OPERATOR'S SAFETY AND SERVICE MANUAL

R670

This manual covers the following for each model listed:

R670H serial number 23-0901-208 and higher

TRENCH RAMMER

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Foreword

This manual has been written to help you operate the R670 Rammer safely. It is intended primarily for dealers and operators of equipment. It is recommended that you keep this manual or a copy of it with the machine so that it is readily available for reference.

Before you operate or carry out any maintenance on this machine YOU MUST READ and UNDERSTAND this manual.

Should you have ANY QUESTIONS about the safe use or maintenance of this machine after reading this manual, ASK YOUR SUPERVISOR or CONTACT:

MBW Europe on (+44) 01204 387784

MBW Europe reserves the right to change machine specification without prior notice or obligation.

Special Instructiions

CAUTION

This CAUTION sign indicates a potential hazard, which if ignored, could result in injuries to the operator and/or those close by, as well as damaging the machine.

WARNING

This WARNING sign indicates a potential hazard, which if ignored could result in the DEATH of the operator and/or those close by.

Contents

Safety Information

For your own personal protection and for the safety of those around you, please read and ensure you fully understand the following safety information. It is the responsibility of the operator to ensure that he/she fully understands how to operate this equipment safely.

CAUTION

Improper maintenance can be hazardous. Read and understand this section before you perform any maintenance, service or repairs.

If you are unsure about the safe and correct use of the Rammer, consult your supervisor or Equipment.

General Safety

- This machine is heavy and must not be lifted single-handedly; either get help or use suitable lifting equipment.
- This machine is to be used for is intended application only.
- This machine must only be operated by well-trained personnel.
- The owner of this machine must observe, and train the user to observe, the effective laws of labour protection in the country of application.
- Personal Protective Equipment (PPE) must be worn by the operator whenever the equipment is being used.
- Cordon off the work area and keep members of the public and unauthorised personnel at a safe distance.
- This machine must be operated on ground where stability is guaranteed. When working near the rim of excavated trenches, use the machine properly so that the machine may not fall down or collapse the excavation.
- Make sure you know how to safely switch this machine OFF before you switch it ON in case you run into any difficulties.
- Always switch OFF the engine before servicing it.
- During use, the engine becomes very hot. Always allow the engine to cool down before touching it.
- Never leave the engine running and unattended.
- Never remove or tamper with any fitted guards; they are there for your own protection. If they are damaged or missing, DO NOT USE THE MACHINE until the guard has been replaced or repaired.
- Always switch OFF the engine before transporting it, moving it around site or servicing it.
- Do not operate the machine when you are ill, feeling tired or when under the influence of alcohol or drugs.
- This machine is designed to eliminate the possible risks arising from the use of it. However, risks DO reside, and these residual risks are not clearly recognisable and may cause personal injury or property damage, and possibly death. If such unpredictable and unrecognisable risks become

apparent, the machine must be stopped immediately, and operator or his supervisor must take appropriate measure to eliminate such risks. It is sometimes necessary that the manufacturer must be informed of such event for future counter measuring.

Fuel Safety

WARNING

Fuel is flammable. It may cause injury and property damage. Shut down the engine, extinguish all open flames and do not smoke while filling the fuel tank. Always wipe up any spilled fuel.

- Before re-fuelling, switch off the engine and allow it to cool.
- When re-fuelling, use a proper funnel, and avoid spilling over the engine.
- When re-fuelling, DO NOT smoke or allow naked flames in the area.
- Spilt fuel must be made safe immediately by using sand. If fuel is spilt on your clothes, change them.
- Store fuel in an approved, purpose made container away from heat and sources of ignition.

Health & Safety

Vibration

Some vibration from the compacting operation is transmitted through the handle to the operator's hands. Ensure operator rotation and do not exceed the maximum recommended usage times.

Dust

The compaction process can produce dust, which may be hazardous to your health. Always wear a mask that is suited to the type of dust being produced.

Fuel

Do not ingest fuel or inhale fuel vapors and avoid contact with your skin. Wash fuel splashes immediately. If you get fuel in your eyes, irrigate with copious amounts of water and seek medical attention as soon as possible.

Exhaust Fumes

WARNING

The exhaust fumes produced by this machine are highly toxic and can kill!

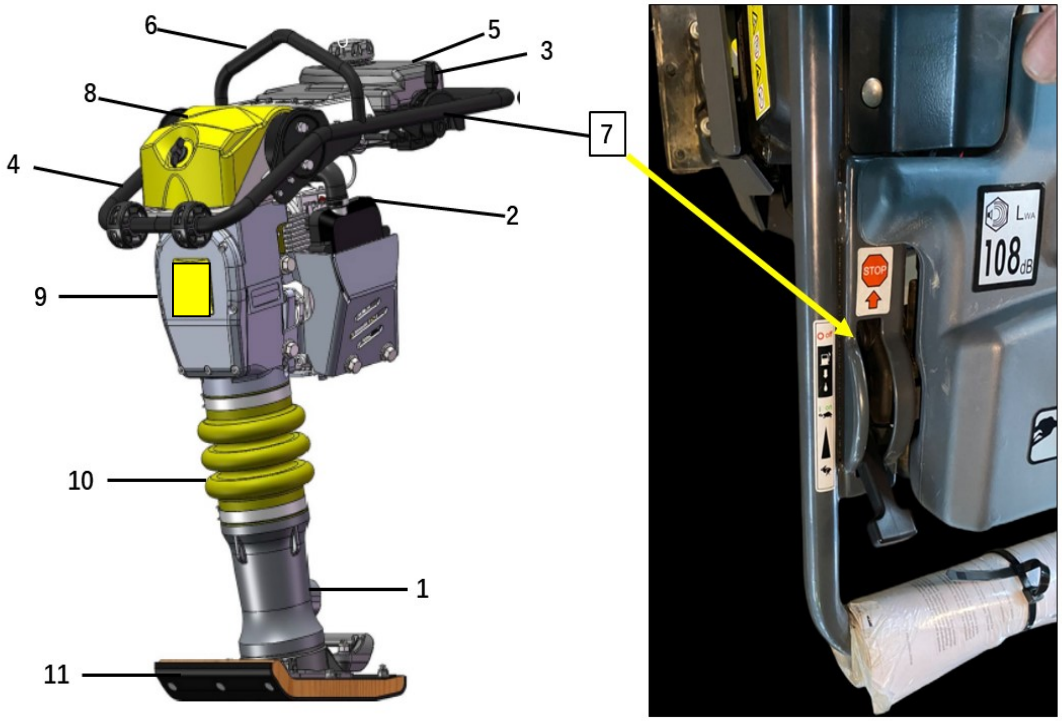
Do not operate the R670 Rammer indoors or in confined spaces. Make sure the work area is adequately ventilated.

Environment

In order to protect the environment please recycle any discarded apparatus or accessories. The table beside provides you with a list of the machine's components and their respective materials. Take the discarded apparatus to the relevant recycling facilities.

Component	Material
Handle	Steel
Ramming Shoe	Plywood and Steel
Rubber Isolators	Rubber and Steel
Bellow	Urethane
Crankcase	Aluminium
Crankcase Cover	Aluminium
Gears	Steel
Engine	Steel and Aluminium
Various Parts	Steel and Aluminium

Machine Description



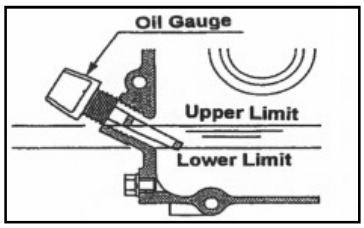
1. Oil Plug/Sight Glass
2. Engine
3. Throttle Lever
4. Operating Handle
5. Fuel Tank
6. Lifting Point
7. Three-Position throttle control (Idle, Full Speed, Engine Stop Switch/Fuel Valve Closed)
8. Primary Air Cleaner
9. Crankcase
10. Bellow
11. Ramming Shoe/Foot

Pre-Start Checks

Inspection prior to start-up

The following inspection must be performed before the start of each work session or after every four hours of use, whichever is first. Please consult the Service and Maintenance section for detailed guidance. If any fault is discovered, the machine must not be used until the fault is rectified.

1. Thoroughly inspect the machine for signs of damage.
2. Check hoses, filler openings, drain plugs and any other areas for signs of leakage. Fix any leaks before operating.
3. Check the engine oil level and top up as necessary.
    3.1 Place the machine on a level surface and check the oil in the engine.
    3.2 Use proper engine oil with the proper viscosity (SAE 10W-30 is recommended).



4. Check the engine fuel level and top up if required. Use clean fuel. Use of contaminated fuel may damage the fuel system.

CAUTION

This machine uses unleaded petrol

5. Check the air filter is clean. Excessive dirt/dust accumulation within the filter element will cause erratic engine operation. Clean the air filter if it is contaminated (see Service and Maintenance section).

Having carried out the check in the ‘Pre-Start’ section, you may now start the engine.

Start and Stop Procedure

CAUTION

Improper operation can be hazardous. Read and understand this section before you start the machine.

1. Open the fuel tap.
2. Set the engine switch to the ON position.
3. Set the speed control lever to the STARTING position (Halfway between HIGH and LOW position).
4. Move the choke lever to the CLOSED position.
5. Taking a firm hold of the Operating handle with one hand, grasp the recoil starter handle with the other, Pull the recoil starter handle until engine resistance is felt, then let starter return.
6. Taking care not to pull the starter rope fully out, pull the starter handle briskly.
7. Repeat until the engine fires.
8. Once the engine fires gradually set the choke lever to the OPEN position.
9. Let the engine run at idle for a few minutes to warm up.

10. After the engine has warmed up, the machine is ready for operation.
11. Move the throttle lever to the high speed position quickly to prevent damage from occurring to the clutch. The 'Full Throttle' position of this machine has been preset at the factory to achieve optimum machine performance.
12. With the engine running in the full throttle position, the machine will move forward and compact loose 'lifts'
13. In preparation for stopping the engine, move the throttle lever to the LOW position.
14. Allow the engine to idle for 1-3 minutes.
15. Set the engine switch to the OFF position. Do not touch the HOT engine part at this time.
16. Close the fuel tap.
17. Pull the recoil starter slowly until you feel resistance. Then release your hand from the starter knob to set it back to its original position. This will prevent any air or humidity from entering into the cylinder.

Model	Engine	Maximum RPM	
		Optimum	Upper Limit
R670	**HONDA GXR120**	3800	4000

The Max rpm as shown above is the number of ignitions per minute. GX120K1 engine for the R670 have the final gears at the ratio of 17/16, and the number of ignitions per minute is different from the number of rotations of the engines Power Take-Off Shaft.

CAUTION

DO NOT alter this setting since irregular vibration or damage to the gear transmission mechanism can result, and both engine and machine warranties will be automatically voided.

Operation

This machine is fitted with a centrifugal clutch. This allows the engine to run at idle without driving the power transmission gears. As the engine speed is increased, the clutch will engage and the engine will drive the power transmission gears. As the engine speed is increased, the clutch will engage and the engine will drive the power transmission gears.

- To avoid damage to the centrifugal clutch, move the throttle lever quickly from the slow to fast position. For correct operation, the engine speed should be set to maximum.
- Avoid operating the machine on a fully compacted, hard, or non-yielding surface. Otherwise, the power transmission gears will be damaged and the life of the machine will be greatly reduced.
- When working in a narrow trench, if the ramming shoe should get caught between the walls of the trenches, the rammer may miss-strike and can be severely damaged.
- Be sure that the rammer is steered only with the handle. It should only be pushed. The rammer must not be pressed into the materials being compacted. Excessive pressure on the operating handle will lead to the unsatisfactory compaction due to the fact that the jumping action is hindered.

Operation at High Altitude

For continuous High-Altitude operation above 1,000m (3,000FT), it will be necessary to change the engine main jet to a type that will allow for correct fueling of the engine. Otherwise, the unit will suffer from a lack of engine power and not work correctly. Please contact Equipment for details.

Service and Maintenance

The Rammers are designed to give many years of trouble free operation. It is, however, important that the simple regular maintenance listed in this section is carried out. It is recommended that an approved equipment dealer carry out all major maintenance and repairs. Always use genuine replacement parts.

Before any maintenance is carried out on the machine, switch off the engine and disconnect the HT lead from the spark plug. Always set the machine on level ground to ensure any fluid levels will be correctly read. Only use recommended oils.

Servicing the Engine

Service the engine according to the engine manufacturer’s specifications. Refer to the engine operation and maintenance manual.

Maintenance: Every 8 hours or daily

1. Check for loose bolts and nuts, retighten if necessary.

2. Check and clean the air filter element, re-lube the element in accordance with the engine manufacturer's recommendations. If operating conditions are unusually dusty and severe, filter element cleaning should be done more frequently.
3. Check oil level in crankcase of engine and replenish as necessary. Check the oil level in the ramming cylinder according to the following procedures:

- Make sure that the machine has not been run in the last 10 minutes.
- Set the machine on a level surface and remove the oil plug.
- The top surface of the oil must be seen just below the lower rim of the hole on the oil sight glass. Replenish as necessary.

NOTICE: Care should be taken not to overfill the rammer with oil. Overfilling will cause excessive load on the engine, which may result in poor or irregular vibration.

Maintenance: Every 50 hours or weekly

Check for loose bolts and nuts. Retighten if necessary.

Maintenance: Every 200 hours

Check the ramming cylinder oil. Do not overfill.

Fuel, Lubricant

Model	Fuel		Engine Crankcase			Ramming Cylinder	
	Type	Capacity	Type	Engine	Capacity	Type	Capacity
R670	Unleaded Petrol	3.8L	SAE 10W – 30, API, SG, SF/CC, CD	GXR120	0.28L	SAE 10W – 30, API, SG, SF/CC, CD	0.8L

Transportation and Storage

Lifting

Where it is necessary to use lifting equipment to position the rammer, check and confirm that the rubber isolators on the operation handle is not damaged or cracked. If they are cracked or damaged, replace the rubber isolators before attempting to lift the machine. Also make sure that the lifting equipment has a WLL (Working Load Limit) suitable for the rammer's weight (see technical data on page 13). Attach suitable chains or slings ONLY to the lifting point on top of the rammer's operating handle.

- NEVER leave the engine running whilst transporting or moving the R670 Rammer, even if it is only a short distance.

On Site Transport

The rammer may be moved vertically by 2 people, or laid only on the Transport Rollers.

Road Transport

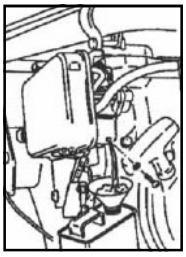
The rammer must be transported as far as possible standing up, strapped to the body side board of the truck, or strapped inside a lorry (panel truck). If not possible, it may be laid down (engine facing upwards, not on its sides) only on the Transport Rollers, in a stable position and strongly strapped down to guard against rolling or sliding.

CAUTION

Wait until the unit is completely cool before laying it down.

Long-term Storage

The chemical composition of the fuel will deteriorate after prolonged storage. When the machine needs to be stored for a long time, remove all the fuel from the fuel tank. You can achieve this by running the engine with the fuel tap being closed (see picture). Also remove the fuel from the drain plug.



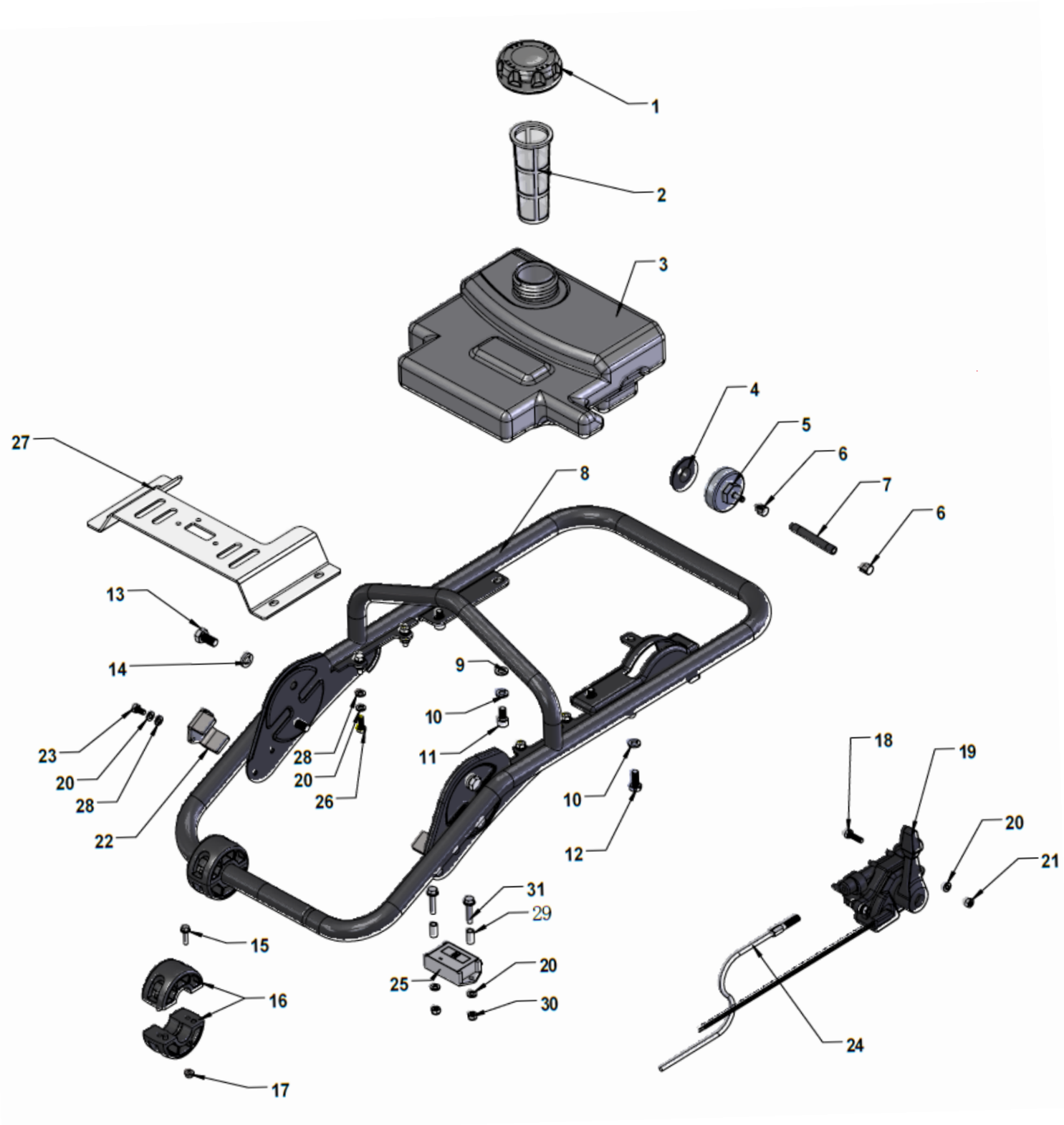
Clean up oil and dust accumulation on rubber parts.
Clean the base plate and apply a light coating of oil to prevent rust formation.
Cover the machine and store in a dry place.

Trouble Shooting

Problems	Possible Causes	Countermeasures
Engine will not start	1. No fuel. 2. Fuel tap has been closed. 3. Engine turned off. 4. Contaminated/damaged spark plug. 5. Faulty carburetor	1. Fill fuel tank. 2. Open fuel tap. 3. Turn engine ON. 4. Replace spark plug. 5. Service the carburetor.
Engine stops suddenly or stops when the engine rpm is increased	1. See above 2. Main jet of the carburetor clogged with dirt. 3. Air filter element dirty. 4. Spark plug cap is loose	1. See above. 2. Take out main jet of the carburetor and clean with an air gun. 3. Clean the element. 4. Tightly fit cap to the plug.
Engine runs but unit does not produce impact	1. Lack of engine power. 2. Clutch is slipping. 3. Power transmission gears are damaged.	1. See above 2. Dismantle clutch assembly, clean shoe and drum with proper solvent. Replace clutch shoe if necessary. 3. Contact dealer.

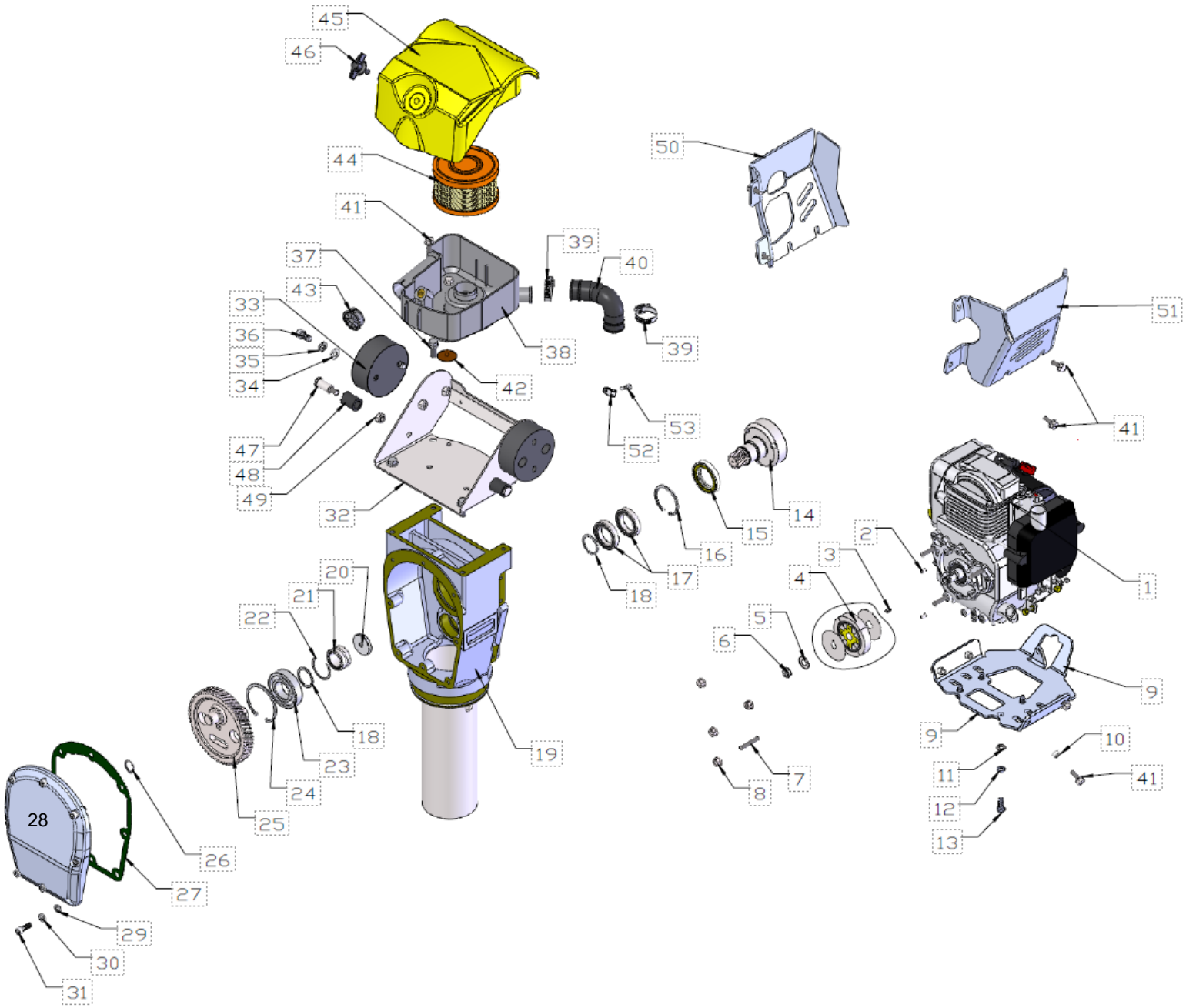
Technical Data

MODEL	R670H
DIMENSION (LxWxH) - mm (in)	775x360x1,062 (30.5x14.2x42)
OPERATING WEIGHT - KG	67
SHOE SIZE (LxW) - mm (in)	340X285 (13.4x11.2)
STROKE - mm (in)	80 (3.2)
IMPACT FORCE - KG (lb)	1,580 (3485)
BLOWS PER MINUTE (bpm)	650 -700
COMPACTION DEPTH (DEPENDING ON SOIL) - cm (in)	61 (24)
TRAVEL SPEED - m/min (ft/m)	8-11 (26-36)
COMPACTED AREA - m²/h (ft²/h)	300 (3,229)
FUEL TANK CAPACITY- Ltr (gal)	3.5 (0.92)
ENGINE	HONDA GXR120
ENGINE TYPE	Air-cooled single-cylinder 4-stroke Gasoline Engine
POWER OUTPUT - hp (Kw)	3.6 (2.7) / 3600RPM



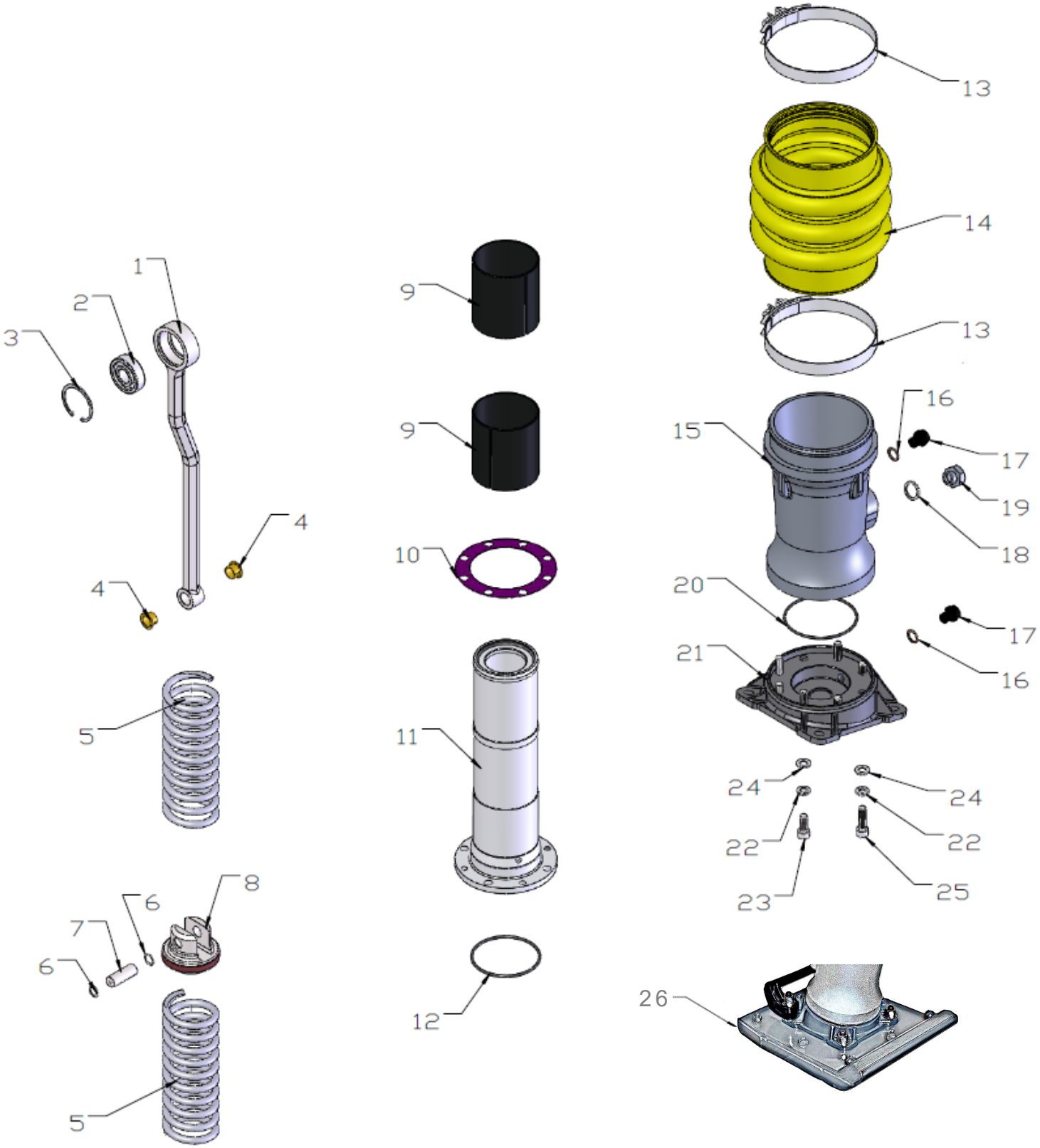
Fuel Tank & Handle Assembly

Item	Part no.	Description	Qty.
1	R670H-70B-010112E	FUEL TANK CAP	1
2	R670H-70B-010120	STRAINER	1
3	R670H-70C-010200	FUEL TANK	1
4	R670H-70ND-010115	PACKING	1
5	R670H-70C-010700	FUEL TANK CAP, BOTTOM	1
6	R670H-70B-000021	HOSE BAND	2
7	R670H-70C-010500	FUEL HOSE	1
8	R670H-010100C	HANDLE	1
9	R670H-FN.W8-DIN-1	WASHER	3
10	R670H-HSPG.W8-DIN-1	SPRING WASHER	4
11	R670H-HS.B-M8x16-8.8-GB-1	SCREW	3
12	R670H-FN.B-M8x20-8.8-DIN-1	BOLT	1
13	R670H-FN.B-M10x25-8.8-DIN-1	BOLT	4
14	R670H-HSPG.W10-DIN-1	SPRING WASHER	4
15	R670H-HF.B-M5x20-8.8-DIN-3	HEXAGON FLANGE BOLT	4
16	R670H-65ND-010100	ROLLER	2
17	R670H-HF.N-M5-DIN-3	HEXAGON FLANGE NUT	4
18	R670H-FN.B-M6x20-8.8-DIN-1	BOLT	2
19	R670H-70C-010300	THROTTLE LEVER ASSY	1
20	R670H-HSPG.W6-DIN-1	SPRING WASHER	6
21	R670H-FN.N-M6-DIN-1	WASHER	2
22	R670H-012400	LIMITED BLOCK	2
23	R670H-HSPG.W6-DIN-1	SCREW	4
24	R670H-W06-S04-L670x780	THROTTLE CABLE	1
25	R670H-20A-020208	HOUR METER	1
26	R670H-FN.B-M6x16-8.8-DIN-1	BOLT	4
27	R670H-014000	COVER	1
28	R670H-HSPG.W6-DIN-1	SPRING WASHER	4
29	R670H-014001	SPACER	2
30	R670H-IN.N-M6-DIN-2	LOCK NUT	2
31	R670H-HF.B-M6X30-8.8-DIN-2	HEXAGON FLANGE BOLT	2



Gear Case & Engine Assembly

Item	Part no.	Description	Qty.
1	R670H-W05-GXR120	ENGINE	1
2	R670H-021500	PIN	2
3	R670H-WKey-4x5x13	WOODRUFF KEY	1
4	R670H-W18-C812A	CENTRIFUGAL CLUTCH ASSY	1
5	R670H-80-0998	LOCK WASHER	1
6	R670H-FNL.N-M12x1.25-DIN-2	THIN NUT	1
7	R670H-020700	BOLT	4
8	R670H-HF.N-M8-DIN-2	HEXAGON FLANGE NUT	4
9	R670H-020500H	SUPPORT BASE, ENGINE	1
10	R670H-PEM NUT-M8	RIVET NUT	4
11	R670H-FN.W8-DIN-1	WASHER	4
12	R670H-HSPG.W8-DIN-1	SPRING WASHER	4
13	R670H-HS.B-M8x20-8.8-GB-1	SCREW	4
14	R670H-020300	PINION	1
15	R670H-W03-62×40×11TCN	OIL SEAL	1
16	R670H-CH.RG55	INTERNAL CIRCLIP	1
17	R670H-W01-6907-J	BEARING	2
18	R670H-CS.RG35	EXTERNAL CIRCLIP	2
19	R670H-025000	GEAR CASE	1
20	R670H-70B-020101	WASHER	1
21	R670H-W01-TAF324220 R670H-W01-LRT283220	BEARING	1 SET
22	R670H-70B-020112	SCREW	1
23	R670H-W01-6207-J	BEARING	1
24	R670H-CH.RG72	INTERNAL CIRCLIP	1
25	R670H-70C-020115	CRANK GEAR	1
26	R670H-CS.RG20	EXTERNAL CIRCLIP	1
27	R670H-020400	PACKING, FRONT COVER	1
28	R670H-021200	FRONT COVER	1
29	R670H-FN.W8-DIN-1	WASHER	8
30	R670H-HSPG.W8-DIN-1	SPRING WASHER	8
31	R670H-HS.B-M8x25-12.9-GB-3	SCREW	8
32	R670H-020100	HANDLE SUPPORT	1
33	R670H-70B-020125A	SHOCK MOUNT	2
34	R670H-FN.W10-DIN-1	WASHER	4
35	R670H-HSPG.W10-DIN-1	SPRING WASHER	4
36	R670H-HS.B-M10x20-8.8-GB-1	SCREW	4
37	R670H-HF.B-M10x20-8.8-GB-1	FLANGE BOLT	4
38	R670H-022100	AIR FILTER BOX	1
39	R670H-60ND-000011	CLIP	2
40	R670H-023200	INTAKE PIPE	1
41	R670H-HF.B-M8x20-8.8-GB-1	FLANGE BOLT	12
42	R670H-022500	DUST CAP	1
43	R670H-022400	FAN	1
44	R670H-022600	AIR FILTER	1
45	R670H-022200	FILTER BOX COVER	1
46	R670H-022300	SCREW	1
47	R670H-012300	SHOULDER BOLT	2
48	R670H-012200	BUSH	2
49	R670H-IN.N-M10-DIN-2	LOCK NUT	2
50	R670H-020900R	COVER-RIGHT	1
51	R670H-020900L	COVER-LEFT	1
52	R670H-CGS250-021100	CLIP	1
53	R670H-HS.B-M6x16-8.8-GB-1	SCREW	1



Guide Cylinder & Spring Assembley

Item	Part no.	Description	Qty.
1	R670H-030600	CONNECTING ROD	1
2	R670H-W01-6304-J	BEARING	1
3	R670H-CH.RG52	INTERNAL CIRCLIP	1
4	R670H-030650	BUSH	2
5	R670H-030700	OUTER SPRING	2
6	R670H-CH.RG16	INTERNAL CIRCLIP	2
7	R670H-030400	PISTON PIN	1
8	R670H-030300	PISTON	1
9	R670H-030250	BUSH	2
10	R670H-70ND-020218	PACKING	1
11	R670H-030200	SPRING CYLINDER	1
12	R670H-W04-88x3.5	O RING	1
13	R670H-50ND-030013	BELLOW CLAMP	2
14	R670H-50ND-030016P	BELLOW	1
15	R670H-030100	SPRING HOUSING	1
16	R670H-GB97.1-M14	WASHER	2
17	R670H-HHOS.B-M14x1.5	HEXAGON HEAD PLUG	2
18	R670H-ZH-D-M20	WASHER	1
19	R670H-100GB-041000	OIL GAUGE	1
20	R670H-W04-94.4x3.1	O RING	1
21	R670H-70C-030200	FOOT PLATE	1
22	R670H-HSPG.W10-DIN-1	SPRING WASHER	8
23	R670H-HS.B-M10x25-8.8-GB-1	SCREW	4
24	R670H-FN.W10-DIN-1	WASHER	8
25	R670H-HS.B-M10x35-8.8-GB-1	SCREW	4
26	R670H-04-175MM	REPLACEMENT SHOE ASSY 7" / 175MM	1
	R670H-04-230MM	REPLACEMENT SHOE ASSY 9" / 230MM	1
	R670H-04-280MM	REPLACEMENT SHOE ASSY 11" / 280MM	1

WARRANTY

1.IN GENERAL - The warranties described in this document are provided by MBW EUROPE, LTD.("MBW") to define what is, what is not, and for how long machines and parts are covered against material defects and/or defective workmanship. To obtain warranty service, the purchaser must, within the Warranty Period (defined in Paragraph 3): (i) report the product defect to an authorised repair center, (ii) make a written request for repair, (iii) provide proof of purchase to the authorised repair center, and (iv) deliver the equipment to the authorised repair centre. A list of authorised repair centres is available on the MBW website (mbweurope.com) or by contacting MBW at (+44) 01204 387784

2.COVERED - MBW's obligation under this limited warranty is limited to the cost of the parts and the labor to repair any defect in material and/or workmanship at an authorised MBW repair center. Transportation charges are not covered by this limited warranty.

3.WARRANTY PERIODS - The Warranty Period begins on, as applicable: (i) the product purchase date by an end user or (ii) the first day the product is put into rental or two years after invoice date from MBW to Dealer, whichever starts the warranty period first. To insure that your warranty is in place, fill out the warranty card and mail it in or register your product online at www.mbw.com/service-support/warranty-registration. The warranty is nontransferable.

The Warranty Period ends after:

A.New Ground compaction equipment - 2 years.
B.New Concrete finishing equipment - 1 year.
C.New Utility equipment - 1 year.
D.Demonstration equipment - 6 months.
E.Wear parts: lubricants, filters, belts and shock mounts - 30 days.

4.NOT COVERED- This warranty does not include, and MBW specifically excluded from any warranty:

A.Used equipment - all used equipment is not warranted and is sold 'as is' 'where is' with all defects.
B.Replacement electrical parts, including but not limited to: electric motors, circuit boards, switches, are not warranted or returnable.
C.OEM: engines, batteries, and chargers. Those warranties are covered by the manufacturer.
D.Consumable parts: trowel and screed blades.
E.Equipment that has been: altered, abused, neglected, not maintained, or modified to run outside its specifications. Any modification to the machine or its parts makes this warranty null and void.
F.Other: damage to a product from normal wear, air freight, overtime, pickup and delivery, temporary replacement rentals, freight damage, or other similar incidents.
G.Product used in a fashion it was not designed for.
H.Parts and labor not performed by authorised dealers.

It is at MBW's discretion if warranty applies and has the right to adjusts labor rates on a claim by claim basis.

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