

OPERATION AND PARTS MANUAL



Mikasa **SERIES**
MODEL MVH508DZ
REVERSIBLE PLATE COMPACTOR
(HATZ 1D81S-325 DIESEL ENGINE)

Revision #0 (04/04/14)

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THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.



CALIFORNIA — Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

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MVH508DZ Reversible Plate Compactor

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NOTICE

Specifications and part numbers are subject to change without notice.

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Note: Discounts Are Subject To Change



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| <input type="checkbox"/> Quantity, Part Number and Description of Each Part | <input type="checkbox"/> Second/Third Day |

NOTICE

All orders are treated as *Standard Orders* and will ship the same day if received prior to 3PM PST.

WE ACCEPT ALL MAJOR CREDIT CARDS!



SAFETY INFORMATION

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



SAFETY MESSAGES

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

SAFETY SYMBOLS

! DANGER

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

! WARNING

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

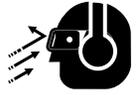
! CAUTION

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

NOTICE

Addresses practices not related to personal injury.

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety messages.

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Respiratory hazards
	Accidental starting hazards
	Eye and hearing hazards
	Rotating parts hazards

SAFETY INFORMATION

GENERAL SAFETY

CAUTION

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



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



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



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

NOTICE

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



SAFETY INFORMATION

COMPACTOR 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.

NOTICE

- **ALWAYS** keep the machine in proper running condition.
- Fix damage to machine and replace any broken parts immediately.
- **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 radiator cap while the engine is hot. High pressure boiling water will gush out of the radiator and severely scald any persons in the general area of the compactor.
- **DO NOT** remove the coolant drain plug while the engine is hot. Hot coolant will gush out of the coolant tank and severely scald any persons in the general area of the compactor.
- **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 compactor.



CAUTION

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing equipment.



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.

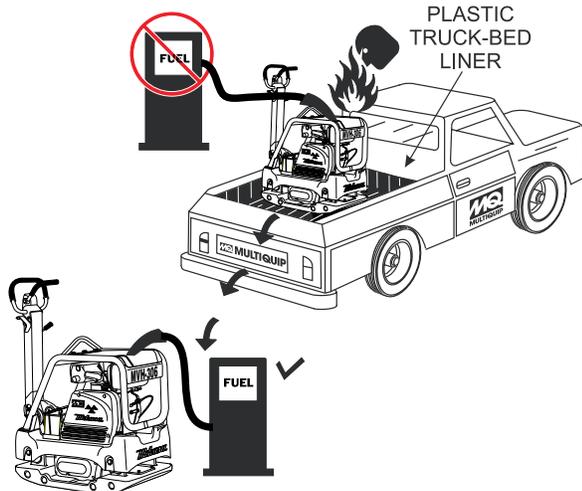


SAFETY INFORMATION

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.

SAFETY INFORMATION

TRANSPORTING SAFETY

CAUTION

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

NOTICE

- Before lifting, make sure that the equipment parts (hook and vibration insulator) are not damaged and screws are not loose or missing.
- Always make sure crane or lifting device has been properly secured to the lifting bail (hook) of the equipment.
- **ALWAYS** shutdown engine before transporting.
- **NEVER** lift the equipment while the engine is running.
- Tighten fuel tank cap 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.
- **DO NOT** lift machine to unnecessary heights.
- **ALWAYS** tie down equipment during transport by securing the equipment with rope.

ENVIRONMENTAL SAFETY/DECOMMISSIONING

NOTICE

Decommissioning is a controlled process used to safely retire a piece of equipment that is no longer serviceable. If the equipment poses an unacceptable and unrepairable safety risk due to wear or damage or is no longer cost effective to maintain (beyond life-cycle reliability) and is to be decommissioned (demolition and dismantlement), be sure to follow rules below:

- **DO NOT** pour waste or oil directly onto the ground, down a drain or into any water source.
- Contact your country's Department of Public Works or recycling agency in your area and arrange for proper disposal of any electrical components, waste or oil associated with this equipment.



- When the life cycle of this equipment is over, remove battery and bring to appropriate facility for lead reclamation. Use safety precautions when handling batteries that contain sulfuric acid.
- When the life cycle of this equipment is over, it is recommended that the trowel frame and all other metal parts be sent to a recycling center.

Metal recycling involves the collection of metal from discarded products and its transformation into raw materials to use in manufacturing a new product.

Recyclers and manufacturers alike promote the process of recycling metal. Using a metal recycling center promotes energy cost savings.

EMISSIONS INFORMATION

NOTICE

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

This engine has been certified to meet US EPA Evaporative emissions requirements in the installed configuration.

Attempting to modify or make adjustments to the engine emission system by unauthorized personnel without proper training could damage the equipment or create an unsafe condition.

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

Emission Control Label

The emission control label is an integral part of the emission system and is strictly controlled by regulations.

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

If a replacement emission label is needed, please contact your authorized Kohler Engine Distributor.

SPECIFICATIONS

Table 1. MVH508DZ Specifications	
Centrifugal Force	14613 lbf (65 kN)
Vibration Frequency	4,150 vpm (70 Hz)
Maximum Traveling Speed	82 ft/min (25 m/min)
Plate Size (W x L)	25.59 x 35.43 in (650 x 900 mm)
Plate Size (W x L) with extension plates	31.5 x 35.43 in (800 x 900 mm)
Max. Forward Speed	82 ft./min (25 m/min)
Operating Weight	1157.42 lbs. (525 kg.)
Operating Weight with extension plates	1181.68 lbs. (536 kg.)

Table 2. Engine Specifications	
Engine Make	HATZ
Engine Model	1D81S-325
Engine Type	Air-cooled, 4 Cycle Diesel Engine
Cylinder Bore X Stroke	3.94 in. x 3.35 in. (100 mm x 85 mm)
Displacement	40.7 cu-in (0.667 l)
Maximum Output	11.9 BHP (8.9 kW) @ 2500 RPM
Fuel Type	Diesel
Oil Capacity	2 qts (1.9 liters)
Starting Method	Recoil/Electric Start
Weight (Recoil Start)	213.8 lbs (97 Kg.)
Weight (Electric Start)	231.4 lbs (105 Kg.)

DIMENSIONS

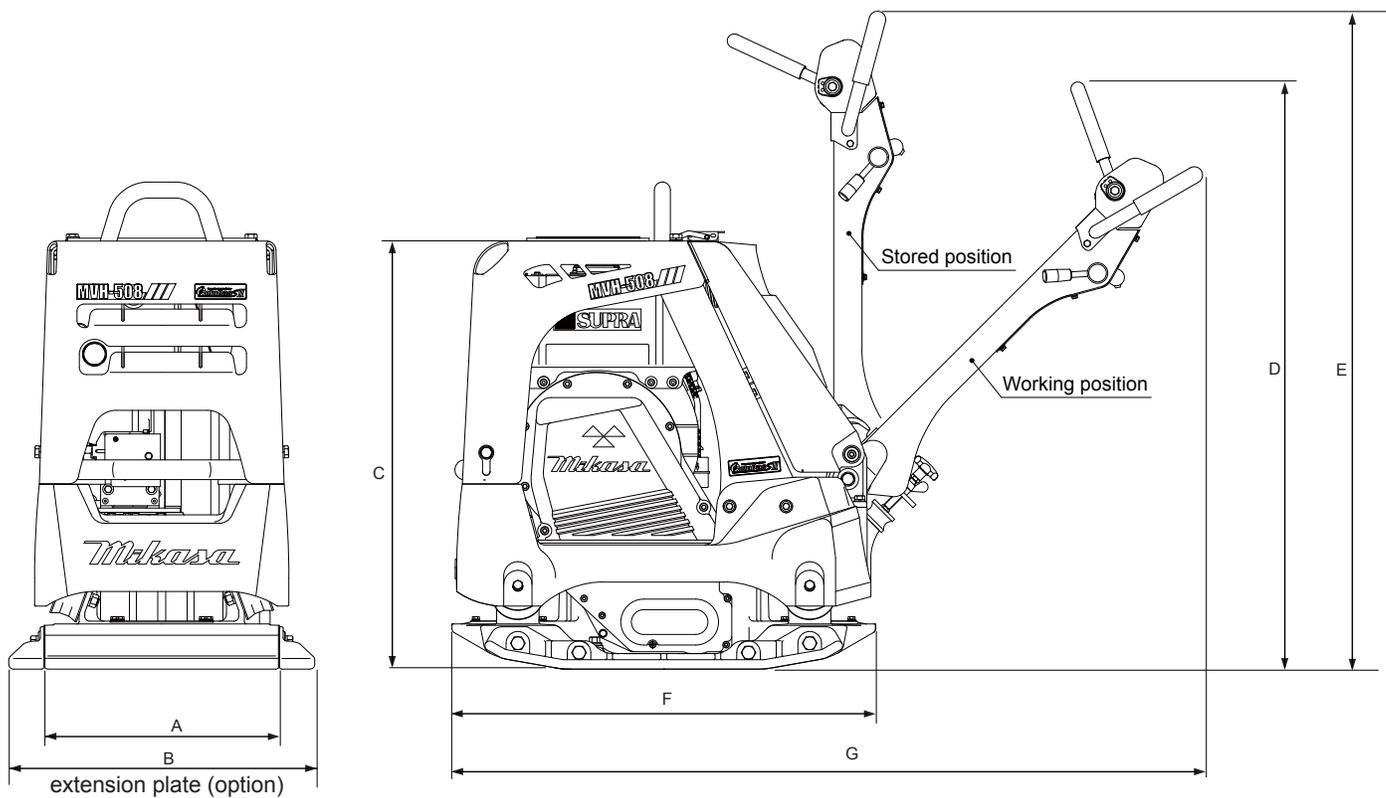


Figure 1. Dimensions

Table 3. Dimensions	
REF. DES	IN. (MM)
A	25.59 (650)
B	31.5 (800)
C	40.94 (1040)
D	47.64 (1210)
E	53.54 (1360)
F	35.43 (900)
G	63.00 (1600)

GENERAL INFORMATION

DEFINITION OF PLATE COMPACTOR

The Mikasa MVH508DZ is a reversible plate compactor designed for efficient compaction of sand, gravel and cohesive soils. This plate compactor is a powerful compacting tool capable of applying a tremendous force in consecutive high frequency vibrations to a soil surface. Its applications include compacting for road, embankments and reservoirs as well as backfilling for gas pipelines, water pipelines and cable installation work.

VIBRATORY PLATES

The vibratory plates of the compactor produce low amplitude high frequency vibrations, designed to compact granular soils and asphalt.

The resulting vibrations cause forward motion. The engine and handle are vibration isolated from the vibrating plate.

FREQUENCY/SPEED

The compactor's vibrating plate produces a vibration frequency of 4,150 VPM (vibrations per minute). The travel speed of the compactor is approximately 82 ft/minute (25 meters/minute).

ENGINE

This plate compactor are equipped with a Hatz 1D81S air cooled, 4-cycle diesel engine. The engine drives an eccentric weight at a high speed to develop a compaction force.

CONTROLS

Before starting the plate compactor identify and understand the function of all the controls and components.

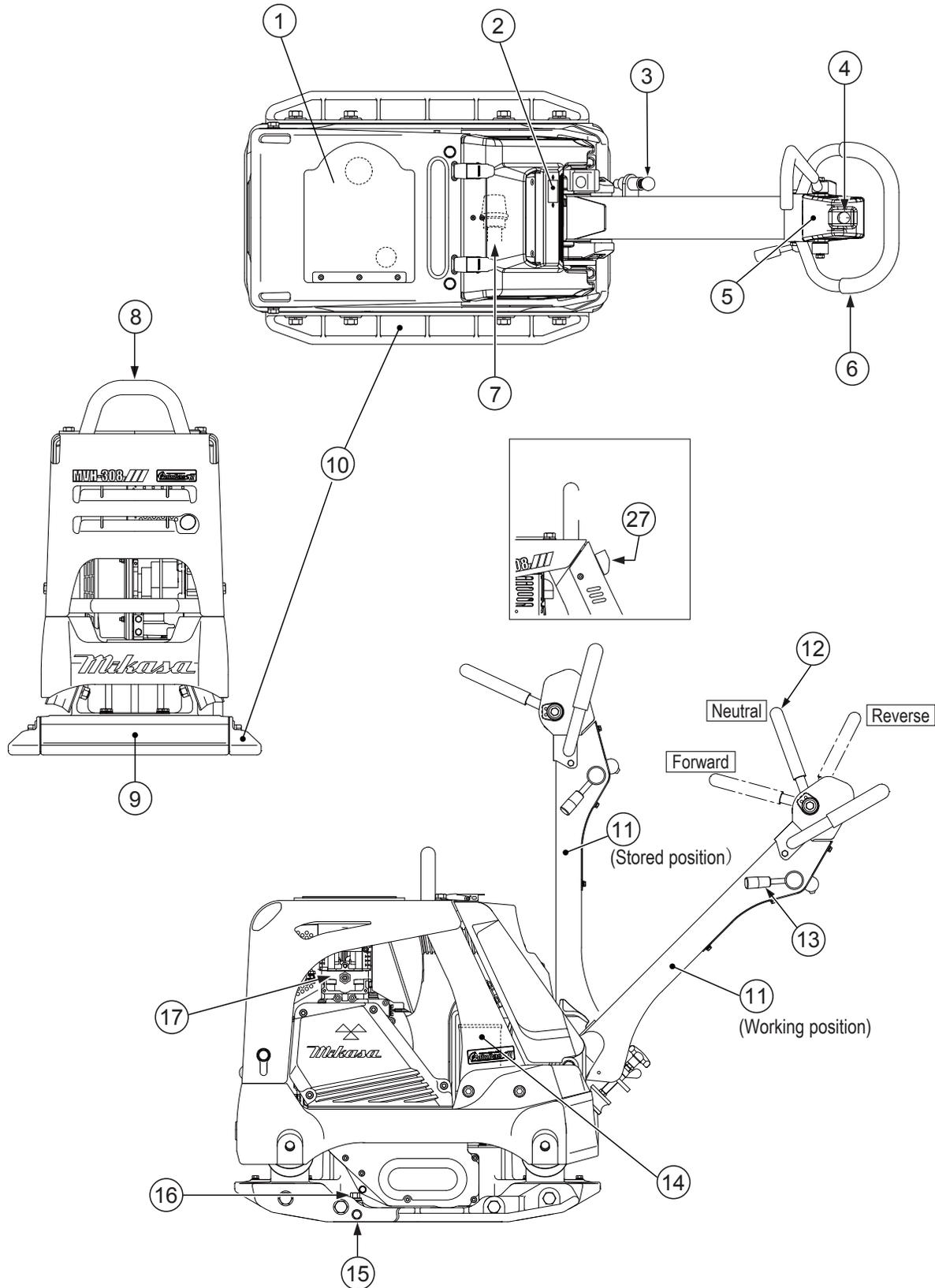


Figure 2. Plate Compactor Components

COMPONENTS

Figure 2 shows the location of the basic controls and components of the MVH508DZ Plate Compactor. The function of each control is described below:

1. **Rubber Cover** — Lift this rubber cover to gain access to the fuel tank.
2. **Hour/Tachometer** — Displays the cumulative time that the machine has been in use. During operation it displays the rpm reading. The tachometer also has a battery checker that lights red when the charge is low.
3. **Handle Bar Height Adjuster** — Adjusts the handle bar to the desired height by loosening the wing nut and turning the grip clockwise to raise the handle bar and counterclockwise to lower the handle bar.
4. **Breather Plug** — Allow pressure to escape to the air in the form of a gas from heat.
5. **Hydraulic Pump (Oil Reservoir)** — Regulates hydraulic oil flow produced by the direction of the control lever.
6. **Hand Grip** — When operating the compactor, use this hand grip to maneuver the compactor.
7. **Cyclone Cleaner** — Filters large dust particles to keep air cleaner from getting clogged easily.
8. **Lifting Bale** — When lifting of the compactor is required either by forklift, crane etc., tie rope or chain around this lifting point.
9. **Vibrating Plate** — A flat, open plate made of durable cast iron construction used in the compacting of soil.
10. **Extension Plate** — Provides additional area of vibration to the vibrating plate.
11. **Handle Bar** — When operating the compactor, this handle is to be in the downward position. When the compactor is to be **stored**, move the handle bar to the upright position.
12. **Direction Control Lever** — *Push* the lever forward to move compactor in a forward direction. *Pull* the lever backwards to move compactor in backwards direction. Placing the lever in the middle (midway) will cause the compactor not to move (neutral).
13. **Throttle Lever** — Controls speed of the plate compactor. Place straight vertically to start, **push** fully counterclockwise for full throttle and fully clockwise to stop plate compactor.
14. **Battery** — Provides +12V DC to the electrical system.
15. **Vibrator Oil Drain Plug** — Used to drain vibrator oil from the machine.
16. **Vibration Case Oil Filler** — Used to add oil to the vibration case.
17. **Engine** — This plate compactor uses a Hatz 1D81S diesel engine. Refer to the owner's manual for engine information.

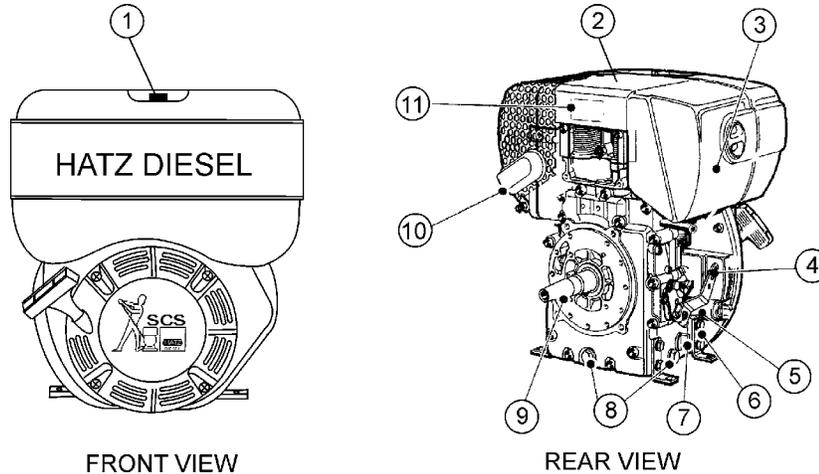


Figure 3. Engine Controls and Components

INITIAL SERVICING

The engine (Figure 3) must be checked for proper lubrication and filled with fuel prior to operation. Refer to the manufacturer's Engine manual for operating and servicing information.

1. **Fuel Filler Cap/Fuel Tank** — Pull this latch to add **diesel** fuel to the tank. After refueling, always make sure the fuel cap is latched properly. **DO NOT** over fill. For additional information refer to engine owner's manual.

DANGER



Adding fuel to the tank should be done only when the engine is stopped and has had an opportunity to cool down. In the event of a fuel spill, **DO NOT** attempt to start the engine until the fuel residue has been completely wiped up, and the area surrounding the engine is dry.

2. **Engine Lifting Straps/Cover** — Remove the air cleaner cover, then lift this cover (the one with decals on it) to gain access to the engine lifting straps.
3. **Air Cleaner/Cover** — Prevents dirt and other debris from entering the fuel system. Remove wing-nut on side of air filter cover to gain access to filter element.
4. **Speed Control Lever** — This lever is connected to the throttle control which is located on the side of the engine compartment cover. Use this lever to control engine speed.
5. **Dipstick** — Remove dipstick to determine if the engine oil level is low. If low, add oil as specified.

6. **Engine Motor Mounts** — Attach these engine mounts to the pump frame. Tighten securely.
7. **Oil Filter** — Remove this bolt to gain access (internal) to the engine oil filter. Service the oil filter as recommended in the maintenance section of this manual.
8. **Oil Drain Plugs** — There are two oil drain plugs, one is underneath the flywheel, the other on the side of the engine. Remove these plugs to drain engine oil from the engine crankcase.
9. **Crankshaft** — Connect this shaft to the input of the transmission.
10. **Muffler** — Used to reduce noise and emissions.
11. **Nameplate** — Contains information about the engine.

NOTICE

Operating the engine without an air filter, with a damaged air filter, or a filter in need of replacement will allow dirt to enter the engine, causing rapid engine wear.

WARNING



Engine components can generate extreme heat. To prevent burns, **DO NOT** touch these areas while the engine is running or immediately after operating. **NEVER** operate the engine with the muffler removed.

BEFORE STARTING

1. Read all safety instructions at the beginning of manual.
2. Clean the compactor, 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 as required.
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 compactor on secure level ground with the engine stopped. If the oil level is low, add oil (Grade CC or above).
2. Lubrication is done from the top of the engine (Figure 4).

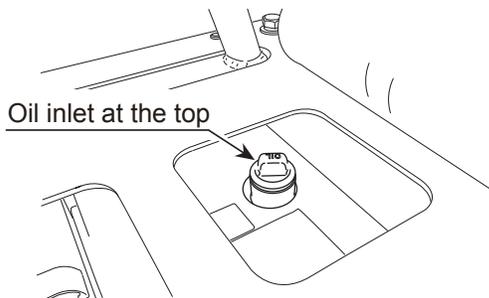


Figure 4. Adding Engine Oil

NOTICE

Pour oil slowly from the top. Oil might overflow if large amount of oil is poured right away.

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

DANGER



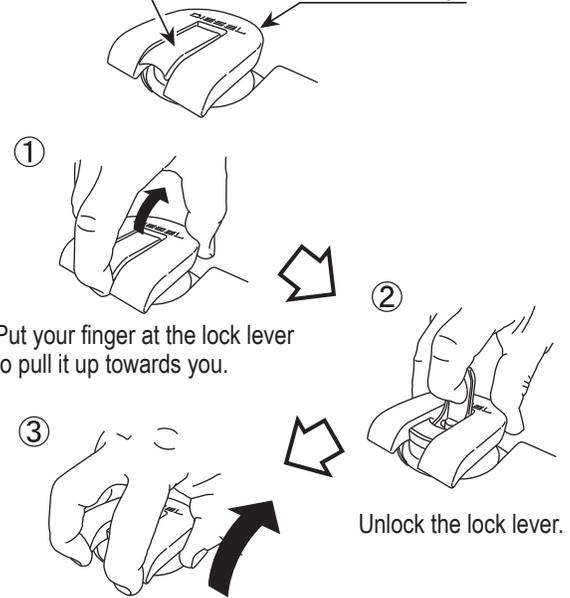
EXPLOSIVE FUEL!

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

FUEL CHECK

1. The fuel tank cap is equipped with a lock lever. Unlock the lever before opening cap (Figure 5).

Lock lever Fuel tank cap



Put your finger at the lock lever to pull it up towards you.

Unlock the lock lever.

Put your fingers to the tabs at the two locations of the tank cap to pull up towards you.

Figure 5. Unlocking Fuel Cap Lever

1. Visually inspect to see if fuel level is low. If fuel is low, replenish with unleaded fuel. Fuel inlet is located under the rubber cover at the front cover top portion.
2. When refueling, be sure to use a strainer for filtration. **DO NOT** top-off fuel. Wipe up any spilled fuel immediately.

V-BELT COVER REMOVAL

To inspect the V-belt, remove the three bolts that secure the belt cover to the frame as shown in Figure 6.

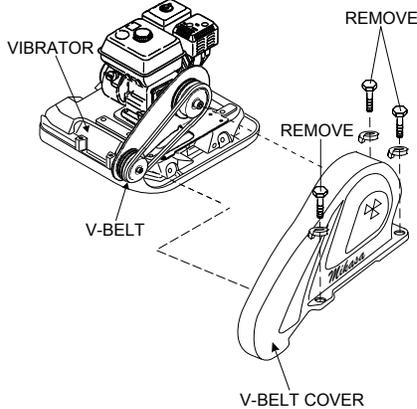


Figure 6. V-Belt Cover Removal

V-BELT INSPECTION

Visually examine the V-belt (Figure 7) and determine if it is full of tiny cracks, frayed, has pieces of rubber missing, is peeling or otherwise damaged.

Also, examine the belt and determine if it is **oil soaked** or **"glazed"** (hard shiny appearance on the sides of the belt). Either of these two conditions can cause the belt to run hot, which can weaken it and increase the danger of it breaking.

If the V-belt exhibits any of the referenced wear conditions replace the V-belt immediately.

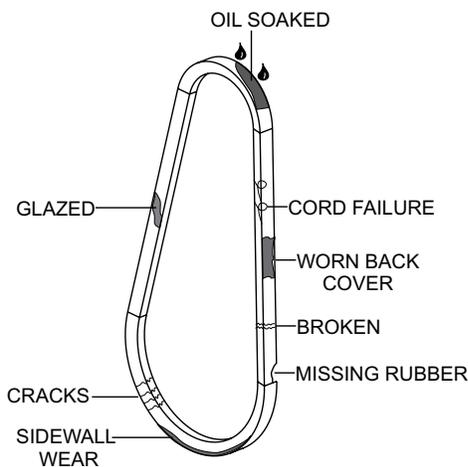


Figure 7. Drive Belt Inspection

V-BELT TENSION

The V-belt tension is proper if the V-belt bends 10 to 15 mm (Figure 8) when depressed with finger at midway between the clutch and vibrator pulleys.

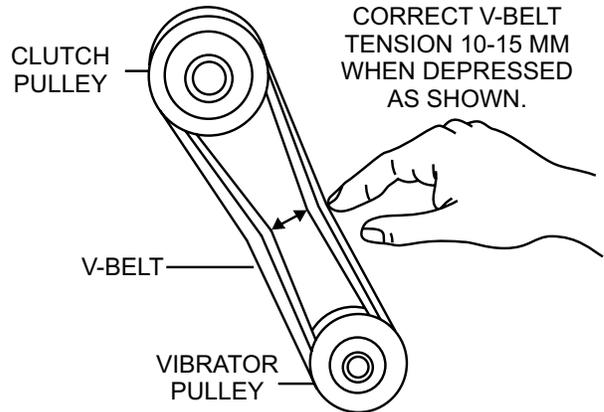


Figure 8. V-Belt Tension

VIBRATOR OIL CHECK

1. Place the plate compactor horizontally on a flat surface. Make sure the compactor is level when checking the oil in the vibrator assembly.
2. Check vibrator oil level by removing the oil plug (vibrator oil gauge) as shown in Figure 9. Clean the oil gauge and re-thread back in. Remove the oil gauge again and confirm oil level does not exceed the cross hash of the oil plug. **DO NOT OVERFILL!**
3. The vibrator holds approximately 20.3 oz. (600 cc). **IMPORTANT**, if oil is required, replace using only SAE 10W-30 motor oil.

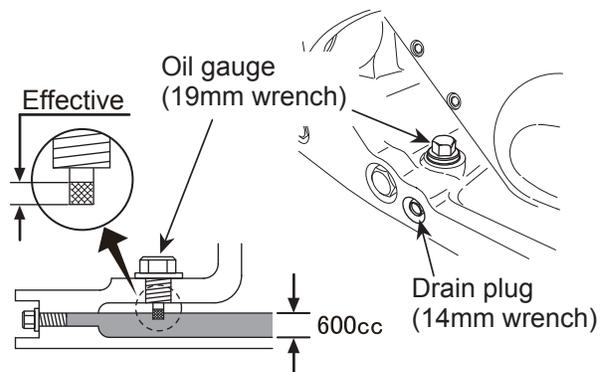


Figure 9. Vibrator Oil Check

HANDLE BAR

The height of the handle bar can be adjusted for ease of use. Adjust the handle height as follows. Refer to Figure 10.

1. Loosen the wing nut.
2. Turn the grip clockwise to raise the handle or counterclockwise to lower the handle.
3. When the handle bar is raised to the desired height, tighten the wing nut.

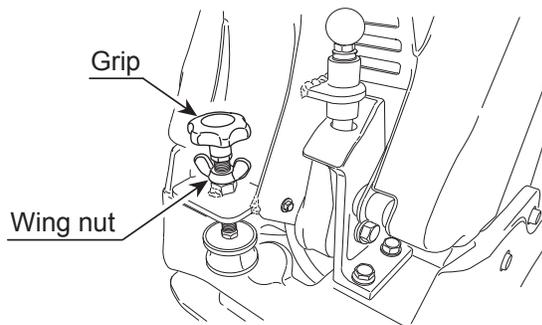


Figure 10. Handle Height Adjustment

CAUTION



DO NOT attempt to operate the compactor until the Safety, General Information and Inspection sections of this manual have been *read and thoroughly understood*.

This section is intended to assist the operator with the initial startup of the compactor. It is extremely important that this section be read carefully before attempting to use the compactor in the field.

STARTING THE ENGINE

Electric Start

1. Insert the key to the key switch.
2. Move the throttle lever (Figure 11) to the *idle* position.

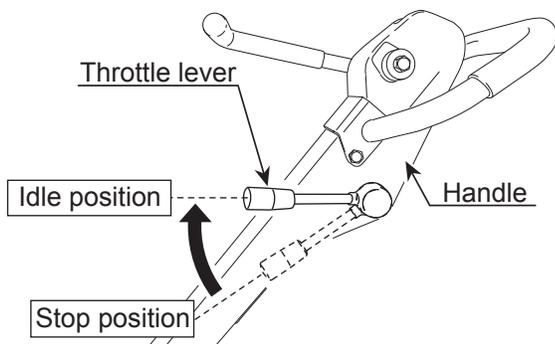


Figure 11. Throttle Lever (Idle Position)

3. Turn the key to the "Run" position (Figure 12). The buzzer sounds.

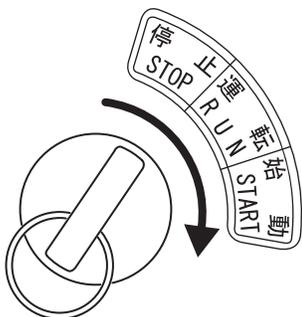
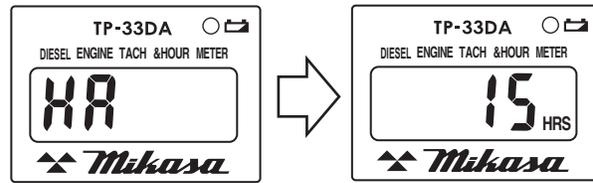


Figure 12. Key Positions

4. After "HA" is displayed on the hour tachometer, the display will change immediately to "cumulative time" (Figure 13).



"HA" is displayed at the operation position, then immediately it will change to "Cumulative time".

Figure 13. Hour Tachometer (Cumulative Time)

5. Turn the key further to the "Start" position to start the engine. When the engine starts, let go of the key. When the engine revolution increases, the buzzer stops.
6. When the engine is in operation, the Hour Tachometer display will show the "rotation number" (Figure 14).

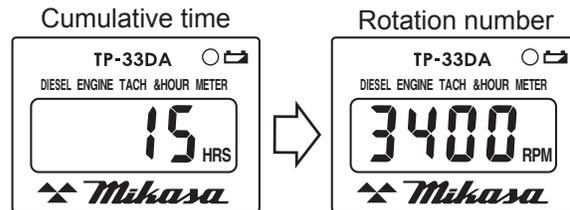


Figure 14. Hour Tachometer (Rotation Number)

7. After the engine has started, warm up the engine at low speed for 2 to 3 minutes, especially in cold weather.

CAUTION

When the engine does not start, do not run the cell motor continuously for more than 5 seconds. Move the key back to the "Run" position then wait about 10 seconds to restart.

While the engine is running, never turn the key switch to the "Start" position.

Recoil Start

1. Insert the key to the key switch.
2. Move the throttle lever (Figure 11) to the *idle* position.
3. Turn the key to the "Run" position (Figure 12). The buzzer sounds.
4. After "HA" is displayed on the hour tachometer, the display will change immediately to "cumulative time"
5. Grasp the starter grip (Figure 15) and slowly pull it out. The resistance becomes the hardest at a certain position, corresponding the compression point. Rewind the rope a little from that point and pull out sharply.

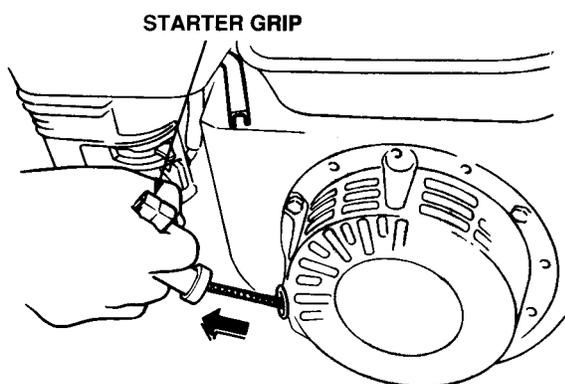


Figure 15. Starter Grip

NOTICE

DO NOT pull the starter rope all the way to the end.

DO NOT release the starter rope after pulling. Allow it to rewind as slow as possible.

6. When engine starts, release the starter grip and allow the rope to recoil.
7. After the engine has started, warm up the engine at low speed for 2 to 3 minutes, especially in cold weather.
8. Before the compactor is placed in to operation, run the engine for several minutes. Check for fuel leaks, and noises that would associate with a loose component.

OPERATION

CAUTION



ALWAYS follow all safety rules in the safety section of this manual before operating compactor. Keep work area clear of debris and other objects that could cause bodily injury or damage to the compactor.

1. Once the engine has started, move the engine throttle lever quickly to the **operation** position (Figure 16).

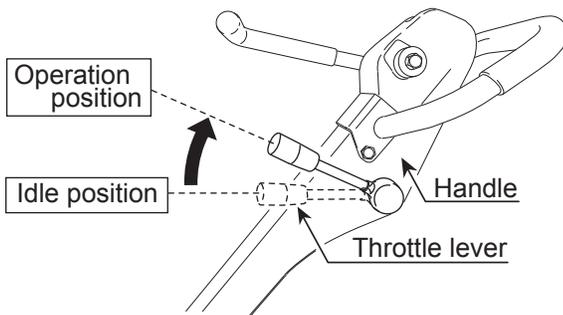


Figure 16. Throttle Lever (Operation Position)

2. With the throttle lever in the run position, the engine speed should be around 2,300 RPM, therefore engaging the centrifugal clutch.

NOTICE

ALWAYS move the throttle lever quickly without hesitation, because increasing the engine speed slowly causes the clutch to slip.

3. Using the direction control lever, move the machine backward or forward (Figure 17). When the direction control lever is pushed forward, the machine moves forward. When pulled backward, the machine moves backward.

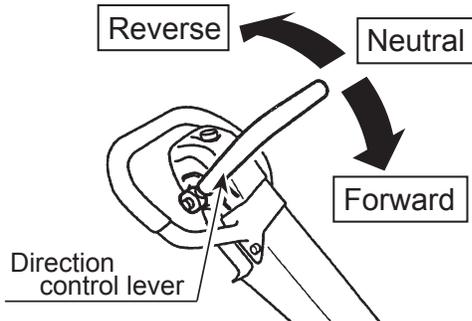


Figure 17. Direction Control Lever

4. When the direction control lever is the neutral position, the machine vibrates staying at the same location

NOTICE

NEVER stop the engine suddenly while working at high speeds.

5. Compactor traveling speed may drop on soils which contain clay, however there may be cases where traveling speed drops because the compaction plate does not leave the ground surface easily due to the composition of the soil. To rectify this problem do the following:
 - Check the bottom plate to see if clay or equivalent material has been lodge in the plate mechanism. If so, wash with water and remove.
 - Remember the compactor does not work as efficiently on clay or soils that have a high moisture content level.
 - If the soil has a high moisture level, dry soil to appropriate moisture content level or carry out compaction twice.

STOPPING THE ENGINE

Normal Shutdown

1. Move the throttle lever to the **idle** position (Figure 18) and run the engine for three minutes at low speed.

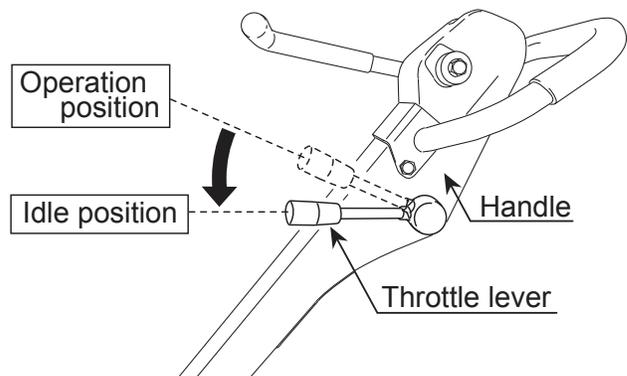


Figure 18. Throttle Lever (Idle)

2. Move the throttle lever (Figure 19) to the "Stop" position to stop the engine. The buzzer will sound.

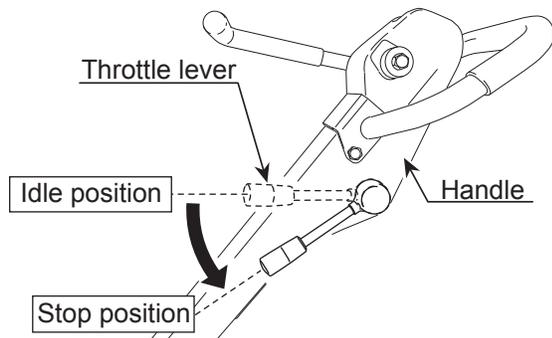


Figure 19. Throttle Lever (Stop Position)

3. Turn the key to the "Stop" position (Figure 20). The buzzer will stop.

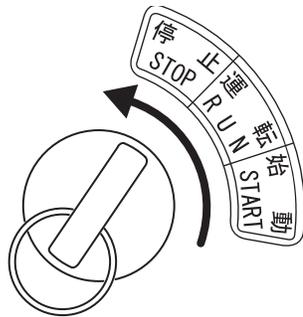


Figure 20. Key Switch (Stop)

Emergency Shutdown

1. Move the throttle lever quickly to the **IDLE** position, and turn the key to the "Stop" position.

GENERAL MAINTENANCE

General maintenance practices are crucial to the performance and longevity of your compactor. This equipment requires routine cleaning, inspection and lubrication. Refer to Table 5 and Table 6 for scheduled engine and compactor maintenance.

The following maintenance procedures can prevent serious compactor damage or malfunctioning.

NOTICE

Refer to **HATZ** engine manual supplied with your compactor for more detailed engine maintenance and troubleshooting.

CAUTION

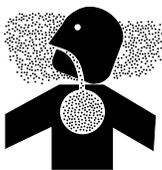


ALWAYS allow the engine to cool before servicing. **NEVER** attempt any maintenance work on a hot engine.

CAUTION

ALWAYS disconnect the spark plug wire from the spark plug and secure away from the engine before performing maintenance or adjustments on the machine.

WARNING



Some maintenance procedures may require the engine to be run. Ensure that the maintenance area is well ventilated. Fuel engine exhaust contains poisonous carbon monoxide gas that can cause unconsciousness and may result in **DEATH**.

General Cleanliness

Clean the compactor daily. Remove all dust and debris buildup (mud, clay etc.). If the compactor is steam-cleaned, ensure that lubrication is accomplished **AFTER** steam cleaning.

NOTICE

Inspection and other services should always be carried out on hard and level ground with the engine shut down.

NOTICE

The inspection intervals listed in the maintenance tables are for operation under normal conditions. Adjust your inspection intervals based on the number hours plate compactor is in use, and particular working conditions.

To make sure your plate compactor is always in good working condition before using, carry out the maintenance inspection in accordance with Table 5 and Table 6.

ENGINE MAINTENANCE

Perform engine maintenance as listed in Table 5.

Table 5. Engine Maintenance Schedule							
Description (3)	Operation	Before	First Month or 10 hrs	Every 3 Months or 25 hrs	Every 6 Months or 50 hrs	Every Year or 100 hrs	Every 2 Years or 200 hrs
Engine Oil	CHECK	X					
	CHANGE		X				
Air Cleaner	CHECK	X					
	CHANGE			X (1)			
All Nuts and Bolts	Retighten If Necessary	X					
Spark Plug	CHECK-CLEAN				X		
	REPLACE						X
Cooling Fins	CHECK				X		
Spark Arrester	CLEAN					X	
Fuel Tank	CLEAN					X	
Fuel Filter	CHECK					X	
Idle Speed	CHECK-ADJUST					X (2)	
Valve Clearance	CHECK-ADJUST						X (2)
Fuel lines	CHECK	Every 2 years (replace if necessary) (2)					

1. Service more frequently when used in **DUSTY** areas.
2. These items should be serviced by your service dealer, unless you have the proper tools and are mechanically proficient. Refer to the **Hatz** Shop Manual for service procedures.
3. For commercial use, log hours of operation to determine proper maintenance intervals.

MACHINE INSPECTION

Perform machine inspection as listed in Table 6.

Interval	Check	Solution
Daily Before Starting	Machine	Clean if necessary.
	Fuel Tank For Leaks	Repair fuel leaks.
	Fuel System for Leaks	Repair fuel leaks.
	Engine Oil	Add oil if necessary.
	Vibrator Oil	Add oil if necessary.
	Air Cleaner Element	Clean/Replace
	Guard Frame	Inspect/deformations
	Shock Absorber	Replace if damaged.
	Hydraulic pump	Check/Repair Leaks
	Hydraulic Pipe System	Check/Repair leaks, Inspect for wear
	Direction Control Lever	Check bolts/nuts, Inspect for wear
	Duct Hose	Check for crack/damage
Every 20 Hours	Engine Oil/Oil Filter	Replace only after first 20 hrs.
Every 100 Hours	Engine Oil	Change
	Engine Oil Filter	Wash
	Vibrator Oil	Check oil level. Check for leaks/dirt.
	Hydraulic Oil	Check oil level. Check for leaks.
	Battery Terminal	Clean
Every 200 hours	V-Belt	Inspect, replace if damaged or worn.
	Clutch	Inspect, replace if not working properly.
	Engine Bolts	Replace bolts if deformed or elongated.
Every 300 hours	Vibrator Oil	Change
	Fuel Filter	Change
	Hydraulic Oil	Change
	Engine Oil Filter	Change
Every 2 years	Fuel Lines	Replace

TIGHTENING TORQUE

Reference Table 7 below (Tightening Torque), for retightening of nuts and bolts.

Material	6mm	8mm	10mm	12mm	14mm	16mm	18mm	20mm
4T	70	150	300	500	750	1,100	1,400	2,000
6-8T	100	250	500	800	1,300	2,000	2,700	3,800
11T	150	400	800	1,200	2,000	2,900	4,200	5,600
*	100 (6mm) 300 ~ 350 (8mm) 650 ~ 700 (10mm)							
**	In case counter-part is of aluminum							
Bolt threads used with this machine are all right handed								
Material and quality of material is marked on each bolt, and screw.								

ENGINE AIR CLEANER

⚠ DANGER



DO NOT use gasoline or low flash point solvents for cleaning the air cleaner. The possibility exists of fire or explosion which can cause damage to the equipment and severe bodily harm or even **DEATH!**

⚠ CAUTION



Wear protective equipment such as approved safety glasses or face shields and dust masks or respirators when cleaning air filters with compressed air.

This engine is equipped with a replaceable, high-density paper air cleaner element. See (Figure 21) for air cleaner components.

1. Remove the air cleaner cover and foam filter element.
2. Tap the paper filter element several times on a hard surface to remove dirt, or blow compressed air not exceeding 30 psi (207 kPa, 2.1 kgf/cm²) through the filter element from the inside out. **NEVER** brush off dirt. Brushing will force dirt into the fibers. Replace the paper filter element if it is excessively dirty.

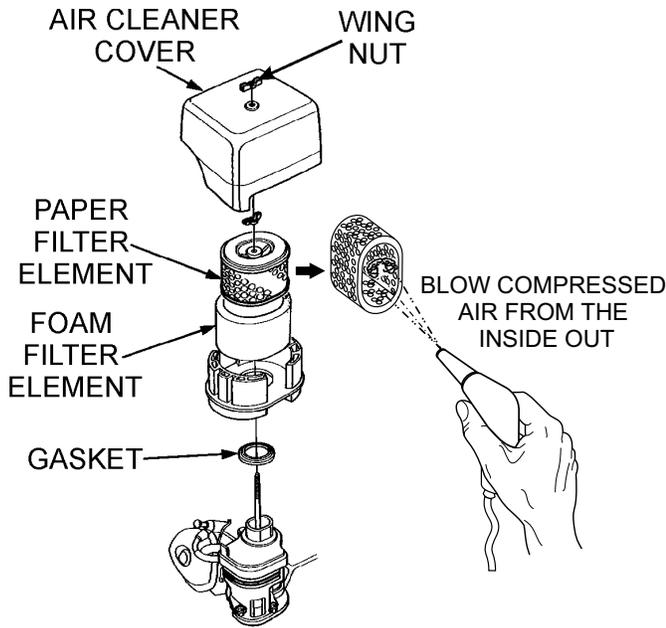


Figure 21. Engine Air Cleaner

3. Clean foam element in warm, soapy water or nonflammable solvent. Rinse and dry thoroughly. Dip the element in clean engine oil and completely squeeze out the excess oil from the element before installing.

NOTICE

Operating the engine with loose or damaged air cleaner components could allow unfiltered air into the engine causing premature wear and failure.

CYCLONE CLEANER

Always clean the dust pot. A clogged dust pot reduces cyclone effect with cleaner element wearing easily.

1. Unlatch and remove dust pot (Figure 22).

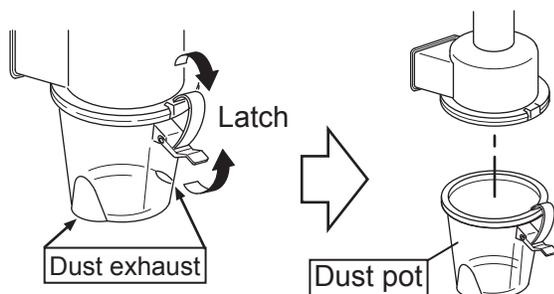


Figure 22. Unlatching Dust Pot

2. Clean dust pot with water and neutral detergent.
3. Return dust pot to air cleaner and latch securely.

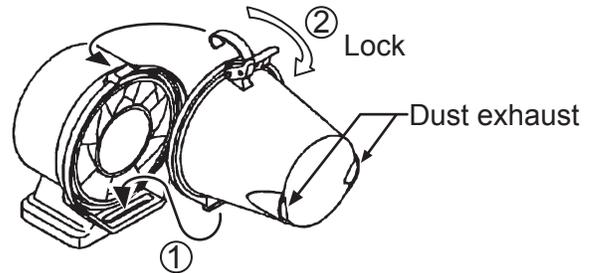


Figure 23. Latching Dust Pot

ENGINE OIL

NOTICE

Drain the engine oil when the oil is warm.

1. Remove the oil drain bolt (Figure 24), and sealing washer and allow the oil to drain into a suitable container.
2. Replace engine oil with recommended type oil as listed in Table 4. For engine oil capacity, see Table 2 (Engine Specifications). **DO NOT** overfill.
3. Reinstall drain bolt with sealing washer and tighten securely.

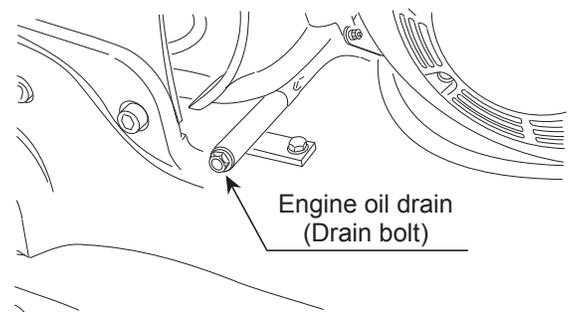


Figure 24. Draining Engine Oil

HYDRAULIC OIL

1. With the handle in vertical position, remove the plug cap from the hydraulic pump (Figure 25).

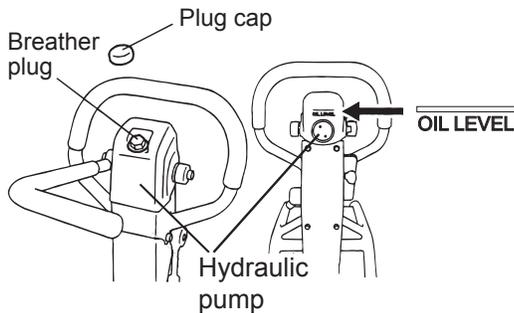


Figure 25. Removing Plug/Breather Cap

2. Remove the breather plug with a 24 mm wrench at the top of the hydraulic pump.
3. Remove the hydraulic hose connected to the cylinder on the vibrator side (Figure 26).

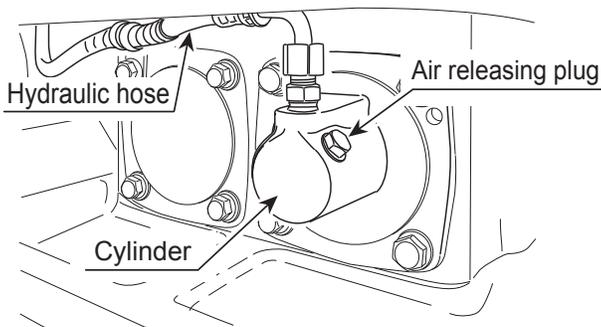


Figure 26. Removing Hydraulic Hose

4. Set the run lever to reverse.
5. Drain the hydraulic oil from the pump.
6. After the oil is drained, attach the hydraulic hose again to the cylinder on the vibrator side.

7. With the direction control lever at the forward-most position, secure the guard frame with a rope to immobilize (Figure 27).

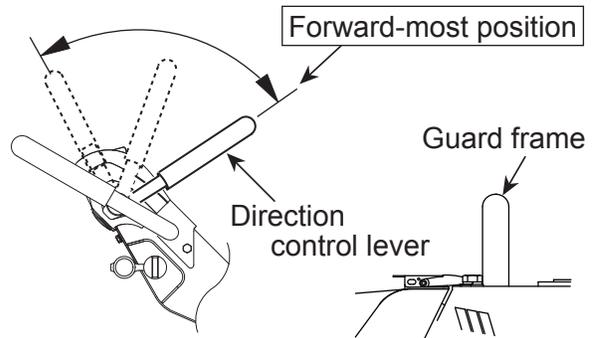


Figure 27. Direction Control Lever (Forward Position)

8. Pour hydraulic oil (550cc) to the hydraulic pump breather plug attachment hole (Figure 25).
9. Remove the air releasing plug of vibrator cylinder. Oil will then come out from the air releasing plug. After air bubbles stop coming out, reattach the plug. Tighten securely (Figure 26).
10. Release the direction control lever and move the lever forward and reverse several times (until no air bubbles are seen). Keep the lever at the forward position for 10 seconds every time. (Because the check valve is opened at the maximum forward position and air bubble will come out from the oil tank of the hydraulic pump).
11. In case the air bleeding is insufficient, repeat steps 9 and 10.
12. Attach the hydraulic pump breather plug and put on the plug cap. After making sure the hydraulic oil in the pump is at OIL LEVEL, attach the breather plug.

CAUTION

DO NOT exceed OIL LEVEL of hydraulic oil. If the level is higher, oil will burst out from the breather plug.

SPARK PLUG

NOTICE

NEVER use a spark plug of incorrect heat range.

1. Remove and clean spark plug (Figure 28) with a wire brush if it is to be reused. Discard spark plug if the insulator is cracked or chipped.
2. Using a feeler gauge adjust spark plug gap to 0.028 ~0.031 inch (0.7~0.8 mm).
3. Thread spark plug into cylinder hole by hand to prevent cross-threading, then tighten securely.

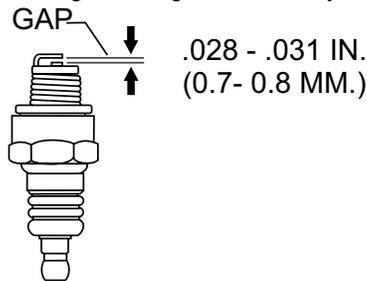


Figure 28. Spark Plug Gap

V-BELT

Visually examine the V-belt (Figure 29) and determine if it is full of tiny cracks, frayed, has pieces of rubber missing, is peeling or otherwise damaged.

Also, examine the belt and determine if it is **oil soaked** or **"glazed"** (hard shiny appearance on the sides of the belt). Either of these two conditions can cause the belt to run hot, which can weaken it and increase the danger of it breaking.

If the V-belt exhibits any of the above wear conditions replace the V-belt immediately.

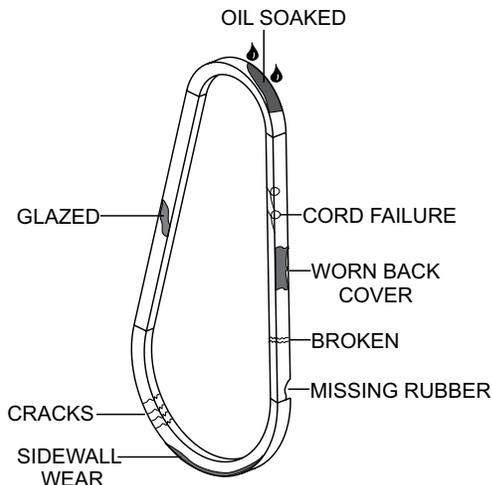


Figure 29. V-Belt Inspection

SPARK ARRESTER CLEANING

Clean the spark arrester every year or 100 hours.

1. Remove the 4 mm screw (3) from the exhaust deflector, then remove the deflector. See (Figure 30).
2. Remove the 5 mm screw (4) from the muffler protector, then remove the muffler protector.
3. Remove the 4 mm screw from the spark arrester, then remove the spark arrester.

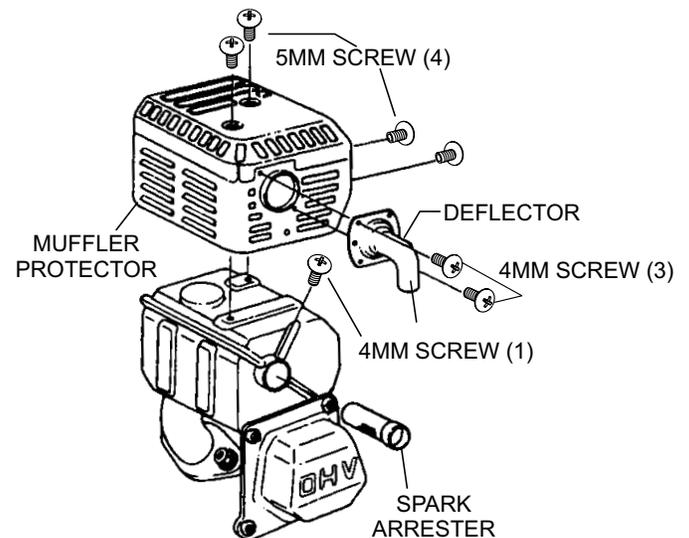


Figure 30. Spark Arrester Removal

4. Carefully remove carbon deposits from the spark arrester screen (Figure 31) with a wire brush.

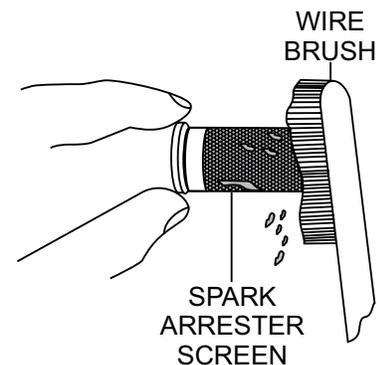


Figure 31. Cleaning The Spark Arrester

5. If the spark arrester is damaged and has breaks or holes, replace with a new one.
6. Reinstall the spark arrester and muffler protector in reverse order of disassembly.

BATTERY

NOTICE

Battery is not included with this machine

The standard battery is a maintenance-free battery. It is not necessary to supply battery fluid. In case of a sudden voltage drop, the battery cannot be charged quickly, so it has to be replaced with a new one.

Checking Battery Capacity

1. Check the battery checker on the hour tachometer (Figure 32).

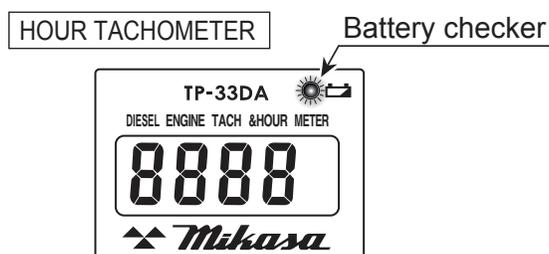


Figure 32. Battery Check

2. When the battery charge gets low, the battery checker lights red.

NOTICE

If an old battery is used, even when the battery checker is not lighted (indicating low charge), the cell starter might not operate because of low charging level. If that happens, change the battery with the new one.

Changing the Battery

1. Unlatch the two stoppers at the top portion of the rear cover to open the rear cover (Figure 33).

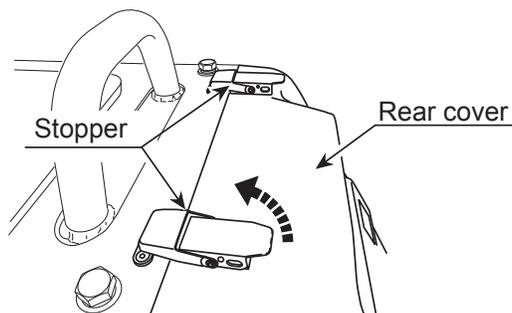


Figure 33. Opening Rear Cover.

2. Loosen the two bolts on each side of the bar connecting the battery to the side rails (Figure 34).

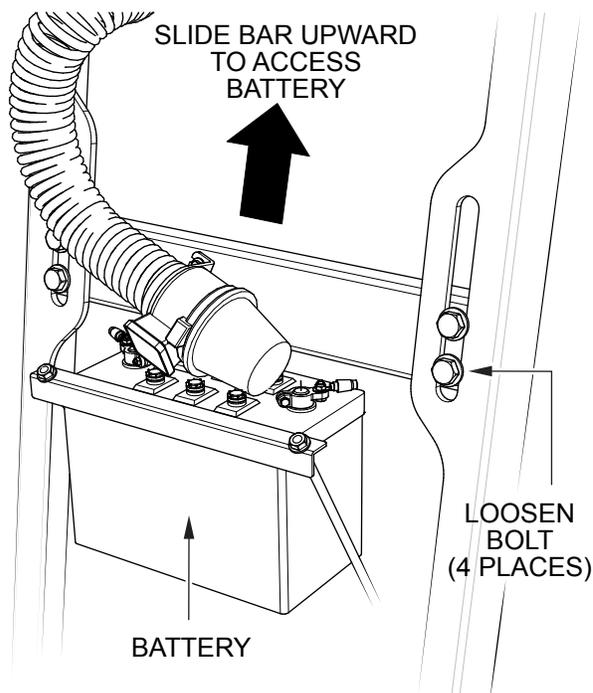


Figure 34. Raising the Battery

3. Slide the bar up the notches for easy access to the battery and tighten the bolts.
4. Take off the nuts and remove the battery holder (Figure 35).
5. After tilting the battery backward, disconnect the battery terminal. Always disconnect the black terminal on the negative side first.
6. Pull up the handle on the top of the battery to remove the battery from the machine.(Figure 35). Make sure that the battery terminals do not touch the frame.

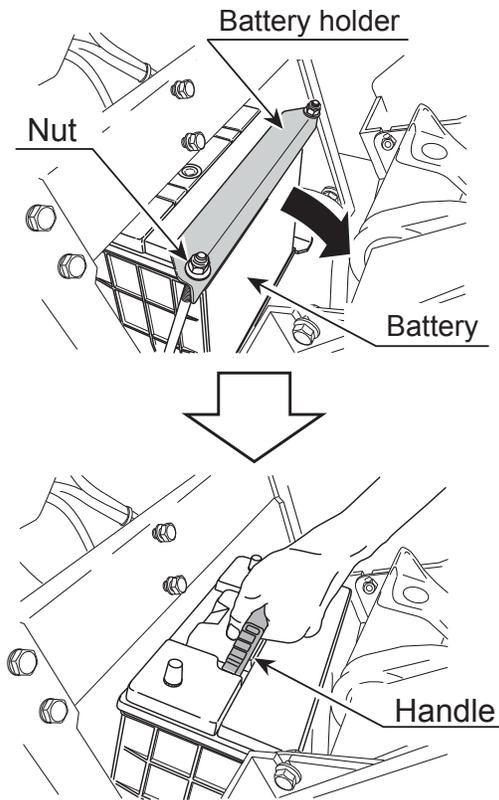


Figure 35. Removing Battery

STORAGE

1. Wash off dirt and soil from every part with water. While washing, be careful not to let the water splash on the electric components such as the battery and the engine muffler.
2. Cover the machine to prevent dust and dirt buildup.
3. Store the machine in a dry area away from direct sunlight.
4. Do not leave the machine outdoors. Keep it indoors.
5. When not used for a long period of time, drain the fuel from the fuel tank, and either disconnect the battery terminals or remove the battery itself.
6. When the machine is used after a long storage period, check the level of engine oil and battery capacity before using.

7. To install new battery, perform the procedure in reverse. Make sure that the red terminal (positive side) is connected first.
8. Loosen the two bolts on each side of the battery bracket and slide the bracket down to lower the battery to its original location.
9. Tighten the four bolts.

TROUBLESHOOTING (COMPACTOR)

Troubleshooting (Compactor)		
Symptom	Possible Problem	Solution
Travel speed low and vibration weak.	Clutch slips?	Adjust or replace clutch.
	V-belt slips?	Adjust or replace V-belt.
	Excessive oil in vibrator?	Fill to correct level.
	Trouble in vibrator internals?	Check vibrator assembly for any worn or defective parts, replace any defective parts.
	Aeration in hydraulic oil for for travel reversing system?	Purge air in hydraulic oil. (Bleed plug)
	Engine speed incorrect?	Set engine speed to correct RPM.
Travels forward or backward but unable to switch direction.	Hydraulic pump problems?	Check hydraulic pump.
	Direction Control Lever installation wrong?	Correct installation of IDirection Control Lever.
	Broken or defective oil hose?	Replace oil hose.
	Aeration in hydraulic oil?	Purge air in hydraulic oil. (Bleed plug)
	Excessive oil in reversing system?	Fill to correct level.
	Hydraulic pump clogged with trash?	Clean valve inside hydraulic pump.
	Cylinder piston bearing failure?	Check piston bearing in cylinder for leakage.
Does not travel in forward or reverse	V-belt disengaged or slips?	Engage V-belt, adjust or replace.
	Clutch slips?	Adjust clutch, replace if necessary.
	Vibrator locks?	Check vibrator and correct problem.
	Cylinder piston bearing failure?	Check piston bearing in cylinder for leakage at USH packing.
Direction Control Lever operating resistance for reverse is high.	Piston inside hydraulic pump not moving smoothly?	Adjust or replace.
	Vibrator cylinder piston does not move smoothly	Adjust or replace.

TROUBLESHOOTING (ENGINE)

Troubleshooting (Engine)		
Symptom	Possible Problem	Solution
Engine will not start or start is delayed, although engine can be turned over.	No Fuel reaching injection pump?	Add fuel. Check entire fuel system.
	Defective fuel pump?	Replace fuel pump.
	Fuel filter clogged?	Replace fuel filter and clean tank.
	Faulty fuel supply line?	Replace or repair fuel line.
	Compression too low?	Check piston, cylinder and valves. Adjust or repair per engine repair manual.
	Fuel pump not working correctly?	Repair or replace fuel pump.
	Oil pressure too low?	Check engine oil pressure.
	Low starting temperature limit exceeded?	Comply with cold starting instructions and proper oil viscosity.
	Defective battery?	Charge or replace battery.
	Air or water mixed in fuel system?	Check carefully for loosened fuel line coupling, loose cap nut, etc.
At low temperatures engine will not start.	Engine oil too thick?	Refill engine crankcase with correct type of oil for winter environment.
	Defective battery?	Replace battery.
Engine fires but stops soon as starter is switched off.	Fuel filter blocked?	Replace fuel filter.
	Fuel supply blocked?	Check the entire fuel system.
	Defective fuel pump?	Replace fuel pump.
Engine stops by itself during normal operation.	Fuel tank empty?	Add fuel.
	Fuel filter blocked?	Replace fuel filter.
	Defective fuel pump?	Replace fuel pump.
	Mechanical oil pressure shutdown sensor stops the engine due to low oil?	Add oil. Replace low oil shutdown sensor if necessary.
Low engine power, output and speed.	Fuel tank empty?	Replace fuel filter.
	Fuel filter clogged?	Replace fuel filter.
	Fuel tank venting is inadequate?	Ensure that tank is adequately vented.
	Leaks at pipe unions?	Check threaded pipe unions tape and tighten unions as required.
	Speed control lever does not remain in selected position?	See engine manual for corrective action.
	Engine oil level too full?	Correct engine oil level.
	Injection pump wear?	Use No. 2-D diesel fuel only. Check the fuel injection pump element and delivery valve assembly and replace as necessary.

TROUBLESHOOTING (ENGINE)

Troubleshooting (Engine) - continued		
Symptom	Possible Problem	Solution
Low engine power output and low speed, black exhaust smoke.	Air filter blocked?	Clean or replace air filter.
	Incorrect valve clearances?	Adjust valves per engine specification.
	Malfunction at injector?	See engine manual.
Engine overheats.	Too much oil in engine crankcase?	Drain off engine oil down to uppermark on dipstick.
	Entire cooling air system contaminated/ blocked?	Clean cooling air system and cooling fin areas.
	Fan belt broken or elongated?	Change belt or adjust belt tension.
	Coolant insufficient?	Replenish coolant.
	Radiator net or radiator fin clogged with dust?	Clean net or fin carefully.
	Fan, radiator, or radiator cap defective?	Replace defective part.
	Thermostat defective?	Check thermostat and replace if necessary.
Head gasket defective or water leakage?	Replace parts.	

EXPLANATION OF CODE IN REMARKS COLUMN

The following section explains the different symbols and remarks used in the Parts section of this manual. Use the help numbers found on the back page of the manual if there are any questions.

NOTICE

The contents and part numbers listed in the parts section are subject to change **without notice**. Multiquip does not guarantee the availability of the parts listed.

SAMPLE PARTS LIST

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	12345	BOLT	1	INCLUDES ITEMS W/%
2%		WASHER, 1/4 IN.		NOT SOLD SEPARATELY
2%	12347	WASHER, 3/8 IN. ...	1	MQ-45T ONLY
3	12348	HOSE		A/R ...MAKE LOCALLY
4	12349	BEARING	1	S/N 2345B AND ABOVE

NO. Column

Unique Symbols — All items with same unique symbol (@, #, +, %, or >) in the number column belong to the same assembly or kit, which is indicated by a note in the “Remarks” column.

Duplicate Item Numbers — Duplicate numbers indicate multiple part numbers, which are in effect for the same general item, such as different size saw blade guards in use or a part that has been updated on newer versions of the same machine.

NOTICE

When ordering a part that has more than one item number listed, check the remarks column for help in determining the proper part to order.

PART NO. Column

Numbers Used — Part numbers can be indicated by a number, a blank entry, or TBD.

TBD (To Be Determined) is generally used to show a part that has not been assigned a formal part number at the time of publication.

A blank entry generally indicates that the item is not sold separately or is not sold by Multiquip. Other entries will be clarified in the “Remarks” Column.

QTY. Column

Numbers Used — Item quantity can be indicated by a number, a blank entry, or A/R.

A/R (As Required) is generally used for hoses or other parts that are sold in bulk and cut to length.

A blank entry generally indicates that the item is not sold separately. Other entries will be clarified in the “Remarks” Column.

REMARKS Column

Some of the most common notes found in the “Remarks” Column are listed below. Other additional notes needed to describe the item can also be shown.

Assembly/Kit — All items on the parts list with the same unique symbol will be included when this item is purchased.

Indicated by:

“INCLUDES ITEMS W/(unique symbol)”

Serial Number Break — Used to list an effective serial number range where a particular part is used.

Indicated by:

“S/N XXXXX AND BELOW”

“S/N XXXX AND ABOVE”

“S/N XXXX TO S/N XXX”

Specific Model Number Use — Indicates that the part is used only with the specific model number or model number variant listed. It can also be used to show a part is NOT used on a specific model or model number variant.

Indicated by:

“XXXXX ONLY”

“NOT USED ON XXXX”

“Make/Obtain Locally” — Indicates that the part can be purchased at any hardware shop or made out of available items. Examples include battery cables, shims, and certain washers and nuts.

“Not Sold Separately” — Indicates that an item cannot be purchased as a separate item and is either part of an assembly/kit that can be purchased, or is not available for sale through Multiquip.

SUGGESTED SPARE PARTS

MVH508DZ PLATE COMPACTOR WITH 1D81S-325 DIESEL ENGINE

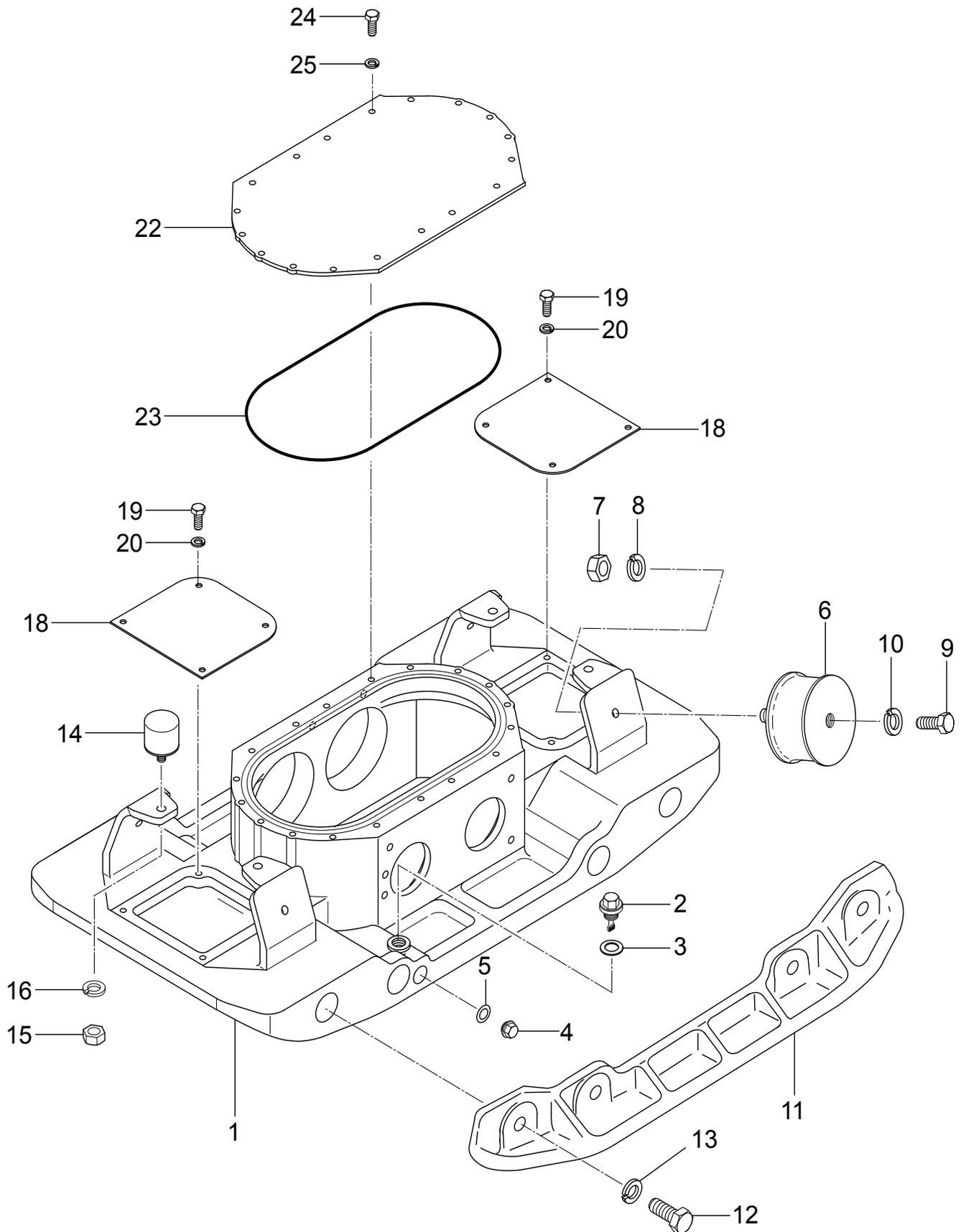
1 to 5 units

Qty.	P/N	Description
4.....	.070200483.....	V-BELT
4.....	.939010010.....	SHOCK ABSORBER, STOPPER
3.....	.50478800.....	FUEL FILTER, IN-LINE
4.....	.939010370.....	SHOCK ABSORBER
1.....	.50384401.....	IGNITION SWITCH
3.....	.50404900.....	KEY, IGNITION SWITCH
1.....	.50385801.....	CAP, FUEL TANK
1.....	.50387300.....	FUEL SIEVE
3.....	.01493000.....	ELEMENT, AIR FILTER
3.....	.01480001.....	ELEMENT, OIL FILTER W/ O-RING

NOTICE

Part numbers on this Suggested Spare Parts list may supersede/replace the part numbers shown in the following parts lists.

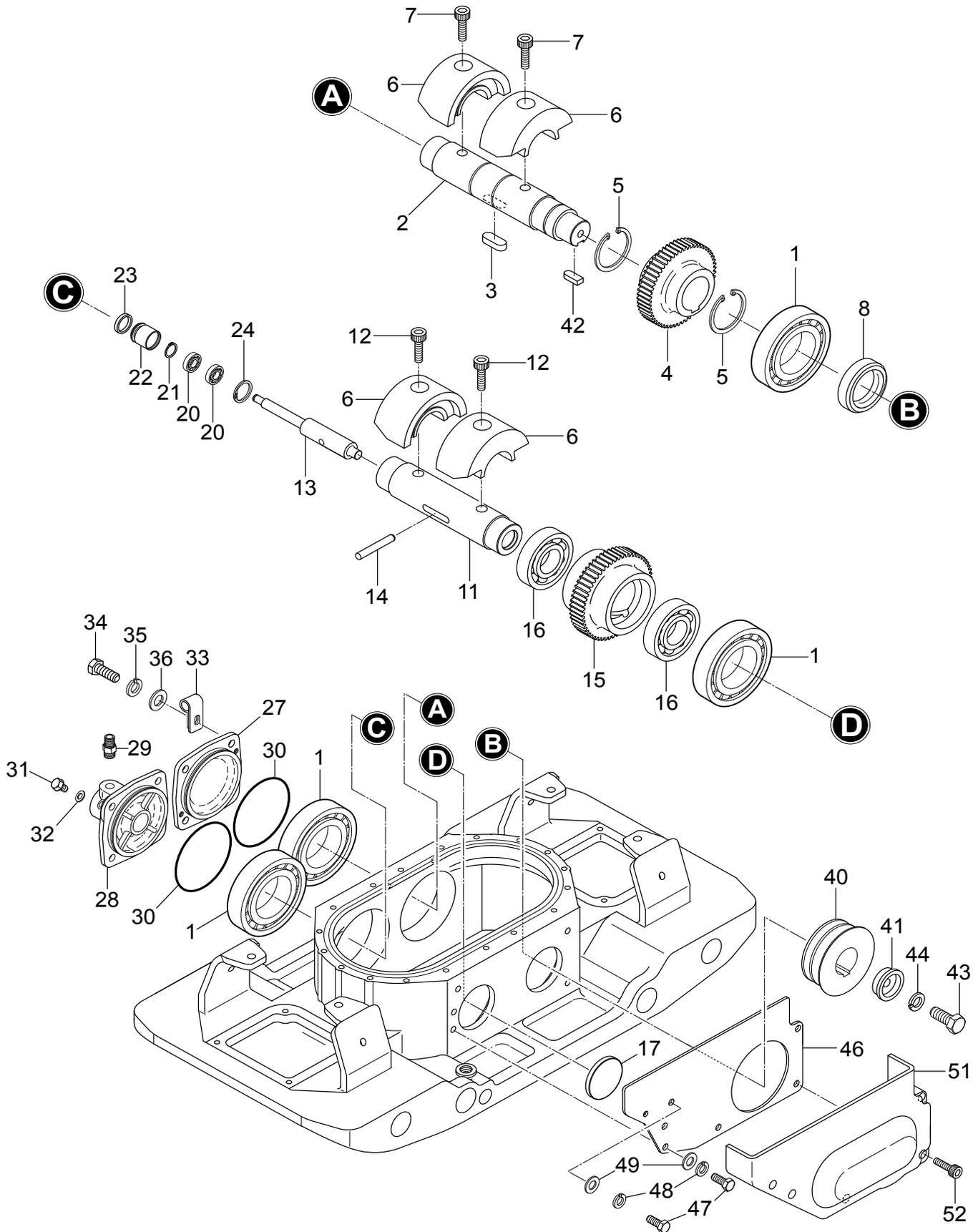
VIBRATING PLATE ASSY.



VIBRATING PLATE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	468121200	VIBRATING PLATE	1	
2	465460670	OIL GAUGE	1	
3	953402930	COPPER PACKING	1	
4	953400270	PLUG	1	
5	953405260	PACKING 1/4	1	
6	939010370	SHOCK ABSORBER	4	
7	020316130	NUT M16	4	
8	030216400	WASHER, LOCK M16	4	
9	001221635	BOLT 16X35	4	
10	030216400	WASHER, LOCK M16	4	
11	467219050	EXTENSION PLATE	2	
12	012218050	BOLT 18X50	8.....	REPLACES 001221850
13	58407	WASHER, LOCK M18	8.....	REPLACES 030218460
14	939010010	SHOCK ABSORBER, STOPPER	4	
15	020310080	NUT M10	4	
16	030210250	WASHER, LOCK M10	4	
18	468352110	COVER, VIBRATING PLATE	2	
19	014208020	BOLT 8X20	8.....	REPLACES 001220820
20	030208200	WASHER, LOCK M8	8	
22	467351790	COVER VIBRATOR	1	
23	050103250	O-RING	1	
24	014208020	BOLT 8X20.....	18.....	REPLACES 001220820
25	030208200	WASHER, LOCK M8	18	

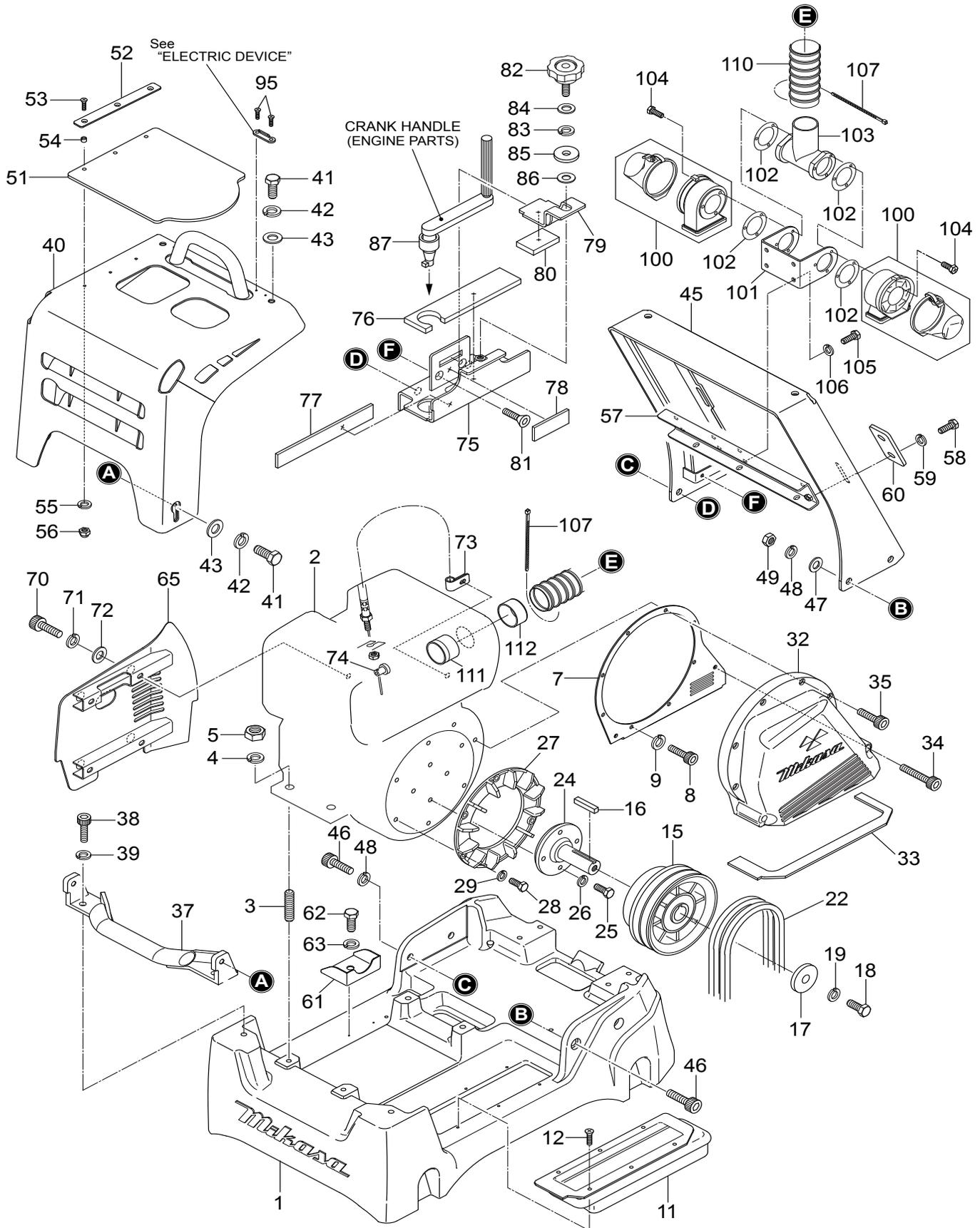
VIBRATOR ASSY.



VIBRATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	047920120	ROLLER BEARING	4	
2	457212410	ROTARY SHAFT, DRIVE	1	
3	951405370	KEY 15X10X39	1	
4	456327150	GEAR, DRIVE	1	
5	080200550	STOP RING	2	
6	469352310	ECCENTRIC ROTATOR	4	
7	009120301	SOCKET HEAD BOLT 16X40	2	
8	060105030	OIL SEAL	1	
11	456337670	ROTARY SHAFT, DRIVEN	1	
12	009120302	SOCKET HEAD BOLT 16X30	2	
13	456337380	PISTON ROD	1	
14	456010010	KNOCK PIN 10X70	1	
15	467351910	GEAR (DRIVEN)	1	
16	040306911	BEARING	2	
17	953010030	SEAL CAP	1	
20	042506000	BEARING 6000ZZSG	2	
21	0080000010	STOP RING	1	REPLACES 080200100
22	455435051	PISTON	1	
23	455010070	PACKING	1	
24	080100260	STOP RING	1	
27	467352540	BEARING COVER	1	
28	467219070	CYLINDER (R)	1	
29	954010020	CONNECTOR PT, PF 1/4	1	
30	050101050	O-RING	2	
31	001720812	FLANGE BOLT 8X12	1	
32	953404600	COPPER PACKING	1	
33	959408880	CLIP 15 (M10)	1	
34	0105091025	BOLT 10X25.....	8	REPLACES 001221025
35	030210250	WASHER, LOCK M10	8	
36	031110160	WASHER, FLAT M10	8	
40	469352320	PULLEY	1	
41	456437920	WASHER, PULLEY	1	
42	951404970	KEY 12X8X30	1	
43	012212035	BOLT 12X35	1	REPLACES 001221235
44	030212300	WASHER, LOCK M12	1	
46	467351920	GUIDE, BELT COVER	1	
47	014208020	BOLT 8X20	2	REPLACES 001220820
48	030208200	WASHER, LOCK M8	2	
49	0401450080	WASHER, FLAT M8	2	REPLACES 031108160
51	469219030	BELT COVER, LOWER	1	
52	001520860	SOCKET HEAD BOLT 8X100	5	

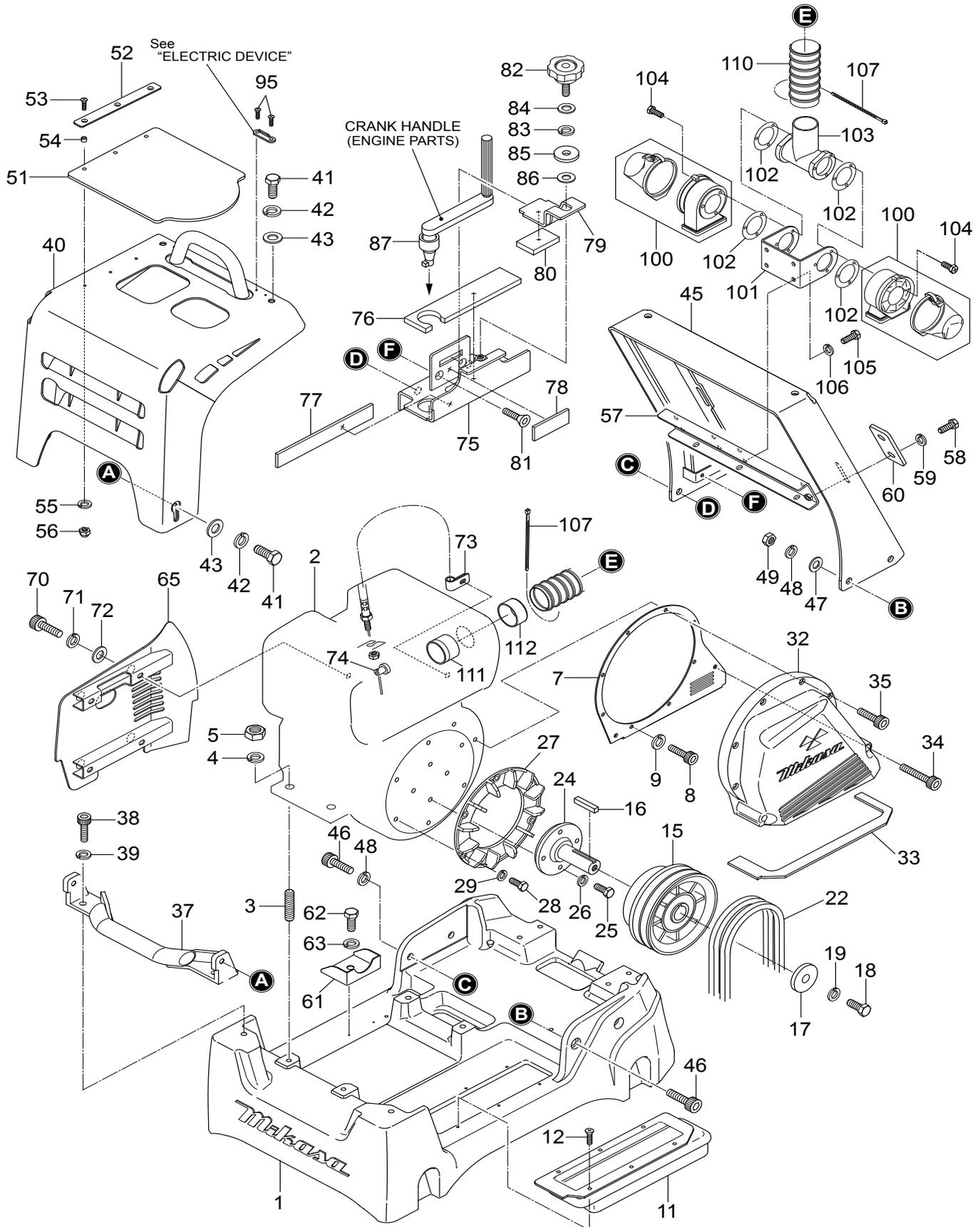
BASE AND ENGINE ASSY.



BASE AND ENGINE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	469121280	BASE	1	
2	918401200	ENGINE ASSY.	1	
3	009120205	STUD BOLT 12X25	4	
4	030212300	WASHER, LOCK M12	4	
5	0039312000	NUT M12	4	REPLACES 020312100
7	469352260	BELT COVER, IN	1	
8	014210020	SOCKET HEAD BOLT 10X20.....	3	REPLACES 001521020
9	030210250	WASHER, LOCK M10	3	
11	469218980	DUST COVER	1	
12	092006010	FLAT HEAD SCREW 6X10	6	
15	469352390	CLUTCH ASSY.	1	
16	951010130	KEY 7X7X49	1	
17	952401390	WASHER 11X40X6	1	
18	0105091025	BOLT 10X25.....	1	REPLACES 001221025
19	030210250	WASHER, LOCK M10	1	
22	070200483	V-BELT, HDPF-5460	2	
24	457339571	STUB SHAFT FAN	1	
25	011208030	BOLT 8X30.....	4	REPLACES 001220830
26	030208200	WASHER, LOCK M8	4	
27	457336380	FAN	1	
28	014208020	BOLT 8X20.....	6	REPLACES 001220820
29	030208200	WASHER, LOCK M8	6	
32	469218990	BELT COVER (OUT)	1	
33	469352270	DUST SPONGE (OUT)	1	
34	001521058	SOCKET HEAD BOLT 10X90	2	
35	001521045	SOCKET HEAD BOLT 10X45	5	
37	469352280	FRONT BUMPER	1	
38	001521435	SOCKET HEAD BOLT 14X35	2	
39	030214350	WASHER, LOCK M14	2	
40	469121290	FRONT COVER	1	
41	001221435	BOLT 14X35 T	4	
42	030214350	WASHER, LOCK M14	4	
43	031114260	WASHER, FLAT M14	4	
45	469219330	CENTER COVER	1	
46	001521440	SOCKET HEAD BOLT 14X40	4	
47	031114260	WASHER, FLAT M14	2	
48	030214350	WASHER, LOCK M14	4	
49	020314110	NUT M14	2	
51	468466890	RUBBER COVER, UPPER	1	
52	467466760	STOPPER COVER	1	
53	009120424	SOCKET HEAD BOLT 6X25	3	
54	617465130	COLLAR 6.2X7.8X4.5	3	
55	030206150	WASHER, LOCK M6	3	
56	022710607	NYLON NUT M6	3	

BASE AND ENGINE ASSY. CONTINUED



BASE AND ENGINE ASSY. CONTINUED

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
57	469352890	CLEANER STAY	1	
58	011208025	BOLT 8X25.....	4	REPLACES 001220825
59	030208200	WASHER, LOCK M8	4	
60	467467580	PLATE, CLEANER STAY	2	
61	469467000	GUIDE, DRAIN	1	
62	011008015	BOLT 8X15	1	REPLACES 001220815
63	030208200	WASHER, LOCK M8	1	
65	469219010	SIDE COVER	1	
70	001521251	SOCKET HEAD BOLT 12X55	4	
71	030212300	WASHER, LOCK M12	4	
72	031112230	WASHER, FLAT M12	4	
73	2067550101	CLAMP COMPLETE	1	
74	DH50642000	CLAMP	1	
75	469219120	HOLDER, CRANK HANDLE	1	
76	469467320	POLYURETHANE SEAT 222X50	1	
77	469467310	POLYURETHANE SEAT 220X30	1	
78	469467300	POLYURETHANE SEAT 80X30X5	1	
79	469352530	HOLDER, CRANK HANDLE	1	
80	469467330	POLYURETHANE SEAT 60X40	1	
81	009120408	SUNK HEAD BOLT 8X20	2	
82	959406961	GRIP BOLT 45X10X30	1	
83	030210250	WASHER, LOCK M10	1	
84	031110160	WASHER, FLAT M10	1	
85	952403450	WASHER 11X35X4.5	1	
86	952008940	SEAL WASHER 10X17X1.6	1	
87	469467190	RUBBER PIPE 25X33X20	1	
95	009120420	SOCKET HEAD BOLT 5X10	4	
100	466218080	CLEANER, CYCLONE	2	
101	469352300	CYCLONE STAY	1	
102	466462850	GASKET, AIR INTAKE	4	
103	469219020	JOINT CLEANER	1	
104	009110057	SOCKET HEAD BOLT 5X18	6	
105	011008015	BOLT 8X15 T.....	4	REPLACES 001220815
106	030208200	WASHER, LOCK M8	4	
107	506010060	CLAMP	2	
110	466348590	DUCT HOSE 50X270	1	
111	469467010	INTAKE PIPE	1	
112	466462840	DUCT GROMMET	1	

ELECTRIC DEVICE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	467218920	BATTERY HOLDER	1	
2	456447590	RUBBER PLATE (E)	1	
3	456447600	RUBBER PLATE	2	
4	012210020	BOLT 10X20.....	2	REPLACES 001221020
5	030210250	WASHER, LOCK M10	2	
9	464313740	HOLDER, BATTERY	1	
10	469467170	TIE-DOWN ROD, BATTERY	2	
11	022710809	NYLON NUT M8	2	
12	0401450080	WASHER, FLAT M8	2	REPLACES 031108160
14	955301030	BATTERY CABLE (+)	1	
15	955301040	BATTERY CABLE (-)	1	
16	506010070	CLAMP	4	
18	469121300	REAR COVER	1	
23	014208020	BOLT 8X20 T	1	REPLACES 001220820
24	030208200	WASHER, LOCK M8	1	
25	0401450080	WASHER, FLAT M8	1	REPLACES 031108160
26	959408920	CLIP 8 (M8)	1	
28	404433430	RUBBER	2	
29	001521051	SOCKET HEAD BOLT 10X55	2	
30	030210250	WASHER, LOCK M10	2	
31	952403450	WASHER	2	
32	467467250	RUBBER WASHER	2	
33	417454420	COLLAR	2	
35	469467470	CATCH CLIP	2	INCLUDES ITEM W/\$
36	009120421	SOCKET HEAD BOLT 5X15	4	
37\$	169467480	HOLDER, CATCH CLIP	2	
40	469352340	BRACKET, STOPPER	1	
41	939010360	STOPPER, RUBBER	2	
42	020108060	NUT M8	2	REPLACES 020308060
43	030208200	WASHER, LOCK M8	2	
45	001200520	BOLT 5X20	3	
46	030205130	WASHER, LOCK M5	3	
47	022710506	NYLON NUT M5	3	
48	467466930	RUBBER PLATE, BATTERY	1	
49	467466920	STOPPER, RUB-PLATE	1	
50	454010020	CLAMP	1	

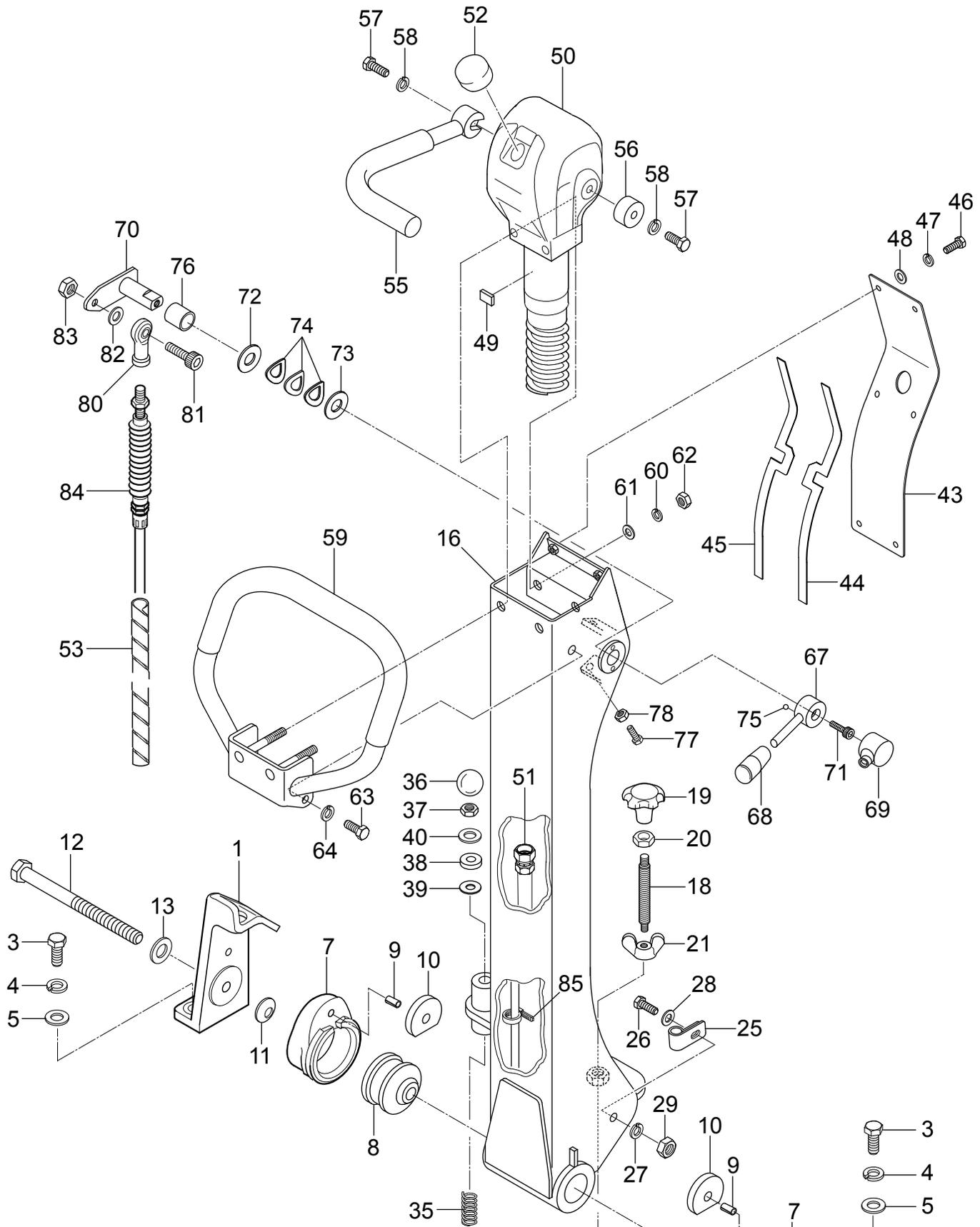
ELECTRIC DEVICE ASSY. CONTINUED

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
51	467352050	PANEL, REAR COVER	1	
53	009110062	SOCKET HEAD SCREW 6X20	4	
54	952404470	WASHER, FLAT M6	4	REPLACES 031106100
55	030206150	WASHER, LOCK M6	4	
56	022710607	NYLON NUT M6	4	
78	465459680	RELAY CABLE/BUZZER	1	
79	959026021	CORRUGATE TUBE	1	
80	959020014	SPIRAL TUBE	1	
82	469352400	PANEL, WITH BUZZER	1	
83	001220635	BOLT 6X35	1	
84	030206150	WASHER, LOCK M6	1	
85	001520530	SOCKET HEAD BOLT 5X30	2	
86	506010070	CLAMP	1	
90	009110072	PAN HEAD SCREW 5X35	2	
91	952407930	COLLAR 6X10X13.5	2	
92	022710506	NYLON NUT M5	2	
93	030205130	WASHER, LOCK M5	2	
94	58151	WASHER, FLAT M5	2	REPLACES 031105080
96	955301020	TACH. AND HOUR METER	1	
97	469467040	RESISTOR, TACH.	1	
98	955407970	WIRING FIXED BASE	2	
101	50384401	IGNITION SWITCH W/ KEY	1	INCLUDES ITEM W/ @
102	469352350	WIRE HARNESS	1	
103	50465100	BUZZER	1	
104@	50404900	KEY, IGNITION SWITCH	1	

CONTROL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	467351950	HANDLE BRACKET (R)	1	
2	467351960	HANDLE BRACKET (L)	1	
3	012212035	BOLT 12X35.....	4	REPLACES 001221235
4	030212300	WASHER, LOCK M12	4	
5	031112230	WASHER, FLAT M12	4	
7	456336400	RUBBER COUPLING	2	
8	456449940	SHOCK ABSORBER	2	
9	025306016	SPRING PIN 6X16	2	REPLACES 025406016
10	456449930	RUBBER PLATE	2	
11	032124400	CONICAL WASHER LOCK M24	2	
12	001221681	BOLT 16X250	1	
13	0401450160	WASHER, FLAT M16	2	REPLACES 031116260
14	020316130	NUT M16	1	
15	020416100	NUT M16	1	
16	467121170	HANDLE BAR	1	
18	455434950	SPINDLE	1	
19	455010030	KNOB	1	
20	020412070	NUT M12	1	
21	022411635	WING NUT M16	1	
22	939010060	SHOCK ABSORBER	1	
23	020310080	NUT M10.....	1	REPLACES 020410060
25	959408930	CLIP	1	
26	011206020	BOLT 6X20.....	1	REPLACES 001220620
27	030206150	WASHER, LOCK M6	1	
28	952404470	WASHER, FLAT M6	1	REPLACES 031106100
29	020106050	NUT M6	1	REPLACES 020306050
34	501402870	HANDLE STOPPER	1	
35	501402880	SPRING/HANDLE	1	
36	959403460	BALL GRIP	1	
37	020310080	NUT M10.....	1	REPLACES 020410060
38	456449980	RUBBER PACKING	1	
39	953405260	PACKING 1/4	1	
40	031110160	WASHER, FLAT M10	1	
43	467351970	HANDLE COVER	1	
43	467351970	HANDLE COVER	1	

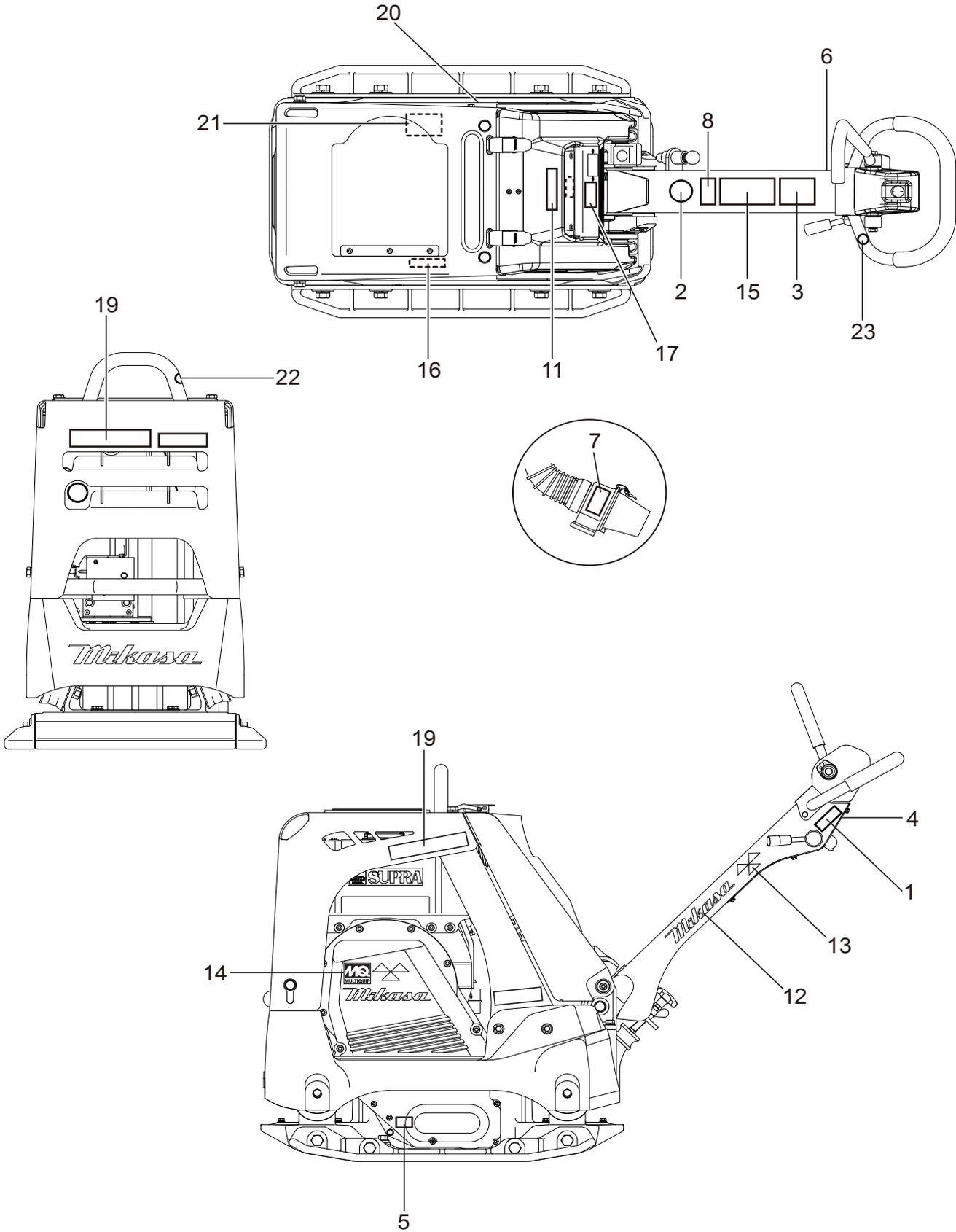
CONTROL ASSY. CONTINUED



CONTROL ASSY. CONTINUED

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
44	467467340	PACKING (L), HANDLE	1	
45	467467350	PACKING (R), HANDLE	1	
46	0105050616	BOLT 6X15 T	6.....	REPLACES 001220615
47	030206150	WASHER, LOCK M6	6	
48	952404470	WASHER, FLAT M6	6.....	REPLACES 031106100
49	464457930	RUBBER PIECE	1	
50	469219180	HYDRAULIC PUMP	1	
51	954003100	OIL HOSE	1	
52	458451630	BREATHER CAP	1	
53	959021813	SPIRAL TUBE	1	
55	464216630	TRAVEL LEVER	1	
56	464457400	HANDLE BOSS	1	
57	012010030	BOLT 10X30.....	2.....	REPLACES 001221030
58	030210250	WASHER, LOCK M10	2	
59	467218900	GRIP	1	
60	030210250	WASHER, LOCK M10	2	
61	031110160	WASHER, FLAT M10	2	
62	020310080	NUT M10	2	
63	0105091025	BOLT 10X25.....	2.....	REPLACES 001221025
64	030210250	WASHER, LOCK M10	2	
67	469466970	THROTTLE LEVER	1	
68	959403840	BAR GRIP, I.D.	1	
69	464457420	COVER , THROTTLE LEVER	1	
70	464457350	ARM, THROTTLE	1	
71	014208020	SOCKET HEAD BOLT 8X20.....	1.....	REPLACES 001520820
72	952408950	WASHER	1	
73	952409020	WASHER	1	
74	033910080	CONICAL WASHER, LOCK	3	
75	464457440	STEEL BALL	1	
76	464010010	DRY BUSHING	1	
77	011606025	BOLT 6X25.....	2.....	REPLACES 001220625
78	020106050	NUT M6	2.....	REPLACES 020306050
80	464010020	ROD END M5	1	
81	001520520	SOCKET HEAD BOLT 5X20	1	
82	58151	WASHER, FLAT M5	1.....	REPLACES 031105080
83	020305040	NUT M5	1	
84	956100071	THROTTLE WIRE	1	
85	454010020	CLAMP	1	

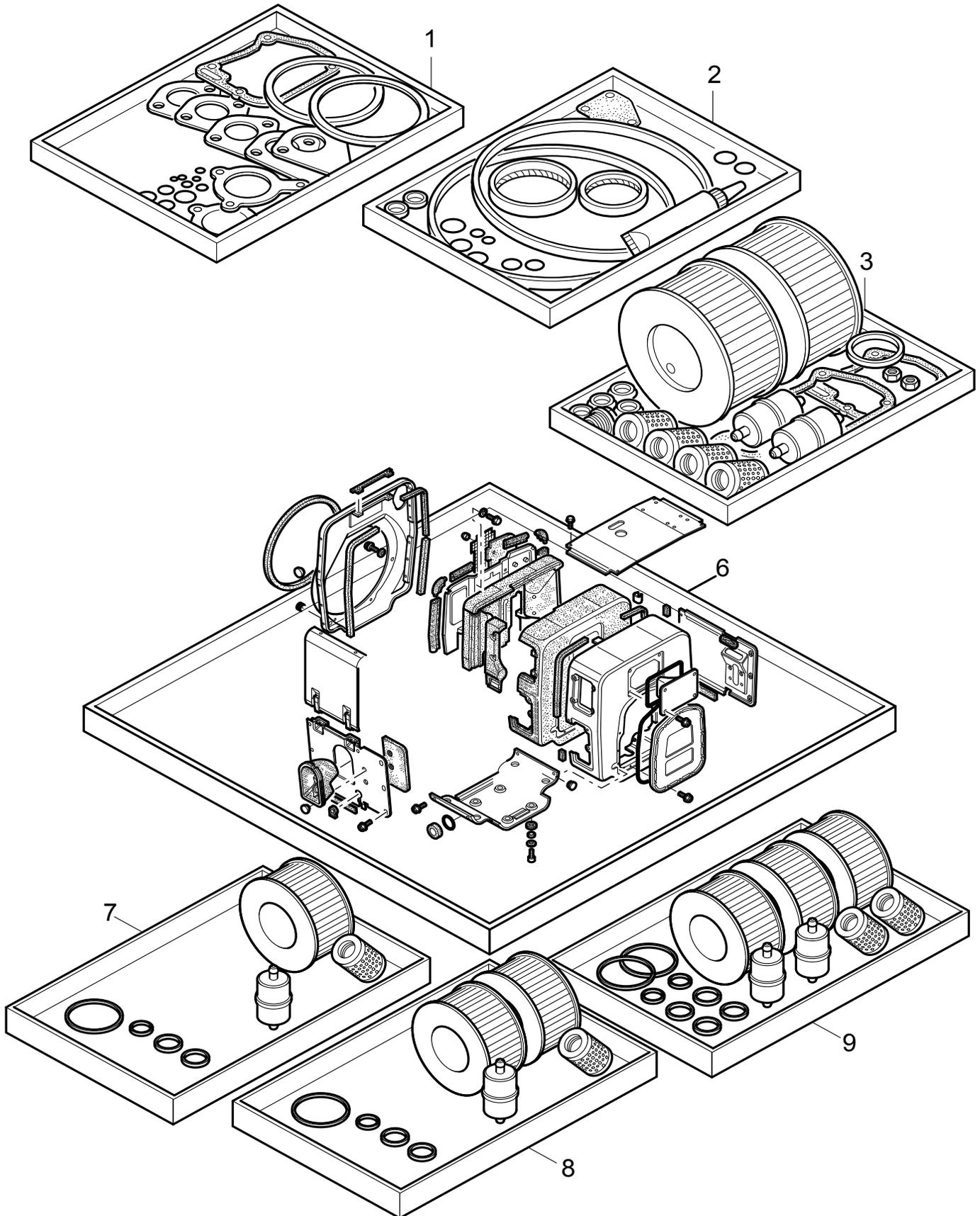
NAMEPLATE AND DECALS ASSY.



NAMEPLATE AND DECALS ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	920204580	DECAL, FULL THROTTLE	1	
2	920203330	DECAL, EAR PROTECTION	1	
3	920211060	DECAL, CAUTION LEVER	1	
4	920211090	DECAL, SHELL TELLUS OIL 32	1	
5	920201950	DECAL, OIL SAE 10W-30	1	
6	920106760	DECAL, STOP-RUN-START	1	
7	920214200	DECAL, CAUTION CYCLONE	1	
8	920214100	DECAL, E/G FIRE WARNING	1	
12	920217130	DECAL, MIKASA MARK(W) 200L	2	
13	920217110	DECAL, MIKASA MARK 35X70	2	
14	920201580	DECAL, MQ MARK 71X55	1	
15	920218390	DECAL, CAUTION	1	
16	920217700	DECAL, V-BELT HDPF-5480	1	
17	920218150	DECAL, E/G RPM 2400	1	
19	920217810	DECAL, MODEL (R)	2	
20	920217820	DECAL, MODEL (L)	1	
21	920217610	PLATE, SERIAL NO.	1	
22	920214740	DECAL, LIFTING POSITION	1	
23	920214730	DECAL, DO NOT LIFT	1	

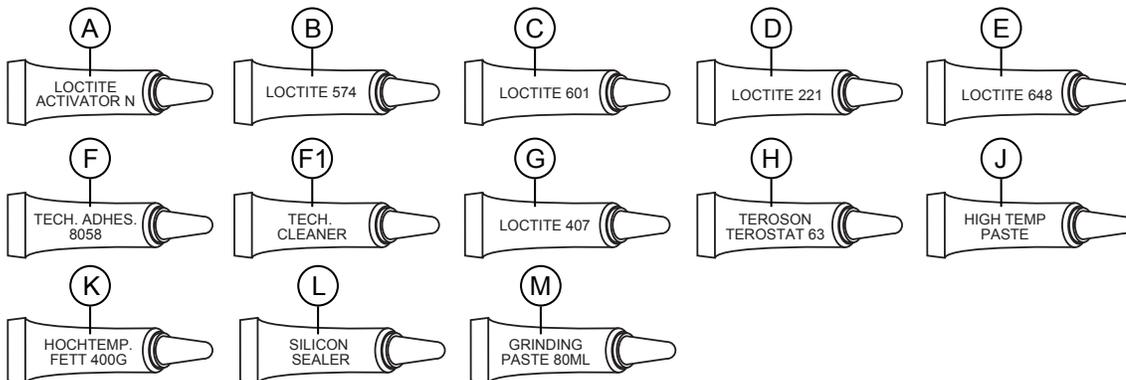
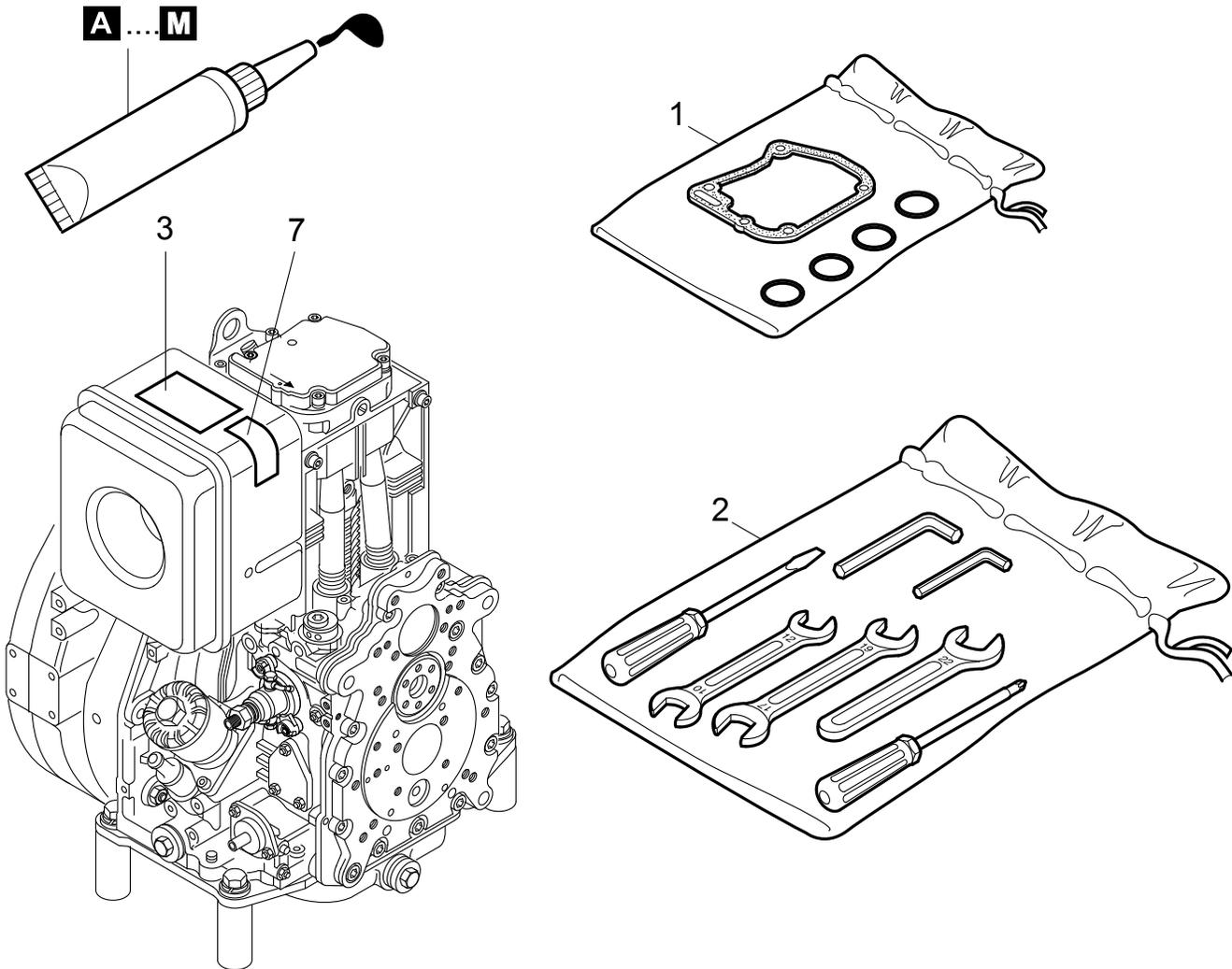
HATZ 1D81S-325 ENGINE SPARE PARTS KIT ASSY.



HATZ 1D81S-325 ENGINE SPARE PARTS KITS ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1517802	GASKET SET, CYLINDER HEAD	1	
2	1249322	GASKET SET, CRANK CASE	1	
3	1249410	MAINTENANCE KIT, 1000H	1	
6	1942000	REPAIR SET, CAPSULE	1	
7	2265300	FILTER KIT, LIGHT	1	
8	2268500	FILTER KIT, MEDIUM	1	
9	2269600	FILTER KIT, HEAVY	1	

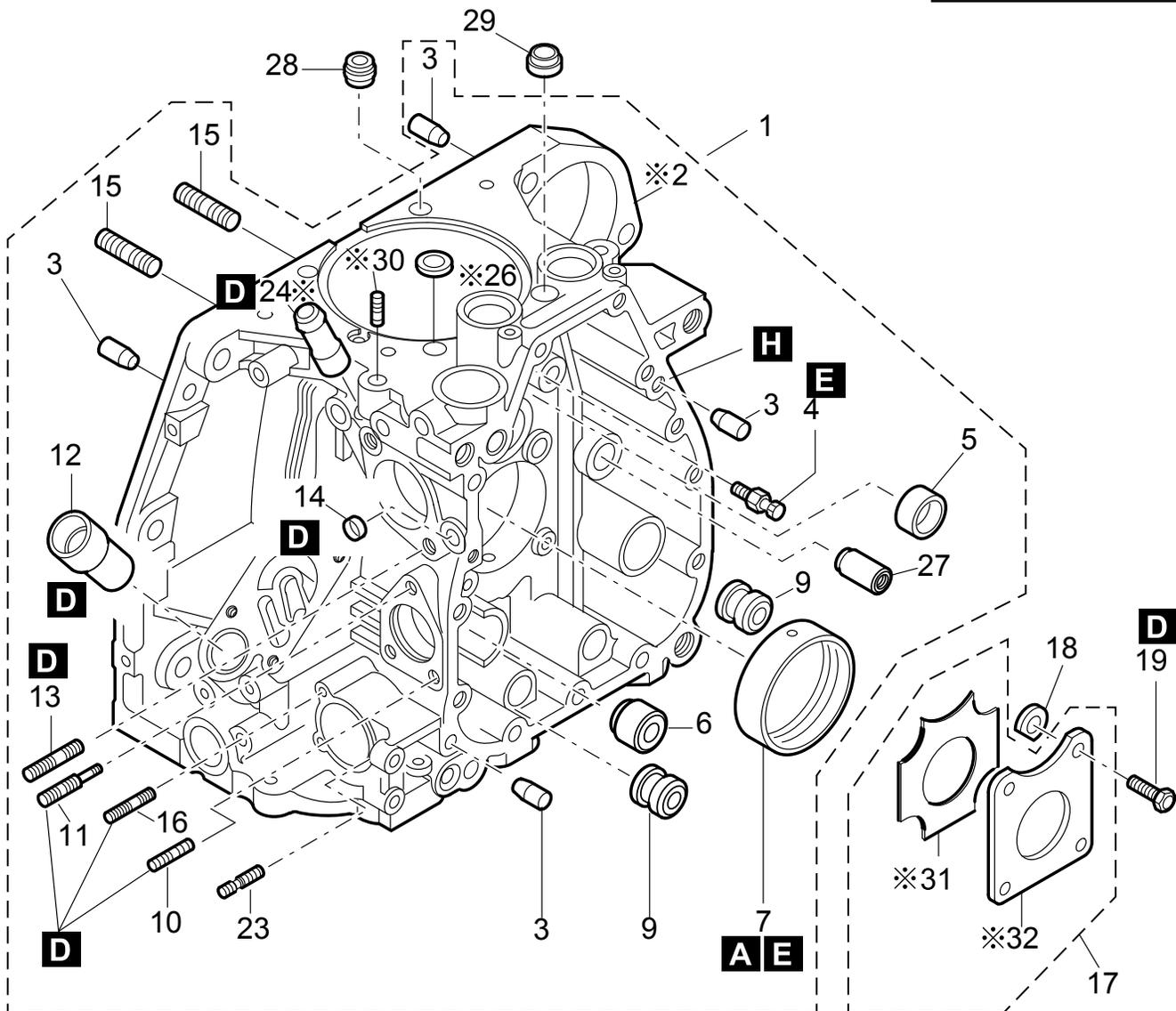
HATZ 1D81S-325 ENGINE ACCESSORIES ASSY.



HATZ 1D81S-325 ENGINE ACCESSORIES ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
A	50223001	LOCTITE ACTIVATOR N	1	
B	50223101	LOCTITE 574	1	
C	50223200	LOCTITE 601	1	
D	50223300	LOCTITE 221	1	
E	50223400	LOCTITE 648	1	
F	50223800	TECHNICAL ADHESIVE 8058	1	
F1	50223900	TECHNICAL CLEANER	1	
G	50256501	LOCTITE IS 407	1	
H	70018944	TEROSON TEROSTAT 63	1	
J	50283004	HIGH TEMPERATURE PASTE	1	
K	50342601	HIGH TEMPERATURE FETT	1	
L	50256600	SILICON SEALER	1	
M	50485100	GRINDING PASTE	1	
1	01247512	ACCESSORIES KIT	1	
2	01247600	TOOLS	1	
3	04048305	STICKER DECAL	1	
7	05025201	STICKER DECAL "START"	1	

HATZ 1D81S-325 ENGINE CRANKCASE 1 ASSY.

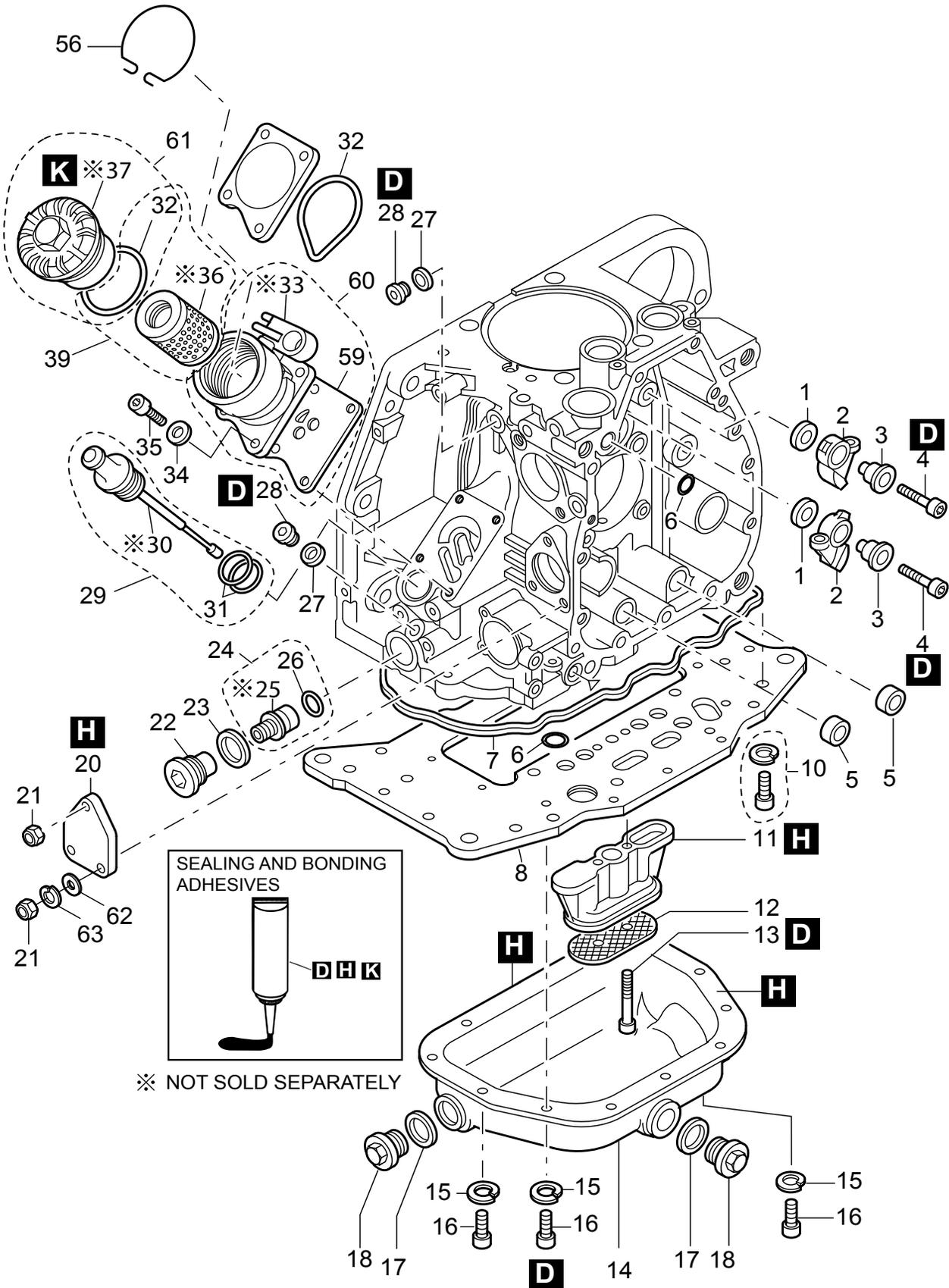


※ NOT SOLD SEPARATELY

HATZ 1D81S-325 ENGINE CRANKCASE 1 ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
A	50223001	LOCTITE ACTIVATOR N	1	
D	50223300	LOCTITE 221	1	
E	50223400	LOCTITE 648	1	
H	70018944	TEROSON TEROSTAT 63	1	
1	01249070	CRANKCASE ASSY.....	1	INCLUDES ITEMS /\$
2\$		CRANKCASE.....	1	NOT SOLD SEPARATELY
3\$	50249102	CYL. PIN	4	
4\$	03793900	NOZZLE	1	
5\$	03793801	BEARING BUSH	1	
6\$	03794000	PLUG	AR	
7\$	03793700	BEARING	1	
7	04033700	MAIN BEARING, O.S. 0.5MM.....	1	FOR -0.5MM SHAFT
9\$	04000800	PLUG	AR	
10\$	50144300	STUD	2	
11\$	03794510	STUD	1	
12\$	03794800	INTERMEDIATE PIECE	1	
13\$	50601200	STUD	2	
14\$	50325500	COVER	1	
15\$	50602901	STUD	8	
16\$	50328200	STUD	2	
17	02228000	THRUST PLATE.....	1	INCLUDES ITEMS W/@
18	04069500	SHIM, 1.05 MM	AR	
18	04069600	SHIM, 1.2 MM	AR	
19	04062010	HEX. HD. SCREW	4	
23	50328200	STUD	1	
24\$		PIPE.....	1	NOT SOLD SEPARATELY
26\$		O-RING.....	AR	NOT SOLD SEPARATELY
27\$	04105000	PLUG	1	
28	50459800	SEALING CYL. SCREW	2	
29	04084500	SEALING RING	2	
30\$		STUD.....	AR	NOT SOLD SEPARATELY
31@		GASKET.....	1	NOT SOLD SEPARATELY
32@		PLATE.....	1	NOT SOLD SEPARATELY

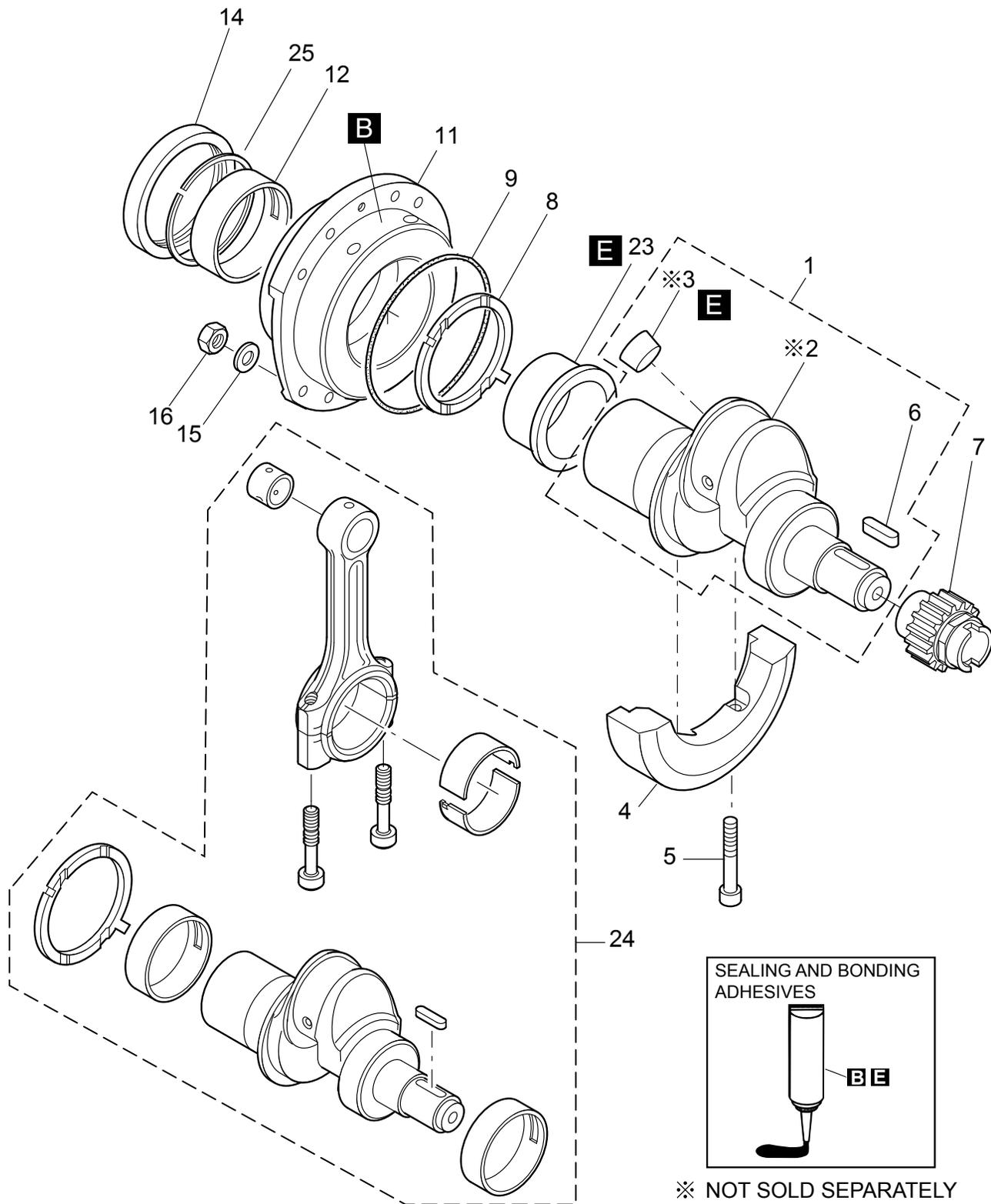
HATZ 1D81S-325 ENGINE CRANKCASE 2 ASSY.



HATZ 1D81S-325 ENGINE CRANKCASE 2 ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE 221	1	
H	70018944	TEROSON TEROSTAT 63	1	
K	50342601	HIGH TEMPERATURE FETT	1	
1	03794100	WASHER	2	
2	03794300	CAM FOLLOWER	2	
3	03794201	CAM FOLLOW SP.	2	
4	50545501	ALLEN, SCREW	2	
5	03795800	O-RING	2	
6	50329000	O-RING	3	
7	03795100	O-RING	1	
8	01248810	PLATE	1	
10	50417600	ALLEN SCREW W / WASHER	22	
11	03794900	HOUSING	1	
12	03795000	SUCTION, SIEVE	1	
13	50327100	ALLEN SCREW	2	
14	01241700	OIL SUMP	1	
15	50170900	WASHER, LOCK	12	
16	50329100	ALLEN SCREW	12	
17	50001600	JOINT A	2	
18	50373100	DRAIN PLG. MAGNT.	2	
20	03794701	COVER	1	
21	50328300	HEXAGON NUT	3	
22	01321200	CLOS., SCREW +SIEVE	1	
23	50286400	JOINT A	1	
24	01321100	OIL RELIEF VALVE W/O-RING.....	1	INCLUDES ITEMS W/\$
25\$		OIL RELIEF VALVE.....	1	NOT SOLD SEPARATELY
26\$	50460400	O-RING	1	
27	50062400	JOINT A	2	
28	50062300	CLOS. SCREW	2	
29	01241500	OIL GAUGE W/O-RING	1	INCLUDES ITEMS W/#
30#		OIL GAUGE	1	NOT SOLD SEPARATELY
31#	50359700	O-RING	2	
32@%	50329200	RING	2	
33+		HOUSING, LUBE, OIL FILTER.....	1	NOT SOLD SEPARATELY
34	50081200	WASHER, LOCK	4	
35	50170600	ALLEN SCREW	4	
36@		ELEMENT, OIL FILTER.....	1	NOT SOLD SEPARATELY
37%		COVER, OIL FILTER.....	1	NOT SOLD SEPARATELY
39	01480001	ELEMENT, OIL FILTER W/RING	1	INCLUDES ITEMS W/@
56	04084001	LIFTING SPRING	1	
59+	05068900	GASKET	1	
60	01318300	HOUSING, LUBE, OIL FILTER, W/GASKET	1	INCLUDES ITEMS W/+
61	01248901	COVER, OIL FILTER W/RING	1	INCLUDES ITEMS W/%
62	50144500	WASHER, FLAT	2	
63	50170900	WASHER, LOCK	2	

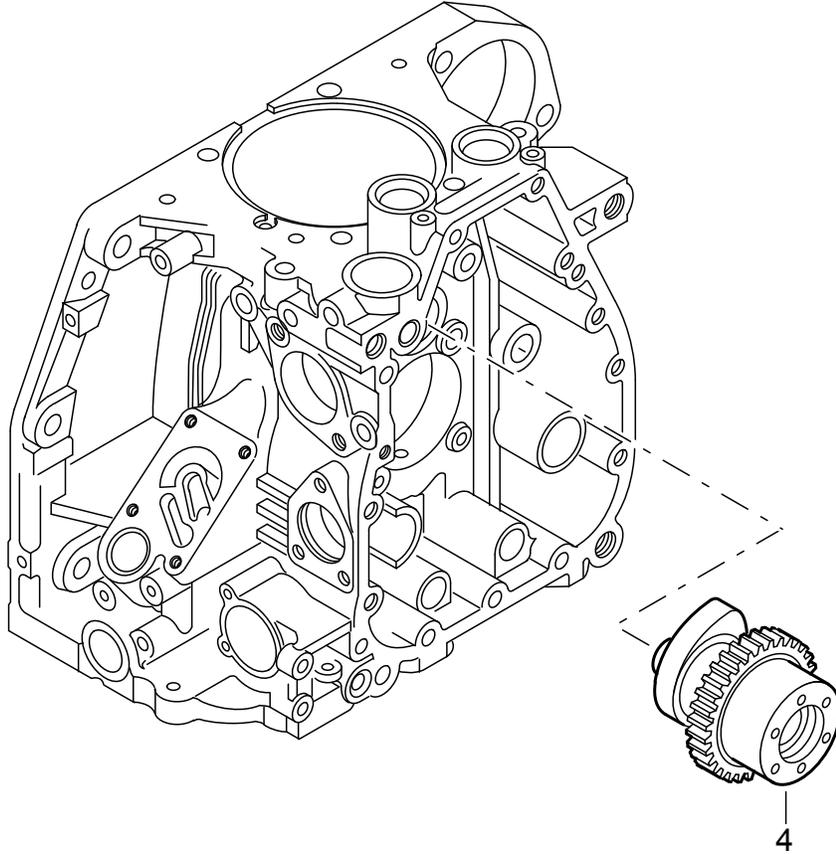
HATZ 1D81S-325 ENGINE CRANKSHAFT BEARING FLANGE ASSY.



HATZ 1D81S-325 ENGINE CRANKSHAFT BEARING FLANGE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
B	50223101	LOCTITE 574	1	
E	50223400	LOCTITE 648	1	
1	01269820	CRANKSHAFT ASSY.....	1.....	INCLUDES ITEMS W/\$
2\$		CRANKSHAFT.....	1.....	NOT SOLD SEPARATELY
3\$		PLUG.....	1.....	NOT SOLD SEPARATELY
4	03796000	COUNTER WEIGHT	1	
5	50055001	ALLEN SCREW	2	
6\$	50362600	FITTING KEY	1	
7	03796120	GEARWHEEL, CRANKSHAFT	1	
8	04000600	BUFFER RING	1	
9	50224900	O-RING	1	
11	04064211	BEARING FLANGE	1.....	REPLACES 04064210
12	04006800	MAIN BEARING	1	
12	04036100	MAIN BEARING, O.S. 0.5MM.....	1.....	FOR -0.5MM SHAFT
14	50362701	OIL SEAL	1	
15	50413600	WASHER	8	
16	50364300	HEXAGON NUT	8	
23	50414400	WEAR SLEEVE	AR	
24	01512010	REPAIR SET, CRANKSHAFT	1	

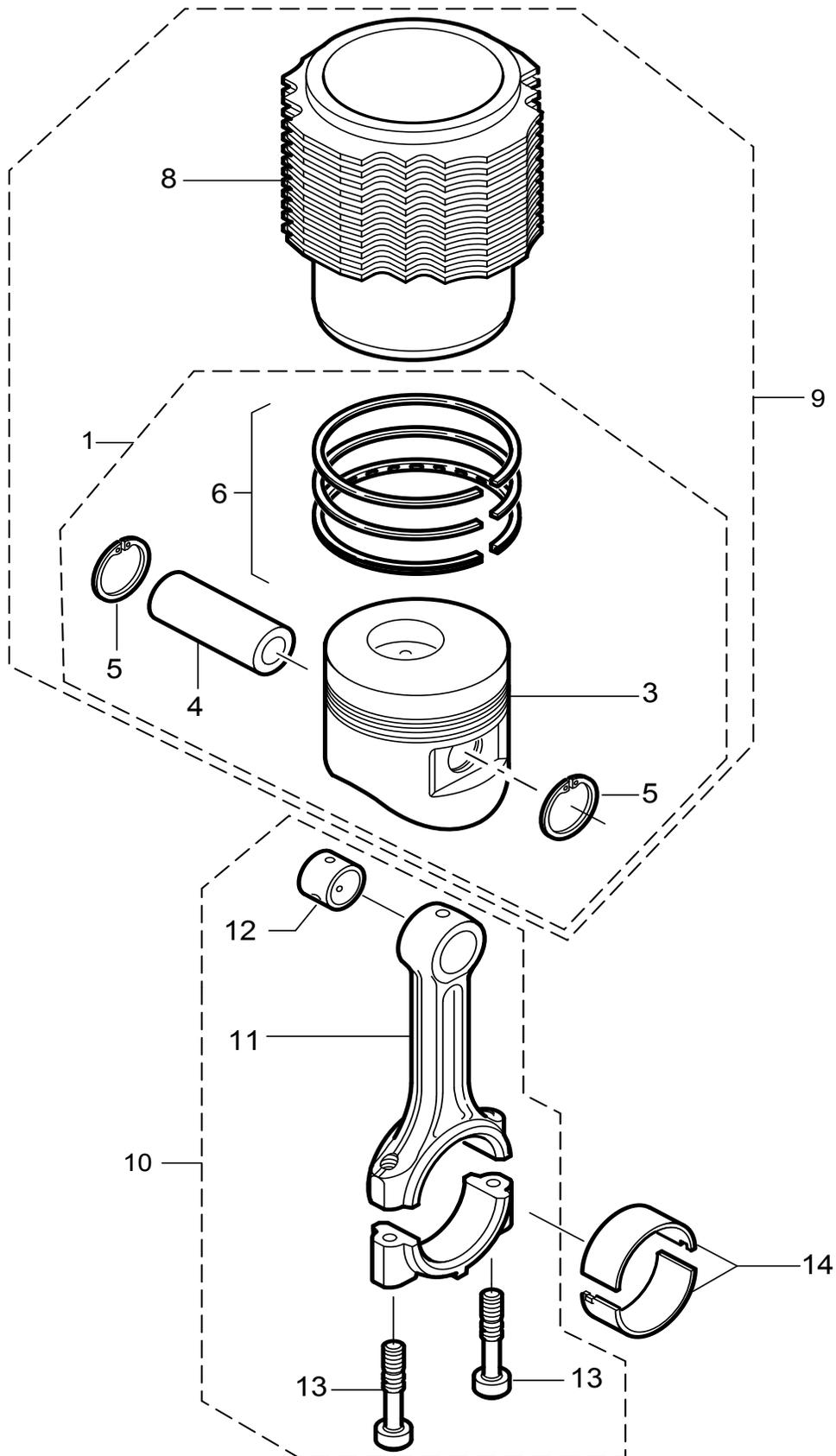
HATZ 1D81S-325 ENGINE CAMSHAFT ASSY.



HATZ 1D81S-325 ENGINE CAMSHAFT ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
4	04099920	CAMSHAFT ASSY.	1	

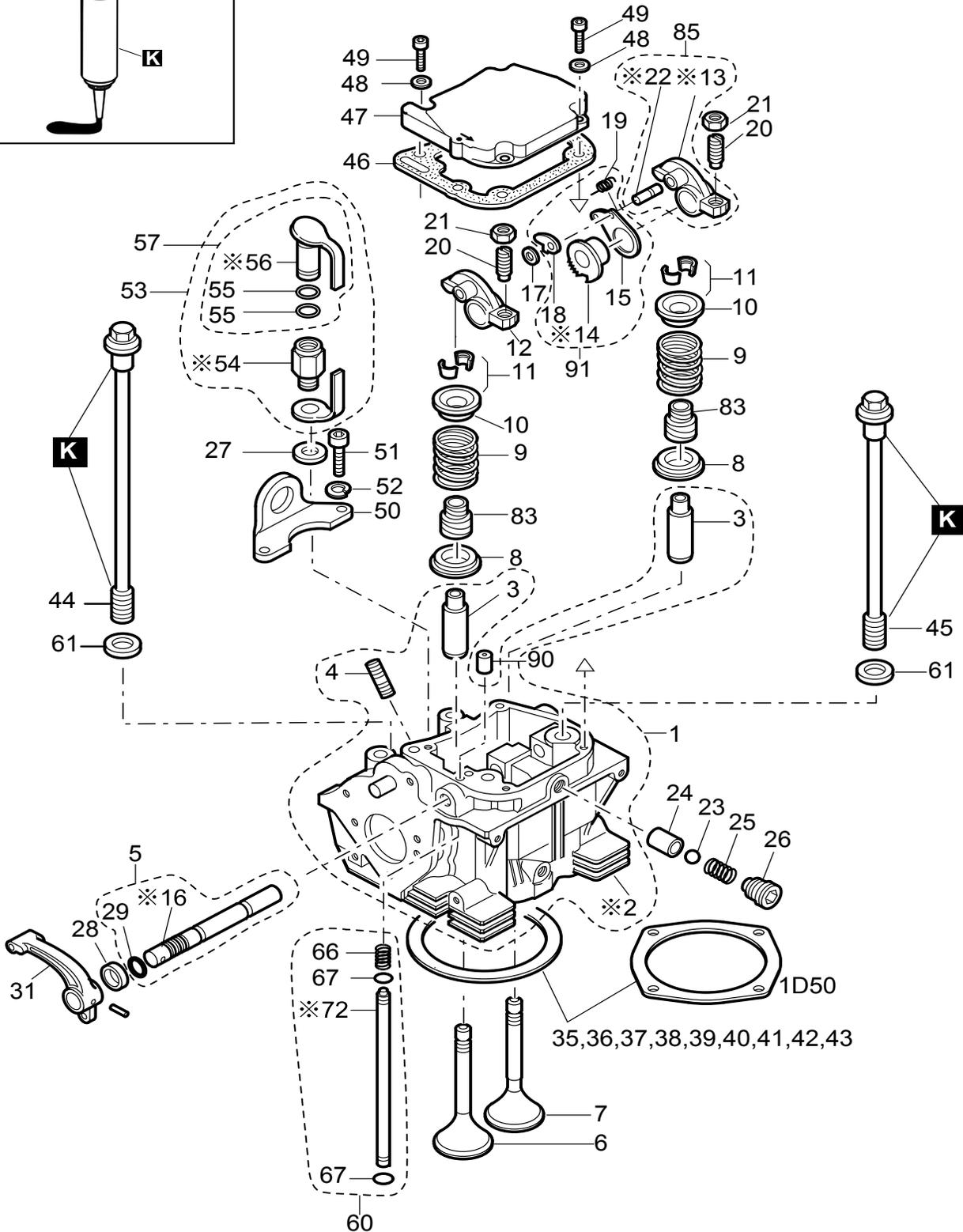
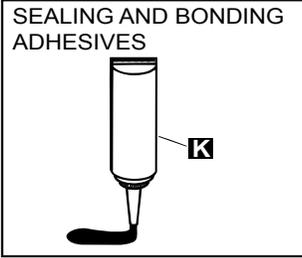
HATZ 1D81S-325 ENGINE PISTON ASSY.



HATZ 1D81S-325 ENGINE PISTON ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1#	01313542	PISTON SET 100 STD.....	1.....	INCLUDES ITEMS W/\$
1	01314641	PISTON 100+0.5MM OVERSIZE.....	1.....	INCLUDES ITEMS W/%
3\$%#		PISTON.....	1.....	NOT SOLD SEPARATELY
4\$%#	50461900	GUDGEON	1	
5\$%#	50594900	CIR CLIP	2	
6\$#	01247310	PISTON RING SET 100/STD	1	
6%	01264510	PISTON RING SET100+0.5MM OVERSIZE	1	
8#		CYLINDER.....	1.....	NOT SOLD SEPARATELY
9	01508330	CYLINDER ASSY.	1.....	INCLUDES ITEMS W/#
10	01244001	CONNECTING ROD ASSY.	1.....	INCLUDES ITEMS W/@
11@		CONNECTING ROD.....	1.....	NOT SOLD SEPARATELY
12@	04032200	BUSH FOR CONROD	1	
13@	04001810	CONROD SCREW	2	
14	02251900	BEARING, BIG END STANDARD	1	
14	02252100	BEARING, BIG END, O.S. 0.5MM	1.....	FOR -0.5MM BRG END

HATZ 1D81S-325 ENGINE CYLINDER HEAD ASSY.

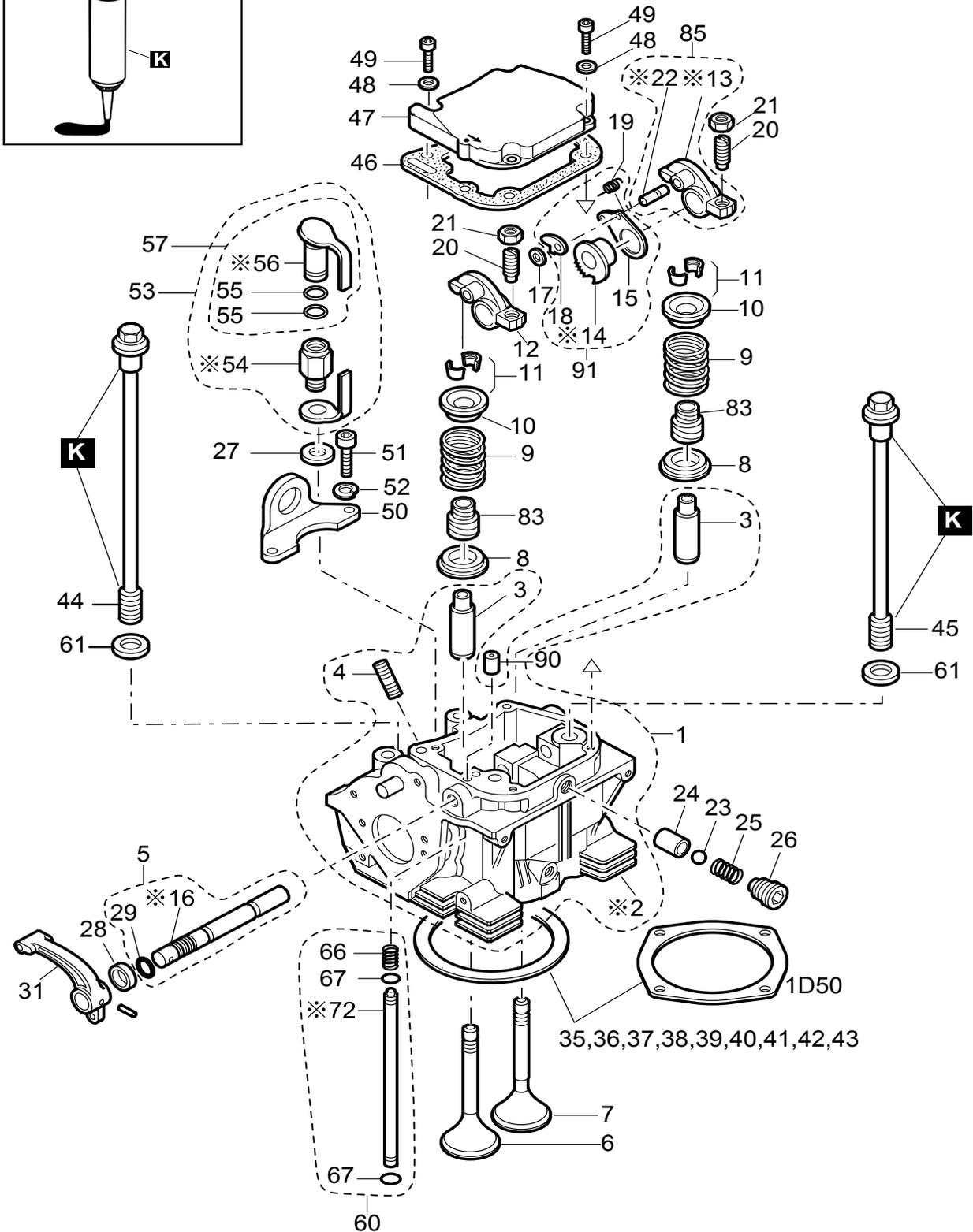
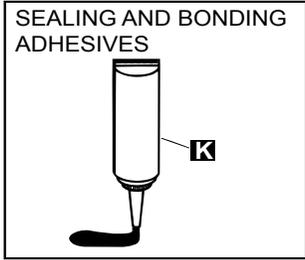


※ NOT SOLD SEPARATELY

HATZ 1D81S-325 ENGINE CYLINDER HEAD ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
K	50342601	HIGH TEMPERATURE FETT	1	
1	01499620	CYLINDER HEAD ASSY.....	1	INCLUDES ITEMS W/\$
2\$		CYLINDER HEAD.....	1	NOT SOLD SEPARATELY
3\$	04008712	VALVE GUIDE	2	
4\$	50038400	STUD	1	
5	01468920	SHAFT ROCKER W/O-RING.....	1	INCLUDES ITEMS W/%
6	04091001	INTAKE VALVE	1	
7	04091100	EXHAUST VALVE	1	
8	04005201	WASHER	2	
9	04005300	VALVE SPRING	2	
10	04005401	CUP	2	
11	02252200	COLLET	2	
12	04003710	ROCKER INLET	1	
13^		ROCKER, EXHAUST.....	1	NOT SOLD SEPARATELY
14*		GEAR HOLDER.....	1	NOT SOLD SEPARATELY
15*	03778401	SPRING SHEET	1	
16%		SHAFT ROCKER.....	1	NOT SOLD SEPARATELY
17	50117200	CIRCLIP	1	
18*	03365710	RATCHET F DECOMPR	1	
19*	03366001	SPRING	1	
20	03783000	ADJUSTING SCREW	2	
21	03173100	HEXAGON NUT	2	
22^		PIN, ROCKER EXHAUST.....	1	NOT SOLD SEPARATELY
23	50123800	BALL	1	
24	04004700	BUSH	1	
25	04004800	PRESSURE SPRING	1	
26	01245200	ADJUSTING SCREW	1	
27	50001100	JOINT A	1	
28	04048900	RUBBER, RING	1	
29%	40022401	O-RING	1	
30	50034700	PIN	1	
31	04009810	HANDLE	1	
35	04068800	GASKET F. CYLINDER HEAD 0.5 MM	1	
35	04240900	GASKET CYLINDER HEAD 0.55 MM	1	
36	04036800	GASKET F. CYLINDER HEAD 0.6 MM	1	
36	04241000	GASKET F. CYLINDER HEAD 0.65 MM	1	
37	04036500	GASKET F. CYLINDER HEAD 0.7 MM	1	
37	04241100	GASKET F. CYLINDER HEAD 0.75 MM	1	
38	04036600	GASKET F. CYLINDER HEAD 0.8 MM	1	
38	04241200	GASKET F. CYLINDER HEAD 0.85 MM	1	
39	04002700	GASKET F. CYLINDER HEAD 0.9 MM	1	
39	04241300	GASKET F. CYLINDER HEAD 0.95 MM	1	
40	04002800	GASKET F. CYLINDER HEAD 1.0 MM	1	
40	04241400	GASKET F. CYLINDER HEAD 1.05 MM	1	

HATZ 1D81S-325 ENGINE CYLINDER HEAD ASSY. (CONTINUED)

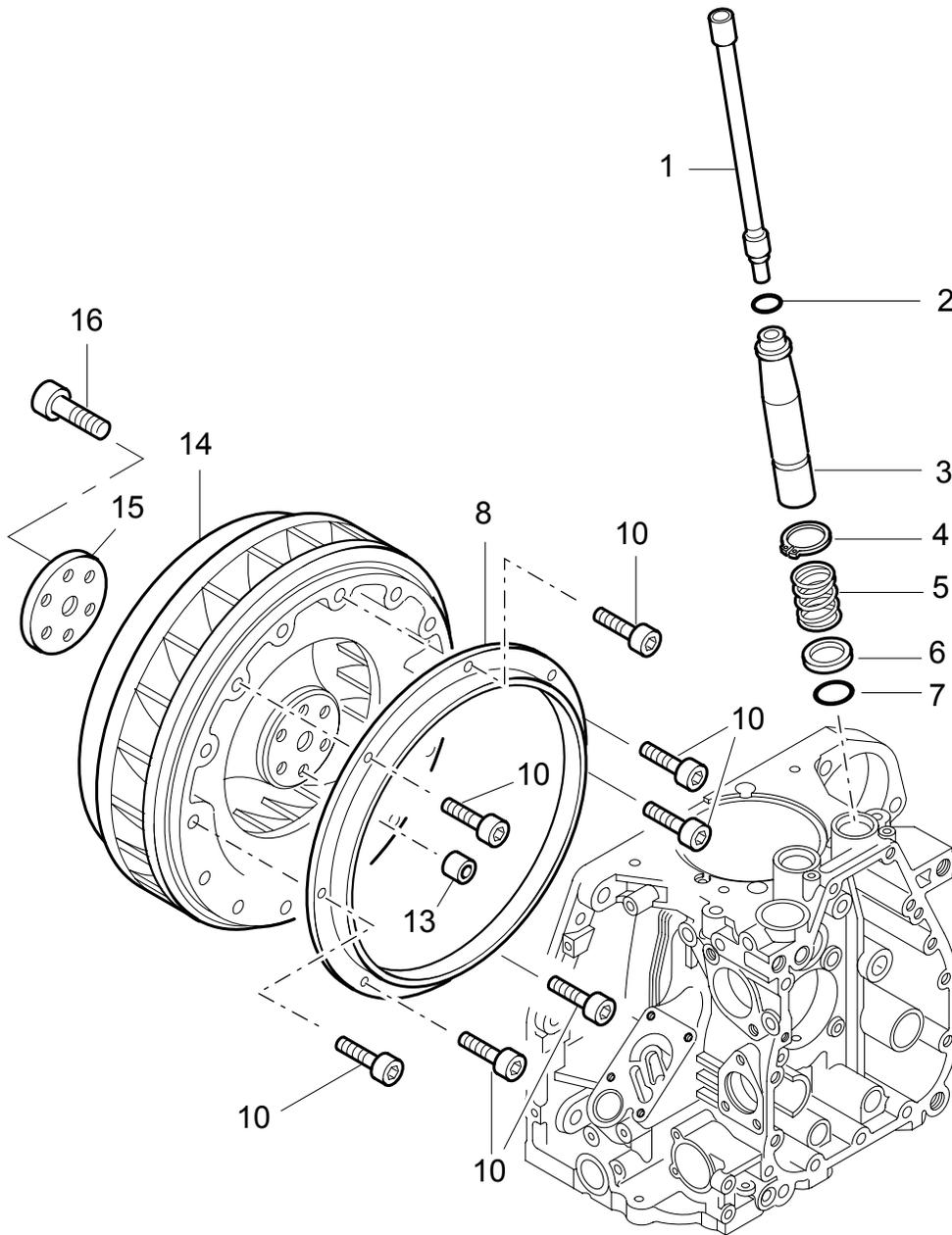


※ NOT SOLD SEPARATELY

HATZ 1D81S-325 ENGINE CYLINDER HEAD ASSY. (CONTINUED)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
41	04002900	GASKET F. CYLINDER HEAD 1.1 MM	1	
41	04241500	GASKET F. CYLINDER HEAD 1.15 MM	1	
42	04003000	GASKET F. CYLINDER HEAD 1.2 MM	1	
42	04241600	GASKET F. CYLINDER HEAD 1.25 MM	1	
43	04003100	GASKET F. CYLINDER HEAD 1.3 MM	1	
44	04003200	CYLINDER HEAD SCREW	2	
45	04003300	CYLINDER HEAD SCREW	2	
46	04006111	GASKET, ROCKER COVER	1	
47	01245414	COVER CYLINDER HEAD	1	
48	50081200	WASHER, LOCK	4	
49	50170800	ALLEN SCREW	4	
50	04008100	LIFTING BRACKET	1	
51	50366300	ALLEN SCREW	2	
52	50208500	WASHER, LOCK	2	
53	01493200	PLUG, FILTER, ASSY.	1	INCLUDES ITEMS W/@
54@		CAP, FILTER PLUG	1	NOT SOLD SEPARATELY
55@+	50326200	O-RING	2	
56@+		PLUG, FILTER	1	NOT SOLD SEPARATELY
57	01308301	CLOSING PLUG "S" W/O-RING & CAP	1	INCLUDES ITEMS W/ +
60	01269700	OIL PRESSURE PIPE W/SPRING & ORINGS..	1	INCLUDES ITEMS W/ #
61	03457500	DISC F. STUD	4	
66#	04004200	PRESSURE SPRING	1	
67#	50330100	O-RING	2	
72#		PIPE OIL PRESSURE	1	NOT SOLD SEPARATELY
83	50634900	VALVE STEM SEAL CAP	2	
85	01285010	ROCKER EXHAUST	1	INCLUDES ITEMS W/ ^
90	04104300	PIN	1	
91	01557600	GEAR, HOLDER, F. DECOMPR	1	INCLUDES ITEMS W/*

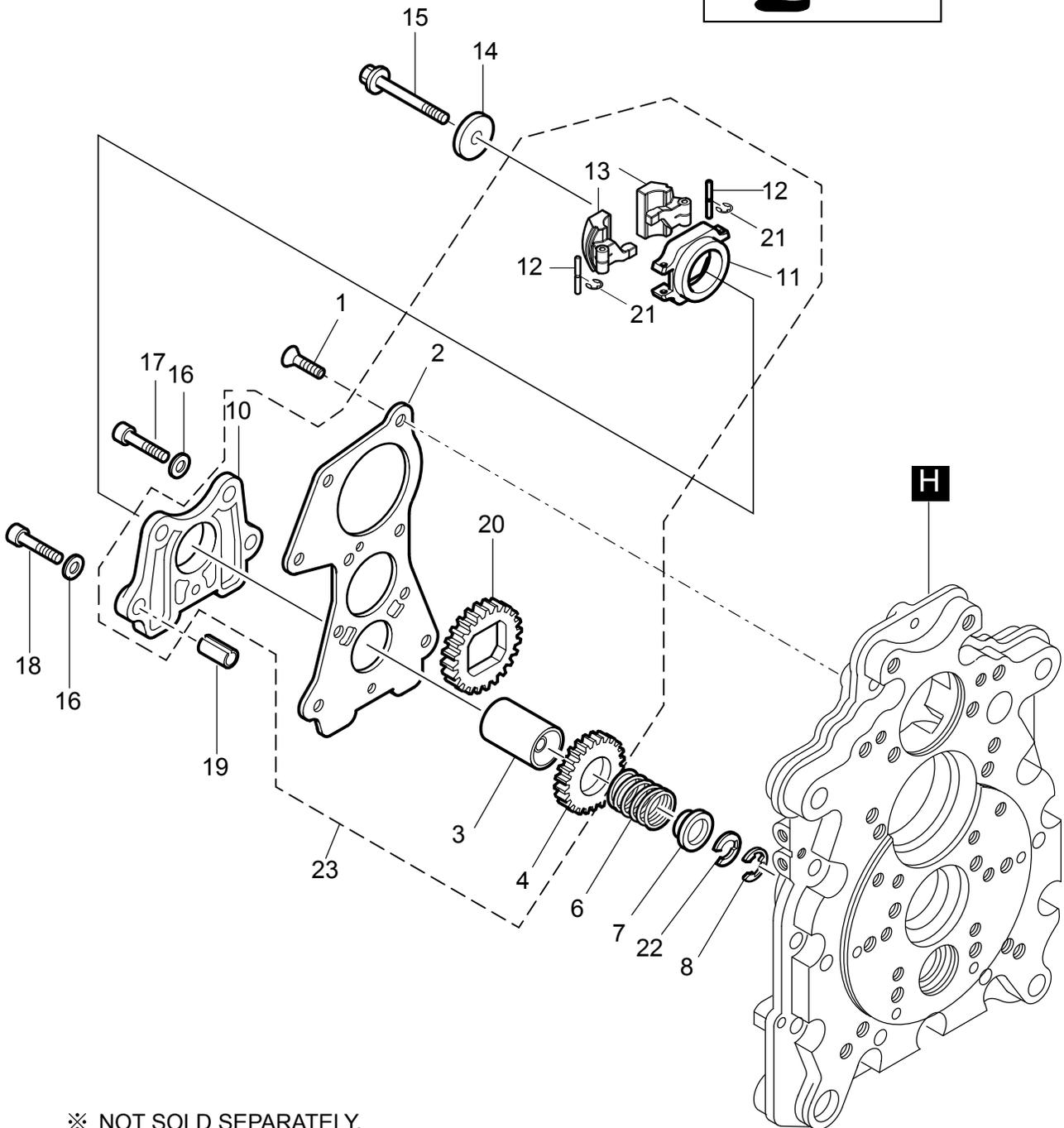
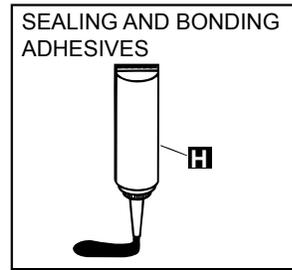
HATZ 1D81S-325 ENGINE PUSHROD, FLYWHEEL ASSY.



HATZ 1D81S-325 ENGINE PUSHROD, FLYWHEEL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01244310	PUSHROD	2	
2	50330200	O-RING	2	
3	04002500	PROTECTION TUBE	2	
4	50347000	CIRCLIP	2	
5	04002600	PRESSURE SPRING	2	
6	04002000	PRESSURE RING	2	
7	50330300	O-RING	2	
8	04007500	RING, FLYWHEEL	2	
10	50397100	ALLEN SCREW	1	
13	03123700	BUSHING	7	
14	04007133	FLYWHEEL	1	
15	04007410	PLATE	1	
16	50363100	ALLEN SCREW	6	

HATZ 1D81S-325 ENGINE OIL PUMP, GOVERNOR ASSY.

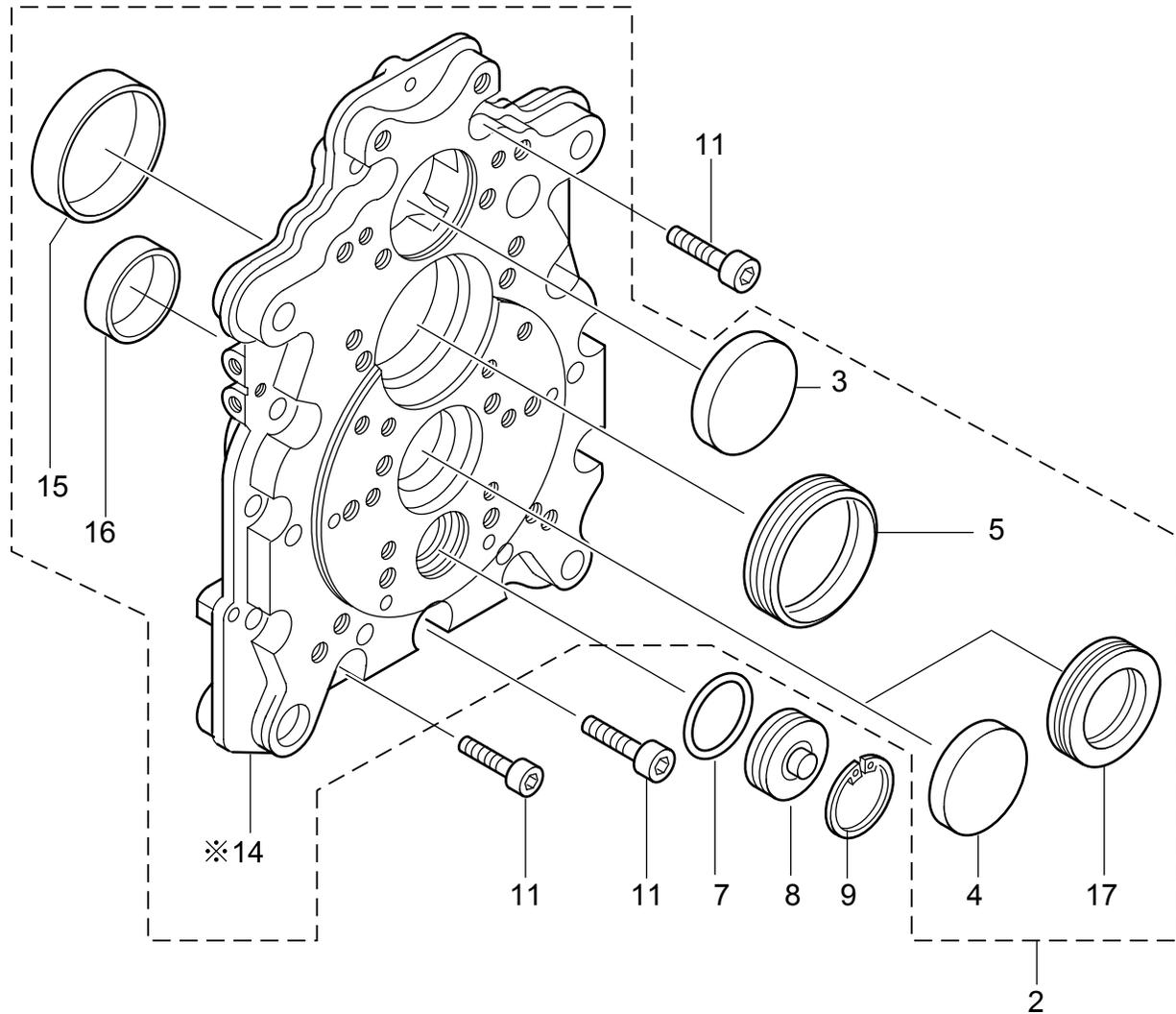


※ NOT SOLD SEPARATELY.

HATZ 1D81S-325 ENGINE OIL PUMP, GOVERNOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
H	70018944	TEROSON TEROSTAT 63	1	
1	50328000	COUNTERSUNK SCREW	5	
2\$	03797412	COVER, OIL PUMP	1	
3\$	01242401	SPRING CAPSULE+BUSH	1	
4\$	03797310	GEAR WHEEL	1	
6	04063400	GOVERNOR SPRING	1	
7	03798600	CUP	1	
8	50334700	CIRCLIP	1	
10\$	03797512	HOUSING FOR OIL PUMP	1	
11\$	04277100	PLATE, CENTRIFUGAL WEIGHT	1	
12\$	04277300	PIN	1	
13\$	04277202	FLYWEIGHT	1	
14	03797900	WASHER	1	
15	03797801	PIN	1	
16	50081200	WASHER, LOCK	5	
17	50170800	ALLEN SCREW	3	
18	50051000	ALLEN SCREW	2	
19	50084901	PIN	2	
20\$	03798720	GEAR WHEEL	1	
21\$	50594300	CIRCLIP	2	
22	04262500	CIRCLIP 0.3 MM	AR	
22	04046000	CIRCLIP 0.5 MM	AR	
23	01242330	SPRING SLEEVE ASSY.	1.....	INCLUDES ITEMS W/ \$

HATZ 1D81S-325 ENGINE TIMING COVER ASSY.

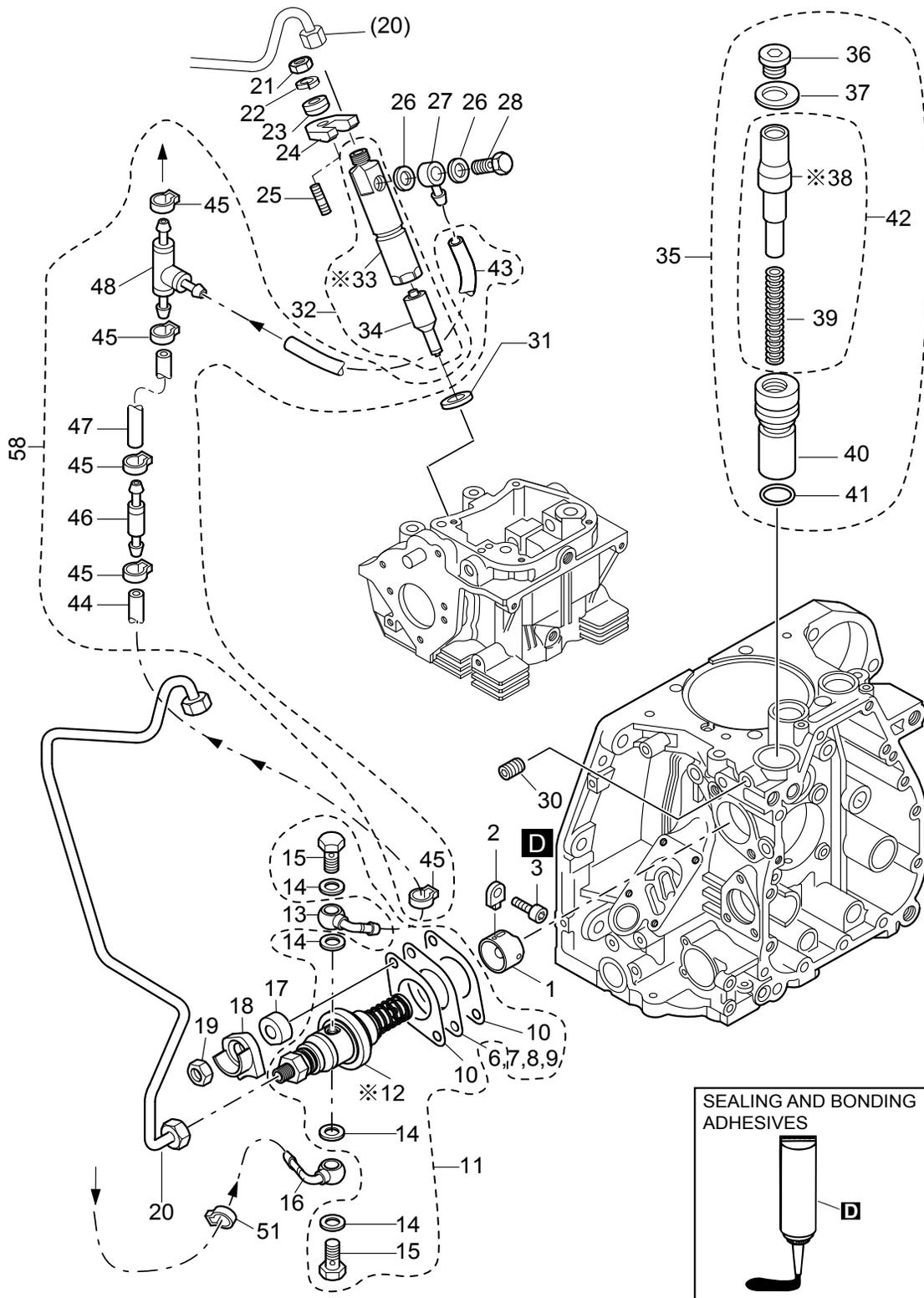


※ NOT SOLD SEPARATELY.

HATZ 1D81S-325 ENGINE TIMING COVER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
2	01267731	TIMING COVER ASSY.....	1.....	INCLUDES ITEMS W/\$
3\$	50325600	COVER 50	1	
4\$	50325701	COVER 52	1	
5\$	50325811	OIL SEAL	1	
7	50330400	O-RING	1	
8	04000400	COVER	1	
9	50399000	CIRCLIP	1	
11	50417400	ALLEN SCREW	13	
14\$		TIMING COVER.....	1.....	NOT SOLD SEPARATELY
15\$	04000310	BEARING, BUSHING	1	
16\$	04023210	BEARING, BUSHING	1	
17\$	50364701	OIL SEAL	1	

HATZ 1D81S-325 ENGINE FUEL PUMP ASSY.

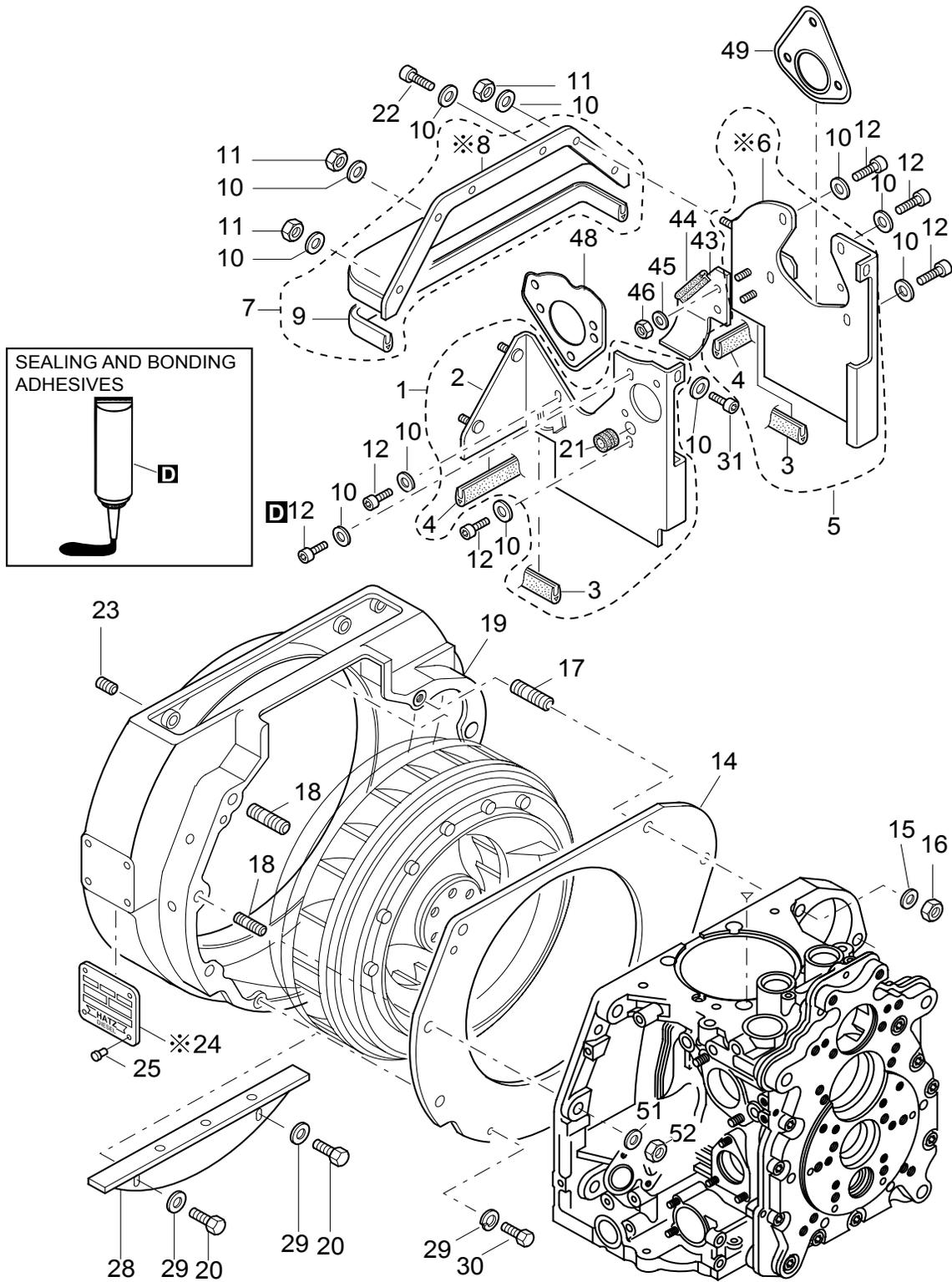


※ NOT SOLD SEPARATELY.

HATZ 1D81S-325 ENGINE FUEL PUMP ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	70018918	LOCTITE 221	1	
1	50492900	ROLLER TAPPET	1	
2	04169200	GUIDE	1	
3	50050700	ALLEN SCREW	1	
6	03209700	SHIM 0.30 MM	AR	
7\$	04102400	SHIM 0.60 MM	AR	
8\$	04102500	SHIM 0.90 MM	AR	
9\$	04102600	SHIM 1.20 MM	AR	
10\$	04071300	GASKET 0.10 MM	AR	
10	04102200	GASKET 0.20 MM	AR	
10	04102300	GASKET 0.30 MM	AR	
11	01864502	INJECTION PUMP ASSY.....	1	INCLUDES ITEMS W/ \$
12\$		INJECTION PUMP.....	1	NOT SOLD SEPARATELY
13	05299701	BANJO CONNECTION	1	
14\$	50586300	PACKING RING	4	
15\$	50577801	BANJO BOLT	2	
16	05299701	BANJO CONNECTION	2	
17	04239300	SPACER	2	
18	04239100	CLAMP, INJECTION PUMP	2	
19	04244300	HEXAGON NUT	2	
20	01313620	FUEL PRESSURE PIPE	1	
21	020108060	HEXAGON NUT	1	REPLACES 50148000
22	50208500	WASHER, LOCK	1	
23	04035700	WASHER	1	
24	03792401	FLANGE	1	
25	50038400	STUD	1	
26	50000800	JOINT A	2	
27	50333400	BANJO CONNECTION	1	
28	50313000	BANJO BOLT	1	
30	50004600	GRUB SCREW	1	
31	04185200	JOINT WASHER	1	
32	50567310	INJECTOR NOZZLE ASSY.....	1	INCLUDES ITEMS W/ %
33%		INJECTOR NOZZLE BODY	1	NOT SOLD SEPARATELY
34%	50567410	INJECTOR NOZZLE	1	
35	01498902	PISTON CYLINDER ASSY.	1	INCLUDES ITEMS W/ @
36@	50330800	CLOSS SCREW	1	
37@	04001600	DISC	1	
38@#		PISTON CYLINDER	1	NOT SOLD SEPARATELY
39@#	05035200	PRESSURE SPRING	1	
40@	04001410	CYLINDER F. EXTR. FUEL DEV	1	
41@	50328900	O-RING	1	
42	01519500	PISTON W/SPRING	1	INCLUDES ITEMS W/ #
43+	03962110	FUEL HOSE	1	
44+	05310200	FUEL PIPE	1	
45+	50570900	CLAMP	5	
46+	00805502	VENT VALVE	1	
47+	05310100	FUEL PIPE	1	
48+	03989601	HOSE NIPPLE T	1	
51	50590000	CLAMP	1	
58	01189910	FUEL PIPE ASSY.....	1	INCLUDES ITEMS W/ +

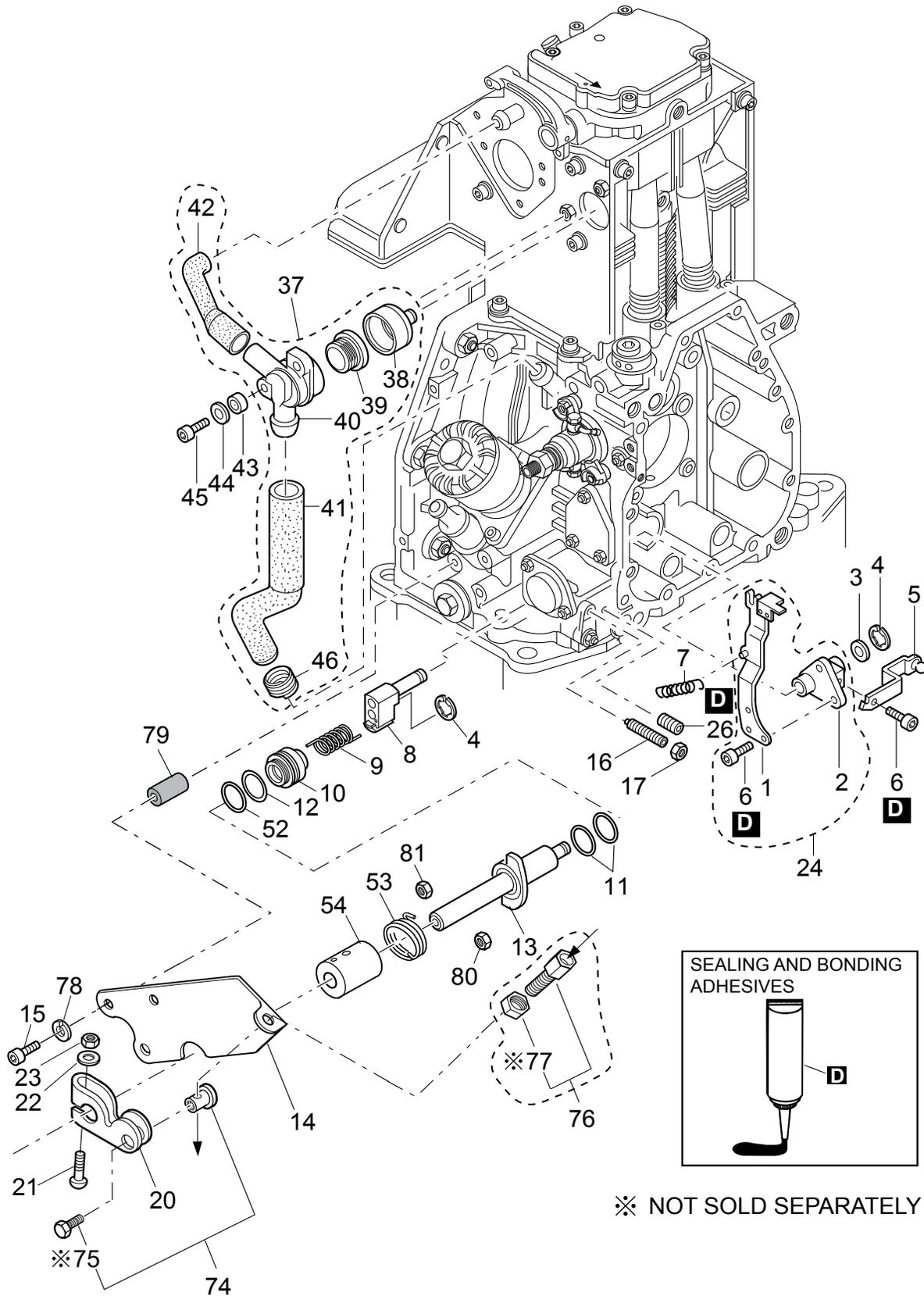
HATZ 1D81S-325 ENGINE AIR DUCTING ASSY.



HATZ 1D81S-325 ENGINE AIR DUCTING ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE 221	1	
1	01246223	COOLING AIR DUCTING	1	INCLUDES ITEMS W/ \$
2\$		AIR DUCT BRACKET	1	NOT SOLD SEPARATELY
3\$@	04007601	SEALING STRIP 35 MM	2	
4\$@	04007720	SEALING STRIP 76 MM	2	
5	01246413	COOLING AIR DUCTING	1	INCLUDES ITEMS W/@
6@		AIR DUCT BRACKET	1	NOT SOLD SEPARATELY
7	01246600	COOLING AIR DUCTING, UPPER	1	INCLUDES ITEMS W/ #
8#		AIR DUCT UPPER.....	1	NOT SOLD SEPARATELY
9#	04007901	SEALING STRIP	1	
10	50390701	CON. WASHER, LOCK	15	
11	020106050	HEXAGON NUT	4	REPLACES 50144400
12	50528100	ALLEN SCREW	7	
14	04008500	PARTING SHEET	1	
15	50093700	WASHER, FLAT	2	
16	50093600	HEXAGON NUT	2	
17	50475000	STUD	2	
18	50474900	STUD	4	
19	01689100	HOUSING, INTERMEDIATE	1	
20	50333500	HEXAGON SCREW	AR	
21\$	50334800	RUBBER SLEEVE	1	
22	50416800	ALLEN SCREW	2	
23	50226000	GRUB SCREW	4	
24		MODEL ID PLATE.....	1	CONTACT MQ PARTS DEPT.
25	40002500	RIVET	4	
28	04080410	COVER, BLOWER DUCTING	AR	
29	50170900	WASHER, LOCK	AR	
30	50177100	HEXAGON SCREW	2	
31	50416800	ALLEN SCREW	2	
43	01268010	COOLING AIR DUCT	1	
44	04038800	SEALING STRIP 94 MM	1	
45	50120000	WASHER, FLAT	2	
46	50328300	HEXAGON NUT	2	
48	04125700	SEALING PLATE	1	
49	04125601	SEALING PLATE	1	
51	50093700	WASHER, FLAT	4	
52	50093600	HEXAGON NUT	4	

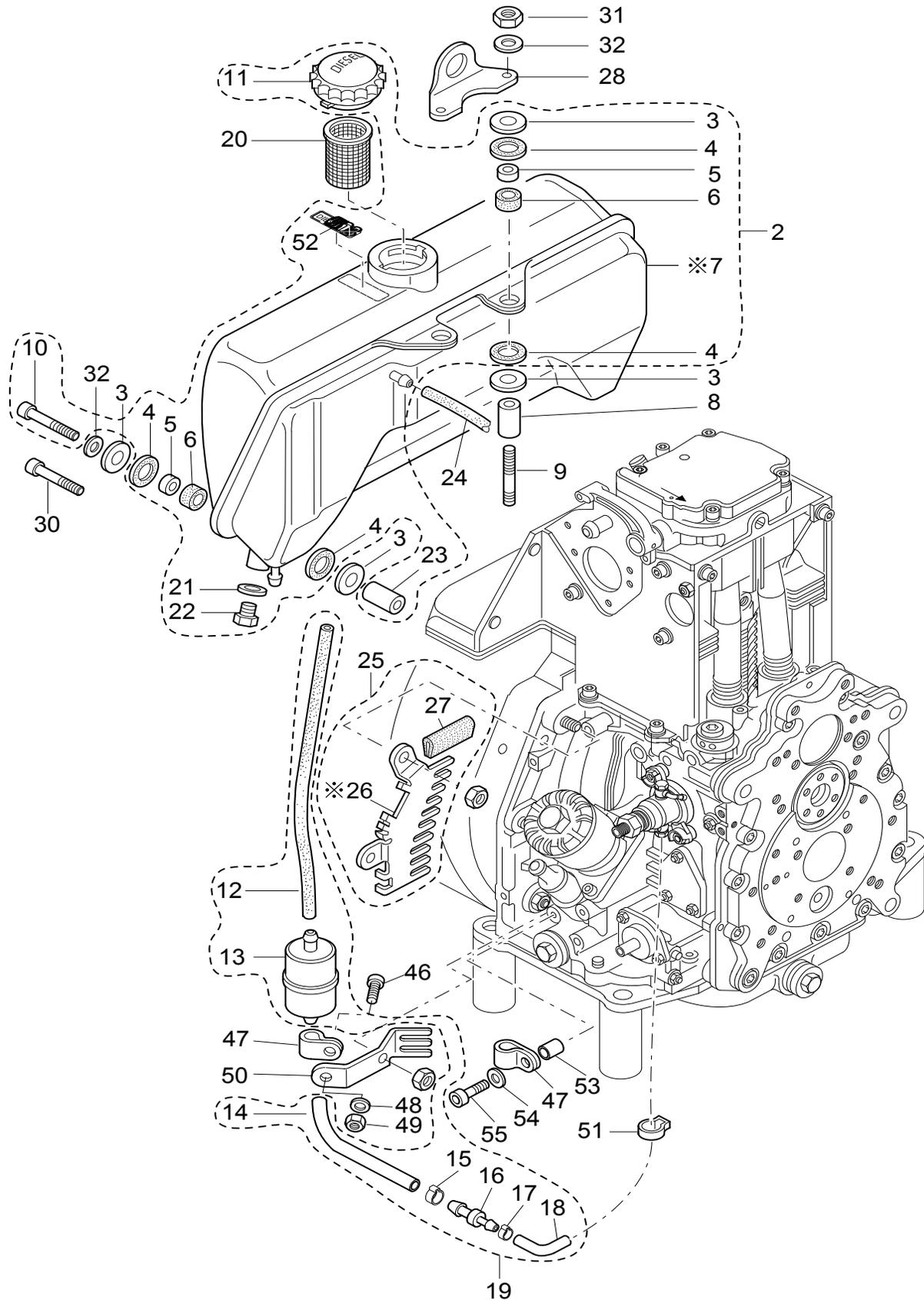
HATZ 1D81S-325 ENGINE SPEED CONTROL ASSY.



HATZ 1D81S-325 ENGINE SPEED CONTROL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE 221	1	
1\$		LEVER, SPEED CONTROL	1	NOT SOLD SEPARATELY
2\$		BRACKET, SPEED CONTROL	1	NOT SOLD SEPARATELY
3	04000100	SHIM	1	
4	50266100	CIRCLIP	2	
5	04037500	LEVER	1	
6\$	50328701	ALLEN SCREW	4	
7	04000200	TENSION SPRING	1	
8	01242811	GUIDE	1	
9	03799010	THIGH SPRING	1	
10	04052710	SPACER RING	1	
11	50412900	O-RING	2	
12	50129900	O-RING	1	
13	01279222	STOP RING. SPD. CONT. S	1	
14	03975602	CONSOLE	1	
15	50170600	ALLEN SCREW	3	
16	50507801	GRUB SCREW	2	
17	020106050	HEXAGON NUT	2	REPLACES 50144400
20	03975801	LEVER	1	
21	03927301	SCREW	1	
22	50144500	WASHER, FLAT	1	
23	50346500	HEXAGON NUT	1	
24	01246803	SPEED CONTROL, ASSY.	1	INCLUDES ITEMS W/ \$
26	50403500	GRUB SCREW	1	
37	01317000	VALVE, BREATHER, ASSY.	1	INCLUDES ITEMS W/@
38@	04080300	BREATHER CUP	1	
39@	03568701	DIAPHRAGM	1	REPLACES 03568700
40@		BREATHER VALVE	1	NOT SOLD SEPARATELY
41@	04074700	BREATHER HOSE	1	
42@	04074800	BREATHER HOSE	1	
43	04080500	BUSH	2	
44	50081200	WASHER, LOCK	2	
45	50170700	ALLEN SCREW	2	
46@	04090500	CLAMP	1	
52	50453600	SUPPORTING DISC	1	
53	05046800	THIGH SPRING	1	
54	01494101	COUPLING SHELL	1	
74	50642000	CABLE CLAMPING ASSY.	1	INCLUDES ITEMS W/ #
75#		BOLT, HX. HD.....	1	NOT SOLD SEPARATELY
76	50374400	ADJUSTING SCREW W/ NUT.....	1	INCLUDES ITEM W/ %
77%		NUT, HEX.....	1	NOT SOLD SEPARATELY
78	50170900	WASHER, LOCK	3	
79	04021000	BUSHING	3	
80	05179300	NUT. HEX.	1	
81	50328300	NUT, HEX.	2	

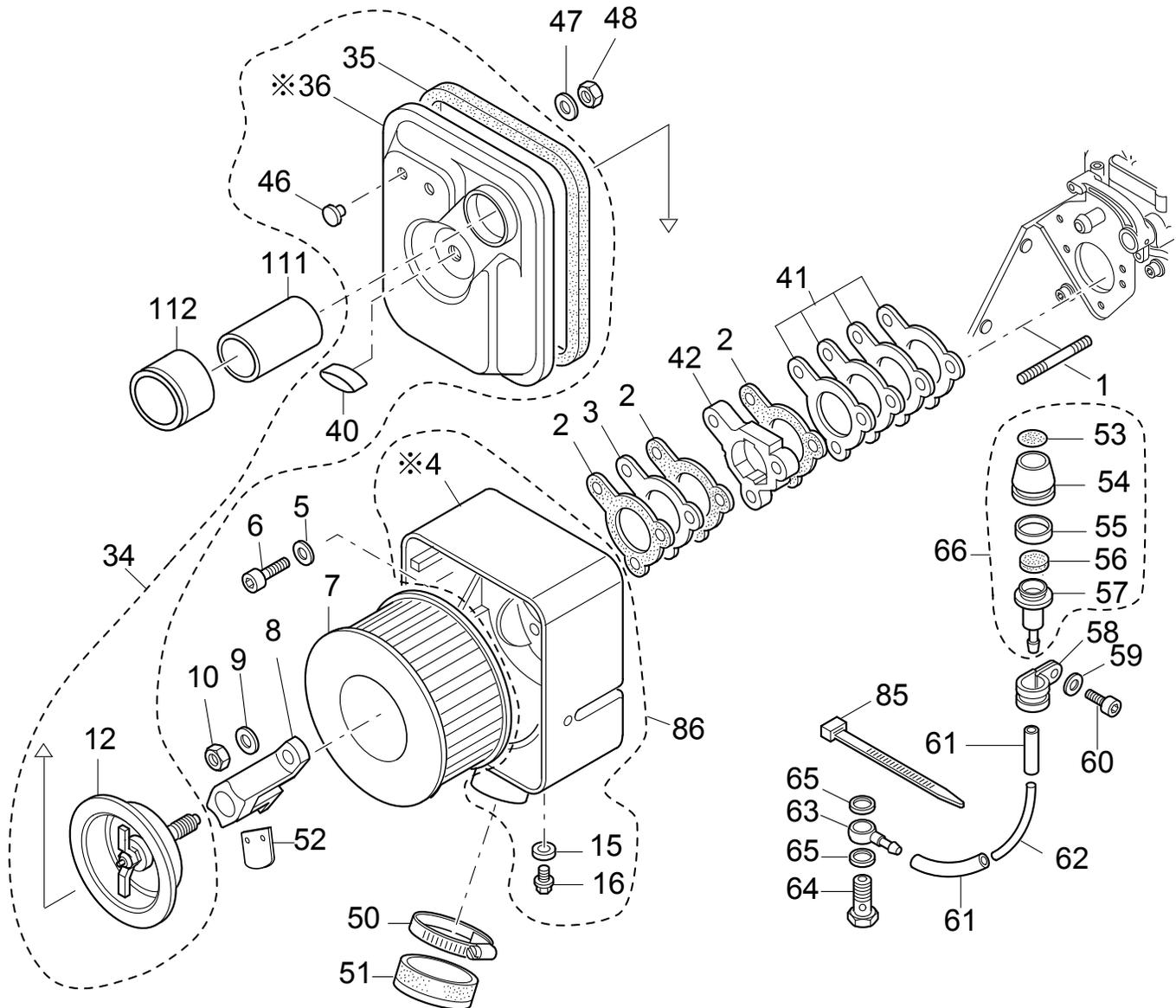
HATZ 1D81S-325 ENGINE FUEL TANK ASSY.



HATZ 1D81S-325 ENGINE FUEL TANK ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
2	01494200	FUEL TANK ASSY.....	1.....	INCLUDES ITEMS W/\$
3	05097600	WASHER	12	
4\$	03981802	RUBBER WASHER	12	
5\$	03981701	BUSH	6	
6\$	03981900	RUBBER SHELL	4	
7\$		FUEL TANK.....	1.....	NOT SOLD SEPARATELY
8	03989800	BUSH	2	
9	50377001	STUD	2	
10\$	50177500	ALLEN SCREW	4	
11\$	50385801	CAP, FUEL TANK	1	
12@	05323600	FUEL HOSE	1	
13@	50478800	FUEL FILTER, IN-LINE	1	
14@	05330000	FUEL HOSE	1	
15@	50523800	CLAMP	1	
16@	05240400	NIPPLE	1	
17@	50570900	CLAMP	1	
18@	03664310	FUEL HOSE	1	
19	01473610	FUEL FILTER W./ HOSES	1.....	INCLUDES ITEMS W/@
20	50387300	FUEL FILTER/SIEVE	1	
21\$	50001000	JOINT A	1	
22\$	05126000	DRAIN PLUG	1	
23\$	05029200	BUSH	4	
24	03663710	FUEL HOSE	1	
25	01490300	PROTECT GUARD TOP W / SEAL.....	1.....	INCLUDES ITEMS W/%
26%		PROTECT GUARD	1.....	NOT SOLD SEPARATELY
27%	04030901	SEALING STRIP	1	
28	04008100	BRACKET, LIFTING	1	
30	50183000	ALLEN SCREW	1	
31	020108060	HEXAGON NUT.....	2.....	REPLACES 50148000
32	50208500	WASHER, LOCK	6	
46	50177100	HEXAGON SCREW	1	
47	50158400	PIPE CLIP 14/15	2	
48	50144500	WASHER, FLAT	1	
49	020106050	HEXAGON NUT	1.....	REPLACES 50144400
50	05031900	GUARD/FILTER	1	
51	50590000	CLAMP	1	
52\$	05235602	STICKER "DIESEL"	1	
53	04098400	SPACER TUBE	1	
54	50170900	WASHER, LOCK	1	
55	50323900	ALLEN SCREW	1	

HATZ 1D81S-325 ENGINE AIR FILTER ASSY.



※ NOT SOLD SEPARATELY.

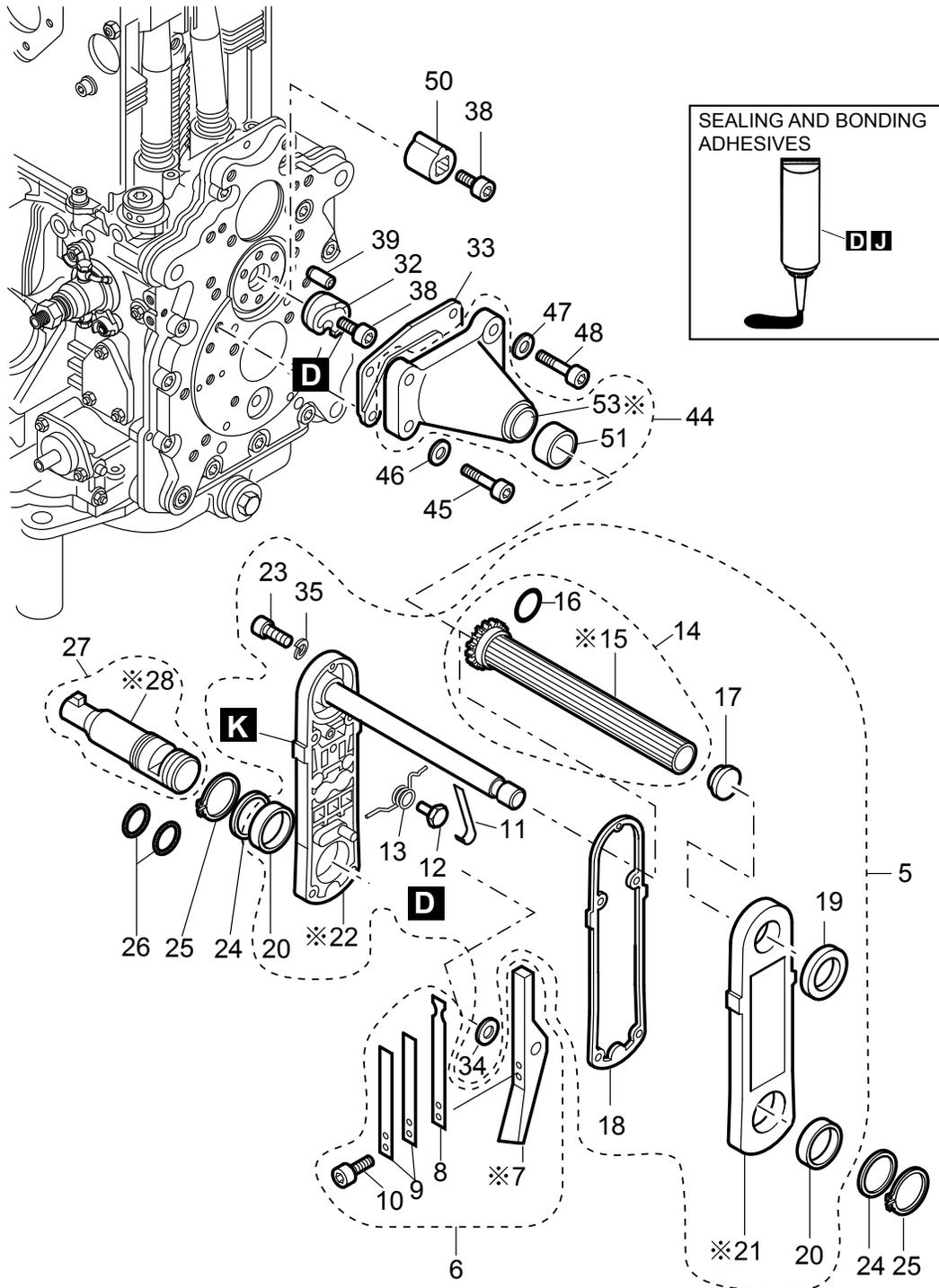
HATZ 1D81S-325 ENGINE AIR FILTER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	50038900	STUD	2	
2	04006300	GASKET, AIR FILTER	3	
3	04006200	INSULATING FLANGE	1	
4%		HOUSING, AIR CLEANER.....	1.....	NOT SOLD SEPARATELY
5	50095100	WASHER, LOCK	1	
6	50398400	ALLEN SCREW	1	
7	01493000	ELEMENT, AIR FILTER	1	
8	01483401	RETAINING BRACKET	1	
9	50148100	WASHER, FLAT	2	
10	50129500	HEXAGON NUT	2	
12#	02024200	CENTER RING COVER	1	
15%	50062400	JOINT A	1	
16%	50062300	ALLEN SCREW	1	
34	02280100	COVER, AIR FILTER, ASSY.	1.....	INCLUDES ITEMS W/ #
35%#	04047701	SEAL STR. LG	1	
36#		COVER, AIR FILTER.....	1.....	NOT SOLD SEPARATELY
40#	50452200	WING SCREW	1	
41	01287900	GASKET, AIR FILTER	1	
42	04047300	INTERMEDIATE FLANGE	1	
46#		PLUG, AIR FILTER COVER.....	2.....	NOT SOLD SEPARATELY
47	50120000	DISC	2	
48	50602400	NUT	2	
50	50406600	HOSE CLIP	2	
51	00575900	CAP	1	
52	05033500	VALVE PLATE	1	
53\$	05044501	INDICATOR. PLATE	1	
54\$	05043601	RUBBER CAP	1	
55\$	05045600	SIGNAL RING	1	
56\$	05137200	FILTER, MAINTENANCE INDICATOR	1	
57\$	05043700	ADAPTER	1	
58	50173500	PIPE CLIP	1	
59	50170900	WASHER, LOCK	1	
60	50170600	ALLEN SCREW	1	
61	05325400	FUEL HOSE	2	
62	05043800	HOSE	1	
63	50159500	RING PIECE	1	
64	50006200	BANJO BOLT	1	
65	50062400	JOINT A	2	
66	01499801	MAINTENANCE INDICATOR, ASSY.	1.....	INCLUDES ITEMS W/ \$
85	50358400	STRAP	1	
86	01486601	AIR FILTER HOUSING, ASSY., W/SEAL.....	1.....	INCLUDES ITEMS W/ %
111	469467010	INTAKE PIPE, CLEANER	1	
112	466462840	DUCT GROMMET	1	

HATZ 1D81S-325 ENGINE MUFFLER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE 221	1	
J	50283004	HIGH TEMPERATURE PASTE	1	
1	01498803	EXHAUST SILENCER ASSY.	1.....	INCLUDES ITEMS W/ \$
2\$		SILENCER, EXHAUST	1.....	NOT SOLD SEPARATELY
3\$	50404000	ALLEN SCREW	3	
6\$	03974300	GASKET EXHAUST SILENCER	1	
18	01191902	MUFFLER, GUARD	1	
19	05034202	WASHER, LOCK	10	
20	50255700	ALLEN SCREW	5	
21	03985300	GUARD	1	
22	50135700	ALLEN SCREW	2	
23	40091400	CLOSING CAP	1	
24	50165400	ALLEN SCREW	2	
27	50120000	WASHER, FLAT	5	
29\$	50208500	WASHER, LOCK	3	
30\$	04125601	SEALING PLATE	1	

HATZ 1D81S-325 ENGINE STARTING HANDLE ASSY.

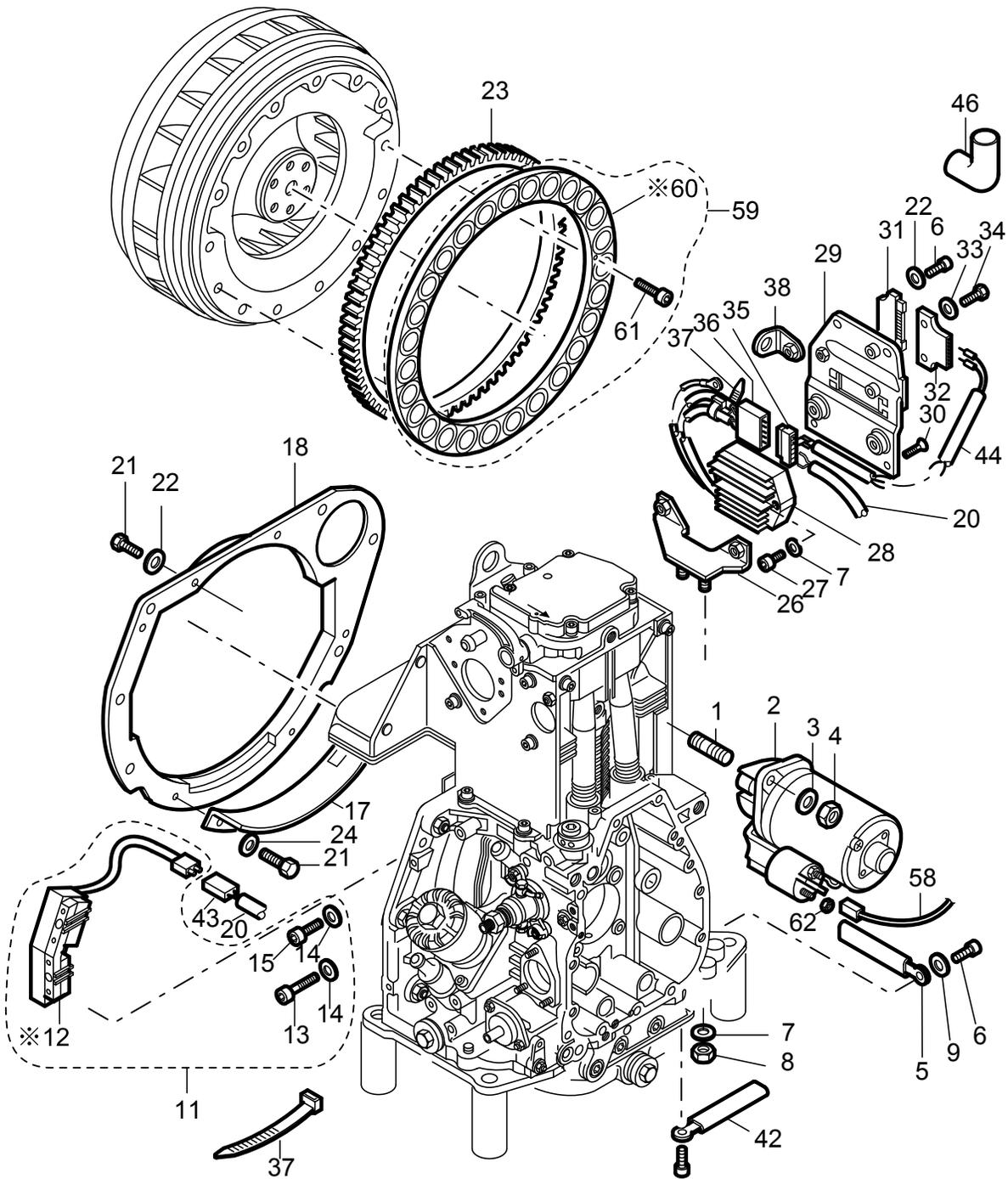


※ NOT SOLD SEPARATELY.

HATZ 1D81S-325 ENGINE STARTING HANDLE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE 221	1	
K	50342600	HIGH TEMPERATURE FETT	1	
5	01027805	CRANK HANDLE-SAFETY, ASSY.	1	INCLUDES ITEMS W/ \$
6\$	01011404	LEVER, ASSY.	1	INCLUDES ITEMS W/ @
7\$@		LEVER	1	NOT SOLD SEPARATELY
8\$@	03812102	PLATE SPRING	1	
9\$@	03917100	PLATE SPRING	2	
10\$@	50316500	ALLEN SCREW	2	
11\$	03954900	PLATE SPRING	1	
12\$	03955600	HEXAGON SCREW	1	
13\$	03955900	SPRING A	1	
14\$	01011310	HANDLE, OUTER W / O-RING	1	INCLUDES ITEMS W/ #
15\$#		HANDLE, OUTER.....	1	NOT SOLD SEPARATELY
16\$#	50169100	O-RING	1	
17\$	50199200	CLOSING PLUG	1	
18\$	03813000	GASKET	1	
19\$	50194200	OIL SEAL	1	
20\$	50193400	BUSH	2	
21\$		HOLDER, CRANK HANDLE, OUTER	1	NOT SOLD SEPARATELY
22\$		HOLDER, CRANK HANDLE, INNER.....	1	NOT SOLD SEPARATELY
23\$	50236600	ALLEN SCREW	5	
24	03928610	SHIM	2	
25	50194300	CIRCLIP	2	
26	50258500	O-RING	2	
27	01187202	SHAFT, CRANK HANDLE	1	INCLUDES ITEM W/+
28+		SHAFT	1	NOT SOLD SEPARATELY
32	04020310	CRANK JOW LEFT	1	
33	03985300	GUARD	1	
34\$	50195800	SHIM	1	
35\$	50170900	WASHER, LOCK	5	
38	50134900	ALLEN SCREW	1	
39	50387100	CYLINDER PIN	1	
44	01459500	GUIDING SHELL, W / BUSHING.....	1	INCLUDES ITEM W/ %
45	50183000	ALLEN SCREW	2	
46	50148100	WASHER, FLAT	2	
47	50145900	WASHER, FLAT	2	
48	50327800	ALLEN SCREW	2	
50	04082900	CRANKING DEVICE	1	
51%	50387601	BUSHING 1"	1	
53%		GUIDING SHELL	1	NOT SOLD SEPARATELY

HATZ 1D81S-325 ENGINE STARTING MOTOR ASSY.

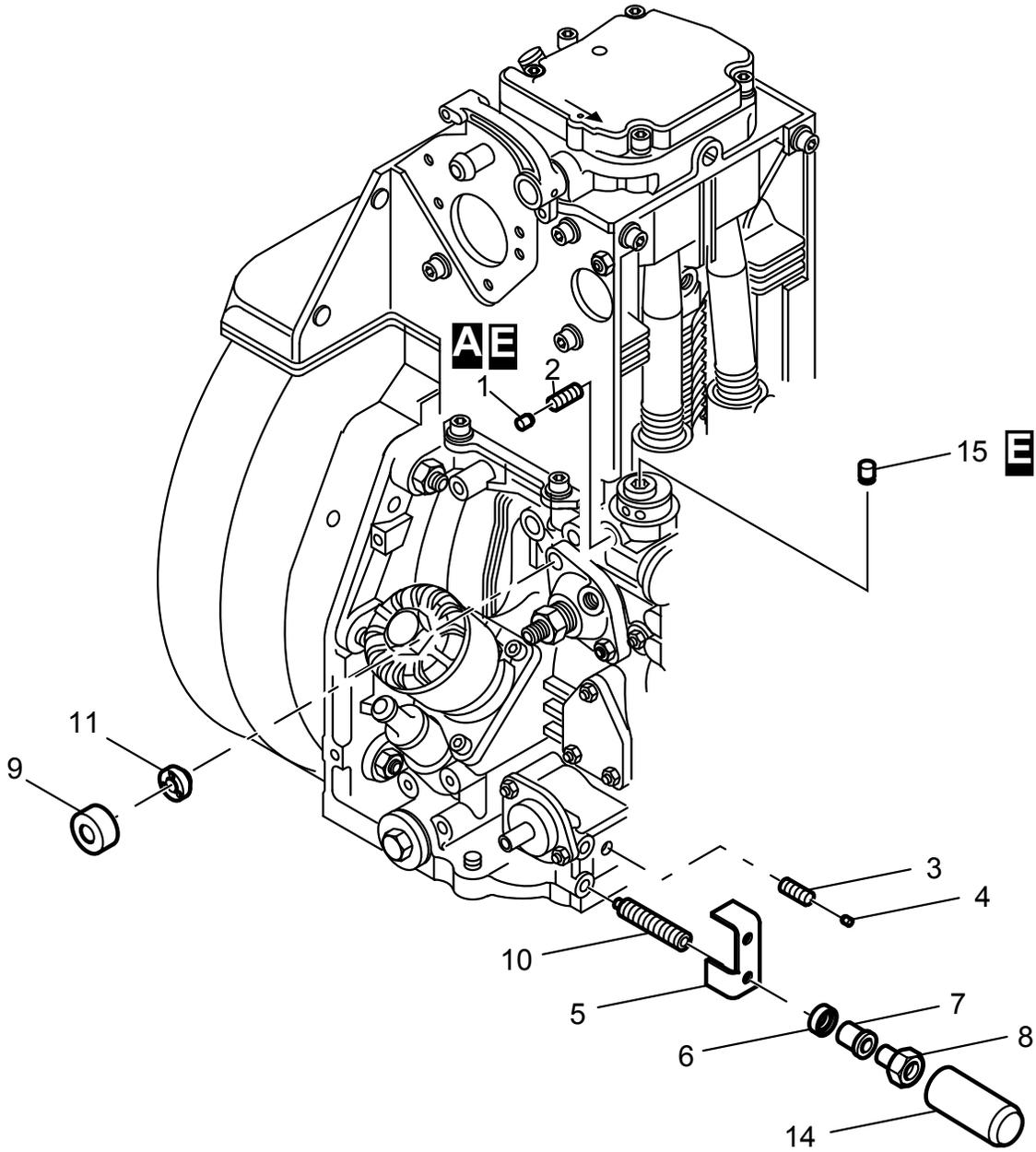


※ NOT SOLD SEPARATELY.

HATZ 1D81S-325 ENGINE STARTING MOTOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	50486400	STUD	2	
2	50495901	STARTING MOTOR ASSY.	1	
3	50093700	WASHER, FLAT	2	
4	50380600	HEXAGON NUT	2	
5	05001200	CLIP	2	
6	50149100	ALLEN SCREW	2	
7	50208500	WASHER, LOCK	4	
8	020108060	HEXAGON NUT	2.....	REPLACES 50148000
9	50144500	WASHER, FLAT	1	
11	01592400	COIL ASSY. 12V 200W	1.....	INCLUDES ITEMS W/ \$
12\$		COIL.....	1.....	NOT SOLD SEPARATELY
13\$	50448800	ALLEN SCREW	1	
14\$	50390701	CON. WASHER, LOCK	2	
15\$	50448700	ALLEN SCREW	1	
17	04021100	PROTECT. ALTERNATOR	1	
18	04009920	PARTING SHEET	1	
20	01558300	ELECTRIC WIRE	1.....	REPLACES 01462800
21	50165500	HEXAGON SCREW	5	
22	50170900	WASHER, LOCK	6	
23	04021210	GEAR, RING	1	
24	50144500	WASHER, FLAT	2	
26	01440303	SUPPORT	1	
27	50183000	ALLEN SCREW	2	
28	01983800	REGULATOR 12V	1	
29	01440100	FASTENING PLATE	1	
30	50422501	COUNTER SUNK SCREW	2	
31	50373700	PLUG SLEEVE HOUSING	1	
32	50373600	PIN TERM. HOUSING 6-WAY	1	
33	50216300	WASHER	2	
34	50335700	HEXAGON SCREW	2	
35	50402100	PLUG SLEEVE HOUSING	1	
36	50402000	PLUG HOUSING 4-P	1	
37	50358400	STRAP	4	
38	01440200	SUPPORT	1	
42	05023900	CLIP	2	
43	50379700	PLUG HOUSING 2-P	1	
44	01439400	WIRING HARNESS	1	
46	40026600	PROTECTION CAP	1	
58	01193401	ELECT. WIRE STARTER	1	
59	01587300	MAGNETIC RING, ASSY. 200W	1.....	INCLUDES ITEMS W/ %
60%		MAGNETIC RING	1.....	NOT SOLD SEPARATELY
61%	50446900	ALLEN SCREW	14	
62	50344700	HEXAGON NUT	1	

HATZ 1D81S-325 ENGINE SPEC. EQUIPMENT ASSY.



HATZ 1D81S-325 ENGINE SPEC. EQUIPMENT ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
A	50223001	LOCTITE ACTIVATOR N	1	
E	50223400	LOCTITE 574	1	
1	04167010	CLOSING PLUG	1	
2	50004600	GRUB SCREW	1	
3	50403500	GRUB SCREW	1	
4	04153700	CLOSING PLUG	1	
5	04153800	SUPPORT	1	
6	04134200	DISC	1	
7	04129700	BUSHING	1	
8	04126700	THREADED BUSHING	1	
9	04244500	CAP	2	
10	50507800	GRUB SCREW	2	
11	04239200	SECURING NUT	2	
14	04187700	CAP	1	
15	04205900	CLOSING PLUG	1	

TERMS AND CONDITIONS OF SALE — PARTS

PAYMENT TERMS

Terms of payment for parts are net 30 days.

FREIGHT POLICY

All parts orders will be shipped collect or prepaid with the charges added to the invoice. All shipments are F.O.B. point of origin. Multiquip's responsibility ceases when a signed manifest has been obtained from the carrier, and any claim for shortage or damage must be settled between the consignee and the carrier.

MINIMUM ORDER

The minimum charge for orders from Multiquip is \$15.00 net. Customers will be asked for instructions regarding handling of orders not meeting this requirement.

RETURNED GOODS POLICY

Return shipments will be accepted and credit will be allowed, subject to the following provisions:

1. A Returned Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
 - a. The parts numbers and descriptions must match the current parts price list.
 - b. The list must be typed or computer generated.
 - c. The list must state the reason(s) for the return.
 - d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
 - e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.

5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
 - a. Obsolete parts. (If an item is in the price book and shows as being replaced by another item, it is obsolete.)
 - b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
 - c. Any line item with an extended dealer net price of less than \$5.00.
 - d. Special order items.
 - e. Electrical components.
 - f. Paint, chemicals, and lubricants.
 - g. Decals and paper products.
 - h. Items purchased in kits.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for five working days from notification, pending instructions. If a reply is not received within five days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.
10. In cases where an item is accepted, for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

PRICING AND REBATES

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price. Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change.

Multiquip reserves the right to quote and sell direct to Government agencies, and to Original Equipment Manufacturer accounts who use our products as integral parts of their own products.

SPECIAL EXPEDITING SERVICE

A \$35.00 surcharge will be added to the invoice for special handling including bus shipments, insured parcel post or in cases where Multiquip must personally deliver the parts to the carrier.

LIMITATIONS OF SELLER'S LIABILITY

Multiquip shall not be liable hereunder for damages in excess of the purchase price of the item with respect to which damages are claimed, and in no event shall Multiquip be liable for loss of profit or good will or for any other special, consequential or incidental damages.

LIMITATION OF WARRANTIES

No warranties, express or implied, are made in connection with the sale of parts or trade accessories nor as to any engine not manufactured by Multiquip. Such warranties made in connection with the sale of new, complete units are made exclusively by a statement of warranty packaged with such units, and Multiquip neither assumes nor authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. Apart from such written statement of warranty, there are no warranties, express, implied or statutory, which extend beyond the description of the products on the face hereof.

Effective: February 22, 2006

OPERATION AND PARTS MANUAL

HERE'S HOW TO GET HELP

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

UNITED STATES

Multiquip Corporate Office

18910 Wilmington Ave.
Carson, CA 90746
Contact: mq@multiquip.com

Tel. (800) 421-1244
Fax (310) 537-3927

Service Department

800-421-1244
310-537-3700

Fax: 310-537-4259

Technical Assistance

800-478-1244

Fax: 310-943-2238

MQ Parts Department

800-427-1244
310-537-3700

Fax: 800-672-7877
Fax: 310-637-3284

Warranty Department

800-421-1244
310-537-3700

Fax: 310-943-2249

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Multiquip

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Tel: (450) 625-2244
Tel: (877) 963-4411
Fax: (450) 625-8664

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This manual MUST accompany the equipment at all times. This manual is considered a permanent part of the equipment and should remain with the unit if resold.

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