33. **Latch** — Pull this latch upward and back to gain access to the engine/pump compartment. There is one latch located on each side of the unit.
34. **Steering Cylinder** — Controls direction of roller.
35. **Engine** — This unit incorporates a HONDA GX630, air cooled engine rated at 20 hp at 3,500 rpm.
36. **Hydraulic Fluid Filler Port** — Remove this cap to add hydraulic fluid. Fill with type ISO 46 anti-wear hydraulic fluid.
37. **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 latches located on each side of the hood.
38. **Compartment Hood Lift Point** — Place hand here then lift upwards to lift compartment hood.
39. **Hydraulic Motor** — This hydraulic motor drives the roller during operation.
40. **Rear Drum Zerk Grease Fitting** — Grease this fitting bi-weekly. See maintenance section of this manual.
41. **Articulation Zerk Grease Fitting** — Grease this fitting once a year. See maintenance section of this manual.
42. **Hand Rail** — Grab hold of this hand rail when lifting yourself onto the operator's platform.

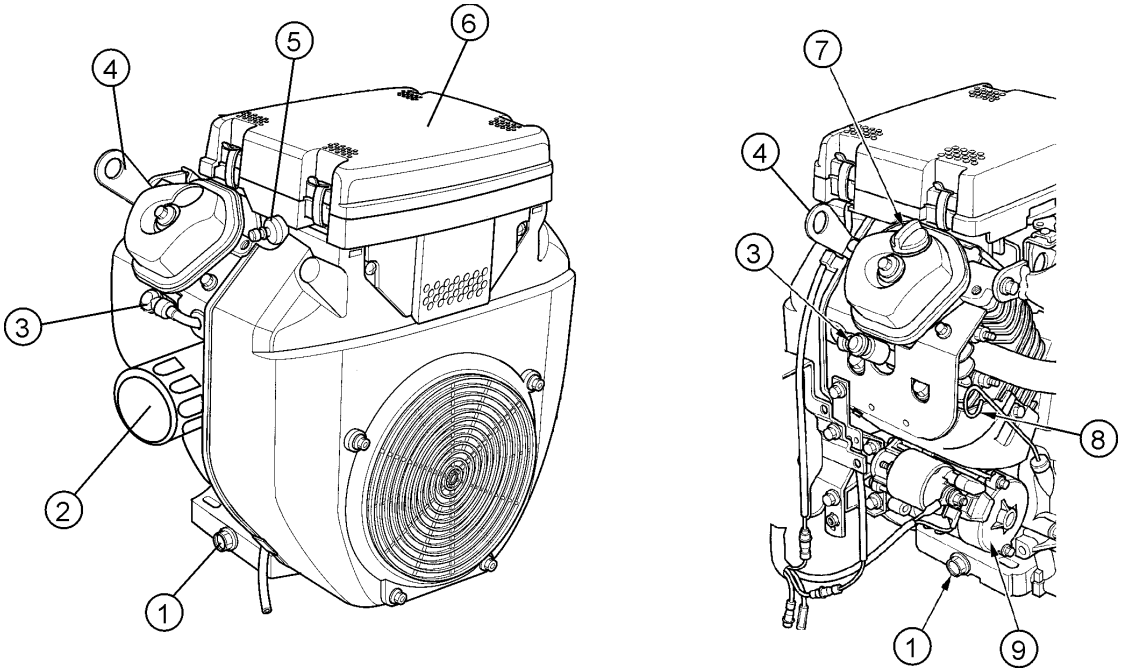


Figure 6. Engine Components

The engine (Figure 6) 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 Dip Stick** — Remove to check amount and condition of oil in crankcase. Refill or replace with recommended type oil as listed in Table 4.
9. **Starter** — Starts engine when ignition key is rotated to the "ON" position.

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 7) and wipe it clean.

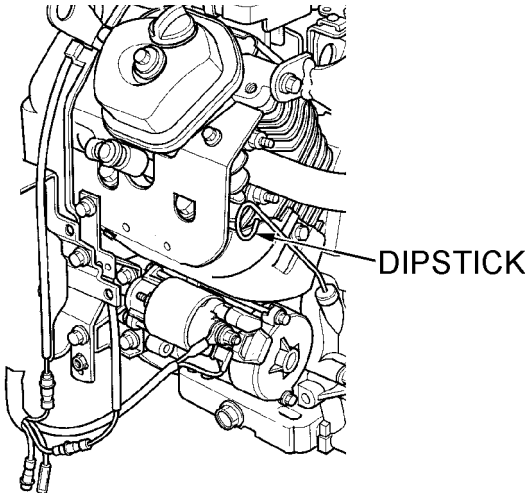


Figure 7. Engine Oil Dipstick (Removal)

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 8).

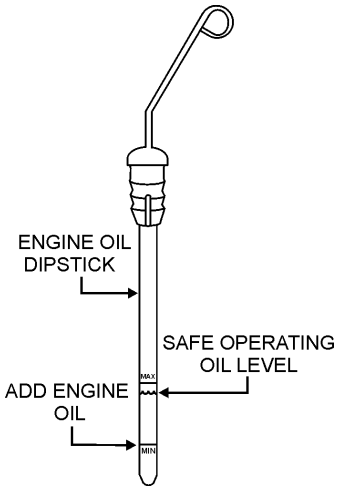


Figure 8. Engine Oil Dipstick Level

4. If the oil level is low, remove the oil filler cap (Figure 9) 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 1.90 quarts (1.8 liters).

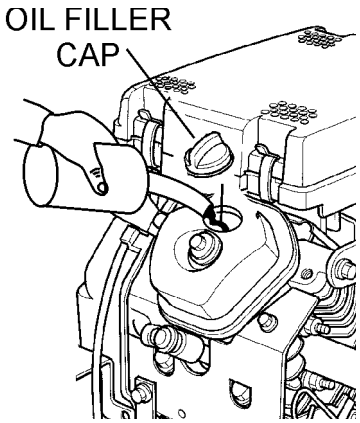


Figure 9. Engine Oil Filler Port

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 be sure to 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 pump 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 10) forward to gain access to the fuel tank.

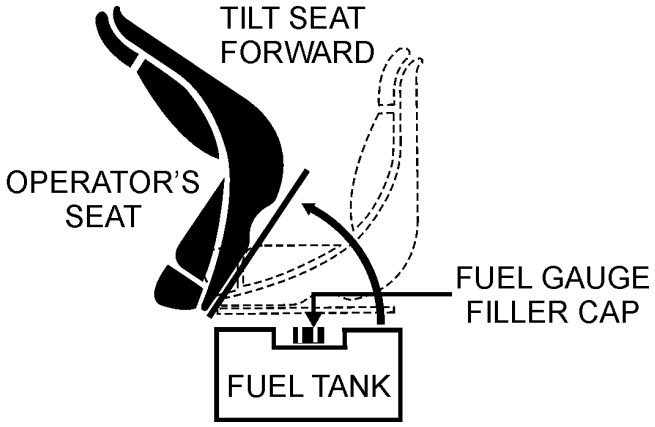


Figure 10. Fuel Tank Access

3. Read the fuel gauge (Figure 11) located on top of the fuel tank to determine if fuel level is low.

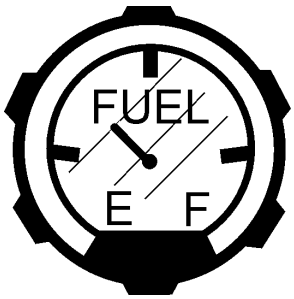


Figure 11. Fuel Gauge

4. If the fuel level is low, remove the fuel filler cap/gauge and fill with unleaded gasoline. Wipe up any spilled fuel immediately.
5. Pay attention to the fuel tank capacity when replenishing fuel (Figure 12). Refer to the fuel tank capacity listed on the specifications table.

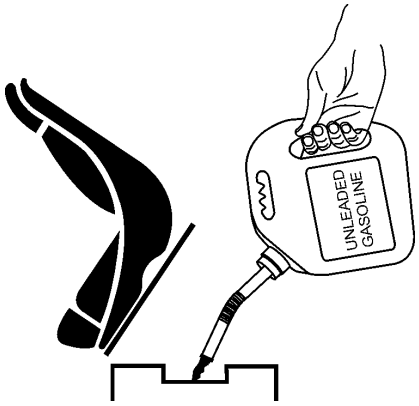


Figure 12. Adding Fuel

6. After replenishing fuel, make sure fuel cap is securely tighten 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!

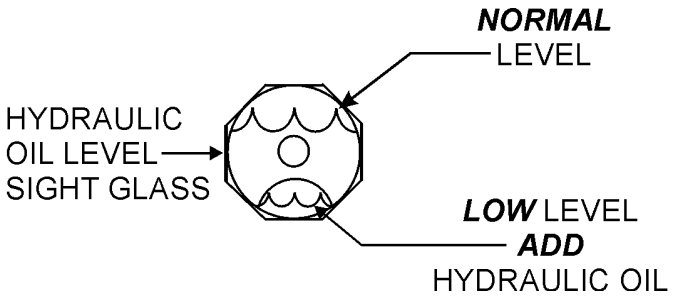


Figure 13. Hydraulic Oil Sightglass

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.

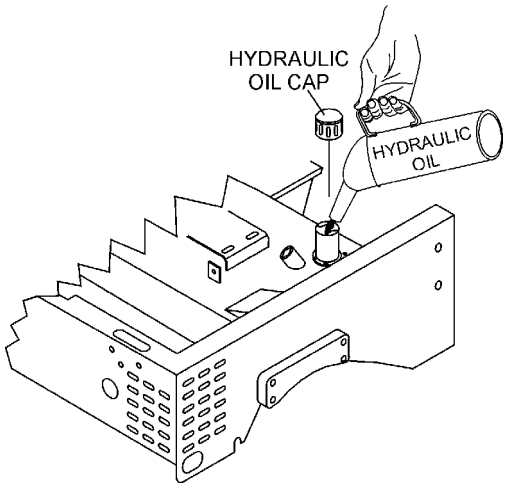


Figure 14. Hydraulic Oil Reservoir Filler Port

WATER TANK CHECK

1. To check the water tank water level, place the roller on secure level ground.
2. The amount of water inside the water tank can be visually inspected by reading the water tube (Figure 15) that runs vertically along the water tank at the rear of the roller. This tube indicates the amount of water inside the water tank. Total tank capacity is 40 gallons (181 liters.)

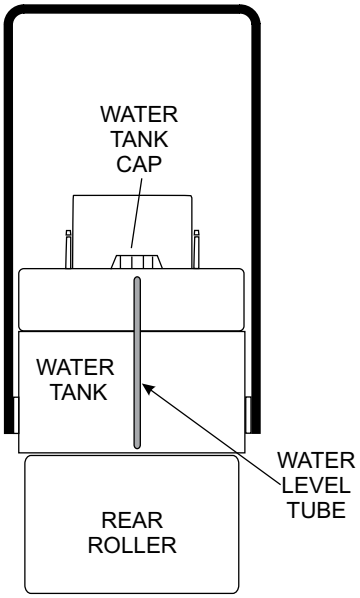


Figure 15. Water Tank

BATTERY CHECK

A 12-volt DC battery (Figure 16) is shipped dry, and will require a proper electrolyte level for operation.

ALWAYS be sure that the battery cables are properly connected to the battery terminals as shown below. 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.

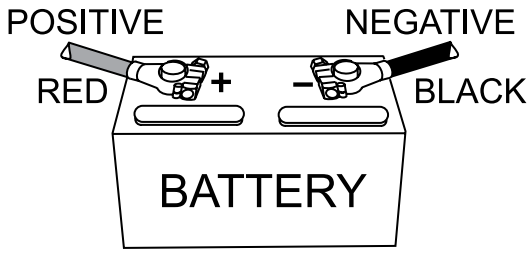


Figure 16. Battery

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.

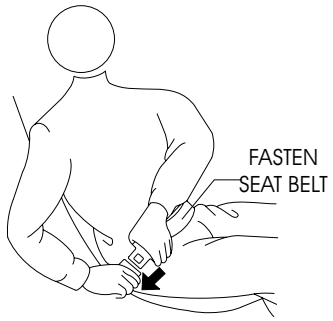


Figure 17. Securing Seat Belt

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 shift lever (Figure 18) is placed in the neutral position.

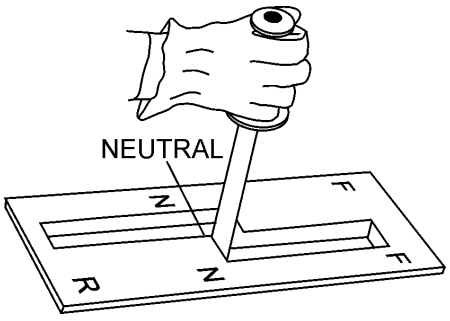


Figure 18. Shift Lever

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.
6. PUSH the "RED" button (Figure 19) on the throttle control and pull the round black knob about halfway out. Make sure that the throttle lock knob has been disengaged.

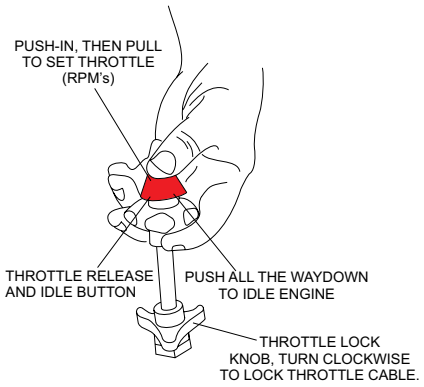


Figure 19. Throttle Control

7. Insert the ignition key into the ignition (Figure 20), then turn and hold the key in the clockwise position until the engine starts, release key.

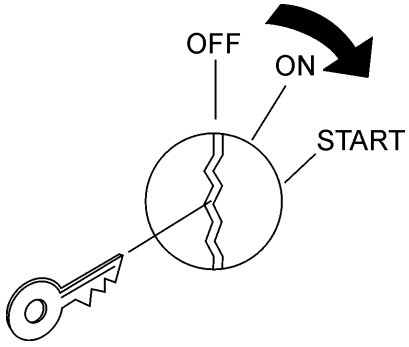


Figure 20. Ignition Switch

8. If the engine does not start, repeat steps 1 through 7 or consult the troubleshooting guide contained in this manual.
9. 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, press and hold the release button (Figure 21) pull up slightly on the parking lever, then push the parking brake lever all the way down.

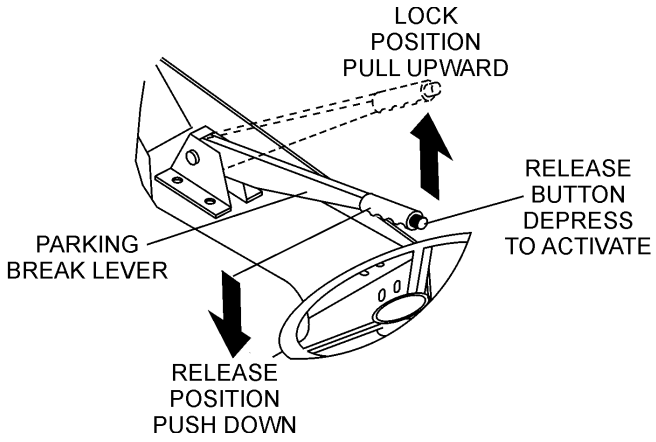


Figure 21. Brake Release Lever

SHIFT LEVER

1. To make the roller move in a forward direction, move the shift lever forward as shown in Figure 22.

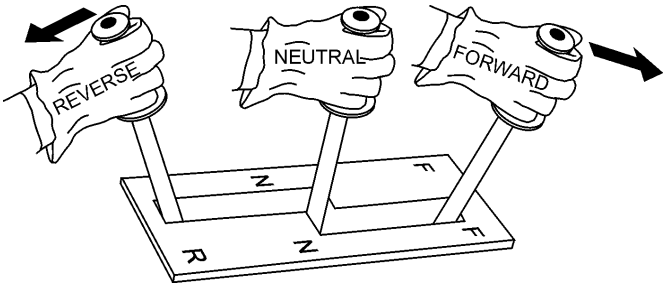


Figure 22. Shift Lever

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 over 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, press the vibratory pushbutton switch located on top of the travel lever as shown in Figure 23. The pressing of this switch will generate 3,100 lbs. (1,406 Kg.) of centrifugal force at a frequency of 4000 vpm (vibrations per minute) to the front drum.

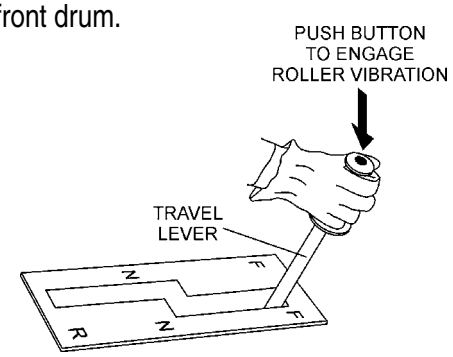


Figure 23. Vibration Pushbutton Switch

2. To stop the vibratory action, press the vibratory pushbutton switch again.

SPRINKLER CONTROLS

If the application requires the wetting of a surface, front and rear drum sprinkler controls have been provided. These controls (Figure 24) are located to the bottom right of the operators seat. The front valve controls the water supply to the front drum spray bar and the back valve controls water flow to the back drum spray bar.

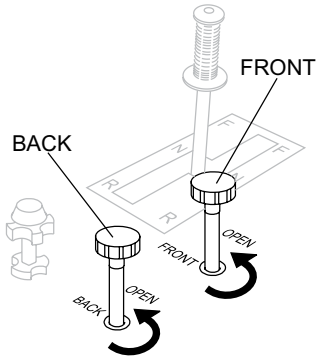


Figure 24. Sprinkler Controls

MAINTENANCE

Perform roller maintenance as indicated by Figure 25 and Table 5.

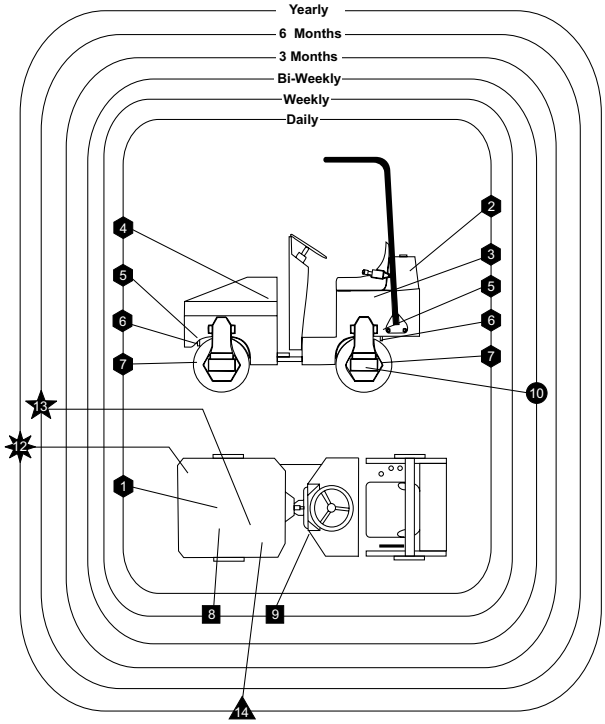


Figure 25. Roller Maintenance Schedule

Table 5. Roller Maintenance Schedule

	Daily	1	2	3	Interval	Notes
1	Engine Oil Level	X	X			See Table 4
2	Water Tank Level	X	X			
3	Fuel Level	X	X			
4	Hydraulic Oil Level	X	X			Use ISO 46 Type Hydraulic Oil
5	Sprinkler System	X				
6	Scraper	X	X			Replace when badly worn
7	Drums (Front/Rear)	X	X			
	Weekly					
8	Air Filter	X	X			Replace paper element once a year.
9	Battery Liquid Level	X	X			
	Bi Weekly					
10	Zerk Grease Fitting (Rear Drum)		X		80 hrs. or Bi-Weekly	Use Type Alvania #2 or equivalent 3 shots max. DO NOT overgrease
	3 Months					
12	Hydraulic Oil Filter (Return)			X	500 hrs.	Replace with same type filter.
	6 Months					
13	Engine Oil Filter			X	20 hrs. or 1 month	After first 20 hrs, change oil filter every 6 months or 100 hrs.
	Yearly					
14	Hydraulic Oil			X	1,100 hrs. or once a year	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. Cleanliness 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 26) is located inside the hydraulic tank. This filter is attached to the fitting connected to the hydraulic pump suction hose.

The return filter (Figure 26) 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 26) and drain the hydraulic oil. Dispose of the used oil in an environmentally friendly manner. Replace the drain plug and tighten.

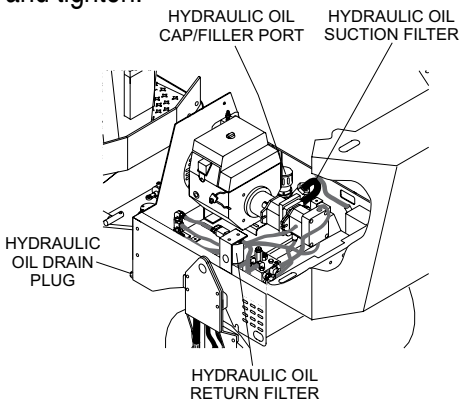


Figure 26. Hydraulic Filter Locations

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 counter-clockwise) this valve (Figure 27) 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.

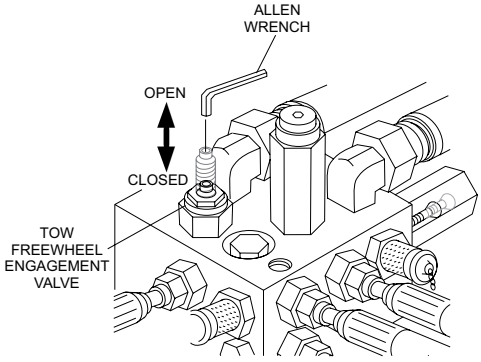


Figure 27. Freewheel Engagement Valve

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 parallel, 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 shift lever located on the right side of the operator seat. When the shift 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.

When shifted into reverse, the high-pressure and suction ports on the hydrostatic pump are reversed. Oil flow is then in the opposite direction of forward (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 "ON/OFF" pushbutton switch mounted on top of 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 pushbutton 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 SCRAPPER MAT

Rubber scraper mats have been provided for the cleaning of the front and rear drums. Adjust the scrapers mats as close as possible to the drums, using the slotted holes (Figure 28) provided. Replace these rubber mats when they become badly worn.

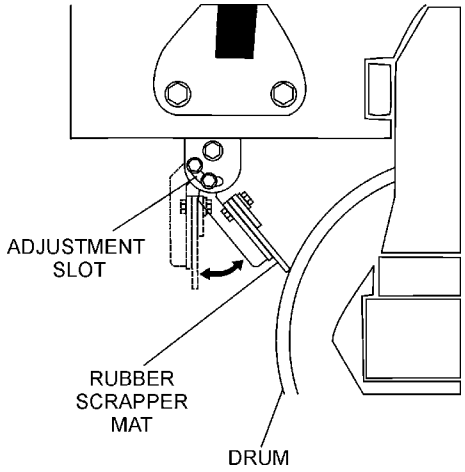


Figure 28. Scraper Bar Adjustment

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 (3,500 +/- 50 RPM).
4. Let engine run for 5 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 29) 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 ± 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, press the pushbutton switch (vibration control) located on top of 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 29).
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 700 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!

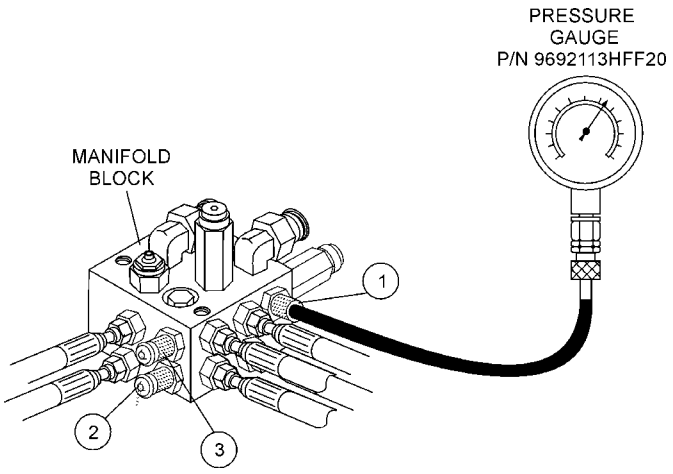


Figure 29. Manifold Test Ports

FORWARD/REVERSE RELIEF VALVES DRIVE ADJUSTMENT

The forward and reverse relief valves (Figure 30) are located in the hydrostatic pump (not on the manifold block) under plugs 1 and 2 . Plug 2 is located in the same location as plug 1, except it is on the bottom side of the pump. Relief valve 1 is reverse and 2 is forward.

NOTICE

Pumps supplied after 01/01/2003 do not have adjustable relief cartridges. The pressure is fixed at 2,900 ± 145 psi. If the relief pressure is not within normal range, the complete cartridge must be replaced.

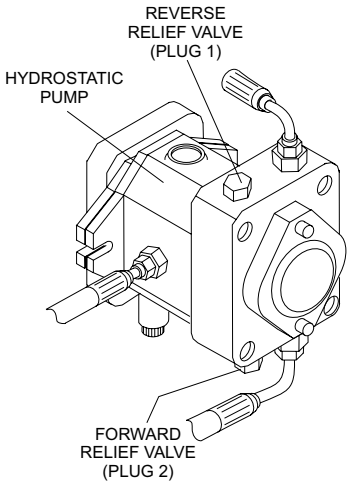


Figure 30. Adjusting Relief Valves

1. Clean the area around the cap.
2. Remove the cap.
3. Carefully remove the valve cartridge.
4. Using an allen wrench, remove the top nut (extreme care must be taken not to loosen existing shims, spring, or valve) Add or remove shims as required. Adding shims increases pressure; removing shims lowers pressure. One shim is equal to approximately 50 psi. Shim P/N is 34538.
5. Install the top nut and install valve in the pump cavity using extreme care not to bind.
6. Install the valve cap.
7. Retest pressure, further adjustment may be needed if pressure is not correct.

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.

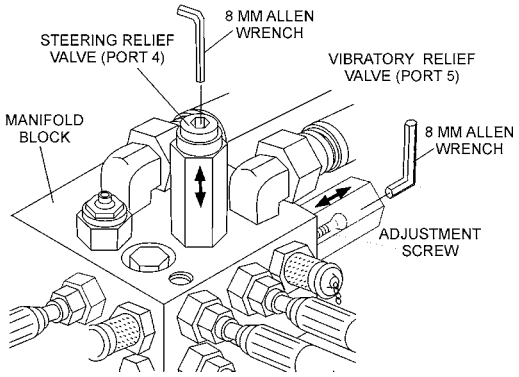


Figure 31. Steering and Vibration Relief Valves

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 700 psi.
5. If the steering relief pressure is not 700 psi, using the allen wrench adjust the pressure at port 4 until the pressure gauge reads 500 psi.

VIBRATION RELIEF VALVE PRESSURE ADJUSTMENT

1. Insert an 8 mm allen wrench into steering relief port 5 (Figure 31) 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, press the pushbutton switch (vibration control) located on top of 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

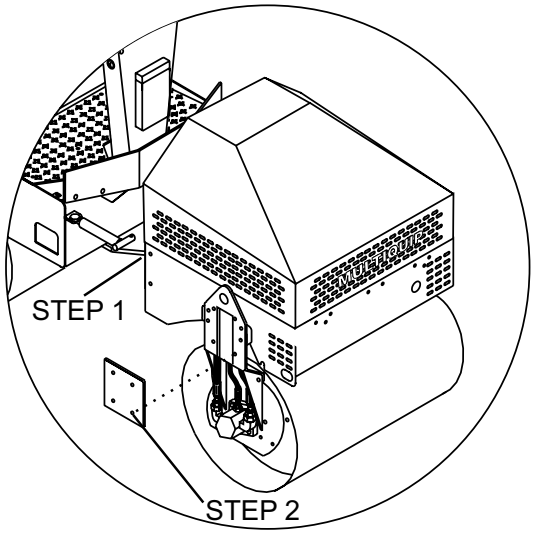
1. Remove the hydrostatic pump as per preceding instructions.
2. Remove all hoses and lines.
3. Disconnect the vibration / steering pump and remove.
4. Repair or replace pump as required.
5. Install the pump in the reverse order of removal, using Locktite 271 on all mounting bolts and nuts.
6. Test operate.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

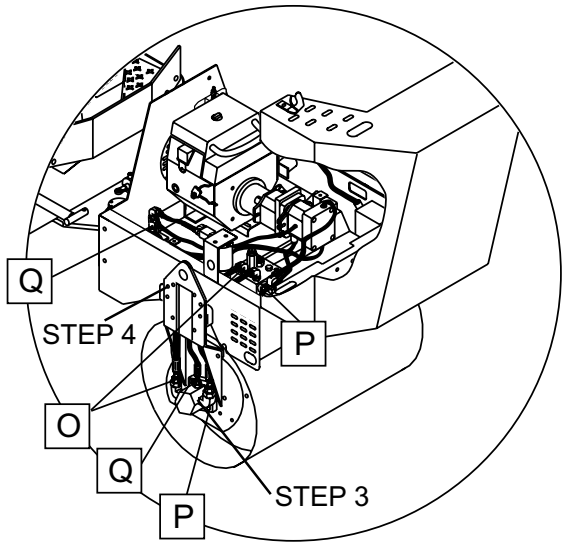
FRONT AND REAR DRUM REMOVAL AND DISASSEMBLY.

Refer to Figure 32, Figure 33, and Figure 34 for the removal and disassembly of the front and rear drums. When reassembling the front drum, use Locktite 271 on all mounting hardware.



1. JACK FRAME UP SLIGHTLY AT ARTICULATION JOINT.

2. REMOVE THE FOUR ALLEN HEAD SCREWS HOLDING THE SIDE COVER OF THE DRUM SUPPORT PLATE.

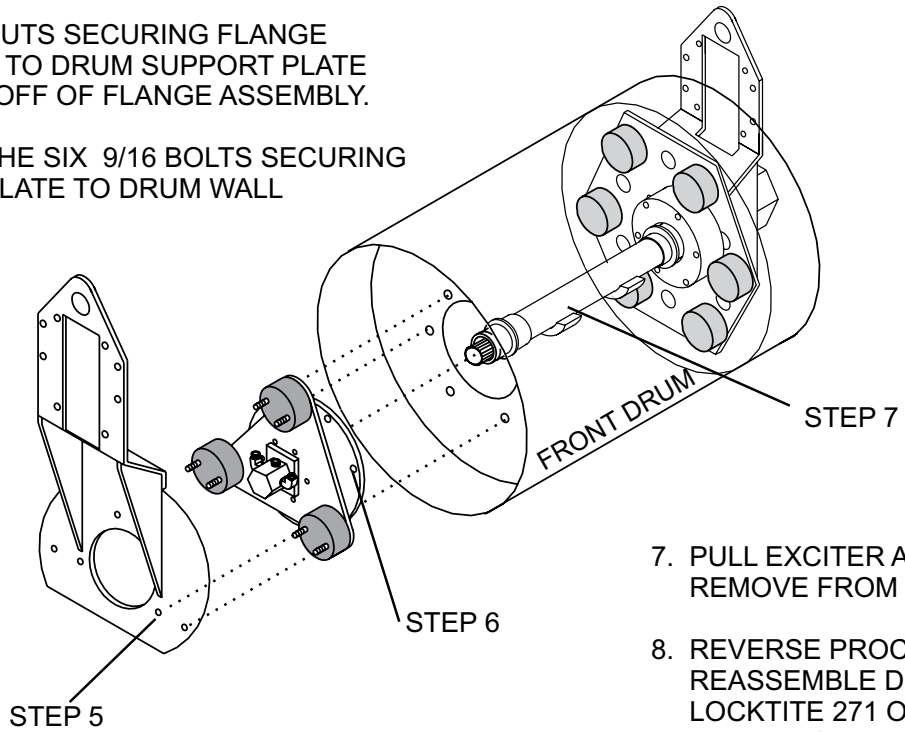


3. MARK AND DISCONNECT HOSES FROM MOTOR AND MANIFOLD.

4. REMOVE FOUR ALLEN HEAD SCREWS FROM DRUM SUPPORT PLATES.(SCREWS MAY NEED TO BE HEATED TO REMOVE)

5. REMOVE NUTS SECURING FLANGE ASSEMBLY TO DRUM SUPPORT PLATE AND PULL OFF OF FLANGE ASSEMBLY.

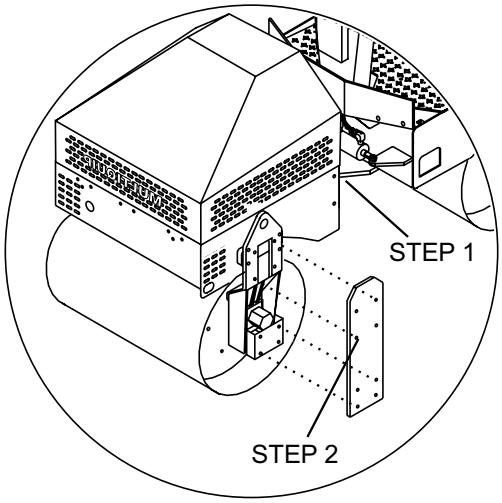
6. REMOVE THE SIX 9/16 BOLTS SECURING EXCITER PLATE TO DRUM WALL

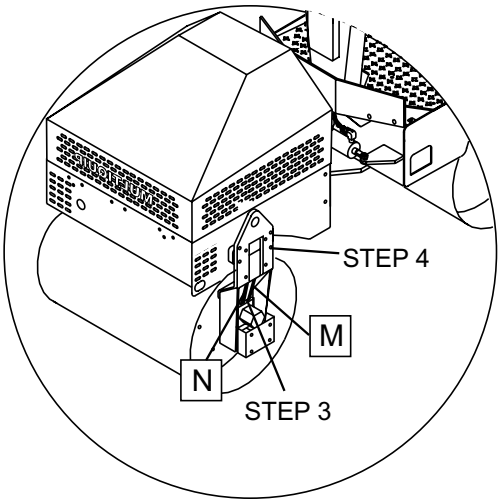


7. PULL EXCITER ASSEMBLY TO REMOVE FROM DRUM INTERIOR.

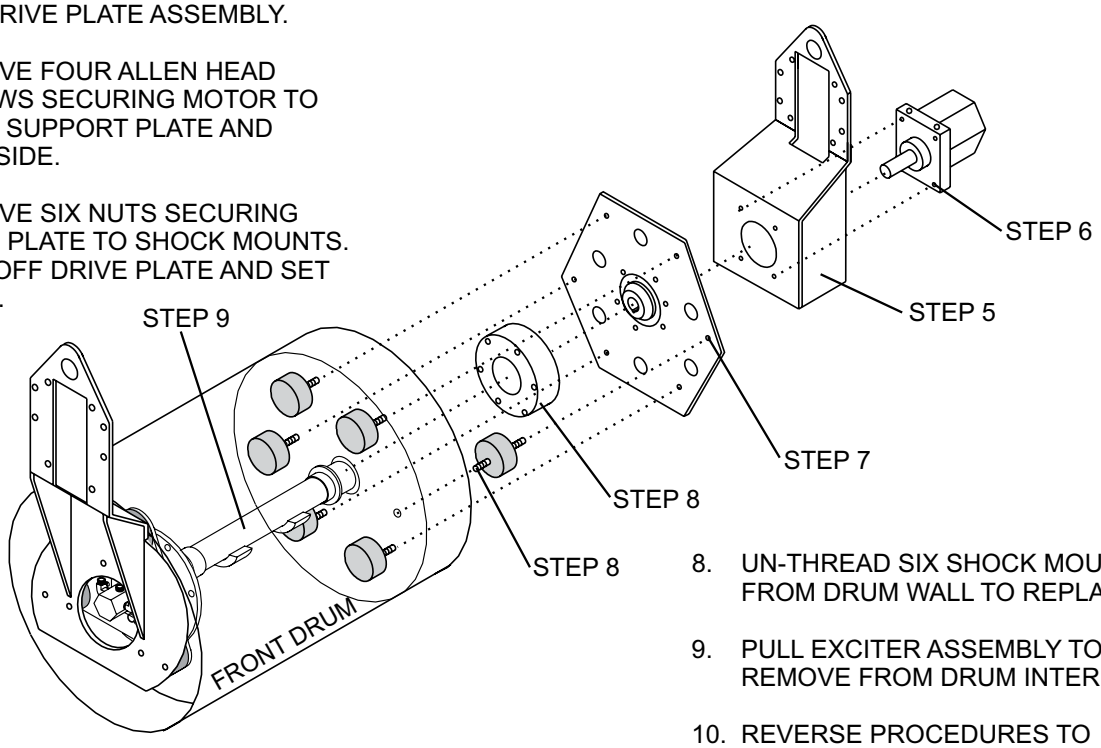
8. REVERSE PROCEDURES TO REASSEMBLE DRUM. USE LOCKTITE 271 ON ALL BOLTS AND NUTS.

Figure 32. Front Right Drum Removal



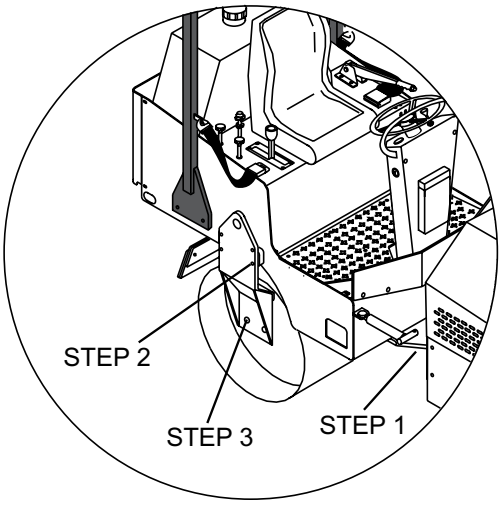


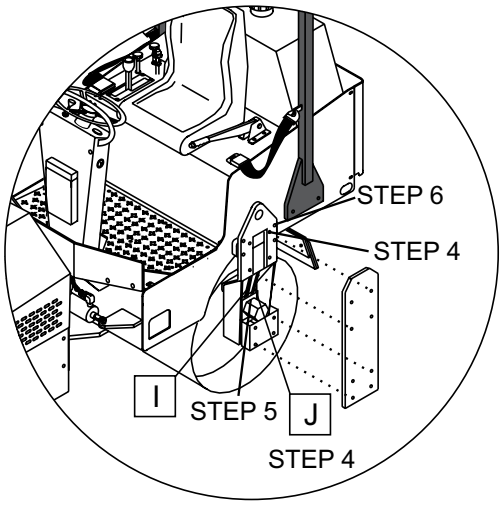
1. JACK FRAME UP SLIGHTLY AT ARTICULATION JOINT.
2. REMOVE THE EIGHT ALLEN HEAD SCREWS HOLDING THE SIDE COVER OF THE DRUM SUPPORT PLATE.
3. MARK AND DISCONNECT HOSES FROM MOTOR.
4. REMOVE FOUR ALLEN HEAD SCREWS FROM DRUM SUPPORT PLATE. (SCREWS MAY NEED TO BE HEATED TO REMOVE)
5. PULL DRUM SUPPORT PLATE OFF DRIVE PLATE ASSEMBLY.
6. REMOVE FOUR ALLEN HEAD SCREWS SECURING MOTOR TO DRUM SUPPORT PLATE AND SET ASIDE.
7. REMOVE SIX NUTS SECURING DRIVE PLATE TO SHOCK MOUNTS. PULL OFF DRIVE PLATE AND SET ASIDE.



8. UN-THREAD SIX SHOCK MOUNTS FROM DRUM WALL TO REPLACE.
9. PULL EXCITER ASSEMBLY TO REMOVE FROM DRUM INTERIOR.
10. REVERSE PROCEDURES TO REASSEMBLE DRUM. USE LOCKTITE ON ALL NUTS AND BOLTS.

Figure 33. Front Left Drum Removal





1. JACK FRAME UP SLIGHTLY AT ARTICULATION JOINT.

2. REMOVE THE FOUR ALLEN HEAD SCREWS SECURING THE DRUM SUPPORT PLATE TO THE FRAME.

3. REMOVE NUTS SECURING BEARING FLANGE TO BASE OF DRUM SUPPORT PLATE.

4. REMOVE ALLEN HEAD SCREWS HOLDING THE SIDE COVER OF THE DRUM SUPPORT PLATE.

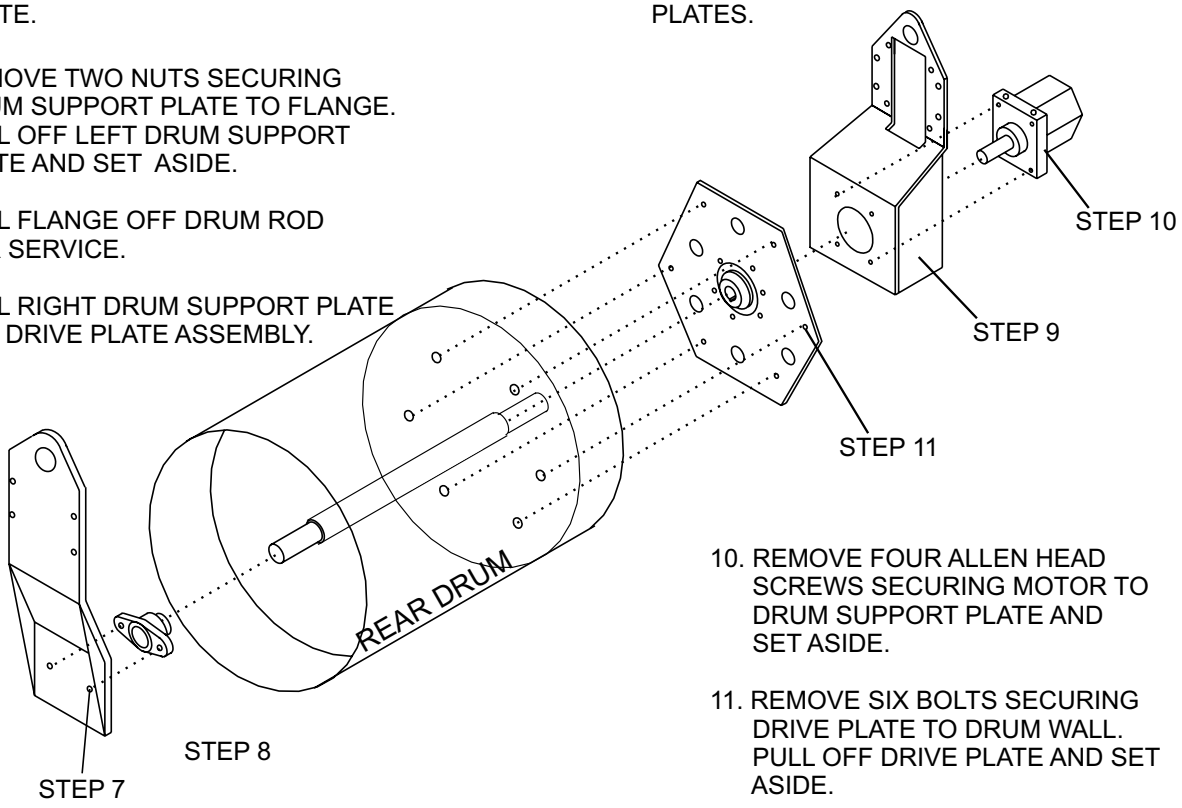
5. MARK AND DISCONNECT HOSES FROM MOTOR.

6. REMOVE FOUR ALLEN HEAD SCREWS FROM DRUM SUPPORT PLATES.

7. REMOVE TWO NUTS SECURING DRUM SUPPORT PLATE TO FLANGE. PULL OFF LEFT DRUM SUPPORT PLATE AND SET ASIDE.

8. PULL FLANGE OFF DRUM ROD FOR SERVICE.

9. PULL RIGHT DRUM SUPPORT PLATE OFF DRIVE PLATE ASSEMBLY.



10. REMOVE FOUR ALLEN HEAD SCREWS SECURING MOTOR TO DRUM SUPPORT PLATE AND SET ASIDE.

11. REMOVE SIX BOLTS SECURING DRIVE PLATE TO DRUM WALL. PULL OFF DRIVE PLATE AND SET ASIDE.

12. REVERSE PROCEDURES TO REASSEMBLE DRUM.

Figure 34. Rear Drum Removal/Installation

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 your Honda dealer.

NEUTRAL SAFETY SWITCH

The travel lever is provided with a neutral safety switch (Figure 35) 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.

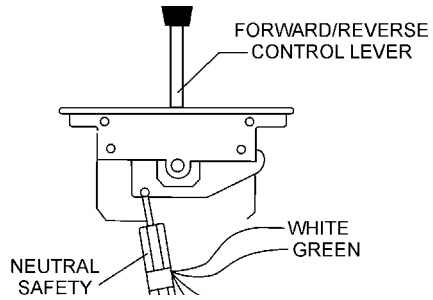


Figure 35. Safety Switch

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 36) 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.

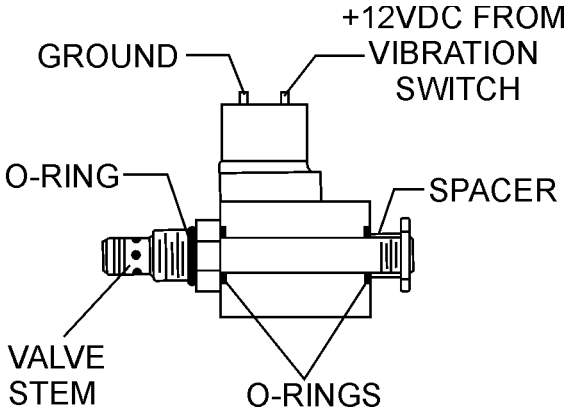


Figure 36. Vibration Solenoid

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.

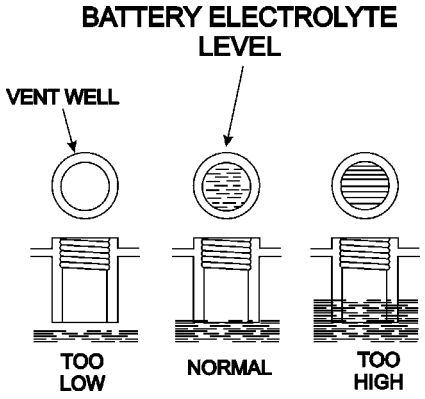
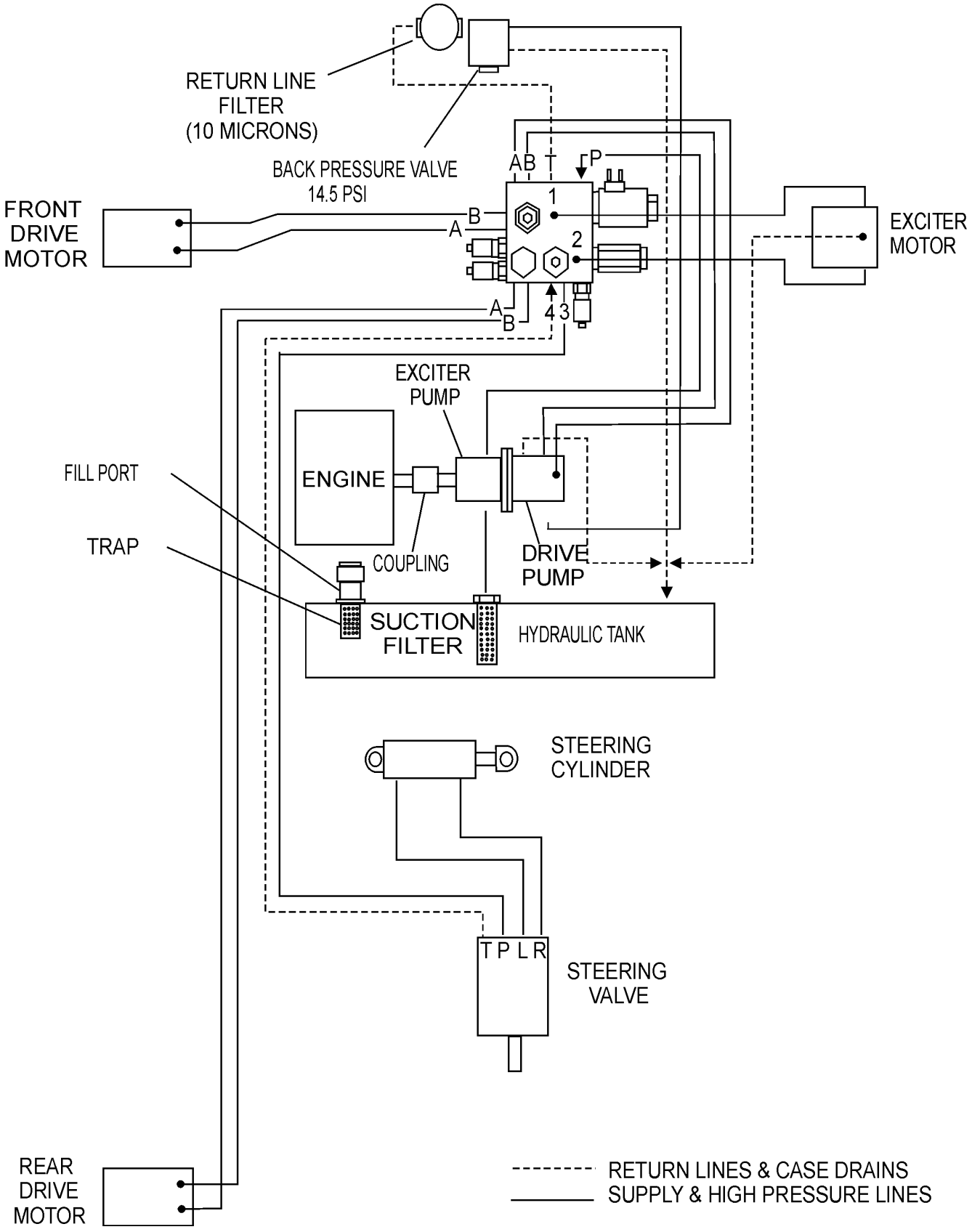


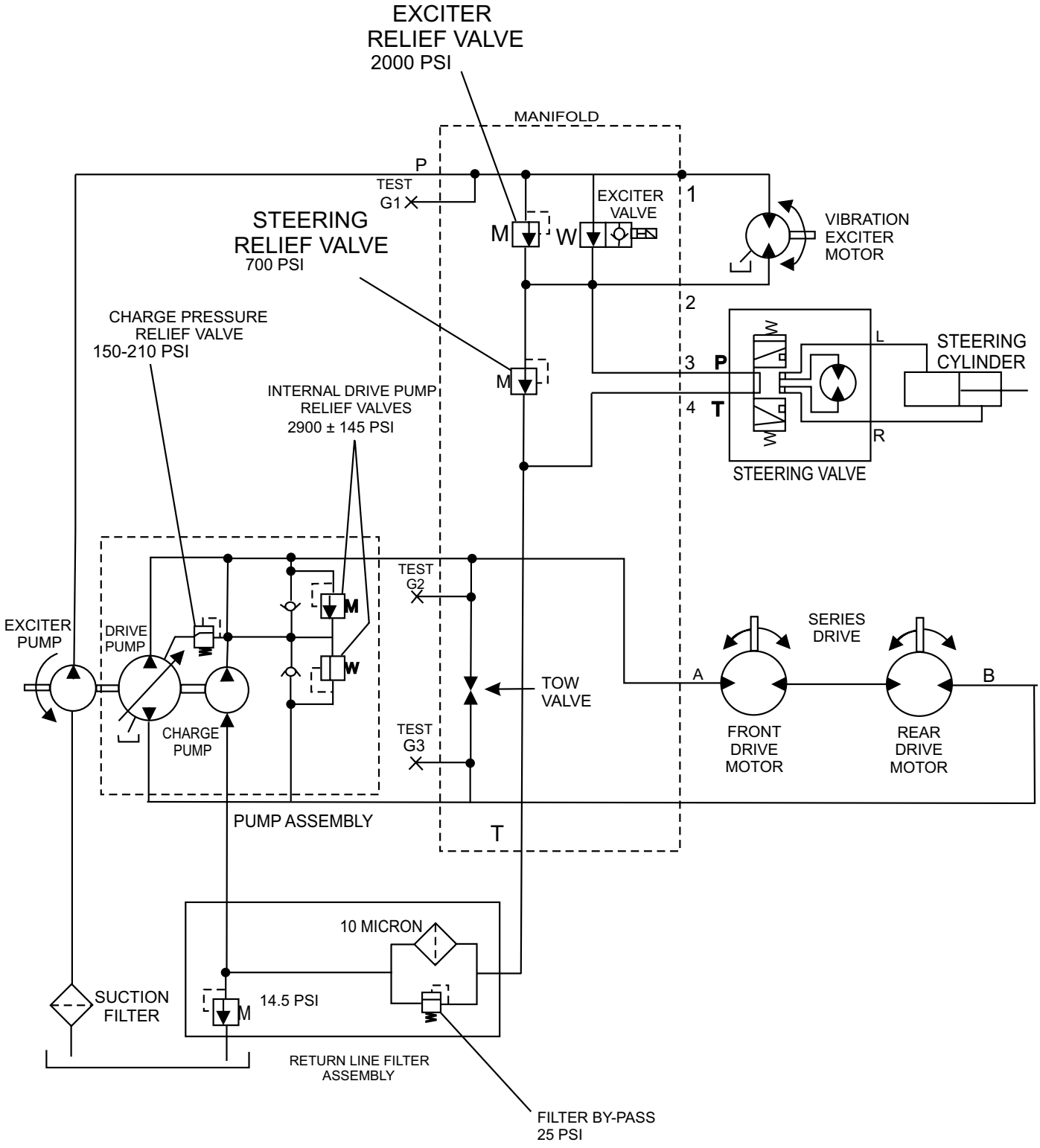
Figure 37. Battery Fluid Levels

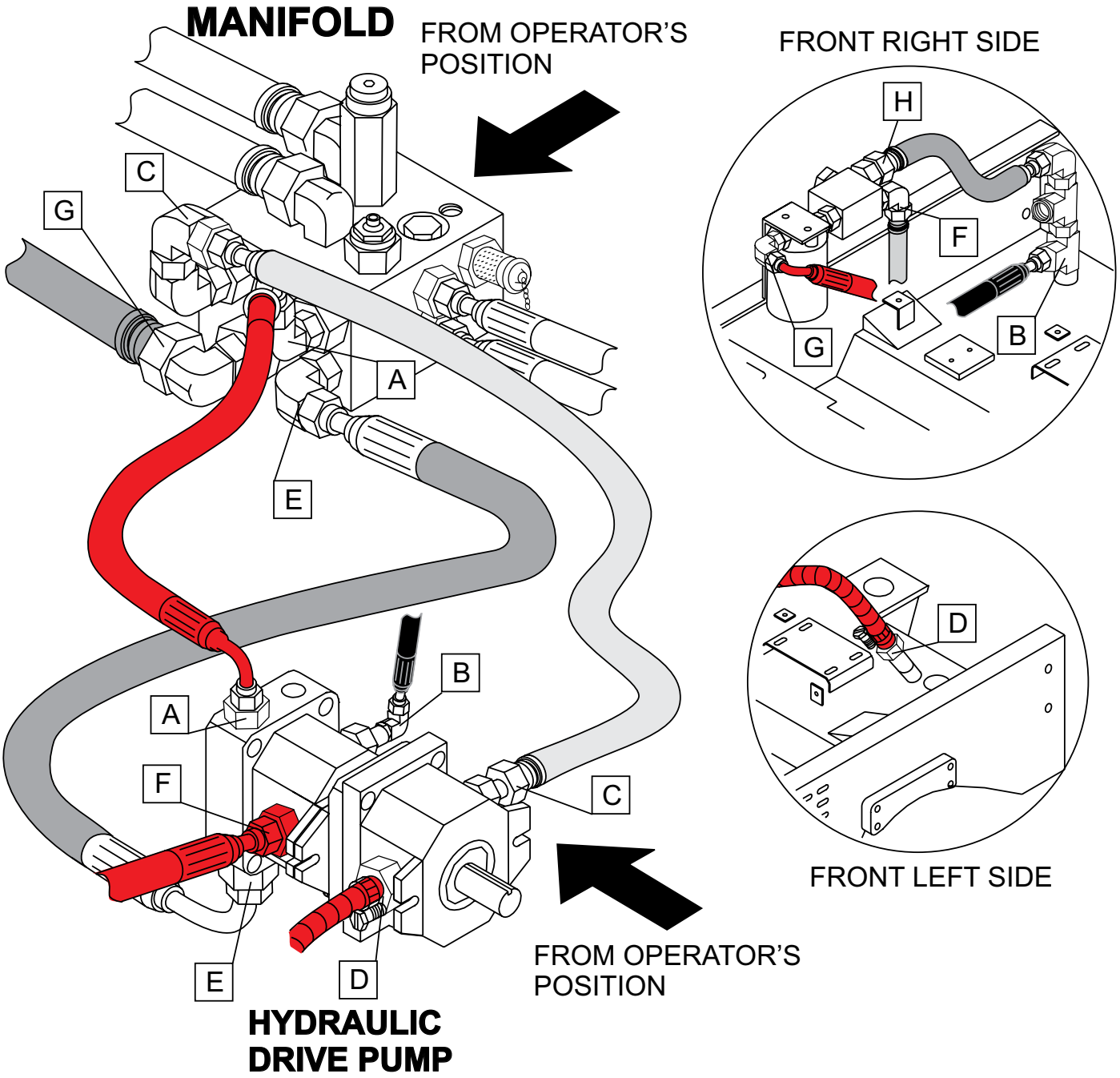
ROLLER STORAGE

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.

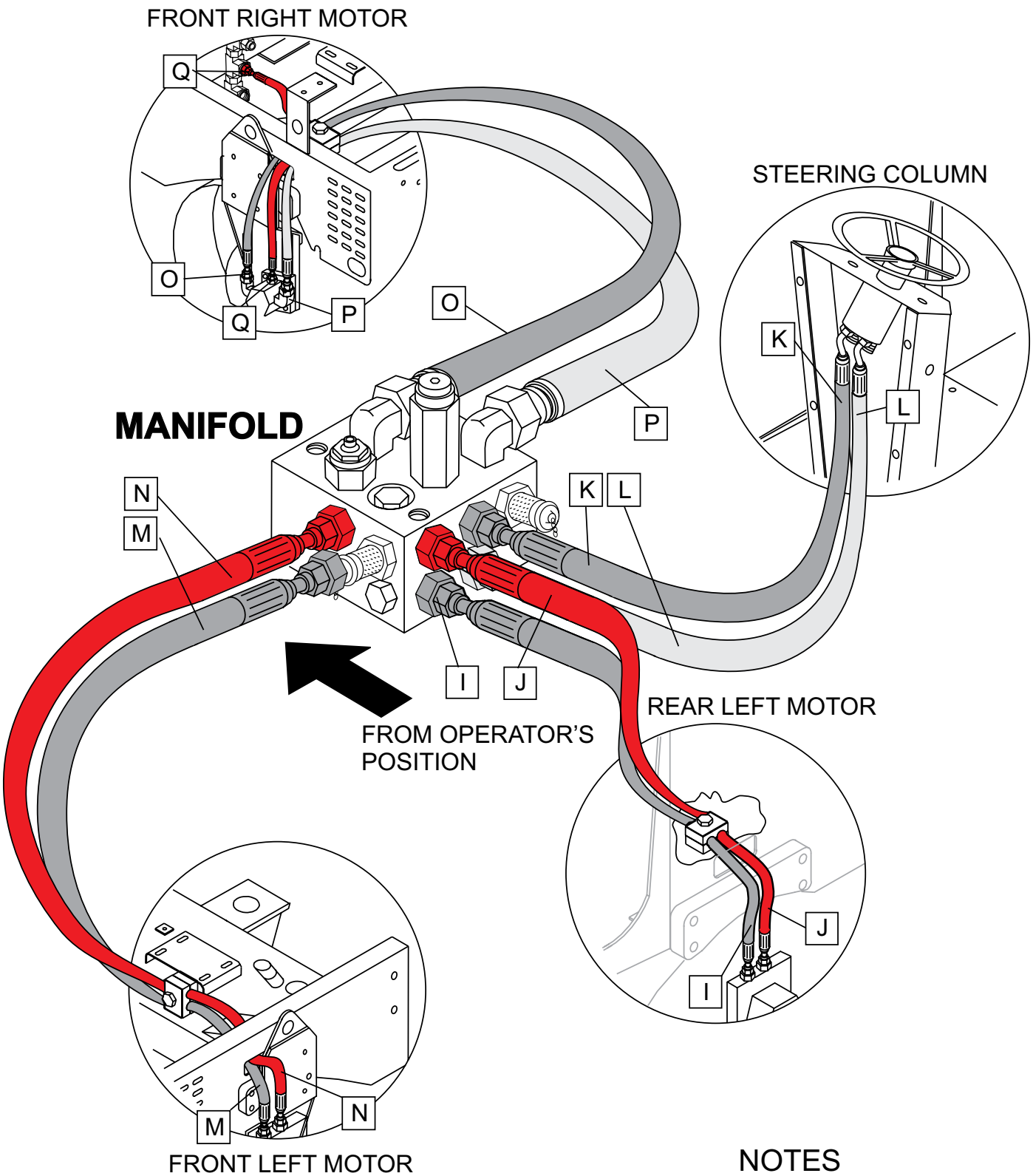

RETURN LINE
FILTER
(10 MICRONS)
BACK PRESSURE VALVE
14.5 PSI
AB T P
1
2
B
A
A
B
4 3
FRONT
DRIVE
MOTOR
EXCITER
MOTOR
EXCITER
PUMP
ENGINE
FILL PORT
TRAP
COUPLING
DRIVE
PUMP
SUCTION
FILTER
HYDRAULIC TANK
STEERING
CYLINDER
T P L R
STEERING
VALVE
REAR
DRIVE
MOTOR
RETURN LINES & CASE DRAINS
SUPPLY & HIGH PRESSURE LINES


EXCITER
RELIEF VALVE
2000 PSI
MANIFOLD
P
TEST
G1
STEERING
RELIEF VALVE
700 PSI
M
W
EXCITER
VALVE
1
VIBRATION
EXCITER
MOTOR
2
CHARGE PRESSURE
RELIEF VALVE
150-210 PSI
M
INTERNAL DRIVE PUMP
RELIEF VALVES
2900 ± 145 PSI
3
P
4
T
L
R
STEERING
CYLINDER
STEERING VALVE
TEST
G2
EXCITER
PUMP
DRIVE
PUMP
CHARGE
PUMP
TOW
VALVE
TEST
G3
A
SERIES
DRIVE
B
FRONT
DRIVE
MOTOR
REAR
DRIVE
MOTOR
PUMP ASSEMBLY
T
10 MICRON
SUCTION
FILTER
14.5 PSI
RETURN LINE FILTER
ASSEMBLY
FILTER BY-PASS
25 PSI



NOTES

HOSES SHADED FOR VISUAL CLARITY.

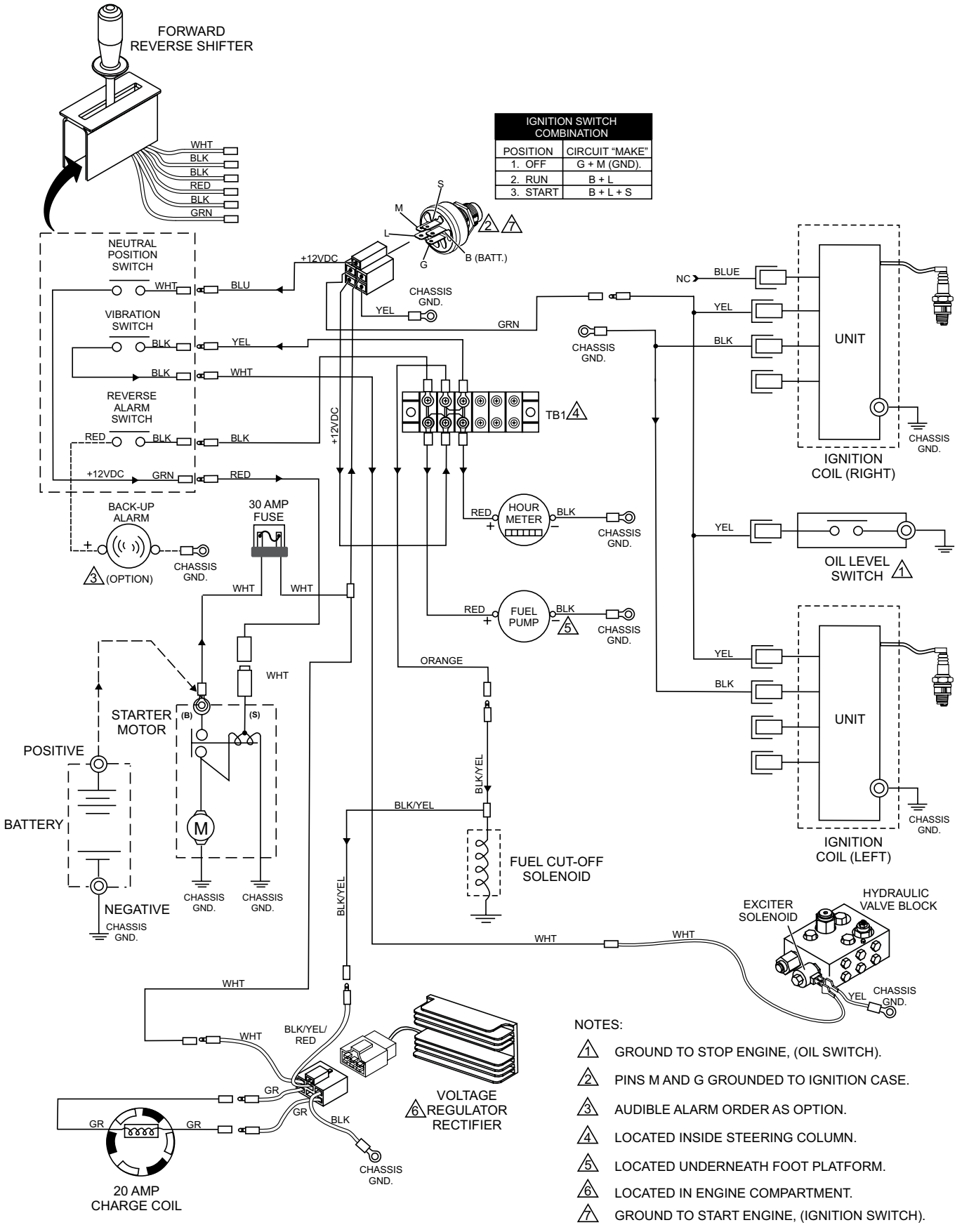


NOTES

HOSES SHADED FOR VISUAL CLARITY.

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.
	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, replace if necessary.
Slow Forward/Reverse Speed	Low hydraulic pressure?	Check pressure.
	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.
	Broken rubber shock mounts or drive plate?	Inspect for cracks, replace if necessary.

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 if transistor ignition unit is broken, and replace defective unit. Check if voltage cord cracked or broken and replace. Check if spark plug is 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.



NOTES:

1. GROUND TO STOP ENGINE, (OIL SWITCH).
2. PINS M AND G GROUNDED TO IGNITION CASE.
3. AUDIBLE ALARM ORDER AS OPTION.
4. LOCATED INSIDE STEERING COLUMN.
5. LOCATED UNDERNEATH FOOT PLATFORM.
6. LOCATED IN ENGINE COMPARTMENT.
7. GROUND TO START ENGINE, (IGNITION SWITCH).

OPERATION MANUAL

HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL NUMBER ON-HAND WHEN CALLING

UNITED STATES

Multiquip Inc.

(310) 537- 3700
6141 Katella Avenue Suite 200
Cypress, CA 90630
E-MAIL: mq@multiquip.com
WEBSITE: www.multiquip.com

CANADA

Multiquip

(450) 625-2244
4110 Industriel Boul.
Laval, Quebec, Canada H7L 6V3
E-MAIL: infocanada@multiquip.com

UNITED KINGDOM

Multiquip (UK) Limited Head Office

0161 339 2223
Unit 2, Northpoint Industrial Estate,
Globe Lane,
Dukinfield, Cheshire SK16 4UJ
E-MAIL: sales@multiquip.co.uk

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