

OPERATION AND PARTS MANUAL



Vibratory Walk-Behind Roller *Mikasa* Model MDR-9DYE (Yanmar Diesel)

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Revision #0 (12/19/03)



MULTIQUIP INC.

18910 WILMINGTON AVE.
CARSON, CALIFORNIA 90746
310-537-3700
800-421-1244
FAX: 310-537-3927

E-mail: mq@multiquip.com • **www:** www.multiquip.com

Atlanta • Boise • Dallas • Houston • Newark
Montreal, Canada • Manchester, UK
Rio De Janeiro, Brazil • Guadalajara, Mexico

PARTS DEPARTMENT:

800-427-1244
FAX: 800-672-7877
SERVICE DEPARTMENT/TECHNICAL ASSISTANCE:
800-478-1244
FAX: 310-631-5032



WARNING



CALIFORNIA — Proposition 65 Warning

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

HERE'S HOW TO GET HELP

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

MULTIQUIP'S MAIN PHONE NUMBERS

800-421-1244 FAX: 310-537-3927
310-537-3700

PARTS DEPARTMENT

800-427-1244 FAX: 800-672-7877
310-537-3700 FAX: 310-637-3284

MAYCOPARTS

800-306-2926 FAX: 800-672-7877
310-537-3700 FAX: 310-637-3284

SERVICE DEPARTMENT

800-478-1244 FAX: 310-537-4259
310-537-3700

MQ POWER SERVICE DEPARTMENT

800-835-2551 FAX: 310-638-8046
310-537-3700

TECHNICAL ASSISTANCE

800-478-1244 FAX: 310-631-5032

WARRANTY DEPARTMENT

800-421-1244, EXT. 279 FAX: 310-537-1173
310-537-3700, EXT. 279

MIKASA MDR-9DYE-VIBRATORY ROLLER

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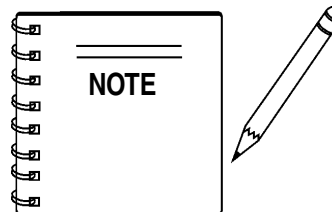
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Specification and part number are subject to change without notice.

When ordering parts, please supply the following information:

- Dealer account number
- Dealer name and address
- Shipping address (if different than billing address)
- Return fax number
- Applicable model number
- Quantity, part number and description of each part
- Specify preferred method of shipment:
 - ✓ FedEx or UPS Ground
 - ✓ FedEx or UPS Second Day or Third Day
 - ✓ FedEx or UPS Next Day
 - ✓ Federal Express Priority One
 - ✓ DHL
 - ✓ Truck

Note: Unless otherwise indicated by customer, all orders are treated as "Standard Orders", and will ship within 24 hours. We will make every effort to ship "Air Shipments" the same day that the order is received, if prior to 2PM west coast time. "Stock Orders" must be so noted on fax or web forms.



Here's how to get help...

Please have the model and serial number on hand when calling.

Parts Department

800-427-1244 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Mayco Parts

800-306-2926 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Service Department

800-478-1244 Fax: 310-537-4259
310-537-3700

MQ Power Service Department

800-835-2551 Fax: 310-638-8046
310-537-3700

Technical Assistance

800-478-1244 Fax: 310-631-5032

Warranty Department

800-421-1244, Ext. 279 Fax: 310-537-1173
310-537-3700, Ext. 279

Multiquip's Main Phone Numbers

800-421-1244 Fax: 310-537-3927
310-537-3700

Place Your Parts Order Via Web or Fax For Even More Savings!

Extra Discounts!

All parts orders which include complete part numbers and are received by our automated web parts order system, or by fax qualify for the following extra discounts:

Ordered via	Standard orders	Stock orders (\$750 list and above)
Fax	3%	10%
Web	5%	10%

Special freight allowances when you order 10 or more line items via Web or Fax! **

FedEx Ground Service **at no charge for freight**
No other allowances on freight shipped by any other carrier.

NOTE: DISCOUNTS ARE SUBJECT TO CHANGE



MULTIQUIP INC.
18910 WILMINGTON AVENUE
POST OFFICE BOX 6254
CARSON, CALIFORNIA 90749
310-537-3700 • 800-421-1244
FAX: 310-537-3927
E-MAIL: mq@multiquip.com
WWW: multiquip.com

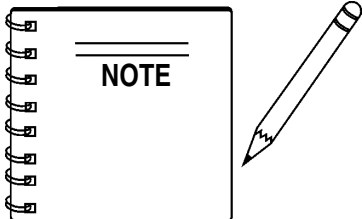
**Direct TOLL-FREE access
to our Parts Department:**

Toll-free nationwide — 800-427-1244

MDR-9DYE — SAFETY MESSAGE ALERT SYMBOLS

FOR YOUR SAFETY AND THE SAFETY OF OTHERS!

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.



This Owner's Manual has been developed to provide complete instructions for the safe and efficient operation of the Multiquip Model MDR-9DYE Vibration Roller. Refer to the engine manufacturer's instructions for data relative to its safe operation.

Before using this vibratory roller, ensure that the operating individual has read and understands all instructions in this manual.

SAFETY MESSAGE ALERT SYMBOLS

The three (3) 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 three words: **DANGER**, **WARNING**, or **CAUTION**.



DANGER: You **WILL** be **KILLED** or **SERIOUSLY** injured if you do not follow directions.



WARNING: You **CAN** be **KILLED** or **SERIOUSLY** injured if you do not follow directions.



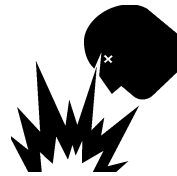
CAUTION: You **CAN** be injured if you do not follow directions.

Potential hazards associated with this vibratory roller operation will be referenced with Hazard Symbols which appear throughout this manual, and will be referenced in conjunction with Safety Message Alert Symbols.

HAZARD SYMBOLS



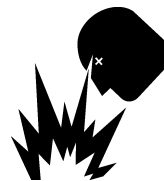
Lethal Exhaust Gases



Engine exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled. **NEVER** operate this equipment in a confined area or enclosed structure that does not provide ample free flow air.



Explosive Fuel



Diesel fuel is extremely flammable, and its vapors can cause an explosion if ignited. **DO NOT** start the engine near spilled fuel or combustible fluids. **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 approved containers, in well-ventilated areas and away from sparks and flames. **NEVER** use fuel as a cleaning agent.



Burn Hazards



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



Rotating Parts



NEVER operate equipment with covers, or guards removed. Keep fingers, hands, hair and clothing away from all moving parts to prevent injury.

MDR-9DYE — SAFETY MESSAGE ALERT SYMBOLS

Accidental Starting



OFF

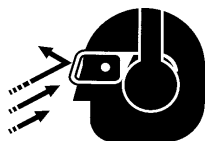
ALWAYS place the engine ON/OFF switch in the **OFF** position, when the vibration roller is not in use.

Respiratory Hazard



ALWAYS wear approved respiratory protection.

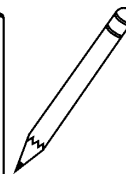
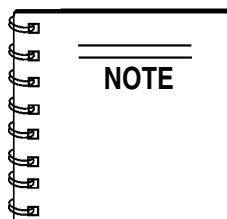
Sight and Hearing hazard



ALWAYS wear approved eye and hearing protection.

Equipment Damage Messages

Other important messages are provided throughout this manual to help prevent damage to your vibration roller, other property, or the surrounding environment.



This vibratory roller, other property, or the surrounding environment could be damaged if you do not follow instructions.

MDR-9DYE — RULES FOR SAFE OPERATION

CAUTION:



Failure to follow instructions in this manual may lead to serious injury or even death! This equipment is to be operated by trained and qualified personnel only! This equipment is for industrial use only.

The following safety guidelines should always be used when operating the MIKASA MDR-9DYE Vibratory Roller.

GENERAL SAFETY

- **DO NOT** operate or service this equipment before reading this entire manual.



- This equipment should not be operated by persons under 18 years of age.

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, steel-toed boots and other protective devices required by the job. **ALWAYS** wear slip resistant safety shoes or boots.



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



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

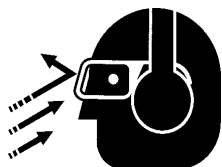


- **NEVER** use accessories or attachments, which are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.

- Manufacturer does not assume responsibility for any accident due to equipment modifications.

- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.

- **ALWAYS** wear proper respiratory (mask), hearing and eye protection equipment when operating the vibratory roller.

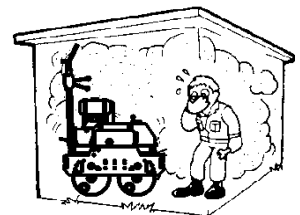


- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing engine or vibratory roller.



- **High Temperatures** – Allow the engine to cool before adding fuel or performing service and maintenance functions. Contact with *hot* components can cause serious burns.

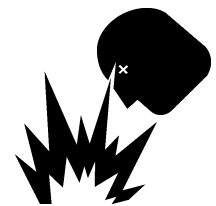
- The engine of this vibratory roller requires an adequate free flow of cooling air. **NEVER** operate the vibratory roller in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause serious damage to the vibratory roller or engine and may cause injury to people and property. Remember the roller's engine gives off **DEADLY** gases.



- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.

- **ALWAYS** use extreme caution when working with **flammable** liquids. When refueling, **stop the** engine and allow it to cool. **DO NOT** smoke around or near the machine. Fire or explosion could result from fuel vapors, or if fuel is spilled on a hot engine.

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



- Topping-off to filler port is dangerous, as it tends to spill fuel.

- **ALWAYS** store the vibratory roller in a clean, dry location out of the reach of children.

- **NEVER** run engine without air cleaner. Severe engine damage may occur.

- **NEVER** leave the vibratory roller unattended, turn off engine.

- **CAUTION** must always be observed while servicing this vibratory roller. Rotating parts can cause injury if contacted.

- **DO NOT** leave vibratory roller with engine running. Use chock blocks if parking vibratory roller on a grade.

MDR-9DYE — RULES FOR SAFE OPERATION

- **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.

Loading and Unloading (Crane)

- Before lifting, make sure that machine parts (hook and vibration insulator) are not damaged and screws are not loosened or lost.
- Always make sure crane or lifting device has been properly secured to the hook of guard frame on vibratory roller.
- **NEVER** lift the machine while the engine is running.
- Use adequate lifting cable (wire or rope) of sufficient strength.
- Use one point suspension hook and lift straight upwards.
- **NEVER** allow any person or animal to stand underneath the machine while lifting.
- Try not to lift machine to unnecessary heights.

Transporting

- Always shutdown engine before transporting.
- Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
- Drain fuel when transporting vibratory roller over long distances or bad roads.
- Always tie-down the vibratory roller during transportation by securing the roller's guard frame with rope.

Emergencies

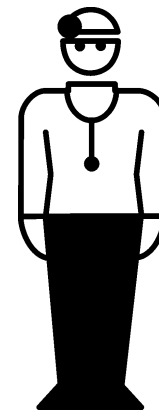
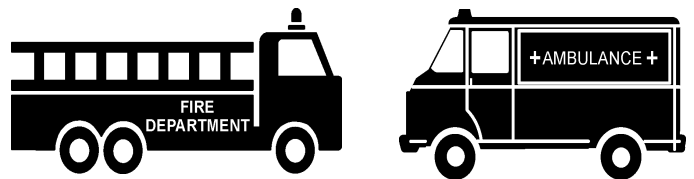
- **ALWAYS** know the location of the nearest **fire extinguisher**.



- **ALWAYS** know the location of the nearest and **first aid kit**.



- In emergencies **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.

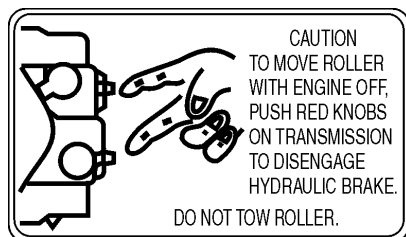


Maintenance Safety

- **NEVER** lubricate components or attempt service on a running machine.
- **ALWAYS** allow the machine a proper amount of time to cool before servicing.
- Keep the machinery in proper running condition.
- Fix damage to the machine immediately and always replace broken parts.
- 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.

MDR-9DYE — OPERATION AND SAFETY DECALS

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



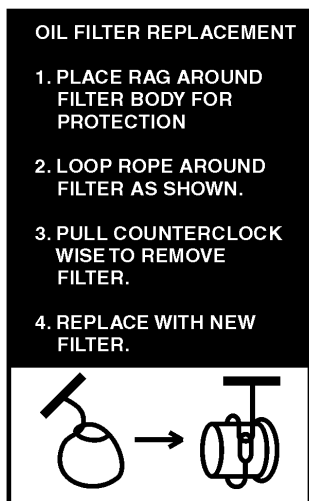
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Mikasa

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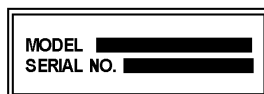
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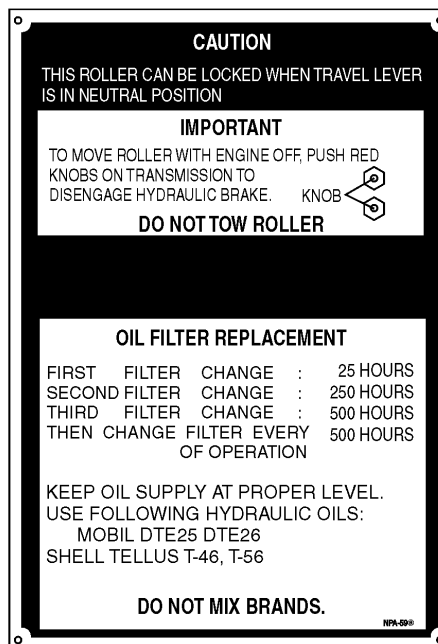
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CONTACT SERVICE DEPT.



P/N: 902000591



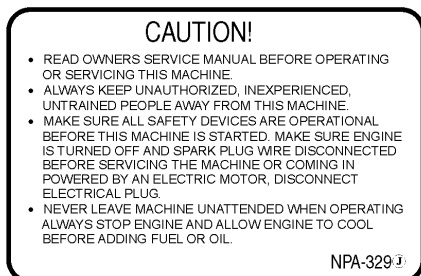
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P/N:920100120



P/N: 920200320



P/N:920203290



P/N: 920200470



P/N:920201100

Figure 1. Operation and Safety Decals

MDR-9DYE — SPECIFICATIONS

Table 1. MDR-9DYE VIBRATORY ROLLER SPECIFICATIONS

Centrifugal Force	6,600 lbs. (3,000 kg)
Vibration Frequency	3,000 vpm
Traveling Speed (forward and reverse)	0 to 1.8 mph (0 to 3 km/hr)
Grade Ability	25°
Diameter x Width of Roller	18 x 27.6 in (457 x 700 cm)
Wheel Base	22.4 in (570 mm)
Side Road Clearance	10.8 in (274 mm)
Length (with Handle)	111.8 in (2,840 mm)
Width	31.3 in (795 mm)
Height	44.1 in (1,120 mm)
Total Weight	1,940 lbs. (880 kg)
Working Input Revolution	2,000 rpm
Continuous Rated Pressure	1,500 psi (105 kg/cm ²)
Oil Tank Capacity	4 gallons (15 liters)
Water Tank Capacity	6 gallons (23 liters)
Working Ability	2,100 m ² /hr

Table 2. ENGINE SPECIFICATIONS

	Model	YANMAR L100EE-DEVK2
Engine	Type	Air-cooled 4 stroke, Single Cylinder, Diesel Engine
	Bore X Stroke	3.46 in. X 2.75 in. (88 mm x 70 mm.)
	Displacement	24.77 cu-in (406 cm ³)
	Max Output	10.0 H.P./3600 R.P.M.
	Fuel Tank Capacity	1.45 gallons (5.5 liters)
	Fuel	Diesel #2
	Lube Oil Capacity	1.75 quarts (1.65 liters)
	Oil Alert System	Yes
	Starting Method	Electric/Recoil Start
Dimension (L x W x H)		16.4 x 18.5 X 19.4 in. (417 X 470 X 494 mm.)
Dry Net Weight		116.6 lbs. (53 Kg.)

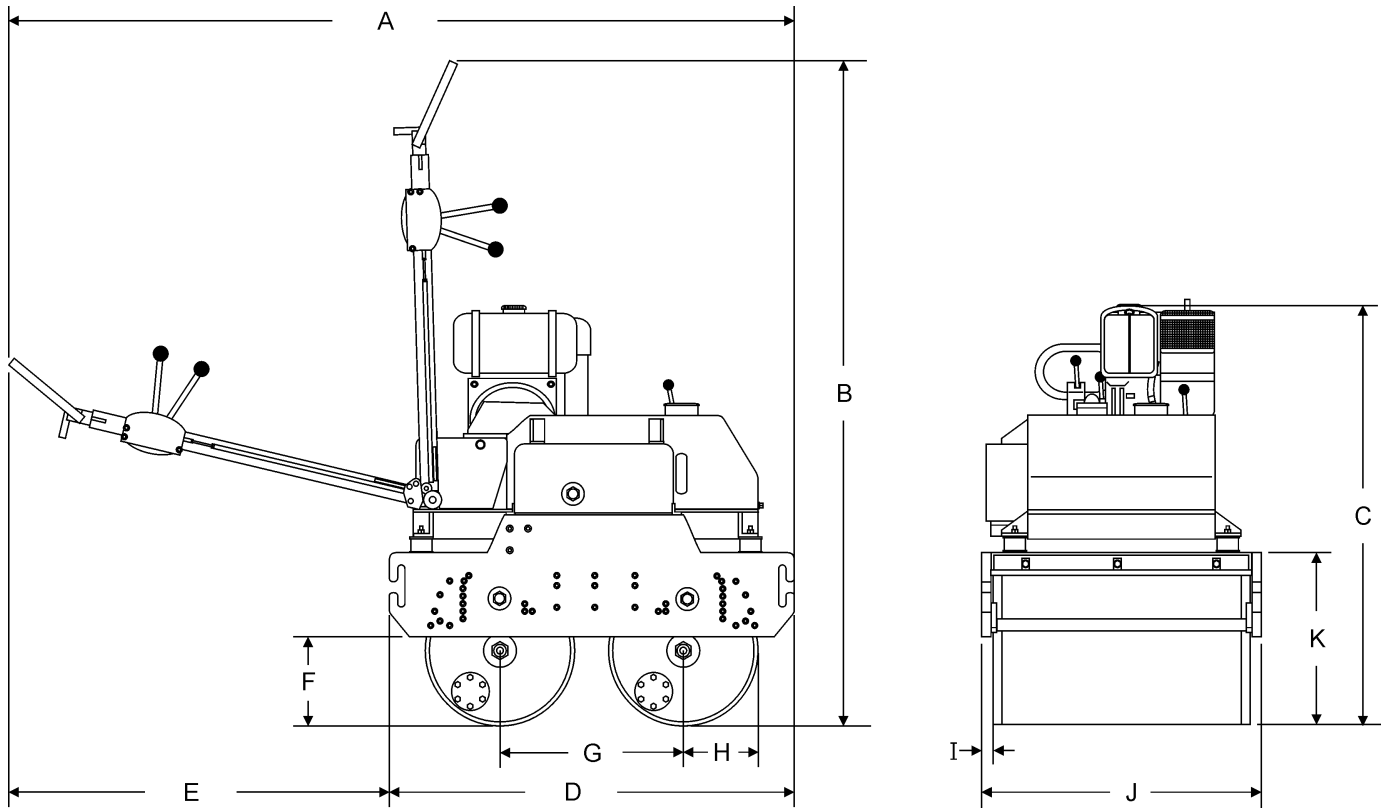


Figure 2. MDR-9DYE Vibratory Roller Dimensions

TABLE 3. ROLLER DIMENSIONS

REF.	DIMENSIONS	REF.	DIMENSIONS
A	111.8 in. (2.8 meters)	F	22.4 in. (.57 meters)
B	88 in. (2.23 meters)	G	18 in. (.457 meters)
C	46 in. (1.17 meters)	H	15.5 in. (.382 meters)
D	45.9 in. (1.16 meters)	I	5.4 in. (.137 meters)
E	11 in. (.279 meters)		

MDR-9DYE — GENERAL INFORMATION

The Mikasa Model MDR-9DYE is a powerful compacting tool capable of applying a tremendous force in consecutive impacts to a soil surface. With 28-inch drums and 32 inches overall width, virtually any asphalt or mixed granular soil compaction job is quickly cut down to size.

The impact force of the MDR-9DYE levels and uniformly compacts voids between soil particles to increase dry density.

Features include:

- Hydraulic variable speed transmission assures easy handling.
- Deadman device which when pressed or hit will cause the travel lever to return to neutral position bringing the machine to a stop.
- Non-corrosive water tank for the sprinkler system with a capacity of 6 gallons.
- Simple dual-lever controls assure operator safety and convenience.
- Sight gauge for hydraulic oil tank.
- Front -mounted auxiliary travel lever.
- Four large rubber shock mounts minimize vibrations to the engine and hydraulics.
- Convenient tie-downs, front and rear.
- Scraper Bar.
- Drum sprinkler system.
- Handle folds to 90 degrees for storage and transport..

FREQUENCY/SPEED

The vibrating roller maximum frequency is 3000 vpm (vibrations per minute). The forward and reverse travel speed of the vibratory roller is approximately 1.8 mph (3 km/hour).

ENGINE

The Mikasa MDR-9DYE Vibratory Roller is equipped with a YANMAR L100EE-DEVK2.

CONTROLS

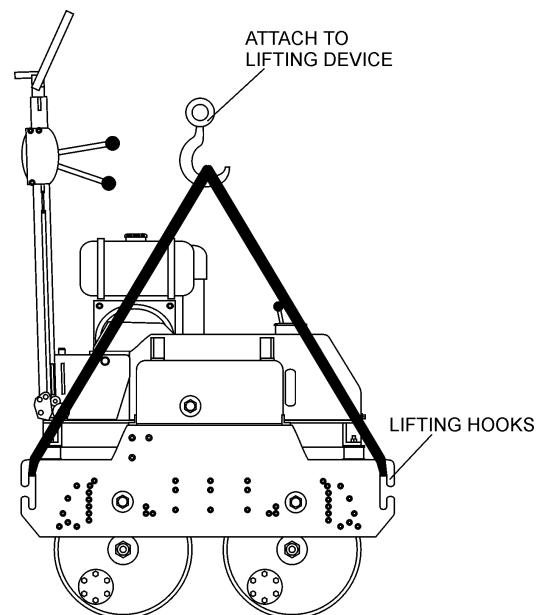
Before starting the MDR-9DYE Vibratory Roller, identify and understand the function of the controls and components as indicated in Figure 6.

TRANSPORTATION

Adjustable transport hooks allow an operator to place the roller on the tailgate of a dump truck without any assistance. The control handle of the MDR-9DYE Vibratory Roller can be folded vertically for ease of transport and storage.

LIFTING THE ROLLER

When lifting of the roller is required (Figure 3), attach a suitable hook or shackle to the **lifting hooks** of the roller. Make sure the lifting device is capable of lifting 1,940 lbs (880 kg).



NOTE: USE LIFTING HOOKS ON BOTH SIDES WHEN LIFTING

Figure 3. Lifting The Roller

MDR-9DYE — GENERAL INFORMATION

CAUTION :



NEVER! stand under, or get onto the roller while it is being lifted or moved.

CAUTION :



ONLY! use steel ropes or chains that are capable of lifting at least 1,940 lbs. (880 kg).

CAUTION :



NEVER! use any other part of the roller for lifting purposes. Use the lifting eye. Using other parts of the roller for lifting will cause severe damage to the roller,

OPERATING ON SLOPES

Special care must be taken when operating the roller on hills or slopes. There exist the possibility of serious injury to the operator and severe damage to the roller in the event of a roll over. **ALWAYS** operate the roller up and down hills rather than from side to side. For safe operation hillside slopes should not exceed 12 degree (21 % grade). See Figure 4 below.

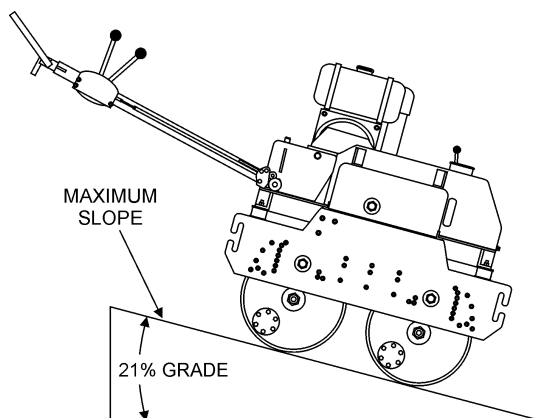


Figure 4. Recommended Slope

Tipping (Rollovers)

NEVER! operate the roller on side slopes (Figure 5). The possibility exist that the roller could tip over (roll over), thus causing bodily harm even death and serious damage to the equipment.

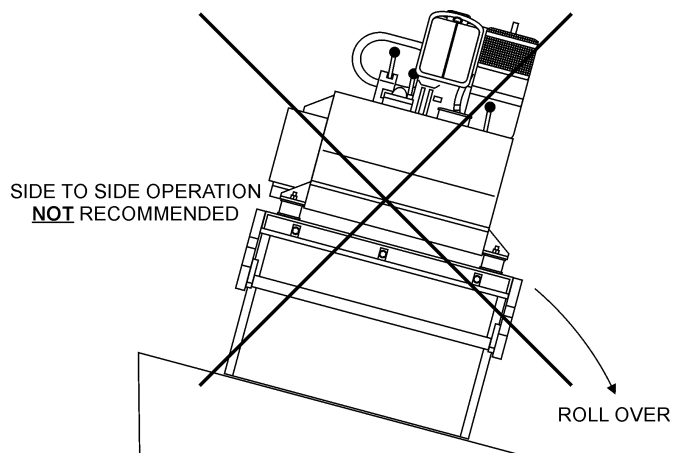


Figure 5. Recommended Slope

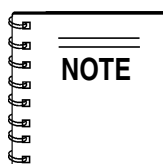
In the event the roller does tip over, extreme care must be taken to prevent damage to the engine. When the roller has been tipped over, oil from the engine crankcase can flow into the combustion chamber, which can severely damage the engine the next time it is started.

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

CAUTION :



To prevent damage to the engine after a rollover, the unit must **NOT** be started. **NEVER** start a unit after a rollover. **CONTACT** your nearest authorized Multiquip dealer for instructions or servicing.



NEVER! operate the roller on *side slopes*. The roller may tip over causing injury to personnel and severe damage to the equipment

MDR-9DYE — VIBRATORY ROLLER COMPONENTS

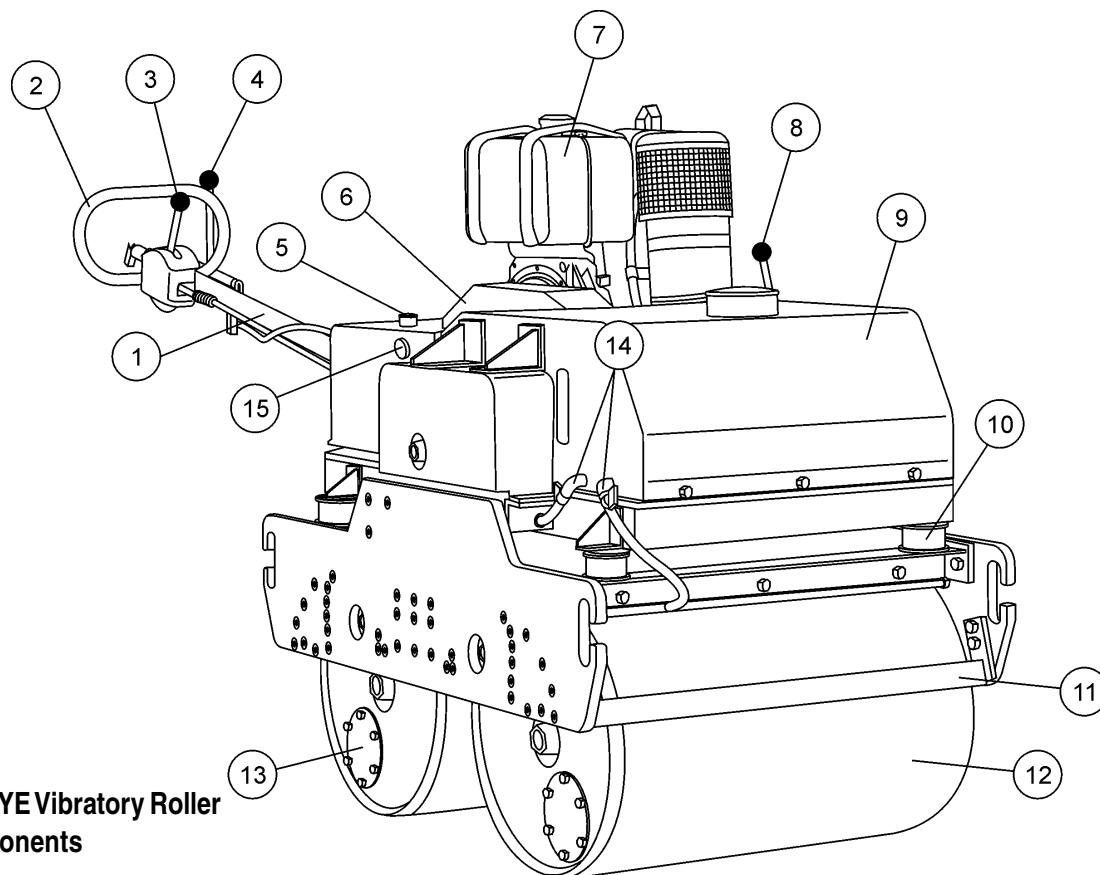


Figure 6. MDR-9DYE Vibratory Roller Components

Figure 6 illustrates the location of the major components for the MDR-9D Vibratory Roller. The function of each component is described below:

1. **Handle Bar** – When operating the roller, this handle is to be in the downward position. When the roller is to be **stored**, move the handle bar to the upright position.
2. **Hand Grip** – When operating the roller, use this hand grip to maneuver the roller. Also has dead man device, when pressed or hit while traveling in reverse, causes the travel lever to return to neutral position to stop the machine.
3. **Travel Lever** – **Push** the lever forward, the roller will move in a forward direction, **pull** the lever backwards, the roller will move in backwards direction. Placing the lever in the middle (midway) will cause the roller not to move (neutral).
4. **Vibrator Lever** – Turns the vibration on and off.
5. **Hydraulic Oil Tank/Cap** – Stores hydraulic fluid. Open cap to fill with recommended hydraulic oil (Shell Tellus #46).
6. **V-Belt Cover** – Remove this cover to gain access to the v-belts. **NEVER** run the vibratory roller 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.
7. **Engine** – This vibratory roller uses a **YANMAR L100EE-DEVMK2** diesel engine. Refer to the owner's manual for engine information and related topics.
8. **Vibrator Lever (on the body of machine)** – Turns the vibration on and off.
9. **Water Tank** – Holds 6 gallons (23 liters) of water for the sprinkler system.
10. **Shock Absorber** -
11. **Scraper Bar** – This bar helps prevent buildup of material between the drum and the frame.
12. **Vibration Rollers** – 18-inch diameter steel drums that provide the compaction force in the compaction and patching of asphalt-type surfaces.
13. **Checking Cover for Chains** – Take off the cover to check and lubricate chains.
14. **Water Valves**– Turn on the water sprinkling system.
15. **Hydraulic Oil Gauge** – Indicates the hydraulic oil level.

MDR-9DYE — YANMAR L100EE-DEVMK2 ENGINE COMPONENTS

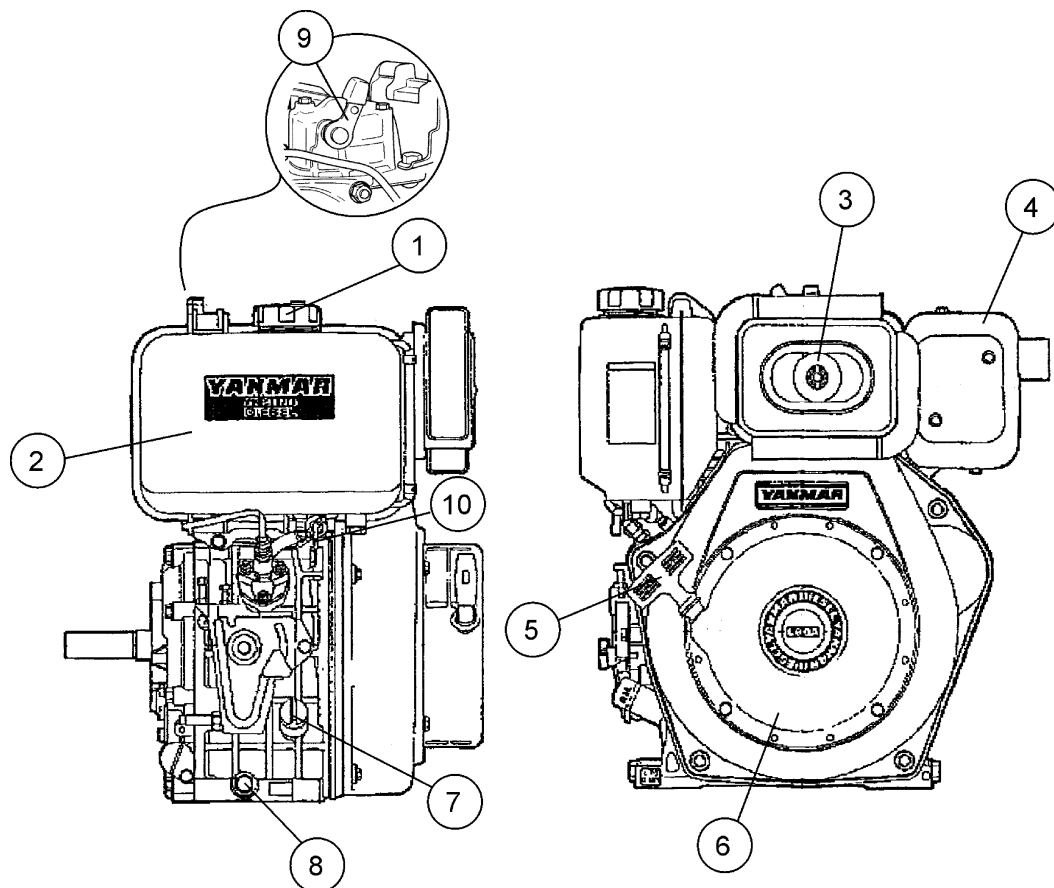


Figure 7. YANMAR L100EE-DEVMK2 Engine Components

ENGINE COMPONENTS

Figure 7 illustrates the location of the major engine components of the Yanmar engine. Each component is described below:

1. **Fuel Filler Cap** – Remove this cap to add unleaded gasoline to the fuel tank. Make sure cap is tighten securely. **DO NOT** over fill.
2. **Fuel Tank** – Diesel engine holds 5.8 quarts of diesel fuel.
3. **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.
4. **Muffler** – Used to reduce noise and emissions.
5. **Recoil Starter (pull rope)** – Type of engine starting method. Alternate type would be electric start (ignition key).
6. **Recoil Starter** – Housing for pull rope and starter.
7. **Oil Filler Cap/Dipstick** – Remove this cap to add oil to the oil tank. Use dipstick to check oil level.
8. **Oil Drain Plug** – Unscrew plug to drain oil from engine crankcase. Dispose of oil in a safe manner.
9. **Decompression Lever** – Press down before starting engine. To prevent damage to the engine, **DO NOT** use for any other purpose.
10. **Fuel Cock** – Controls the flow of diesel fuel to the engine. Must be in the **ON** position when starting and running the engine.

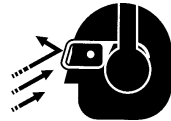
CAUTION :



Never operate the vibratory roller in a confined area or enclosed structure that does not provide ample *free flow of air*.



ALWAYS wear approved eye and hearing protection before operating the vibratory roller.



BEFORE STARTING

1. Read safety instructions 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 vibratory roller, removing dirt and dust, particularly, the bottom of the plate, engine cooling air inlet.



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 8).

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.

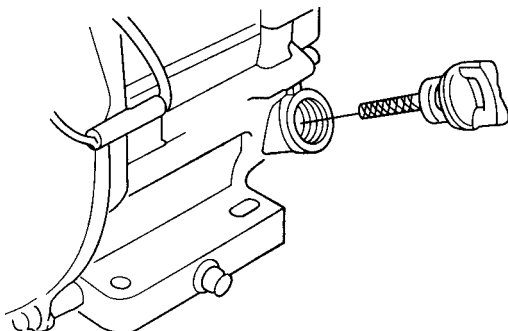


Figure 8. Oil Dipstick

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 1.6 quarts (1.1 liters).

TABLE 4. OIL TYPE

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

Explosive Fuel

DANGER



Diesel fuel is highly flammable and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the vibratory roller if the engine is *hot!* or *running*.



CHECKING 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 9).
3. When refueling, be sure to use a strainer for filtration. **DO NOT** top-off fuel. Wipe up any spilled fuel.

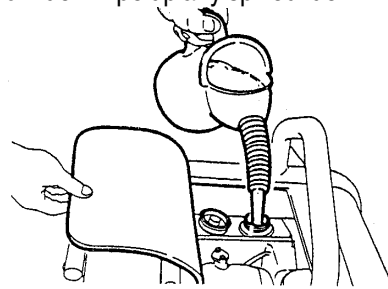
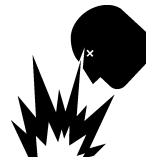


Figure 9. Refueling

DANGER



Fuel spillage on a hot engine can cause a *fire* or *explosion*. If fuel spillage occurs, wipe up the spilled fuel completely to prevent fire hazards. **NEVER!** smoke around or near the roller.



CHECKING HYDRAULIC SYSTEM

1. Check the oil tank level gauge (Figure 10). Oil level should be at the middle indication of the gauge or higher. Fill as required
2. Check the surroundings of the oil tank, hydraulic pump and motor for oil leakage.

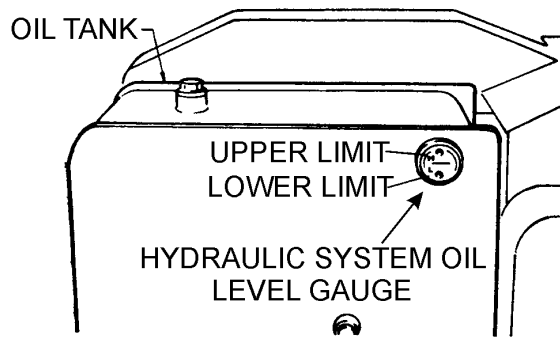


Figure 10. Hydraulic System Oil Level Gauge

DANGER



ALWAYS keep hands and fingers away from pinch points. **DO NOT** allow anyone to reach in on dangerous sections of the machine to avoid any accidents.

CHECKING THE V-BELT

1. Check all bolts and screws and make sure all are securely tightened.
2. Check V-belt for proper tension. The normal slack should be approximately 1/8 inch (3 to 5 mm) when the belts are forcibly depressed between the two sheaves (Figure 11). Insufficient tension causes weak vibration and machine damage.

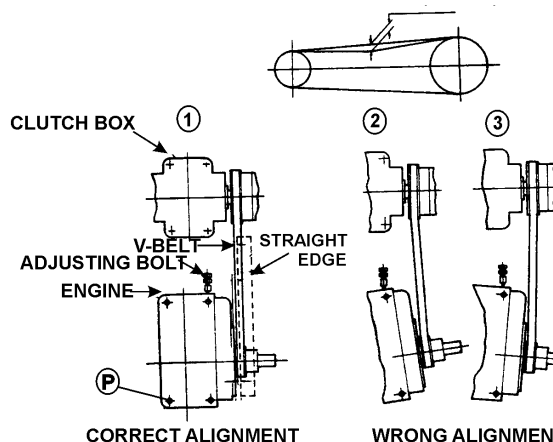


Figure 11. V-Belt Tension

CHECKING THE CLUTCH BOX OIL LEVEL

1. Check clutch box for any oil leakage.
2. Remove the level plug and check oil level (Figure 12).
3. Add oil if necessary.

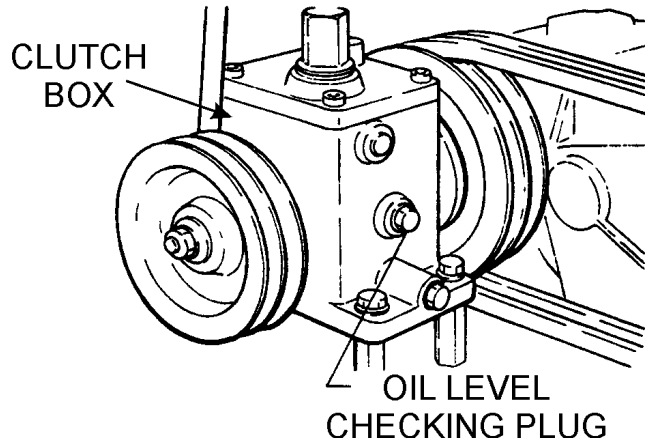


Figure 12. Clutch Box Oil Level Check

CHECKING THE VIBRATOR OIL LEVEL

1. Remove the red filler plug and the oil level inspection hole plug from the vibrator case (Figure 13).
2. Fill with oil until oil overflows from inspection hole.

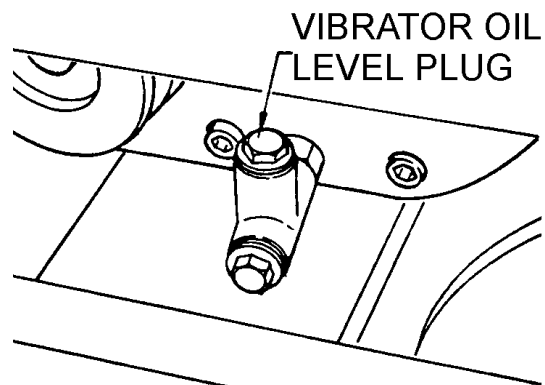


Figure 13. Vibrator Oil Level Check

CHECKING WATER TANK

1. Check the water tank to see if filled. Add water if necessary. The water tank has a capacity of approximately 6 gallons (23 liters) (Figure 14).

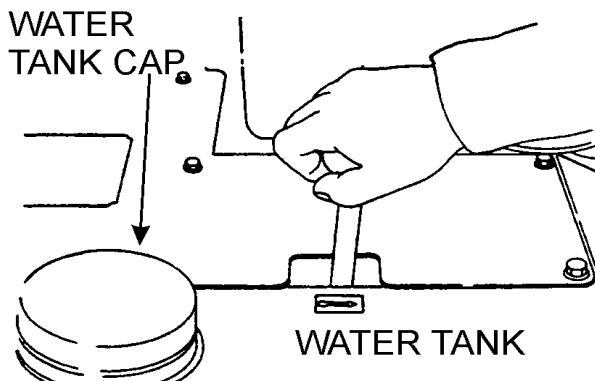


Figure 14. Water Tank Check

CAUTION :



Be careful not to confuse the water tank with the oil tank.

CHECKING LEVERS

1. Check travel and vibrator levers to make sure they are functioning properly (Figure 6).
2. With travel lever placed in reverse, push the deadman device and verify that the travel lever returns to neutral position. The travel lever stays in neutral position once the deadman device is released.

CHECKING SCRAPER BAR

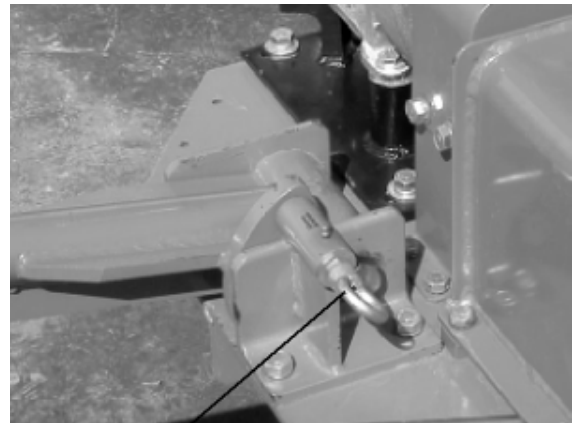
1. Check scraper bar and make sure that they are not clogged with mud, bent or damaged (Figure 6).
2. Adjust clearance between drums and scrapers as necessary.

CHECKING BOLTS, NUTS, AND SCREWS

1. Check bolts, nuts, and screws on various parts of the machine, including the engine, for proper tightness.

POSITIONING THE HANDLE BAR

1. Release the handle bar release pin (Figure 15) and position the handle bar to the lowered position before starting operation.
2. When machine is not in use, release the handle bar release pin and position the handle bar to the upright position.



Handle Bar Release Pin

Figure 15. Handle Bar Positioning

INITIAL STARTUP (ENGINE)

Electric Start

1. On the handle bar:
 - A. Move the *travel lever* to the **NEUTRAL** position.
 - B. Move the *vibrator lever* to the **OFF** position.
2. Open the fuel cock by turning it clockwise to the down position (Figure 16).

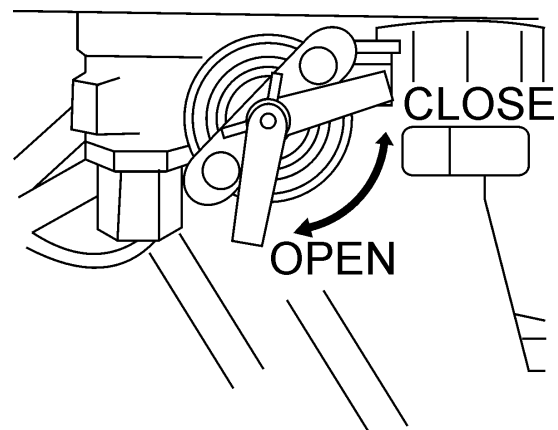


Figure 16. Open Fuel Cock

3. Insert the starter key into the key switch and turn it to the **RUN** position (Figure 17).

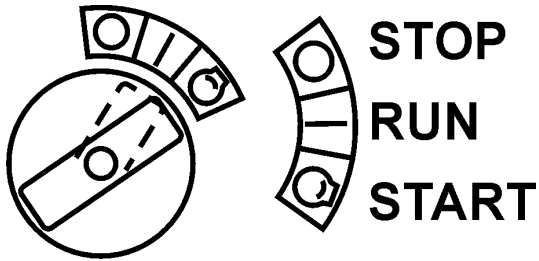


Figure 17. Starter Key

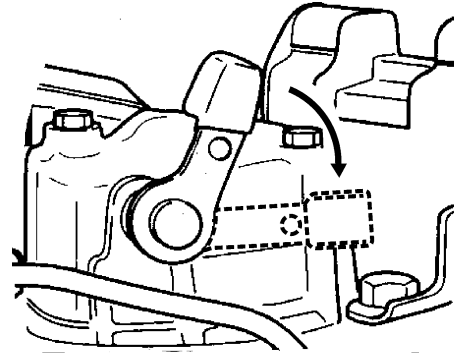
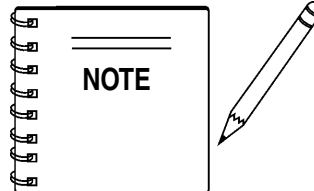


Figure 19. Decompression Lever

4. Turn the starter key further to the right to the **START** position to start the engine.
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 20 to 30 seconds before starting again.
6. After starting the engine, continue to warm up the engine for about 3 to 10 seconds especially in cold weather.



When starting with a motor starter, a decompressor is not normally required. However, when ambient temperature or battery charger level is low, use of a decompressor will help make the start-up easier.

Recoil Start

1. Open the fuel cock by turning it clockwise to the down position (Figure 16).
2. Pull the starting handle slowly until you feel some resistance (Figure 18). Return handle to original position.

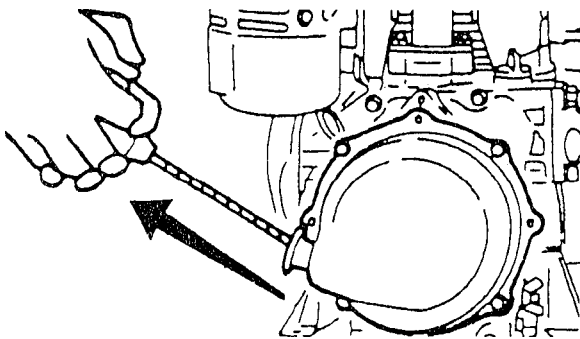


Figure 18. Engine Start Handle

3. Push down the decompression lever (Figure 19).
4. Pull the starting handle hard and fast to start engine.
5. If the engine does not start, repeat steps 2 through 4.

TRAVELING CAUTION :



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

1. To make the roller move in the forward direction push the travel lever (Figure 20) forward. This roller has a hydraulic variable speed transmission. By moving the travel lever various increments, you can vary the speed from 0 to 1.8 mph (0 to 3 km/hr).

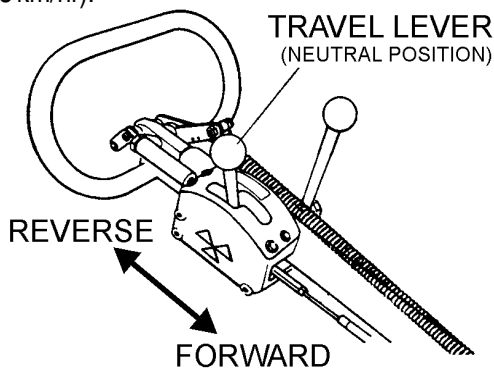


Figure 20. Travel Lever

2. To make the roller move in the reverse direction pull the travel lever (Figure 20) backwards.
3. Firmly grasp the roller's hand grip, the roller will begin moving in the desired position when the direction lever has been placed in the desired position.

CAUTION :



DO NOT reduce speed during work. When shifting travel lever from forward to reverse, be sure to stop the lever at the neutral position first before moving the lever to the opposite direction. **DO NOT** shift the lever from forward to reverse (or reverse to forward) in one motion.

CAUTION :



After test travel, shut down engine and check for any problems including oil leakage. If any trouble is found, correct the problem before attempting to operate the roller again.

VIBRATING

1. Shift the two vibrator levers (Figures 21 and 22) to the vibrate position to start vibrations.

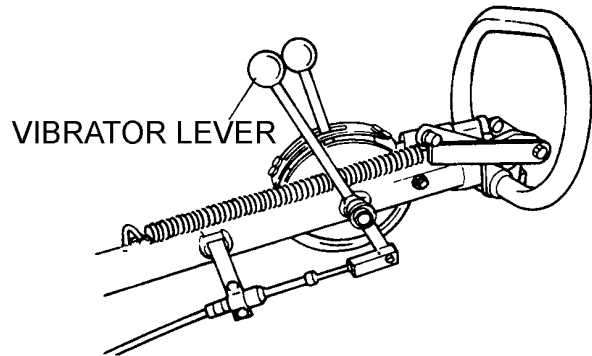


Figure 21. Vibrator Lever

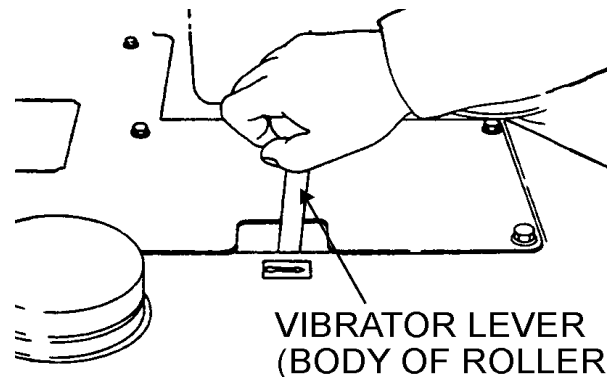


Figure 22. Vibrator Lever (Body)

CAUTION :



Using vibration with clutch slipping causes the clutch to burn. Also, vibration should **NOT** be used over completely compacted area, paved road surface, or with stationary roller.

WATERING

1. To operate water sprinkling system, turn on the front and rear water valves on the side of the roller. (Figure 23).

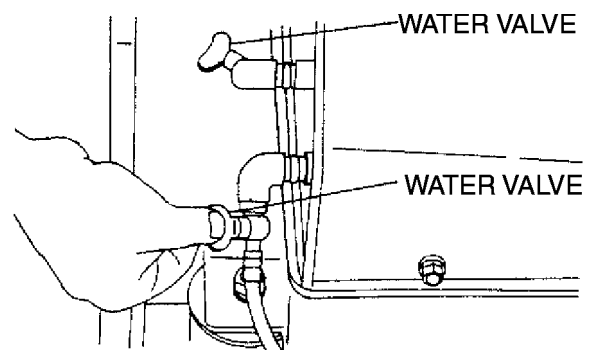


Figure 23. Water Valves

STOPPING

1. Place the vibrator and travel levers to the neutral position.
2. Slow down the engine and allow to cool for at least 2 minutes. In an electric start, return the key switch to the STOP position as soon as the engine stops.

CAUTION :



Neglecting to return the key switch to the STOP position will cause the battery to discharge, making start-up impossible the next time.

3. After the engine stops, close the fuel cock.
4. The hydraulic brake is automatically engaged when the travel lever is in neutral position. When parked on a slope with the engine turned off, place a block against the roller drum to prevent the roller from moving.

UNLOADING

1. If you need to move the roller by pushing it manually once engine is stopped, push in the upper and lower knobs of the transmission check valve. This will cause the hydraulic break to disengage and allow the roller to be moved without causing damage (Figure 24).

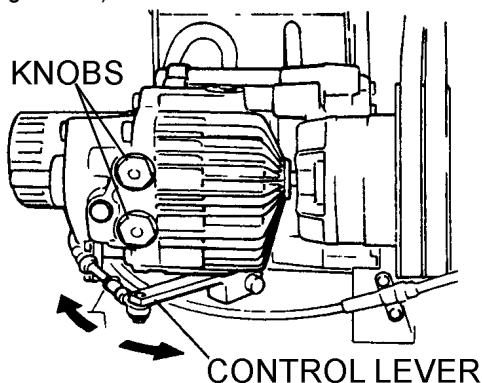


Figure 24. Disengaging Hydraulic Brake

2. After moving, reset upper and lower knobs.

CAUTION :



NEVER tow roller with any type of vehicle. Doing so will damage the hydraulic system.

NEVER perform unloading procedure on a slope. This may cause roller to roll down if parking brake or blocking is deficient.

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 vibratory roller is always in good working condition before using, carry out the maintenance inspection in accordance with Tables 5 through 7.

TABLE 5. MDR-9DYE 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)	
Chain Tension Adjustment	Every 50 hours	See page 26
Hydraulic Oil Filter Replacement	Initially after 25 hours, then every 250 hours (2 months), every 500 hours (4 months), every 1,000 hours thereafter.	See page 28
Hydraulic Oil Check	Initially, every 4 to 5 hours. After one week, twice a day. After 2 weeks, once a day.	See page 27
Hydraulic Oil Replacement	Every 1,000 to 1,500 hours	See page 27
Vibration Clutch Check	As necessary	See page 27

CAUTION:



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

TABLE 6. MDR-9DYE 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 6 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 roller.
- Check the levers, cables and linkage.
- Check engine oil.

ENGINE OIL REPLACEMENT

1. Replace engine oil in the first 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.

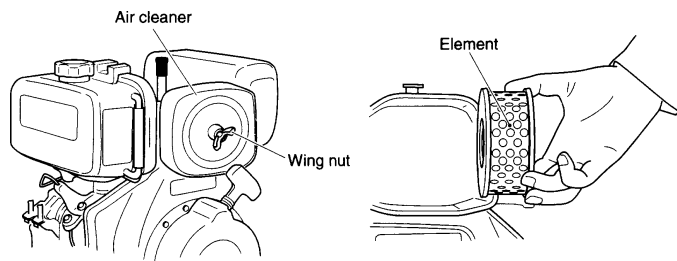


Figure 25. Engine Air Filter and Element

2. To clean or replace air filter loosen the wing nut on the air filter housing (Figure 25) 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.

CHECKING THE CHAINS

1. Take off the checking cover on roller and coat grease on the chain if necessary (Figure 26). The chain should be lightly lubricated with motor oil.

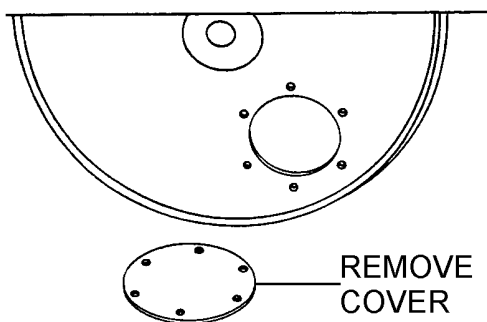


Figure 26. Chain Cover

2. Check the chain tension and if loose, adjust the chain tension with the tightener (Figure 27). Chain tension should be adjusted every 50 hours of operation.

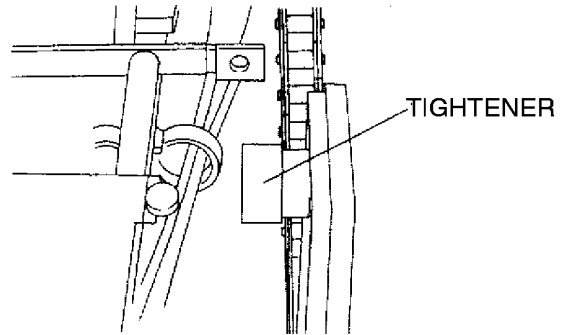


Figure 27. Chain Tightener

CAUTION:



NEVER attempt to check the V-belt with the engine running. Severe injury can occur if your hand gets caught between the V-belt and the clutch (Figure 28). Always use safety gloves.

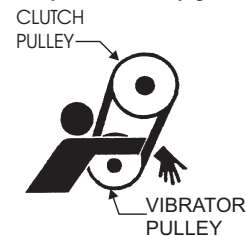


Figure 28. V-Belt Hazard

VIBRATION CLUTCH ADJUSTMENT

1. Remove the protective cover from the clutch by removing the 4 allen screws.
2. Pull out the stop key and turn to the release position (Figure 29).
3. Viewing the clutch from the shifter-pulley side: if the clutch nut is turned to the right, the clearance between the adjusting and pressure plate decreases as the amount of torque increases. Normal adjustment is from 1 to 2 notches.
4. Make sure that the shifting lever is not too stiff. Lever should engage with moderate pressure.
5. After adjustment, return the stop key to the locked position.

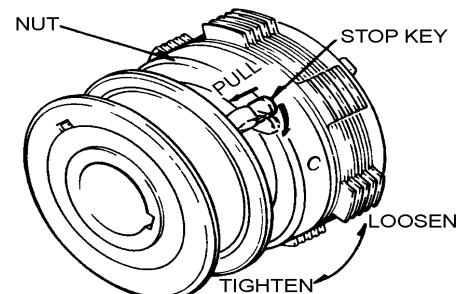


Figure 29. Clutch Adjustment

HYDRAULIC OIL CHECK

1. Check for any oil leakage from the hoses and joints daily.
2. Check hydraulic oil level every 4 to 5 hours after starting operation.
3. After one week of operation, check hydraulic level twice a day .
4. After two weeks of operation, check hydraulic level once a day .
5. 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.

REPLACING HYDRAULIC OIL

1. Change the hydraulic oil every 1,000 to 1,500 hours of operation. Change the hydraulic oil more often in high ambient temperature operation.
2. Remove the drain plug and hose tank and drain the hydraulic oil.
3. Reinstall the drain plug to the oil tank.
4. Open the tank cap (Figure 30) and fill tank with hydraulic oil. (Capacity: About 4.5 gallons). Use **Shell Tellus Oil #46** or equivalent.

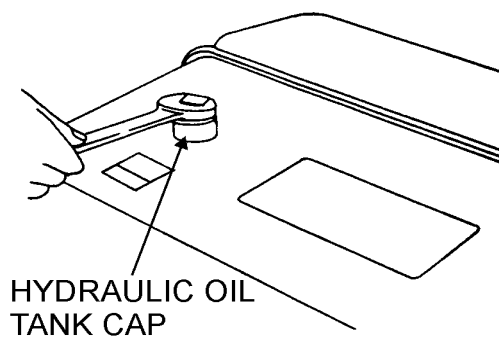


Figure 30. Hydraulic Oil Change

5. After filling tank, tighten the tank cap firmly with a wrench.

CAUTION:



Make sure that dust , water, and other foreign objects do not enter tank. It is recommended to filter the oil through a cloth.

HYDRAULIC OIL FILTER CHECK

1. The hydraulic oil filter should be replaced after first 25 hours of operation.
2. After first replacement, it should be replaced after 250 hours operation (2 months), every 500 hours of operation (4 months), and every 1,000 hours of operation thereafter.
3. When the suction resistance exceeds 254 mmHg (oil temperature in operation is 140 degrees F), replace filter.
4. To remove the oil filter, wind a cloth around the filter to prevent slipping (Figure 31).
5. Tie a rope securely around the filter (Figure 31).

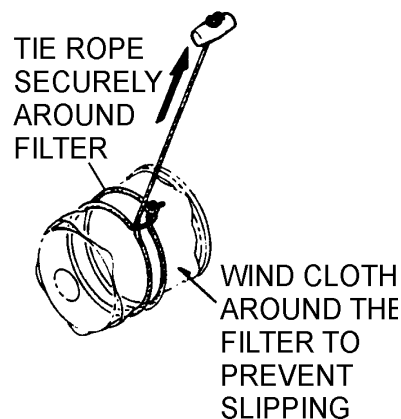


Figure 31. Cloth and Rope Around Filter

6. Forcibly pull the rope to remove the filter (Figure 32).

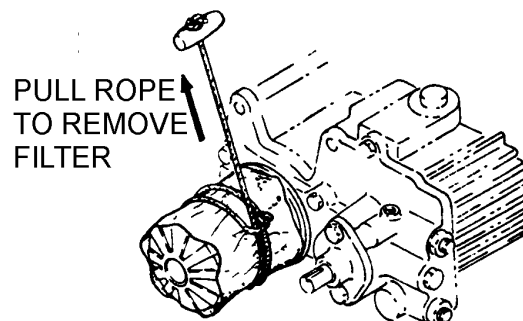
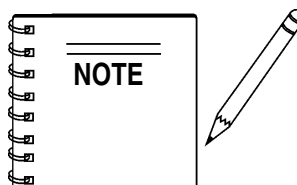


Figure 32. Filter Removal

7. Immediately replace with new filter, screwing it on by hand to avoid hydraulic oil leak.



Use only genuine Mikasa replacement oil filters (10 micron filter paper). Do not use automobile-type oil filters.

HYDRAULIC AIR EXTRACTION

1. After filling hydraulic oil tank with oil, loosen the oil hose joint and check that oil is enough to reach the oil suction and outlet ports in the hydraulic transmission. Tighten the hose joint securely after checking.
2. Loosen the charge relief valve located on the front side of the hydraulic transmission (Figure 33).

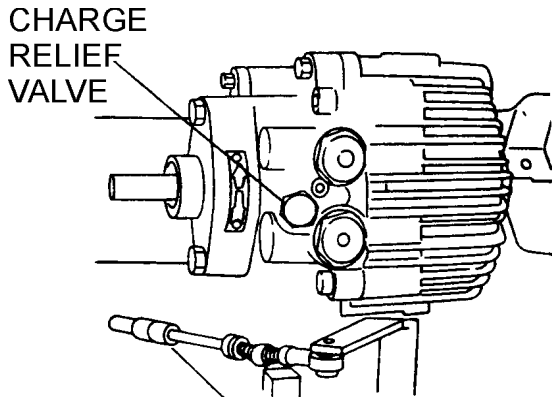


Figure 33. Loosening Charge Relief Valve

3. Check that oil flows out from the valve hole.
4. Replace the charge relief valve tightly.
5. With the travel and vibrator levers in neutral position, start the engine and idle at low speed for 3 to 5 minutes.
6. Check the forward and reverse rotation of the output shaft by moving the travel lever slowly to its forward and reverse positions.
7. Check the oil level gauge and make sure that there are no air bubbles mixed in the oil. After checking, operate the roller slowly at first then at full speed.
8. When oil level in the tank is low, replenish oil up to the specified level, and screw the cap securely with a wrench.
9. If bubbles remain in the oil or foam is found, air is being sucked through the suction side and should be checked.

NEUTRAL POSITION ADJUSTMENT

Once the travel lever has been set to neutral position with the engine running, the hydraulic brake is operating and the roller should not move. If the roller inches forward or backwards with the lever in the neutral position, turn-buckle of the cable should be adjusted as follows:

1. Stop the engine and set the travel lever in the neutral position.
2. Unscrew the two lock nuts on the sides of the cable (Figures 34 and 35).

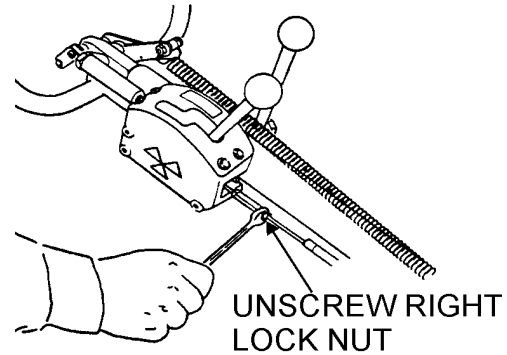


Figure 34. Unscrewing Right Lock Nut

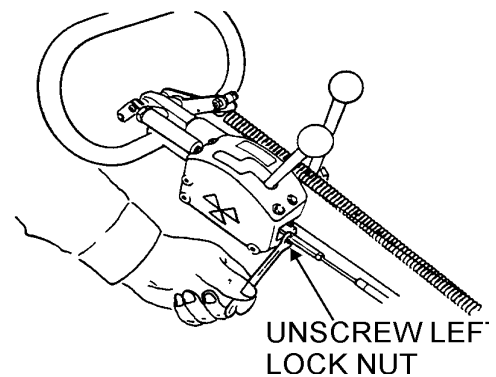


Figure 35. Unscrewing Left Lock Nut

3. If the machine moves forward, screw the turn-buckle clockwise. If the machine moves backwards, screw the turn-buckle counterclockwise (Figure 36).
4. Screw back the lock nuts on the turn-buckle.
5. Start the engine and make sure that the roller does not inch forward or backward at the neutral position of the travel lever.

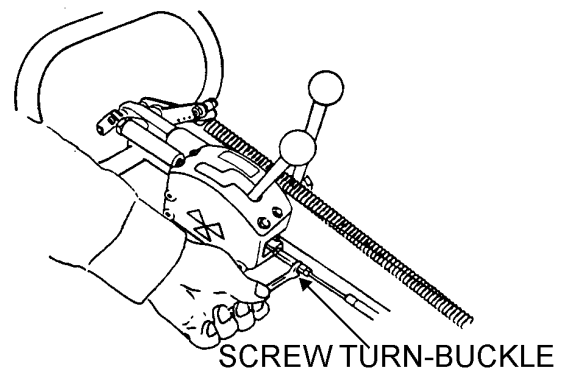


Figure 36. Adjusting the Turn-Buckle

If the neutral position of the travel lever and the neutral point of transmission do not match after adjustment is repeated, align as follows:

1. Loosen the hex socket head bolt M10 used for mounting the control lever on the underside of the transmission (Figure 37).
2. For forward movement, move the control lever slightly to the left.
3. for backwards movement, move the control lever slightly to the right.

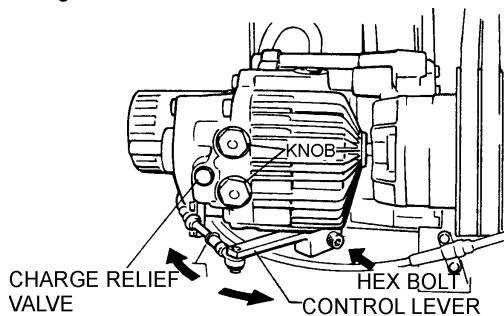


Figure 37. Unscrewing Left Lock Nut

BATTERY MAINTENANCE

DANGER :



Lead-acid battery contains sulfuric acid, which may damage eyes or skin on contact.



FOR YOUR SAFETY:

- **ALWAYS** wear a face shield to avoid acid getting into the eyes. If acid gets in contact with eyes, flush immediately with clean water and get medical advice.
- Wear rubber gloves and protective clothes to keep acid off skin. If acid gets in contact with skin, wash off immediately with clean water.
- Use a flashlight to check battery electrolyte level. **ALWAYS** check the engine is stopped.
- **DO NOT** charge battery or jump-start engine when the battery is frozen. Warm the battery to 15 degrees F or battery may explode.
- Replace the battery with the same or similar capacity battery or battery may explode.

- **DO NOT** close the exhaust outlet of battery. The gas pressure building up in the battery may cause explosion.
- Before using a battery charger, read and understand the charger instruction manual thoroughly.
- Charge the battery in a non-spark, well-ventilated area. Avoid fire from cigarette sparks or matches.

1. If a battery has not been used for some time, reduce the charge level initially to protect each plate inside the battery.
2. Check the battery terminals periodically to ensure that they are in good condition.
3. Use wire brush or sand paper to clean the battery terminals.
4. 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.
5. Measure the specific gravity of electrolyte:
 - completely charged: 1.270 - 1.290
 - needs charging: 1.260 or lower
6. If the machine will not be in operation for a long period of time, charge the battery sufficiently, tighten all caps, correctly, store in cool dry place and check the battery charge level every month to maintain the performance of the battery.

BATTERY CABLE CONNECTION

1. When removing cable, disconnect the ground side (normally negative) first (Figure 38).
2. When installing cable connect the ground side (normally negative) last.

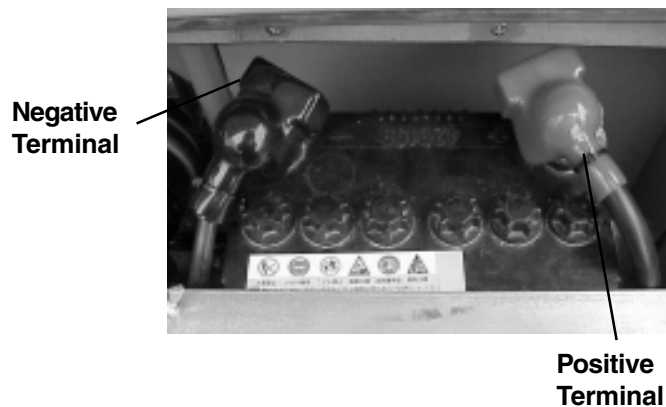


Figure 38. Battery Connection

MDR-9DYE — ENGINE 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 Engine and Roller Troubleshooting (Tables 8 and 9) information shown below and on the preceding page. 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.
At low temperatures engine will not start.	Low starting temperature limit exceeded?	Comply with cold starting instructions and proper oil viscosity.
	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 fires but stops soon as starter is switched off.	Engine oil too thick?	Refill engine crankcase with correct type of oil for winter environment.
	Throttle lever in STOP position?	Reposition throttle lever to RUN position.
	Fuel filter blocked?	Replace fuel filter.
Engine stops by itself during normal operation.	Fuel supply blocked?	Check the entire fuel system.
	Fuel tank empty?	Add fuel.
Low engine power, output and speed.	Fuel filter blocked?	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.

MDR-9DYE — ENGINE 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 Engine Troubleshooting (Table 8) information shown below and on the proceeding page. 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 (CONTINUED)

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
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.

MDR-9DYE — ROLLER 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 Roller Troubleshooting (Table 9) information shown below and on the proceeding page. 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. ROLLER TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Unit does not travel or travel is not smooth.	Defective centrifugal clutch?	Repair or replace clutch.
	Damaged rubber coupling and flange?	Replace rubber coupling and flange.
	Defective travel cable and link?	Repair or replacetravel cable and link.
	Damaged scraper or too much mud in scraper?	Replace or repair scraper.
	Damaged or clogged oil filter?	Replace filter.
	Damaged or leaking hydraulic pipe?	Repair or replace parts.
	Low oil level or contaminated oil?	Replenish or replace oil.
	Damaged or leaking hydraulic transmission?	Repair or replace hydraulic pump.
	Damaged or leaking hydraulic transmission?	Repair or replace hydraulic motor.
	Damaged drum gear and bearing?	Repair parts.
	Bad drum rotation?	Repair or replace drum.
Unit does not vibrate or has weak vibration.	Defective centrifugal clutch?	Repair or replace clutch.
	Damaged or slipping V-belt?	Replace V-belt or adjust tension.
	Damaged vibration cable and linkage?	Replace or repair vibration cable and linkage.
	Damaged vibration clutch?	Adjust or replace clutch.
	Defective clutch vibrator pulley V-belt?	Replace V-belt.
	Vibrator does not turn smoothly with hand?	Check and repair vibrator. Check if oil level is not excessively high.

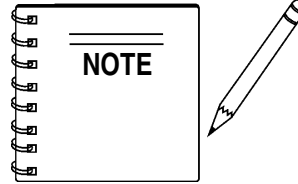
EXPLANATION OF CODE IN REMARKS COLUMN

How to read the marks and remarks used in this parts book.

Items Found In the “Remarks” Column

Serial Numbers-Where indicated, this indicates a serial number range (inclusive) where a particular part is used.

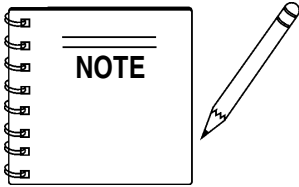
Model Number-Where indicated, this shows that the corresponding part is utilized only with this specific model number or model number variant.



The contents of this parts catalog are subject to change without notice.

Items Found In the “Items Number” Column

All parts with same symbol in the number column, *, #, +, %, or <, belong to the same assembly or kit



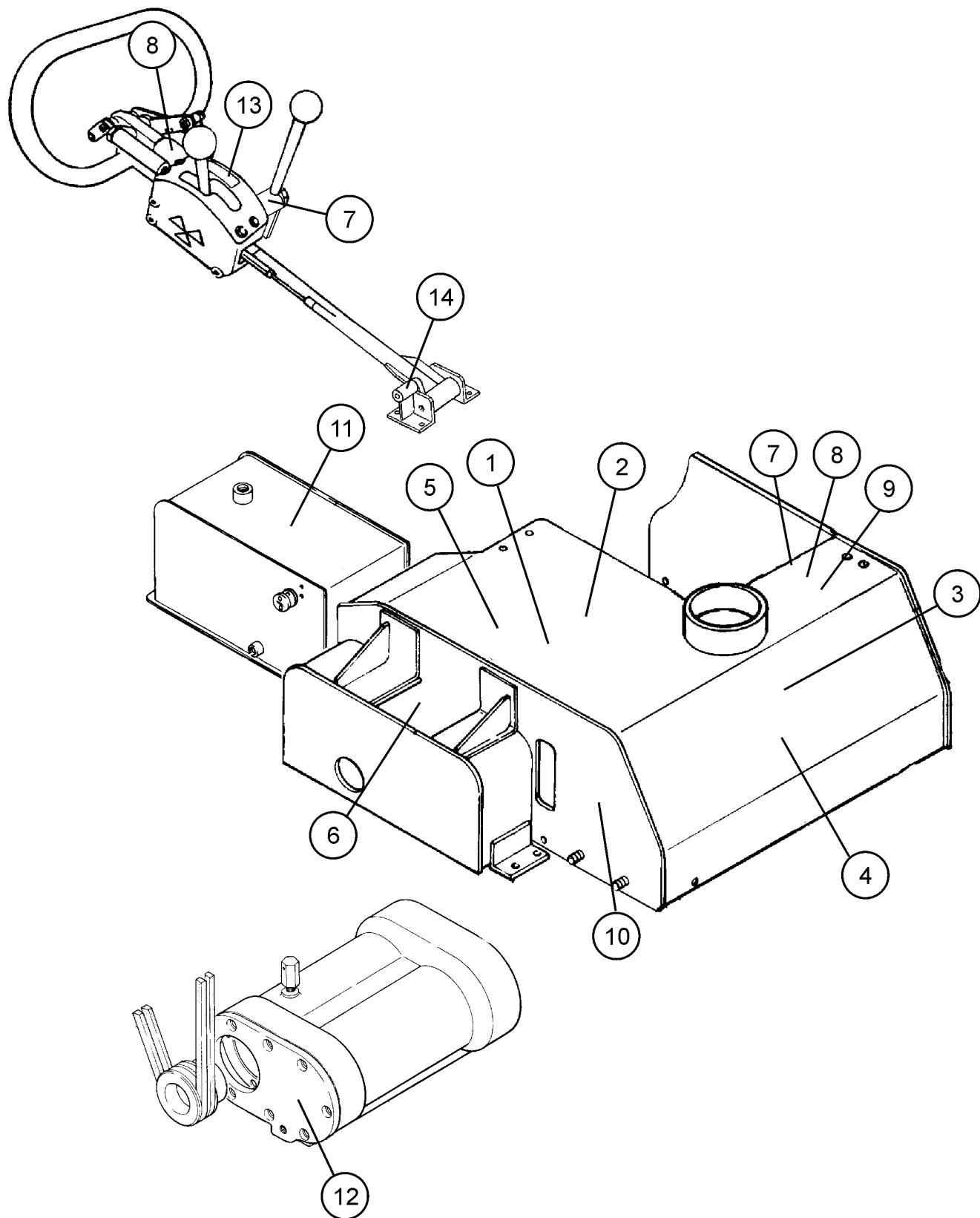
If more than one of the same reference number is listed, the last one listed indicates newest (or latest) part available.

MQ MIKASA MDR-9DYE VIBRATORY WALK-BEHIND
ROLLER W/YANMAR L100EE-DEVK2 DIESEL ENGINE

1 to 3 Units

<u>Qty.</u>	<u>P/N</u>	<u>Description</u>
3	501010440	OIL FILTER, TRANSMISSION
1	075080061	CHAIN, DRIVE
6	EM505834	V-BELT
3	502303040	THROTTLE WIRE
6	11465012590	ELEMENT, AIR CLEANER
1	11465076631	ROPE, STARTER
3	11425055100	FILTER, FUEL SCREEN
6	11425055121	FILTER, FUEL OIL
3	11425035110	STRAINER, LUBE OIL ASSY.
3	10610077630	KEY, IGNITION

DECAL PLACEMENT



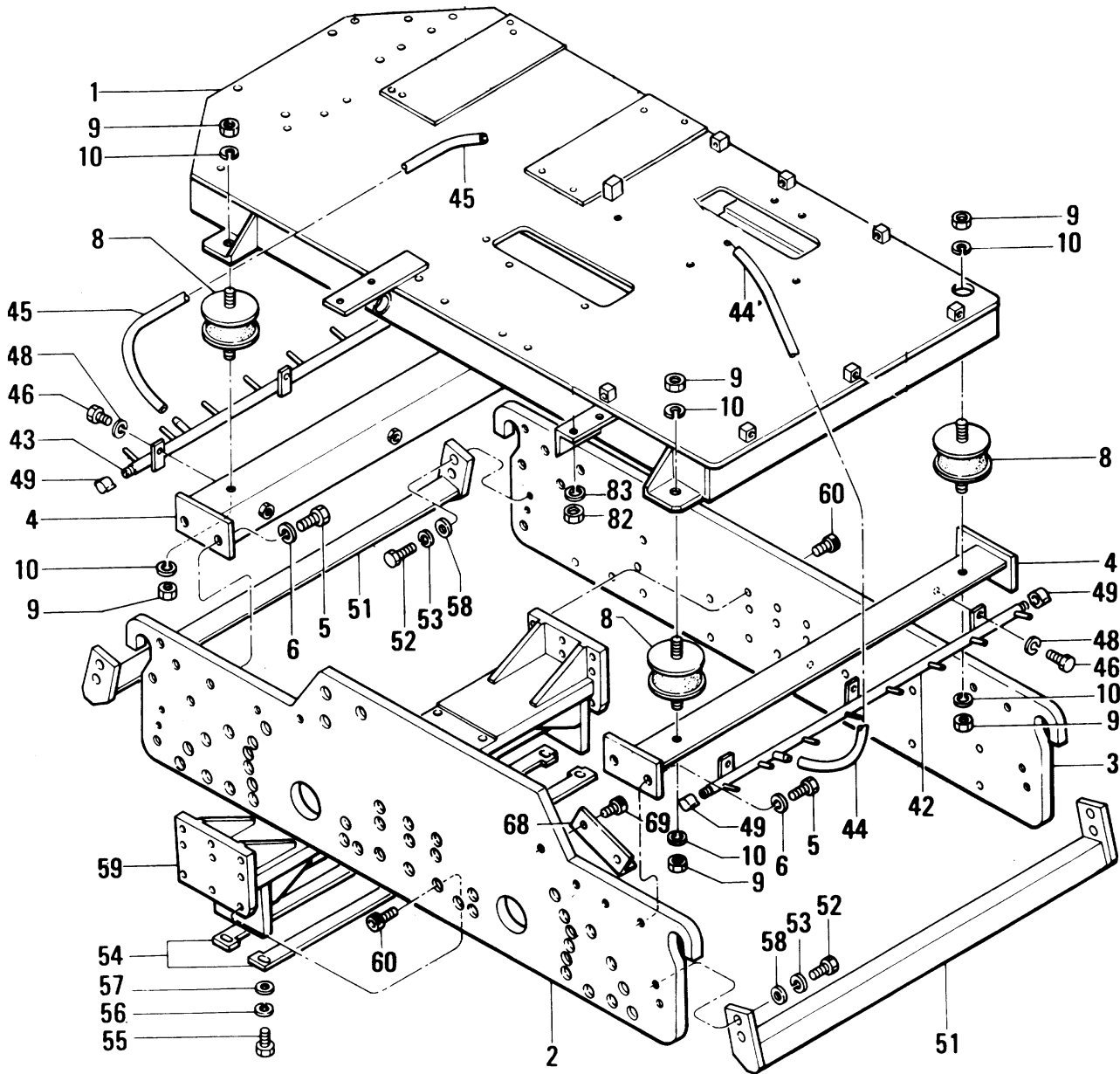
MDR-9DYE — DECAL PLACEMENT

DECAL PLACEMENT

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	920200591	PLATE, CAUTION	1	
2	920200630	PLATE, SERIAL NO.	1	
3	920201590	DECAL, MQ MARK 98X70	1	
4	920101510	DECAL, MIKASA MARK 440MM	1	
5	920203290	DECAL, CAUTION	1	
6	920200450	DECAL, OIL FILTER	1	
7	920101290	DECAL, VIBRATION	2	
8	920201100	DECAL, CLUTCH LEVER	2	
9	920200320	DECAL, WATER TANK	1	
10	920200440	DECAL, PROHIBIT TOW	1	
11	920200470	DECAL, OIL TANK	1	
12	920101480	DECAL, OIL LEVEL	1	
13	920101280	DECAL, FORWARD & REVERSE	1	
14	920101200	DECAL, GREASE	1	

MDR-9DYE — BODY ASSY.

BODY ASSY.

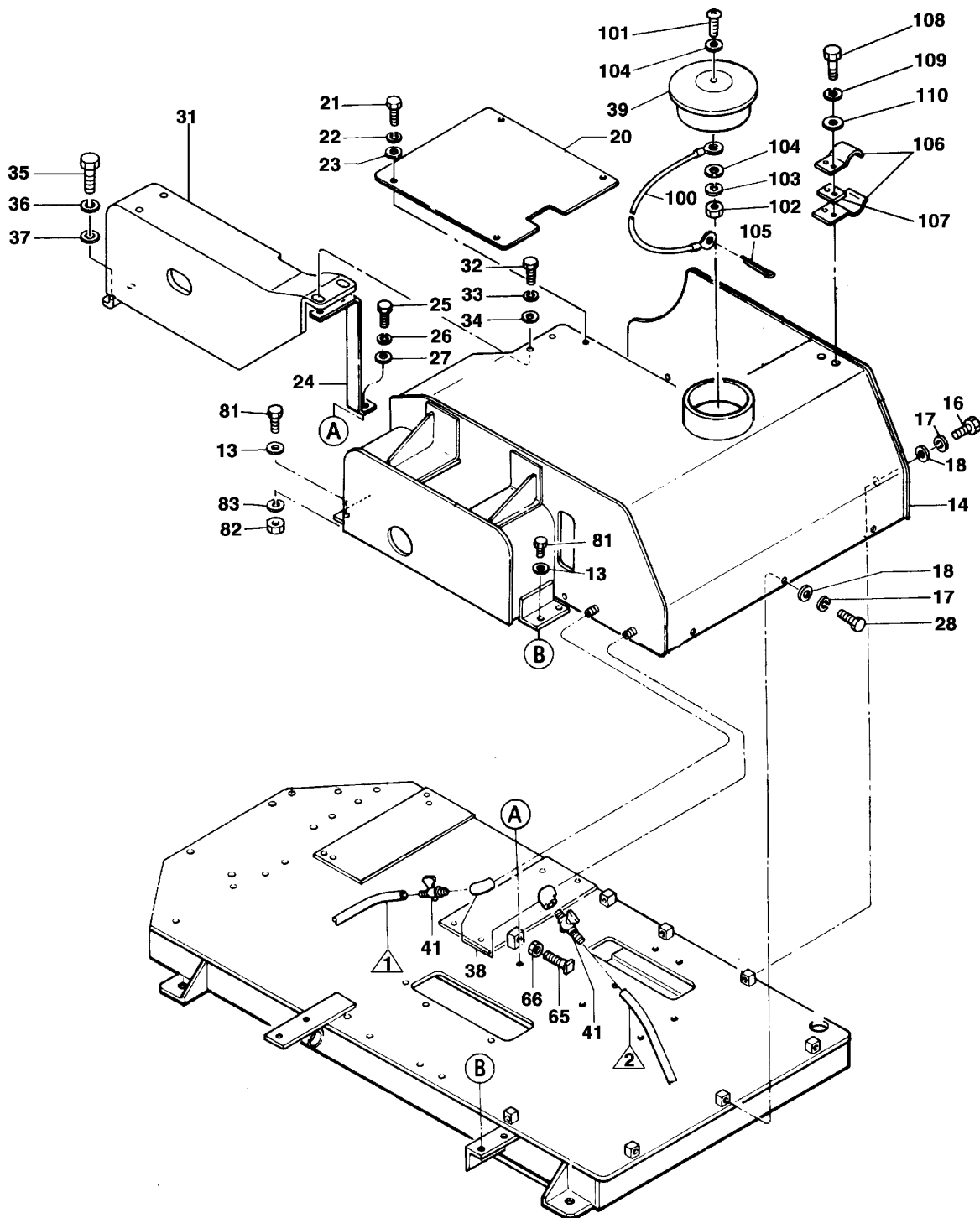


BODY ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	502101270	BASE	1	
2	502100720	SIDE PLATE, RIGHT	1	
3	502100710	SIDE PLATE, LEFT	1	
4	502200960	RUBBER PLATE	2	
5	001211430	BOLT 14X30 H	8	
6	030214350	LOCK WASHER M14	8	
8	930407021	SHOCK ABSORBER MED	4	
9	020312100	NUT M12	8	
10	030212300	LOCK WASHER M12	8	
42	502201150	SPRINKLING PIPE, FRONT	1	
43	502201160	SPRINKLING PIPE, REAR	1	
44	502402930	VINYL PIPE 10X13X280	1	
45	502402940	VINYL PIPE 10X13X950	1	
46	001221025	BOLT 10X25 T	6	
48	030210250	LOCK WASHER M10	6	
49	501010150	CAP 1/4	4	
51	502302511	SCRAPER, END	2	
52	001221030	BOLT 10X30 T	8	
53	030210250	LOCK WASHER M10	8	
54	502424050	SCRAPER/CENTER	2	
55	001220825	BOLT 8X25 T	6	
56	030208200	LOCK WASHER M8	6	
57	952401560	WASHER 8.5X20X3	6	
58	031110160	FLAT WASHER M10	8	
59	502200990	BASE, SCRAPER	1	
60	001521225	SOCKET HEAD BOLT 12X25 T	18	
68	502403940	CHAIN COVER	2	
69	001521020	SOCKET HEAD BOLT 10X20 T	4	
82	020310080	NUT M10	4	
83	030210250	LOCK WASHER M10	4	

MDR-9DYE — FRONT COVER ASSY.

FRONT COVER ASSY.



NOTES:

- △ 1 BODY ASSY., ITEM 44
- △ 2 BODY ASSY., ITEM 45

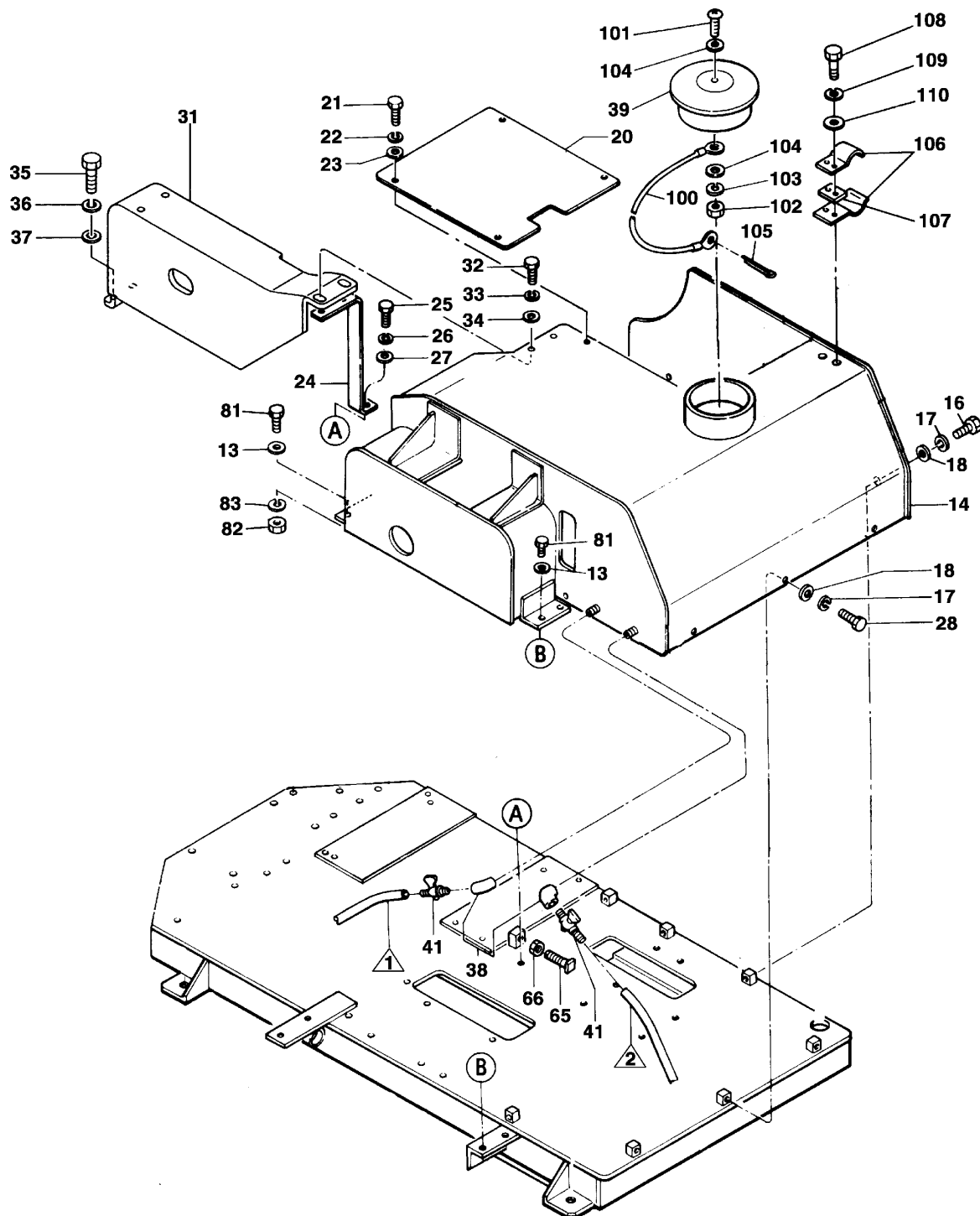
MDR-9DYE — FRONT COVER ASSY.

FRONT COVER ASSY.



<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
13	031110160	FLAT WASHER M10	4	
14	502103800	FRONT COVER	1	
16	001220820	BOLT 8X20 T	4	
17	030208200	LOCK WASHER M8	7	
18	952401560	WASHER 8.5X20X3	7	
20	502302490	CHECK COVER	1	
21	001220815	BOLT 8X15 T	4	
22	030208200	LOCK WASHER M8	4	
23	031108160	FLAT WASHER M8	4	
24	502302500	SUPPORT/COVER	1	
25	001221020	BOLT 10X20 T	1	
26	030210250	LOCK WASHER M10	1	
27	021110160	FLAT WASHER M10	1	
28	001220825	BOLT 8X25 T	3	
31	502215470	BELT COVER (GX340)	1	
32	001221020	BOLT 10X20 T	2	
33	030210250	LOCK WASHER M10	2	
34	031110160	FLAT WASHER M10	2	
35	001221015	BOLT 10X15 T	2	
36	030210250	LOCK WASHER M10	2	
37	031110160	FLAT WASHER M10	2	
38	502010650	ELBOW 90 DEG. 1/4	2	
39	407310670	TANK CAP D108-120, RUBBER	1	
41	954403241	COCK PT 1/4, BH-1211 (AL)	2	

MDR-9DYE — FRONT COVER ASSY. (CONTINUED)

FRONT COVER ASSY.



NOTES:

-  BODY ASSY., ITEM 44
-  BODY ASSY., ITEM 45

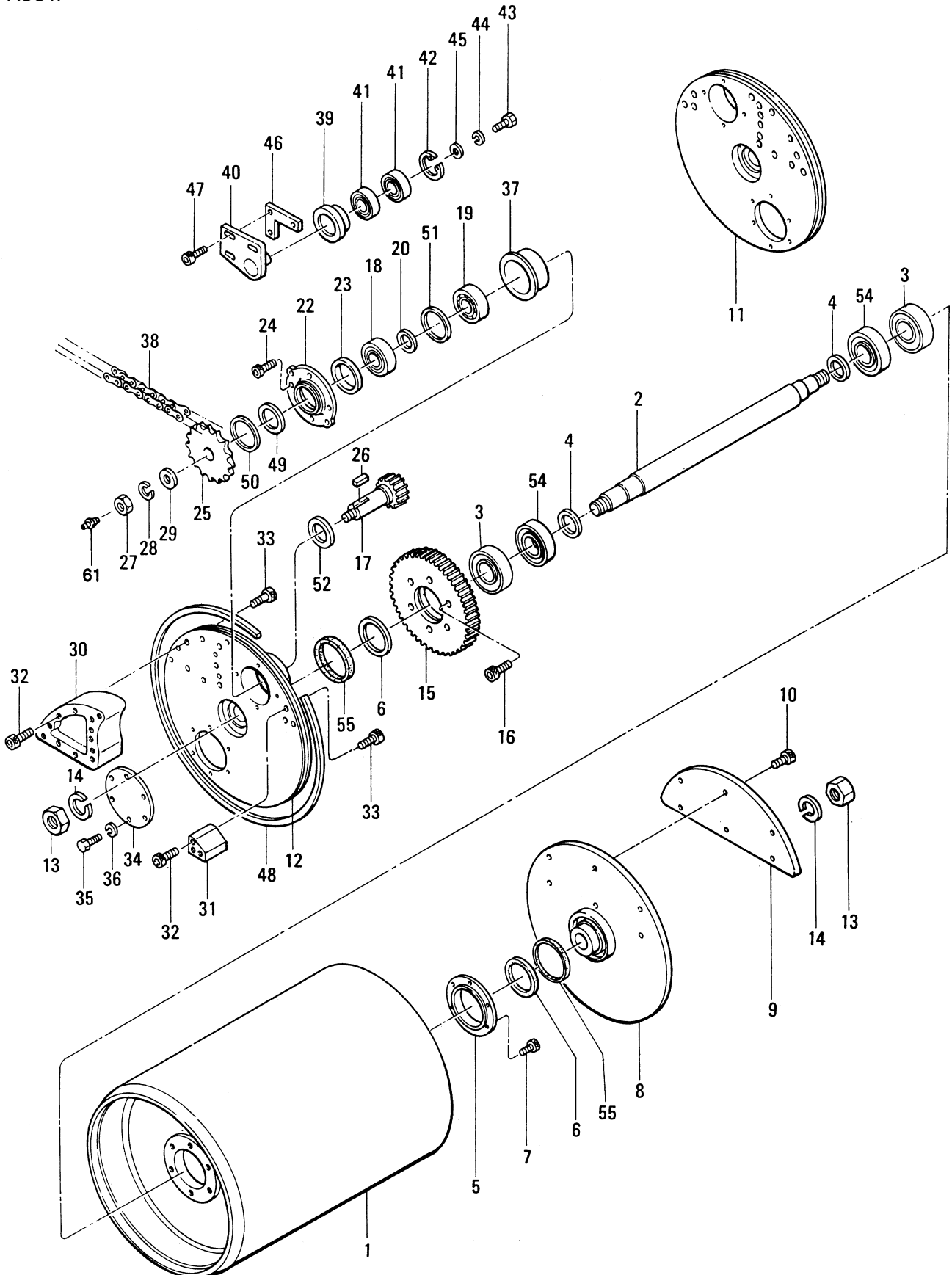
MDR-9DYE — FRONT COVER ASSY. (CONTINUED)

FRONT COVER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
65	001801050	BOLT 10X50 WHOLE THREAD	1	
66	020310080	NUT M10		
81	001211030	BOLT 10X30 H	4	
82	020310080	NUT M10	4	
83	030210250	LOCK WASHER M10	4	
88	920200591	PLATE, CAUTION	1	
89	920200630	PLATE, SERIAL NO.	1	
90	920201590	DECAL, MQ MARK 98X70	1	
91	920101510	DECAL, MIKASA MARK 440MM	1	
92	920203290	DECAL, CAUTION	1	
93	920206450	PLATE, MADE IN JAPAN	1	
94	920200450	DECAL, OIL FILTER	1	
95	920101290	DECAL, VIBRATION	1	
96	920201100	DECAL, (CLUTCH LEVER)	1	
97	920200320	DECAL, WATER TANK	1	
98	920200440	DECAL, PROHIBIT TOW	1	
100	959402990	ROPE	1	
101	091005020	SCREW 5X20	1	
102	020305040	NUT M5	1	
103	030205130	LOCK WASHER M5	1	
104	031105080	FLAT WASHER M5	2	
105	025203020	SPLIT COTTER PIN 3X20	1	
106	959403251	PLATE SPRING	2	
107	502420150	SPACER	1	
108	001200820	BOLT 8X20	2	
109	030208200	LOCK WASHER M8	2	
110	031108160	FLAT WASHER M8	2	

MDR-9DYE — AXLE ASSY.

AXLE ASSY.

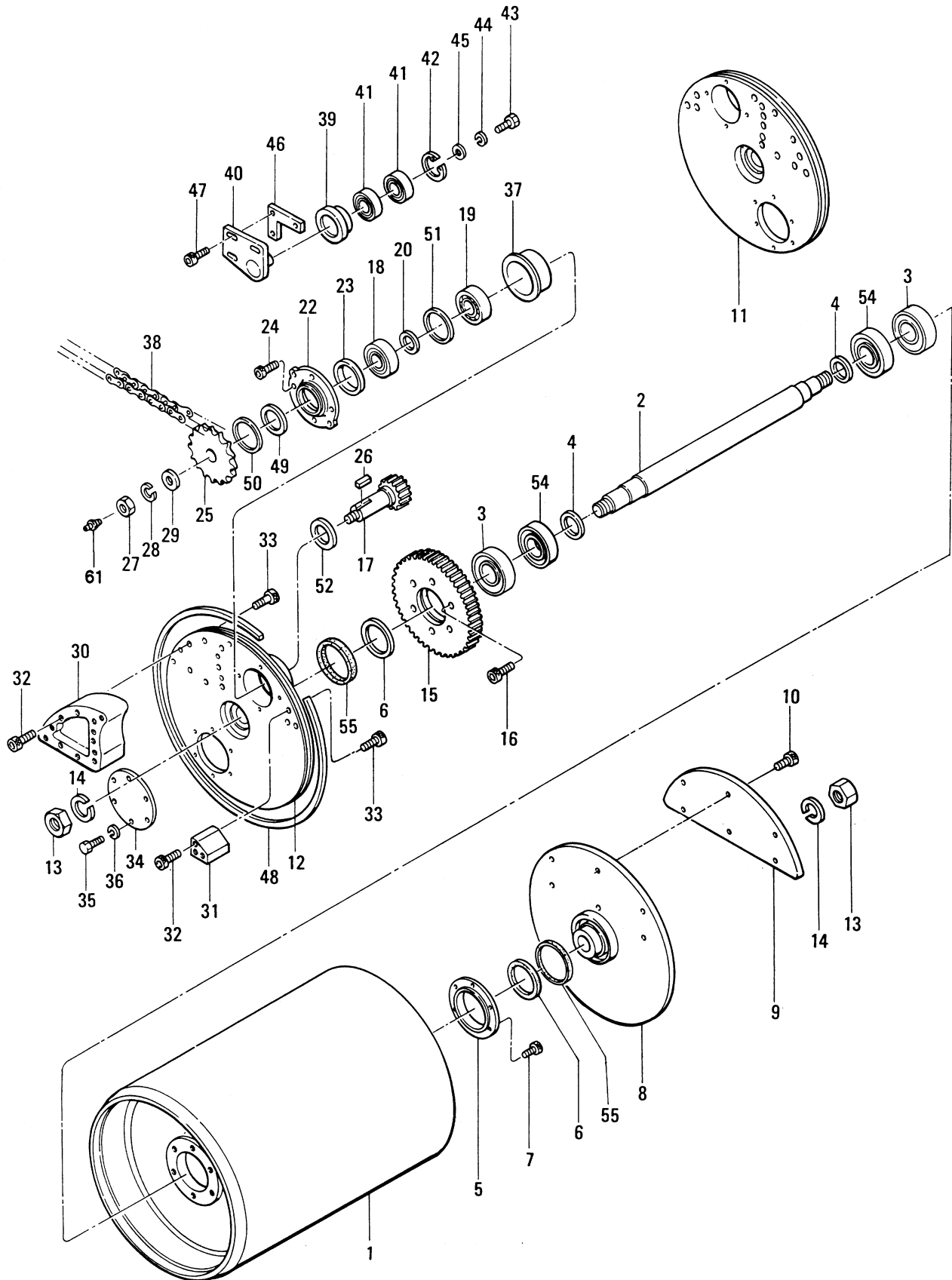


AXLE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	502101570	DRUM	2	
2	502202290	ROLLER SHAFT	2	
3	044006309	BEARING 6309VV	4	
4	952400940	SPACER 45605	4	
5	502302420	BEARING COVER	2	
6	060406010	OIL SEAL TC-689012	4	
7	001521025	SOCKET HEAD BOLT 10X25 T	12	
8	502200930	BRACKET/L	2	
9	502302430	SPACER	2	
10	001521240	SOCKET HEAD BOLT 12X40 T	12	
11	502200940	BRACKET/R FRONT	1	
12	502200950	BRACKET/R REAR	1	
13	020130240	NUT M30, P2.0	4	
14	030230750	LOCK WASHER M30	4	
15	502302440	GEAR 57	2	
16	001521040	SOCKET HEAD BOLT 10X40 T	12	
17	502303370	GEAR SHAFT	2	
17	502338050	GEAR SHAFT	2	
18	044006370	BEARING 6307VV	2	
19	047910050	ROLLER BEARING NF307W	2	
20	952401240	SPACER 35453	2	
20	952406190	SPACER 35X45X3 S	2	
22	502302460	COVER/GEAR SHAFT	2	
23	060305010	OIL SEAL TB-55729	2	
24	001520820	SOCKET HEAD BOLT 8X20 T	8	
25	502402720	SPROCKET 15	2	
26	951400090	KEY 10X8X33	2	
27	020118150	NUT M18, P1.5	2	
28	030218460	LOCK WASHER M18	2	
29	952400950	WASHER 19456	2	
30	502305360	BLOCK	2	
31	502303590	CYLINDER BLOCK	2	
32	001521235	SOCKET HEAD BOLT 12X35 T	30	
33	001521240	SOCKET HEAD BOLT 12X40 T	30	
34	502402740	BRACKET COVER	2	
35	001210820	BOLT 8X20 H	12	
36	030208200	LOCK WASHER M8	12	
37	502403090	BEARING HOLDER	2	
38	075080061	CHAIN RS80-61	1	
39	502402920	TIGHTENER	1	

MDR-9DYE — AXLE ASSY. (CONTINUED)

AXLE ASSY.



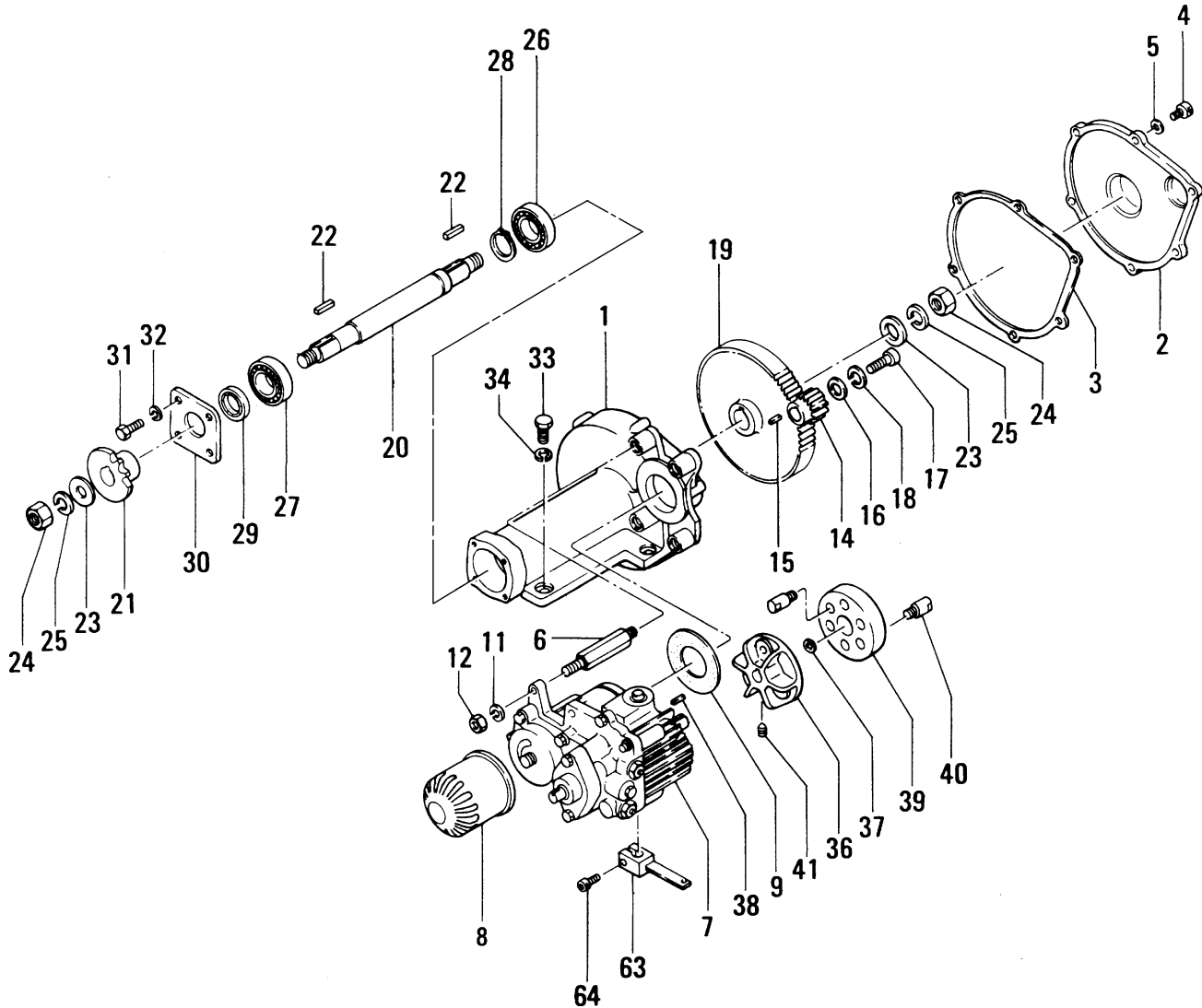
MDR-9DYE — AXLE ASSY. (CONTINUED)

AXLE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
40	502302480	TIGHTENER PLATE (SHAFT)	1	
41	044006205	BEARING 6205VV	2	
42	080100520	STOP RING R-52	1	
43	001210820	BOLT 8X20 H	1	
44	030208200	LOCK WASHER M8	1	
45	952400130	WASHER 9304	1	
46	502402750	TIGHTENER PLATE HOLDER	1	
47	001521230	SOCKET HEAD BOLT 12X30 T	3	
48	502402760	FELT SEAL 6X8X1350	2	
49	502402770	FELT SEAL 6X8X188	2	
50	502402780	FELT SEAL 5X6X217	2	
51	952401330	COLLAR 72803	2	
52	060604030	OIL SEAL VC-45686	2	
54	042006309	BEARING 6309ZZ	4	
55	502408150	FELT RING BRACKET	4	
61	351010050	GREASE FITTING A-MT6X1	2	

MDR-9DYE — TRANSMISSION ASSY.

TRANSMISSION ASSY.



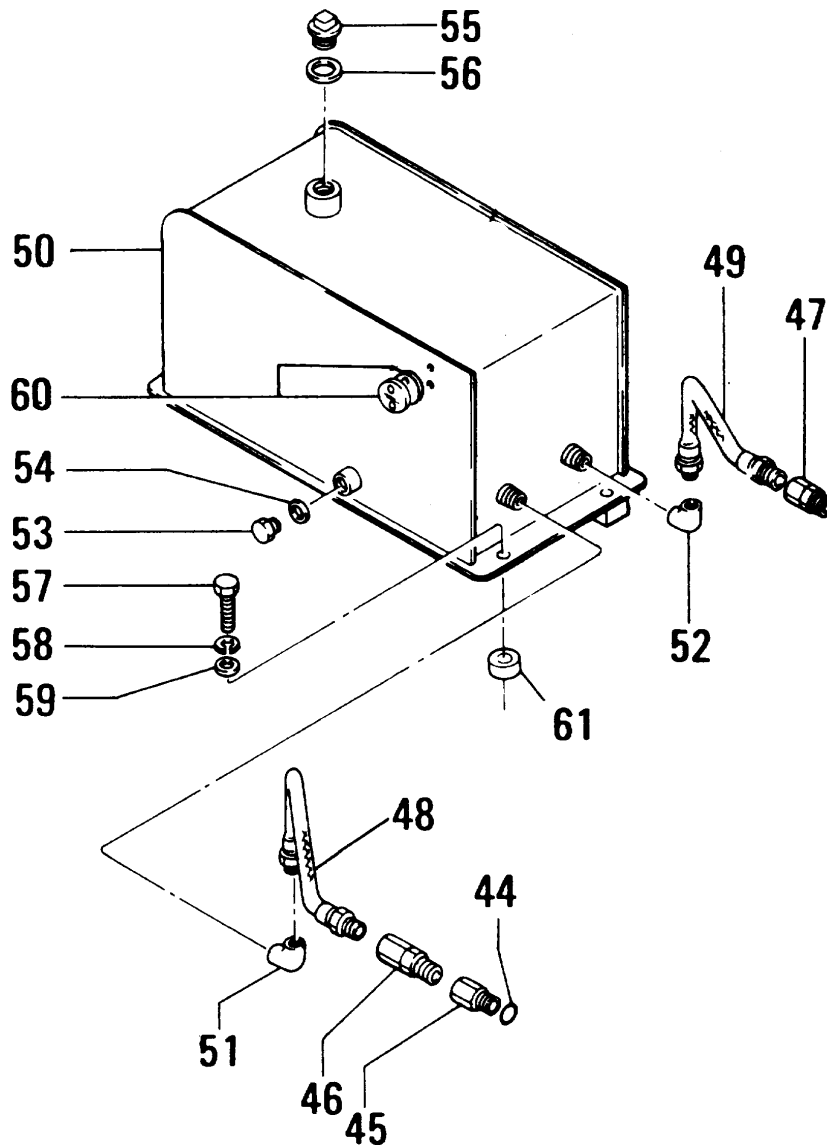
MDR-9DYE — TRANSMISSION ASSY.

TRANSMISSION ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	502010530	GEAR CASE	1	
2	502010540	COVER, GEAR CASE	1	
3	501010410	PACKING, GEAR CASE COVER	1	
4	001520620	SOCKET HEAD BOLT 6X20 T	6	
5	031106100	FLAT WASHER M6	6	
6	501010420	SET BOLT, 87L-M12-M10/HST	4	
7	501010430	TRANSMISSION 1515-522	1	
8	501010440	OIL FILTER	1	
9	501010450	PACKING/TRANSMISSION	1	
11	030210250	LOCK WASHER M10	4	
12	020310080	NUT M10	4	
14	501010460	PINION 15	1	
15	951400100	KEY 5X5X35	1	
16	952400130	WASHER 9304	1	
17	001210820	BOLT 8X20 H	1	
18	030208200	LOCK WASHER M8	1	
19	502303350	GEAR 80	1	
20	502010570	DRIVE SHAFT	1	
21	501010500	SPROKET 9	1	
22	951400110	KEY 7X7X35	2	
23	952400170	WASHER 19454	2	
24	020118150	NUT M18, P1.5	2	
25	030218460	LOCK WASHER M18	2	
26	042006207	BEARING 6207ZZ	1	
27	042006306	BEARING 6306ZZ	1	
28	080200350	STOP RING S-35	1	
29	060303030	OIL SEAL TB-30428	1	
30	501010520	BEARING COVER	1	
31	001220825	BOLT 8X25 T	4	
32	030208200	LOCK WASHER M8	4	
33	001211025	BOLT 10X25 H	4	
34	030210250	LOCK WASHER M10	4	
36	502302530	FLANGE FAN	1	
37	080100160	STOP RING R-16	1	
38	502010590	KEY 5X5X22/4DK	1	
39	502321570	RUBBER COUPLING	1	
40	515447020	COUPLING PIN	6	
41	099208012	SOCKET HEAD SCREW 8X12 T	2	
63	502402800	LEVER	1	
64	001521025	SOCKET HEAD BOLT 10X25 T	1	

MDR-9DYE — HYDRAULIC OIL TANK ASSY.

HYDRAULIC OIL TANK ASSY.



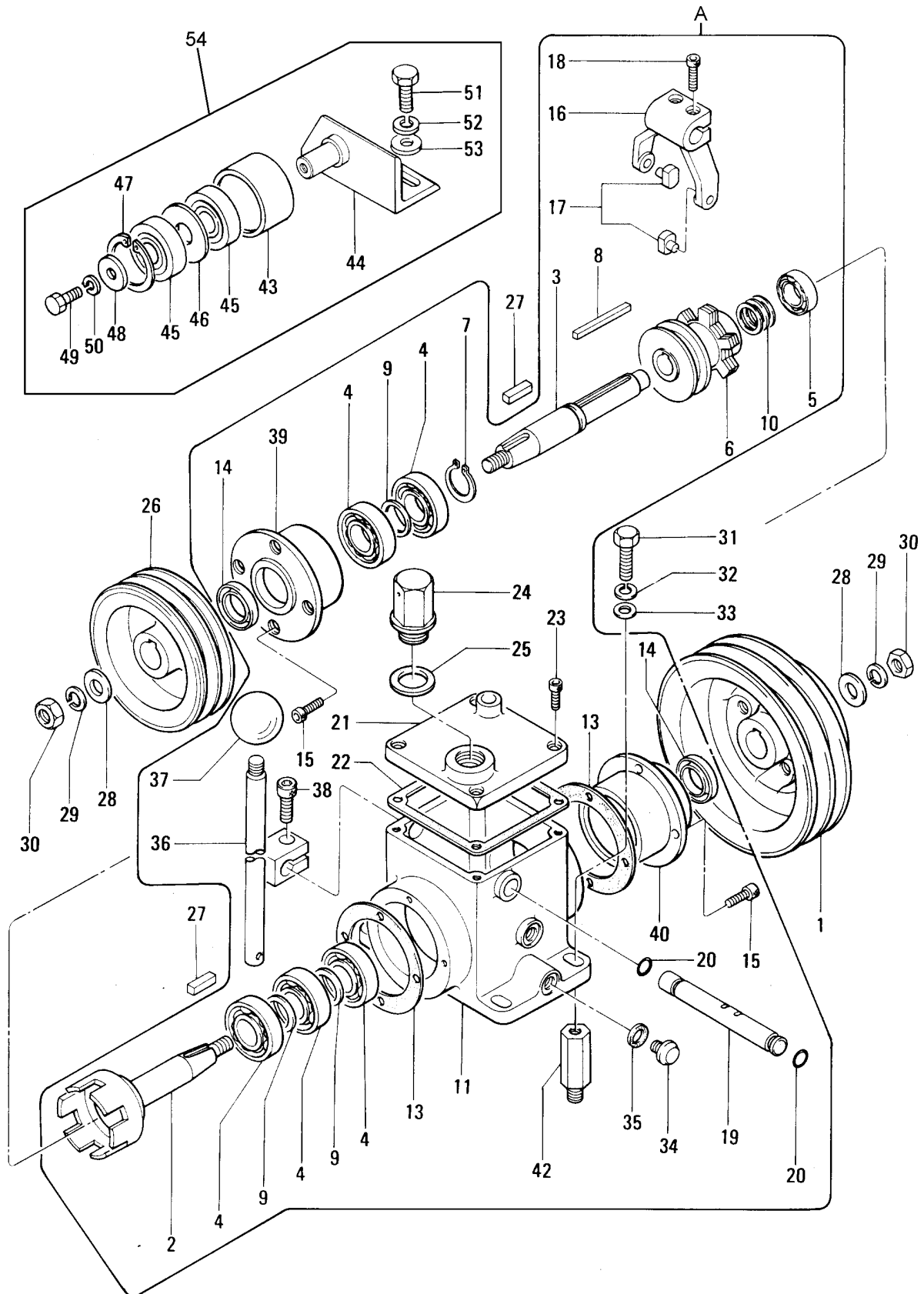
MDR-9DYE — HYDRAULIC OIL TANK ASSY.

HYDRAULIC OIL TANK ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
44	050200160	O-RING P-16	1	
45	501010720	JOINT 3/4-16	1	
46	501010590	JOINT 3/8	1	
47	501010600	JOINT 1/4	1	
48	502302850	OIL HOSE 3/8 320L	1	
49	502302840	OIL HOSE 1/4 320L	1	
50	502201000	OIL TANK	1	
51	502010640	ELBOW 90 DEG. 3/8	1	
52	502010650	ELBOW 90 DEG. 1/4	1	
53	953405270	PLUG 1/4X14 13L	1	
54	953405260	PACKING 1/4 (CU)	1	
55	953405840	DRAIN PLUG M18 (H)	1	
56	953400020	PACKING 19302	1	
57	001221035	BOLT 10X35 T	4	
58	030210250	LOCK WASHER M10	4	
59	031110160	FLAT WASHER M10	4	
60	959010110	LEVEL GAUGE/SP-1 W/P	1	
61	952401960	COLLAR 11X30X16	1	
104	920200470	DECAL, OIL TANK	1	

MDR-9DYE — CLUTCH BOX ASSY.

CLUTCH BOX ASSY.



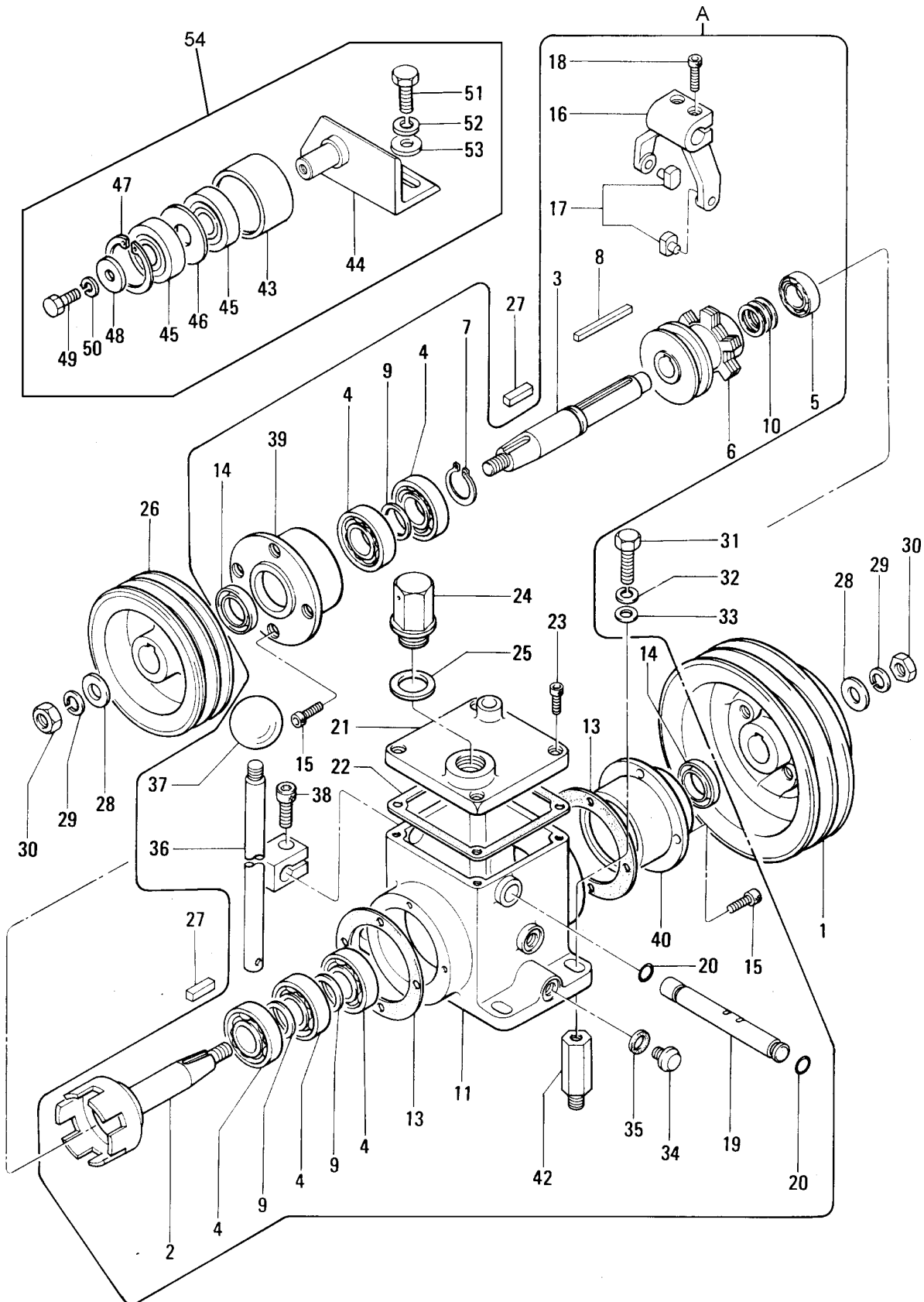
MDR-9DYE — CLUTCH BOX ASSY.

CLUTCH BOX ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
A	502910010	CLUTCH BOX ASSY.	1	INCLUDES ITEMS W/*
1	502302610	CLUTCH PULLEY/IN	1	
2*	502302620	CLUTCH SHAFT/IN	1	
3*	502302630	CLUTCH SHAFT/OUT	1	
4*	040006205	BEARING 6205	5	
5*	040006202	BEARING 6202	1	
6*	501010800	CLUTCH SL1.2-20/OS225	1	
7*	080200250	STOP RING S-25	1	
8*	951400060	KEY 5X5X58	1	
9*	501010810	COLLAR 25322/BEARING	3	
10*	501010822	SPACER 0.8T/CLUTCH	AR	
10*	501010823	SPACER 1.0T/CLUTCH	AR	
10*	501010824	SPACER 2.3T/CLUTCH	AR	
10*	501010825	SPACER 3.2T/CLUTCH	AR	
11*	501010830	CLUTCH CASE	1	
13*	501010830	PACKING/BEARING HOLDER	2	
14*	060102010	OIL SEAL SB-25388	2	
15*	001520620	SOCKET HEAD BOLT 6X20 T	8	
16*	501010850	SHIFTER FORK	1	
17*	501010860	FORK BLOCK	2	
18*	001520625	SOCKET HEAD BOLT 6X25 T	2	
19*	501010870	SHIFTER SHAFT	1	
20*	050200110	O-RING P-11	2	
21*	501301160	COVER, CLUTCH CASE	1	
22	501010890	PACKING, CLUTCH CASE	1	
23*	001520625	SOCKET HEAD BOLT 6X25 T	4	
24*	501010900	PLUG 3/4	1	
25*	501010910	PACKING 3/4	1	
26	502302640	CLUTCH PULLEY/OUT	1	
27	951400070	KEY 7X7X26	2	
28	952400140	WASHER 13304	2	
29	030212300	LOCK WASHER M12	2	
30	020312100	NUT M12	2	
31	001221035	BOLT 10X35 T	4	
32	030210250	LOCK WASHER M10	4	
33	952401860	WASHER 112545	4	
34	953400270	PLUG 1/4X14 10L	2	
34	953405270	PLUG 1/4X14 13L	2	

MDR-9DYE — CLUTCH BOX ASSY. (CONTINUED)

CLUTCH BOX ASSY.



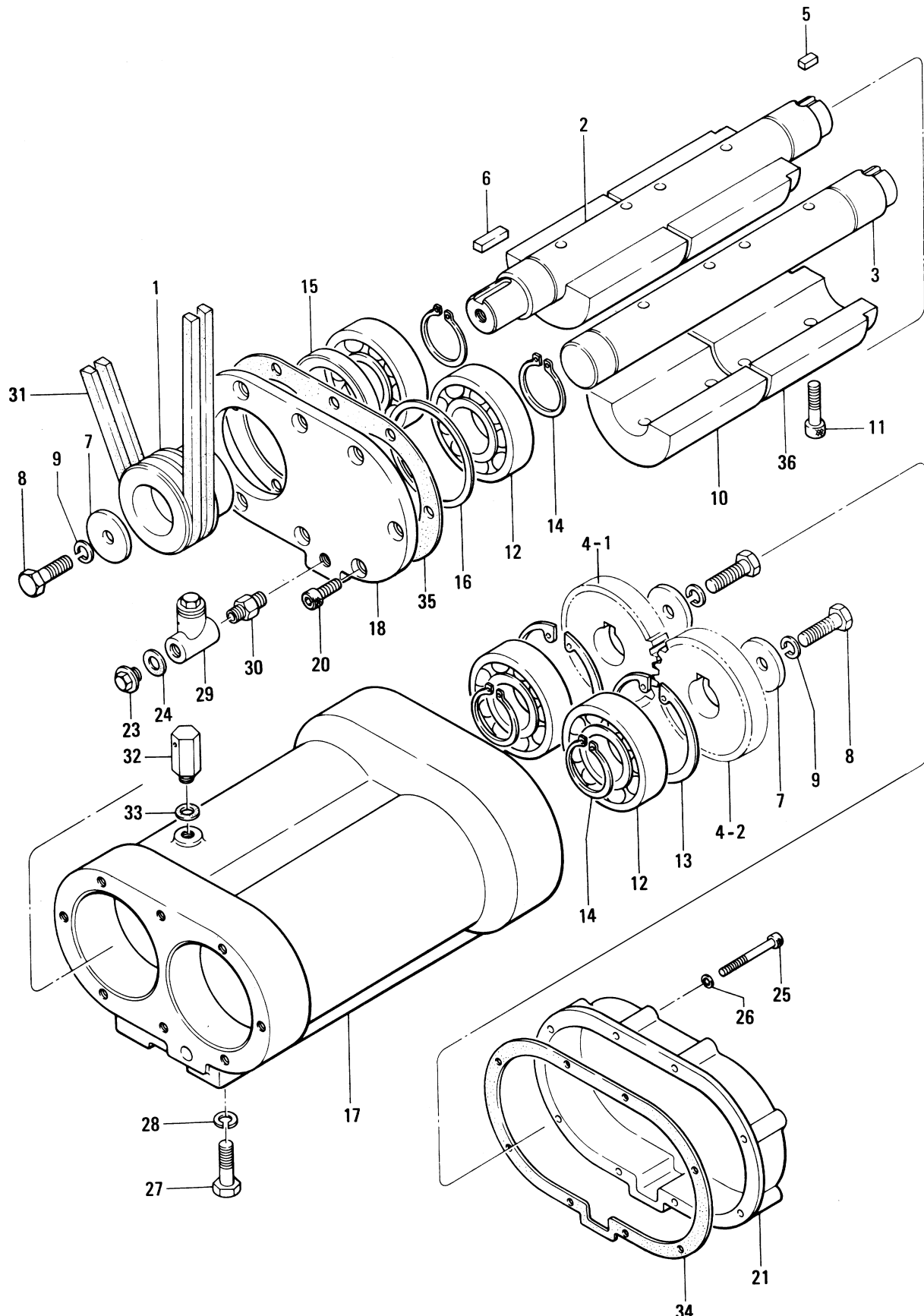
MDR-9DYE — CLUTCH BOX ASSY. (CONTINUED)

CLUTCH BOX ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
35*	953405260	PACKING 1/4 (CU)	2	
36*	502302650	CLUTCH LEVER	1	
37*	959402980	BALL GRIP 40D-M12	1	
38*	001521025	SOCKET HEAD BOLT 10X25 T	1	
39*	501010950	BEARING HOLDER	1	
40*	502302660	BEARING HOLDER/INPUT SIDE	1	
42*	501402260	SET BOLT, L50M10M12/CLUTCH	4	
43\$	501402400	TIGHTENER PULLEY	1	
44\$	501302160	TIGHTENER SUPPORT	1	
45\$	042006204	BEARING 6204ZZ	2	
46\$	952400930	COLLAR 20252	1	
47\$	080100470	STOP RING R-47	1	
48\$	952400130	WASHER 9304	1	
49\$	001200820	BOLT 8X20	1	
50\$	030208200	LOCK WASHER M8	1	
51\$	001221035	BOLT 10X35 T	2	
52\$	030210250	LOCK WASHER M10	2	
53\$	031110160	FLAT WASHER M10	2	
54	501910040	BELT TIGHTENER ASSY.	1 INCLUDES ITEMS W/\$

MDR-9DYE — VIBRATION CASE ASSY.

VIBRATION CASE ASSY.



MDR-9DYE — VIBRATION CASE ASSY.

VIBRATION CASE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	502302570	VIBRATING PULLEY	1	
2	502201010	ROTARY SHAFT/L	1	
3	502201020	ROTARY SHAFT/R	1	
4-1	502302582	GEAR (DRIVE-1P)	1	
4-2	502302581	GEAR 44 (DRIVEN-2P)	1	
5	951400081	KEY 10X8X17	2	
6	951400090	KEY 10X8X33	1	
7	952400900	WASHER 13446	3	
8	001211235	BOLT 12X35 H	3	
9	030212300	LOCK WASHER M12	3	
10	502302590	ECCENTRIC ROTATOR	2	
11	001521040	SOCKET HEAD BOLT 10X40 T	8	
12	040006309	BEARING 6309	4	
13	080101000	STOP RING R-100	2	
14	080200450	STOP RING S-45	4	
15	060106010	OIL SEAL SB-659013	1	
15	060206020	OIL SEAL SC-659013	1	
16	952400911	SPACER 801003	1	
17	502100650	VIBRATING CASE	1	
18	502302600	CASE COVER	1	
20	001521025	SOCKET HEAD BOLT 10X25 T	8	
21	502201030	GEAR COVER	1	
23	953400270	PLUG 1/4X14 10L	2	
23	953405270	PLUG 1/4X14 13L	2	
24	953405260	PACKING 1/4 (CU)	2	
25	001520652	SOCKET HEAD BOLT 6X60 T	8	
26	031106100	FLAT WASHER M6	8	
27	001221445	BOLT 14X45 T	14	
28	030214350	LOCK WASHER M14	14	
29	502403140	T-JOINT	1	
30	502010860	NIPPLE PT1/4	1	
31	070100360	V-BELT A-36	2	
32	502402300	BREATHER	1	
33	953405260	PACKING 1/4 (CU)	1	
34	502303010	PACKING, VIBRATION CASE/A	1	
35	502303020	PACKING, VIBRATION CASE/B	1	
36	502305480	ECCENTRIC ROTATOR	2	
37	920101480	DECAL, OIL LEVEL	1	

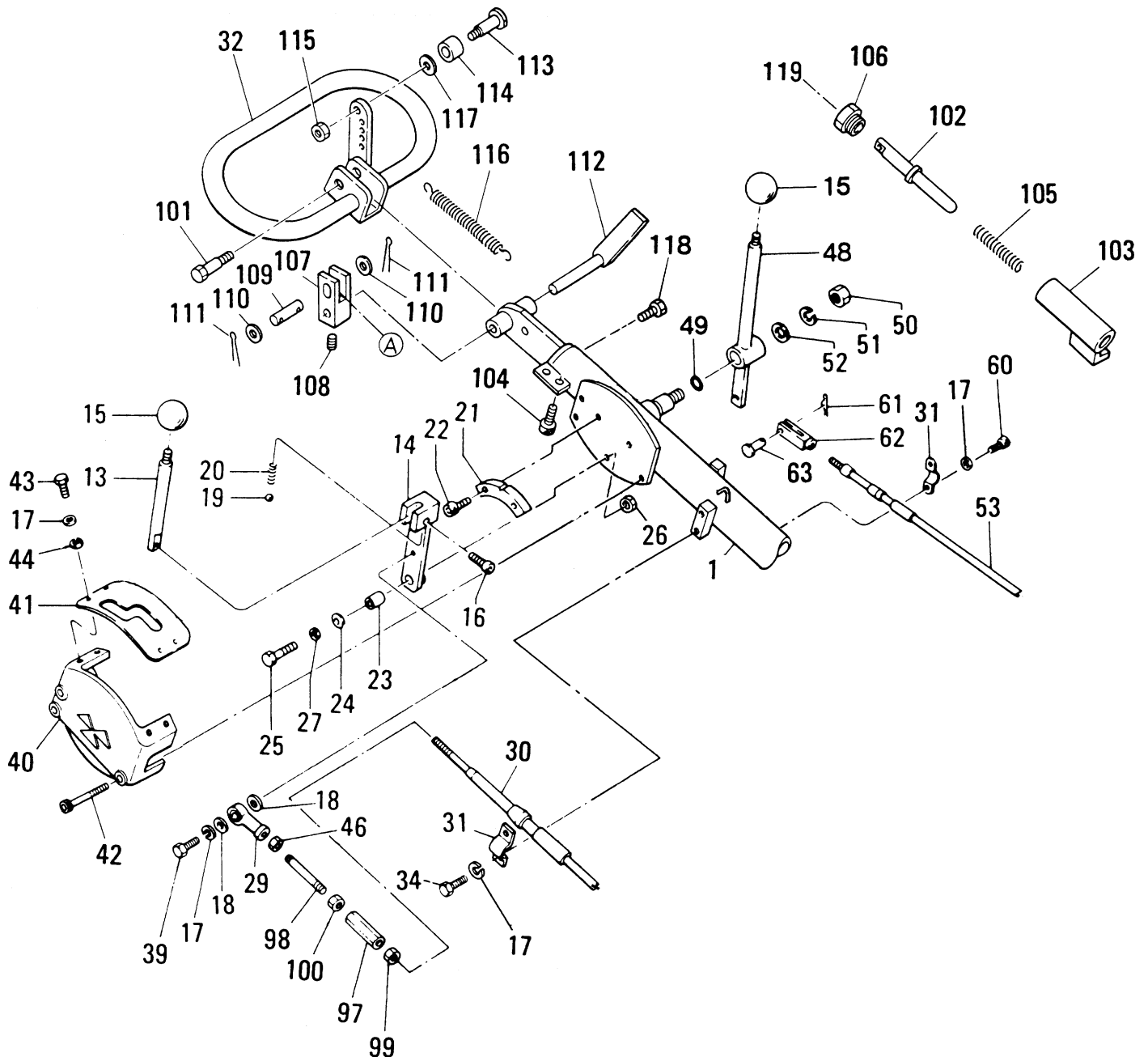
MDR-9DYE — UPPER CONTROL HANDLE ASSY.

UPPER CONTROL HANDLE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	502101480	BAR HANDLE, D.C./9D	1	
13	501011090	TRAVELING LEVER	1	
14	501011100	LINK	1	
15	959402980	BALL GRIP 40D-M12	2	
16	001520620	SOCKET HEAD BOLT 6X20 T	1	
17	030206150	LOCK WASHER M6	15	
18	031106100	FLAT WASHER M6	6	
19	501011110	STEEL BALL	1	
20	501011120	SPRING, 1.2X8X34	1	
21	505422750	GUIDE	1	
22	001520615	SOCKET HEAD BOLT 6X15 T	2	
23	501011140	BUSH 8918, LINK	1	
24	501011150	CONICAL SPRING WASHER	1	
25	001200835	BOLT 8X35	1	
26	020308060	NUT M8	1	
27	031108160	FLAT WASHER M8	1	
29	501011162	ROD END PR6-209	3	
30	502314420	CABLE ASSY./C2110	1	
31	501011180	CLAMP HC-40	4	
32	501203980	HANDLE, D.C.	1	
34	001210615	BOLT 6X15 H	4	
39	001210620	BOLT 6X20 H	2	
40	501202200	LEVER COVER, D.C.	1	
41	501011220	LEVER GUIDE	1	
42	001520652	SOCKET HEAD BOLT 6X60 T	3	
43	001210615	BOLT 6X15 H	4	
44	031106100	FLAT WASHER M6	4	
48	501011310	VIBRATING LEVER	1	
49	050200160	O-RING P-16	1	
50	020312100	NUT M12	1	
51	030212300	LOCK WASHER M12	1	
52	031112230	FLAT WASHER M12	1	
53	502314410	CABLE ASSY./C2550	1	
60	001220615	BOLT 6X25 T	4	

MDR-9DYE — UPPER CONTROL HANDLE ASSY. (CONTINUED)

UPPER CONTROL HANDLE ASSY.



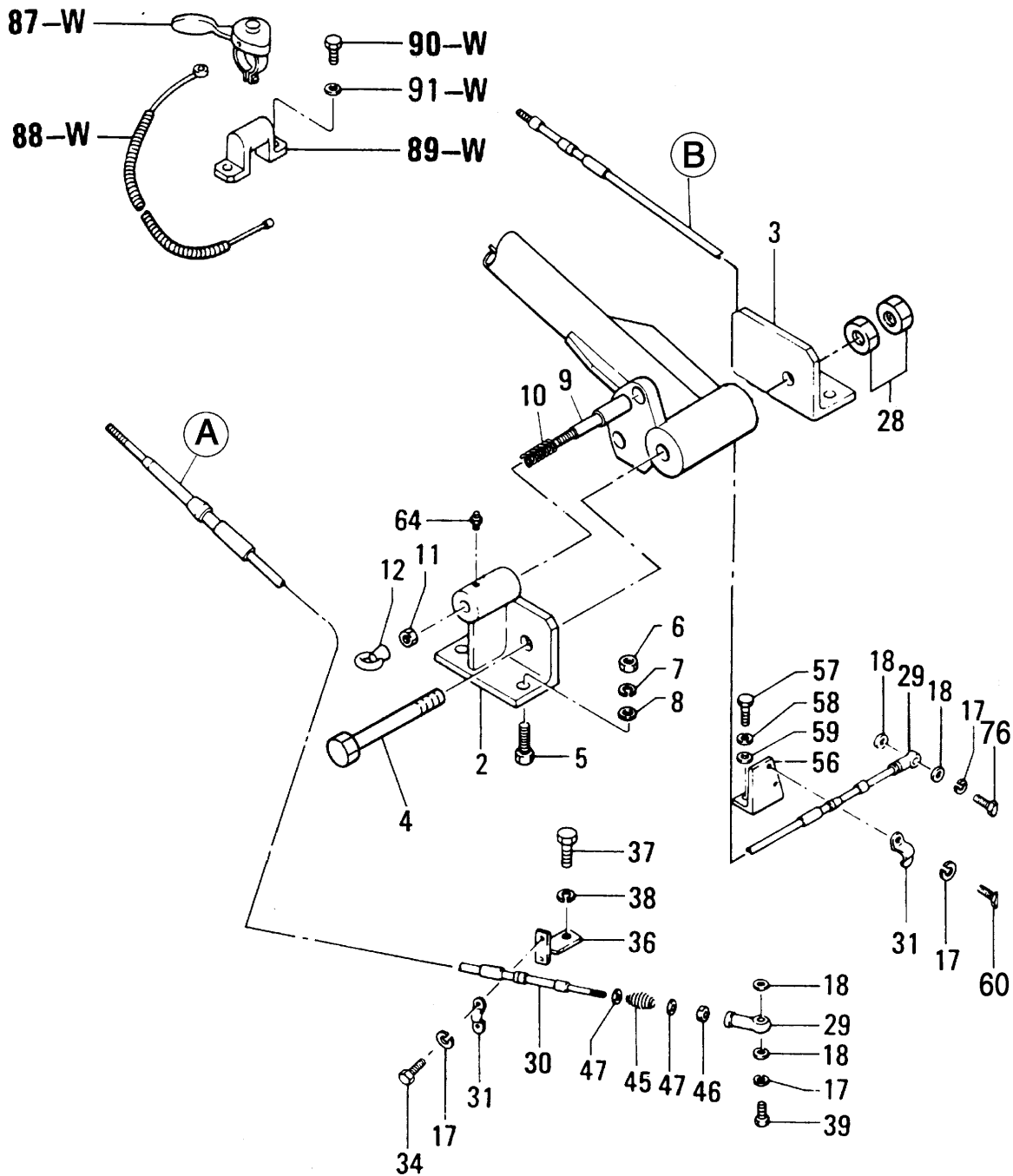
MDR-9DYE — UPPER CONTROL HANDLE ASSY. (CONTINUED)

UPPER CONTROL HANDLE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
61	025202020	SPLIT COTTER PIN 2X20	1	
62	502010930	CLEVIS	1	
63	502010940	CLEVIS PIN	1	
93	920101290	DECAL, VIBRATION	1	
94	920201100	DECAL, CLUTCH LEVER	1	
95	920101280	DECAL / FORWARD & REVERSE	1	
97	501413650	TURN BUCKLE	1	
98	501413660	ADJUST BOLT	1	
99	020306050	NUT M6	1	
100	022910090	NUT M6 (L)	1	
101	501407790	HANDLE PIN, D.C.	1	
102	501305190	ROD, D.C.	1	
103	502416960	ROD-GUIDE	1	
104	001520815	SOCKET HEAD BOLT 8X15 T	2	
105	501407810	ROD SPRING, D.C.	1	
106	501407820	NUT, D.C.	1	
107	501416950	LINK, D.C.	1	
108	099206008	SOCKET HEAD SCREW 6X8 T	1	
109	501407840	LINK PIN, D.C., 6X28-23	1	
110	031106100	FLAT WASHER M6	2	
111	025202012	SPLIT COTTER PIN 2X12	2	
112	501416970	LEVER, D.C.	1	
113	001200830	BOLT 8X30	1	
114	501407880	GUIDE ROLLER, D.C.	1	
115	020308060	NUT M8	1	
116	501407890	LEVER SPRING, D.C.	1	
117	031108160	FLAT WASHER M8	1	
118	001220815	BOLT 8X15 T	1	
119	502910020	HANDLE STOPPER	1	

MDR-9DYE — LOWER CONTROL HANDLE ASSY.

LOWER CONTROL HANDLE ASSY.



NOTES:

- (A) UPPER CONTROL ARM ASSY., ITEM 30
- (B) UPPER CONTROL ARM ASSY., ITEM 53

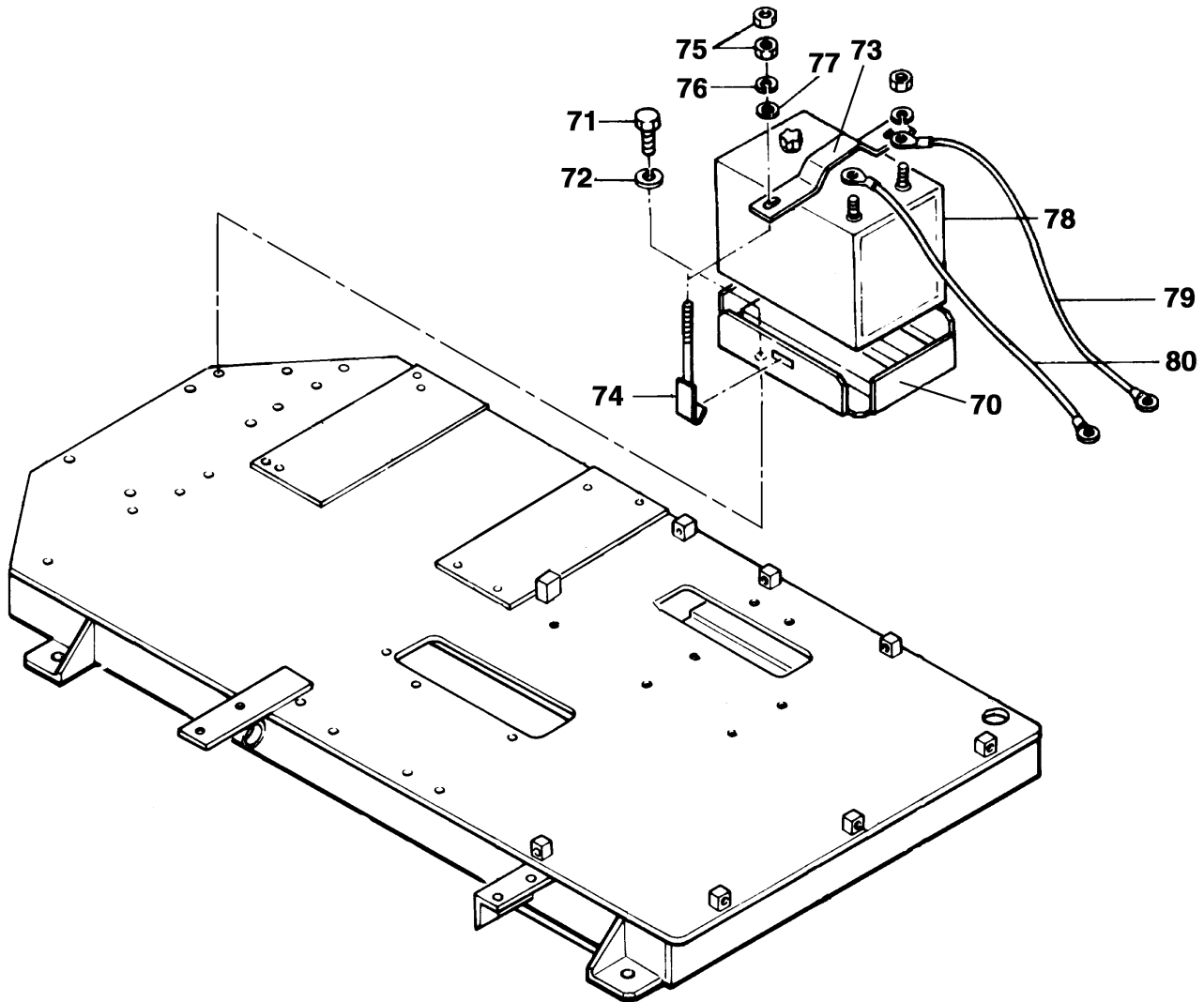
MDR-9DYE — LOWER CONTROL HANDLE ASSY.

LOWER CONTROL HANDLE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
2	501302670	HANDLE BRACKET, RIGHT	1	
3	501302680	HANDLE BRACKET, LEFT	1	
4	501402860	BOLT 20X170	1	
5	001221245	BOLT 12X45 T	4	
6	020312100	NUT M12	4	
7	030212300	LOCK WASHER M12	4	
8	031112230	FLAT WASHER M12	4	
9	501402870	HANDLE STOPPER	1	
10	501402880	SPRING/HANDLE (1.4X18X44)	1	
11	020310080	NUT M10	1	
12	959010413	EYE NUT M10	1	
28	020120160	NUT M20, P1.5	2	
29	501011162	ROD END PR6-209	3	
30	502314420	CABLE ASSY./C2110	1	
31	501011180	CLAMP HC-40	4	
34	001210615	BOLT 6X15 H	4	
36	502402900	CABLE STOPPER	1	
37	001221020	BOLT 10X20 T	1	
38	030210250	LOCK WASHER M10	1	
39	001210620	BOLT 6X20 H	2	
45	0830000010	COIL SPRING	1	
46	020306050	NUT M6	4	
47	031106100	FLAT WASHER M6	2	
56	502402890	CABLE STOPPER	1	
57	001220820	BOLT 8X20 T	2	
58	030208200	LOCK WASHER M8	2	
59	031108160	FLAT WASHER M8	2	
60	0012-20615	BOLT 6x15 T	4	
64	351010050	GREASE FITTING A-MT6X1	1	
76	001220620	BOLT 6X20 T	1	
87W	956300060	THROTTLE LEVER AY 22	1	
88W	502303040	THROTTLE WIRE S520-640	1	
89W	501310130	LEVER HOLDER	1	
90W	001220820	BOLT 8X20 T	2	
91W	030208200	LOCK WASHER M8	2	
96	920101200	DECAL, GREASE	1	

MDR-9DYE — BATTERY ASSY.

BATTERY ASSY.



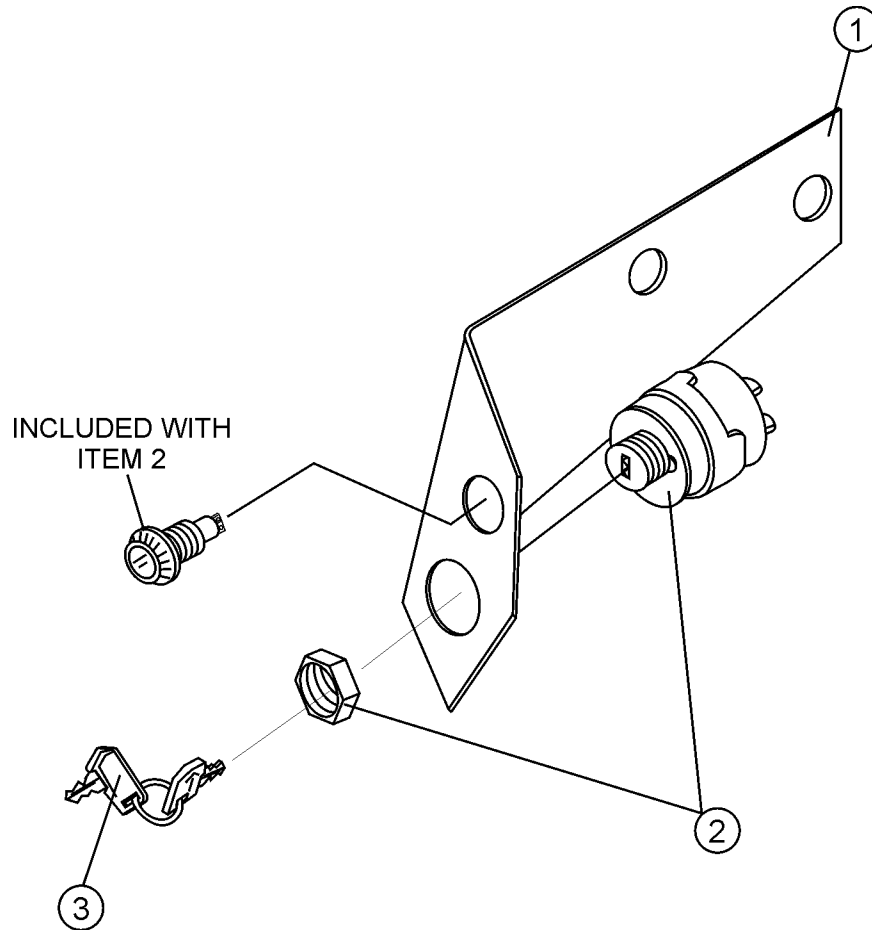
MDR-9DYE — BATTERY ASSY.

BATTERY ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
70	502215490	BATTERY BASE	1	
71	001200815	BOLT 8X15	4	
72	030208200	SW M8	4	
73	502403310	BATTERY PROTECT	1	
74	502403320	BOLT/BATTERY	2	
75	020308060	NUT M8	4	
76	030208200	WASHER, LOCK M8	2	
77	031108160	WASHER, FLAT M8	2	
78	607010030	BATTERY 12N24-3.26A19L	1	
79	502301040	BATTERY CORD (+) 220	1	
80	502301050	BATTERY CORD (-) 380	1	

MDR-9DYE — IGNITION SWITCH/MOUNTING PLATE ASSY.

IGNITION SWITCH AND MOUNTING PLATE ASSY.



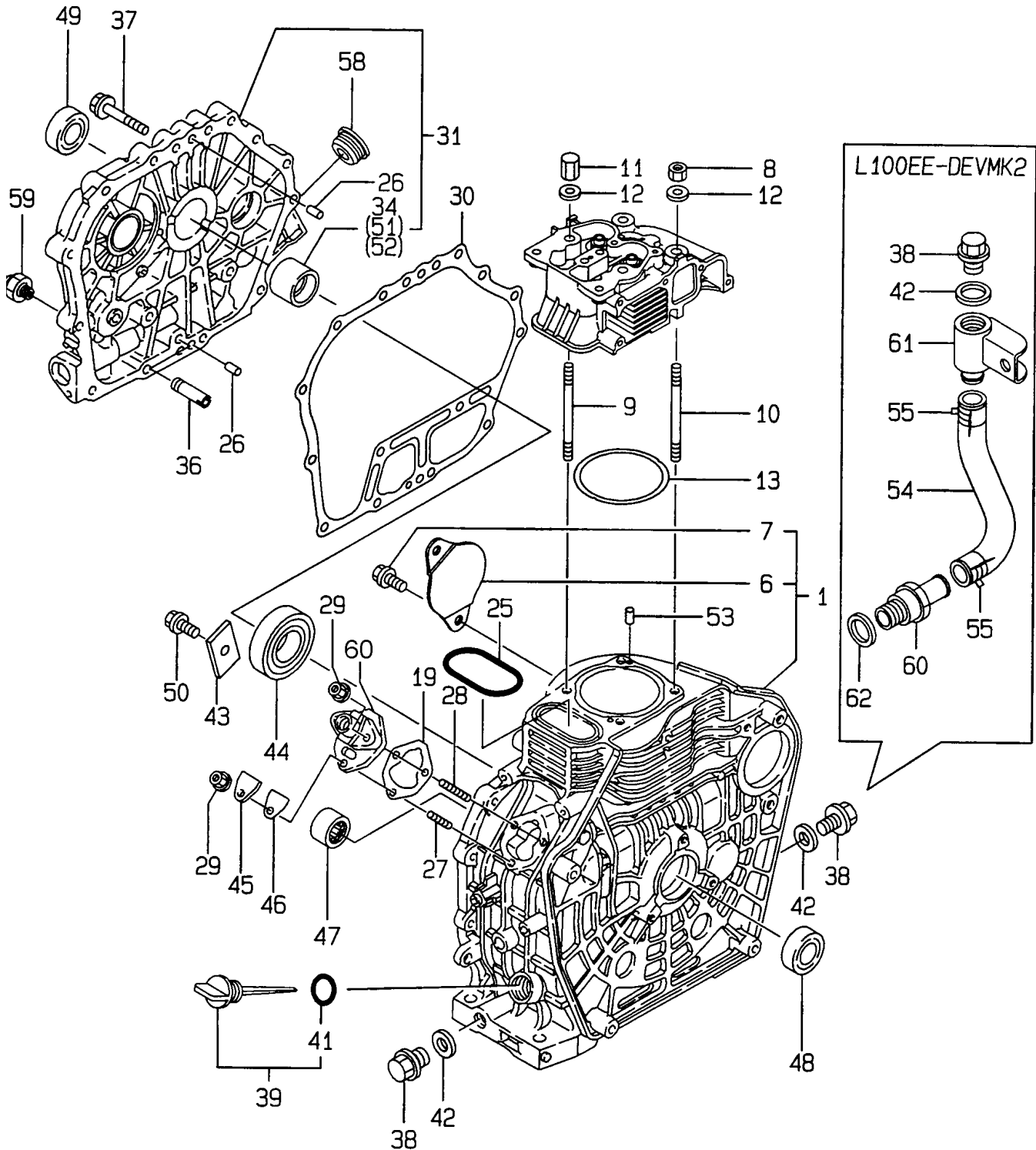
MDR-9DYE — IGNITION SWITCH/MOUNTING PLATE ASSY.

IGNITION SWITCH AND MOUNTING PLATE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	34578	SWITCH HOLDER	1	
2	11435177500	SWITCH, IGNITION	1	
3	10610077630	KEY, IGNITION	1	

YANMAR L100EE DEVMK2 — CYLINDER BLOCK ASSY.

CYLINDER BLOCK ASSY.



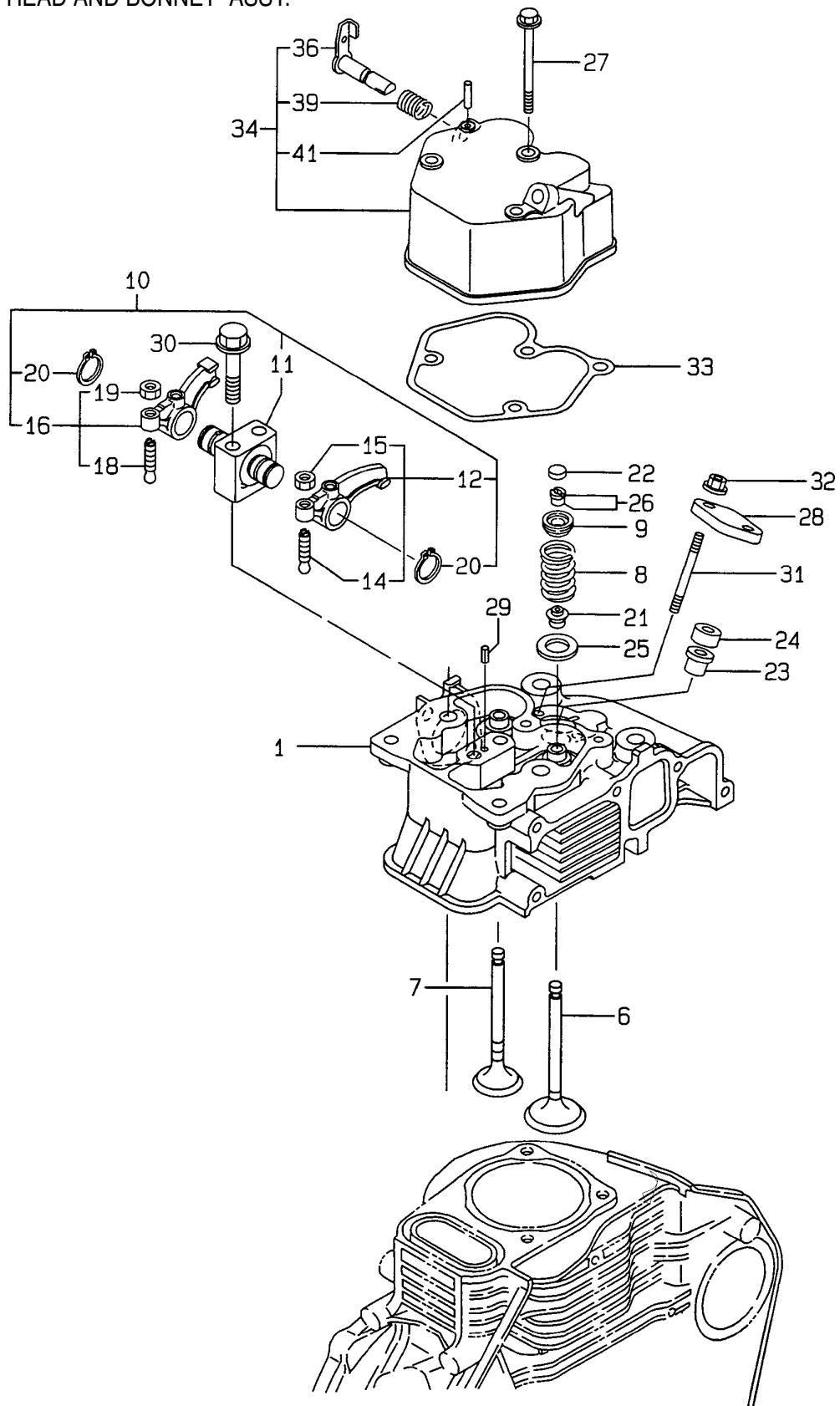
YANMAR L100EE DEVMK2 — CYLINDER BLOCK ASSY.

CYLINDER BLOCK ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	71497001560	BLOCK ASSY. CYLINDER	1	INCLUDES ITEMS W/*
6*	11435001700	COVER, STARTER	1	
7*	26106100122	BOLT M10X 12 PLATED	2	
8	10502501220	NUT 10	2	
9	11465001230	STUD, CYLINDER HEAD	2	
10	11465001240	STUD, CYLINDER HEAD	2	
11	11465001250	NUT 10	2	
12	11465001260	WASHER	4	
13	11465101330	GASKET, CYLINDER HEAD CMP	1	
19	11425001800	SHIM SET	1	
25	11465001380	O-RING	1	
26	11427001600	PARALLEL PIN 8 X 12	2	
27	26226060182	STUD M 6 X 18 PLATED	1	
28	26226060222	STUD M 6 X 22 PLATED	2	
29	26366060002	NUT M 6	3	
30	11465001412	GASKET CRANKCASE	1	
31	11466001471	COVER D, CRANKCASE	1	INCLUDES ITEMS W/+
34+	11465002100	BEARING, MAIN	1	
36	11425035150	PIPE, L.O. INLET	1	
37	26106080352	BOLT M 8 X 35 PLATED	16	
38	10542501690	PLUG M16	2	
39	11469901760	CAP, W/LUB.OIL GAUGE	1	INCLUDES ITEMS W/#
41#	11429901950	O-RING	1	
42	22190160002	SEAL WASHER 16S	2	
43	11429902030	RETAINER	1	
44	11465002150	BALL BEARING	1	
45	11425001830	COVER, INSPEC. WINDOW	1	
46	11425001841	GASKET	1	
47	24162152112	NEEDLE BEARING	1	
48	24423355008	SEAL, OIL	1	
49	22423355008	SEAL, OIL	1	
50	26106080122	BOLT M 8 X 12 PLATED	1	
51	11465002200	MAIN BEARING US = 0.25	1	
52	11465002210	MAIN BEARING US = 0.50	1	
53	22312040080	PIN 4 X 8 STRAIGHT	2	
54	11498401940	PIPE	1	
55	23000019000	CLAMP 19	2	
58	16011001870	PLUG, RUBBER W/SCREW	1	
59	12125239450	SENDER, OIL PRESSURE	1	
60	11498508350	NIPPLE, DRAIN	1	
61	11435239400	JOINT, DRAIN	1	
62	22190160002	SEAL WASHER 16S	1	

YANMAR L100EE DEVMK2 — CYLINDER HEAD AND COVER ASSY.

CYLINDER HEAD AND BONNET ASSY.



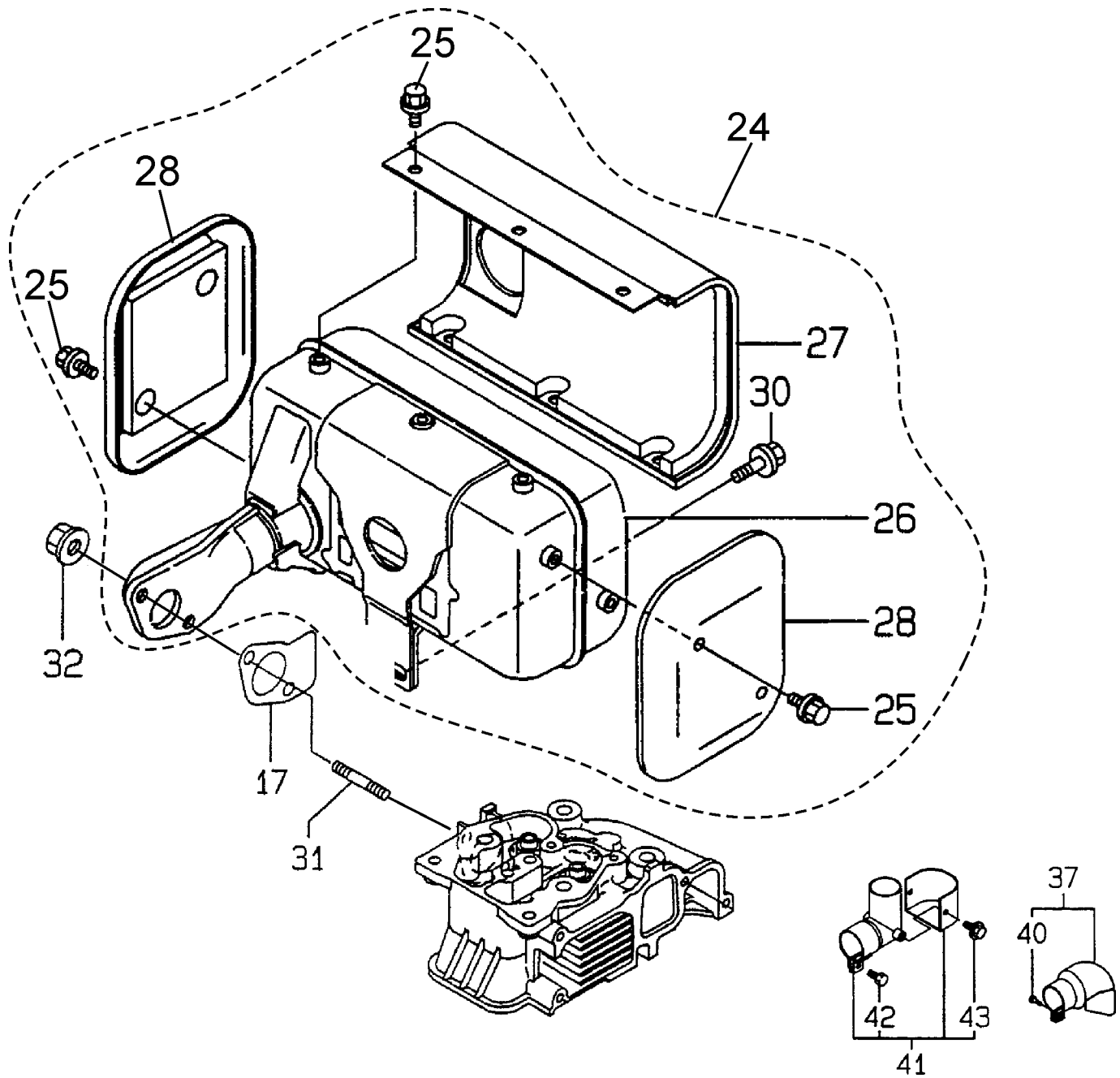
YANMAR L100EE DEVMK2— CYLINDER HEAD AND COVER ASSY.

CYLINDER HEAD AND COVER ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11465111020	CYLINDER HEAD	1	
6	11465111100	VALVE, SUCTION	1	
7	11465111110	VALVE, EXHAUST	1	
8	11465011121	SPRING, VALVE	2	
9	11962011180	RETAINER, SPRING	2	
10	11465111250	SUPPORT CMP, ARM	1	INCLUDES ITEMS W/*
11*	11465111260	SUPPORT, ROCKER ARM	1	
12*	11465111650	ARM ASSY. INTAKE	1	
14*	11425011240	SCREW, VALVE ADJUST	1	
15*	26856060002	LOCK NUT 6	1	
16*	11465111660	ARM ASSY., EXHAUST	1	
18+	11425011240	SCREW, VALVE ADJUST	1	INCLUDES ITEMS W/+
19+	26856060002	LOCK NUT 6	1	
20*	22242000150	CIRCLIP 15	2	
21	11465011340	SEAL, VALVE STEM	2	
22	10421111370	CAP, VALVE	2	
23	11477111461	GASKET, NOZZLE	1	
24	11477111470	SPACER, NOZZLE	1	
25	11465011600	WASHER	2	
26	27310070000	COTTER 7	4	
27	26106060702	BOLT M 6 X 70 PLATED	3	
28	11425011901	RETAINER	1	
29	22351040008	SPRING PIN 4 X 8	1	
30	26106080552	BOLT M 8 X 55 PLATED	2	
31	26226060552	STUD M 6 X 55 PLATED	2	
32	26366060002	NUT M 6	2	
33	11465111310	GASKET, BONNET	1	
34	11465111950	COVER ASSY. HEAD	1	INCLUDES ITEMS W/#
36#	11425003591	SHAFT ASSY., DECOMP.	1	
39#	11425003640	SPRING	1	
41#	22312030160	PARALLEL PIN 3 X 16	1	

YANMAR L100EE-DEVMK2— MUFFLER ASSY.

MUFFLER ASSY.



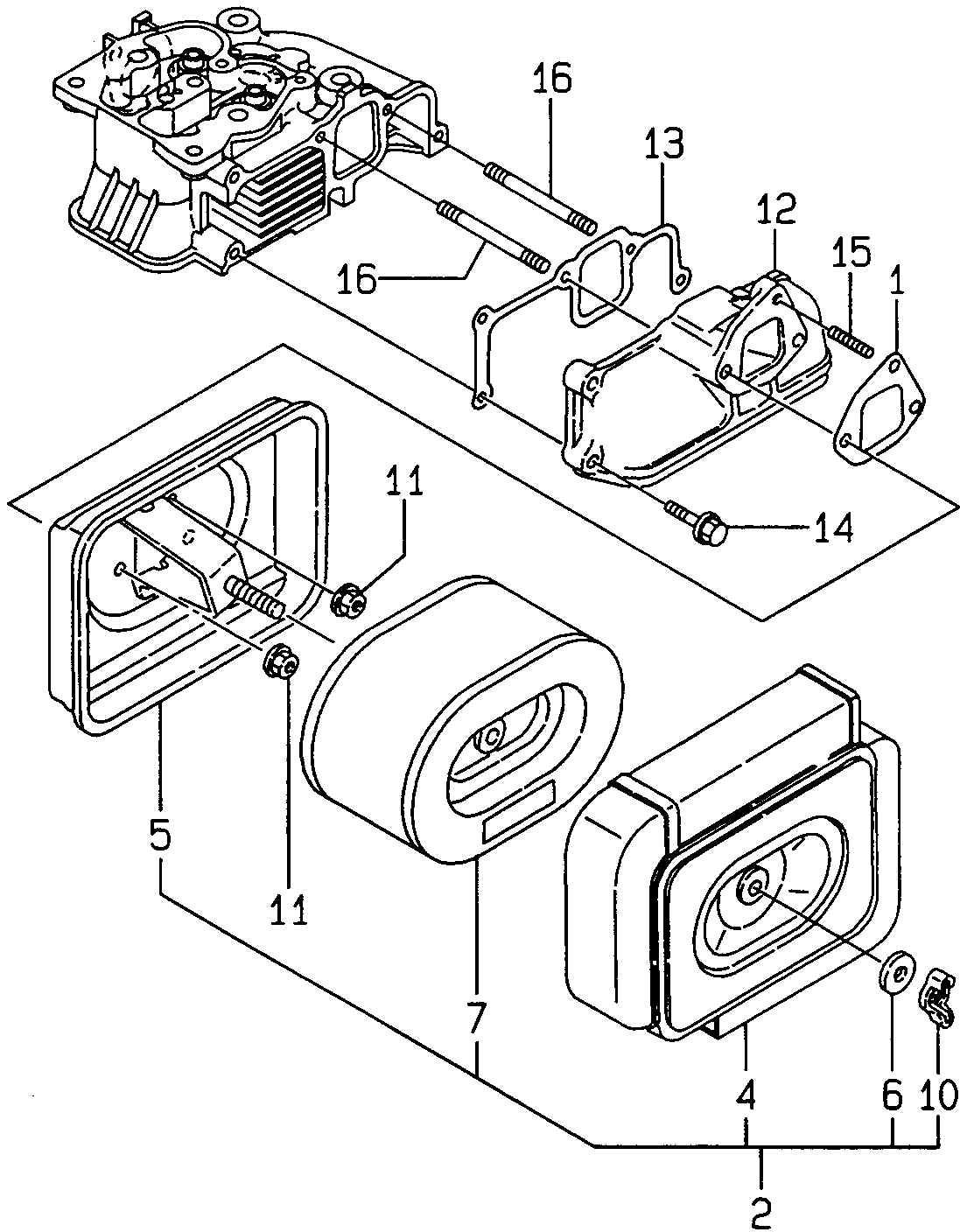
YANMAR L100EE-DEVMK2— MUFFLER ASSY.

MUFFLER ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
17	11465013201	GASKET, NON-ASB.	1	
24	11497013551	MUFFLER ASSY.	1	INCLUDES ITEMS W/*
25*	16026001580	BOLT M 6 X 6	10	
26*	11497013561	MUFFLER	1	
27*	11497013700	COVER A, MUFFLER	1	
28*	11497013710	COVER, MUFFLER	2	
30*	26106080182	BOLT, M 8 X 16 PLATED	2	
31	26216080182	STUD, M 8 X 18 PLATED	2	
32	26366080002	NUT, M 8	2	
37	10519813621	EXTENTION, SILENCER	1	INCLUDES ITEM W/#
40#	10509813990	BOLT	1	
41	11498513701	PIPE, SILENCER	1	INCLUDES ITEMS W/+
42+	10509813990	BOLT	1	
43+	26113060082	BOLT, M 6 X8	2	

YANMAR L100EE-DEVMK2— AIR CLEANER ASSY.

AIR CLEANER ASSY.



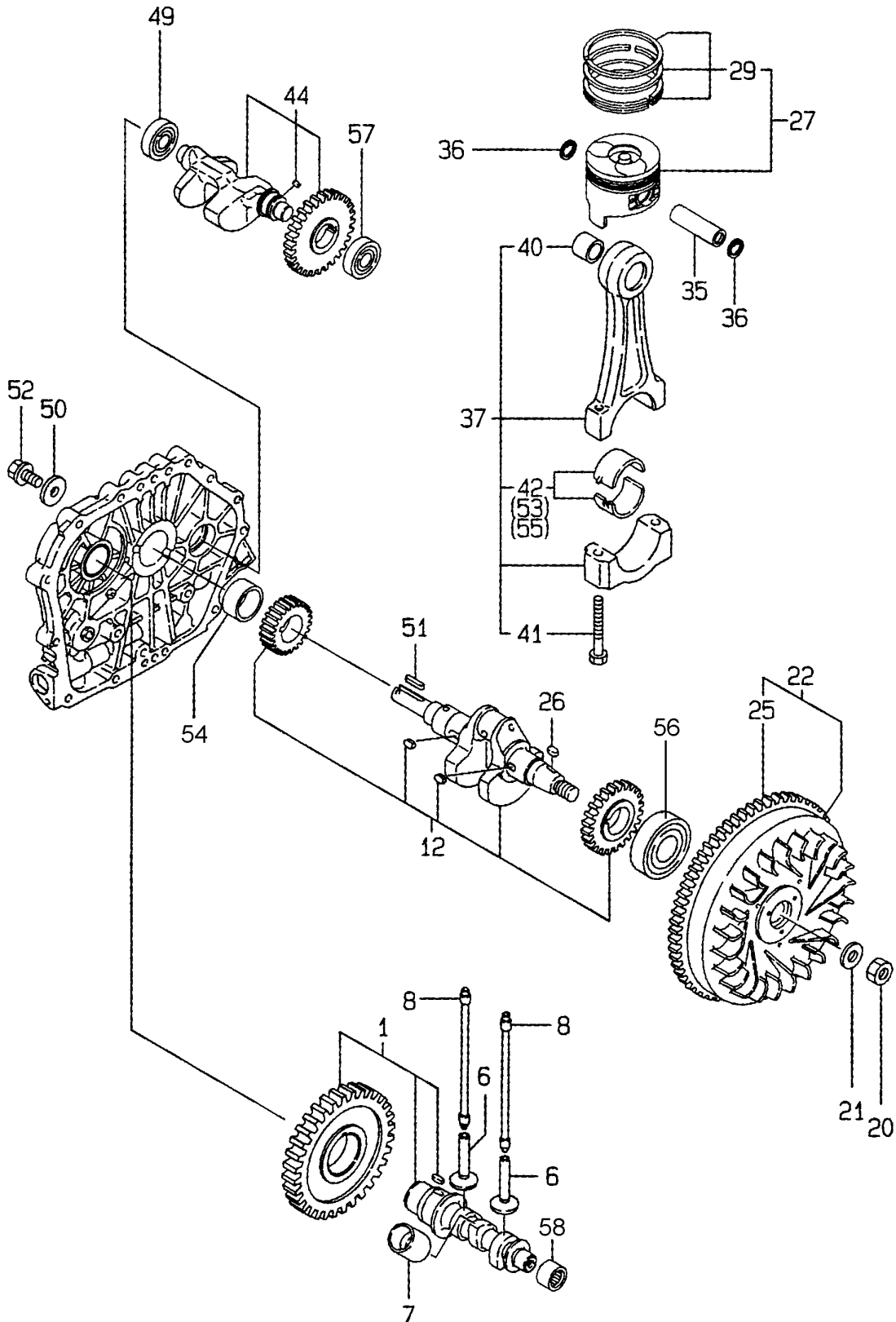
YANMAR L100EE-DEVMK2— AIR CLEANER ASSY.

AIR CLEANER ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11465012211	GASKET, AIR CLEANER	1	
2	71465012560	CLEANER ASSY. AIR	1	INCLUDES ITEMS W/*
4*	11465012520	COVER, AIR CLEANER	1	
5*	11465012530	CASE, AIR CLEANER	1	
6*	11425212560	WASHER M 8, SEAL	1	
7*	11465012590	ELEMENT W/PRE-FILTER	1	
10*	11425212550	WING, NUT M 8	1	
11	11425012300	U- NUT	3	
12	11469912020	PIPE, AIR INTAKE	1	
13	11465012301	GASKET, AIR INTAKE	1	
14	26106060252	BOLT M 6 X 25 PLATED	3	
15	26226060142	STUD M 6 X 14 PLATED	1	
16	26226060752	STUD M 6 X 75	2	

YANMAR — CRANKSHAFT, PISTON AND CAMSHAFT ASSY.

CRANKSHAFT, PISTON AND CAMSHAFT ASSY.



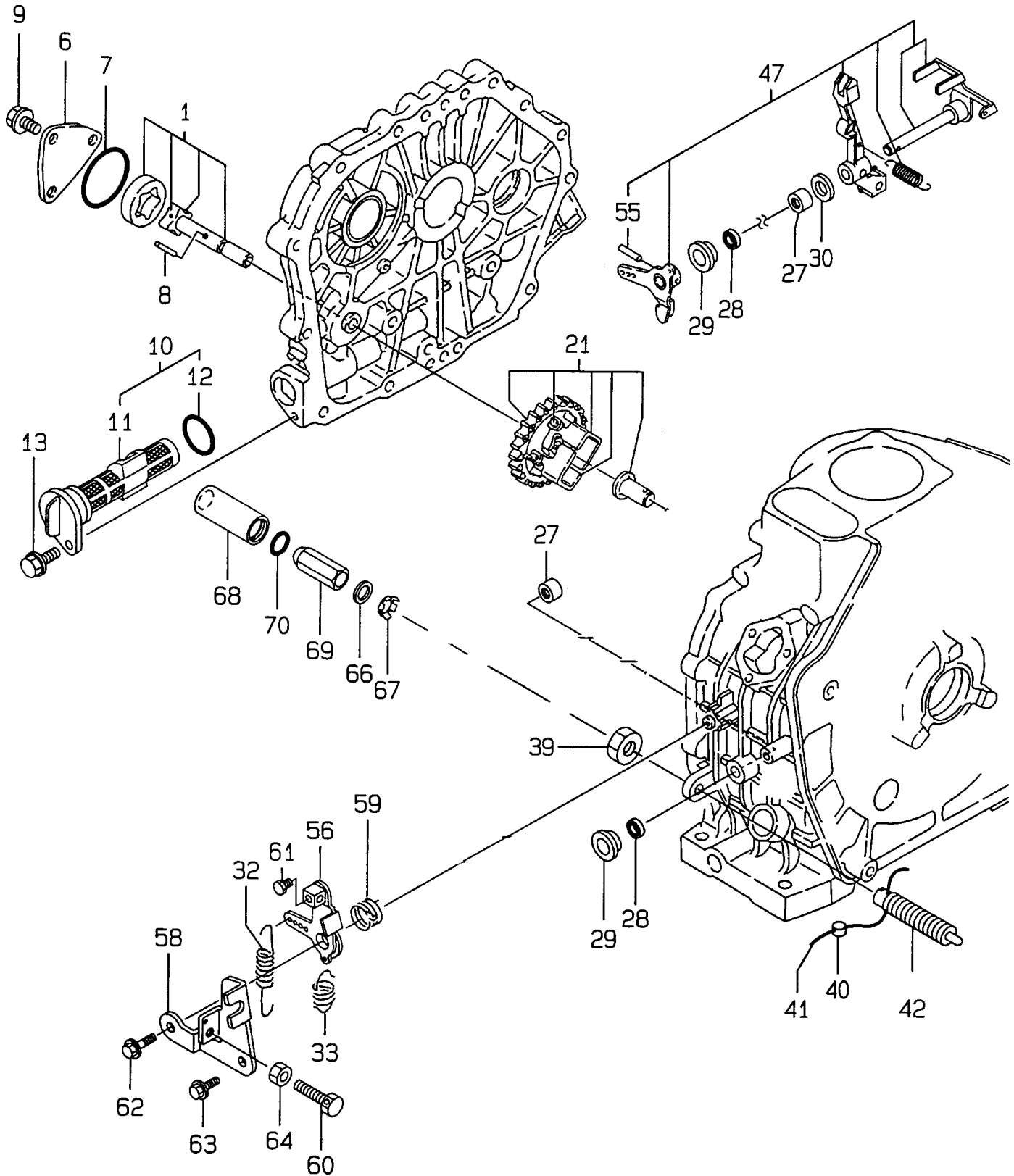
YANMAR — CRANKSHAFT, PISTON AND CAMSHAFT ASSY.

CRANKSHAFT, PISTON AND CAMSHAFT ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	71466014100	CAMSHAFT ASSY., D	1	
6	11465014200	TAPPET	2	
7	11477114260	TAPPET, F.O.	1	
8	11465014401	ROD, PUSH	2	
12	71465421730	CRANKSHAFT ASSY.	1	
20	12271001220	NUT, M18	1	
21	11465021551	WASHER, FLYWHEEL	1	
22	11466221593	FLYWHEEL, DEJ., W/GEAR	1	INCLUDES ITEMS W/ #
25 #	11466221601	GEAR, RING	1	
26	22512050140	KEY, 5 X 14	1	
27	71465222720	PISTON, W/RINGS	1	INCLUDES ITEMS W/*
29*	71497022500	RING SET, PISTON	1	
35	11469922300	PIN, PISTON D=23	1	
36	12979222400	CIRCLIP 23	2	
37	71465023100	ROD ASSY., CONNECTING	1	INCLUDES ITEMS W/%
40%	12406023100	BUSH, PISTON PIN	1	
41%	10530023200	BOLT, ROD	2	
42%	71465023600	BEARING, CRANKPIN	1	
44	71497028100	SHAFT ASSY., BALANCER	1	
49	24101062034	BALL BEARING	1	
50	16031014550	WASHER	1	
51	22512070360	KEY 7 X 36	1	
52	26106080202	BOLT M 8 X 20 PLATED	1	
53	71465023610	BEARING, CRANKPIN U.S=0.25	1	
54	11465002100	BEARING, MAIN	1	
55	71465023620	BEARING, CRANKPIN U.S=0.50	1	
56	11465002150	BALL BEARING	1	
57	24101063034	BALL BEARING	1	
58	24162152112	NEEDLE BEARING	1	

YANMAR L100EE-DEVMK2— LUB. OIL PUMP AND GOVERNOR ASSY.

LUB. OIL PUMP AND GOVERNOR ASSY.



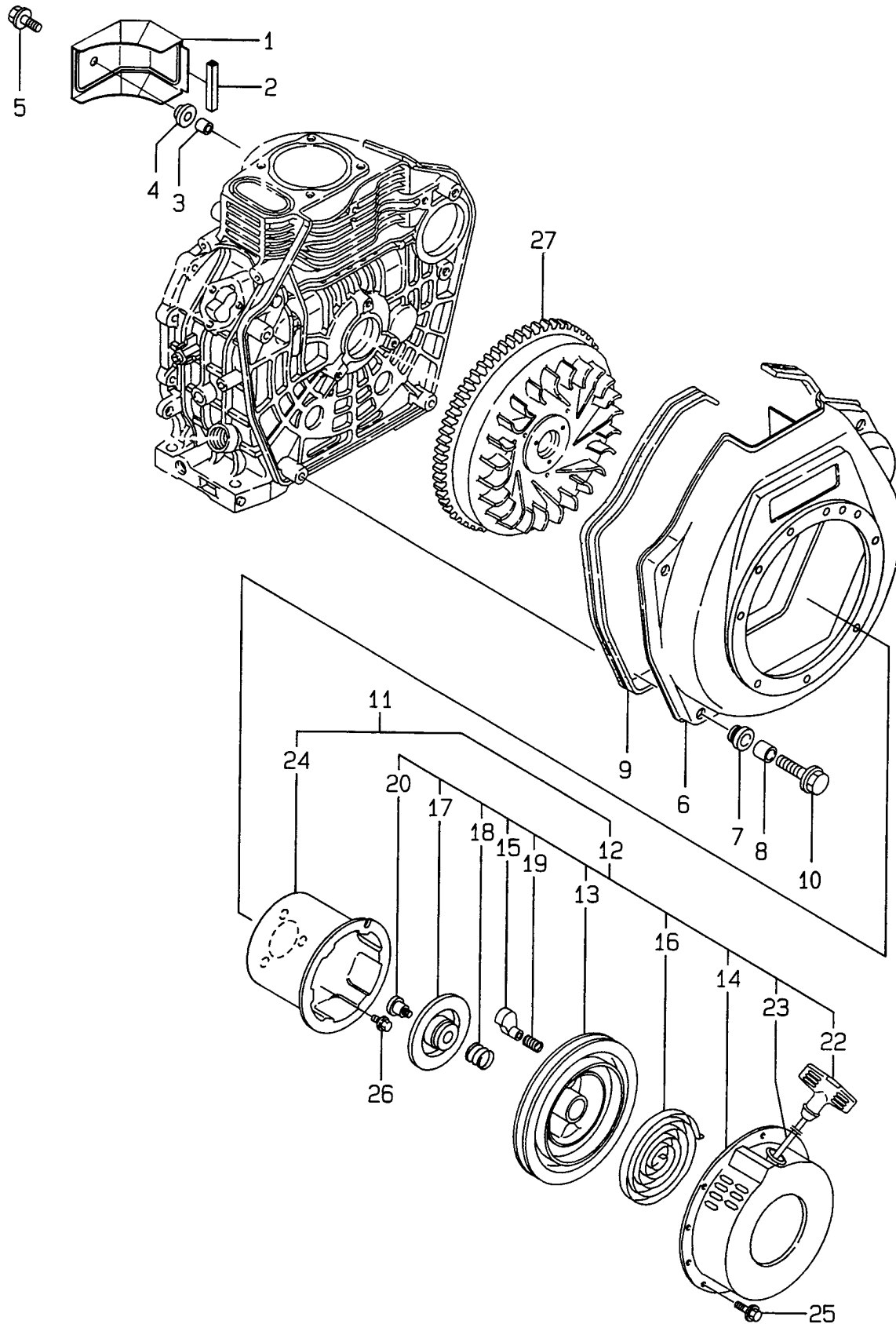
YANMAR L100EE-DEVMK2— LUB. OIL PUMP AND GOVERNOR ASSY.

LUB. OIL PUMP AND GOVERNOR ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11465032010	PUMP ASSY. LUB. OIL	1	
6	11425032070	COVER, LUB. OIL PUMP	1	
7	10333832570	O-RING	1	
8	22312030160	PARALLEL PIN 3 X 16	1	
9	26476060142	BOLT, M 6 X14, TAPPING	3	
10	11425035110	STRAINER, LUB. OIL ASSY.	1	INCLUDES ITEMS W/*
11*	11425035070	STRAINER, LUB. OIL	1	
12*	24341000224	O-RING 1A S-22.4	1	
13	26106060162	BOLT M 6 X 16 PLATED	1	
21	71468561700	GOVERNOR ASSY.	1	
27	11477061520	BEARING, NEEDLE	2	
28	11477061600	SEAL, OIL	1	
29	11477061610	WASHER, THRUST	1	
30	22137080000	WASHER 8, POLISHED	1	
32	11497066010	SPRING, REGULATOR	1	
33	11425066200	SPRING, RETURN	1	
39	26776100002	LOCK NUT M10 PLATED	1	
40	13521061090	LEAD	1	
41	22451060000	WIRE 0.6	1	
42	11425066550	TORQUE SPRING ASSY.	1	
47	71468561500	LEVER ASSY., GOVERNOR	1	
10	11425035110	STRAINER, LUB. OIL ASSY.	1	INCLUDES ITEMS W/+
55+	22322030200	TAPER PIN 3 X 20	1	
56	11425266051	HANDLE, REGULATOR	1	
58	18336066110	BRACKET, REGULATOR	1	
59	11425266252	SPRING, RETURN	1	
60	11425066440	BOLT, ADJUSTING	1	
61	10522566990	SCREW	1	
62	26106060202	BOLT M 6 X 20 PLATED	1	
63	26476060142	BOLT M 6 X 14 TAPPING	1	
64	26757060002	NUT 6	1	
66	11477161800	WASHER	1	
67	11477161820	PLATE	1	
68	11477161900	PROCTECTOR	1	
69	11477161930	NUT	1	
70	24311000125	O-RING 1A P-12.5	1	

YANMAR L100EE-DEVMK2 — COOLING AND STARTING DEVICE ASSY.

COOLING AND STARTING DEVICE ASSY.



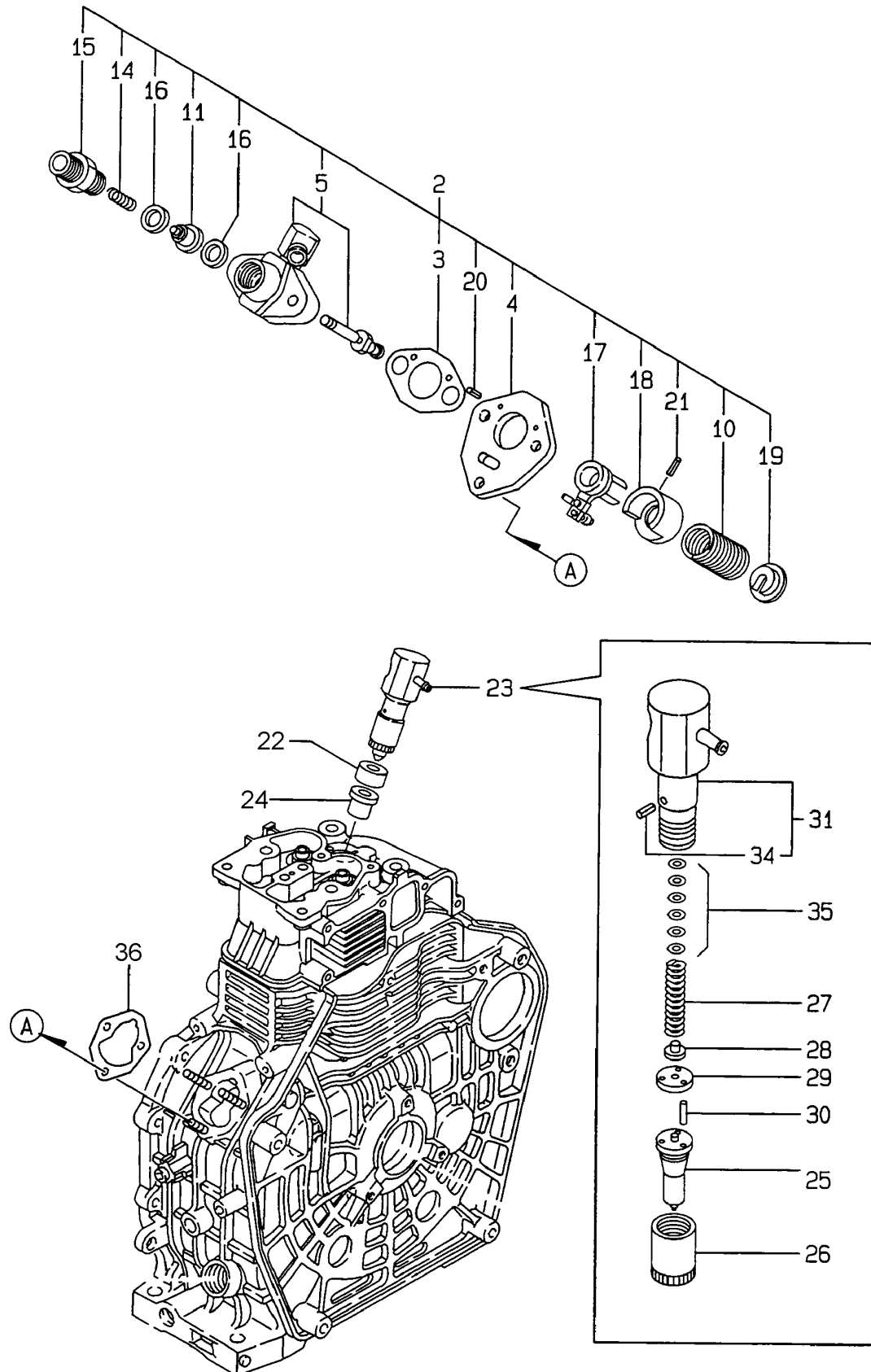
YANMAR L100EE-DEVMK2 — COOLING AND STARTING DEVICE ASSY.

COOLING AND STARTING DEVICE ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11465045201	COVER	1	
2	11435045320	RUBBER, SEAL	1	
3	11435045340	COLLAR	1	
4	18372055210	GROMMET	1	
5	26106060202	BOLT M 6 X 20 PLATED	1	
6	11466845102	CASE, FAN SILVER 17	1	
7	11425045301	RUBBER, CUSHION	4	
8	11425045310	COLLAR	4	
9	11465045330	SEAL, FAN CASE	1	
10	11437045351	BOLT, FAN CASE	4	
11	11466076052	RECOIL STARTER D ASSY.....	1	INCLUDES ITEMS W/*
12*	11466076251	RECOIL ASSY.	1	INCLUDES ITEMS W/\$
13*\$	11488076520	REEL, RECOIL	1	
14*\$	11466076531	CASE D, W/NO LABEL	1	
15*\$	11487076530	RATCHET	2	
16*\$	11487076540	SPRING, SPRIAL	1	
17*\$	11487076550	GUIDE, RATCHET	1	
18*\$	11487076560	SPRING, FRICTION	1	
19*\$	11487076570	SPRING, RETURN	2	
20*\$	11487076580	SET SCREW	1	
22*\$	11487076620	KNOB, STARTER	1	
23*\$	11465076631	ROPE, RECOIL STARTER	1	
24*	11466076592	PULLEY, STARTER	1	
25	26106060082	BOLT M 6 X 8 PLATED	4	
26	26106060122	BOLT M 6 X 12 PLATED	3	
27	11466221593	FLYWHEEL, DEJ. W/ GEAR	1	

YANMAR L100EE-DEVMK2— FUEL INJECTION PUMP ASSY.

FUEL INJECTION PUMP ASSY.



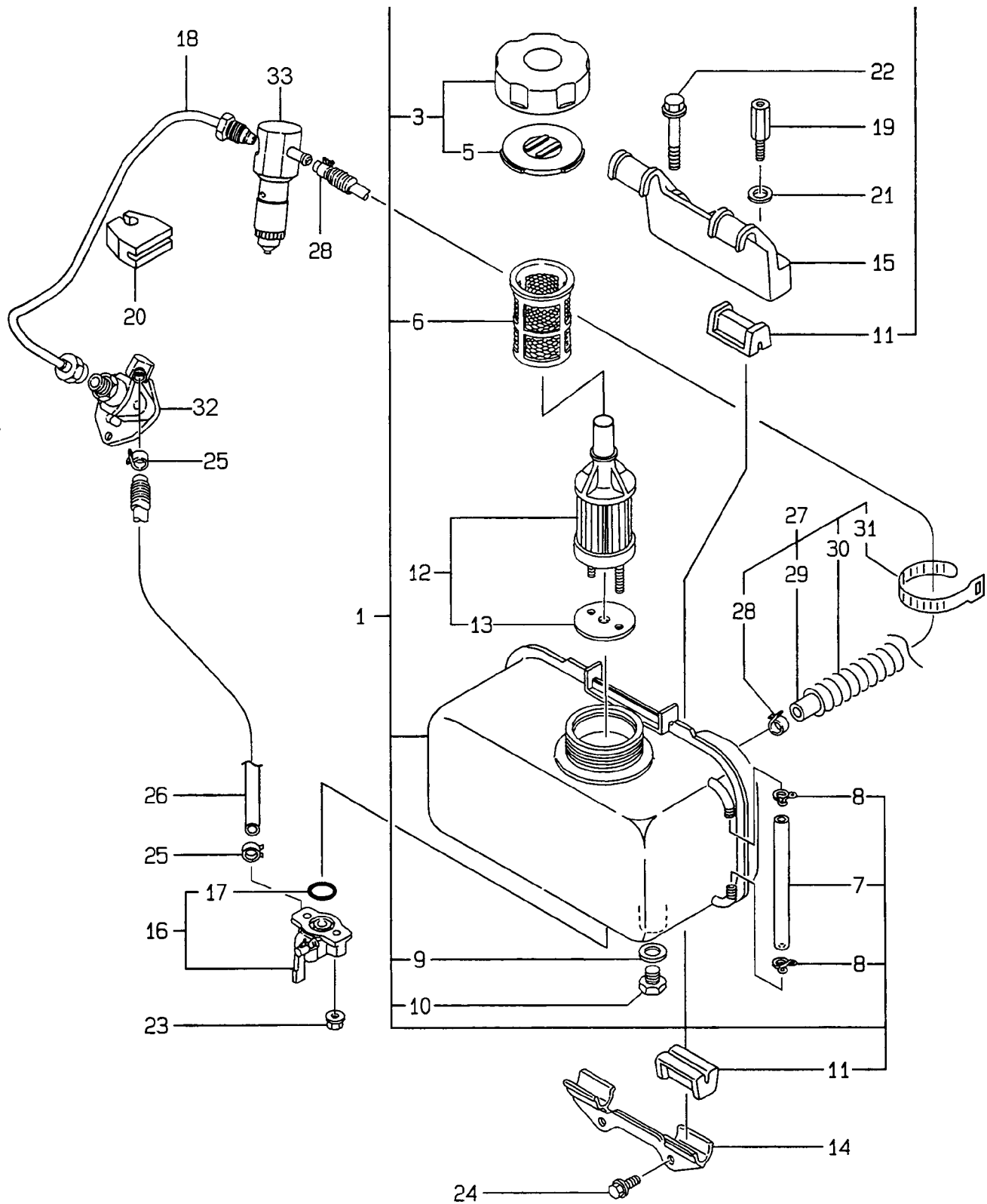
YANMAR L100EE-DEVMK2— FUEL INJECTION PUMP ASSY.

FUEL INJECTION PUMP ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
2	71465651110	PUMP ASSY., FUEL INJECTORS	1	INCLUDES ITEMS W/*
3*	10554651020	GASKET	1	
4*	11425051080	PLATE	1	
5*	11497051100	BODY, F.I. PUMP	1	
10*	11425051160	SPRING	1	
11*	11465051300	VALVE ASSY., DELIVERY	1	
14*	10554651330	SPRING, DELIVERY VALVE	1	
15*	11425051340	HOLDER, F. I. P. DELIVERY	1	
16*	12455051350	GASKET, DELIVERY	2	
17*	11425051600	LEVER ASSY., CONTROL	1	
18*	11425051640	SEAT A, SPRING	1	
19*	11425051650	SEAT B, SPRING	1	
20*	22351020006	SPRING PIN 2 X 6	2	
21*	22351030008	SPRING PIN 3 X 8	2	
22	11477111470	SPACER, NOZZLE	1	
23	71487553101	VALVE ASSY., F. INJECT	1	INCLUDES ITEMS W/+
24	11477111461	GASKET, NOZZLE	1	
25+	11487153000	NOZZLE, ASSY.	1	
26+	11959353080	NUT, NOZZLE CASE	1	
27+	11425053120	SPRING, NOZZLE	1	
28+	11959353130	RETAINER	1	
29+	11477553140	SPACER, VALVE STOP	1	
30+	11477553210	PIN	2	
31+	11487553100	HOLDER ASSY.	1	INCLUDES ITEMS W/%
34+%	11425053331	PIN, SPRING	1	
35+	11425053400	SHIM PACK	1	
36	11425001800	SHIM SET	1	

YANMAR L100EE-DEVMK2 — FUEL TANK AND FUEL PIPE ASSY.

FUEL TANK AND FUEL PIPE ASSY.



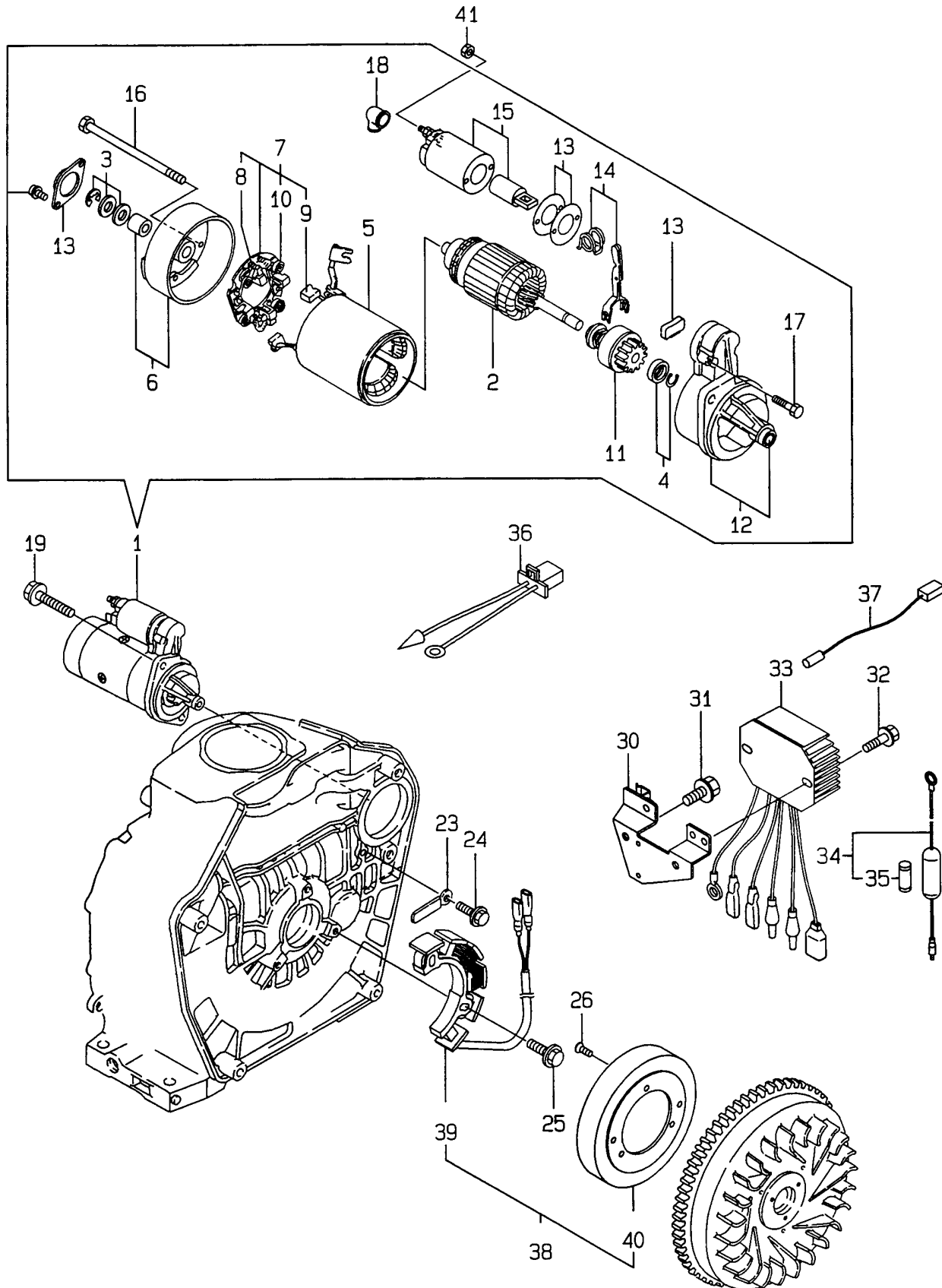
YANMAR L100EE-DEVMK2 — FUEL TANK AND FUEL PIPE ASSY.

FUEL TANK AND FUEL PIPE ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	71465055130	TANK ASSY., FUEL	1	INCLUDES ITEMS W/*
3*	11428855041	CAP ASSY., FUEL TANK	1	INCLUDES ITEMS W/+
5*+	11428855081	VALVE	1	
6*	11425055100	FILTER, FUEL	1	
7	11465055150	PIPE, GAUGE	1	
8	10385455220	CLAMP	2	
9*	23414080000	GASKET 8, ROUND	1	
10*	10530055080	PLUG, DRAIN	1	
11	11425055201	DAMPER, FUEL TANK	4	
12*	11425055121	FILTER, FUEL OIL	1	INCLUDES ITEMS W/#
13#	11425055130	GASKET	1	
14	11429955210	STAY	1	
15	11469955230	STAY B, FUEL TANK	1	
16	11425055300	COCK ASSY., FUEL	1	INCLUDES ITEMS W/%
17%	24341000150	O-RING 1A S-15.0	1	
18	11465159802	PIPE, FUEL INJECTION	1	
19	11456055810	BOLT, LIFTING	1	
20	11465059850	BRACKET, PIPE	1	
21	22117080000	WASHER 8	1	
22	26106080452	BOLT M 8 X 45 PLATED	1	
23	26366060002	NUT M 6	2	
24	26476060142	BOLT M 6 X 14 TAPPING	2	
25	10699044660	CLIP, HOSE	2	
26	11426859061	PIPE, FUEL OIL	1	
27	11465259300	PIPE, FUEL RETURN	1	INCLUDES ITEMS W/<
28<	12472259050	CLAMP 9	2	
29<	11465059060	PIPE, FUEL RETURN	1	
30<	11465259310	TUBE, PROTECT	1	
31<	12175059890	CLAMP 140	1	
32	71465651110	PUMP ASSY., FUEL INJECTION	1	
33	71465653101	VALVE ASSY., FUEL INJECTION	1	

YANMAR L100EE-DEVMK2 — STARTING MOTOR AND DYNAMO ASSY.

STARTING MOTOR AND DYNAMO ASSY.



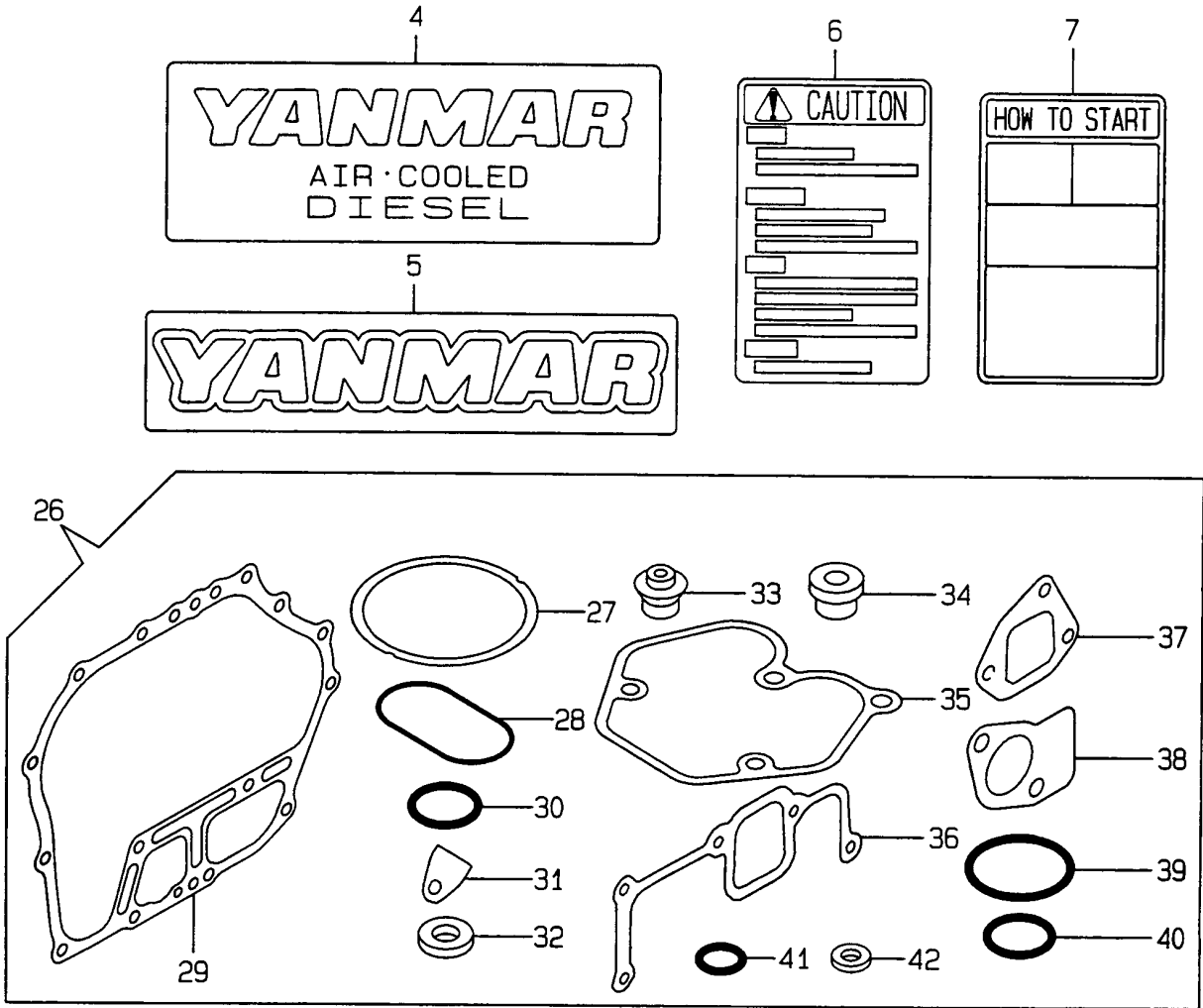
YANMAR L100EE-DEVK2 — STARTING MOTOR AND DYNAMO ASSY.

STARTING MOTOR AND DYNAMO ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11436277011	STARTER, S114-651A	1	INCLUDES ITEMS W/*
2*	11438177110	ARMATURE	1	
3*	X2114811000	WASHER KIT, THRUST	1	
4*	X2114715500	STOPPER SET, PINION	1	
5*	11438177130	COIL ASSY., FIELD	1	
6*	11438177140	COVER, REAR	1	
7*	11437177160	HOLDER ASSY., BRUSH	1	INCLUDES ITEMS W/ +
8* +	11437179040	BRUSH, -	1	
9* +	11437179050	BRUSH, +	1	
10* +	11437179060	SPRING, BRUSH	4	
11*	X211485016	PINION ASSY.	1	
12*	11438177151	HOUSING ASSY. GEAR	1	
13*	11437177170	COVER KIT, DUST	1	
14*	11437177180	SHIFT LEVER KIT	1	
15*	12429877020	SWITCH, MAGNET	1	
16*	12419577770	BOLT, THROUGH	2	
17*	11437179070	BOLT M 6 X 37	2	
18	X2114274200	COVER, TERMINAL	1	
19	26106100302	BOLT M 10 X 30 PLATED	2	
23	16071078710	CLAMP, CORD	1	
24	26106060122	BOLT M 6 X 12 PLATED	1	
25	26106060202	BOLT M 6 X 20 PLATED	3	
26	26577060142	SCREW M 6 X 14	3	
30	11438577400	BRACKET	1	
31	26106060122	BOLT M 6 X 12 PLATED	2	
32	26106060202	BOLT M 6 X 20 PLATED	2	
33	11435177210	REGULATOR	1	
34	11435177640	FUSE ASSY.	1	INCLUDES ITEMS W/%
35%	29411200000	FUSE 20A, CARTRIDGE	1	
36	10519878570	HARNESS C, WIRE	1	
37	11498578560	HARNESS, WIRE	1	
38	11435178261	DYNAMO ASSY.	1	INCLUDES ITEMS W/ #
39 #	11435178771	STATOR ASSY., 132.1MM	1	
40 #	11435178781	WHEEL, STATOR, 132.1MM	1	
41	26716080002	NUT M 8	1	

YANMAR L100EE-DEVMK2 — TOOL LABEL AND GASKET SET ASSY.

TOOL LABEL AND GASKET SET ASSY.



YANMAR L100EE-DEVMK2 — TOOL LABEL AND GASKET SET ASSY.

TOOL LABEL AND GASKET SET ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
4	11425007090	LABEL, AIR COOLED	1	
5	11425007111	LABEL, YANMAR	1	
6	11426807240	LABEL, CAUTION	1	
7	11426107350	LABEL	1	
26	71465192620	GASKET SET	1	INCLUDES ITEMS W/*
27*	11465101330	GASKET, CYLINDER HEAD CMP.	1	
28*	11465001380	O-RING	1	
29*	11465001412	GASKET, CRANKCASE	1	
30*	11429901950	O-RING	1	
31*	11425001841	GASKET	1	
32*	22190160002	SEAL WASHER 16S	4	
33*	11465011340	SEAL, VALVE STEM	2	
34*	11477111461	GASKET, NOZZLE	1	
35*	11465111310	GASKET, BONNET	1	
36*	11465012301	GASKET, AIR INTAKE	1	
37*	11465012211	GASKET, AIR CLEANER	1	
38*	11465013201	GASKET, NON-ASB	2	
39*	10333832570	O-RING	1	
40*	24341000224	O-RING 1A S-22.4	1	
41*	24311000125	O-RING 1A P-12.5	1	
42*	23414080000	GASKET 8, ROUND	1	

PAYMENT TERMS

Terms of payment for parts are net 10 days.

FREIGHT POLICY

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

MINIMUM ORDER

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

RETURNED GOODS POLICY

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

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

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

PRICING AND REBATES

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

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

SPECIAL EXPEDITING SERVICE

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

LIMITATIONS OF SELLER'S LIABILITY

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

LIMITATION OF WARRANTIES

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

OPERATION AND PARTS MANUAL

HERE'S HOW TO GET HELP

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

MULTIQUIP'S MAIN PHONE NUMBERS

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310-537-3700

PARTS DEPARTMENT

800-427-1244 FAX: 800-672-7877
310-537-3700 FAX: 310-637-3284

MAYCO PARTS

800-306-2926 FAX: 800-672-7877
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SERVICE DEPARTMENT

800-478-1244 FAX: 310-537-4259
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MQ POWER SERVICE DEPARTMENT

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