

**OPERATION AND PARTS MANUAL**



*Mikasa* SERIES  
**MODELS**

**MVH502DSB**

**MVH502DSB2**

**REVERSIBLE PLATE COMPACTOR**

**(HATZ 1D81S DIESEL ENGINE)**

Revision #5 (03/11/11)



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 <b>WARNING</b> 
<b>CALIFORNIA — Proposition 65 Warning</b>
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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## HATZ1D81S DIESEL ENGINE

### NOTICE

*Drawings and Parts Lists of Hatz1D81S Engine is only for Tier 1 engines (MVH502DSB units). If you have a Tier 2 engine (MVH502DSB2 units), contact Hatz engine manufacturer for parts information.*

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### NOTICE

*Specification and part number are subject to change without notice.*

# SAFETY INFORMATION




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










## SAFETY MESSAGES

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

## SAFETY SYMBOLS

 <b>DANGER</b>
<p>Indicates a hazardous situation which, if not avoided, <b>WILL</b> result in <b>DEATH</b> or <b>SERIOUS INJURY</b>.</p>
 <b>WARNING</b>
<p>Indicates a hazardous situation which, if not avoided, <b>COULD</b> result in <b>DEATH</b> or <b>SERIOUS INJURY</b>.</p>
 <b>CAUTION</b>
<p>Indicates a hazardous situation which, if not avoided, <b>COULD</b> result in <b>MINOR</b> or <b>MODERATE INJURY</b>.</p>
<b>NOTICE</b>
<p>Addresses practices not related to personal injury.</p>

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.





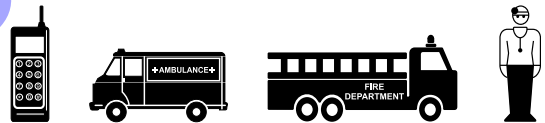
- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication. 
- **NEVER** operate this equipment under the influence of drugs or alcohol.



- **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.



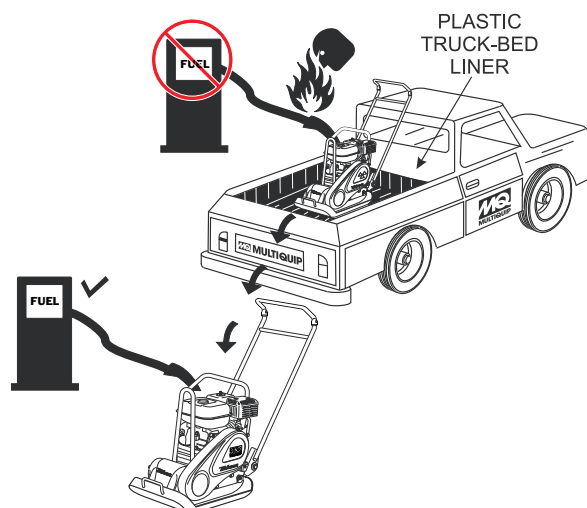


# SAFETY INFORMATION

## 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)

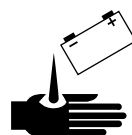
### DANGER

- **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.



## 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

### NOTICE

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

# OPERATION AND SAFETY DECALS

Figure 1 displays the operation and safety decals as they appear on the reversible plate compactor. Should any of these decals become damaged or unreadable, contact the Multiquip Parts Department for a replacement set.



P/N: 920204580



P/N: 920207480



P/N: 920203260



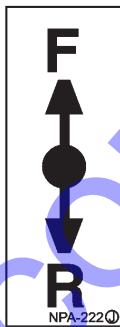
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<p><b>OPERATIONAL CAUTION</b>                  Prior to OPERATION:                  Check engine oil and fuel levels.                  If not enough, add to proper levels.                  To START engine:                  1. Warm up engine at low speed for 3 to 5 minutes.                  2. Operate machine at full throttle speed.                  (Incorrect clutch engagement cause clutch to burn.)                  3. Use travel lever for forward and reverse motion.                  Do not push or pull travel lever strongly.                  To STOP engine: (for electric start engine)                  Move stop key switch to "OFF" position.                  To LIFT machine:                  Use lifting hook in center.                  Outdoor Storage                  Store until covered with plastic sheet in a moisture.</p> <p><b>MIKASA SANGYO CO., LTD TOKYO JAPAN</b> (NPA-639)</p>	<p><b>DANGER FUEL</b></p> <p><b>Fire Risk</b></p>	<p><b>DANGER FUEL</b></p> <p><b>Operate only in well-ventilated area</b></p>	<p><b>DANGER LIFTING</b></p> <p><b>Do not stand next to machine while lifting</b></p>	<p><b>DANGER LIFTING</b></p> <p><b>Do not use machine handle</b></p>	<p><b>CAUTION READ</b></p> <p><b>Use caution while operating in reverse</b></p>
	<p><b>WARNING NOISE</b></p> <p><b>Wear eye protection</b></p>	<p><b>WARNING HOT TEMP.</b></p> <p><b>Operate only in well-ventilated area</b></p>	<p><b>WARNING TRANSPORT</b></p> <p><b>Set transport wheel tightly by chain</b></p>	<p><b>CAUTION MOVING PARTS</b></p> <p><b>Do not touch moving parts in operation</b></p>	<p><b>CAUTION READ</b></p> <p><b>Read operator's manual carefully before use</b></p>

P/N: 920206370



P/N: 920101580



P/N: 920202220



P/N: 920203330

# MVH-502

P/N: 920205000

Figure 1. Operation and Safety Decals

## SPECIFICATIONS

**TABLE 1. MVH-502DSB REVERSIBLE PLATE COMPACTOR SPECIFICATIONS**

Centrifugal Force	14,000 lbs. (6,350 kg)
Vibration Frequency	4,000 vpm (67 Hz)
Traveling Speed	0 to 75.5 ft/min (0 to 23 m/min)
Plate Size (L x W)	39 x 21.7 in (990 x 550 mm)
Overall Length	60 in (1,525 mm)
Overall Width	21.7 in (550mm )
Overall Height	43.3 in (1,100 mm )
Operating Weight	1122 lbs. (510 kg)
Lubricating Oil in Vibration Case	33.8 fl oz (1,000 cc)

**Table 2. ENGINE SPECIFICATIONS**

<b>Table 2. ENGINE SPECIFICATIONS</b>		
<b>Engine</b>	<b>Model</b>	<b>Hatz 1D81S</b>
	Type	Air-cooled, 4-Stroke, Single Cylinder, Diesel Engine
	Bore X Stroke	3.94 in. X 3.34 in. (100 mm x 85 mm.)
	Displacement	40.70 cu-in (667 cm <sup>3</sup> )
	Max Output	15.0 H.P./3600 R.P.M.
	Fuel Tank Capacity	1.85 gallons (7.0 liters)
	Fuel	Diesel #2
	Lube Oil Capacity	1.8 quarts (1.7 liters)
	Starting Method	Crank Handle/Electric
	Battery min./max. Ah	12V 45/70 Ah
<b>Dimension (L x W x H)</b>	14.31 x 19.62 X 23.00 in. (363.5 X 498.5 X 584.5 mm.)	
<b>Dry Net Weight</b>	201 lbs. (91 Kg.)	

# DIMENSIONS

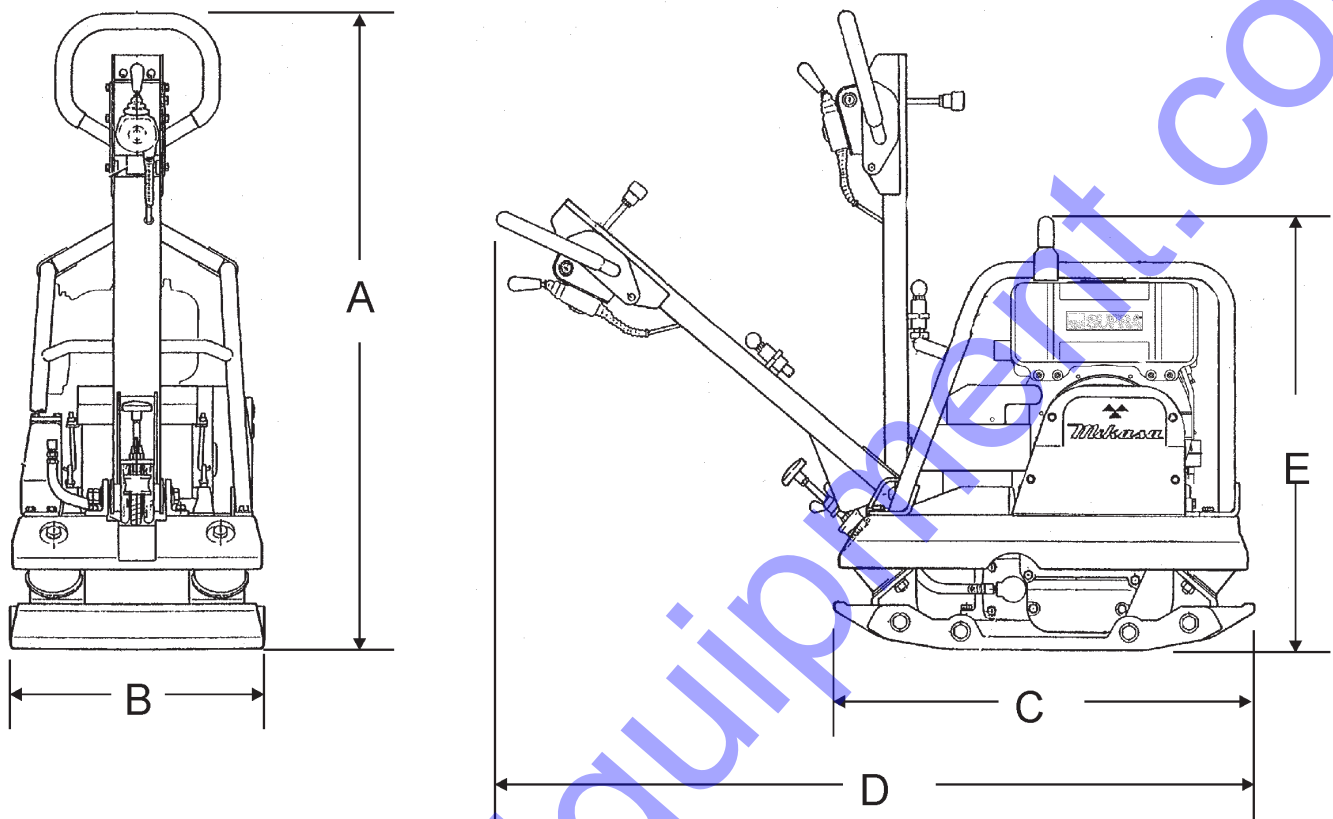


Figure 2. MVH502DSB/DSB2 Reversible Plate Compactor Dimensions

TABLE 3. DIMENSIONS

REF.	DIMENSIONS
A	53 in. (134.6 cm.)
B	24 in. (61 cm.)
C	34 in. (86 cm.)
D	63.8 in. (162 cm.)
E	38.2 in. (97 cm.)

## GENERAL INFORMATION

### Plate Compactor

The Mikasa MVH502DSB/DSB2 is a walk behind, reversible plate compactor designed for the compaction of sand, clay and asphalt. 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 soil 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 MVH502DSB/DSB2 produce low amplitude high frequency vibrations, designed to compact granular soils.

The resulting vibrations cause forward motion. The engine and handle are vibration isolated from the vibrating plate. The heavier the plate, the more compaction force it generates.

### Reversible Vibratory Plates

Reversible vibratory plates have two eccentric weights that allow a smooth transition for forward and reverse travel, plus increased compaction force as the result of dual weights.

Due to their weight and force, reversible plates are ideal for semi-cohesive soils.

### Frequency/Speed

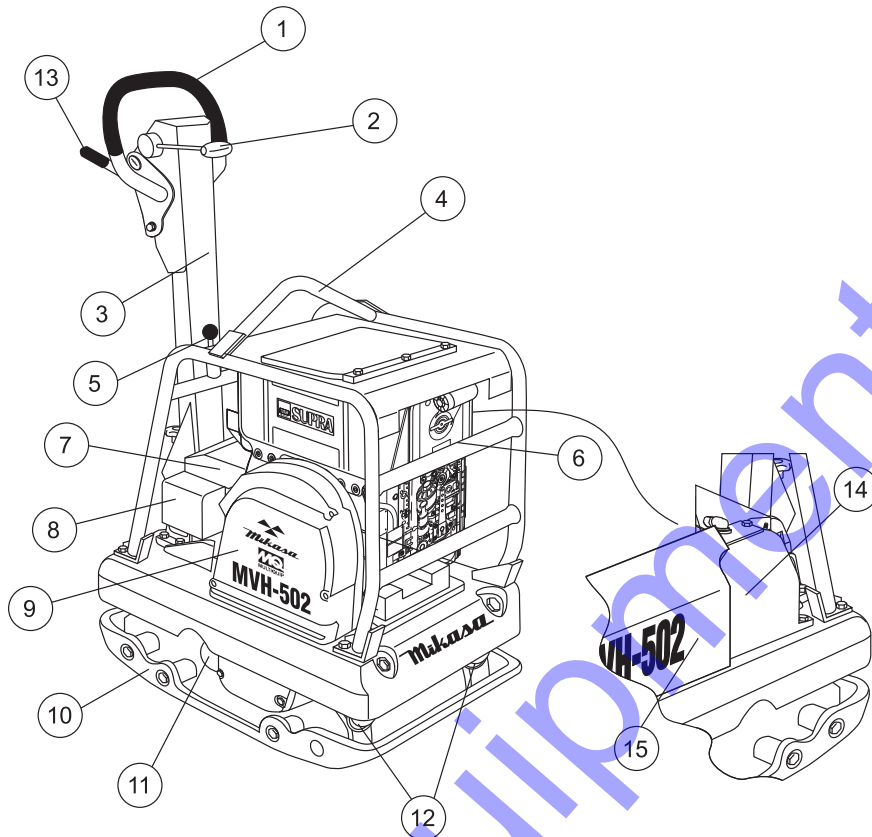
The compactor's vibrating plate maximum frequency is 4000 vpm (vibrations per minute). The forward and reverse travel speed of the compactor is approximately 75.5 ft./minute (23 meters/minute).

### Engine

The Mikasa MVH502DSB/DSB2 Plate Compactor is equipped with a HATZ 1D81S diesel engine.

### Controls

Before starting the MVH502DSB/DSB2 Plate Compactor, identify and understand the function of the controls and components as indicated in Figure 3.



**Figure 3. MVH502DSB/DSB2 Reversible Plate Compactor Components**

Figure 3 illustrates the location of the major components for the MVH502DSB/DSB2 Reversible Plate Compactor. The function of each component is described below:

1. **Hand Grip** – When operating the compactor use this hand grip to maneuver the compactor.
2. **Forward & Reverse Lever** – *Push* the lever forward, the compactor will move in a forward direction, *pull* the lever backwards, the compactor will move in backwards direction. Placing the lever in the middle (midway) will cause the compactor not to move (neutral).
3. **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.
4. **Guard Hook** – Used to lift the machine with crane or other lifting device.
5. **Stopper** – Locks the handle in place in the upward position for stowing.
6. **Engine** – This plate compactor uses a **HATZ 1D81S** diesel engine. Refer to the owner's manual for engine information and related topics.
7. **Battery** – Maintenance-free type requiring no electrode replenishment.
8. **Starter Switch** – Engine starts when key is turned to the **RUN** position
9. **Belt Cover** – Remove this cover to gain access to the V-belts. **NEVER** run the compactor without the V-belt cover. If the V-belt cover is not installed, the possibility exist that your hand may get caught between the V-belt and clutch, thus causing serious injury and bodily harm.
10. **Base Plate** – Designed to compact sand, clay, and asphalt.
11. **Vibration Case** – Encloses the eccentric, gears and counter weights.
12. **Shock Absorber** – Protects plate compactor from damage by absorbing vibration during operation.
13. **Throttle Lever** – Controls the speed of the plate compactor. Place straight vertically to start, push fully counterclockwise for full throttle and fully clockwise to stop plate compactor.
14. **Oil Tank** – Fill with proper grade of diesel engine oil.
15. **Hydraulic Cylinder** – Activated by moving the travel lever. The cylinder controls the direction of movement by the plate compactor.



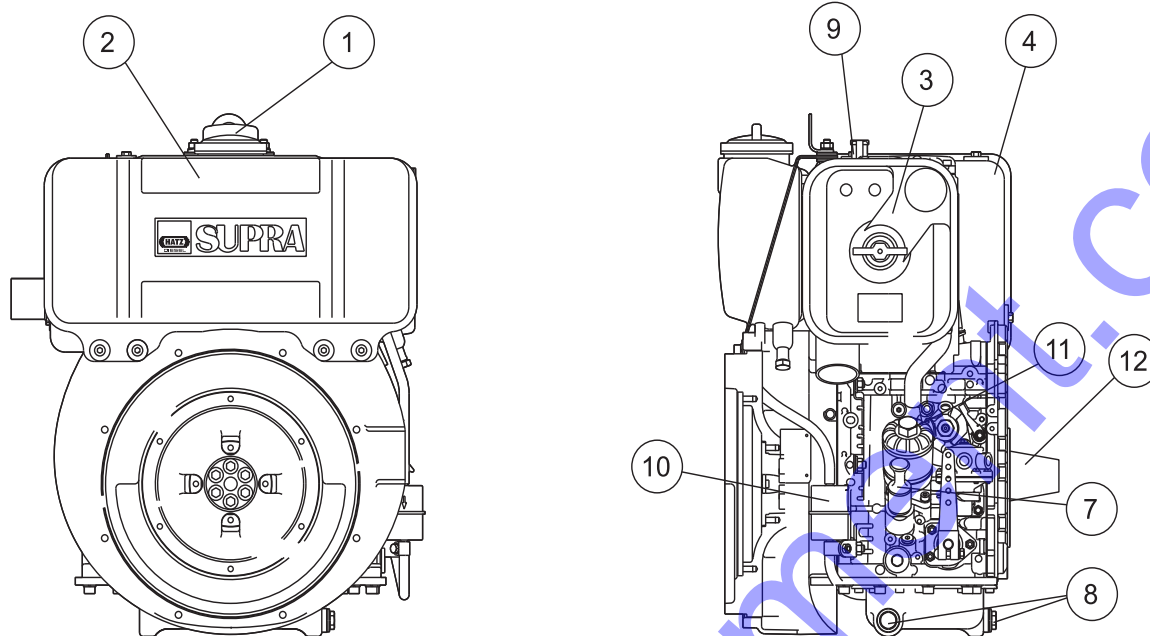


Figure 4. MVH502DSB/DSB2 Engine Components

## ENGINE COMPONENTS

Figure 4 illustrates the location of the major engine components of the machine. Each component is described below:

- Fuel Filler Cap** – Remove this cap to add unleaded gasoline to the fuel tank. Make sure cap is tighten securely. **DO NOT** over fill.

### WARNING



Add fuel to the tank only when the engine is stopped and has cooled 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.

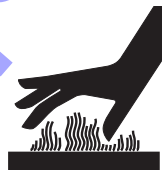
- Fuel Tank** – Capacity is 1.85 gallons (7.0 liters) of #2 diesel fuel.
- Air Cleaner** – Prevents dirt and other debris from entering the fuel system. Remove wing-nut on top of air filter cannister to gain access to filter element.

### 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.

- Muffler** – Used to reduce noise and emissions.

### 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.

- Oil Filler Cap/Dipstick** – Remove this cap to add oil to the oil tank. Use dipstick to check oil level.
- Oil Drain Plug** – Unscrew plug to drain oil from engine crankcase. Dispose of oil in a safe manner.
- Decompression Lever** – Press down before starting engine. To prevent damage to the engine, **DO NOT** use for any other purpose.
- Fuel Filter** – Controls the flow of diesel fuel to the carburetor. Must be in the ON position when starting and running the engine.
- Oil Filter** – Filters oil for contaminates. Replace as necessary.
- Starting Handle Guide Sleeve** – Insert starting handle into the guide sleeve and turn to crank start engine.

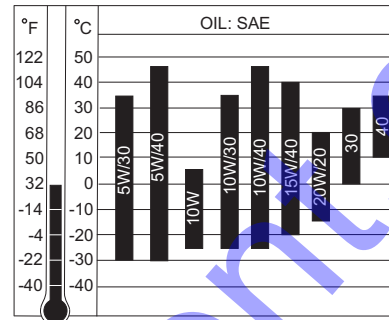
## Before Starting

1. Read safety information at the beginning of manual.
2. Familiarize yourself with the operating and control elements of the machine and the working environment. This includes obstacles in the working area, bearing capacity of the ground and the necessary safety provisions.
3. Check the air filter for dirt and dust. If the air filter is dirty, replace air filter with a new one as required.
4. Check fastening nuts and bolts for tightness. Loose threads may cause damage to the machine when vibrating.
5. Understand the geographical features and regulations of the job site.
6. Clean the compactor, removing dirt and dust, particularly, the bottom of the plate, engine cooling air inlet.



3. If the oil level is low, fill to the edge of the oil filler hole with the recommended oil type (Table 4). Maximum oil capacity is 2 quarts (1.9 liters).

Table 4. Oil Selection Chart



## Checking Engine Oil Level

1. Make sure that the machine is situated in a flat surface so that level measurements will be accurate.
2. Pull out the dipstick from the oil tank (Figure 5).

**CAUTION**

**DO NOT** overfill oil tank. This could cause oil leaks and sluggish operation. Clean cap and surrounding area before opening to prevent dirt from entering tank.

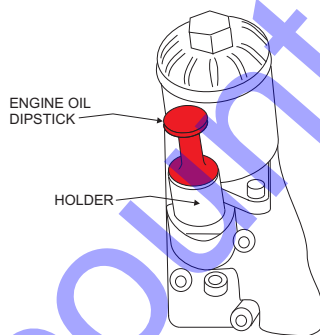


Figure 5. Oil Dipstick

**DANGER**

**EXPLOSIVE FUEL!**

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

## Checking The Fuel

1. Remove the fuel cap located on top of fuel tank.
2. Visually inspect to see if fuel level is low. If fuel is low, replenish with diesel fuel (Figure 6).
3. When refueling, be sure to use a strainer for filtration. **DO NOT** top-off fuel. Wipe up any spilled fuel.

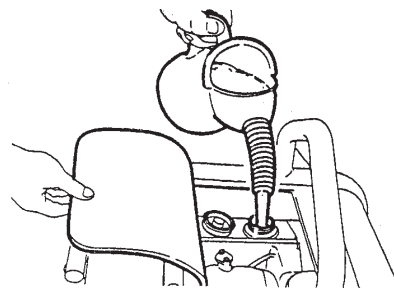


Figure 6. Refueling

## CAUTION



**DO NOT** attempt to run the compactor until the Safety, General, and Inspection sections have been read and understood.

### Adjusting Handle Height

The height of the handle is adjustable for your comfort .

1. Loosen the butterfly screw (Figure 7).
2. Turn the grip clockwise to raise the handle or counterclockwise to lower the handle.
3. When the handle is raised to the desired height, tighten the butterfly screw.

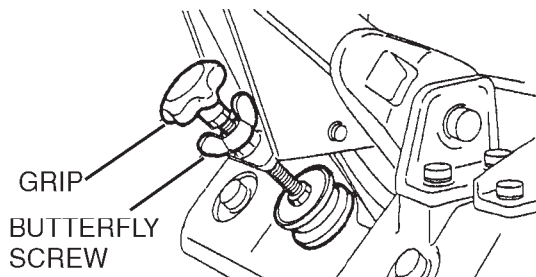


Figure 7. Handle Adjustment

### STARTING THE ENGINE

#### Electric Start

1. Move the throttle lever to the **START** position by opening it to about 20 degrees (Figure 8).

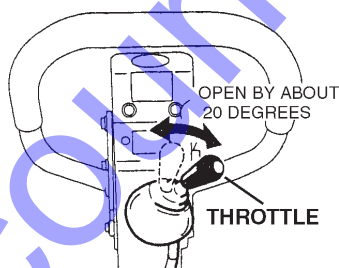


Figure 8. Throttle Lever (Start Position)

2. Insert the starter key into the key switch and turn it to the **RUN** position (Figure 9).

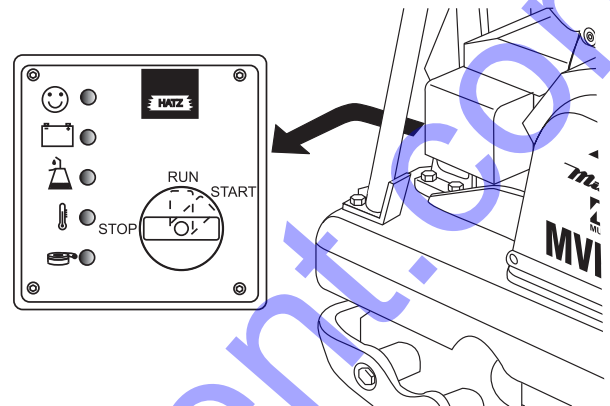


Figure 9. Starter Switch

3. Except for the "**Happy Face**" status LED, verify that all other engine status LED's are **OFF**.

#### Engine Status LED's Definitions

- "**Happy Face**" status LED. This LED when lit indicates that the engine and associated components are functioning correctly.
- "**Battery**" status LED. This LED when lit indicates that the battery charging system is not working correctly. If this LED remains **ON**, stop the engine and correct the problem.
- "**Oil Pressure**" status LED. This LED when lit indicates that the Oil pressure is low. If this LED remains **ON**, stop the engine and correct the problem.
- "**Water Temperature**" status LED. This LED when lit indicates that the Water temperature is too high. If this LED remains **ON**, stop the engine and correct the problem.
- "**Air Filter**" status LED. This LED when lit indicates that the air filter is dirty and is not functioning correctly. If this LED remains **ON**, stop the engine and correct the problem.

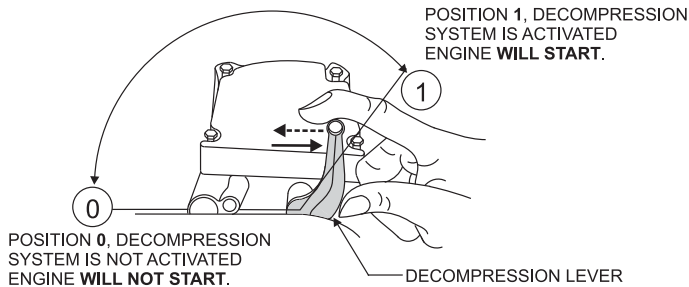
4. Turn the starter key further to the right to the **START** position to start the engine. Buzzer stops sounding and the engine starts.
5. If the engine fails to start, do not continue to rotate the starter key for more than 5 seconds. Return the key to the **RUN** position and wait 10 seconds before starting again.

## CAUTION

While the engine is running, never try to turn the starter key to the **START** position.

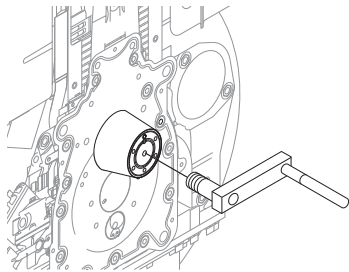
## Crank Handle Start

1. Move the throttle lever to the **START** position by opening it to about 20 degrees (Figure 8).
2. Pull up decompression lever (Figure 10) to position 1 and release.



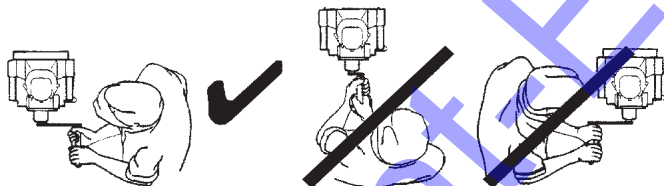
**Figure 10. Decompression Lever**

3. Insert the crank handle into the engine's starting handle guide sleeve (Figure 11).



**Figure 11. Crank Handle Guide Sleeve**

4. When turning the crank handle, observe the correct operating position (Figure 12).



**Figure 12. Starting Handle Operating Position**

5. Grasp the crank handle firmly in both hands and turn counterclockwise at increasing speed. Five turns of the starting handle are needed to build up enough compression to start the engine.
6. Once the engine starts, stop cranking and remove the starting handle from the guide sleeve.

### **CAUTION**

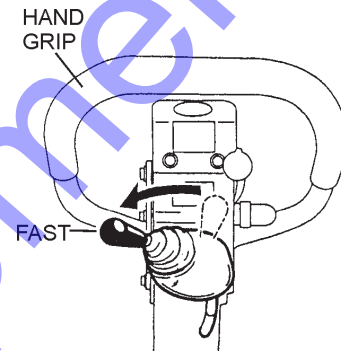
There is a risk of injury from the rotating crank handle. When using the crank handle, keep the body clear of the handle to avoid being struck. If the engine backfires because the handle was not turned firmly enough release the starting handle immediately and stop the engine.

## TRAVELING

### **CAUTION**

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

1. Grasp the compactor's hand grip (Figure 13), and move the engine throttle lever (Figure 13) quickly to the **fast** position.
2. With the throttle lever in the fast position, the engine speed should be around 2,300 RPM, therefore engaging the centrifugal clutch.

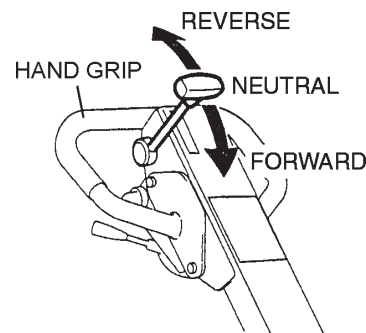


**Figure 13. Throttle Lever ((Fast))**

### **NOTICE**

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

3. To make the compactor move in the forward direction push the travel lever (Figure 14) forward.



**Figure 14. Direction Lever**

4. To make the compactor move in the reverse direction pull the travel lever (Figure 13) backwards.
5. Firmly gasp the compactor's hand grip, the compactor will begin moving in the desired position when the direction lever has been placed in the desired position.

6. Slowly walk behind the compactor and be on the lookout for any large objects or foreign matter that might cause damage to the compactor or bodily injury.
7. If travel lever is placed in the neutral position, the machine will vibrate in place.
8. To move the compactor laterally, hold the hand grip firmly and swing compactor. Do not swing compactor while gripping the travel lever.

## STOPPING

1. Return the throttle lever to the **START** position (Figure 9). Allow the machine to cool down for 2 to 3 minutes.
2. Turn the throttle lever to the **STOP** position (Figure 15) to stop the engine. In a motor start, return the key switch to the **STOP** position (Figure 16) as soon as the engine stops.

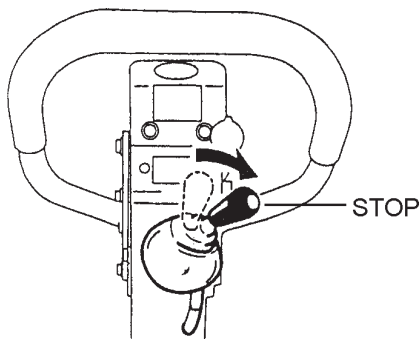


Figure 15. Throttle Lever (Stop)

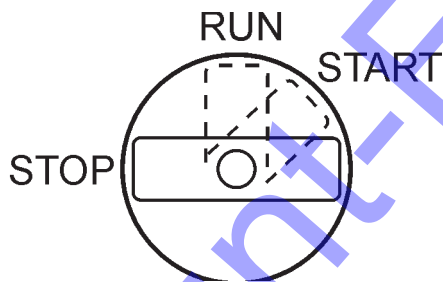


Figure 16. Starter Switch (STOP)

## Emergency Shutdown

1. Move the throttle lever quickly to the **STOP** position, and place the engine **IGNITION** switch in the **OFF** position.

## STOWING THE HANDLE

1. Push up the handle (Figure 17).
2. Pull the stopper grip upward into the hole of the guard frame to lock the handle.

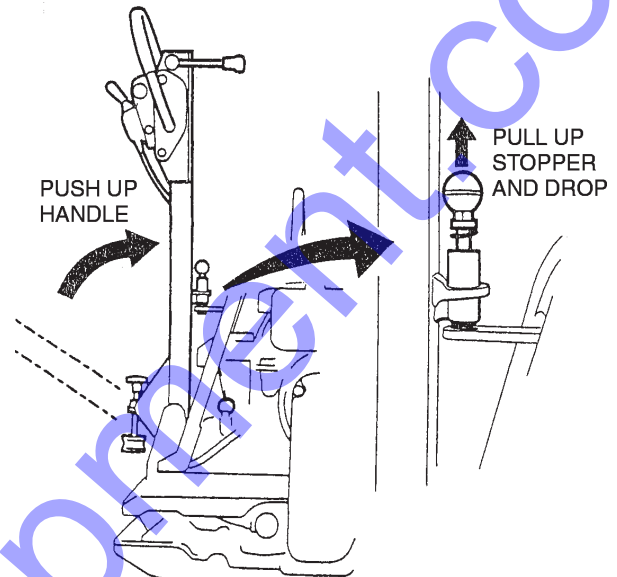


Figure 17. Stowing the Handle

## LIFTING

1. Use a crane or lift to load and unload the machine. A skilled crane operator is required to perform the job.
2. When lifting the machine, check for any damaged or loose bolts, lifting hooks, and shock mounts.
3. Check any damaged or loose bolts in the guard frame to avoid machine sliding off.
4. Make sure that the machine is shut off before machine is lifted.
5. Use reliable cable for lifting.
6. Always lift the machine vertically and keep the machine away from workers and animals.
7. Do not lift the machine higher than the required height.

## TRANSPORTING

1. Always make sure that the machine is shut off while being transported.
2. Check that the fuel cap is properly closed and tightened.
3. When traveling long distances or on rugged terrain, drain the fuel of the machine before transporting.
4. Tie down the machine securely on the transportation so that it will not move or topple over.



**⚠ CAUTION**

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

**⚠ CAUTION**

Fuel piping and connections should be replaced every 2 years.

**Inspection and Maintenance Service Tables.**

- To make sure your plate compactor is always in good working condition before using, carry out the maintenance inspection in accordance with Tables 5 through 7.

**TABLE 5. MVH-502DSB MACHINE INSPECTION**

ITEM	HOURS OF OPERATION	REMARKS
Loose or Missing Screws	Every 8 hours (every day)	
Damaged Parts	Every 8 hours (every day)	
Function of Controlling System Part	Every 8 hours (every day)	
Hydraulic System Leak	Every 100 hours	See page 20
Vibrator Oil Check	Every 100 hours	See page 22
Vibrator Oil Replacement	Every 300 hours	See page 22
Hydraulic Oil Check	Every 100 hours	See page 22
Hydraulic Oil Replacement	First after 200 hours, then every 1,000 hours	See page 22
V-belt (clutch) Check	Every 200 hours	See page 21
Battery Check	Every 100 hours	See page 23

**⚠ CAUTION**

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

**TABLE 6. MVH-502DSB ENGINE CHECK**

ITEM	HOURS OF OPERATION
Oil or Fuel Leak	Every 8 hours (every day)
Tightness of Fastening Threads	Every 8 hours (every day)
Engine Oil Check and Replenishment	Every 8 hours (every day) (Replenish to specified maximum level)
Engine Oil Replacement	After first 25 hours then every 50 to 100 hours
Air Filter Cleaning	Every 100 hours
See separate engine manual for details on engine check.	

**Daily Service**

- Check for leakage of fuel or oil.
- Check for loose screws including tightness. See Table 7 below (tightening torque), for retightening:

**TABLE 7.**

**TIGHTENING TORQUE (in. kg/cm) Diameter**

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	300~350	650 ~ 700					

\* (In case counter-part is of aluminum)  
(Threads in use with this machine are all right handed)  
Material and quality of material is marked on each bolt, and screw.

- Remove soil and clean the bottom of compaction plate.
- Check hydraulic pump, piping and hose for any leakage. A loosened hydraulic hose can be a cause for leakage. Check hydraulic hose connections with wrench applied for tightness.
- Check engine oil.

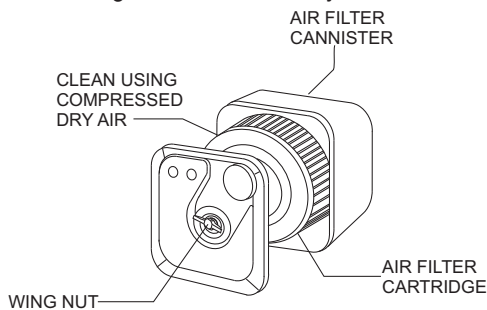


## Engine Oil Replacement:

1. Replace engine oil, first in 25 hours of operation and every 50 to 100 hours afterwards.
2. Oil may be drained more easily when it is warm after operation (For more details, see separate engine Owner's Manual).

## Air Filter

1. The air filter element should be cleaned because a clogged air cleaner can cause poor engine starting, lack of power and shorten engine life substantially.

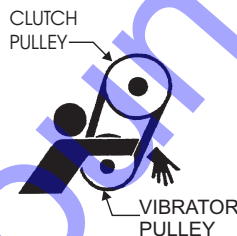


**Figure 18. Engine Air Filter**

2. To clean or replace air filter loosen the wing nut on the air filter housing (Figure 18), remove the cover and take out air filter cartridge. If only cleaning of the air filter is desired blow through the air filter cartridge from the inside, moving a jet of dry compressed air up and down until all dust is removed.

### **WARNING**

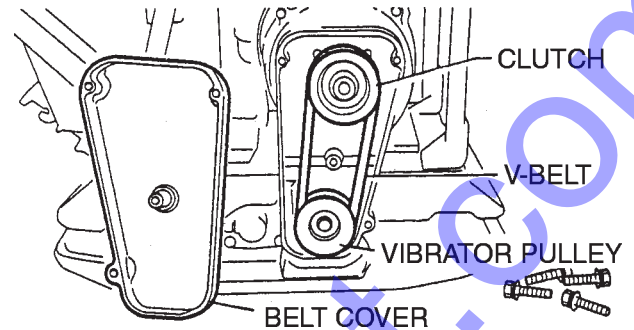
**NEVER** attempt to check the V-belt with the engine running. Severe injury can occur if your hand (Figure 5) gets caught between the V-belt and the clutch. Always use safety gloves.



**Figure 19. V-Belt Hazard**

## Checking and Replacing the V-Belt and Clutch

1. After 200 hours of operation, remove the belt cover to check the V-belt tension (Figure 20). Tension is proper if the belt bends about 10 mm when depressed strongly with finger between shafts. Loose or worn V-belts reduces power transmission efficiency, causing weak compaction and reduces the life of the belt itself.



**Figure 20. V-Belt Check**

### ● Replacing the V-belt

Remove the belt cover. Engage an offset wrench (19 mm) or the like to vibrator pulley (lower) fastening bolt. Engage waste cloth or the like at midway of V-belt on the left side and while pulling it back strongly, rotate the offset wrench clockwise so that the V-belt will come off.

### ● Reinstalling the V-belt

Engage V-belt to lower vibrator pulley and push the V-belt to left side of upper clutch and, in the same manner as in removal, rotate offset wrench clockwise so that the V-belt goes back on.

### ● Checking Clutch

Check the clutch simultaneously with V-belt checking. With belt cover removed, check outer drum of the clutch for seizure and "V" groove for wear or damage with your eyes. Clean the "V" groove as necessary. Wear of lining or shoe should be checked with running check. If the shoe is worn, power transmission becomes deficient and slipping will result.

### ● Replacing Clutch

Remove V-belt. Remove bolt at engine power output by giving a shock to an engaged wrench (tapping with hammer or the like) and rotating bolt counterclockwise. Remove clutch with a pulley extractor. To reinstall, reverse the procedure.

### **WARNING**

Whenever the compactor's vibration becomes weak or lost during normal operation regardless of operation hours, check the V-belt and clutch immediately.

## Vibrator Oil Level Check

### NOTICE

Always clean the area around the vibrator oil level check hole before removing oil check plug. This will prevent dirt and debris from entering the system.

1. In every 100 hours of operation, with the machine positioned horizontally, remove vibrator oil level check plug (Figure 21) off vibrator (19 mm wrench) and see if oil is up to filler port. Be sure to clean area around check hole to prevent dirt and dust from entering.
2. In every 300 hours of operation, replace oil (capacity 1,500 cc). For draining oil through level check hole, have the machine inclined with a sleeper or the like placed under the compaction plate on opposite side.

\* Use engine oil 10W-30 for this lubrication.

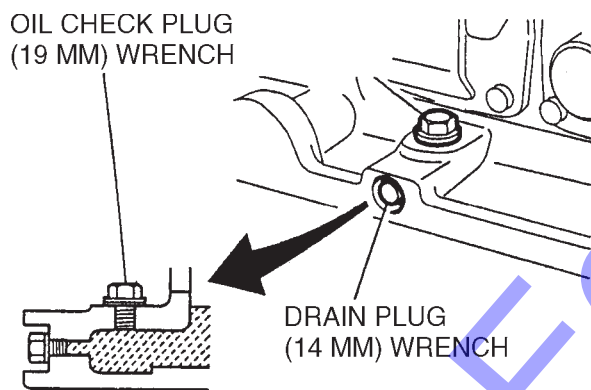


Figure 21. Vibrator Oil Maintenance

## Hydraulic Oil

1. Check hydraulic oil in every 100 hours of operation. With handle bar positioned vertically (storage position), remove breather plug (Figure 23) off the top of hydraulic pump and check for proper oil level.
2. Replace hydraulic oil after first 200 hours and in every 1,000 hours of operation.

### CAUTION

Make sure hydraulic oil is at a normal safe operating level. **DO NOT** over fill. Over filling (excessive oil) will cause excess oil to blow out of breather plug.

## Replacing Hydraulic Oil

1. Remove the drain plug (Figure 22) at the bottom of the oil tank with a 6 mm hex wrench and drain the hydraulic oil.
2. Clean the filter with light oil.
3. Reinstall the drain plug to the oil tank. Apply seal tape or Ractite #575 to thread portion.
4. Fill tank with hydraulic oil. (Capacity: About 2,500 cc). Use **Shell Tellus Oil #46** or equivalent.
5. After filling tank, temporarily install cover. Loosen bleeder plug located at the top of the cylinders on side of vibrator (Figure 23). Air remaining in the circuit will be forced out of the bleeder plug.
6. Tighten the breather plug. Check oil level in the tank again.
7. Install the cover of oil tank. Coat packing with liquid packing such as Threebond #1215. Use loctite #242 for mounting screw.

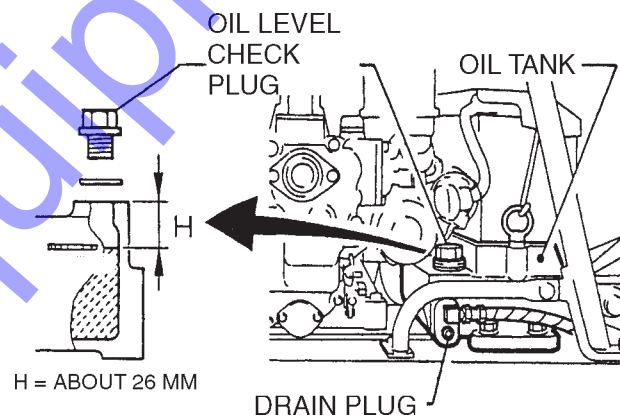


Figure 22. Hydraulic Oil Maintenance

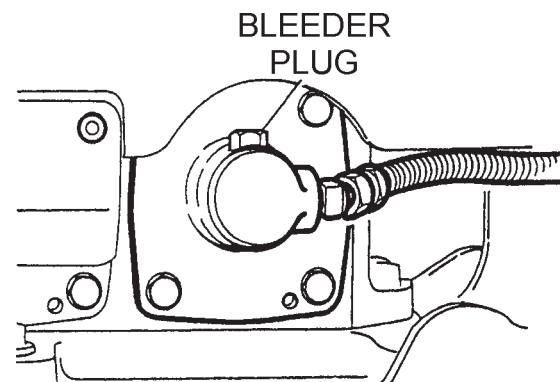


Figure 23. Bleeder Plug

## BATTERY MAINTENANCE

1. Check the battery terminals periodically to ensure that they are in good condition.
2. Use wire brush or sand paper to clean the battery terminals.
3. Check battery for cracks or any other damage. If white pattern appears inside the battery or paste has accumulated at the bottom, replace the battery.
- 4.. If the machine will not be in operation for a long period of time, store in cool dry place and check the battery charge level every month to maintain the performance of the battery.

## BATTERY CABLE CONNECTION

1. Take off the battery cover by removing the M6 nuts (Figure 24).
2. When removing cable, disconnect the ground side (normally negative) first (Figure 24).
3. When installing cable connect the ground side (normally negative) last.

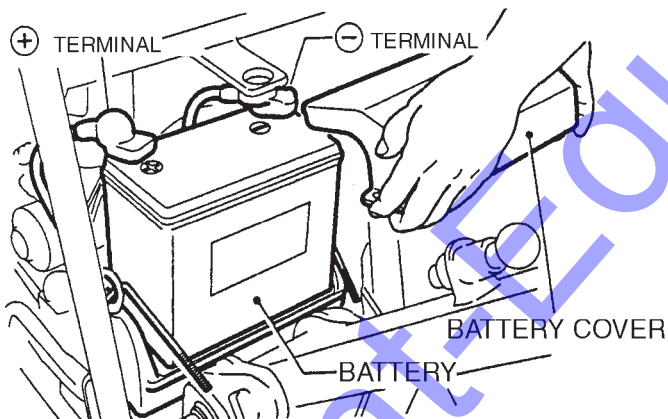


Figure 24. Battery Maintenance

### CAUTION

Wear **safety glasses** or **face mask**, **protective clothes**, and **rubber gloves** when working with battery.



# TROUBLESHOOTING

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, please take a remedial action following the

diagnosis based on the Troubleshooting (Table 8) information shown below. If the problem cannot be remedied, please leave the unit just as it is and consult our company's business office or service plant.

**TABLE 8. ENGINE TROUBLESHOOTING**

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine will not start or start is delayed, although engine can be turned over.	Speed control lever is in "STOP" position?	Set speed control lever to "START" position.
	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 injector not working correctly?	Repair or replace injector in accordance with engine repair manual.
	Oil pressure too low?	Check engine oil pressure.
	Low starting temperature limit exceeded?	Comply with cold starting instructions and proper oil viscosity.
At low temperatures engine will not start.	Fuel separates has inadequate resistance to low temperatures?	Check whether clear (not turbid) fuel emerges from the fuel line (detach from injection pump). If the fuel is turbid or separated, warm up the engine or drain the complete fuel supply system. Refuel with winter grade diesel fuel.
	Engine oil too thick?	Refill engine crankcase with correct type of oil for winter environment.
Engine fires but stops soon as starter is switched off.	Throttle lever in STOP position?	Reposition throttle lever to RUN position.
	Fuel filter blocked?	Replace fuel filter.
	Fuel supply blocked?	Check the entire fuel system.
Engine stops by itself during normal operation.	Fuel tank empty?	Add fuel.
	Fuel filter blocked?	Replace fuel filter.
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.
	Speed control lever does not remain in selected position?	See engine manual for corrective action.
	Engine oil level too full?	Correct engine oil level.
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.

# TROUBLESHOOTING

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, please take a remedial action following the

diagnosis based on the Troubleshooting (Table 9) information shown below. If the problem cannot be remedied, please leave the unit just as it is and consult our company's business office or service plant.

**TABLE 9. TROUBLESHOOTING COMPACTOR**

SYMPTOM	POSSIBLE CAUSE	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 syste.?	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.	Travel reversing system inoperative.?	Check entire travel system.
	Reversing lever installation correct?	Clean installation of reversing lever.
	Broken or defective oil hose?	Replace oil hose.
	Aeration in hydraulic oil for for travel reversing syste.?	Purge air in hydraulic oil. (Bleed plug)
	Excessive oil in reversing system?	Fill to correct level..
	Selector valve clogged with trash?	Clean selector valve.
	Cylinder piston bearing failure?	Check piston bearing in cylinder for leakage at USH packing.
Does not travel in forward or reverse.	V-belt dis-engaged or slips?	Engage V-belt, adjust or replace.
	Clutch slips?	Adjust clutch, replace if necessary.
	Pump input shat key or adapter key-way damaged?	Replace input shatkey or adapter key-way
	Cylinder piston bearing failure?	Check piston bearing in cylinder for leakage at USH packing.
Reversing lever operating resistance great.	Excessive hydraulic oil?	Fill to correct level.



# 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

MQ MIKASA MVH502DSB/DSB2 REVERSIBLE PLATE  
COMPACTOR W/HATZ 1D81S DIESEL ENGINE

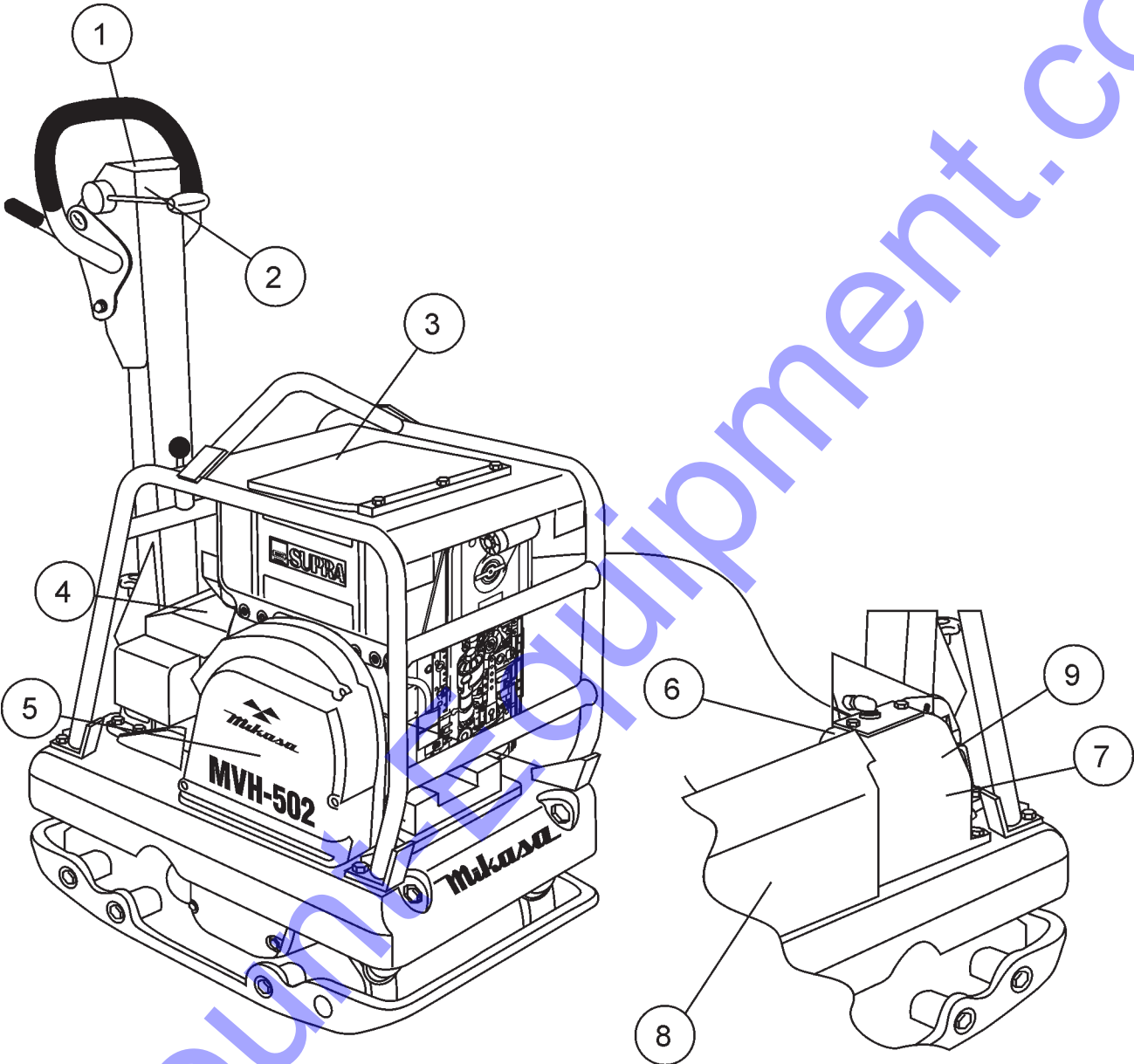
### 1 to 3 Units

Qty.	P/N	Description
6	070200453	V-BELT-45 GREEN
3	456499280	FILTER, HYDRAULIC OIL TANK
1	457333760	THROTTLE CABLE ASSY.
6	01480000	OIL FILTER, ENGINE
1	50397300	SEIVE, FUEL TANK
6	50478800	FUEL FILTER
1	50385800	CAP, FUEL TANK
6	01493000	AIR FILTER
3	50345300	KEY, IGNITION

#### NOTICE

*Drawings and Parts Lists of Hatz1D81S Engine is only for Tier 1 engines (MVH502DSB units). If you have a Tier 2 engine (MVH502DSB2 units), contact Hatz engine manufacturer for parts information.*

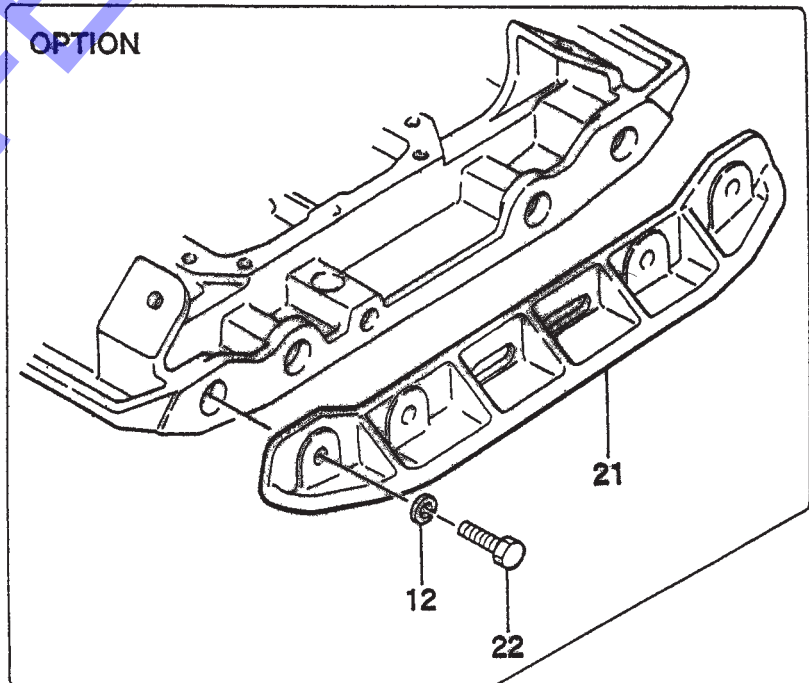
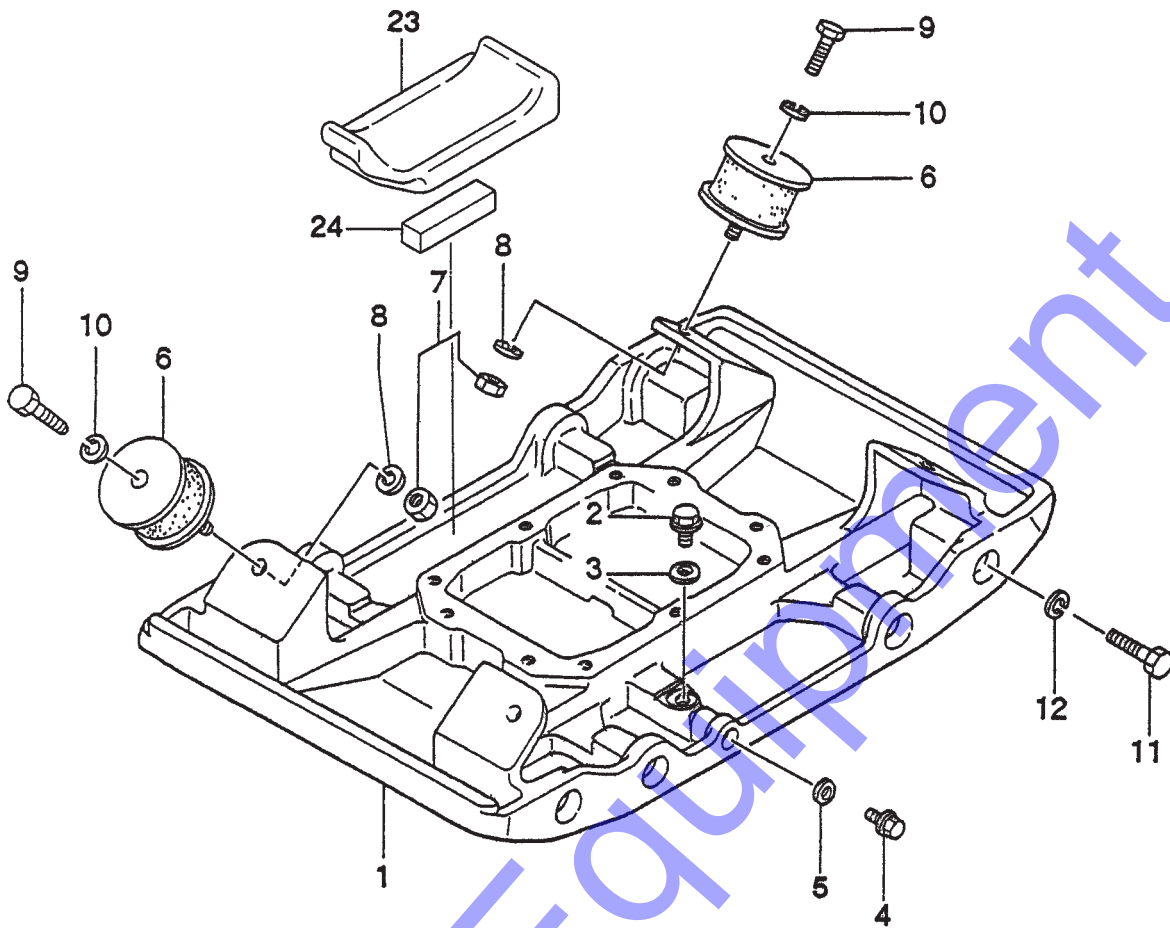
**DECAL PLACEMENT**



## DECAL PLACEMENT

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	920204580	FULL THROTTLE DECAL	1	NPA-458
2	920202220	FORWARD/REVERSE DECAL	1	NPA-222
3	920206370	OPERATIONAL CAUTION DECAL	1	NPA-538
4	920203330	HEARING PROTECTION DECAL .....	1.....	NPA-333
5	920201580	MULTIQUIP LOGO DECAL	1	
6	920103670	OIL LEVEL INDICATOR DECAL	1	NPA-367
7	920207480	SHELL OIL #46DECAL	1	NPA-748
8	920205000	MVH-502 DECAL	1	
9	920203260	OIL TANK DECAL	1	NPA-326

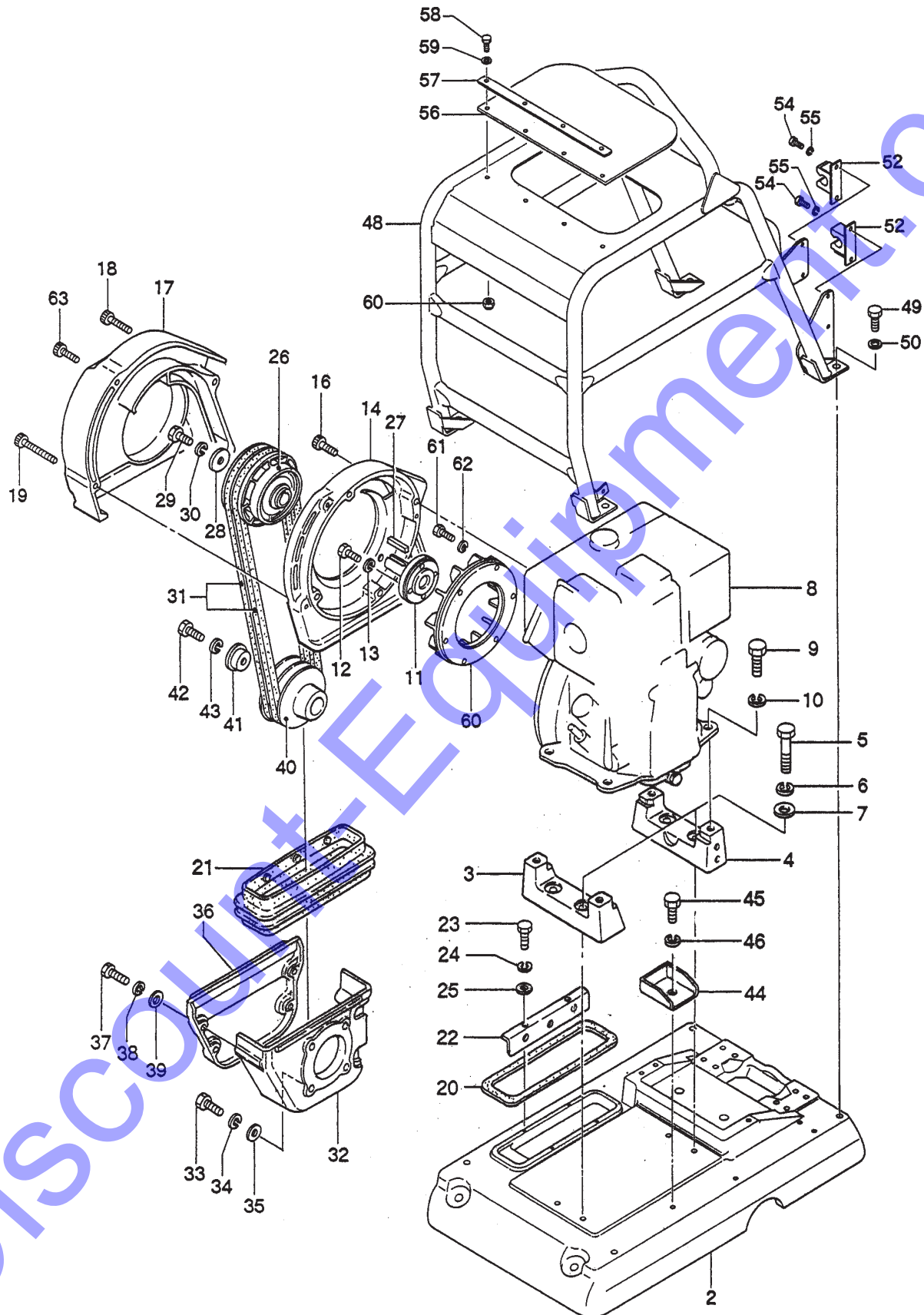
# VIBRATING PLATE ASSY.



## VIBRATING PLATE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	457112370	VIBRATING PLATE 550B	1	
2	953405840	DRAIN PLUG M 18 (R)	1	
3	953402930	COPPER PACKING 19X30X1	1	
4	953400270	PLUG 1/4X14 10L	1	
5	953405260	PACKING 1/4 (CU)	1	
6	939010070	SHOCK ABSORBER 100	4	
7	020316130	NUT M16	4	
8	030216400	WASHER, LOCK M16	4	
9	001221655	BOLT 16X75 T	4	
10	030216400	WASHER, LOCK M16	4	
11	001201830	BOLT 18X30	8	
12	030218460	WASHER, LOCK M18	8	
21	456210690	EXTENSION PLATE .....	2	OPTION
22	001221850	BOLT 18X50 T .....	8	OPTION
23	457215350	BELT COVER GUARD .....	1	G1185-
24	457454090	CUSHION, BELT COVER GUARD .....	1	G1185-

# BASE AND ENGINE ASSY.

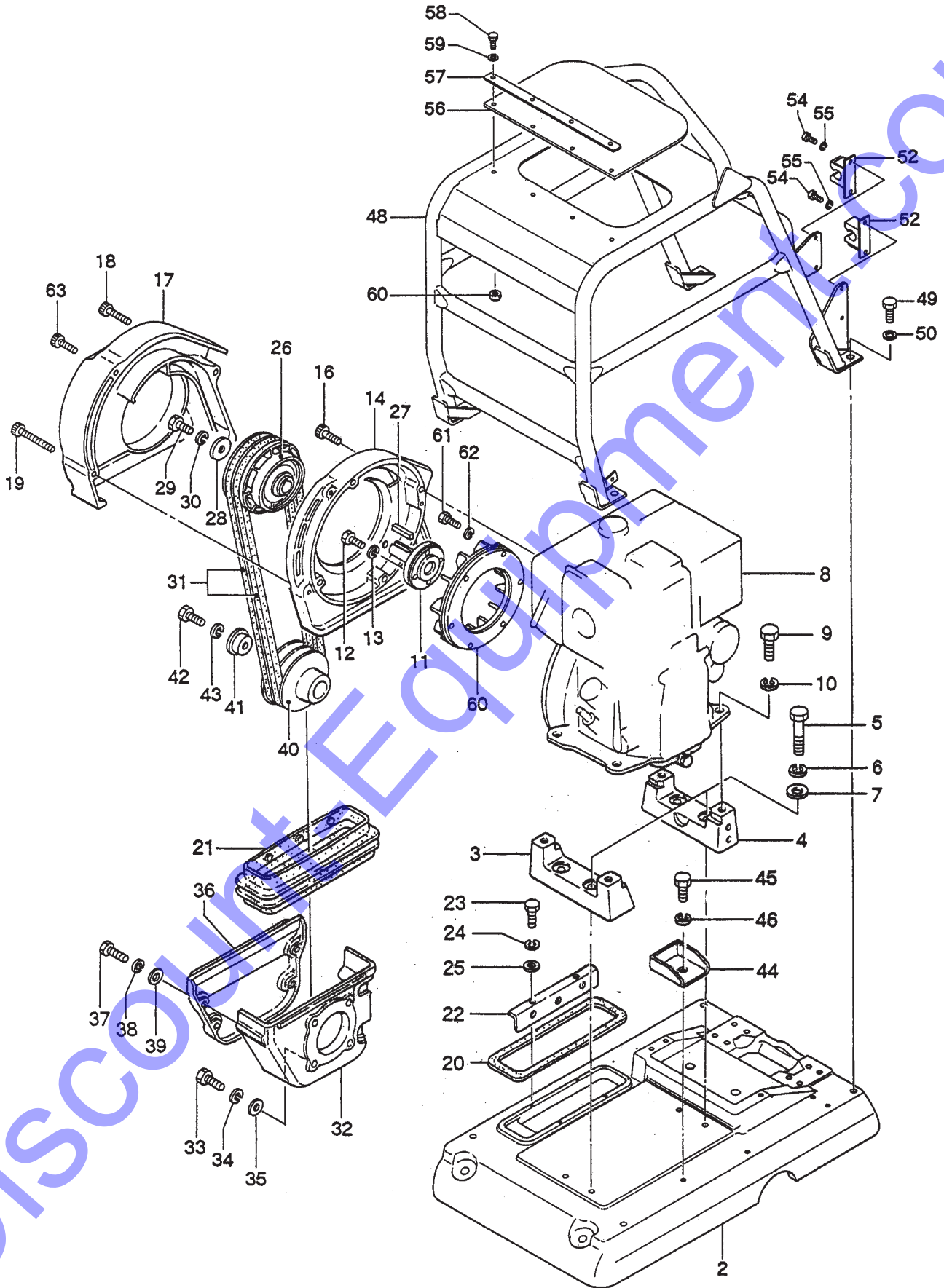




## BASE AND ENGINE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
2	457116080	BASE	1	
3	457333670	ENGINE PLATE (F)	1	
4	457333680	ENGINE PLATE (R)	1	
5	001221252	BOLT 12X60 T	4	
6	030212300	WASHER, LOCK M12	4	
7	031112230	WASHER, FLAT M12	4	
8	918400600	ENGINE AY 1D81S	1	
9	001221225	BOLT 12X25 T	4	
10	030212300	WASHER, LOCK M12	4	
11	457336260	STUB SHAFT (1D81)	1	
11	457339570	STUB SHAFT (1D- 81) .....	1	G1195-
12	001220830	BOLT 8X30 T	4	
12	001221025	BOLT 10X25 T .....	1	G1195-
13	030208200	WASHER, LOCK M8	4	
14	457114280	BELT COVER (IN)	1	
16	001521040	SOCKET HEAD BOLT 10X40 T	4	
17	457114290	BELT COVER (OUT)	1	
18	001521055	SOCKET HEAD BOLT 10X75 T	1	
19	001521058	SOCKET HEAD BOLT 10X90 T	2	
20	457445880	DUST PACKING	1	
21	457112431	DUST COVER	1	
22	457335980	HOLDER, DUST COVER	2	
23	001220615	BOLT 6X15 T	4	
24	030206150	WASHER, LOCK M6	4	
25	031106100	WASHER, FLAT M6	4	
26	457336370	CLUTCH AY B2- 175	1	
27	951400360	KEY 7X7X49	1	
28	952401390	WASHER 11X40X6	1	
29	001221035	BOLT 10X35 T	1	
30	030210250	WASHER, LOCK M10	1	
31	070200453	V- BELT - 45 GREEN	2	
32	457112440	BELT COVER (LOWER- IN)	1	

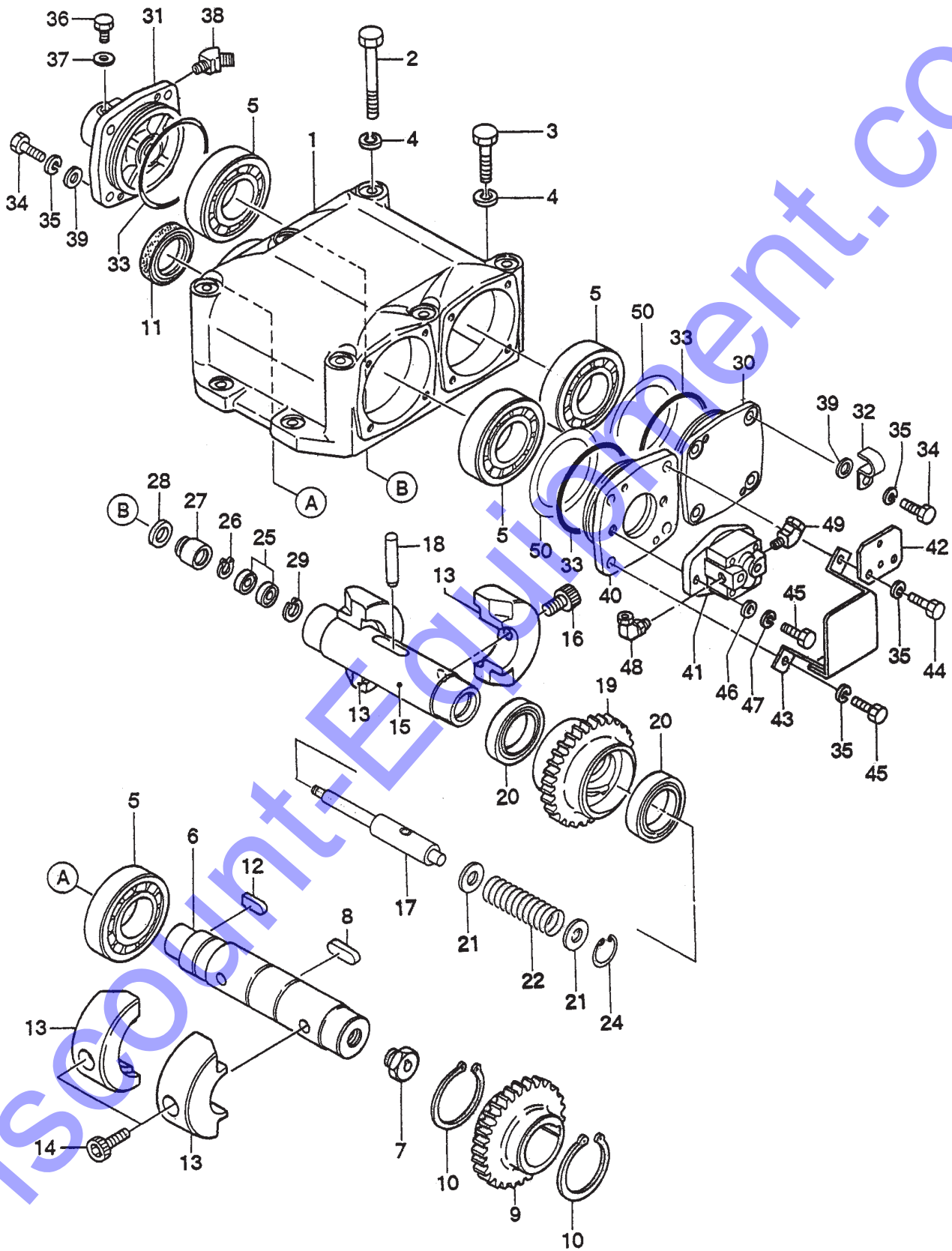
# BASE AND ENGINE ASSY.



## BASE AND ENGINE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
33	001221025	BOLT 10X25 T	4	
34	030210250	WASHER, LOCK M10	4	
35	031110160	WASHER, FLAT M10	4	
36	457212400	BELT COVER (LOWER- OUT)	1	
37	001220835	BOLT 8X35 T	4	
38	030208200	WASHER, LOCK M8	4	
39	031108160	WASHER, FLAT M8	4	
40	457332401	PULLEY B2- 125 / 131- 68	1	
41	456437920	WASHER, PULLEY	1	
42	001221235	BOLT 12X35 T	1	
43	030212300	WASHER, LOCK M12	1	
44	457333710	DRAIN GUIDE	1	
45	001221015	BOLT 10X15 T	1	
46	030210250	WASHER, LOCK M10	1	
48	457116020	GUARD FRAME	1	
49	001221430	BOLT 14X30 T	4	
50	030214350	WASHER, LOCK M14	4	
52	452312020	STOPPER, CRANK HANDLE	2	
54	001220812	BOLT 8X12 T	4	
55	030208200	WASHER, LOCK M8	4	
56	457452690	RUBBER COVER, GUARD FRAME	1	
57	457452710	PLATE, COVER	1	
58	001220825	BOLT 8X25 T	4	
59	031108160	WASHER, FLAT M8	4	
60	457336380	FAN	1	
61	001220820	BOLT 8X20 T	6	
62	030208200	WASHER, LOCK M8	6	
63	001521052	SOCKET HEAD BOLT 10X60 T	1	

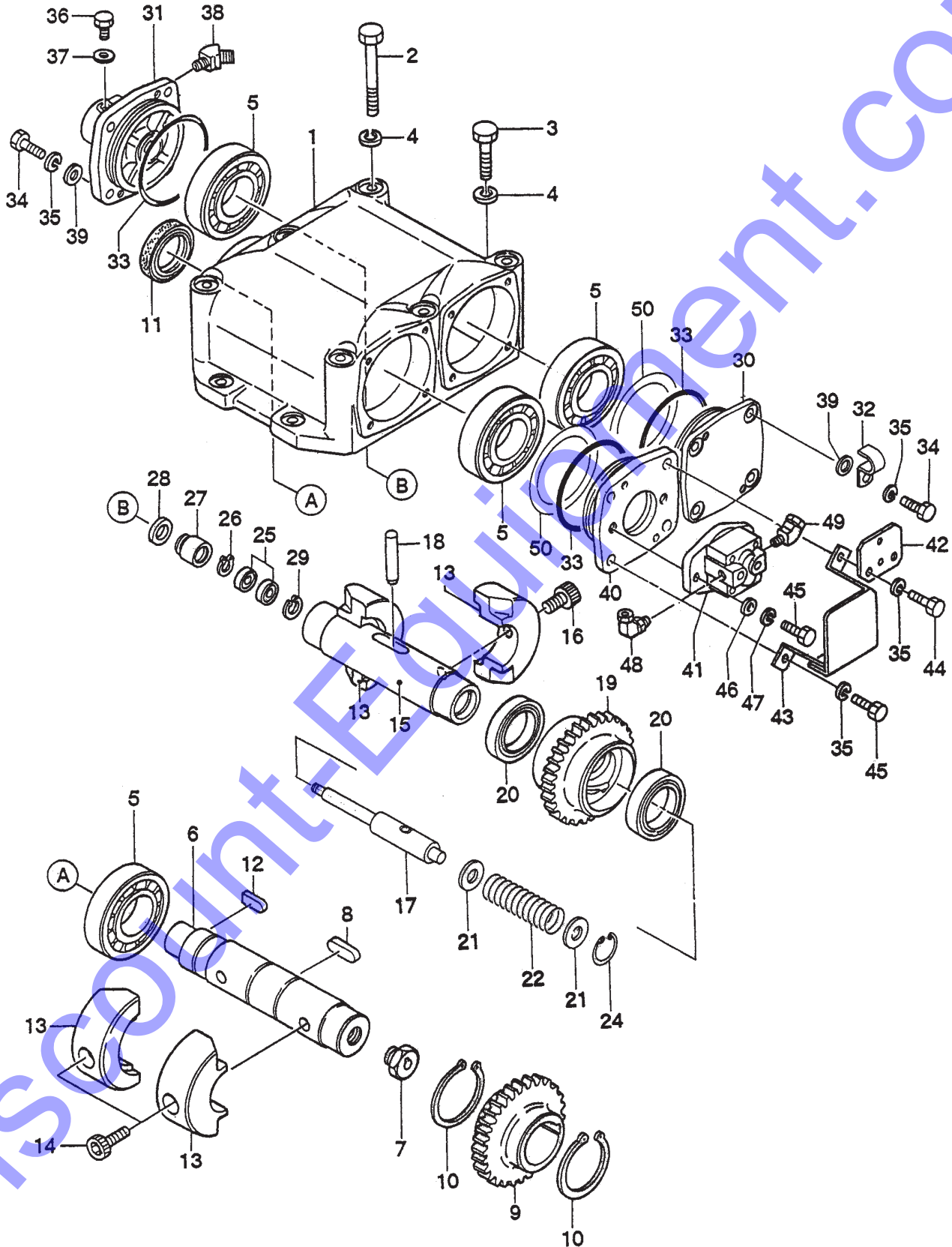
**VIBRATOR ASSY.**



## VIBRATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	457112460	VIBRATING CASE	1	
2	001221470	BOLT 14X150 T	6	
3	001221450	BOLT 14X50 T	4	
4	030214350	WASHER, LOCK M14	10	
5	047920060	ROLLER BEARING NJ310MC4	4	
6	457212410	ROTARY SHAFT, DRIVE	1	
7	457445831	ADAPTER, PUMP ( 30L )	1	
8	951405370	KEY 15X10X39 RR	1	
9	456327150	GEAR, DRIVE	1	
10	080200550	STOP RING S- 55	2	
11	060105030	OIL SEAL SB- 50729	1	
12	951404970	KEY 12X8X30 R	1	
13	457333720	ECCENTRIC ROTOR	4	
14	009120301	SOCKET HEAD BOLT 16X40 T	2	
15	456337670	ROTARY SHAFT, DRIVEN	1	
16	009120302	SOCKET HEAD BOLT 16X30 T	2	
17	456337380	PISTON ROD	1	
18	456010010	KNOCK PIN 10X70	1	
19	456327120	GEAR, DRIVEN	1	
20	040006911	BEARING 6911	2	
21	455435020	COLLAR 17X30X3	2	
22	456451280	SPRING 3.2- 26.3- 102L	1	
24	080100300	STOP RING R- 30	1	
25	042506000	BEARING 6000ZZSG	2	

**VIBRATOR ASSY.**

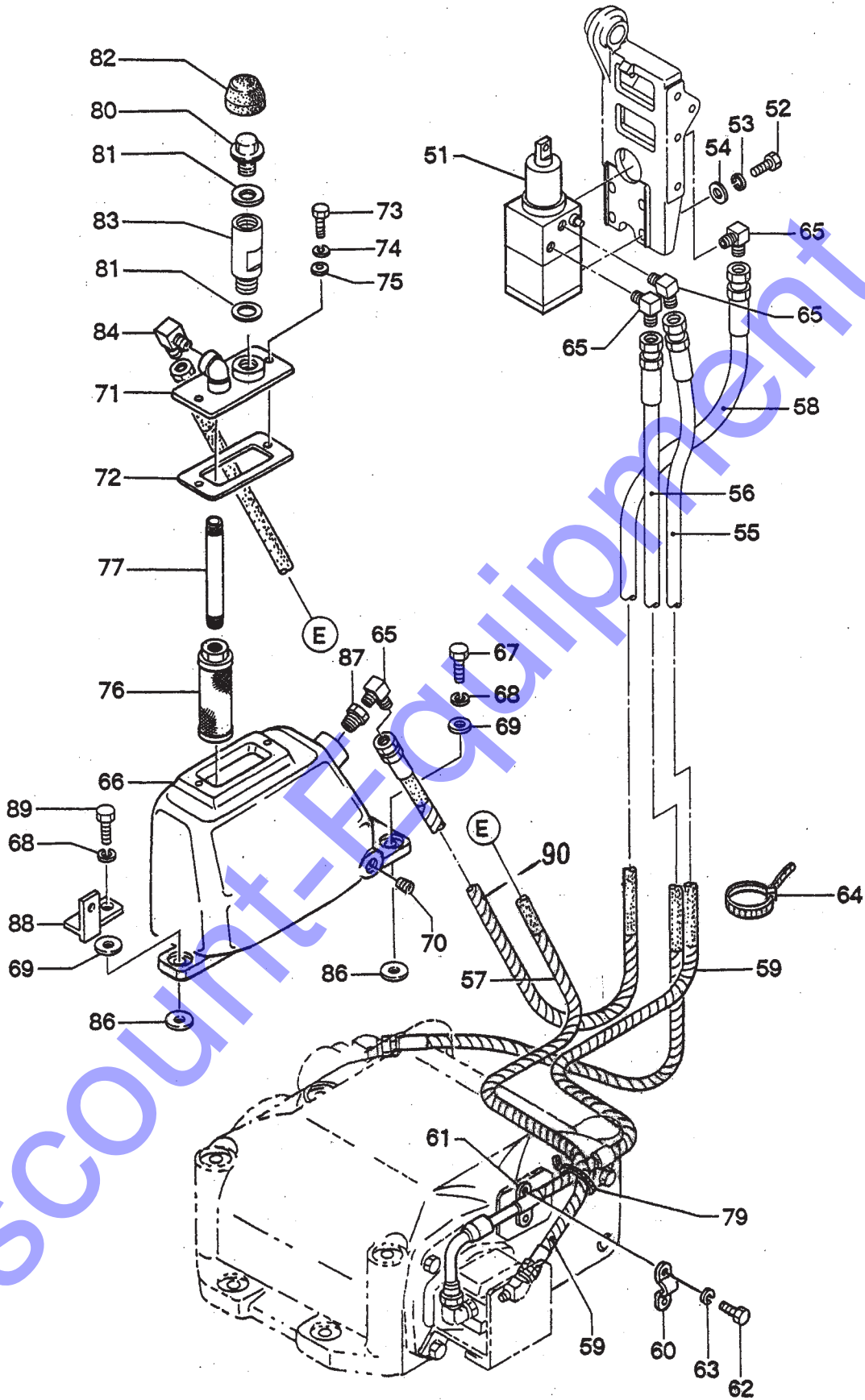




**VIBRATOR ASSY.**

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
26	080200100	STOP RING S- 10	1	
27	455435051	PISTON, 22.4D	1	
28	455010070	PACKING USH- 22.4X30X5	1	
29	080100260	STOP RING R-26	1	
30	456327130	BEARING COVER	1	
31	456210646	CYLINDER ( R ) ( AC)	1	
32	954405550	CLAMP 15 R	1	
33	050101050	O- RING G- 105	3	
34	001221025	BOLT 10X25 T	7	
35	030210250	WASHER, LOCK M10	12	
36	001220812	BOLT 8X12 T	1	
37	953404600	COPPER PACKING 8X16X2	1	
38	455010020	ELBOW 45 15- 0404	1	
39	031110160	WASHER, FLAT M10	7	
40	457332430	FLANGE, PUMP	1	
41	457010010	PUMP FBL	1	
42	457445840	BRACKET, CLAMP	1	
43	457212420	PUMP COVER	1	
44	001221035	BOLT 10X35 T	2	
45	001221030	BOLT 10X30 T	5	
46	952405540	WASHER 10.5- 22- 3	2	
47	030210250	WASHER, LOCK M10	2	
48	954010140	ELBOW 90 UES90G02G02	1	
49	954001780	ELBOW 45 PF3/8- PF1/4	1	
50	952405470	SHIM 90X110X0.5	2	

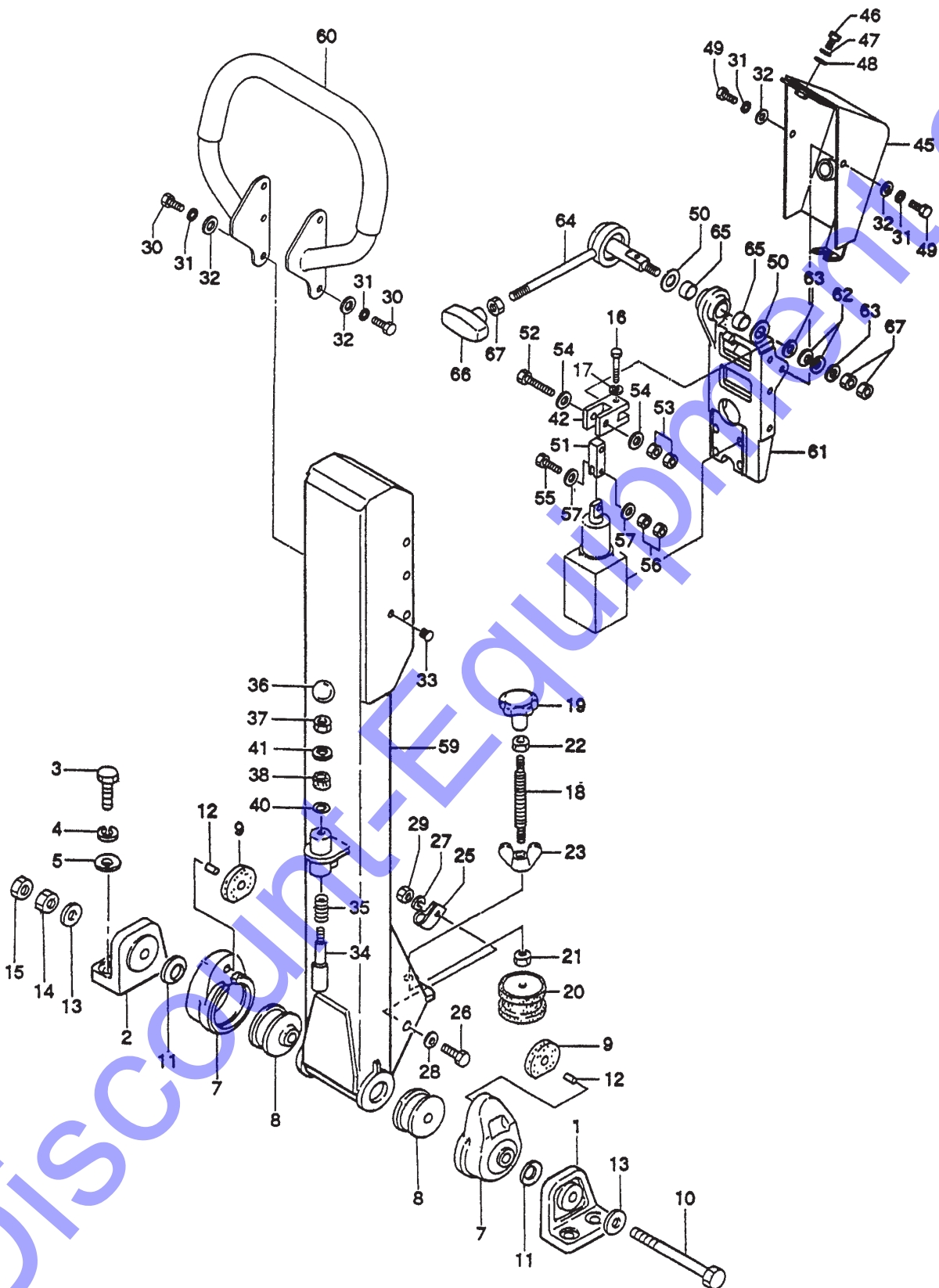
# HYDRAULIC SYSTEM ASSY.



## HYDRAULIC SYSTEM ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
51	456337780	SELECTOR VALVE	1	
52	001220615	BOLT 6X15 T	4	
53	030206150	WASHER, LOCK M6	4	
54	031106100	WASHER, FLAT M6	4	
55	457446180	OIL HOSE 1370L	1	
56	457446190	OIL HOSE 1150L	1	
57	457451750	OIL HOSE IB105- L820	1	
58	457446210	OIL HOSE 1100L	1	
59	955404271	SPIRAL TUBE, SR15- 850L	2	
60	954403060	CLAMP HC- 40	1	
61	954403070	CLAMP SPACER HC- 40	1	
62	001220612	BOLT 6X12 T	2	
63	030206150	WASHER, LOCK M6	2	
64	506010070	CLAMP TC-150	1	
65	954001160	ELBOW 90 PT1/4- PF1/4	4	
66	457112910	OIL TANK	1	
67	001221030	BOLT 10X30 T	2	
68	030210250	WASHER, LOCK M10	3	
69	031110160	WASHER, FLAT M10	3	
70	505015380	PLUG PT 1/4	1	
71	457332440	COVER, OIL TANK	1	
72	457445870	PACKING, OIL TANK	1	
73	001220820	BOLT 8X20 T	2	
74	030208200	WASHER, LOCK M8	2	
75	031108160	WASHER, FLAT M8	2	
76	456449280	FILTER OIL TANK	1	
77	457445861	JOINT 80L	1	
79	506010060	CLAMP TC- 350	2	
80	457448680	BREATHER PLUG	1	
81	05340020	PACKING 19302	2	
82	457448380	BREATHER CAP	1	
83	457451740	BREATHER JOINT	1	
84	551010630	ELBOW PT1/4- PF3/8 1034- 06	1	
86	953405260	PACKING 1/4 ( CU )	3	
87	605010360	BUSHING 3/8X1/4	1	
88	457446820	COVER BRACKET	1	
89	001221035	BOLT 10X35 T	1	
90	955404276	SPIRAL TUBE 11D- 250L .....	1 .....	G1185-

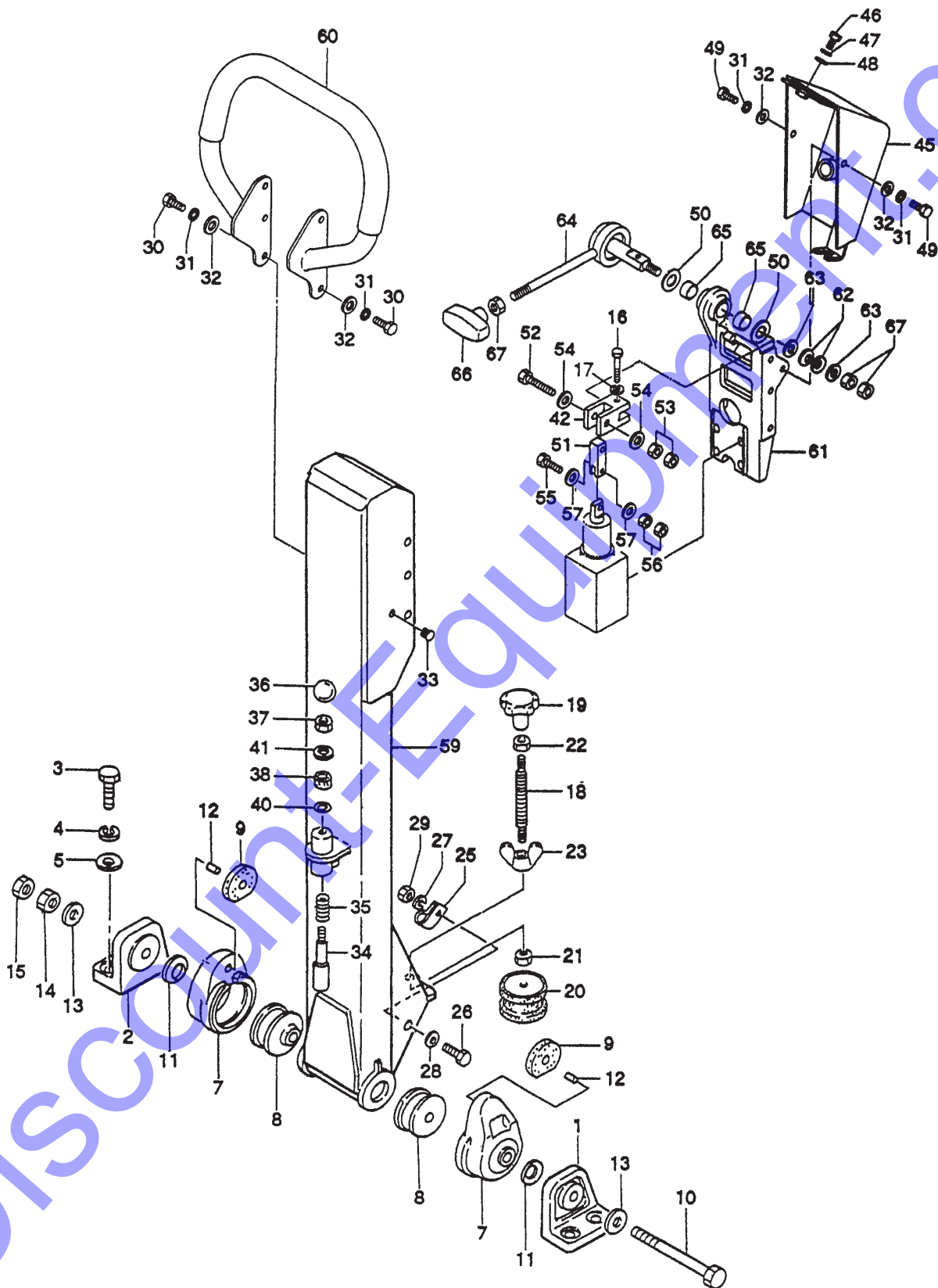
# CONTROL ASSY.



**CONTROL ASSY.**

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	456336410	HANDLE BRACKET ( L )	1	
2	456336420	HANDLE BRACKET ( R )	1	
3	001221235	BOLT 12X35 T	4	
4	030212300	WASHER, LOCK M12	4	
5	031112230	WASHER, FLAT M12	4	
7	456336400	RUBBER COUPLING	2	
8	456449940	SHOCK ABSORBER	2	
9	456449930	RUBBER PLATE	2	
10	001221681	BOLT 16X250 T	1	
11	032124400	CONICAL SPRING WASHER M24	2	
12	025406016	SPRING PIN 6X16	2	
13	031116260	WASHER, FLAT M16	2	
14	020316130	NUT M16	1	
15	030416100	NUT M16, H=10	1	
16	001220640	BOLT 6X40 T	1	
17	020306050	NUT M6	1	
18	455434950	SPINDLE	1	
19	455010030	KNOB	1	
20	939010060	SHOCK ABSORBER 60	1	
21	020410060	NUT M10, H=6	1	
22	020412070	NUT M12, H=7	1	
23	022411635	WING NUT M16	1	
25	954404230	CLAMP SA120- 18	1	
26	001220620	BOLT 6X20 T	1	
27	030206150	WASHER, LOCK M6	1	
28	031106100	WASHER, FLAT M6	1	
29	020306050	NUT M6	1	
30	001220825	BOLT 8X25 T	6	
31	030208200	WASHER, LOCK M8	8	
32	031108160	WASHER, FLAT M8	8	
33	953401580	PLUG	1	
34	501402870	HANDLE STOPPER	1	

# CONTROL ASSY.

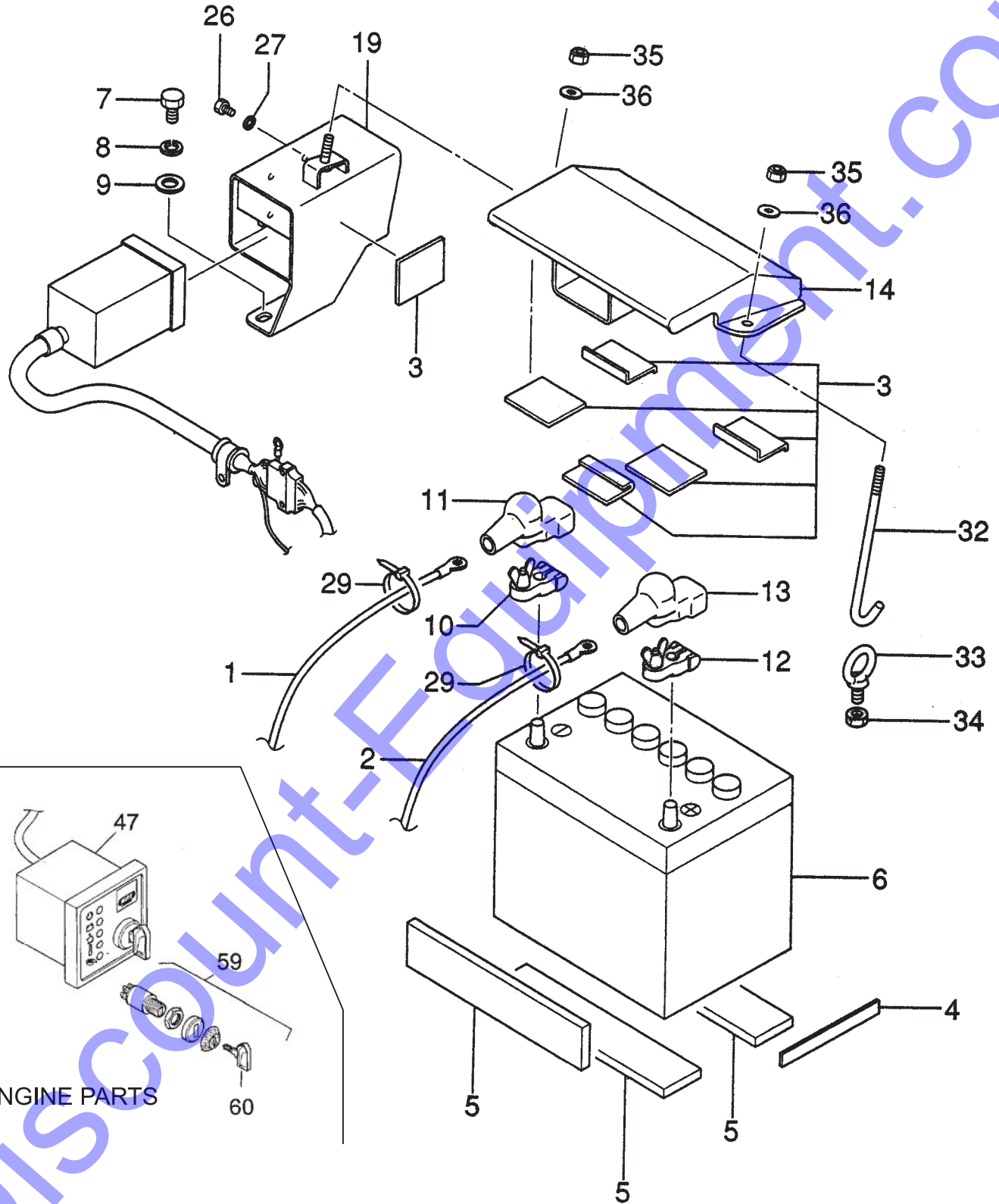




**CONTROL ASSY.**

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
35	501402880	SPRING/ HANDLE ( 1.4X18X44 )	1	
36	959403460	BALL GRIP 32D- M10	1	
37	020410060	NUT M10, H=6	1	
38	456449980	RUBBER PACKING 9D- 20D- 5T	1	
40	953405260	PACKING 1/4 ( CU )	1	
41	031110160	WASHER, FLAT M10	1	
42	456450760	JOINT	1	
45	457214910	LEVER BRACKET	1	
46	001220820	BOLT 8X20 T	1	
47	030208200	WASHER, LOCK M8	1	
48	031108160	WASHER, FLAT M8	1	
49	001220815	BOLT 8X15 T	2	
50	033910020	THRUST WASHER 20- 36- 1.5T	2	
51	457445910	CLEVIS	1	
52	001220850	BOLT 8X50 T	1	
53	020308060	NUT M8	2	
54	031108160	WASHER, FLAT M8	2	
55	001220630	BOLT 6X30 T	1	
56	020306050	NUT M6	2	
57	031106100	WASHER, FLAT M6	2	
59	457116030	HANDLE	1	
60	456214220	HANDLE GRIP	1	
60	456214222	HANDLE GRIP	1	
61	456214210	VALVE BRACKET	1	
62	032112220	CONICAL SPRING WASHER M12	2	
63	456451400	WASHER 12.2- 27- 0.6T	2	
64	456337400	TRAVEL LEVER	1	
65	608010090	BUSHING MB2015DU	2	
66	457332480	GRIP, TRAVEL LEVER 00	1	
67	020412070	NUT M12, H=7	3	

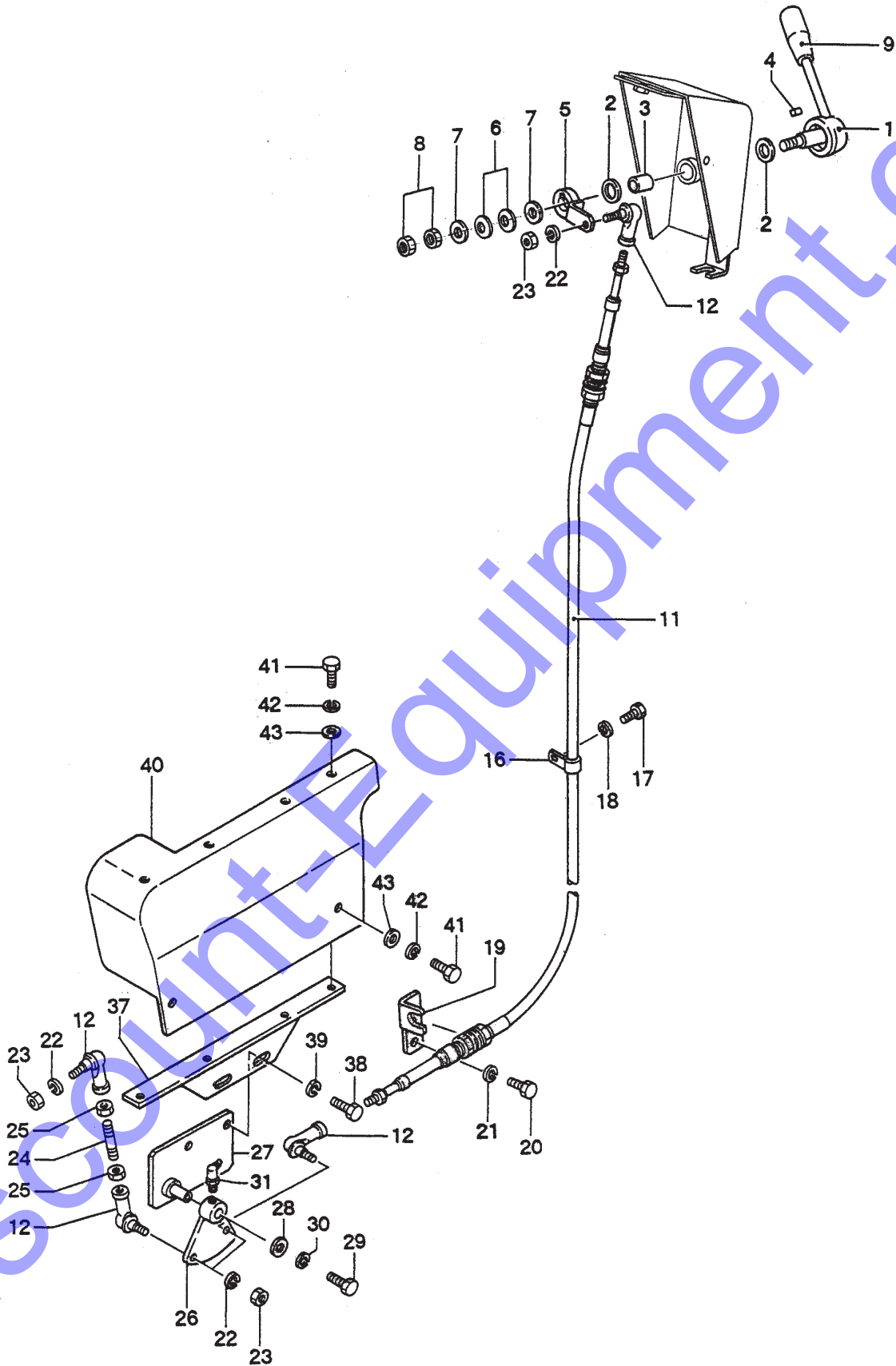
# BATTERY ASSY.



**CONTROL ASSY.**

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	456438080	BATTERY CORD ( ) 370L	1	
2	456438090	BATTERY CORD (+) 200L	1	
3	959406070	RUBBER PLATE 3- 50- 60	6	
4	456447580	RUBBER PLATE (D) 15X130X3	1	
5	456447600	RUBBER PLATE 50X240X10	3	
6	955010070	BATTERY (DC22-NF)	1	
7	001221020	BOLT 10X20 T	2	
8	030210250	WASHER, LOCK M10	2	
9	031110160	WASHER, FLAT M10	2	
10	955404130	BATTERY TERMINAL , BE511	1	
11	955300220	TERMINAL COVER ( BLACK)	1	
12	955404140	BATTERY TERMINAL + , BE513	1	
13	955300210	TERMINAL COVER ( RED)	1	
14	457115960	BATTERY COVER	1	
19	457214900	SWITCH BOX	1	
26	001220625	BOLT 6X25 T	3	
27	030206150	WASHER, LOCK M6	3	
29	454010020	CLAMP TC- 100	2	
32	457452700	BATTERY BOLT	1	
33	959403830	EYE BOLT M10X18	1	
34	020310080	NUT M10	1	
35	022710809	NYLON NUT M8	2	
36	031108160	WASHER, FLAT M8	2	
47	01551802	INSTRUMENT BOX 12V	1	
59	50384401	SWITCH, KEY A, Y/ID81	1	
60	50404900	IGNITION SWITCH KEY	1	

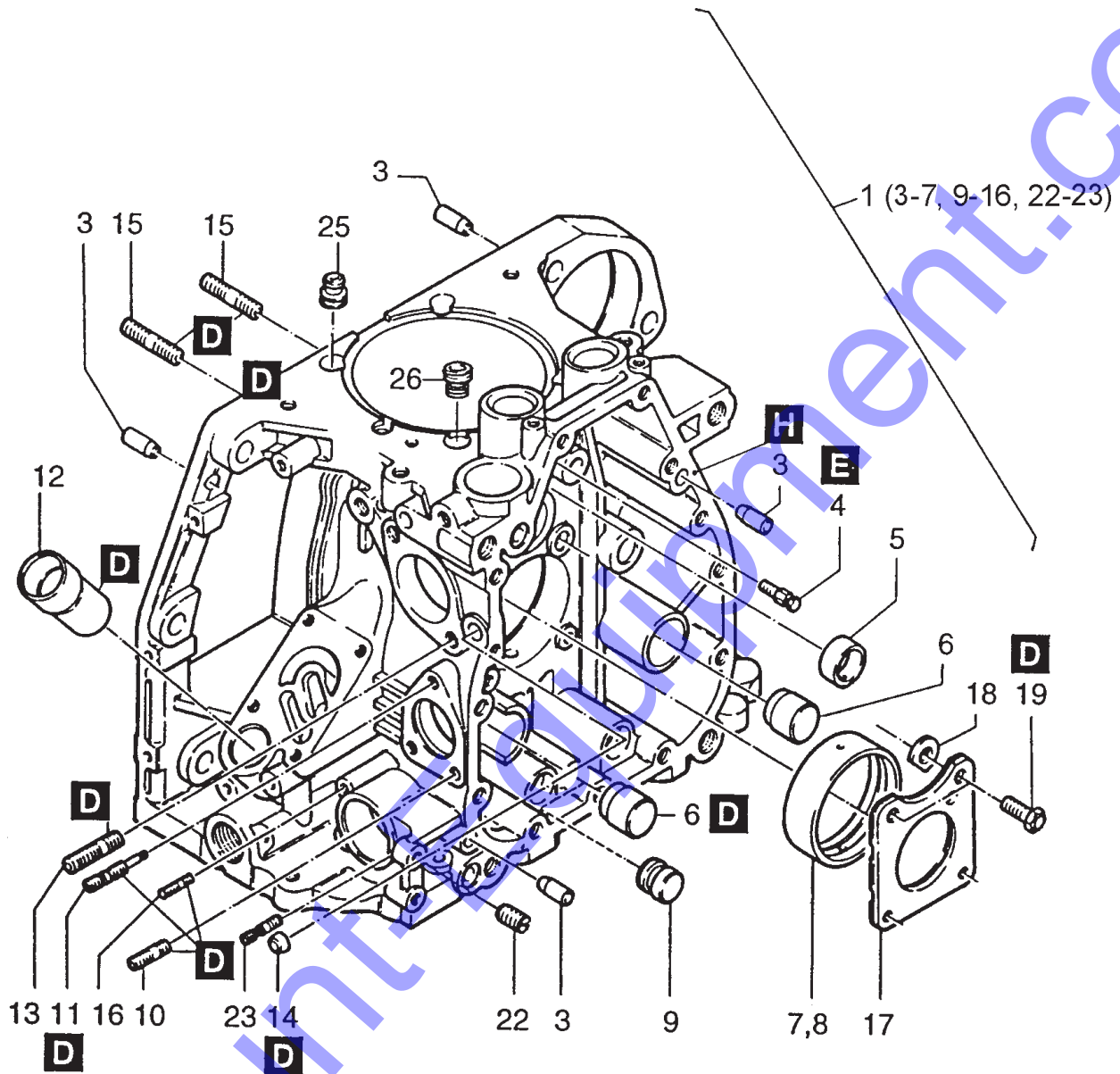
# THROTTLE ASSY.



## THROTTLE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	456337690	THROTTLE LEVER	1	
2	953402930	COPPER PACKING 19X30X1	2	
3	509010130	BUSHING MB1825DU	1	
4	951401431	KEY 5X5X8	1	
5	457446840	THROTTLE LEVER	1	
6	032112220	CONICAL SPRING WASHER M12	2	
7	031112230	WASHER, FLAT M12	2	
8	020412070	NUT M12, H= 7	2	
9	959403840	BAR GRIP, I.D. 12MM	1	
11	457333760	CABLE AY 33075E1400	1	
12	457010070	ROD END PBL- 6	4	
16	954404100	CLAMP CLA0	1	
17	001220610	BOLT 6X10 T	1	
18	030206150	WASHER, LOCK M6	1	
19	457333730	CABLE SUPPORT ( E/G ) 502	1	
20	001220820	BOLT 8X20 T	2	
21	030208200	WASHER, LOCK M8	2	
22	030206150	WASHER, LOCK M6	4	
23	020306050	NUT M6	4	
24	457446860	LINK ARM	1	
25	020306050	NUT M6	2	
26	457333740	LINK LEVER	1	
27	457333750	LINK BRACELET	1	
28	952402610	WASHER 8.5X25X3	1	
29	001220825	BOLT 8X25 T	1	
30	030208200	WASHER, LOCK M8	1	
31	301010090	GREASE FITTING - PT1/8	1	
37	457212920	COVER BRACKET	1	
38	001220820	BOLT 8X20 T	2	
39	030208200	WASHER, LOCK M8	2	
40	457112930	SIDE COVER	1	
41	001220815	BOLT 8X15 T	6	
42	030208200	WASHER, LOCK M8	6	
43	031108160	WASHER, FLAT M8	6	

# HATZ 1D81S ENGINE — CRANKCASE ASSY.



LETTERS IN BOLD INDICATE TYPE OF BONDING ADHESIVE TO BE USED.

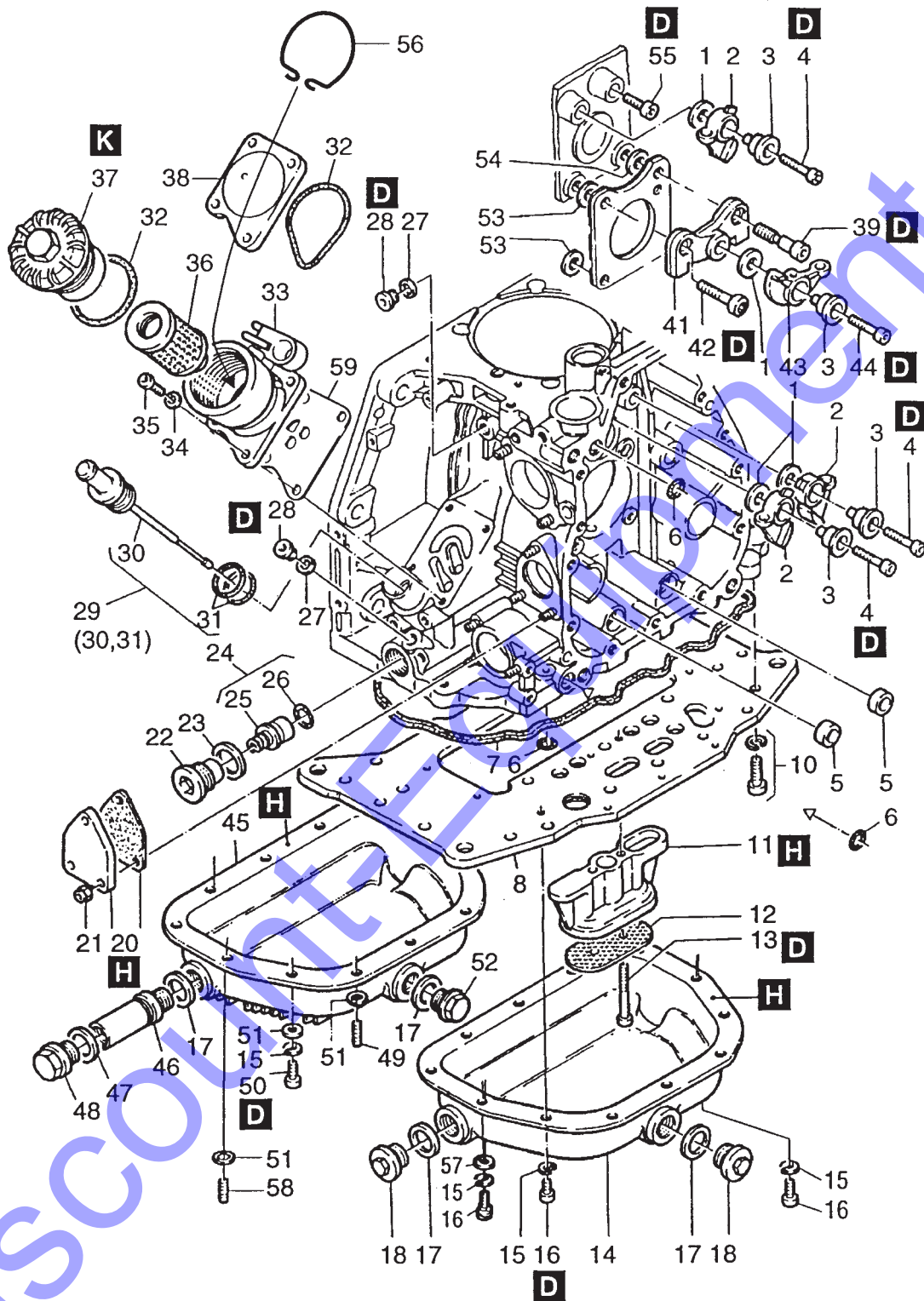
D= LOCTITE 221 H= SILICON E= LOCTITE 648



## HATZ 1D81S ENGINE — CRANKCASE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01249051	CRANKCASE .....	1	INCLUDES ITEMS W/*
3*	50249101	CYL. PIN 6/20	4	
4*	03793900	NOZZLE	1	
5*	03793800	BEARING BUSH	1	
6*	03794000	PLUG	1..2	
7*	03793700	MAIN BEARING	1	
8	04033700	MAIN BEARING -0.5	1	
9*	04000800	PLUG	1	
10*	50144300	STUD M 6X16	2	
11*	03794510	STUD	1	
12*	03794800	INTERMEDIATE PIECE	1	
13*	50098300	STUD 8 X 20	2	
14*	50325500	COVER 10	1	
15*	50037800	STUD M 8 X 22	8	
16*	50328200	STUD M 16 X 22	2	
17	04011650	THRUST PLATE	1	
18	04069500	SHIM 1.05	0..4	
19	04062010	HEX SCREW M 9 X 28	4	
22*	50357700	GRUB SCREW M 8 X 10	1	
23*	04087400	STUD M 6 X 22	1	
25	04084500	SEALING RING	2	
26	04084500	SEALING RING	2	

# HATZ 1D81S ENGINE — CRANKCASE ASSY. (EXTERNAL PARTS)



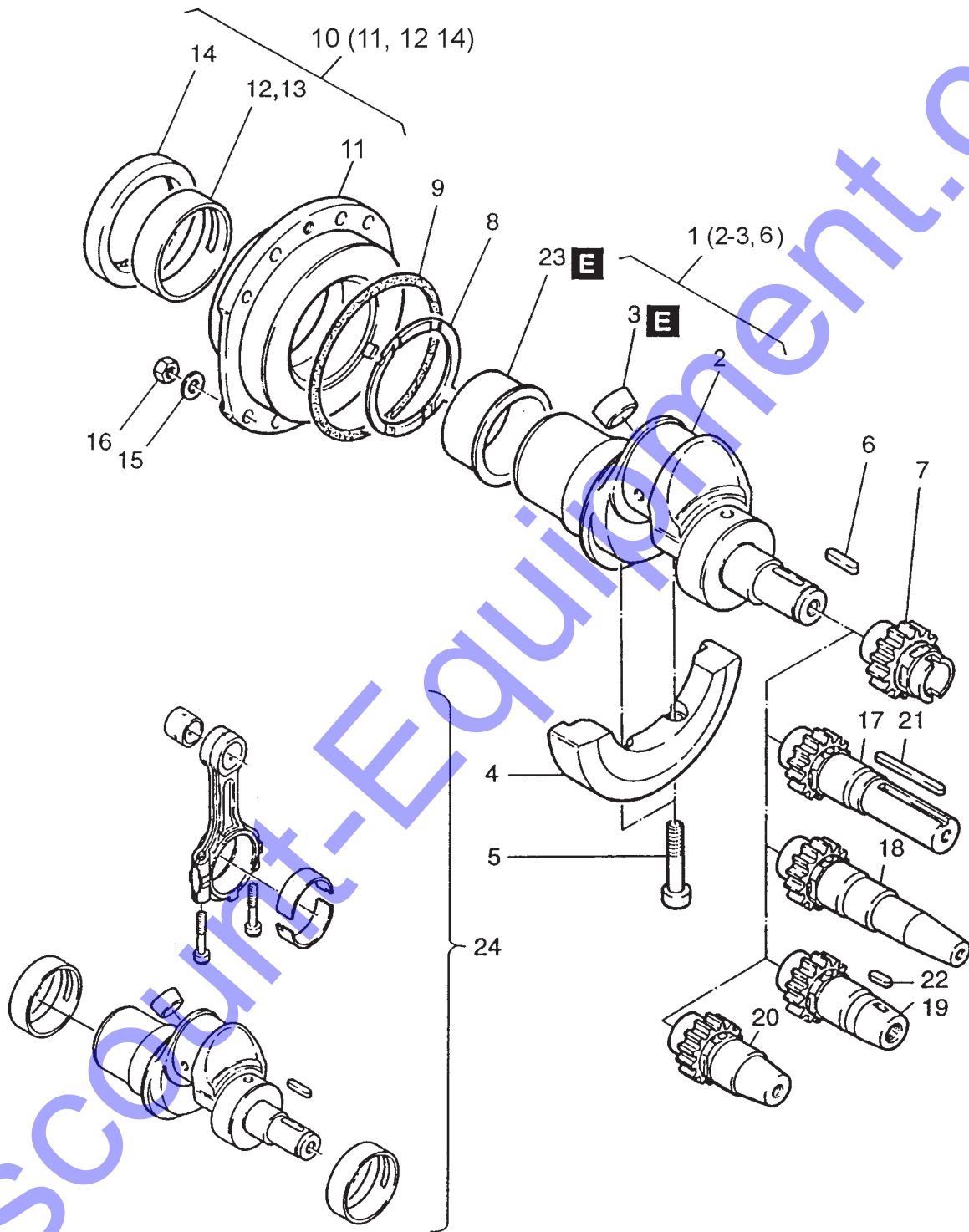
LETTERS IN BOLD INDICATE TYPE OF BONDING ADHESIVE TO BE USED.

D= LOCTITE 221 H= SILICON E= LOCTITE 648

## HATZ 1D81S ENGINE — CRANKCASE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	03794100	WASHER	2	
2	03794300	CAM FOLLOWER	2	
3	93794201	CAM FOLLOW SPINDLE	2	
4	50051000	ALLEN SCREW M 6 X 30	2	
5	03795800	O-RING 12 X 18, 3 X 7.3	2	
6	50329000	O-RING 9.5 X 2.5	3	
7	03795100	O-RING 265 X 269, 4 X 3.6	1	
8	01248810	PLATE	1	
10	50417600	ALL. SCREW. M 8 X 25 Z4	22	
11	03794900	HOUSING	1	
12	03795000	SUCTION SIEVE	1	
13	50327100	ALLEN SCREW M 6 X 50	2	
14	01241700	OIL SUMP	1	
15	50170900	LOCK WASHER 6	12	
16	50329100	ALLEN SCREW M 6 X 10	12	
17	50001600	JOINT A22X27	2	
18	50373100	DRAIN PLUG M 22 X 1.5	0..2	
18	50140400	DRAIN PLUG	0..2	
20	03794700	COVER	1	
21	50328300	HEXAGON NUT M6	3	
22	01321200	CLOS. SCREW + SIEVE	1	
23	50286400	JOINT A 24 X 29	1	
24	01321100	OIL RELIEF VALVE ASSY. ....	1	INCLUDES ITEMS W/#
25#		OIL RELIEF VALVE .....	1	CANNOT BE PURCHASED SEPARATELY
26#	50412900	O-RING 18 X 2	1	
27	50062400	JOINT A10 X 13.5	2	
28	50062300	CLOSING SCREW M10 X 1	2	
29	01241500	DIPSTICK ASSY .....	1	INCLUDES ITEMS W/
30*		DIPSTICK .....	1	CANNOT BE PURCHASED SEPARATELY
31*	50359700	O-RING 20.29 X 2.62	2	
32	50329200	O-RING 50X55X3	2	
33	05068800	LUB. OIL FILT. HOUS.	1	
34	50081200	LOCK WASHER A6	4	
35	50170600	ALLEN SCREW M 6 X 20	4	
36	01480000	SUPRA OIL FILTER	1	
37	01248900	COVER	1	
38	04033401	COVER	1	
39	04053210	SET SCREW M9	1	
41	04024220	CAM FOLLOWER BRACK.	1	
42	04062110	BOLT	1	
43	04024301	CAM FOLLOWER T/U	1	
44	50170800	ALLEN SCREW M 6 X 25	1	
45	04045800	OIL SUMP	1	
46	04046300	DRAIN EXTENSION	1	
47	50001400	JOINT A 18 X 22	1	
48	50044200	CLOS. SCREW M 18 X 1.5	1	
49	50434300	STUD M 8 X 18	2	
50	50050700	ALLEN SCREW M 6 X 16	8	
52	50140400	DRAIN PLUG	1	
53	04069500	SHIM 1.05	0..3	
53	04069600	SHIM 1.2	0..3	
54	04069800	SHIM 1.05	0..1	
54	04069900	SHIM 1.20	0..1	
55	04065400	CYLINDER HEAD BOLT	1	
56	04084000	LIFTING SPRING	1	
58	50139200	STUD M 6 X 16	2	
59	05068900	GASKET	1	

# HATZ 1D81S ENGINE — CRANKSHAFT ASSY.



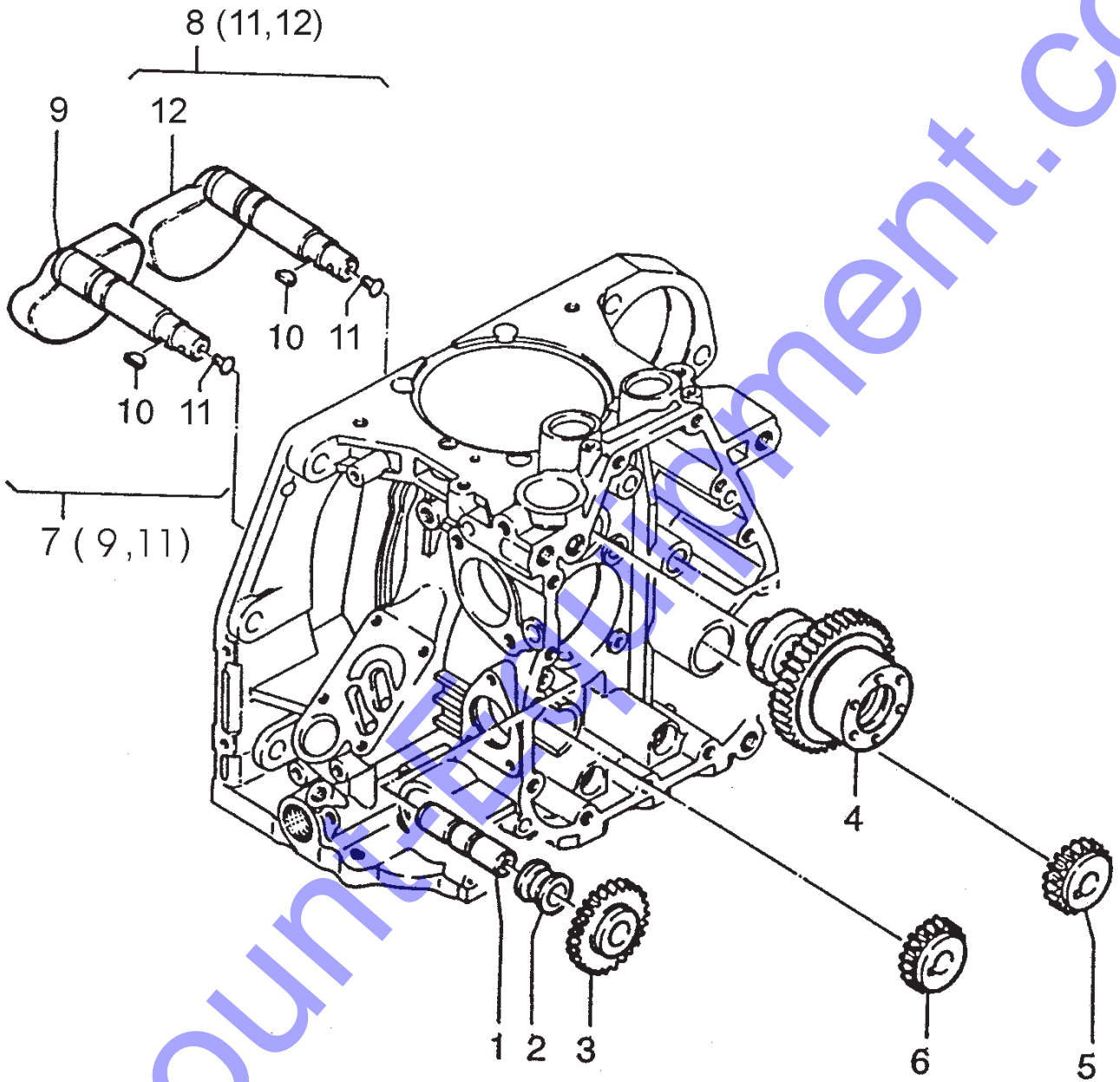
LETTERS IN BOLD INDICATE TYPE OF BONDING ADHESIVE TO BE USED.

D= LOCTITE 221 H= SILICON E= LOCTITE 648

## HATZ 1D81S ENGINE — CRANKSHAFT ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	01269810	CRANKSHAFT ASSY. ....	1	INCLUDES ITEMS W/*
2*		CRANKSHAFT .....	1	CANNOT BE PURCHASED SEPARATELY
3*	50087200	COVER 28	1	
4	03796000	COUNTER WEIGHT	1	
5	50055000	ALLEN SCREW M 10 X 50	2	
6*	50362600	FITTING KEY A 6 X 4 X 32	1	
7	03796120	GEARWHEEL F. CRANKS	1	
8	04000600	BUFFER RING	1	
9	50224900	O-RING 123 X 2.5	1	
10	01292100	BEARING FLANGE ASSY. ....	1	INCLUDES ITEMS W/#
11#		BEARING FLANGE .....	1	CANNOT BE PURCHASED SEPARATELY
12#	04006800	MAIN BEARING		
13	04036100	MAIN BEARING -0.5	1	
14#	50362700	OIL SEAL 62 X 90 X 10	1	
15	50413600	WASHER	8	
16	50364300	HEXAGON NUT M8	8	
17	04023110	STUBSHAFT SAE W/KEY	1	
18	01485500	STUBSHAFT SAE TAPER	1	
19	04022910	STUBSHAFT ITALIA	1	
20	05033200	STUBSHAFT ITALIA 23	1	
21	03962700	FITTING KEY A6.35 X 63	1	
22	50017800	WOODRUFF KEY 4 X 6.5	1	
23	50414400	WEAR SLEEVE 62 X 12.7	0..1	
24	01512001	KIT, CRANKSHAFT REPLACEMENT60-81	1	

# HATZ 1D81S ENGINE — CAMSHAFT ASSY.

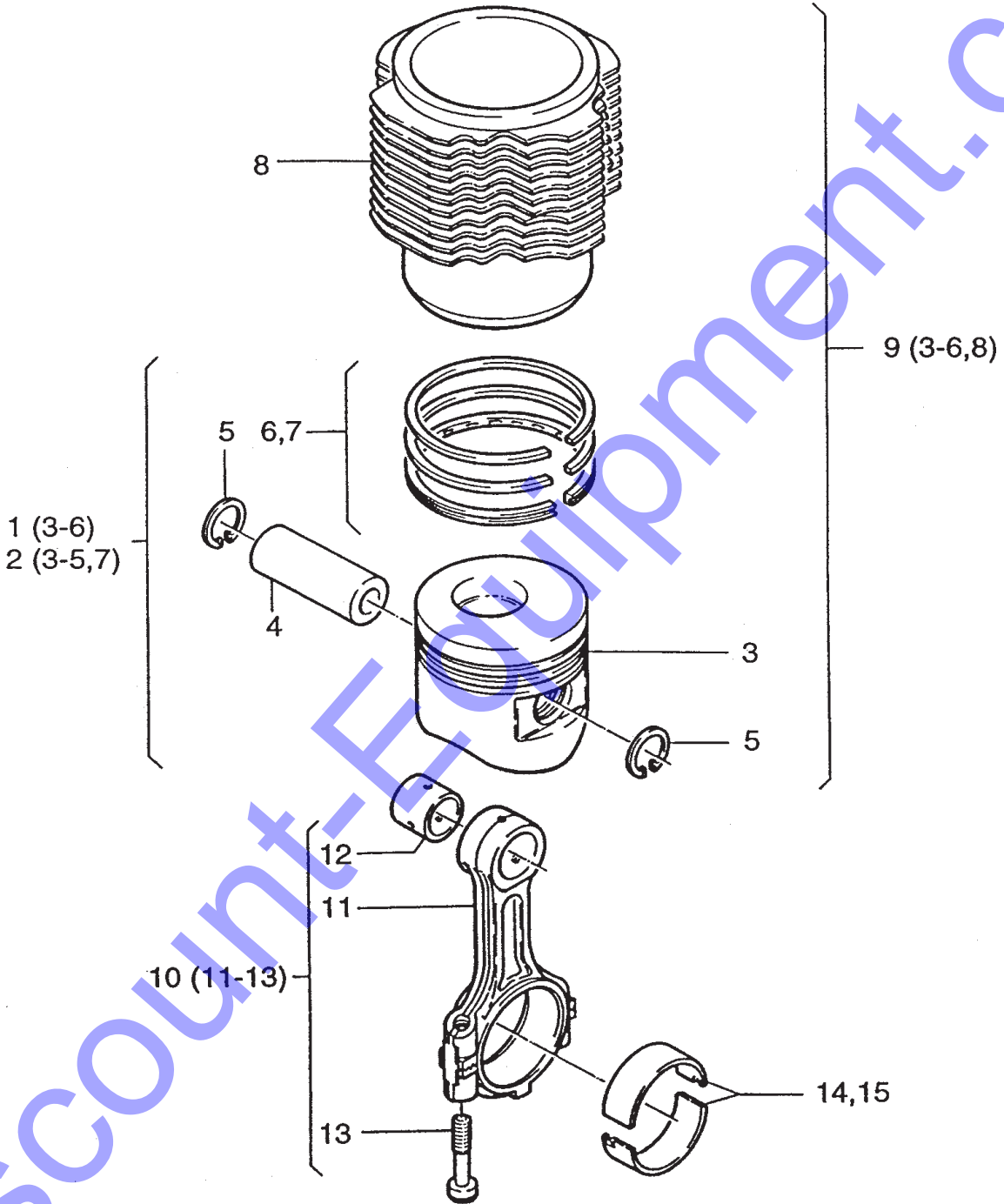




## HATZ 1D81S ENGINE — CAMSHAFT ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	03796400	SHAFT	2	
2	03796500	BUSH	2	
3	01242000	GEARWHEEL	2	
4	04099900	CAMSHAFT	1	
5	03796800	GEARWHEEL	1	
6	03796900	GEARWHEEL	1	
7	01267300	SHAFT, PUMP SIDE .....	1	INCLUDES ITEMS W/*
8	01267200	SHAFT STARTER SIDE .....	1	INCLUDES ITEMS W/#
9*		COUNTER BALANCE .....	1	CANNOT BE PURCHASED SEPARATELY
10	50324900	WOODRUFF KEY 3 X 3.7	2	
11*#		PIN .....	2	CANNOT BE PURCHASED SEPARATELY
12#		COUNTERBALANCE .....	1	CANNOT BE PURCHASED SEPARATELY

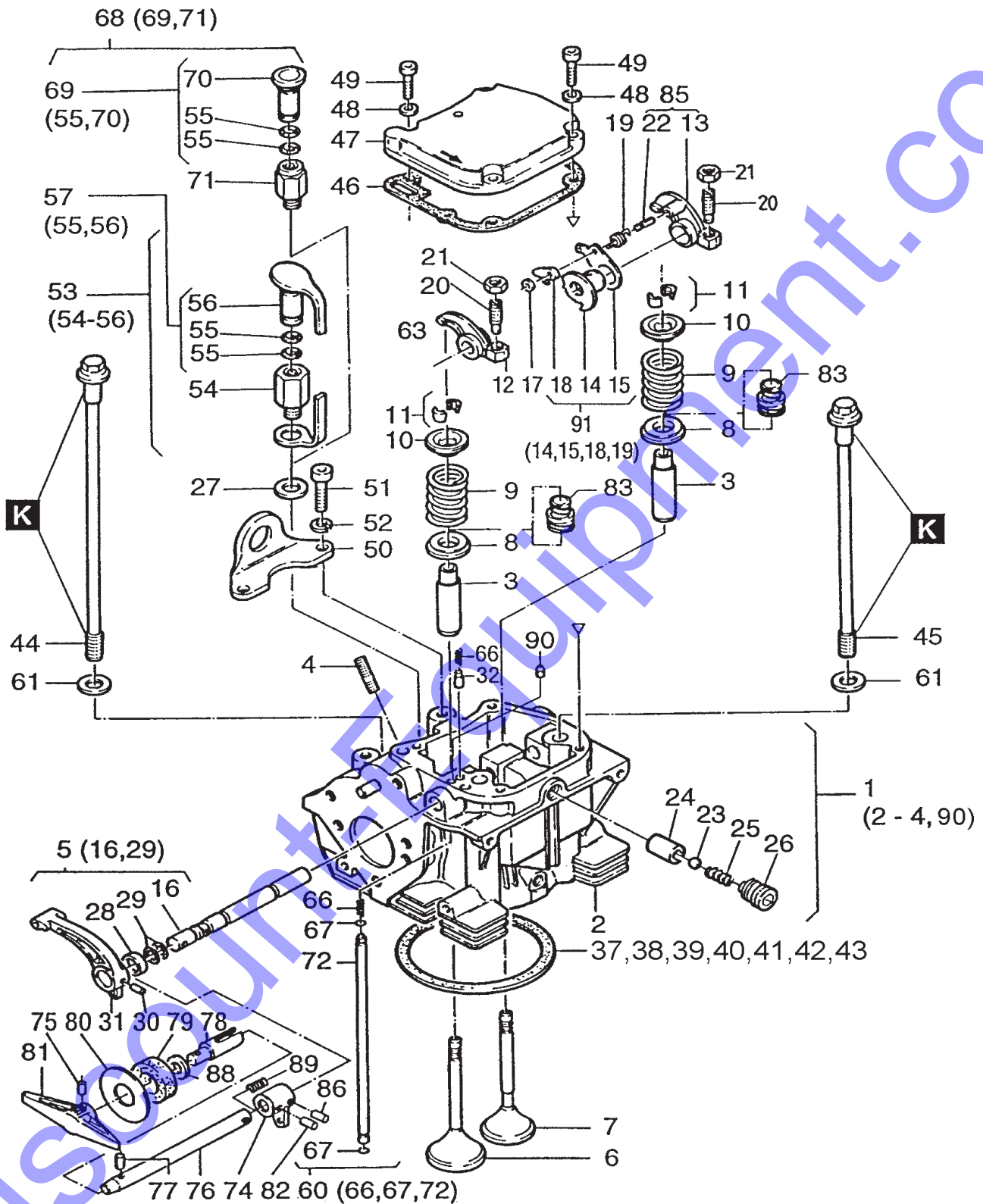
**HATZ 1D81S ENGINE — PISTON/RINGS ASSY.**



## HATZ 1D81S ENGINE — PISTON/RINGS ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01243901	PISTON ASSY. STD. ....	1	INCLUDES ITEMS W/*
1	01313510	PISTON ASSY. OVERSIZED .....	1	INCLUDES ITEMS W/*
2	01265101	PISTON ASSY. 100+0.5 .....	1	INCLUDES ITEMS W/#
2	01265201	PISTON ASSY. 100+1.0 .....	1	INCLUDES ITEMS W/#
2	01314610	PISTON ASSY. 100+0.5 .....	1	INCLUDES ITEMS W/#
2	01314710	PISTON ASSY. 100+1.0 .....	1	INCLUDES ITEMS W/#
3*#+		PISTON .....	1	CANNOT BE PURCHASED SEPARATELY
4*#+	50353600	WRIST PIN	1	
5*#+	50020800	CIRCLIP 30 X 1.2	2	
6*+	01247300	PISTON RING SET 100	1	
7#	01264500	PISTON RING SET +0.5	1	
7#	01265000	PISTON RING SET +1.0	1	
8+		CYLINDER .....	1	CANNOT BE PURCHASED SEPARATELY
9	01508301	CYLINDER ASSY. W/ PISTON .....	1	INCLUDES ITEMS W/+
10	01244001	CONROD ASSY. ....	1	INCLUDES ITEMS W/%
11%		CONROD .....	1	CANNOT BE PURCHASED SEPARATELY
12%	04032200	BUSH FOR CONROD	1	
13%	04001800	CONROD SCREW	2	
14	04001900	BIG END BEARING	1	
15	04033100	ROD BEARING -0.5	1	

# HATZ 1D81S ENGINE — CYLINDER HEAD ASSY.

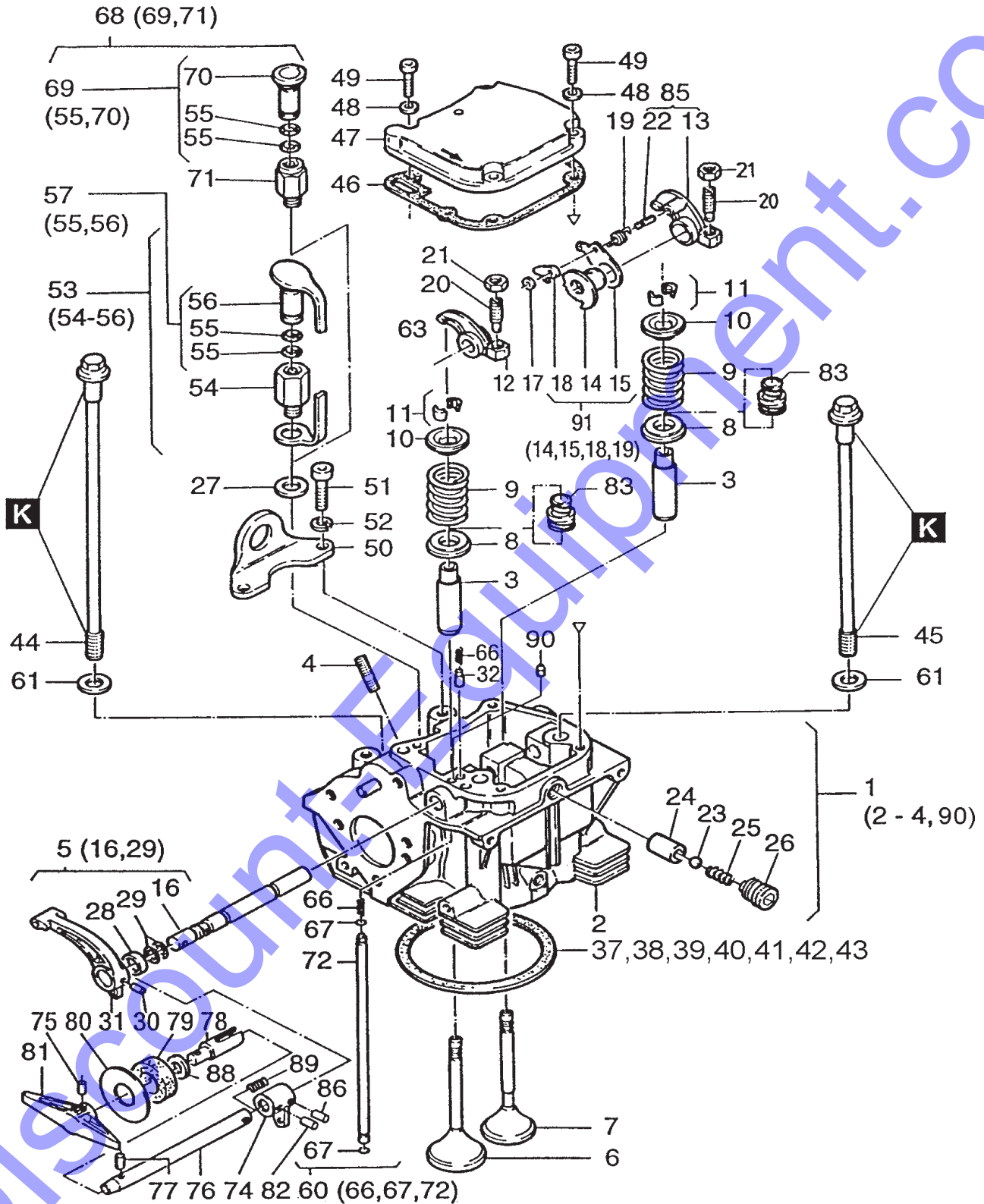


K= HOT TEMPERATURE FELT 100g

## HATZ 1D81S ENGINE — CYLINDER HEAD ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	01264810	CYLINDER HEAD ASSY. ....	1	INCLUDES ITEMS W/*
1	01499610	CYLINDER HEAD ASSY. ....	1	INCLUDES ITEMS W/*
2*		CYLINDER HEAD .....	1	CANNOT BE PURCHASED SEPARATELY
3*	04008710	VALVE GUIDE	2	
4*	50038400	STUD M 8 X 35	1	
5	04068910	ROCKER SHAFT ASSY. "C" .....	1	INCLUDES ITEMS W/+
5	04068920	ROCKER SHAFT ASSY. ....	1	INCLUDES ITEMS W/+
6	04005001	VALVE INLET	1	
6	04091001	VALVE INLET	1	
7	04005101	VALVE EXHAUST	1	
7	04091100	VALVE EXHAUST	1	
8	04005201	WASHER	2	
9	04005300	VALVE SPRING	2	
10	04005401	CUP	2	
11	03786300	VALVE COLLET	2	
12	04003710	ROCKER INLET	1	
13#		ROCKER INLET .....	1	CANNOT BE PURCHASED SEPARATELY
14%		RATCHET WHEEL .....	1	CANNOT BE PURCHASED SEPARATELY
15%	03778401	SPRING SHEET	1	
16+		ROCKER SHAFT .....	1	CANNOT BE PURCHASED 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#		DOWEL PIN .....	1	CANNOT BE PURCHASED SEPARATELY
23	50123800	BALL 7MM III	1	
24	04004700	BUSH	1	
25	04004800	PRESSURE SPRING	1	
26	01245200	ADJUSTING SCREW	1	
27	50001100	JOINT A 12 X 15.5	1	
28	04048900	RUBBER RING	1	
29+	40022401	O-RING 8 X 2 GRAY	1..2	
30	50034700	PIN 4 X 22	1	
31	04009810	HANDLE	1	
32	04004100	PIN	1	
35	04068800	GASK. F. CYL. HEAD 0.5	0..1	
36	04036800	GASK. F. CYL. HEAD 0.6	0..1	
37	04036500	GASK. F. CYL. HEAD 0.7	0..1	
38	04036600	GASK. F. CYL. HEAD 0.8	0..1	
39	04002700	GASK. F. CYL. HEAD 0.9	0..1	
40	04002800	GASK. F. CYL. HEAD 1.0	0..1	
41	04002900	GASK. F. CYL. HEAD 1.1	0..1	
42	04003000	GASK. F. CYL. HEAD 1.2	0..1	
43	04003100	GASK. F. CYL. HEAD 1.3	0..1	
44	04003200	CYL. HEAD SCREW 305 MM	2	
45	04003300	CYL. HEAD SCREW 258 MM	2	
46	04006111	VALVE COVER GASKET 16>	1	
47	01245410	VALVE COVER	1	
48	50081200	LOCK WASHER A6	4	
49	50170800	ALLEN SCREW M 6 X 25	4	
50	04008100	LIFTING BRACKET	1	

# HATZ 1D81S ENGINE — CYLINDER HEAD ASSY.

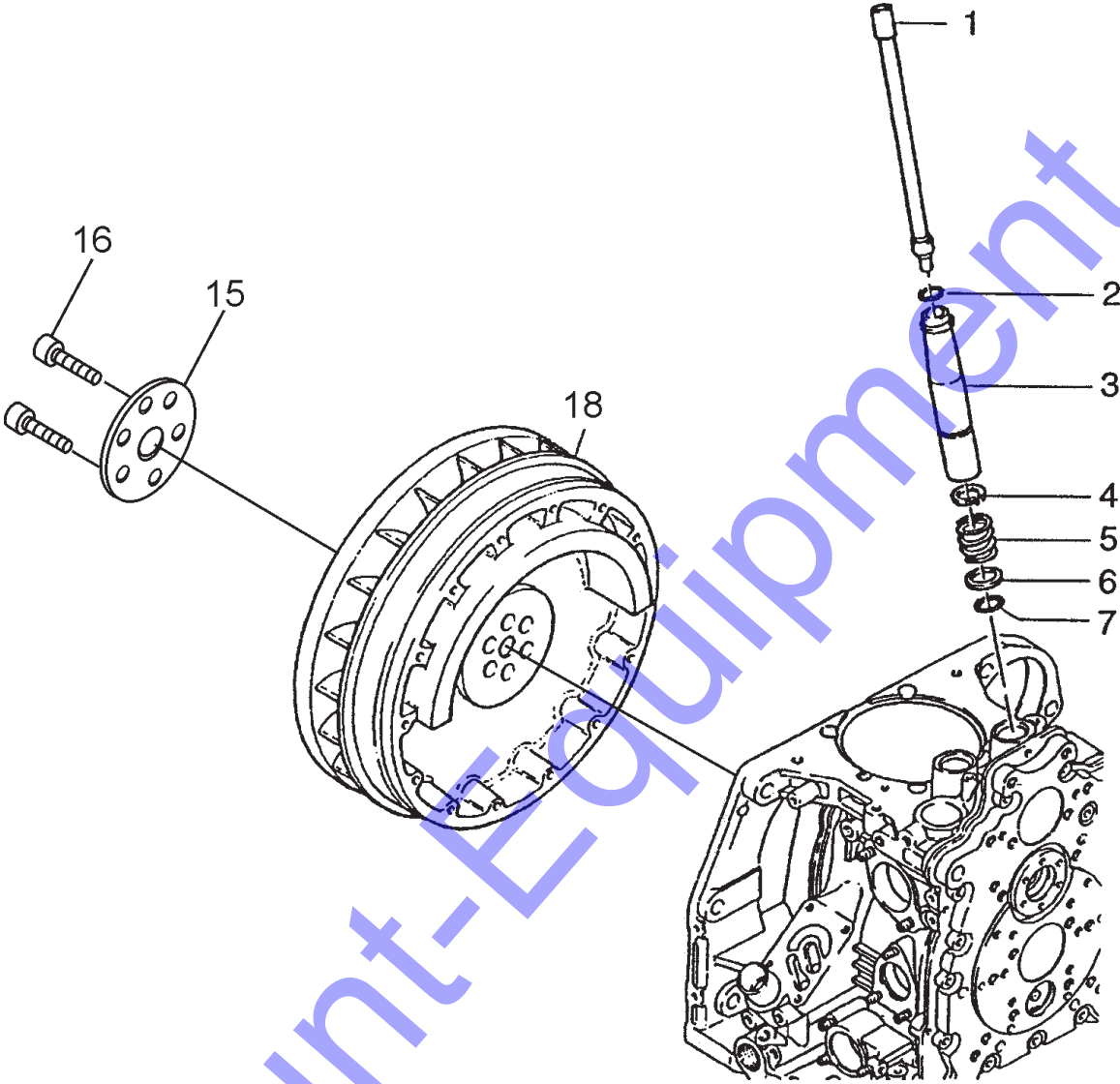




## HATZ 1D81S ENGINE — CYLINDER HEAD ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
51	50366300	ALLEN SCREW M 8X 20	2	
52	50208500	LOCK WASHER 8	2	
53	01493200	DEVICE HOUSING .....	1	INCLUDES ITEMS W/■
54■		HOUSING DEVICE BASE .....	1	CANNOT BE PURCHASED SEPARATELY
55■✓+	40081700	O-RING 12 X 16 X2	2	
56■✓		CAP .....	1	CANNOT BE PURCHASED SEPARATELY
57	01308300	CLOSING PLUG .....	1	INCLUDES ITEMS W/✓
60	01269700	OIL PRESSURE PIPE	1	INCLUDES ITEMS W/⊗
61	03457500	DISC F. STUD	4	
66⊗	04004200	PRESSURE SPRING	1	
67⊗	50330100	O-RING 4 X 1.2	2	
68	01280600	OIL FILTER DEVICE .....	1	INCLUDES ITEMS W/⊗
69⊗	01275610	CLOSING PLUG ASSY 46MM.....	1	INCLUDES ITEMS W/
70+		CLOSING PLUG .....	1	CANNOT BE PURCHASED SEPARATELY
71⊗		TUBE .....	1	CANNOT BE PURCHASED SEPARATELY
72⊗		ROD .....	1	CANNOT BE PURCHASED SEPARATELY
74	04047920	INTERM. PIECE DECOMP.	1	
75	50132000	ROLL PIN 4 X 16	1	
76	04048220	DECOMPRESSION SHAFT "C"	1	
77	50034500	ROLL PIN 4 X 14	1	
78	04048110	INTERMEDIATE PIECE	1	
79	03579800	RUBBER WASHER	1	
80	04048000	WASHER 10.5 X 50 X 0.8	1	
81	03778200	HANDLE 6 X 18	1	
82	50132000	ROLL PIN 4 X 16	1	
83	50405200	VALVE STEM SEAL CAP	2	
85	01285010	ROCKER EXHAUST .....	1	INCLUDES ITEMS W/#
86	50034600	ROLL PIN 4 X 18	1	
88	03787300	SHIM 0.2	1	
89	04097200	PRES. SPRING DECOMPR.	1	
90*	04038500	OIL RESTRICTOR VALVE ASSY.	1	
90*	04104300	OIL RESTRICTOR VAVE	1	
91	01557600	GEARWHEEL F. DECOMPR.....	1	INCLUDES ITEMS W/%

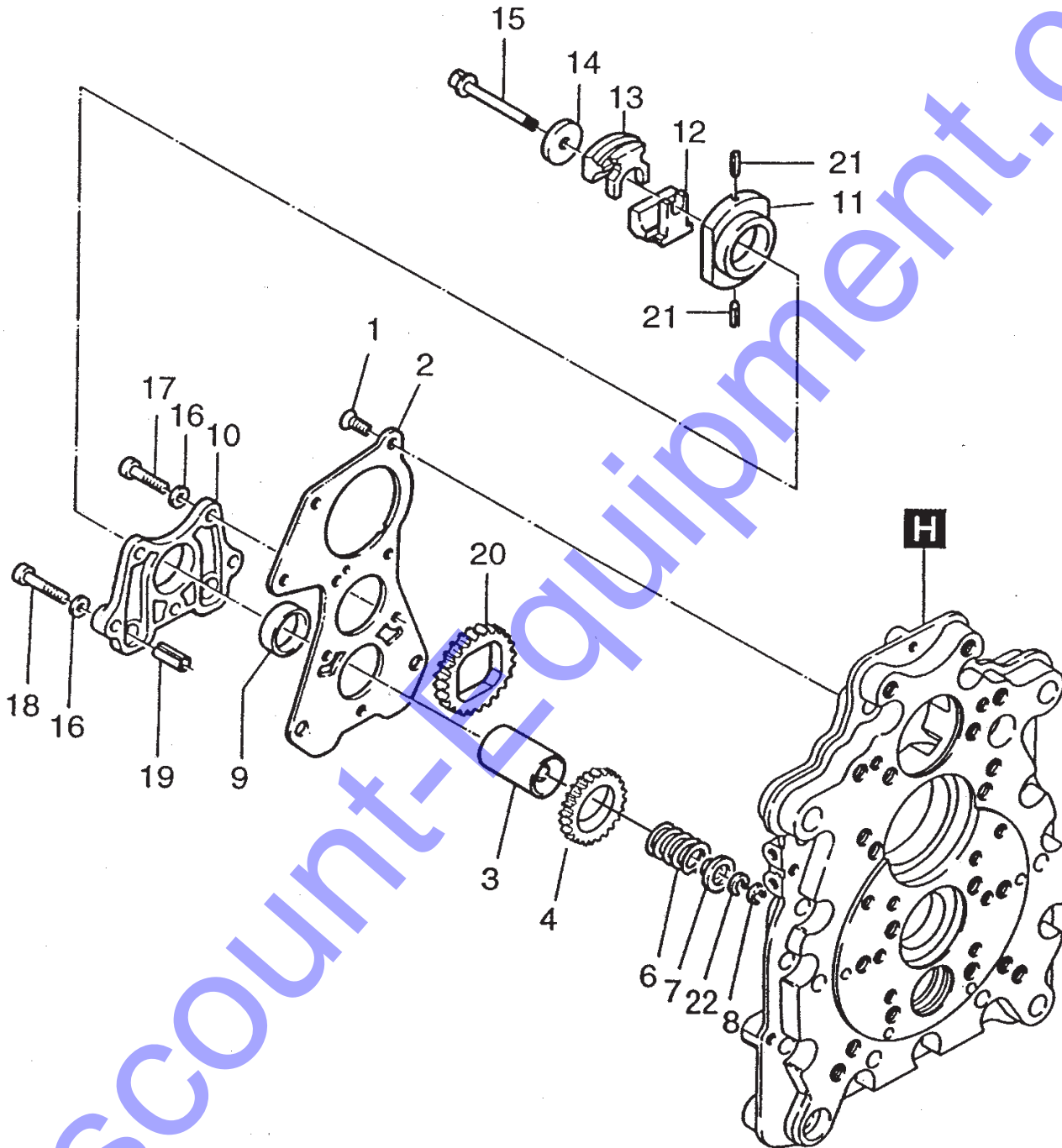
**HATZ 1D81S ENGINE — FLYWHEEL ASSY.**



## HATZ 1D81S ENGINE — 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 19 X 3N	2	
3	04002500	PROTECTION TUBE	2	
4	50347000	CIRCLIP AS 24 X 1.75	2	
5	04002000	PRESSURE SPRING	2	
6	04002000	PRESSURE RING	2	
7	50330300	O-RING 23 X 3	2	
15	04007410	PLATE	1	
16	50363100	ALLEN SCREW M 10 X 40	6	
18	04007131	FLYWHEEL , ELECTRIC START	1	

# HATZ 1D81S ENGINE — OIL PUMP ASSY.



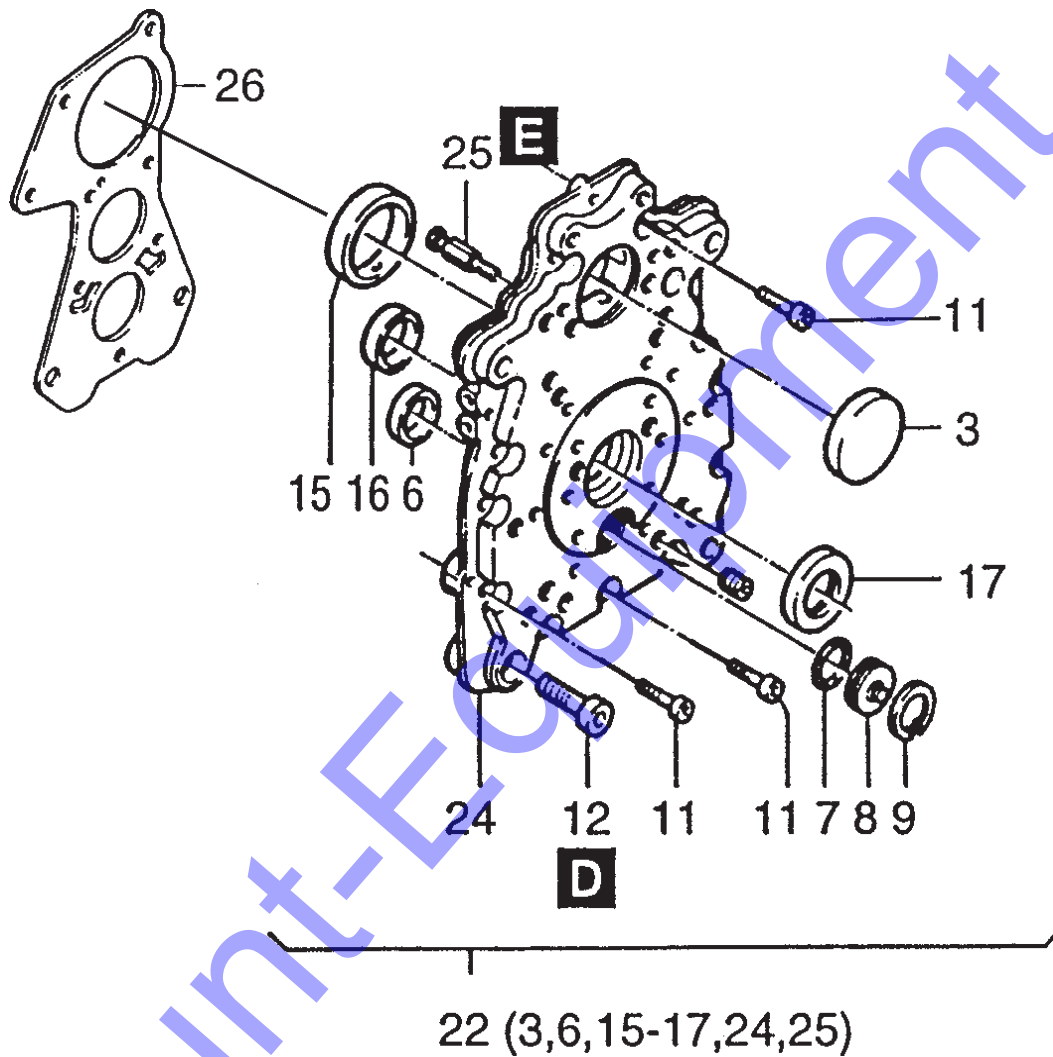
LETTERS IN BOLD INDICATE TYPE OF BONDING ADHESIVE TO BE USED.

D= LOCTITE 221 H= SILICON E= LOCTITE 648

## HATZ 1D81S ENGINE — FLYWHEEL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	50328000	CTR. SUNK SCR.AM 6 X 16	5	
2	03797412	COVER F. OIL PUMP	1	
3	01242401	SPRING CAPSULE+BUSH	1	
4	03797310	GEARWHEEL	1	
6	04063400	GOVERNOR SPRING 2.9	1	
7	03798600	CUP	1	
8	50334700	CIRCLIP5	1	
9	03797600	BEARING BUSH	1	
10	03797510	HOUSING	1	
11	03797701	PLATE CENTRIF. WEIGHT	1	
12	03798002	CENTRIFUGAL WEIGHT	1	
13	03798102	CENTRIFUGAL WEIGHT	1	
14	03797900	WASHER	1	
15	03797801	PIN	1	
16	50081200	LOCK WASHER A6	5	
17	50170800	ALLEN SCREW M 6 X 25	3	
18	50051000	ALLEN SCREW M 6 X 30	2	
19	50084901	PIN 8 X 12	2	
20	03798720	GEARWHEEL	1	
21	50260501	ROLL PIN 2 X 10	2	
22	04046000	CIRCLIP	0.3	

# HATZ 1D81S ENGINE — TIMING COVER ASSY.



LETTERS IN BOLD INDICATE TYPE OF BONDING ADHESIVE TO BE USED.

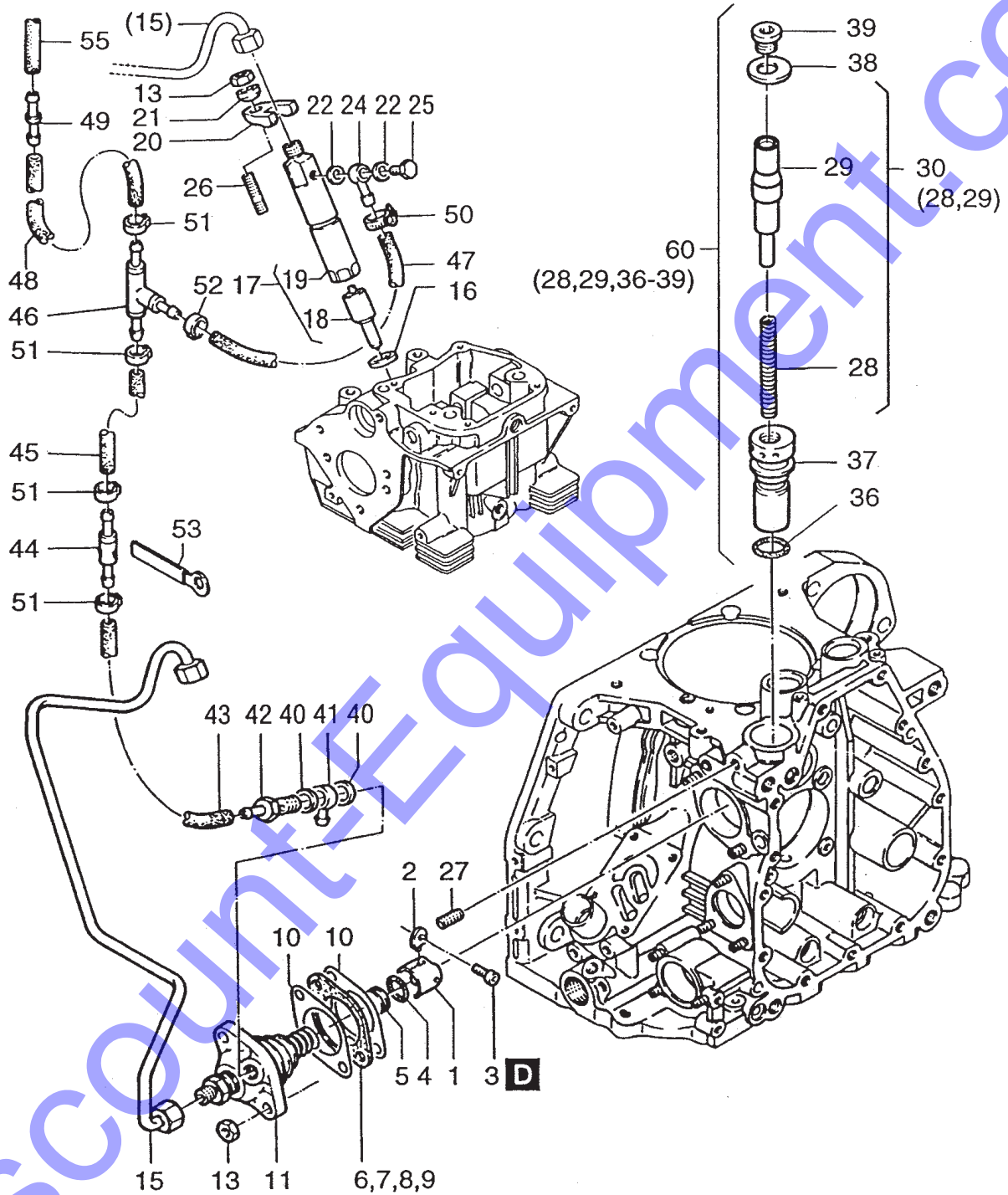
D= LOCTITE 221 H= SILICON E= LOCTITE 648

## HATZ 1D81S ENGINE — FLYWHEEL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
3#	05325600	COVER 50	1	
6#	03797600	BEARING BUSH	1	
7	50330400	O-RING 27 X 2N	1	
8	04000400	COVER	1	
9	50399000	CIRCLIP 32 X 1.2	1	
11	50417400	ALLEN SCREW M 8 X 30 Z3	13	
12	50329500	ALLEN SCREW M 12 X 40	1	
15#	04000310	BEARING BUSH	1	
16#	04023210	BEARING BUSH	1	
17#	50364700	OIL SEAL 32 X 52 X 7	1	
22	01281001	TIMING COVER ASSY. NO. 3 .....	1	INCLUDES ITEMS W/#
24#		TIMING COVER .....	1	CANNOT BE PURCHASED SEPARATELY
25#	04052400	NOZZLE	1	
26	03797412	COVER F. OIL PUMP	1	



# HATZ 1D81S ENGINE — FUEL DEVICE ASSY.



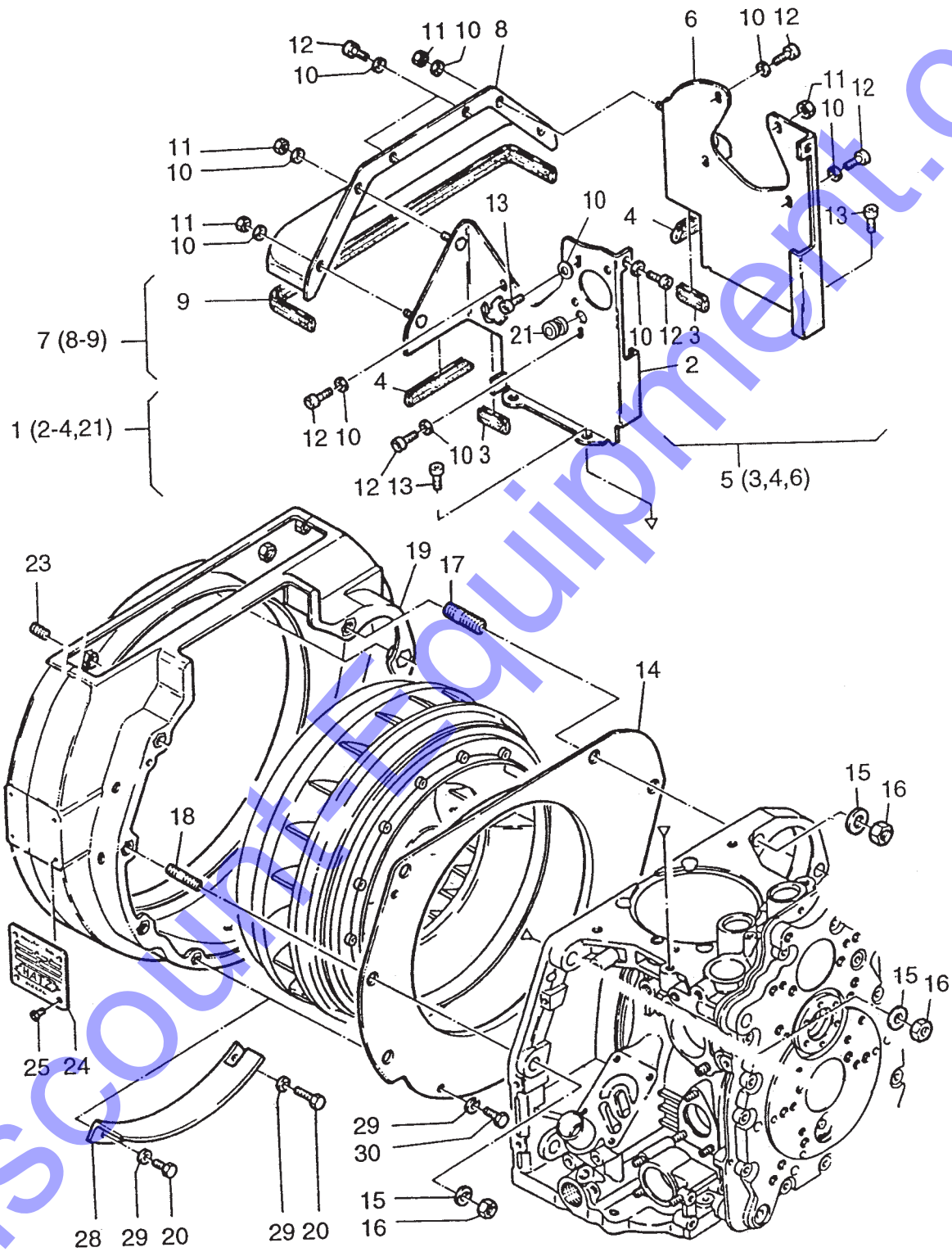
LETTERS IN BOLD INDICATE TYPE OF BONDING ADHESIVE TO BE USED.

D= LOCTITE 221 H= SILICON E= LOCTITE 648

## HATZ 1D81S ENGINE — FUEL DEVICE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	50331500	ROLLER TAPPET CPL.	1	
2	04000901	GUIDE	1	
3	50050700	ALLEN SCREW M 6 X 16	1	
4	50390200	O-RING 17 X 1.1	0..1	
4	50363400	O-RING 17 X 1.2	0..1	
5	04011700	PLATE	1	
6	03209700	SHIM 0.3	0..1	
7	04102400	SHIM 0.60/42.2	0..1	
8	04102500	SHIM 0.90/42.2	0..1	
9	04102600	SHIM 1.20/42.2	0..1	
10	04071300	GASKET	0.2	
10	04102200	GASKET INJECTION PUMP 0.2	0..2	
10	04102300	GASKET INJECTION PUMP 0.3	0..2	
11	50416200	INJECTION PUMP	1	
13	50148000	HEXAGON NUT M8	3	
15	01313600	FUEL PRESSURE PIPE	1	
16	04025800	JOINT WASHER	1	
16	40085001	INJECTOR SEAL	1	
17	50415101	INJECTOR .....	1	INCLUDES ITEMS W/%
18%	50415200	NOZZLE DLLA 154PV3	1	
19%		INJECTOR .....	1	CANNOT BE PURCHASED SEPARATELY
20	03792400	FLANGE	1	
21	04035700	WASHER	1	
22	50000800	COPPER WASHER	2	
24	50333400	BANJO UNION	1	
25	50313000	BANJO BOLT M6	1	
26	50038400	STUD M 8 X 35	1	
27	50004600	SET SCREW AM 8 X 16	1	
28*#	05035200	PRESSURE SPRING	1	
29*#		PIN .....	1	CANNOT BE PURCHASED SEPARATELY
30	01519500	PIST. + SPRG. EXT. FUEL .....	1	INCLUDES ITEMS W/*
36#	50328900	O-RING 22 X 1.6	1	
37#	04001410	CYL. F. EXTR. FUEL DEV.	1	
38#	04001600	DISC.	1	
39#	50330800	CLOS. SCREW M 16 X 1.5	1	
40	50001100	JOINT A12 X 15.5	2	
41	50015800	RING PIECE NW6	1	
42	03662300	PIPE NIPPLE	1	
43	04060400	FUEL HOSE 4.5 X 100	1	
44	00805500	VENT VALVE	1	
45	03807100	FUEL HOSE 4.5/150	1	
45	04060200	FUEL HOSE 4.5 X 55	1	
46	50157800	T-CONNECTION NW3	1	
47	03902000	FUEL PIPE 390	1	
48	05029600	FUEL HOSE 4.5/850	1	
49	50279600	CONNECTING NIPPLE	1	
50	50357200	HOSE CLIP 5SKZ	2	
51	50399801	CLAMP 11.3	4	
52	50399900	CLAMP 9.5	1	
53	01459700	CLIP	1	
60	01498902	PIST. + CYL. EXTR. FUEL .....	1	INCLUDES ITEMS W/#

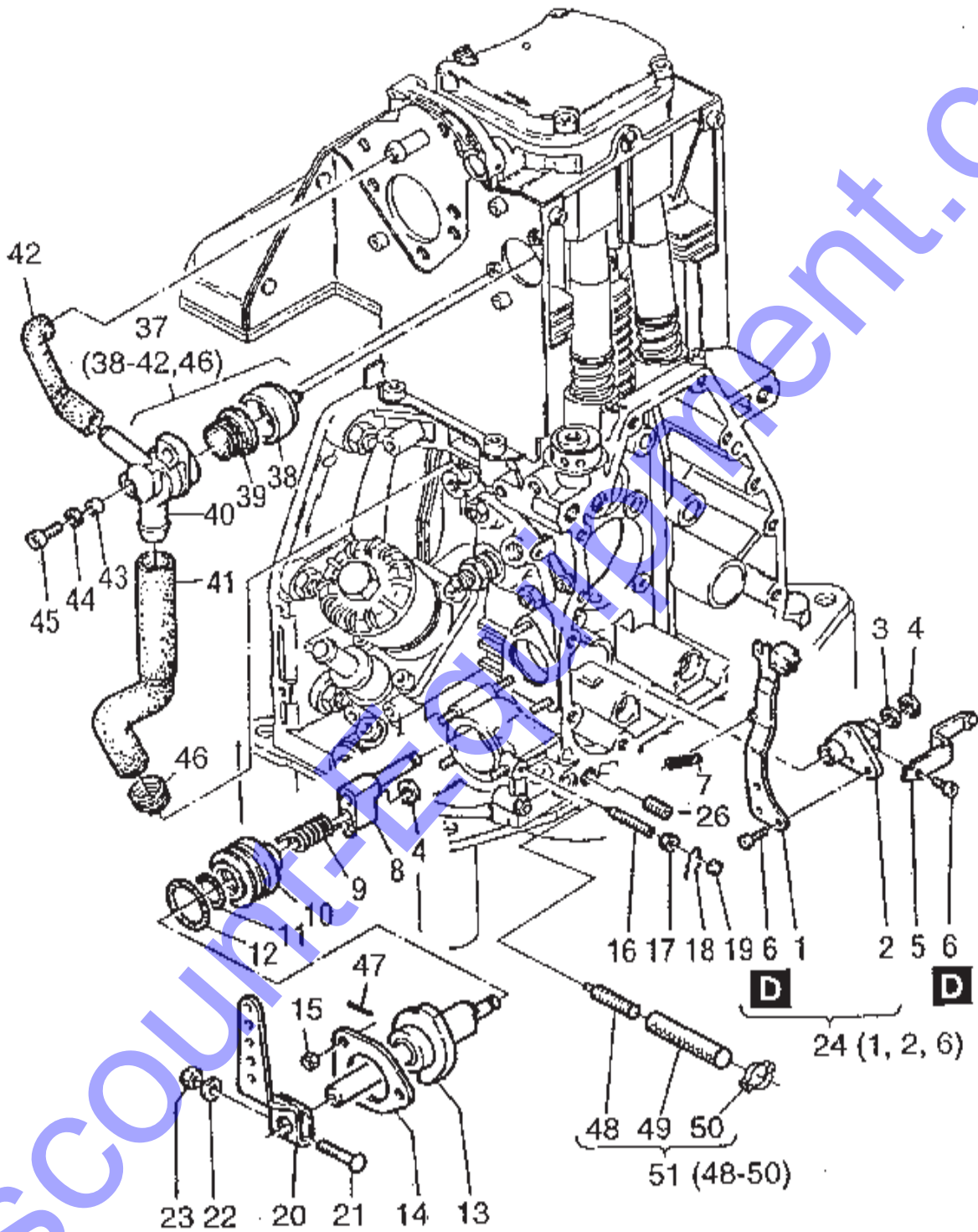
# HATZ 1D81S ENGINE — AIR DUCTING ASSY.



## HATZ 1D81S ENGINE — AIR DUCTING ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	01246220	COOLING AIR DUCT ASSY .....	1 .....	INCLUDES ITEMS W/*
2*		COOLING AIR DUCT .....	1 .....	CANNOT BE PURCHASED SEPARATELY
3*%	04007601	SEALING STRIP 32.2MM	2	
4*%	04007720	SEALING STRIP 76MM	2	
5	01246411	COOLING AIR DUCT .....	1 .....	INCLUDES ITEMS W/*
6%		SIDE SHROUD .....	1 .....	CANNOT BE PURCHASED SEPARATELY
7	01246600	COOLING AIR DUCT ASSY.....	1 .....	INCLUDES ITEMS W/*
8#		COOLING AIR DUCT .....	1 .....	CANNOT BE PURCHASED SEPARATELY
9#	04007901	SEALING STRIP 413MM	1	
10	50081200	LOCK WASHER A6	15	
11	50144400	HEXAGON NUT M6	4	
12	50149100	ALLEN SCREW M6 X 12	12	
13	50206300	ALLEN SCREW M8 X 18	4	
14	04008500	PARTING SHEET	1	
15	50093700	FLAT WASHER A13	6	
16	50093600	HEXAGON NUT M12	6	
17	50364900	STUD M12 X 40	2	
18	50331400	STUD M12 X 35	4	
19	04008211	INTERMED. HOUSING	1	
20	50333500	HEXSCREW M 6 X 8	2	
21*	50334800	RUBBER SLEEVE	1	
23	50226000	GRUB SCREW M 8 X 6	4	
24	03225504	NAME PLATE	1	
25	40002500	POP RIVET 2.4 MM	4	
28	04080400	COVER F. BLOW DUCTING	1	
29	50170900	LOCK WASHER 6	4	
30	50177100	HEXSCREW M 6 X 16	2	

# HATZ 1D81S ENGINE — BREATHER ASSY.



LETTERS IN BOLD INDICATE TYPE OF BONDING ADHESIVE TO BE USED.

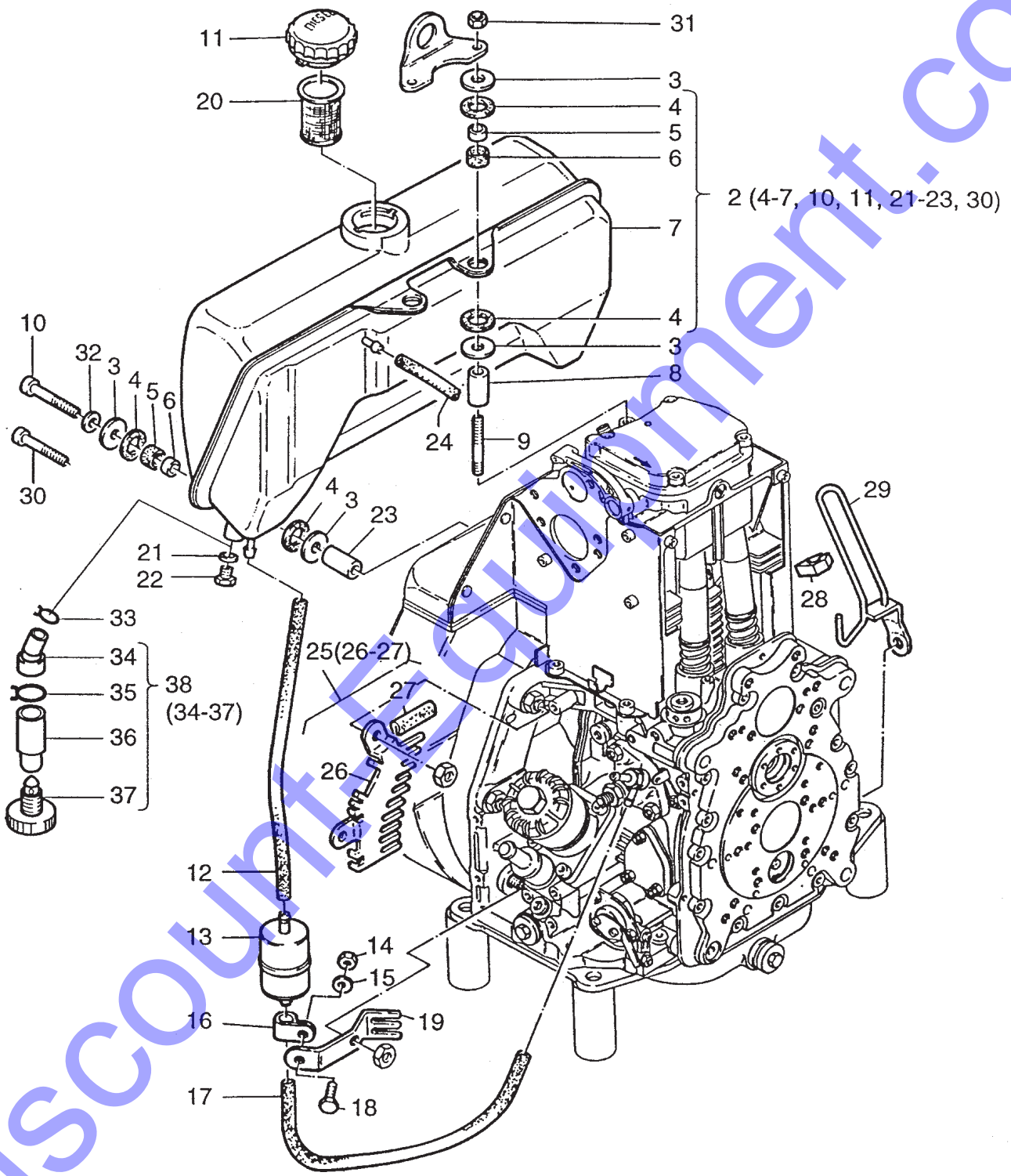
D= LOCTITE 221 H= SILICON E= LOCTITE 648

## HATZ 1D81S ENGINE — BREATHER ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1#		THROTTLE ARM .....	1	CANNOT BE PURCHASED SEPARATELY
2#		THROTTLE LINKAGE .....	1	CANNOT BE PURCHASED SEPARATELY
3	04000100	SHIM	1	
4	50266100	CIRCLIP 6	2	
5	04037500	LEVER	1	
6#	50328701	ALLEN SCREW M 5 X 8	4	
7	04000200	TENSION SPRING	1	
8	01242810	GUIDE	1	
9	03799010	THIGH SPRING	1	
10	04052700	SPACER RING	1	
11	50386100	O-RING 21 X 2	1	
12	50129900	O-RING 32 X 37 X 2.5	1	
13	01279210	STOP RING SPD. CONT. S	1	
13	01302910	STOP RING SPD. CONT. C	1	
14	03799210	FRICTION PLATE	1	
15	50328300	HEXAGON NUT M6	3	
16	03799400	GRUB SCREW	2	
17	50144400	HEXAGON NUT M6	2	
18	40021500	SEAL WIRE 0.5-0.3	2	
19	40021400	LEAD SEAL 8MM	2	
20	03888300	THROTTLE LEVER	1	
21	03927300	SCREW M 6 X 32	1	
22	50144500	FLAT WASHER 6.4	1	
23	50144400	HEXAGON NUT M6	1	
24	01246801	GOVERNOR LEVER ASSY. ....	1	INCLUDES ITEMS W/#
26	50403500	GRUB SCREW M 8 X 20	1	
37	01317000	BREATHER VALVE ASSY. ....	1	INCLUDES ITEMS W/%
38%	04080300	BREATHER CUP	1	
39%	03568700	RUBBER DIAPHRAM	1	
40%		BREATHER .....	1	CANNOT BE PURCHASED SEPARATELY
41%	04074700	BREATHER HOSE	1	
42%	04074800	BREATHER HOSE	1	
43	04080500	BUSH	2	
44	50081200	LOCK WASHER A6	2	
45	50170700	ALLEN SCREW M 6 X 16	2	
46%	04090500	CLIP	1	
47	50411500	SET PIN	1	
48*	50405301	GRUB SCREW M 6 X 45	1	
49*	05038000	HOSE 7 X 12 X 120	1	
50*	50388300	HOSE CLAMP	1	
51	01475600	ADJUST. SCREW ID 1D81 .....	1	INCLUDES ITEMS W/*



# HATZ 1D81S ENGINE — FUEL TANK ASSY.

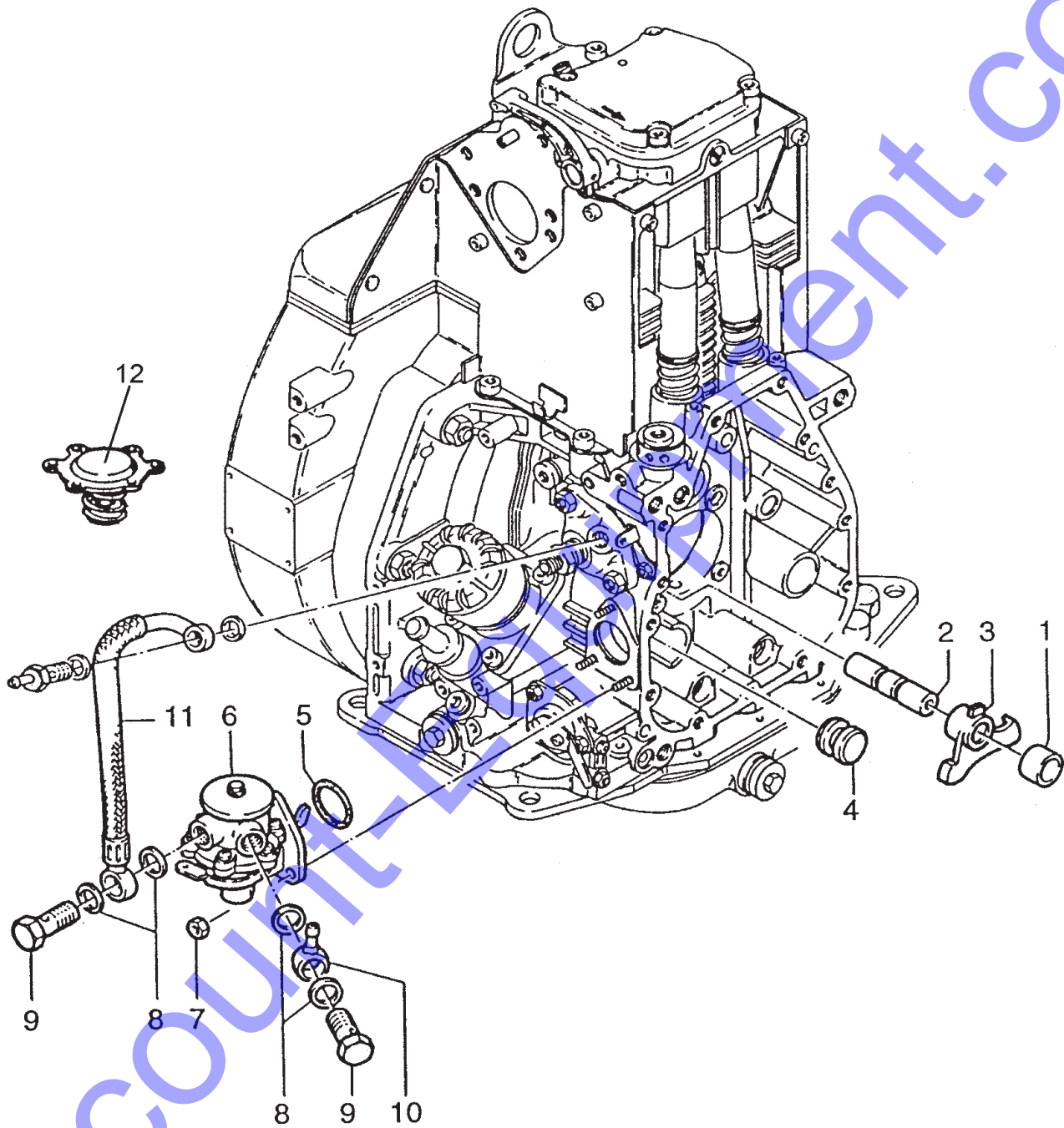




## HATZ 1D81S ENGINE — FUEL TANK ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
2	01494200	FUEL TANK ASSY ( 7 LTRS.) .....	1	INCLUDES ITEMS W/#
3	05097600	WASHER	12	
4#	03981802	RUBBER WASHER	12	
5#	03981701	BUSH 8.4 X 13 X 7.5	6	
6#	03981900	RUBBER SHELL	6	
7#		FUEL TANK .....	1	CANNOT BE PURCHASED SEPARATELY
8	03989800	BUSH 8.5 X 20 X 49	2	
9	50377001	STUD M 8 X 75	2	
10#	50177500	ALLEN SCREW M 8 X 40	4	
11#	50385800	CAP, FUEL TANK	1	
12	03801200	FUEL HOSE 7/220	1	
13	50478800	FUEL FILTER .....	1	REPLACES 40089401
14	50144400	HEXAGON NUT M6	1	
15	50144500	FLAT WASHER 6.4	1	
16	03165500	PIPE CLIP	1	
17	03493600	FUEL HOSE 7/330	1	
18	50165500	HEXSCREW M 6 X 12	1	
19	05031900	GUARD	1	
20	50387300	SIEVE	1	
21#	50001000	JOINT A 10 X 16	1	
22#	50359800	HEXSCREW M 10 X 12	1	
23#	05029200	BUSH 9 X 18 X 8	4	
24	03663700	FUEL PIPE L W 4.5 X 50	1	
25	01490300	PROTEC. GUARD TOP .....	1	INCLUDES ITEMS W/%
26%		FINGER GUARD .....	1	CANNOT BE PURCHASED SEPARATELY
27%	04030901	SEALING STRIP 29 MM	1	
28	03150900	CLAMP	1	
29	01402200	GUARD	1	
30#	50183000	ALLEN SCREW M 8 X 35	4	
31	50148000	HEXAGON NUT M8	2	
32	50208500	LOCK WASHER 8	4	
33	05045300	CLAMP 21 MM	1	
34*	05044001	HOSE 10/12 MM	1	
35*	05036900	HOSE CLIP	1	
36*	05043900	WATER SEPARATOR	1	
37*	50414800	CLOS. SCREW M 10	1	
38	01519401	WATER SEPARATOR .....	1	INCLUDES ITEMS W/*

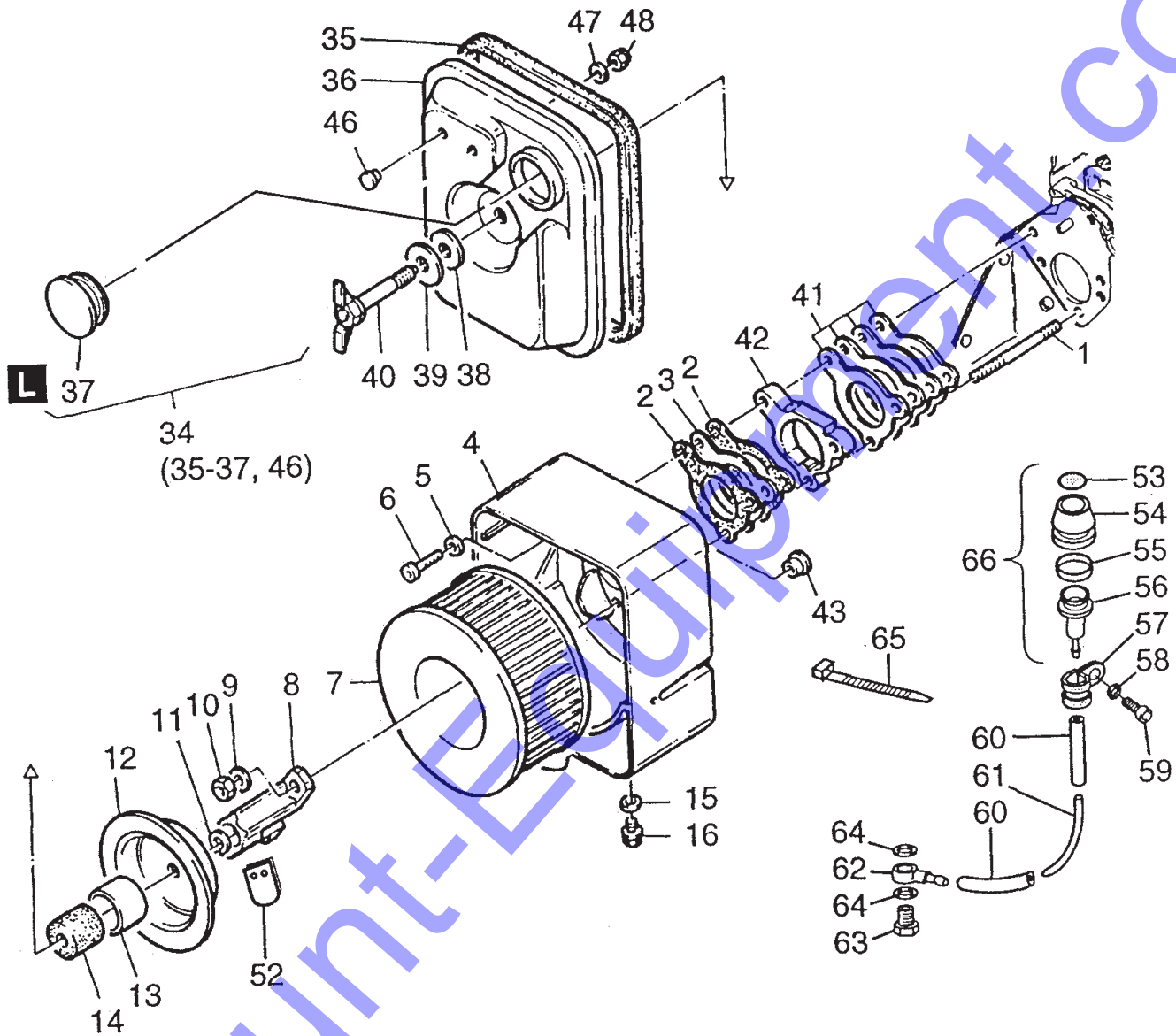
# HATZ 1D81S ENGINE — FUEL PUMP ASSY.



## HATZ 1D81S ENGINE — FUEL PUMP ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	04011900	BUSH	1	
2	03796400	SHAFT	1	
3	04011801	LEVER F. FEED PUMP	1	
4	04000800	PLUG	1	
5	50331800	O-RING	1	
6	50332301	FUEL FEED PUMP	1	
7	50328300	HEXAGON NUT M6	3	
8	50001200	JOINT A 14 X 18	4	
9	50006400	BANJO BOLT A8	2	
10	50015900	RING PIECE N W 8	1	
11	01468801	FUEL PIPE	1	
12	49062501	DIAPHRAM	1	

# HATZ 1D81S ENGINE — AIR FILTER ASSY.

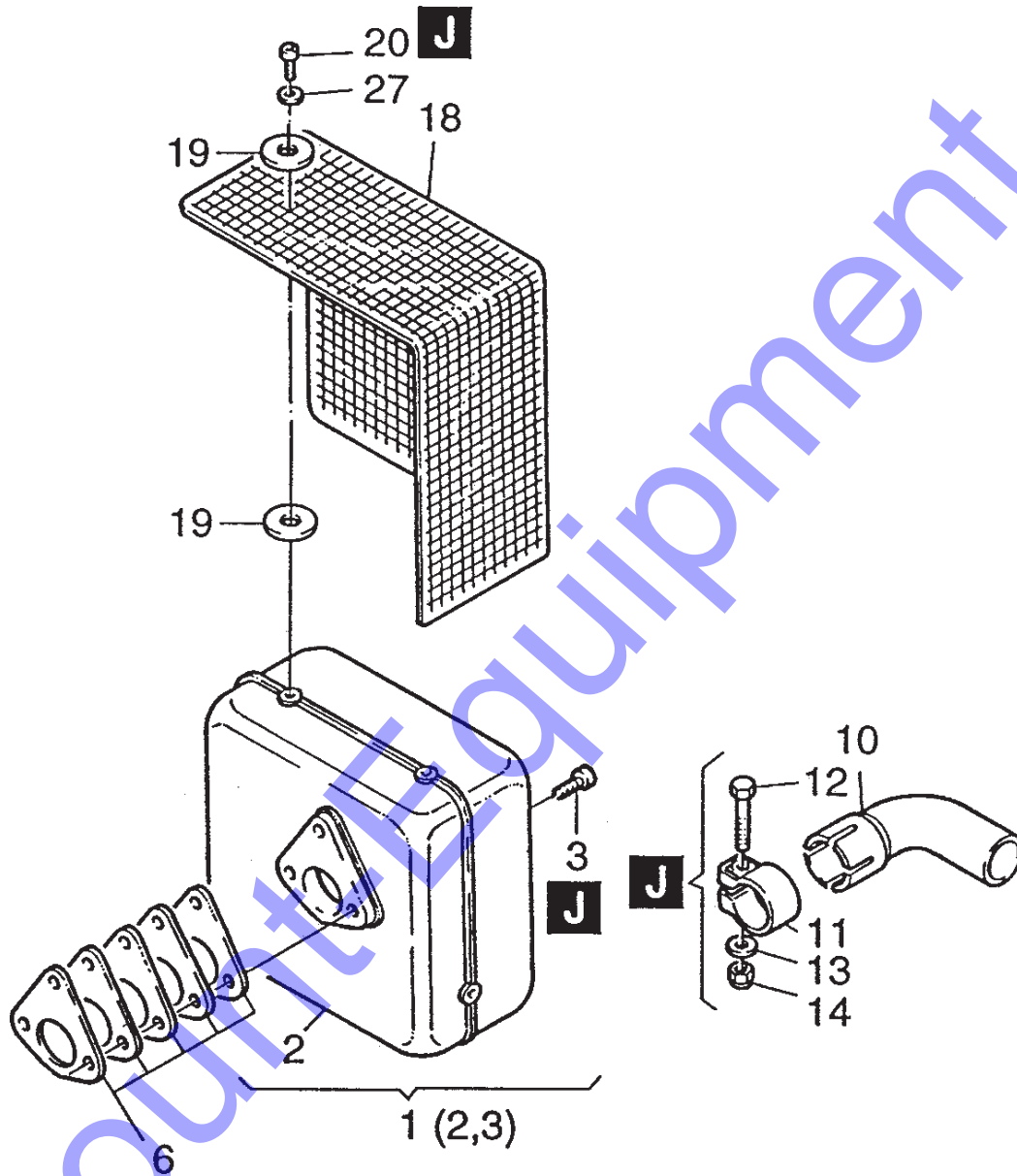


L= SILICON SEALER

## HATZ 1D81S ENGINE — AIR FILTER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	50038900	STUD M 8 X 60	2	
2	04006300	GASKET	2	
3	04006200	INSULATING FLANGE	1	
4	04004312	AIRFILTER HOUSING	1	
5	50095100	LOCK WASHER A8	1	
6	50398400	CYLINDER HEAD BOLT	1	
7	01493000	AIR FILTER	1	
8	01483400	RETAINING STRAP	1	
9	50148100	FLAT WASHER 8.4	2	
10	50129500	HEXAGON NUT M8	2	
11	50412000	CIRCLIP 10 X 1	1	
12	05036400	CENTERING COVER	1	
13	05039300	BUSH 33 X 35 X 23.5	1	
14	03579400	SEALING RING	1	
15	50062400	JOINT A 10 X 13.5	1	
16	50062300	CLOSING SCREW M 10 X 1	1	
34	01496800	COVER AIRFILTER .....	1	INCLUDES ITEMS W/*
35*	04047701	SEALING STRIP LG 704	1	
37*	05039401	CLOSING CAP	1	
36*		CLOSING COVER .....	1	CANNOT BE PURCHASED SEPARATELY
38	03814100	INSULATING DISC	1	
39	05038700	WASHER 11 X 36 X 3	1	
40	01490800	WING SCREW	1	
41	01287900	GASKET AIRFILTER	1	
42	04047300	INTERMEDIATE FLANGE	1	
43	50395700	COVER 15	1	
46*	50411900	CLOSING PLUG 7	2	
47	50120000	DISC A 6.4	2	
48	40028300	HEXAGON NUT M 6	2	
52	05033500	VALVE PLATE	1	
53#	05044501	INDIC. PLATE	1	
54#	05043601	RUBBER CAP	1	
55#	05045600	SIGNAL RING	1	
56#	05043700	ADAPTER	1	
57	50173500	PIPE CLIP	1	
58	50170900	LOCK WASHER 6	1	
59	50170600	ALLEN SCREW M 6 X 20	1	
60	03961400	FUEL HOSE 3.51-50	2	
61	05043800	HOSE 2 X 4 X 170	1	
62	50159500	RING PIECE N W 4	4	
63	50006200	BANJO BOLT A 4	1	
64	50062400	JOINT A 10 X 13.5	2	
65	50358400	STRAP	1	
66	01499800	MAINT. INDICATOR .....	1	INCLUDES ITEMS W/#

# HATZ 1D81S ENGINE — EXHAUST SILENCER ASSY.



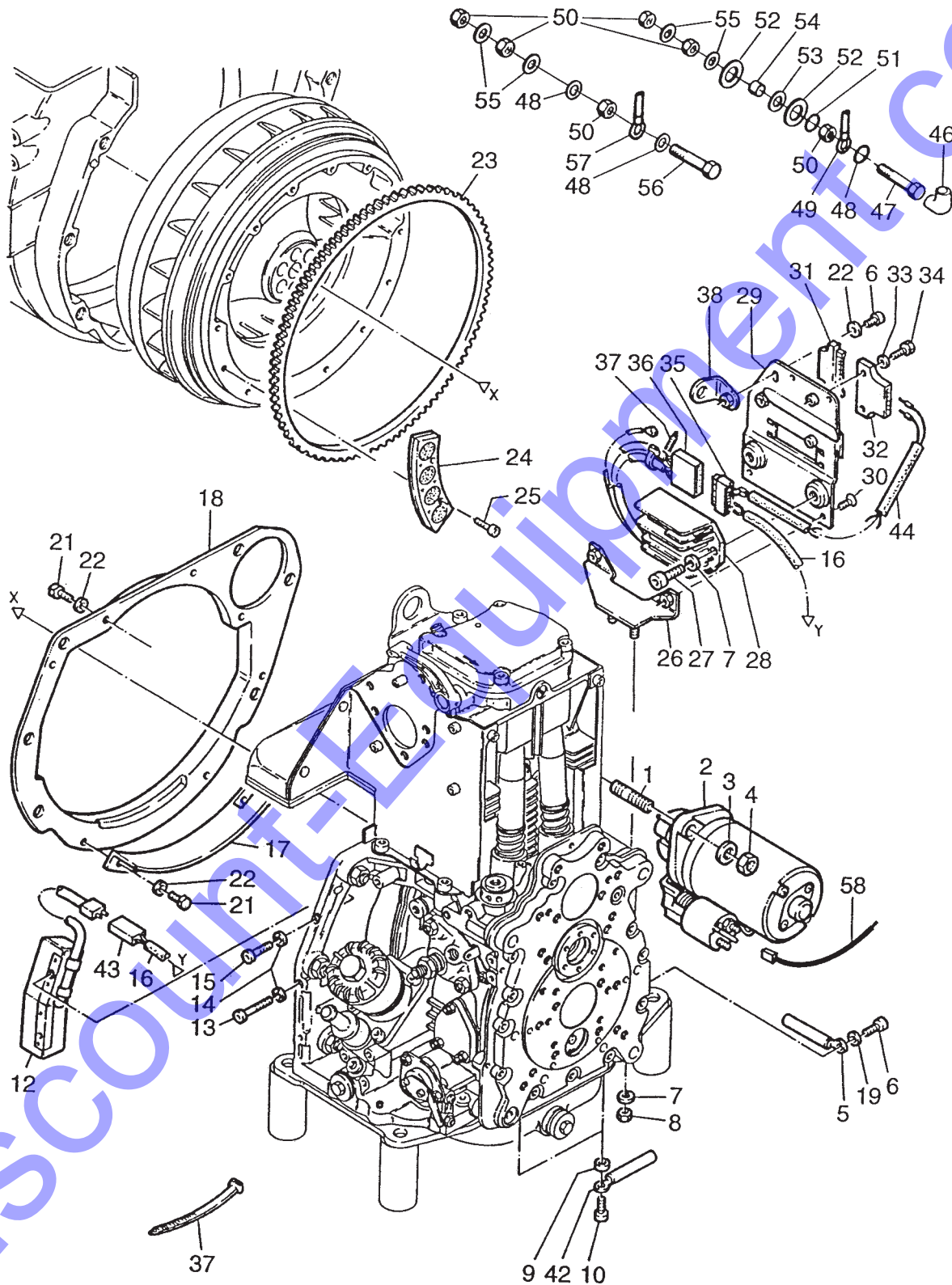
J= HOT TEMPERATURE PASTE

## HATZ 1D81S ENGINE — EXHAUST SILENCER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01498800	EXHAUST SILENCER S ASSY. ....	1	INCLUDES ITEMS W/*
2*		EXHAUST SILENCER .....	1	CANNOT BE PURCHASED SEPARATELY
3*	50404000	ALLEN SCREW M 8 X 30	3	
6	01471110	GASKET SET EXHAUST SIL.	1	
10	03877300	ELBOW	1	
11	03877700	PIPE CLIP 52.5	1	
12	50249500	HEX SCREW M 10 X 50	1	
13	50145900	FLAT WASHER 10.5	1	
14	40028600	HEX NUT M 10	1	
16	03997100	EXHAUST TUBE	1	
18	01191901	MUFFLER GUARD ID	1	
19	05034200	LOCK WASHER	10	
20	50255700	ALLEN SCREW M 6 X 12	5	



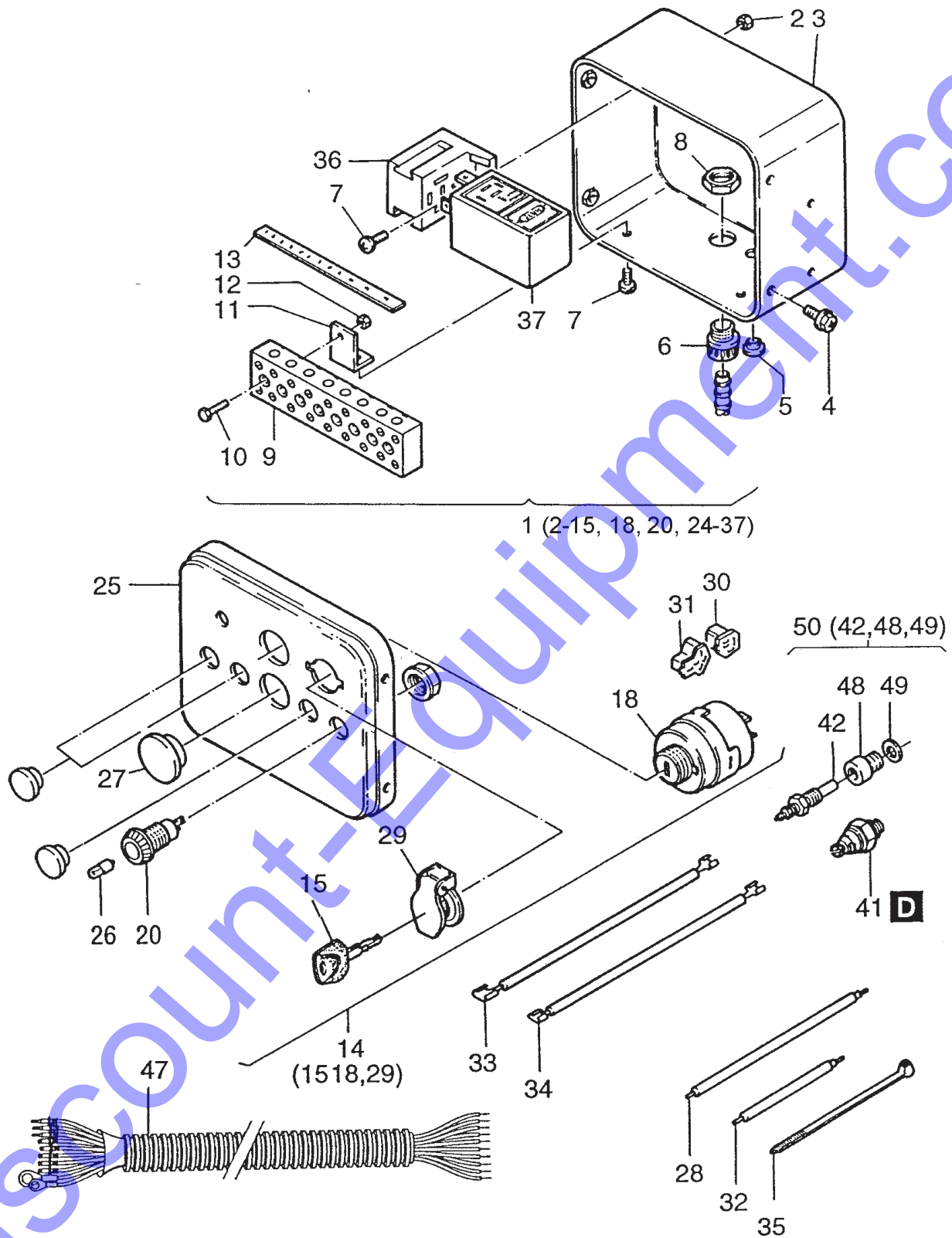
# HATZ 1D81S ENGINE — STARTER/ALTERNATOR ASSY.



## HATZ 1D81S ENGINE — STARTER/ALTERNATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	50201200	STUD M 12 X 50	2	
2	50353420	STARTER 12 V 10 TOOTH	1	
3	50093700	FLAT WASHER A 13	2	
4	50380600	HEXAGON NUT M 12	2	
5	01459700	CLIP	2	
6	50149100	ALLEN SCREW M 6 X 12	2	
7	50208500	LOCK WASHER 8	4	
8	50148000	HEXAGON NUT M 8	2	
9	04021000	BUSH 6.3 X 12.15 X 5	2	
10	50170700	ALLEN SCREW M 6 X 16	2	
12	01439000	COIL WITH WIRE 12 V	1	
13	50401200	ALLEN SCREW M 6 X 35	1	
14	50165600	LOCK WASHER	2	
15	50236600	ALLEN SCREW M 6 X 25	1	
16	01462800	ELECTRIC WIRE	1	
17	04021100	PROTECT. ALTERNATOR	1	
18	04009920	PARTING SHEET	1	
19	50144500	FLAT WASHER 6.4	1	
21	50165500	HEXSCREW M 6 X 12	5	
22	50170900	LOCK WASHER 6	6	
23	04021210	GEAR RING 123 TEETH	1	
24	04020421	MAGNET SEGMENT	7	
25	50397100	ALLEN SCREW M 4 X 10	14	
26	01440300	SUPPORT	1	
27	50165400	ALLEN SCREW M 8 X 16	2	
28	01248121	REGULATOR 12 V	1	
28	01425021	REGULATOR 24 V	1	
29	01440100	FASTENING PLATE	1	
30	50380800	CTR. SUNK SCREW M 6 X 10	2	
31	50373700	PLUG SLEEVE HOUSING	1	
32	50373600	PIN TERM. HOUSING 6 WAY	1	
33	50216300	WASHER 5.3	2	
34	50335700	HEXSCREW M 5 X 25	2	
35	50402100	PLUG SLEEVE HOUSING	1	
36	50402000	PLUG SLEEVE HOUSING	1	
37	50358400	STRAP	4	
38	01440200	SUPPORT	1	
42	01470200	CLIP	2	
43	50379700	PLUG SLEEVE HOUSING	1	
44	01439400	WIRING HARNESS	1	
46	40026600	PROTECTION CAP. RUBBER	1	
47	50400300	HEXSCREW M 8 X 40	1	
48	50179900	STAR WASHER	1..2	
49	01430800	BATTERY CABLE PLUS	1	
50	50023000	HEXAGON NUT M 8	3	
51	50426900	SERRATED WASH. A 8.4	1	
52	03814100	INSULATING DISC	2	
53	50426800	TOOTH LOCK J 10.5	1	
54	03814200	INSULATING TUBE	1	
55	50016800	DISC 8.4	2	
56	50275300	HEXSCREW M 8 X 35	1	
57	01430900	BATTERY CABLE MINUS	1	
58	01193401	ELECTRIC WIRE	1	

# HATZ 1D81S ENGINE — INSTRUMENT BOX ASSY.



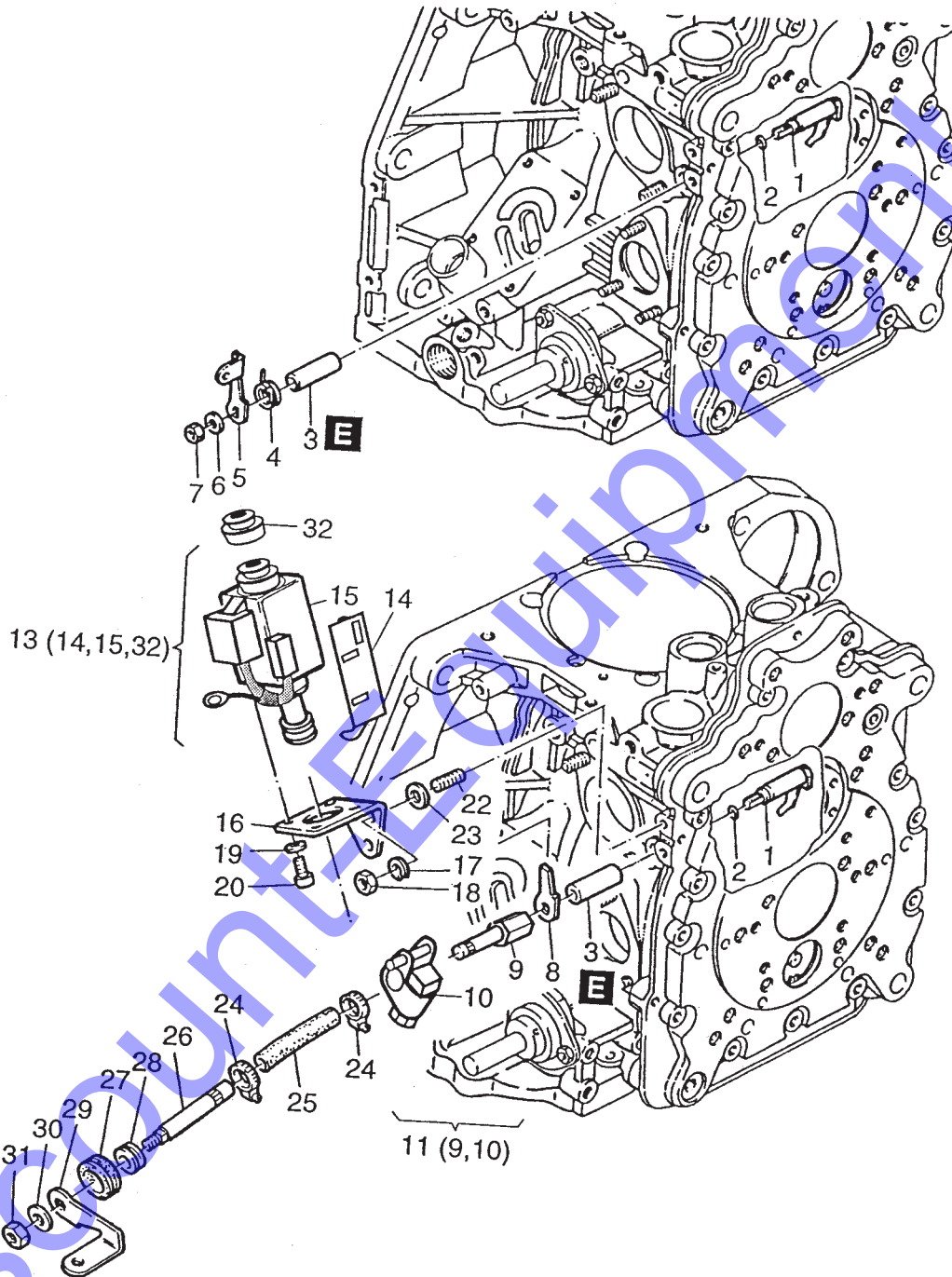
LETTERS IN BOLD INDICATE TYPE OF BONDING ADHESIVE TO BE USED.

D= LOCTITE 221 H= SILICON E= LOCTITE 648

## HATZ 1D81S ENGINE — INSTRUMENT BOX ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	01407000	INSTRUMENT BOX 12 V .....	1 .....	INCLUDES ITEMS W/*
1	01457700	INSTRUMENT BOX 24 V .....	1 .....	INCLUDES ITEMS W/*
2*	40028200	HEX. NUT M5	1	
3*	00716311	INSRTUMENT BOX, ENCL.	1	
4*	50289200	HEXSCREW M 6 X 12	4	
5*	50160800	CLOSING PLUG, PLASTIC	1	
6*	50159010	MALE CABLE COUPLING	1	
7*	50049300	ALLEN SCREW M 5 X 10	3	
8*	50159100	HEXAGON NUT, PLASTIC	1	
9*	50160700	CONNECTING BLOCK	1	
10*	50158800	ALLEN SCREW M 4 X 20	2	
11*	03666700	BRACKET	2	
12*	50147100	HEXAGON NUT M 4	2	
13*	05004300	DECAL F. INST. BOX	1	
14*	50276502	GLOW START. SWITCH .....	1 .....	INCLUDES ITEMS W/%
14	50384401	GLOW STARTSWITCH .....	1 .....	S/N G-1185 AND ABOVE
15*%	50345300	IGN. KEY DS 14603	1	S/N G-1184 AND BELOW
15	50404900	IGN. KEY .....	1 .....	S/N G-1185 AND ABOVE
18%*		KEY SWITCH (S/N G-1184) .....	1 .....	CANNOT BE PURCHASED SEPARATELY
20*	50176501	INDICATOR LAMP, BATTERY	1	
21	50176600	INDICATOR LAMP, OIL	1	
22	50176400	INDICATOR LAMP, TEMP.	1	
24*	40096000	CLOSING PLUG	0.3	
25*	03509211	INSTRU. BOX FRONT	1	
26*	40009700	BULB 12 V 2 W	0.4	
26*	40009800	BULB 24 V 2 W	0.4	
27*	40091400	CLOSING PLUG, PLASTIC	0.2	
28*	01150101	DIODE ASSY.	1	
29*%	49050900	FLAP FOR SWITCHBOX	1	
30*	50276600	PLUG SLEEVE HOUSING	1	
31*	50276700	PLUG SLEEVE HOUSING	1	
32*	01090201	DIODE ASSY.	2	
33*	01089801	DIODE ASSY.	1	
34*	01089901	DIODE ASSY.	1	
35*	50358400	STRAP	1	
36*	50276000	RELAY SOCKET	1	
37*	50275802	MOTOR START RELAY	1	
37*	50275902	RELAY ENG. PROT. 24 V	1	
41	40021300	OIL PRESSURE SWITCH	1	
42#	50268600	TEMP. SWITCH	1	
47	01433601	WIRING HARNESS	1	
48#	05027800	INTERMED. PIECE. TEMP	1	
49#	50001000	JOINT A 10 X 16	1	
50	01475200	TEMP. SWITCH 12 V "C" .....	1 .....	INCLUDES ITEMS W/#

# HATZ 1D81S ENGINE — LIFTING MAGNET/STOP DEVICE ASSY.



LETTERS IN BOLD INDICATE TYPE OF BONDING ADHESIVE TO BE USED.

D= LOCTITE 221 H= SILICON E= LOCTITE 648

# HATZ 1D81S ENGINE — LIFTING MAGNET/STOP DEVICE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	01254602	LEVER CPL.	1	
2	50343300	O-RING 4.6 X 1.85	1	
3	04021400	BUSH	1	
4	04021800	SPRING	1	
5	04021700	LEVER	1	
6	50144500	FLAT WASHER 6.4	1	
7	50328300	HEXAGON NUT M 6	1	
8	05015100	SUPPORT SOLENOID	1	
9#		BUSHING .....	1	CANNOT BE PURCHASED SEPARATELY
10#		LINKAGE .....	1	CANNOT BE PURCHASED SEPARATELY
11	01515300	SHAFT + LEVER STOPMAG .....	1	INCLUDES ITEMS W/#
13	01515500	LIFTING MAGNET 12 V .....	1	INCLUDES ITEMS W/*
14*	05058400	CABLE HOLDER	1	
15*		STOP MAGNET .....	1	CANNOT BE PURCHASED SEPARATELY
16	05023501	CONSOLE	1	
17	50170900	LOCK WASHER 6	2	
18	50144400	HEXAGON NUT M 6	2	
19	50216300	WASHER 5.3	3	
20	50112600	ALLEN SCREW M 5 X 10	4	
22	50366800	STUD M 6 X 12	2	
23	50114300	DISC 6.4	2	
24	40037300	CLAMP 8-12	2	
25	03999001	FUEL HOSE 7/70	1	
26	03996600	SHAFT	1	
27	03565400	RUBBER SLEEVE	1	
28	05069200	BUSH F. BELT TENSION	1	
29	04021700	LEVER	1	
30	50144500	WASHER	1	
31	50328300	HEXAGON NUT M6	1	
32*	50248900	BELLOWS	1	



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