

PARTS AND OPERATION MANUAL

MQ POWER DCA-60SSI2 WHISPERWATT™ GENERATOR

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PARTS LIST NO. 8081500G

REV. #3 (09/15/01)



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WARNING



CALIFORNIA--Proposition 65 Warning

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*

PARTS DEPARTMENT

800/427-1244 or 310/537-3700

FAX: 800/672-7877 or 310/637-3284

SERVICE DEPARTMENT

800/835-2551 or 310/537-3700

FAX: 310/638-8046

WARRANTY DEPARTMENT

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NOTE

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

- 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:
 - UPS Ground
 - UPS Second Day or Third Day*
 - UPS Next Day*
 - Federal Express Priority One (please provide us with your Federal Express account number)*
 - Airborne Express*
 - Truck or parcel post

**Normally shipped the same day the order is received, if prior to 2PM west coast time.*

Earn Extra Discounts when you order by FAX!

All parts orders which include complete part numbers and are received by fax qualify for the following extra discounts:

<u>Number of line items ordered</u>	<u>Additional Discount</u>
1-9 items	3%
10+ items**	5%

Get special freight allowances when you order 10 or more line items via FAX! **

- UPS Ground Service at no charge for freight
- PS Third Day Service at one-half of actual freight cost

No other allowances on freight shipped by any other carrier.

**Common nuts, bolts and washers (all items under \$1.00 list price) do not count towards the 10+ line items.

DISCOUNTS ARE SUBJECT TO CHANGE

Fax order discount and UPS special programs revised June 1, 1995

**Extra Fax Discount
for Domestic USA
Dealers Only**

**Up to 5%
extra savings!**

**UPS
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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 DCA-60SSI2 portable generator:

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.

- **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 MQ Power 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 check the machine for loosened threads or bolts before starting.

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



- **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 generator requires an adequate free flow of cooling air. Never operate the generator 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 generator or engine and may cause injury to people. The generator engine gives off **DEADLY** carbon monoxide gas.

CAUTION:



- 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.

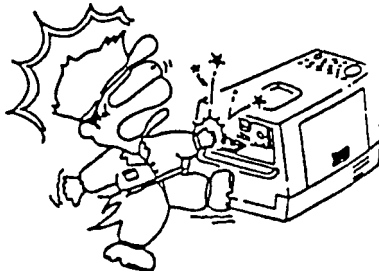
- **NEVER** operate the generator in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe *bodily harm or even death*.

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



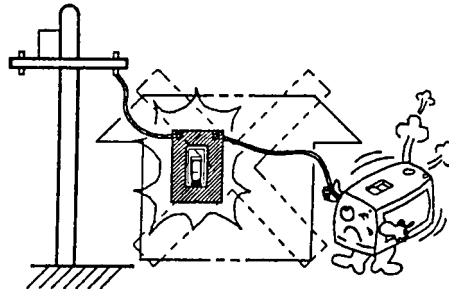
RULES FOR SAFE OPERATION

CAUTION:



■ **NEVER** touch output terminals during operation. This is extremely dangerous. Always stop the machine when contact with the output terminals is required.

CAUTION:



■ **Backfeed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is opened.**

CAUTION:



Never use damaged or worn cables when connecting power tools or equipment to the generator. Make sure power connecting cables are securely connected to the generator's output terminals, insufficient tightening of the terminal connections may cause damage to the generator and electrical shock.

CAUTION:



DO NOT touch or open any of the below mentioned components while the generator is running. Always allow sufficient time for the engine and generator to cool before performing maintenance.

Radiator

1. **Radiator Cap** - Removing the radiator cap while the engine is hot will result in high pressurized, boiling water to gush out of the radiator, causing severe scalding to any persons in the general area of the generator.
2. **Coolant Drain Plug** - Removing the coolant drain plug while the engine is hot will result in hot coolant to gush out of the coolant drain plug, therefore causing severe scalding to any persons in the general area of the generator.
3. **Engine Oil Drain Plug** - Removing the engine oil drain plug while the engine is hot will result in hot oil to gush out of the oil drain plug, therefore causing severe scalding to any persons in the general area of the generator.

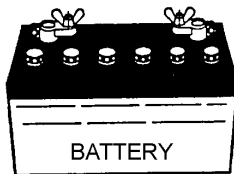
Battery

CAUTION:



Never over fill the battery with water above the upper limit.

The battery contains acids that can cause injury to the eyes and skin. To avoid eye irritation, always wear safety glasses. Use well insulated gloves when picking up the battery. Use the following guidelines when handling the battery:



1. **DO NOT** drop the battery. There is the possibility of risk that the battery may explode.
 2. **DO NOT** expose the battery to open flames, sparks, cigarettes etc. The battery contains combustible gases and liquids. If these gases and liquids come in contact with a flame or spark, an explosion could occur.
 3. Always keep the battery charged. If the battery is not charged a buildup of combustible gas will occur.
 4. Always keep battery charging and booster cables in good working condition. Repair or replace all worn cables.
 5. Always recharge the battery in an open air environment, to avoid risk of a dangerous concentration of combustible gases.
 6. In case the battery liquid (dilute sulfuric acid) comes in contact with **clothing or skin**, rinse skin or clothing immediately with plenty of water.
 7. In case the battery liquid (dilute sulfuric acid) comes in contact with your **eyes**, rinse eyes immediately with plenty of water, then contact the nearest doctor or hospital, and seek medical attention.
- **NEVER** Run engine without air filter. Severe engine damage may occur.
 - Always service air cleaner frequently to prevent carburetor malfunction.
 - Always disconnect the battery before performing service on the generator.
 - Always be sure the operator is familiar with proper safety precautions and operations techniques before using generator.
 - Always store equipment properly when not in use. Equipment should be stored in a clean, dry location out of the reach of children.
 - **DO NOT** leave the generator running in the manual mode unattended.
 - **DO NOT** allow unauthorized people to operate this equipment.
 - Always read, understand, and follow procedures in Operator's Manual before attempting to operate equipment.
 - Refer to the **Isuzu Engine Owner's Manual** for engine technical questions or information.
- ### Loading and Unloading (Crane)
- Before lifting, make sure the generator's lifting hook is secure and that there is no apparent damage to the generator itself (loose screws, nuts and bolts). If any part is loose or damaged, please take corrective action before lifting.
 - Always drain fuel prior to lifting.
 - Always make sure crane or lifting device has been properly secured to the hook of guard frame on generator.
 - **NEVER** lift the machine while the engine is running.
 - Use adequate lifting cable (wire or rope) of sufficient strength.
 - When lifting the generator, always use the balanced center-point suspension hook and lift straight upwards.
 - **NEVER** allow any person or animal to stand underneath the machine while lifting.
 - When loading the generator on a truck, be sure to use the front and back frame bars as a means to secure the generator during transport.

RULES FOR SAFE OPERATION

Transporting

- Always shutdown engine before transporting.
- Tighten fuel tank cap securely.
- Drain fuel when transporting generator over long distances or bad roads.
- Always tie-down the generator during transportation by securing the generator.
- If generator is mounted on a trailer, make sure trailer complies with all local and state safety transportation laws. See page 10 for basic towing procedures.

Emergencies

- Always know the location of the nearest **fire extinguisher** and **first aid kit**. Know the location of the nearest telephone. Also know the phone numbers of the nearest **ambulance**, **doctor** and **fire department**.

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, coolant, fuel, and fuel filters.
- **DO NOT** use plastic containers to dispose of hazardous waste.
- **DO NOT** pour waste, oil, coolant or fuel directly onto the ground, down a drain or into any water source.

DCA-60SSI2 — TOWING RULES FOR SAFE OPERATION

Towing Safety Precautions

CAUTION :



Check with your county or state safety towing regulations department before towing your generator.

To reduce the possibility of an accident while transporting the generator on public roads, always make sure the trailer (Figure 1) that supports the generator and the towing vehicle are in good operating condition and both units are mechanically sound.

The following list of suggestions should be used when towing your generator:

- Make sure the hitch and coupling of the towing vehicle are rated equal to, or greater than the trailer "gross vehicle weight rating" (GVWR).
- **ALWAYS** inspect the hitch and coupling for wear. **NEVER** tow a trailer with defective hitches, couplings, chains etc.
- Check the tire air pressure on both towing vehicle and trailer. Also check the tire tread wear on both vehicles.
- **ALWAYS** make sure the trailer is equipped with a "Safety Chain".
- **ALWAYS** attach trailer's safety chain to bumper of towing vehicle.
- **ALWAYS** make sure the vehicle and trailer directional, backup, brake, and trailer lights are connected and working properly.
- The maximum speed for highway towing is **45 MPH** unless posted otherwise. Recommended off-road towing is not to exceed **10 MPH** or less depending on type of terrain.
- Place *chocked blocks* underneath wheel to prevent **rolling**, while parked.
- Place *support blocks* underneath the trailer's bumper to prevent **tipping**, while parked.
- Use the trailer's hand winch to adjust the height of the trailer, then insert locking pin to lock wheel stand in place, while parked.
- Avoid sudden stops and starts. This can cause skidding, or jack-knifing. Smooth, gradual starts and stops will improve gas mileage.
- Avoid sharp turns to prevent rolling.
- Remove wheel stand when transporting.
- **DO NOT** transport generator with fuel in tank.

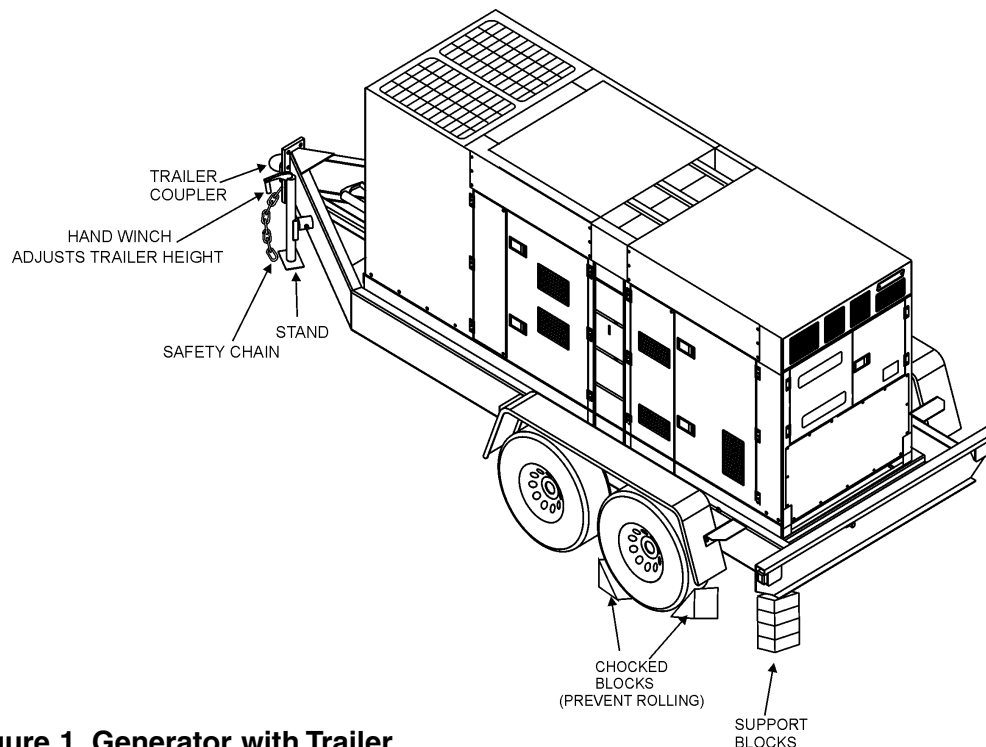


Figure 1. Generator with Trailer

CAUTION:



ALWAYS make sure the trailer is in good operating condition. Check the tires for proper inflation and wear. Also check the wheel lug nuts for proper tightness.

Explanation of Chart:

This section is to provide the user with trailer service and maintenance information. The service and maintenance guidelines referenced in this section apply a wide range of trailers. Remember periodic inspection of the trailer will ensure safe towing of the equipment and will prevent damage to the equipment and personal injury.

It is the purpose of this section to cover the major maintenance components of the trailer. The following trailer components will be discussed in this section:

- Brakes
- Tires
- Lug Nut Torquing
- Suspension
- Electrical
- Brake Troubleshooting Tables

Use the following definitions with reading Table 1.

1. **Fuel Cell** - Provides an adequate amount of fuel for the equipment in use. Fuel cells must be empty when transporting equipment.
2. **Braking System** - System employed in stopping the trailer. Typical braking systems are electric, surge, hydraulic, hydraulic-surge and air.
3. **GVWR**- Gross Vehicle Weight Rating (GVWR), is the maximum number of pounds the trailer can carry, including the fuel cell (empty).
4. **Frame Length** - This measurement is from the ball hitch to the rear bumper (reflector).
5. **Frame Width** - This measurement is from fender to fender.
6. **Jack Stand** - Trailer support device with maximum pound requirement from the tongue of the trailer.
7. **Coupler** - Type of hitch used on the trailer for towing.
8. **Tire Size** - Indicates the diameter of the tire in inches (10,12,14, etc.), and the width in millimeters (175,185,205, etc.). The tire diameter must match the diameter of the tire rim.
9. **Tire Ply** - The tire ply (layers) number is rated in letters; 2-ply,4-ply,6-ply, etc.
10. **Wheel Hub** - The wheel hub is connected to the trailer's axle.
11. **Tire Rim** - Tires mounted on a tire rim. The tire rim must match the size of the tire.
12. **Lug Nuts** - Used to secure the wheel to the wheel hub. Always use a torque wrench to tighten down the lug nuts. See Table 4 and Figure 5 or lug nut tightening and sequence.
13. **Axle** - Indicates the maximum weight the axle can support in pounds, and the diameter of the axle expressed in inches (see Table 3). Please note that some trailers have a double axle. This will be shown as 2-6000 lbs., meaning two axles with a total weight capacity of 6000 pounds.
14. **Suspension** - Protects the trailer chassis from shocks transmitted through the wheels. Types of suspension used are leaf, Q-flex, and air ride.
15. **Electrical** - Electrical connectors (looms) are provided with the trailer so the brake lights and turn signals can be connected to the towing vehicle.
16. **Application** - Indicates which units can be employed on a particular trailer.

DCA-60SSIU —TRAILER-SPECIFICATIONS

Table 1. Specifications

MODEL	APPLICATION	FUEL CELL	BRAKE SYSTEM	GVWR	FRAME LENGTH	FRAME WIDTH	JACK STAND
TRLR-10W	SDW225, SGW250, TLW300	NO	NO	1900LBS	96"	50"	800LB. FULL TILT WHEEL
TRLR-10	DCA10, TLG12, DCA-15	NO	NO	1900LBS	96"	50"	800LB. FULL TILT WHEEL
TRLR-10XF	DCA10, TLG-12, DCA15, TLW-300	52 GAL	NO	1900LBS	96"	50"	800LB. FULL TILT WHEEL
TRLR-225W	WELDERS, DA7000SS	NO	NO	2200LBS	85"	42"	800LB. FULL TILT WHEEL
TRLR-BLW400	BLW-400	NO	ELECTRIC	2700LBS	W/MAST 154" W/O 124"	55" (78" TALL)	800LB. FULL TILT WHEEL
TRLR-50X	DCA-25	NO	NO	2700LBS	124"	55"	800LB. FULL TILT WHEEL
TRLR-50XF	DCA-25	41 GAL	NO	2700LBS	124"	55"	800LB. FULL TILT WHEEL
TRLR-70W	DCA-45, -60, 70	NO	SURGE	7000LBS	186"	77"	2000LB. FLAT PAD
TRLR-70X	DCA-45, -60, 70	OPT	SURGE	7000LBS	138"	66"	2000LB. FLAT PAD
TRLR-70XF	DCA-45, -60, 70	53 GAL	SURGE	7000LBS	138"	66"	2000LB. FLAT PAD
TRLR-100XF	DCA-100, 125	150 GAL	HYDRAULIC SURGE	7000LBS	190"	76"	2000LB. FLAT PAD
TRLR-85/125	DCA-85, 100, 125	145 GAL	HYDRAULIC	10000LBS	186"	77"	2000LB. FLAT PAD
TRLR-150XF	DCA-150, 180	200 GAL	HYDRAULIC SURGE	11160LBS	204"	84"	5000 LB. FLAT PAD
TRLR-220XF	DCA-220	250 GAL	HYDRAULIC SURGE	14000LBS	222"	83"	5000 LB. FLAT PAD
TRLR-300XF	DCA-300	250 GAL	HYDRAULIC SURGE	18000LBS	238"	83"	5000 LB. FLAT PAD
TRLR-400XF	DCA-400	350 GAL	ELECTRIC	18000LBS	238"	83"	5000 LB. FLAT PAD
TRLR-600XF	DCA-600, 800	550 GAL	AIR	30000LBS	384"	96"	5000 LB. FLAT PAD
TRLR-800SX	DCA-600, 800	550 GAL	AIR	30000LBS	384"	96"	5000 LB. FLAT PAD

DCA-60SSIU —TRAILER-SPECIFICATIONS

Table 1. Specifications (Con't)

MODEL	COUPLER	TIRES	WHEELS	AXLE	HUBS	SUSPENSION	ELECTRICAL
TRLR-10W	2" BALL CLASS 2 ADJUSTABLE	175-13C	13"X4.50"	2200# 2X2	5 LUG	3 LEAF	4 WIRE LOOM W/ 4 POLE FLAT
TRLR-10	2" BALL CLASS 2 ADJUSTABLE	175-13C	13"X4.5"	2200#2X2	5 LUG	3 LEAF	4 POLE FLAT
TRLR-10XF	2" BALL CLASS 2 ADJUSTABLE	175-13C	13"X4.5"	2200#2X2	5 LUG	3 LEAF	4 POLE FLAT
TRLR-225W	2" BALL CLASS 2 ADJUSTABLE	175-13B	13X4.5"	2200#2X2	5 LUG	Q FLEX	4 POLE FLAT
TRLR-BLW 400	2" BALL CLASS 2 ADJUSTABLE	175-13C	13 X 4.5"	2200#2X2	5 LUG	3 LEAF	4 POLE FLAT
TRLR-50X	2" BALL CLASS	B78-13LRC	13"X4.50"	3500lbs. 2-3/8"	5 LUG	4 LEAF	4 POLE RUBBER FLAT
TRLR-50XF	2" BALL CLASS	B78-13LRC	13"X4.50"	3500lbs. 2-3/8"	5 LUG	4 LEAF	4 POLE RUBBER FLAT
TRLR-70W	2" BALL CLASS 3" ADJUSTABLE	205-14C BIAS (4)	14"X5"	3500lbs. 3"	5 LUG	5 LEAF	4 POLE RUBBER FLAT
TRLR-70X	2" BALL CLASS 3" ADJUSTABLE	205-14C BIAS (4)	14"X5"	3500lbs 3"	5 LUG	5 LEAF	4 POLE RUBBER FLAT
TRLR-70XF	2" BALL CLASS 3" ADJUSTABLE	205-14C BIAS (4)	14"X5"	3500lbs. 3"	5 LUG	5 LEAF	4 POLE RUBBER FLAT
TRLR-100XF	ADJUSTABLE 2-5/6 OPT 3" EYE	205-15C BIAS (4)	14"X5.5"	3500lbs 3"	5 LUG	5 LEAF	4 WIRE LOOM
TRLR-85/125	ADJUSTABLE 2-5/6 OPT 3" EYE	ST225/75R15D RADIAL (4)	14"x6"	(2)-6000lbs	6 LUG	7 LEAF	4 WIRE LOOM
TRLR-150XF	3" BALL EYE	750-16 E BIAS (4)	16"X7"	(2)-6000lbs	8 LUG	7 LEAF	4 WIRE LOOM
TRLR-220XF	3" EYE ADJUSTABLE	ST235/85R16E RADIAL(4)	16"X7"	(2)-7000lbs	8 LUG	Q FLEX	4 WIRE LOOM
TRLR-300XF	3" EYE ADJUSTABLE	ST235/85R16E RADIAL(6)	16"X7"	(2)-6000lbs	8 LUG	Q FLEX	4 WIRE LOOM
TRLR-400XF	3" EYE ADJUSTABLE	ST235/85R16E RADIAL(6)	16"X7"	(3)-7000lbs.	8 LUG	Q FLEX	4 WIRE LOOM
TRLR-600XF	5TH WHEEL	ST215/75R17.5H RADIAL (8)	16"X7"	(3)-10000lbs	8 LUG	7 LEAF	6 WIRE LOOM
TRLR-800AR	5TH WHEEL	ST215/75R17.5H RADIAL (8)	16"X7"	(3)-10000lbs	8 LUG	AIR-RIDE	6 WIRE LOOM

Brakes

If your trailer has a braking system, the brakes should be inspected the first 200 miles of operation. This will allow the brake shoes and drums to seat properly. After the first 200 mile interval, inspect the brakes every 3,000 miles. If driving over rough terrain, inspect the brakes more frequently.

Electric Brakes

Electrically actuated brakes (Figure 2) are similar to hydraulic brakes. The basic difference is that hydraulic brakes are actuated by an electromagnet.

Listed below are some of the advantages that electric brakes have over hydraulic brakes:

- Brake system can be manually adjusted to provide the corrected braking capability for varying road and load conditions
- Brake system can be modulated to provide more or less braking force, thus easing the brake load on the towing vehicle
- Brake system has very little lag time between the time the vehicle's brakes are actuated and the trailer's brakes are actuated
- Brake system can provide an independent emergency brake system

Remember in order to properly synchronize the tow vehicle's braking to the trailer's braking, can only be accomplished by road testing. Brake lockup, grabbiness or harshness is due to lack of synchronization between the tow vehicle and the trailer being towed or under-adjusted brakes.

Before any brake synchronizations adjustments can be made, the trailer brakes should be burnished-in by applying the brakes 20-30 times with approximately a 20 m.p.h. decrease in speed, e.g. 40 m.p.h. to 20 m.p.h. Allow ample time for brakes to cool between application. This allows the brake shoes to slightly be seated into the brake drum surface.

Figure 2 displays the major electric brake components that will require inspection and maintenance. Please inspect these components as required.

Electric Brake Adjustment

1. Place the trailer on jack stands. Make sure the jack stands are placed on secure level ground.
2. Check the wheel and drum for free rotation.
3. Remove the adjusting hole cover from the adjusting slot at the bottom brake backing plate.
4. With a screwdriver or standard adjusting tool, rotate the star wheel of the adjuster assembly to expand the brake shoes.
5. Adjust the brake shoes outward until the pressure of the lining against the wheel drum makes the wheel difficult to turn.
6. Rotate the star wheel in the opposite direction until the wheel rotates freely with slight lining drag.
7. Replace the adjusting hole cover and lower the trailer to the ground.
8. Repeat steps 1 through 6 on the remaining brakes.

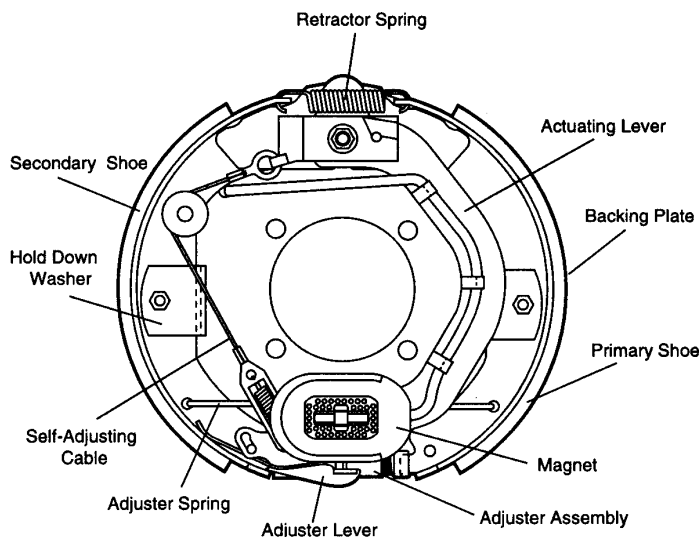


Figure 2. Electrical Brake Components

Hydraulic/Air/Surge Brakes

Hydraulic brakes (Figure 3) should not require any special attention with the exception of routine maintenance such as shoe and lining replacement. These brakes can be adjusted in the same manner as electric brakes. Brake lines should be periodically checked for cracks, kinks, or blockage.

Figure 3 below displays the major hydraulic/air/surge brake components that will require inspection and maintenance. Please inspect these components as required using steps 1 through 6 as referenced in the electric brake adjustments section.

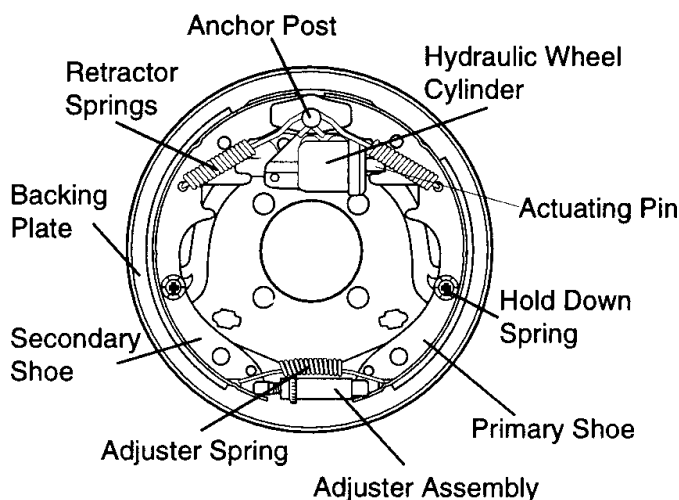


Figure 3. Hydraulic Brake Components

Tires/Wheels/Lug Nuts

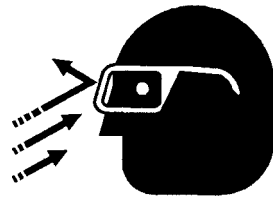
Tires and wheels are a very important and critical components of the trailer. When specifying or replacing the trailer wheels it is important the wheels, tires, and axle are properly matched.

CAUTION:



DO NOT attempt to repair or modify a wheel. DO NOT install an inner tube to correct a leak through the rim. If the rim is cracked, the air pressure in the inner tube

may cause pieces of the rim to explode (break off) with great force and cause serious eye or bodily injury.



Tire Wear/Inflation

Tire inflation pressure is the most important factor in tire life. Pressure should be checked cold before operation DO NOT bleed air from tires when they are hot. Check inflation pressure weekly during use to insure the maximum tire life and tread wear.

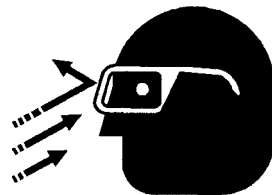
Table 2 (Tire Wear Troubleshooting) will help pinpoint the causes and solutions of tire wear problems.

TABLE 2. TIRE WEAR TROUBLESHOOTING			
WEAR PATTERN		CAUSE	SOLUTION
	Center Wear	Over Inflation.	Adjust pressure to particular load per tire manufacturer.
	Edge Wear	Under Inflation.	Adjust pressure to particular load per tire manufacturer.
	Side Wear	Loss of camber or overloading.	Make sure load does not exceed axle rating. Align wheels.
	Toe Wear	Incorrect toe-in.	Align wheels.
	Cupping	Out-of-balance.	Check bearing adjustment and balance tires.
	Flat Spots	Wheel lockup & tire skidding.	Avoid sudden stops when possible and adjust brakes.

Suspension

The leaf suspension springs and associated components (Figure 4) should be visually inspected every 6,000 miles for signs of excessive wear, elongation of bolt holes, and loosening of fasteners. Replace all damaged parts (suspension) immediately. Torqued suspension components as detailed in Table 3.

CAUTION:



NOTE

ALWAYS wear safety glasses when removing or installing force fitted parts. Failure to comply may result in serious injury.

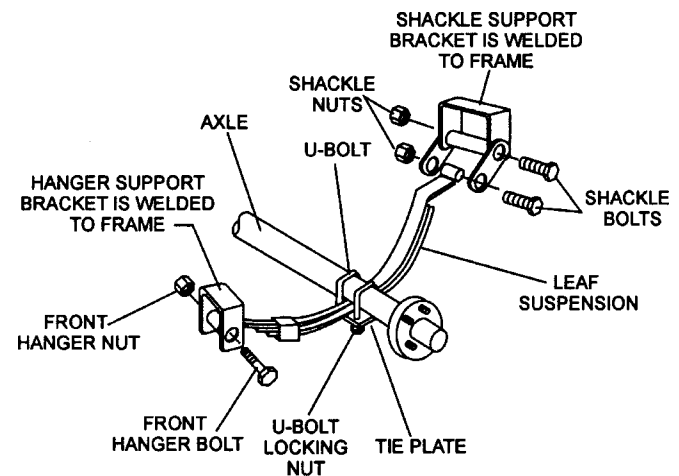


Figure 4. Major Suspension Components

Table 3. Suspension Torque Requirements

Item	Torque (Ft.-Lbs.)
3/8" U-BOLT	MIN-30 MAX-35
7/16" U-BOLT	MIN-45 MAX-60
1/2" U-BOLT	MIN-45 MAX-60
SHACKLE BOLT SPRING EYE BOLT	SNUG FIT ONLY. PARTS MUST ROTATE FREELY. LOCKING NUTS OR COTTER PINS ARE PROVIDED TO RETAIN NUT-BOLT ASSEMBLY.
SHOULDER TYPE SHACKLE BOLT	MIN-30 MAX-50

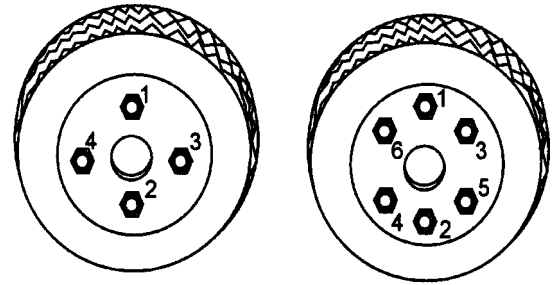
Lug Nut Torque Requirements

It is extremely important to apply and maintain proper wheel mounting torque on the trailer. Be sure to use only the fasteners matched to the cone angle of the wheel. Proper procedure for attachment of the wheels is as follows:

1. Start all wheel lug nuts by hand.
2. Torque all lug nuts in sequence. See Figure 5. **DO NOT** torque the wheel lug nuts all the way down. Tighten each lug nut in 3 separate passes as defined by Table 4.
3. After first road use, retorque all lug nuts in sequence. Check all wheel lug nuts periodically.

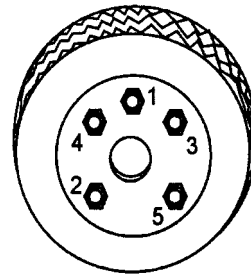
Table 4. Tire Torque Requirements

Wheel Size	First Pass FT-LBS	Second Pass FT-LBS	Third Pass FT-LBS
12"	20-25	35-40	50-65
13"	20-25	35-40	50-65
14"	20-25	50-60	90-120
15"	20-25	50-60	90-120
16"	20-25	50-60	90-120

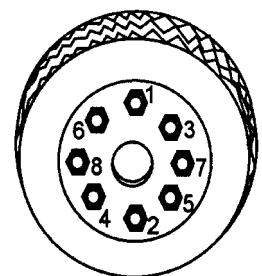


4-LUG NUTS

6-LUG NUTS



5-LUG NUTS



8-LUG NUTS

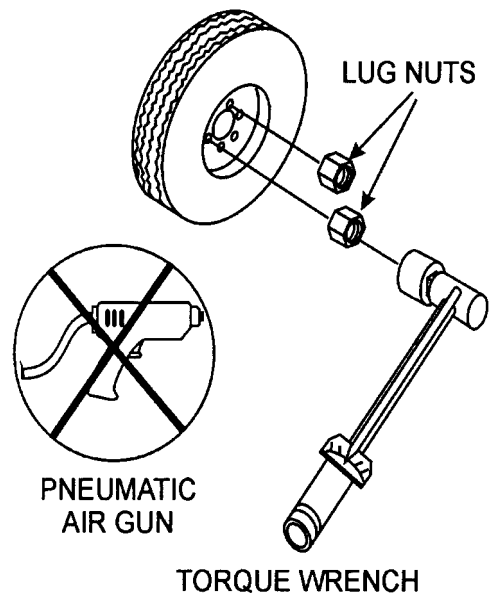


Figure 5. Wheel Lug Nuts Tightening Sequence

NOTE

NEVER use an pneumatic air gun to tighten wheel lug nuts.

DCA-60SSIU —TRAILER-WIRING DIAGRAM

TRAILER SIDE

TOWING VEHICLE SIDE

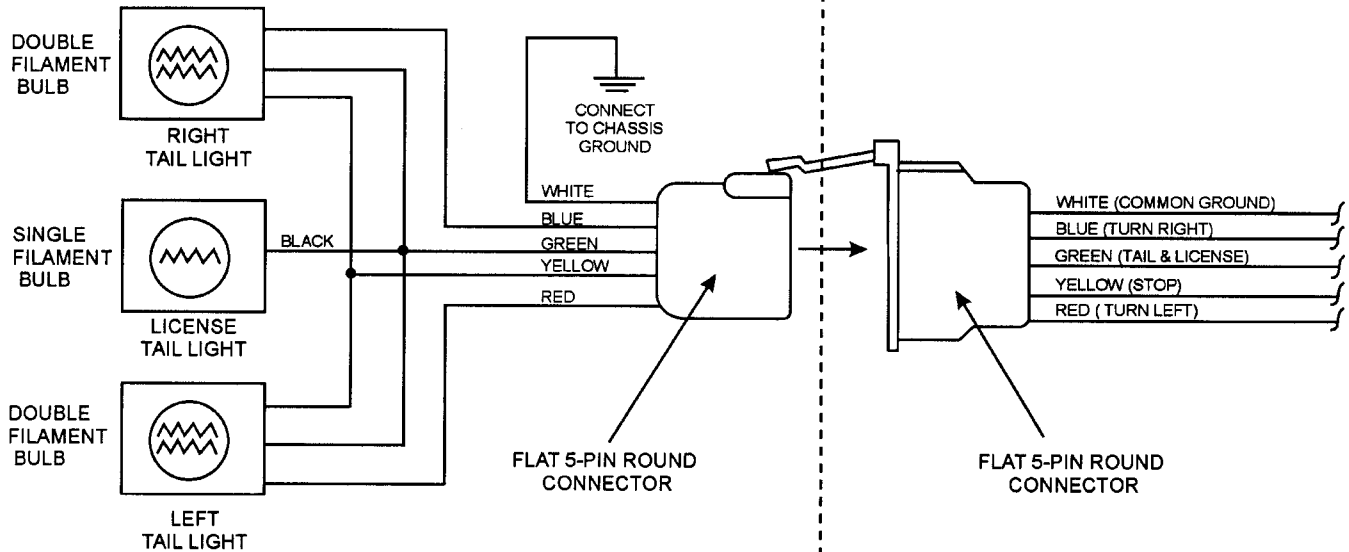
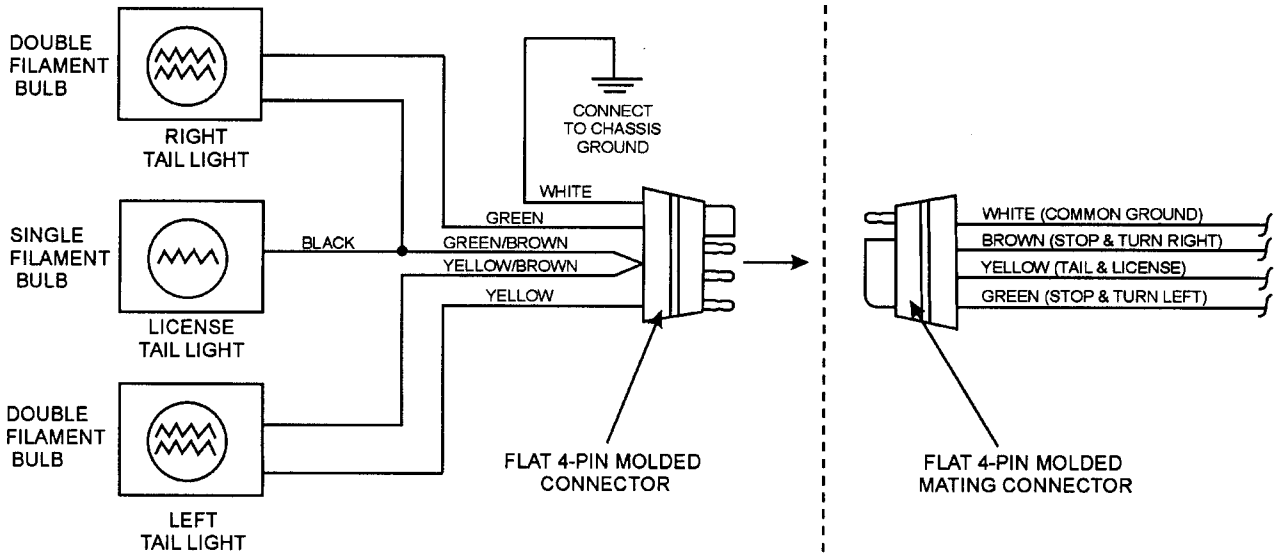


Table 5. Electric Brake Troubleshooting

Symptom	Possible Cause	Solution
No Brakes or Intermittent Brakes	Any open circuits or broken wires?	Find and correct.
	Any short circuits?	Find and correct.
	Faulty controller?	Test and correct.
	Any loose connections?	Find and repair.
	Ground wire secure?	Find and secure.
Weak Brakes or Brakes Pull to One Side	Grease or oil on magnets or linings?	Clean or replace.
	Connections corroded?	Clean and correct cause of corrosion.
	Brake drums scored or grooved?	Machine or replace.
	Brakes synchronized?	Correct.
Locking Brakes	Brake components loose, bent or broken?	Replace components.
	Brake drums out-of-round?	Replace.
Noisy Brakes	System lubricated?	Lubricate.
	Brake components correct?	Replace and correct.
Dragging Brakes	Bearings of the wheel adjusted?	Adjust.

Table 6. Hydraulic Brake Troubleshooting

Symptom	Possible Cause	Solution
No Brakes	Brake line broken or kinked?	Repair or replace.
Weak Brakes or Brakes Pull to One Side	Brake lining glazed?	Reburnish or replace.
	Trailer overloaded?	Correct weight.
	Brake drums scored or grooved?	Machine or replace.
	Tire pressure correct?	Inflate all tires equally.
	Tires unmatched on the same axle?	Match tires.
Locking Brakes	Brake components loose, bent or broken?	Replace components.
	Brake drums out-of-round?	Replace.
Noisy Brakes	System lubricated?	Lubricate.
	Brake components correct?	Replace and correct.
Dragging Brakes	Brake lining thickness correct or in right wrong position?	Install new shoes and linings.
	Enough brake fluid or correct fluid?	Replace rubber parts fill with dot4 fluid.

The DCA -100SSJU generator is equipped with a number of safety decals. These decals are provided for operator safety and maintenance information. The illustration below and on the preceding pages show the decals as they appear on the machine. Should any of these decals become unreadable, replacements can be obtained from your dealer.

OPERATING PROCEDURES

Manual Starting

1. Check the engine oil, coolant, and fuel levels. Replenish if necessary.
2. Place all Generator Circuit Breakers in the "OFF" position and close all doors.
3. Check that the Voltage select switch (or the Voltage change-over board) is present at desired voltage.
(In case of generator having multiple voltage ratings)
4. Set the Engine speed switch to the "LOW" position.
5. Turn the Auto-Off/Reset-Manual switch to the "Manual" position to start the engine. If the engine fails to start in the specified number of attempts, the overcrank lamp will indicate and the Auto-Off/Reset-Manual switch must be returned to the "Off/Reset" position before proceeding.
6. When the engine is ready for starting during cold weather operating conditions, push the Intake Heater button for approximately 30 seconds. Start engine using the Auto-Off/Reset-Manual switch to the "Manual" position. As soon as the engine starts, release the button.
If the engine still does not start, utilize the water heater until water is warm. (If additional water heater is supplied)
7. After starting, allow the engine to run for 1 or 2 minutes to warm-up. At temperatures below freezing, this time period must be extended to 2 to 4 minutes.
8. When the engine starts, immediately check for abnormal noise, vibration, fluid leakage or any indication of a problem. Check the control panel gauges. If all is normal, let the engine remain at the "Low" position for a short time, depending on the ambient conditions, warm up.
9. After sufficient warm-up time has elapsed, set the Engine speed switch to the "High" position and the unit is ready for operation.
10. Check the NO-Load speed as shown in the table below.
60Hz operation—Approx. 50 Ohz (1500rpm)
11. Adjust the Voltage Regulator to the specified voltage.

Manual Stopping

1. Place the Generator Circuit Breakers in the "OFF" position.
2. Set the Engine speed switch to the "LOW" position, and allow the unit to cool for a few minutes.
3. Turn the Auto-Off/Reset-Manual switch, to the "Off/Reset" position.

Auto Starting/Stopping

1. With the Auto/Manual switch in the Auto position, the Auto Starting/Stopping controller monitors remote start contacts. Closure of the remote start contacts will begin engine cranking. When the contacts are opened cranking will stop or if running the engine will stop. All functions of the Automatic shutdown System work as in Manual Starting/stopping.
2. For cold weather conditions utilize the water heater until water is warm. If the engine still does not start, please operate as in Manual Starting.

Emergency Stopping

1. Place the Generator Circuit Breakers in the "OFF" position.
2. Turn the Auto-Off/Reset-Manual switch to the "Off/Reset" position.

M35200010

P/N M3552000103

SAFETY INSTRUCTIONS

Improper operation of this machine can cause severe injury or death.

- Read the instruction manual carefully before operating or servicing.

This machine should only be operated by a person with sufficient knowledge and skill to ensure safe operation.

High voltage circuits are located inside the output terminal cover and control panel.

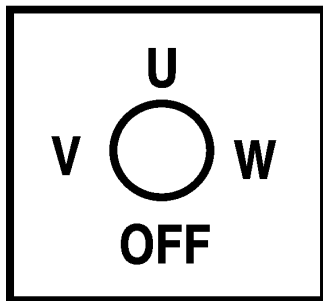
- Close the cover and control panel before operating.

Moving parts and hot surfaces are contained within the enclosure.

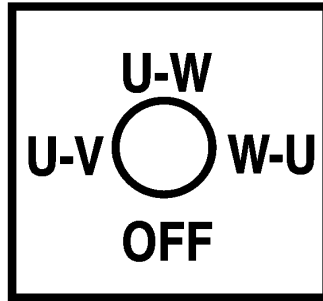
- Close all doors and lock them before operating.

M92010030

P/N M9520100304



P/N M9520000104



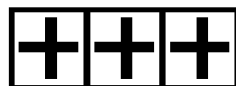
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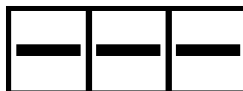
P/N M950000004



P/N M9510200002



P/N M9500300104



P/N M9500300004

OVER CURRENT RELAY

If it is Impossible to reset the CIRCUIT BREAKER, open the control panel and push the RESET BUTTON as below.

M92020010

P/N M9520200104



P/N M9500500104

DIESEL FUEL


M90050000

P/N M9500500004

WATER • OIL CHECK AND FILL DAILY

M90300010

P/N M9503000103



⚠ WARNING
ELECTRIC SHOCK HAZARD

- Do not touch internal wiring or connections while this machine is operating.
- Turn power off before servicing.

M92010000

P/N M9520100004

DANGER
HIGH VOLTAGE

M92010040


P/N M9520100401

NOTE

To use 50 AMP receptacles, adjust the voltage selector switch to the single phase position and the main line circuit breaker to the on position.


M1500020

P/N M1550000204

	<p>⚠ WARNING ELECTRIC SHOCK HAZARD</p> <ul style="list-style-type: none"> • Do not touch output terminals while this machine is operating. • Turn power off before servicing. 	<p>⚠ WARNING ELECTRIC SHOCK HAZARD</p> <ul style="list-style-type: none"> • Always complete the grounding path from the ground terminal on this genset to an external grounding source. See instruction manual for details. 	<p>⚠ WARNING</p> <ul style="list-style-type: none"> • Before connecting this generator to any building's electrical system, a licensed electrician must install an isolation (transfer) switch. • Serious injury or death may result without this transfer switch.
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M92010050

P/N M9520100503




⚠ WARNING
HOT COOLANT can cause severe burns.

- Do not remove cap if radiator is hot.

M90310000

P/N M9503100004



⚠ WARNING
ENGINE EXHAUST can cause severe injury or death.

- Use only in open, well ventilated areas or vent exhaust outside.


M90320000

P/N M9503200004

⚠ CAUTION
Stop engine before switching.

M92010020

P/N M9520100204




⚠ CAUTION
MOVING PARTS can cause severe injury.

- Do not operate with doors open.
- Stop engine before servicing.

M90300000

P/N M9503000004




⚠ WARNING
HOT PARTS can burn skin.

- Do not touch until the machine has sufficiently cooled.

M91010000

P/N M9510100004



⚠ WARNING
ELECTRIC SHOCK HAZARD

- Do not touch internal wiring or connections while this machine is operating.
- Turn power off before servicing.

M92010000

P/N M9520100004

DCA-60SSI2 — SPECIFICATIONS

Table 7. Specifications		
Generator Specifications		
Model	DCA-60SSI2	
Type	Revolving field, self ventilated, open protected type synchronous generator	
Armature Connection	Star with Neutral	Zig Zag
Phase	3	Single
Standby Output	72 KVA (57.6 KW)	41.5KW
Prime Output	60 KVA (48 KW)	34.6KW
Voltage	240V or 480V	240/120V
Frequency	60 Hz	
Speed	1800 rpm	
Power Factor	0.8	1
Aux. AC Power	Single Phase, 60 Hz	
Voltage	120 V	
Output	4.8 KW (2.4 KW x 2)	
Engine Specifications		
Model	ISUZU A-6BG1	
Type	4 Cycle, water-cooled, direct injection	
No. of Cylinders	6 cylinders	
Bore x Stroke	4.1 in. x 4.9 in. (105 mm x 125 mm)	
Rated Output	77HP/1800 rpm	
Displacement	396 cu. in. (6494 cc)	
Starting	Electric	
Coolant Capacity	7.8 gal. (29.5 liters)	
Lube Oil Capacity	5.1 gal. (19.3 liters)	
Fuel Consumption	3.9 gal. (14.9L)/hr at full load	3.0 gal. (11.4L)/hr at 3/4 load
	2.4 gal. (9.1L)/hr at 1/2 load	1.9 gal. (7.2L)/hr at 1/4 load
Battery	12V- 100AH x 2	
Fuel	#2 Diesel Fuel	

DCA-60SSI2 FAMILIARIZATION

Generator

The MQ Power Model DCA-60SSI2 is a 48 kW **generator** that is designed as a high quality portable (requires a trailer for transport) power source for telecom sites, lighting facilities, power tools, submersible pumps and other industrial and construction machinery.

Engine Operating Panel

The "Engine Operating Panel" is provided with the following:

- Tachometer
- Water Temperature Gauge
- Oil Pressure Gauge
- Charging Ammeter Gauge
- Engine Throttle Lever
- Panel Light
- Panel Light Switch
- Oil Pressure and WaterTemp. Indicator lights

Generator Control Panel

The "Generator Control Panel" is provided with the following:

- Output Voltage Adjustment Knob
- Frequency Meter (Hz)
- AC Ammeter (Amps)
- AC Voltmeter (Volts)
- Ammeter Change-Over Switch
- Voltmeter Change-Over Switch

Output Terminal Panel

The "Output Terminal Panel" is provided with the following:

- Three 120/240V output receptacles, 50 amp
- Two 120V input receptacles, 20 amp
- 3 Load Circuit Breakers 240V @50 amps
- 2 Load GFCI Circuit Breakers 120V@ 20amps

Control Box

The "Control Box" is provided with the following:

- Main Circuit Breaker 150 amps
- Over-Current Relay

Open Delta Excitation System

The DCA-60SSI2 generator is equipped with the state of the art "**Open-Delta**" excitation system. The open delta system consist of an electrically independent winding wound among stationary windings of the AC output section.

There are four leads: A, B, C and D. During light loads, the power to the **Automatic Voltage Regulator (AVR)** is supplied from the leads parallel connections of B&C. When loads increase, the AVR switches and accepts power from leads A&D. The output of leads A&D increase proportionally with load. This of adding the voltages to each phase provides better voltage response during heavy loads.

The connections of the AVR to the AC output windings are for sensing only. No power is required from these windings.

The open-delta design provides virtually unlimited excitation current, offering maximum motor starting capabilities. The excitation does not have a "**fixed ceiling**" and responds according the demands of the required load.

Engine

The **DCA-60SSI2** is powered by a 4 cycle, water cooled, Isuzu A-6BG1 **diesel** engine. This engine is designed to meet every performance requirement for the generator. Reference Table 1, page13 for engine specifications.

In keeping with Multiquip's policy of constantly improving its products, the specifications quoted herein are subject to change without prior notice.

The basic controls and indicators for the DCA-60SSI2 generator are addressed on the following pages.

Mechanical Governor System

The mechanical governor system control the RPM of the engine. When the engine demands increase or decrease, the mechanical governor system regulates the frequency variation to $\pm 1.5\%$. The electronic governor option increases frequency variation to $\pm .25\%$.

DCA-60SSI2 — MAJOR COMPONENTS

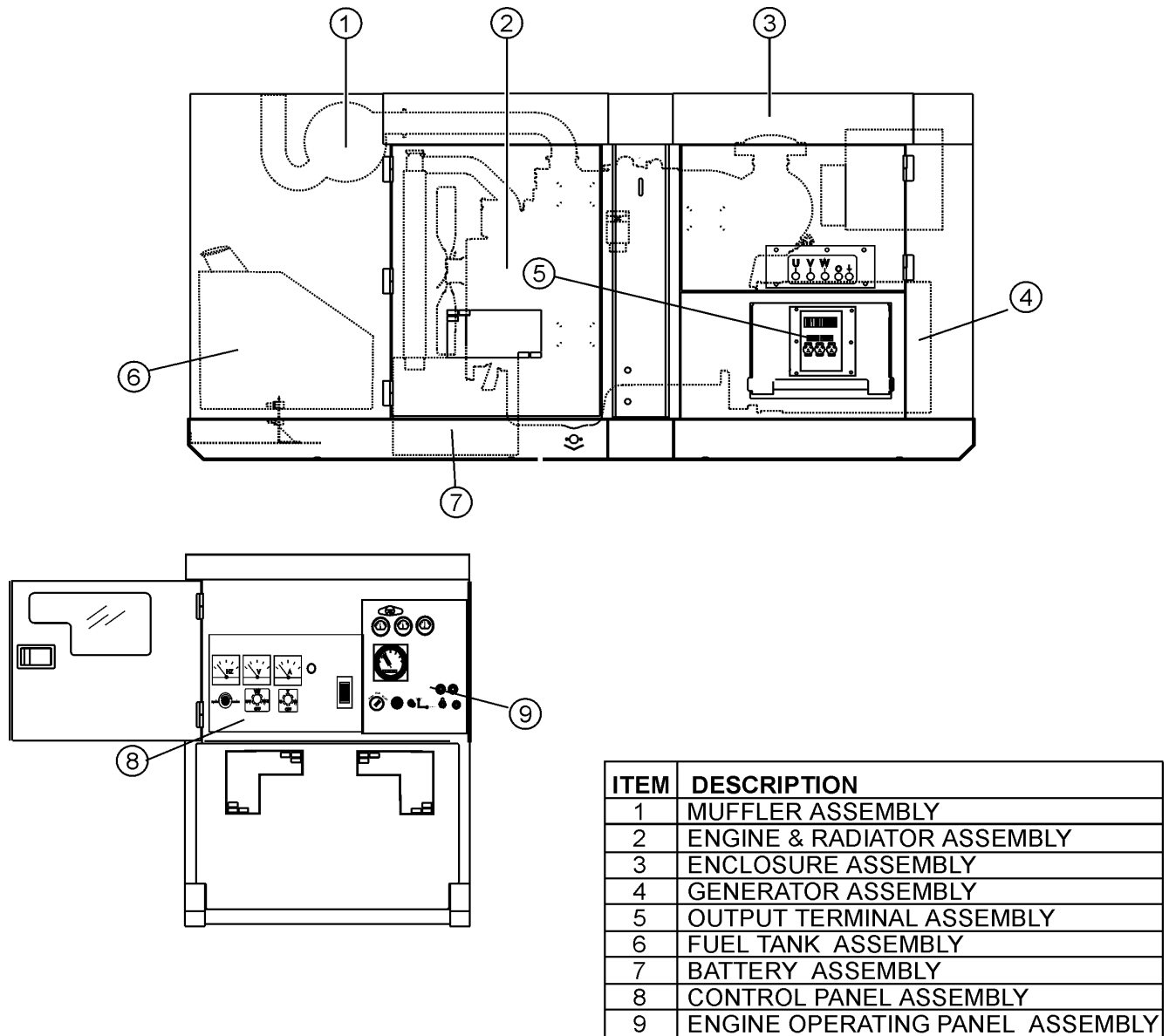


Figure 6. Major Components

DCA-60SSI2 — DIMENSIONS (TOP, SIDE AND FRONT)

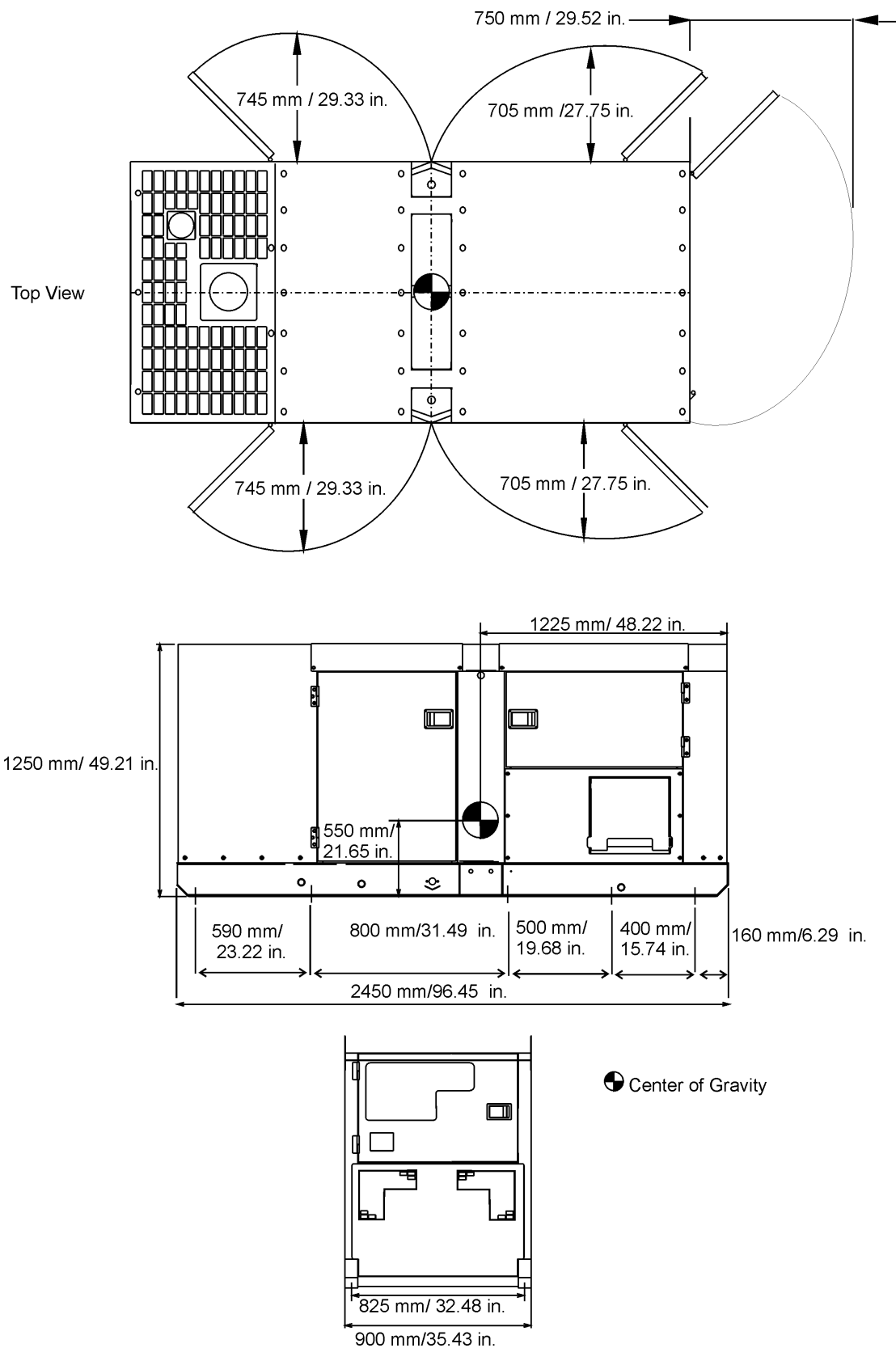
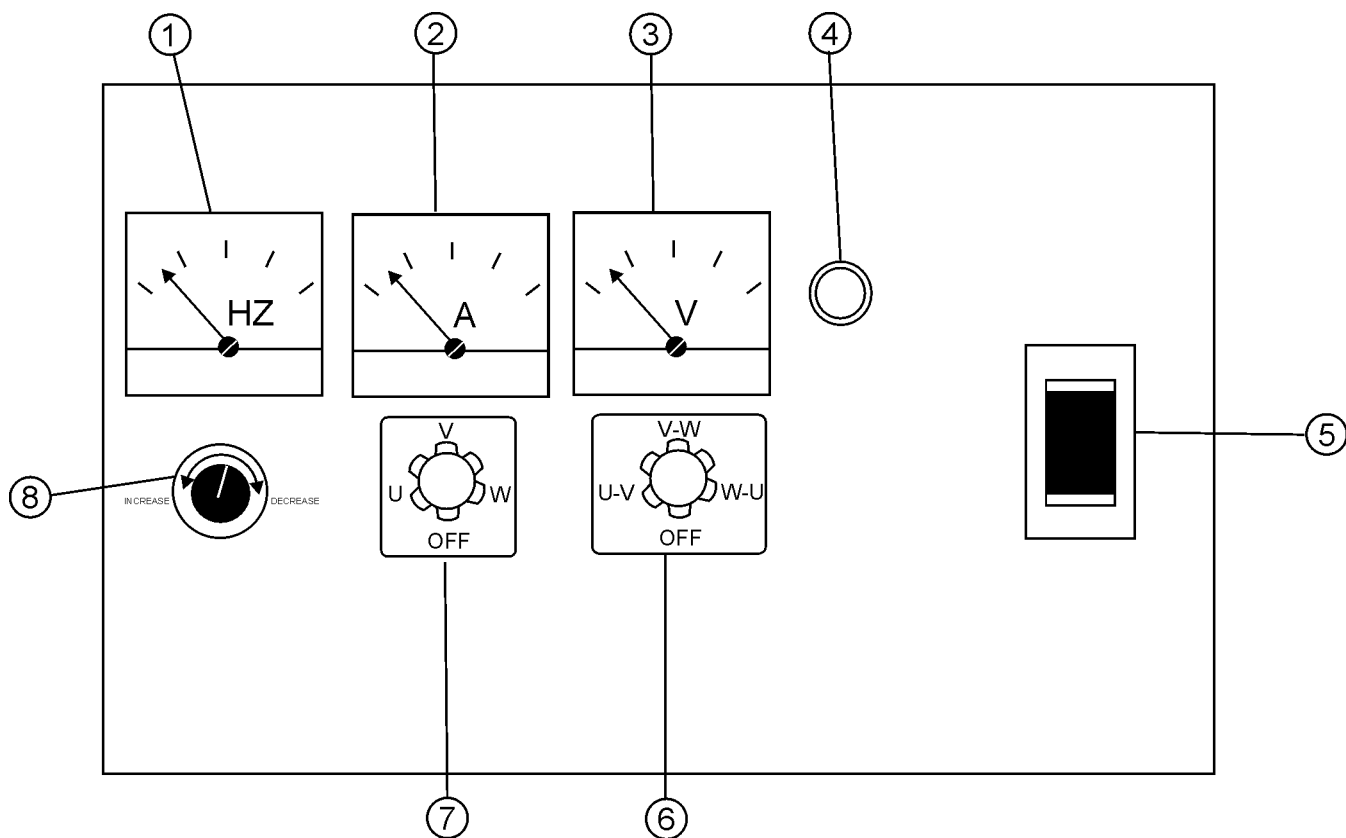


Figure 7. Dimensions



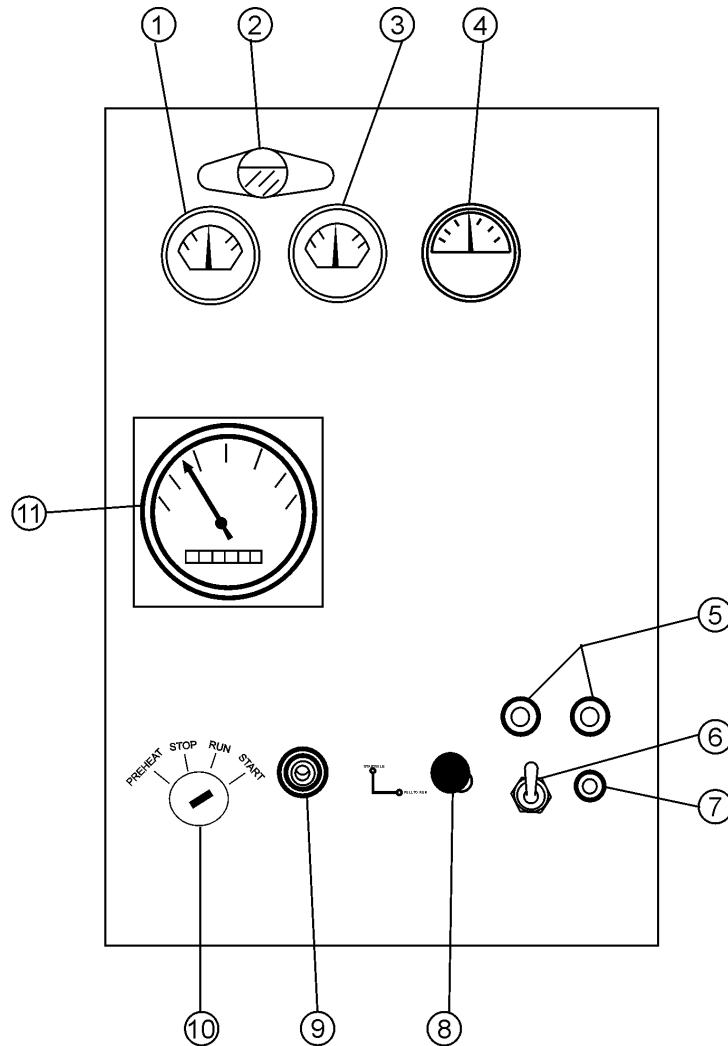
NO	ITEM
1	FREQUENCY METER
2	AC AMMETER
3	AC VOLTMETER
4	PILOT LAMP
5	MAIN CIRCUIT BREAKER
6	VOLTMETER CHANGE-OVER SWITCH
7	AMMETER CHANGE-OVER SWITCH
8	VOLTAGE REGULATOR

Figure 8. Control Panel

The definitions below describe the controls and functions of the DCA-60SSI2 " **Control Panel** " (Figure 8).

1. **Frequency Meter** – Indicates the output frequency in hertz (Hz). Normally 60 Hz \pm 1 Hz .
2. **AC Ammeter** – Indicates the amount of current the load is drawing from the generator.
3. **AC Voltmeter** – Indicates the single phase output voltage present at the UNV terminals.
4. **Pilot Lamp** - This lamp indicates the load is not properly set. Readjust the load, or use the voltmeter change-over switch to adjust phase position.
5. **Main Circuit Breaker** – This three-pole, 150 amp main breaker is provided to protect the UNV voltage output terminals from overload.
6. **Voltmeter Change-Over Switch** – This switch allows the AC voltmeter to indicate phase to phase voltage between any two phases of the output terminals or to be switched off.
7. **Ammeter Change-Over Switch** – This switch allows the AC ammeter to indicate the current flowing to the load connected to any phase of the output terminals, or to be switched off.
8. **Voltage Regulator Control** – Allows manual adjustment of the generator's output voltage.

DCA-60SSI2 — ENGINE OPERATING PANEL



NO	ITEM
1	OIL PRESSURE GAUGE
2	PANEL LIGHT
3	WATER TEMPERATURE GAUGE
4	CHARGING AMMETER
5	INDICATOR LIGHTS
6	PANEL LIGHT SWITCH
7	LAMP CHECK SWITCH
8	ENGINE THROTTLE LEVER
9	PREHEAT INDICATOR
10	STARTER SWITCH
11	TACHOMETER

Figure 9. Engine Operating Panel

The definitions below describe the controls and functions of the DCA-60SSI2 " **Engine Operating Panel** " (Figure 9).

1. **Oil Pressure Gauge** – Normal operation should be about 25 psi. When starting the generator the oil pressure may read a bit higher, but after the engine warms up the oil pressure should return to normal.
2. **Panel light** - Normally used in dark places or at night. When activated, panel will luminate. When the generator is not in use, turn the panel light switch to the 'OFF' position.
3. **Water Temperature Gauge** – During normal operation this gauge should read between 165° to 215°.
4. **Charging Ammeter Gauge** – Indicates the current being supplied by the engine's alternator which provides current for generator's control circuits and battery charging system.
5. **Indicator Lights** - These lights indicate if the oil pressure or water temperature is at dangerous levels and will shut off the engine. The oil pressure indicator will initially light at start-up, but will go off once the pressure rises.
6. **Panel light switch**- When activated, will turn on control panel light.
7. **Lamp Check Switch** - This is used to check the indicator lights. Turn on the engine, then press this to check the bulbs. If they don't light, replace the bulbs.
8. **Engine Throttle Lever** - Pull or push this lever to change the speed of the engine when a load is applied.
9. **Pre-Heat Indicator** – Under cold conditions, turn the starter key to preheat. Once the indicator lights, the engine is ready to start.
10. **Starter Switch** - Turn this to start, stop, and preheat the engine.
11. **Tachometer** – Indicates engine speed in RPM's for 60 Hz operation. This meter should indicate 1800 RPM's when the engine is at full speed and a load is applied. In addition, a built in hour meter will record the number of operational hours that the generator has been in use.

Output Terminal Panel

The output control panel is located on the rear (control panel) end of the generator. The UNV lugs are protected by a face plate cover that can be secured in the close position by a pad lock.

120 Volt Receptacle

One GFCI Duplex NEMA 5-20R (120V, 20 Amp) receptacle is located on the output terminal. This receptacle can be used anytime the generator is in operation. The receptacle is controlled by the circuit breaker located on the control panel.

The reset button will reset the receptacle after being tripped. Pressing the "Test Button" (Figure 8) in the center of this receptacle will check the GFCI function. The receptacle should be tested at least once a month.

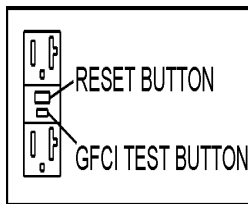


Figure 10. GFCI Test Button

Generator Grounding

Make sure the generator is properly grounded before applying load. Generators are NOT considered grounded when mounted on a trailer.

Twist Lock Dual Voltage Receptacles - To use these receptacles, place the voltage selector switch in the single phase 240/120 voltage position and adjust the output voltage to 240 volts with the voltage regulator on the Control Panel (Figure 8, page 28). Place the voltmeter change-over switch to the U-W position and the ammeter change-over switch to the U or W to read the output.

Connecting Load

Loads can be connected to the generator by the UVWO lugs or the duplex receptacles. (See figure 3). Make sure to read the operation manual before attempting to connect a load to the generator.

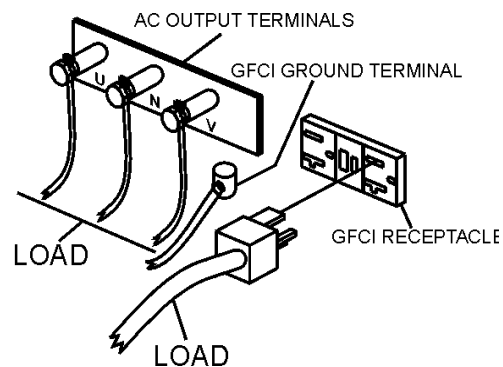


Figure 11. Load Application

Circuit Breakers

To protect the generator from an overload, a 3-pole, 150 amp, **main** circuit breaker is provided to protect the UVWO output terminals from overload. In addition two single-pole, 20 amp **GFCI** circuit breakers are provided to protect the GFCI receptacles from overload. Three 50 amp **load** circuit breakers have also been provided to protect the load side of the generator from overload. Make sure to switch **ALL** circuit breakers to the "OFF" position prior to starting the engine.

Maximum Output

The entire load connected to the UVWO lugs, all four slots in the duplex receptacles, and the must not exceed 52.8 kW in standby or 48 kW in prime output.

Generator Grounding

Make sure to ground the generator in **EVERY** application prior to connecting a load. Generators are **NOT** grounded just because they are mounted on trailers or other vehicles that are on rubber tires.

DCA-60SSIU — OUTPUT TERMINAL VOLTAGE SELECTION

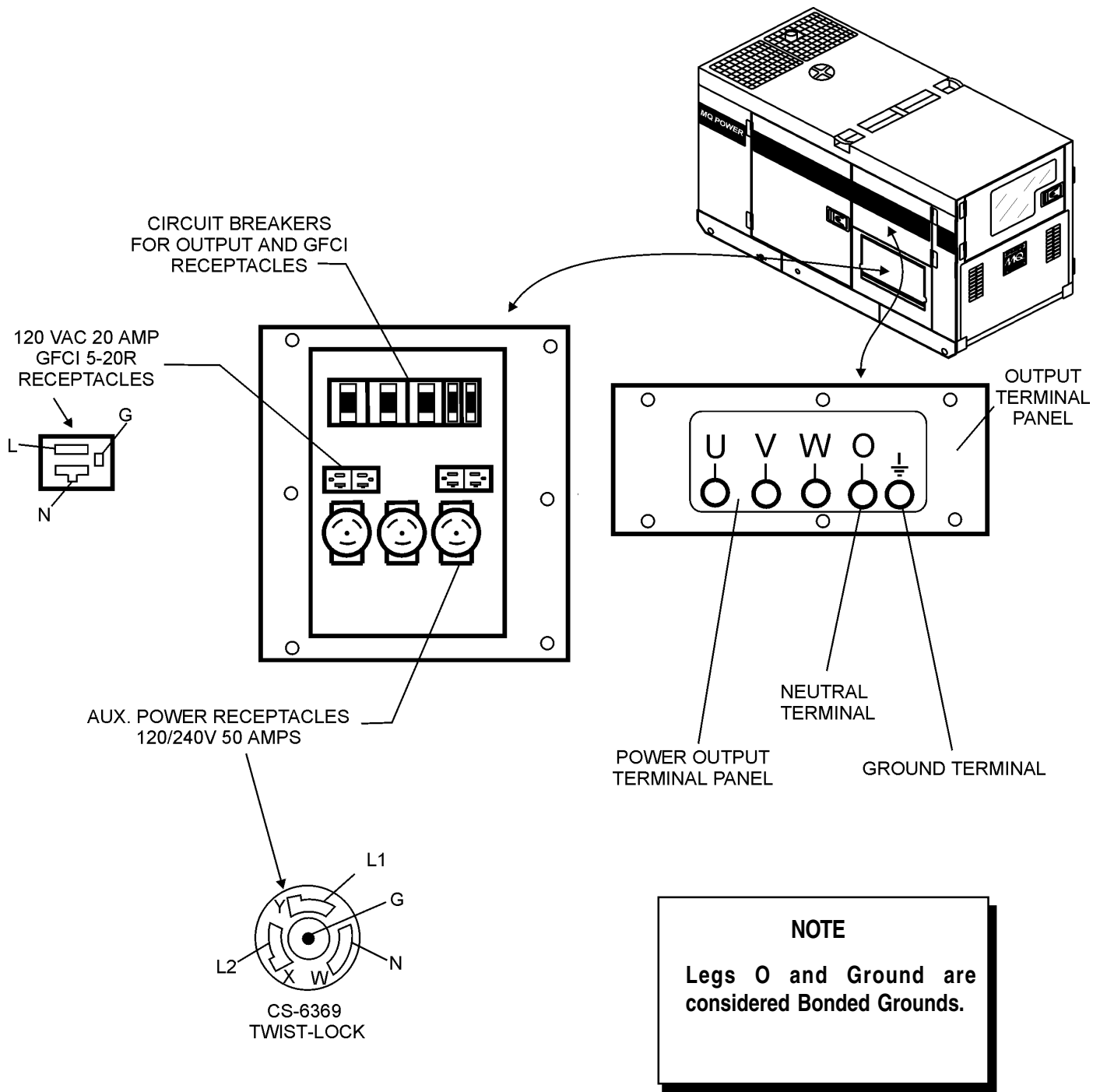


Figure 12. Output Panel Location

DCA-60SSIU — OUTPUT AMPERAGE SETUP

Output Terminal Panel Available Voltages

A wide range of voltages are available to supply load to many different applications. Voltages may be selected by using the voltage selector switch and depending how you hookup your hard wire connection to the generator. To obtain some of the voltages listed, fine adjustment with the voltage regulator on the control panel is necessary. See Table 8 for available voltages the generator will supply.

Over Current Relay

An over current relay is connected to the circuit breaker. During an over current situation, both the circuit breaker and the over current relay will trip. If the circuit breaker can not be reset, the reset button on the over current relay must be pressed. The over current relay is located inside the control box.

Table 8. Voltage Available

3 Phase (Switchable)	208 VOLT	220 VOLT	240 VOLT	416 VOLT	440 VOLT	480 VOLT
Single Phase (Switchable)	120 VOLT	127 VOLT	139 VOLT	240 VOLT	254 VOLT	277 VOLT

CAUTION :



NEVER switch Voltage Selector Switch position while the engine is engaged.

Voltage Selector Switch Locking Button

The voltage selector switch has a locking button to protect the generator and generator load from being switched while the engine is running. To lock the voltage selector switch, press in the red button located on the voltage selector switch, and use a pad lock to hold it into this position.

Maximum Amps

Table 9 shows the maximum amps the generator will provide. Do not exceed the maximum amps listed.

Table 9. Maximum Amps

Rated Voltage	Maximum Amps
Single Phase 120 Volt	133.3 amps (4 wire)
Single Phase 240 Volt	66.7 amps (4 wire)
Three Phase 240 Volt	144 amps
Three Phase 480 Volt	72 amps

Receptacle Use

When the UVWO terminals are providing power, the receptacle power availability will decrease.

How To Read The Output Terminal Gauges.

The gauges (Figure 15 and 17) and change-over switches on the control panel DO NOT effect the generator output. They are to help observe how much power is being supplied at the UVWO legs.

When the voltage selector switch is in the 240/120V position (Figure 13), place the AC voltmeter change-over switch to the W-U position (Figure 14) and the AC ammeter change-over switch to the U or W position (Figure 16) to read the output on the selected leg.

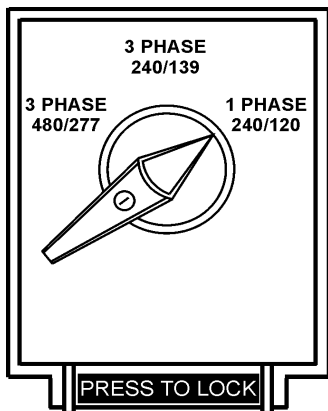


Figure 13. Voltage Selector Switch 240/120V Single Phase Position

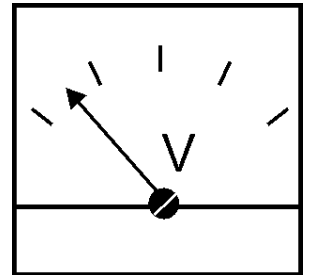
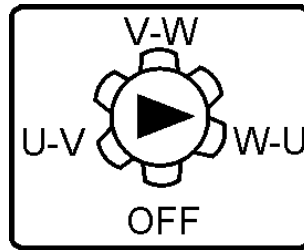


Figure 14 and 15. AC Voltmeter Change-over switch and Voltmeter Gauge

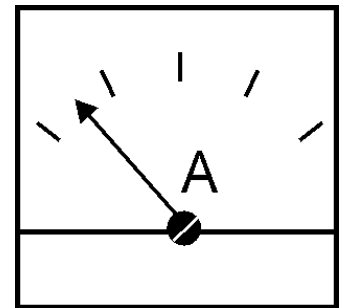
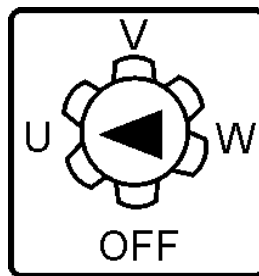


Figure 16 and 17. AC Ammeter Change-over Switch and Ammeter Gauge

NOTE

When using plural single phase voltages, make sure to balance the load on each of the single phase legs.

DCA-60SSIU — OUTPUT VOLTAGE SETUP

240/120V Hard Wire Hookup

With the voltage selector set and locked at 'single phase 240/120' and using single phase 120 volts, the generator will provide three legs available with 100 amps each on three different circuits (Figure 18).

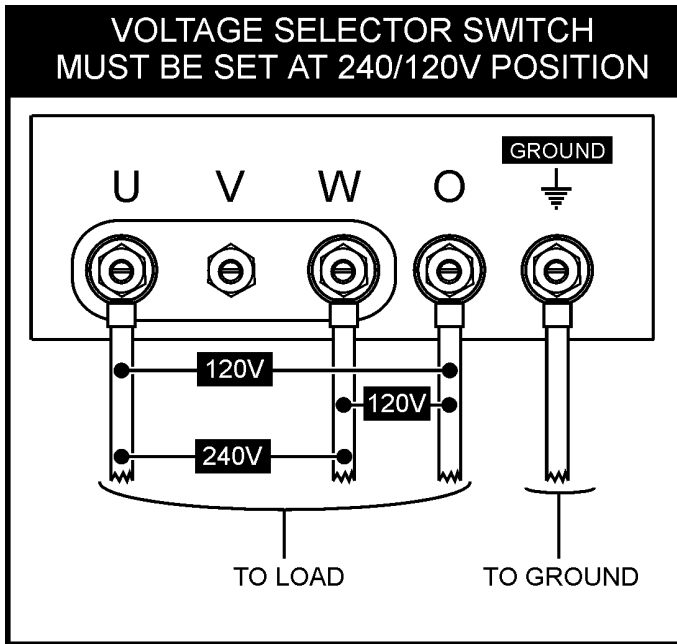


Figure 18. Hard Wire Hookup at 240/120V Position

480/240V Hard Wire Hookup

With the voltage selector set and locked at '3 phase 480/277' (Figure 19) and using the 3-phase 240 hookup, it will provide one circuit available at 108 amps with any two wires plus the ground (Figure 20).

When using the 3-phase 480 volts hookup, it will provide one circuit available at 50 amps with all three wires plus ground.

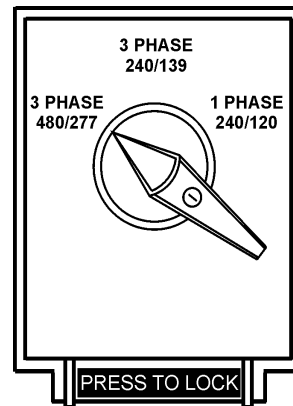


Figure 19. Voltage Selector Switch 480/277V Three Phase Position

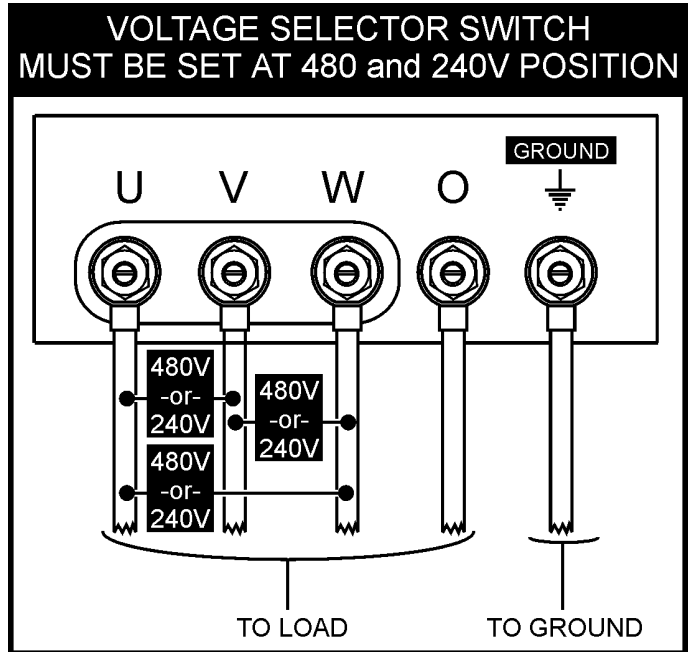


Figure 20. Hard Wire Hookup at 480/240V Position

Voltage Selector Switch- 3 Phase 480/277V Position

The following are additional voltages available when the voltage selector switch is in the '3 phase 480/277V' position.



Figure 21. Voltage Regulator Knob

3 Phase, 480V, 440V, or 416 Volt

This setting can provide 3-phase power at 480, 440, or 416 volts. After hooking up the hard wires to the lugs as shown in Figure 22, 480 volts can be obtained with the voltage regulator knob turned toward maximum; 440 volts can be obtained with the voltage regulator knob is turned down; and 416 volts can be obtained with the voltage regulator knob is at the lowest setting.

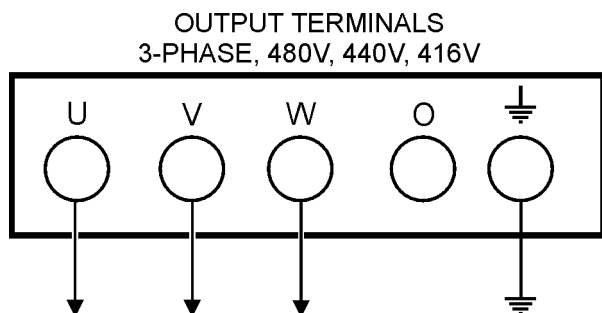


Figure 22. Hard Wire Hookup for Three Phase 480V, 440V, or 416V

Single Phase: 480V, 440V, or 416 Volt

This setting can provide single phase power at 480, 440, or 416 volts. After hooking up the hard wires to the lugs as shown in Figure 23, 480 volts can be obtained with the voltage regulator knob turned toward maximum; 440 volts can be obtained with the voltage regulator knob is turned down; and 416 volts can be obtained with the voltage regulator knob is at the lowest setting.

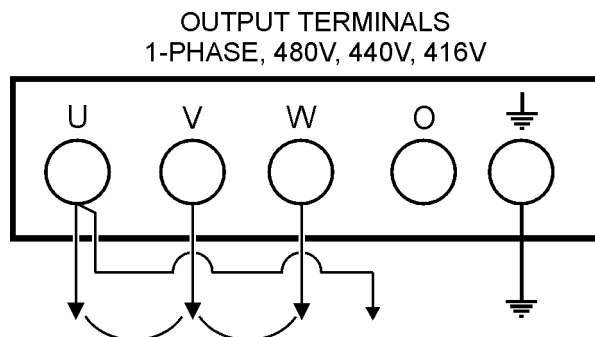


Figure 23. Hard Wire Hookup for Single Phase 480V, 440V, or 416V

Single Phase: 277V, 254V, or 240V

This setting can provide single phase power at 277, 254, or 240 volts. After hooking up the hard wires to the lugs as shown in Figure 24, 277 volts can be obtained with the voltage regulator knob turned toward maximum; 254 volts can be obtained with the voltage regulator knob is turned down; and 240 volts can be obtained with the voltage regulator knob is at the lowest setting.

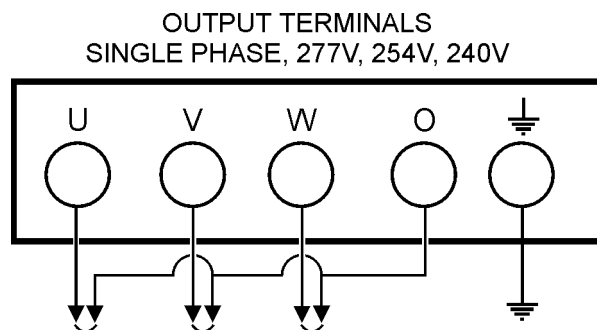


Figure 24. Hard Wire Hookup for Single Phase 277V, 254V, or 240V

Voltage Selector Switch- 3 Phase 240/139V Position

The following are additional voltages available when the voltage selector switch is in the '3 phase 240/139V' position.

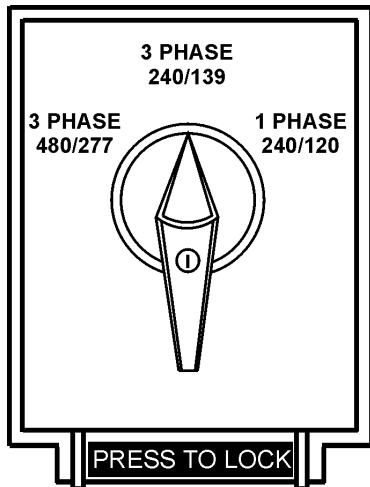


Figure 25. Voltage Selector Switch 240/139V Three Phase Position

3 Phase, 240V, 220V, or 208 Volt

This setting can provide 3-phase power at 240, 220, or 208 volts. After hooking up the hard wires to the lugs as shown in Figure 26, 240 volts can be obtained with the voltage regulator knob turned toward maximum; 220 volts can be obtained with the voltage regulator knob is turned down; and 208 volts can be obtained with the voltage regulator knob is at the lowest setting.

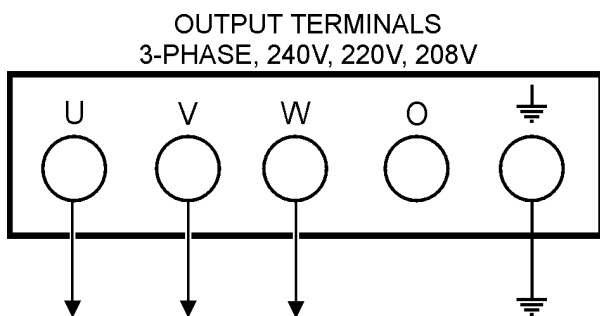


Figure 26. Hard Wire Hookup for Three Phase 240V, 220V, or 208V

Single Phase: 240V, 220V, or 208 Volt

This setting can provide single phase power at 240, 220, or 208 volts. After hooking up the hard wires to the lugs as shown in Figure 27, 240 volts can be obtained with the voltage regulator knob turned toward maximum; 220 volts can be obtained with the voltage regulator knob is turned down; and 208 volts can be obtained with the voltage regulator knob is at the lowest setting.

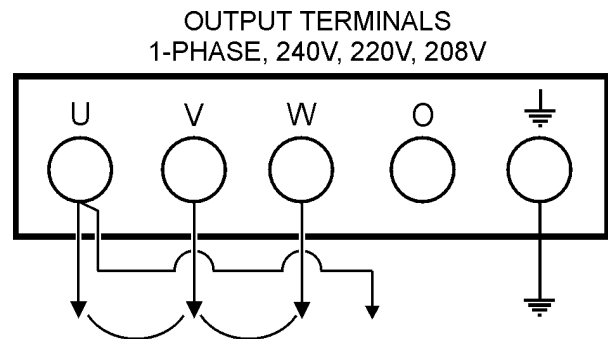


Figure 27. Hard Wire Hookup for Single Phase 240V, 220V, or 208V

Single Phase: 139V, 127V, or 120V

This setting can provide single phase power at 139, 127, or 120 volts. After hooking up the hard wires to the lugs as shown in Figure 28, 139 volts can be obtained with the voltage regulator knob turned toward maximum; 127 volts can be obtained with the voltage regulator knob is turned down; and 120 volts can be obtained with the voltage regulator knob is at the lowest setting.

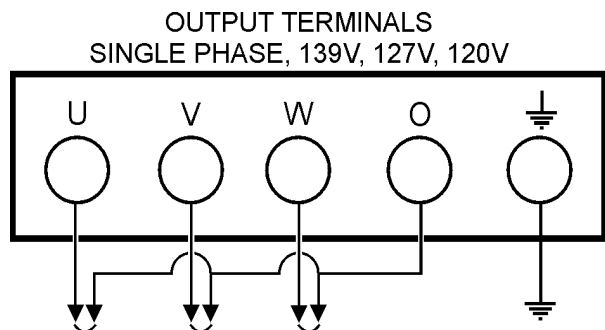


Figure 28. Hard Wire Hookup for Single Phase 139V, 127V, or 120V

Voltage Selector Switch- Single Phase 240/120V

Position

The following are additional voltages available when the voltage selector switch is in the 'single phase 240/120V' position.

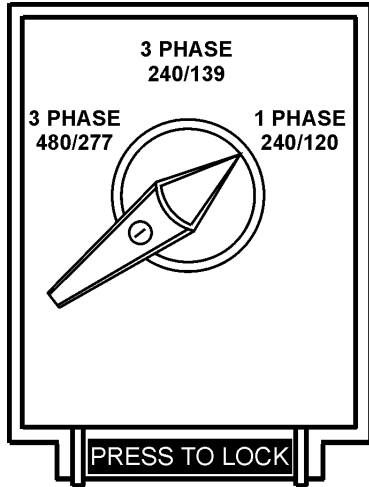


Figure 29. Voltage Selector Switch 240/120V Single Phase Position

Single Phase: 120 Volt

This setting can provide single phase power at 120 volts. After hooking up the hard wires to the lugs as shown in Figure 31, 120 volts can be obtained with the voltage regulator knob turned to fine tune.

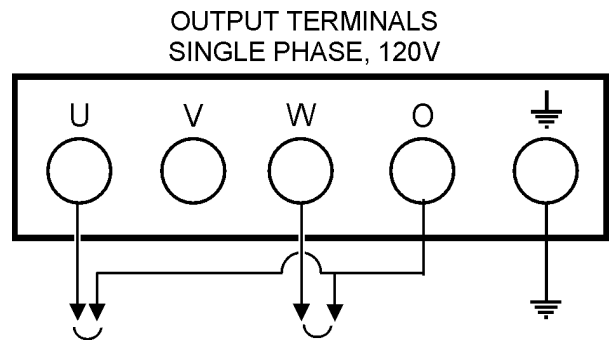


Figure 31. Hard Wire Hookup for Single Phase, 120 volt

Single Phase, 240 Volt

This setting can provide single phase power at 240 volts. After hooking up the hard wires to the lugs as shown in Figure 30, 240 volts can be obtained with the voltage regulator knob turned to fine tune.

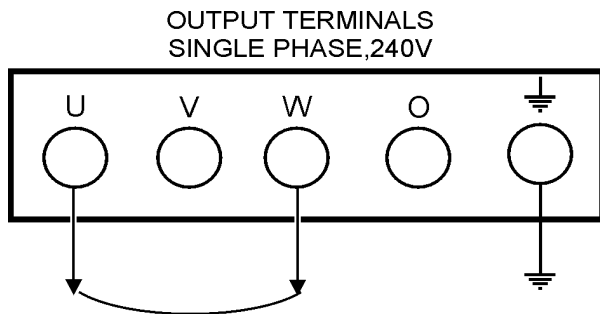


Figure 30. Hard Wire Hookup for Single Phase 240 volt

Outdoor Installation

Install the generator in a location where it will not be exposed to rain or sunshine. Make sure the generator is on secure level ground so that it cannot slide or shift around. Also install the generator in a manner so that the exhaust will not be discharged in the direction of nearby homes.

The installation site must be relatively free from moisture and dust. All electrical equipment should be protected from excessive moisture. Failure to do will result in deterioration of the insulation and will result in short circuits and grounding.

Foreign materials such as dust, sand, lint and abrasive materials have a tendency to cause excessive wear to engine and alternator parts.

CAUTION :



Pay close attention to ventilation when operating the generator inside tunnels and caves. The engine exhaust contains noxious elements. Engine exhaust must be routed to a ventilated area.

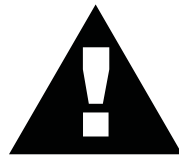
Indoor Installation

Exhaust gases from diesel engines are extremely poisonous. Whenever an engine is installed indoors the exhaust fumes must be vented to the outside. The engine should be installed at least two feet from any outside wall. Using an exhaust pipe which is too long or too small can cause excessive back pressure which will cause the engine to heat excessively and possibly burn the valves.

Mounting

The generator must be mounted on a solid foundation (such as concrete) and set firmly on the foundation to isolate vibration of the generator when it is running. The generator must set at least 6 inches above the floor or grade level (in accordance to NFPA 110, Chapter 5-4.1). DO NOT remove the metal skids on the bottom of the generator. They are to resist damage to the bottom of the generator and to maintain alignment.

CAUTION :



An electric shock may happen when vibrators are used. Pay close attention to handling when operating vibrators and always use rubber boots and gloves to insulate the body from electrical shock.

Generator Grounding

To guard against electrical shock and possible damage to the equipment, it is important to provide a good **EARTH** ground.

Article 250 (Grounding) of the National Electrical Code (NEC) provides guide lines for proper grounding and specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

NEC articles 25064(b) a and 250-66 set the following grounding requirements:

1. Use one of the following wire types to connect the generator to earth ground.
 - a. Copper - 10 AWG (5.3 mm²) or larger.
 - b. Aluminum - 8 AWG (8.4 mm²) or larger.
2. When grounding the generator (Figure 32) connect the ground cable between the lock washer and the nut on the generator and tighten the nut fully. Connect the other end of the ground cable to earth ground.
3. NEC article 250-52(c) specifies that the earth ground rod should be buried a minimum of 8 ft. into the ground.

NOTE

When connecting the generator to any buildings electrical system **ALWAYS** consult with a licensed electrician.

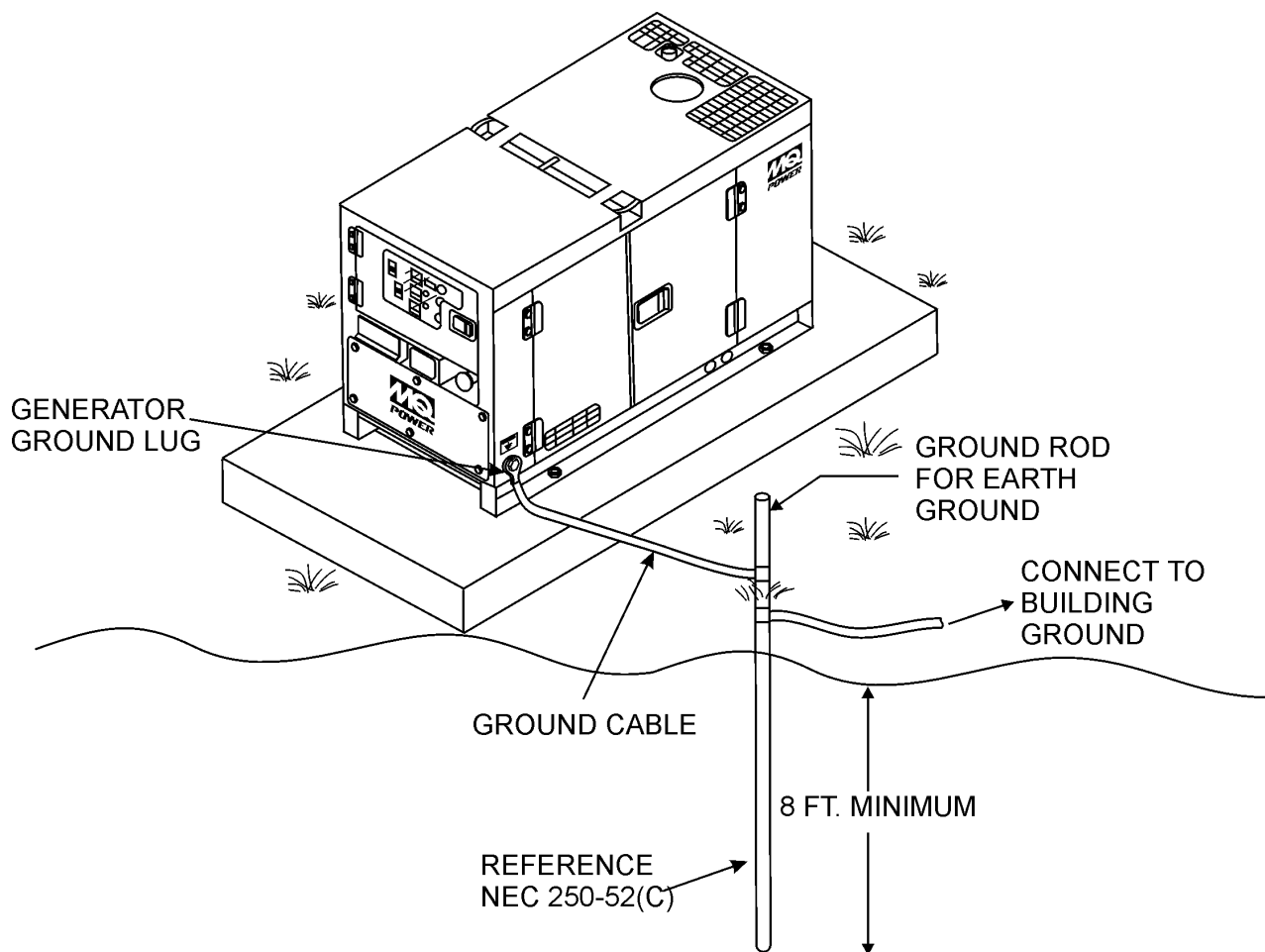


Figure 32. Typical Generator Grounding Application

General Inspection Prior to Operation

The DCA-60SSI2 generator has been thoroughly inspected and accepted prior to shipment from the factory. However, be sure to check for damaged parts or components, or loose nuts and bolts, which could have occurred in transit.

Extension Cable

When electric power is to be provided to various tools or loads at some distance from the generator, extension cords are normally used. Cables should be sized to allow for distance in length and amperage so that the voltage drop between the generator and point of use (load) is held to a minimum. Use the Cable Selection Guide (Table 10) as a guide for selecting proper cable size.

Circuit Breakers

To protect the generator from an overload, a 3-pole, 150 amp, **main** circuit breaker is provided to protect the UNV output terminals from overload. In addition two single-pole, 20 amp **GFCI** circuit breakers are provided to protect the GFCI receptacles from overload. Three 50 amp **load** circuit breakers have also been provided to protect the load side of the generator from overload. Make sure to switch **ALL** circuit breakers to the "OFF" position prior to starting the engine.

NOTE

ALWAYS consult with a licensed electrician for correct extension cord wire size.

Table 10. Cable Selection (60 Hz, Single Phase Operation)

Current in Amperes	Load In Watts		Maximum Allowable Cable Length			
	At 120 Volts	At 240 Volts	#10 Wire	#12 Wire	#14 Wire	#16 Wire
2.5	300	600	1000 ft.	600 ft.	375 ft.	250 ft.
5	600	1200	500 ft.	300 ft.	200 ft.	125 ft.
7.5	900	1800	350 ft.	200 ft.	125 ft.	100 ft.
10	1200	2400	250 ft.	150 ft.	100 ft.	
15	1800	3600	150 ft.	100 ft.	65 ft.	
20	2400	4800	125 ft.	75 ft.	50 ft.	

CAUTION: Equipment damage can result from low voltage.

Lubrication Oil

Fill the engine crankcase with lubricating oil through the filler hole, but do not overfill. Make sure the generator is level. With the dipstick inserted all the way, but without being screw into the filler hole, verify that the oil level is maintained between the two notches (Figure 33) on the dipstick. See Table 11 for proper selection of engine oil.

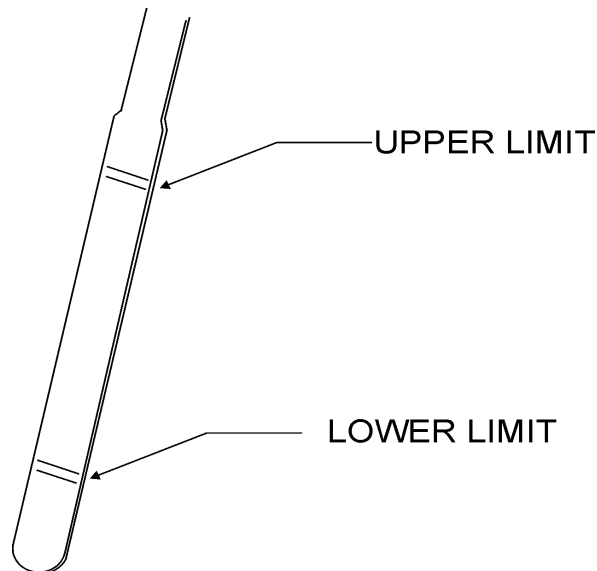


Figure 33. Engine Oil Dipstick

When checking the engine oil, be sure to check if the oil is clean and viscous. If the oil is not clean, drain the oil by removing the oil drain plug, and refill with the specified amount of oil as outlined in the **Isuzu Engine Owner's Manual**.

Fuel

Fill the fuel tank with clean and fresh **diesel fuel**. **DO NOT** fill the tank beyond capacity.

Pay attention to the fuel tank capacity when replenishing fuel. Refer to the fuel tank capacity listed on page 23, Specification Table 7.

The fuel tank cap must be closed tightly after filling. Handle fuel in a safety container. If the container does not have a spout, use a funnel. Wipe up any spilled fuel immediately.

CAUTION:



Never fill the fuel tank while the engine is running or in the dark. Diesel spillage on a hot engine can cause a fire or explosion. If diesel spillage occurs, wipe up the spilled diesel completely to prevent fire hazards.

Coolant

Use only drinkable tap water. If hard water or water with many impurities is used, the inside of the engine and radiator may become coated with deposits and cooling efficiency will be reduced.

An anticorrosion additive added to the water will help prevent deposits and corrosion in the cooling system. See the engine manual for further details.

Table 11. Recommended Motor Oil	
Temperature Range	Type Oil
104° F ~ 23° F (40° C ~ -5°C)	SAE 30
23° F ~ 5° F (-5° C ~ -15°C)	SAE 20 or SAE 10W-30
Below 5° C (-15°)	SAE 10W or SAE 10W-30

CAUTION :



When adding coolant or antifreeze to the radiator, do not remove the radiator cap until the unit has completely cooled.

Day-to-day addition of coolant is done from the reserve tank. When adding coolant to the radiator, **DO NOT** remove the radiator cap until the unit has completely cooled. See Table 12. for engine, radiator, and reserve tank coolant capacities. Make sure the coolant level in the reserve tank is always between the "H" and the "L" markings.

Table 12. Coolant Capacity

Engine and Radiator	7.8 Gal. (29.5 Liter)
Reserve Tank	.95 Gal. (2 Liter)

Operation in Freezing Weather

When operating in freezing weather, be certain the proper amount of antifreeze (Table 13) has been added.

Table 13. Anti-Freeze Operating Temperatures

Vol % Anti-Freeze	Freezing Point		Boiling Point	
	°C	°F	°C	°F
40	-24	-12	106	222
50	-37	-34	108	226

NOTE

When the antifreeze is mixed with water, the antifreeze mixing ratio must be less than 50%.

Cleaning the Outer Radiator

The engine may overheat if the radiator fins become overloaded with dust or debris. Periodically clean the radiator fins with compressed air. Cleaning inside the radiator is dangerous, so clean only with the engine turned off and the battery disconnected.

Air Cleaner

Periodic cleaning/replacement is necessary. Inspect it in accordance with the **Isuzu Engine Owner's Manual**.

Fan Belt Tension

A slack fan belt may contribute to overheating, or to insufficient charging of the battery. Inspect the fan belt for damage and wear and adjust it in accordance with the **Isuzu Engine Owner's Manual**.

The fan belt tension is proper if the fan belt bends 10 to 15 mm (Figure 34) when depressed with the thumb as shown below. Never place hands near the belts or fan while the generator is running.

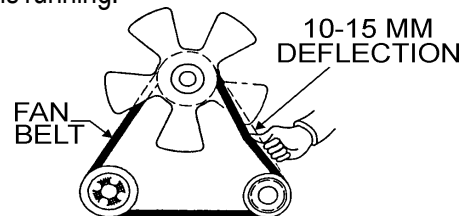


Figure 34. Fan Belt Tension

CAUTION :



Never place hands near the belts or fan while the generator set is running.

Adjusting Fan Belt

If the fan belt does not have the 10 to 15 mm deflection follow the procedure below to adjust:

Loosen the alternator adjusting plate and alternator mounting bolt.

Pivot the alternator at the mounting bolt toward the engine left or right until the belt reflects the proper tension.

Tighten the mounting bolt and the adjusting bolt.

Battery

This unit is of negative ground. **DO NOT** connect in reverse. Always maintain battery fluid level between the specified marks. Battery life will be shortened, if the fluid level is not properly maintained. Add only distilled water when replenishment is necessary. **DO NOT** over fill.

The battery is sufficiently charged if the specific gravity of the battery fluid is 1.28 (at 68° F). If the specific gravity should fall to 1.245 or lower, it indicates that the battery is dead and needs to be recharged or replaced.

Check to see whether the battery cables are loose. Poor contact may result in poor starting or malfunctions. Always keep the terminals firmly tightened. Coating the terminals with a thin film of grease will help to inhibit corrosion.

Battery Cable Installation

ALWAYS be sure the battery cables (Figure 35) are properly connected to the battery terminals as shown below. The **RED** cable is connected to the positive terminal of the battery, and the **BLACK** cable is connected to the negative terminal of the battery.

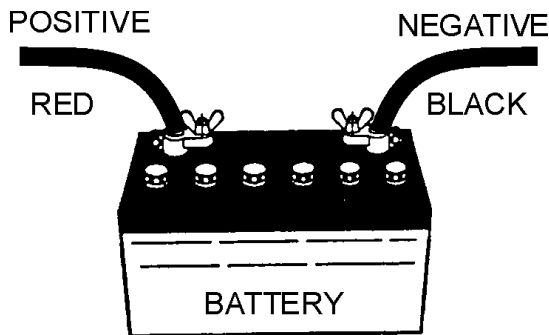


Figure 35. Battery Connections

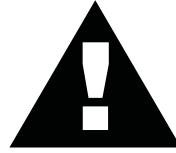
Alternator

The polarity of the alternator is negative grounding type. When an inverted circuit connection takes place, the circuit will be in short circuit instantaneously resulting the alternator failure.

Do not put water directly on the alternator. Entry of water into the alternator leads an electrolyte corrosion causing an alternator failure.

Before charging the battery with an external electric source, be sure to disconnect the battery cables.

CAUTION :

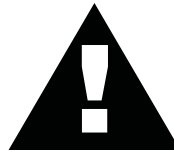


If the battery cable is connected incorrectly, damage to the generator will occur. Pay close attention to the polarity of the battery when connecting the battery.

When connecting battery do the following:

1. **DO NOT** connect the battery cables to the battery terminals when the key is in the ignition and is set in 'START' mode. **ALWAYS** remove the key from the ignition and the ignition switch is in the OFF position when connecting the battery.
2. Place a small amount of grease around both battery terminals. This will ensure a good connection and will help prevent corrosion around the battery terminals.

CAUTION :



Inadequate battery connections may cause poor starting of the generator, and create other malfunctions.

Wiring

Inspect the entire generator for bad or worn electrical wiring or connections. If any wiring or connections are exposed (insulation missing) replace wiring immediately.

Piping and Hose Connection

Inspect all piping, oil hose, and fuel hose connections for wear and tightness. Tighten all hose clamps and check hoses for leaks.

If any hose (fuel or oil) lines are defective replace them immediately.

Single Phase Load

Always be sure to check the nameplate on the generator and equipment to insure the wattage, amperage and frequency requirements are satisfactorily supplied by the generator for operating the equipment.

Generally, the wattage listed on the nameplate of the equipment is its rated output. Equipment may require 130—150% more wattage than the rating on the nameplate, as the wattage is influenced by the efficiency, power factor and starting system of the equipment.

When the voltage selector switch is in single phase (240/120V position), place the AC voltmeter change-over switch to the U-W position and the AC ammeter change over-switch to the U or W position to read the output.

NOTE

If wattage is not given on the equipment's name plate, approximate wattage may be determined by multiplying nameplate voltage by the nameplate amperage.

$$\text{WATTS} = \text{VOLTAGE} \times \text{AMPERAGE}$$

The power factor of this generator is 1.0. See Table 14. below when connecting loads.

Table 14. Power Factor By Load

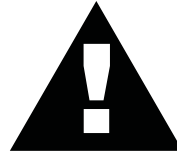
Type Of Load	Power Factor
Single-phase induction motors	0.4 - 0.75
Electric heaters, incandescent lamps	1.0
Fluorescent lamps, mercury lamps	0.4 - 0.9
Electronic devices, communication equipment	1.0
Common power tools	0.8

Three Phase Load

When calculating the power requirements for 3-phase power use the following equation:

$$\text{KVA} = \frac{\text{VOLTAGE} \times \text{AMPERAGE} \times 1.732}{1000}$$

CAUTION:



Motors and motor-driven equipment draw much greater current for starting than during operation.

An inadequate size connecting cable which cannot carry the required load can cause a voltage drop which can burn out the appliance or tool and overheat the cable.

- When connecting a resistance load such as an incandescent lamp or electric heater, a capacity of up to the generating set's rated output (kW) can be used.
- When connecting a fluorescent or mercury lamp, a capacity of up to the generating set's rated output (kW) multiplied by 0.6 can be used.
- When connecting an electric drill or other power tools, pay close attention to the required starting current capacity.

If wattage is not available on the equipment, approximate wattage may be determined by multiplying the nameplate voltage by the nameplate amperage for three-phase:
 $\text{WATTS} = 1.732 \times \text{VOLTAGE} \times \text{AMPERAGE}$

CAUTION:



Before connecting this generator to any building's electrical system, a licensed electrician must install an isolation (transfer) switch. Serious injury or death may result without this transfer switch.

NOTE

If output (kVA) is not given on the equipment nameplate, approximate output may be determined by multiplying voltage by amperage by $\sqrt{3}$

WARNING:



The engine's exhaust contains harmful emissions. **ALWAYS** ventilate the exhaust when operating inside tunnels, excavations or buildings. Direct exhaust away from nearby personnel.

Before Starting

Engine

1. Check the lubricating oil level prior to starting the engine. Make sure the generator is level. The oil level must be maintained between two notches on the dipstick.
2. When there is not enough lubricating oil, fill the crankcase with high grade motor oil. Use a high quality detergent oil classified CC or higher (See Table 11 on page 43).
3. Check the coolant level in the radiator and subtank. Replenish with antifreeze as necessary. Always maintain the coolant level between the **FULL** and **LOW** markings on the coolant container. Be sure that the radiator cap is fastened securely.
4. Check the fuel level on the fuel gauge. If fuel is low, fill the fuel tank with clean fresh unleaded automotive diesel. If diesel spillage occurs, completely wipe up the spilled fuel immediately.

Before Starting

Generator and Control Panel

CAUTION:



NEVER start the engine with the **main, GFCI** or **load** circuit breakers in the **ON** position.

1. Be sure to disconnect the electrical load and switch the **main, load** and **G.F.C.I.** circuit breakers (Figure 12) to the "OFF" position prior to starting the engine.

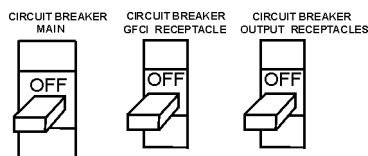


Figure 36. Main, GFCI and Load Circuit Breakers

2. Connect the load to the UVW terminals as shown in Figure 37. These terminals can be found on the output terminal panel, (see page 22 Figure 6). To gain access to the output terminals lift the UVW cover. Tighten terminal nuts securely to prevent load wires from slipping out.

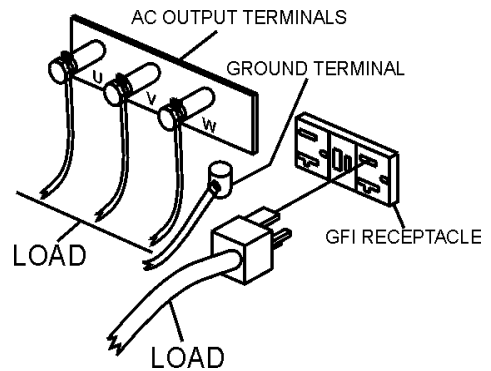


Figure 37. UVW Terminal Lugs (Load)

3. Connect the negative battery cable (BLACK) to the negative post on the battery (Figure 38).

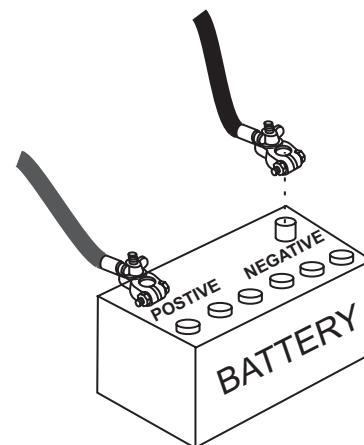


Figure 38. Battery Connections

DCA-60SSI2 — GENERATOR START-UP PROCEDURE

4. Close all engine enclosure doors (Figure 39).

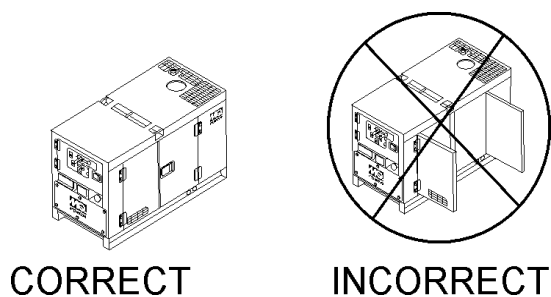


Figure 39. Engine Enclosure Doors

5. Check the voltage selection switch (Figure 40) is at the desired voltage.

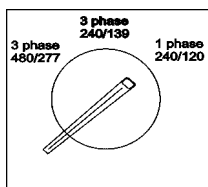


Figure 40. Voltage Selection Switch

6. Check to see if the engine throttle lever (Figure 41) is pushed in.

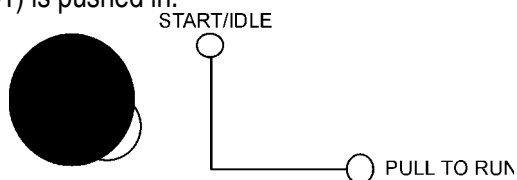


Figure 41. Engine Throttle Lever

7. Turn the starter switch to 'PREHEAT' (Figure 42) until the indicator light turns on. The oil pressure indicator light will initially turn on, but should turn off once the pressure rises.

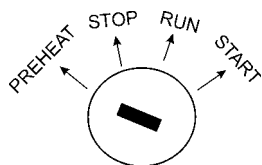


Figure 42. Key Switch (Preheat)

8. Once the preheat indicator lights, turn the key to 'START' (Figure 43). After the engine cranks, release the key to 'RUN'.

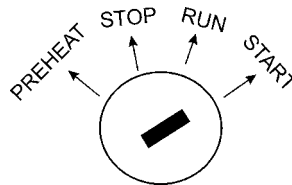


Figure 43. Starter Switch (Start)

9. Pull the engine throttle lever and turn left until the lever sets on the knob (Figure 44).

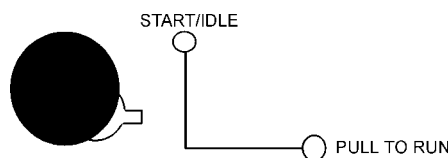


Figure 44. Engine Throttle Lever (Up)

10. The generator's frequency meter (Figure 45) displays the 60 cycle output frequency in **HERTZ**.

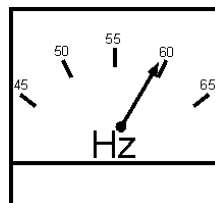


Figure 45. Frequency Meter (Hz)

11. The generator's voltage meter (Figure 46) displays the 120 VAC in **VOLTS**. If the voltage is not within the specified frequency tolerance, use the voltage adjustment control knob (Figure 47) to increase or decrease the desired voltage.

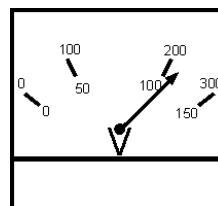


Figure 46. Voltage Meter (Volts)

DCA-60SSI2 — GENERATOR START-UP PROCEDURE

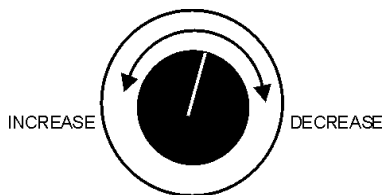


Figure 47. Voltage Adjust Control Knob

12. The ammeter (Figure 48) will indicate zero amps with no load applied. When a load is applied, this meter will indicate the amount of current that the load is drawing from the generator's alternator.

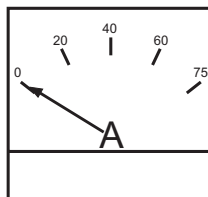


Figure 48. Ammeter (No Load)

13. The engine oil pressure gauge (Figure 49) will indicate the oil pressure (kg/cm²) of the engine. Under normal operating conditions the oil pressure is approximately 25 psi.

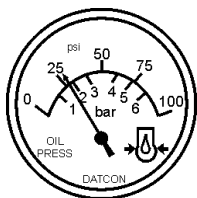


Figure 49. Oil Pressure Gauge

14. The coolant temperature gauge (Figure 50) will indicate the coolant temperature. Under normal operating conditions the coolant temperature is between 165 and 215 degrees fahrenheit.

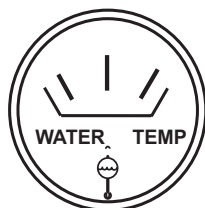


Figure 50. Coolant Temperature Gauge

15. The charging ammeter (Figure 51) will indicate if the battery is properly charged.



Figure 51. Charging Ammeter

16. The tachometer (Figure 52) will indicate the speed of the engine when the generator is operating. Under normal operating conditions this speed is approximately 1800 RPM's.

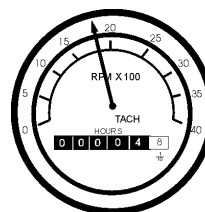


Figure 52. Engine Tachometer

17. Turn the MAIN, GFCI and LOAD circuit breakers to their ON position (Figure 53).

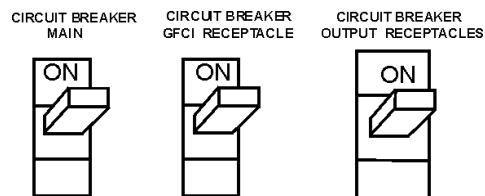


Figure 53. Main and GFCI Circuit Breakers

18. Observe the generator's ammeter (Figure 54) and verify it reads the anticipated amount of current with respect to the load. The ammeter will only display a current reading if the load is in use.

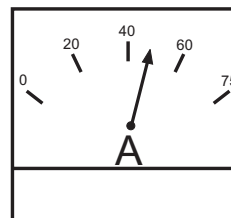


Figure 54. Ammeter (Load)

19. The generator will run until manually stopped or an abnormal condition occurs.

DCA-60SSI2 — GENERATOR SHUT-DOWN PROCEDURE

ENGINE SHUTDOWN

To shutdown the generator, use the following procedure:

1. Switch both the MAIN, GFCI and LOAD circuit breakers (Figure 55) to the “OFF” position.

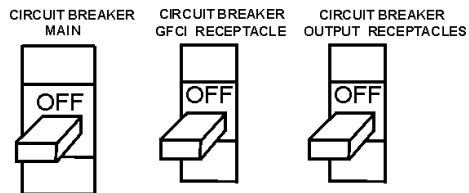


Figure 55. Main, GFCI and Load circuit breakers

2. Turn to the right and press in the engine throttle lever (Figure 56).

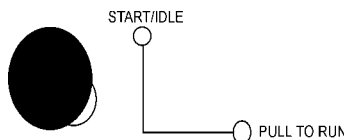


Figure 56. Engine Throttle Lever

3. Let the engine cool by running it for 3-5 minutes with no load applied.
4. Turn the key switch to ‘STOP’ (Figure 57).

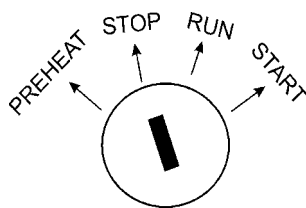


Figure 57. Key Switch (OFF)

5. Remove the load from the UVW terminal strip.

EMERGENCY STOP

1. To stop the engine in the event of an emergency, switch the MAIN, GFCI and LOAD circuit breakers to ‘OFF’ position.
2. Turn the key switch to ‘STOP’.

General Inspection

Prior to each use, the generator should be cleaned and inspected for deficiencies. Check for loose, missing or damaged nuts, bolts or other fasteners. Also check for fuel, oil, and coolant leaks.

Engine Side (Refer to the Engine Instruction Manual)

Air Cleaner

Every 50 hours: Remove air cleaner element and clean heavy duty paper element with kerosene, or foam element with liquid detergent and hot water. Wrap foam element in a cloth and squeeze dry. For heavy duty paper element, wipe excess kerosene with towel.

The air cleaner is equipped with an indicator. After the dirty air cleaner has been replaced, press the dust indicator button to reset the indicator.

Fuel Addition

Add diesel fuel (the grade may vary according to season and locations). Always pour through the mesh filter.

Removing Water from the Fuel Tank

After prolonged use, water and other impurities accumulate in the bottom of the tank. Occasionally remove the drain cock and drain the contents. During cold weather, the more empty volume inside the tank, the easier it is for water to condense. This can be reduced by keeping the tank full as much as possible.

Air Removal

If air enters the fuel injection system of a diesel engine, starting becomes impossible. After running out of fuel, or after disassembling the fuel system, bleed the system according to the following procedure.

To restart after running out of fuel, turn the switch to the "ON" position for 15-30 seconds. Try again, if needed. This unit is equipped with an automatic air bleeding system.

Service Daily

If the engine is operating in very dusty or dry grass conditions, a clogged air cleaner will result. This can lead to a loss of power, excessive carbon buildup in the combustion chamber in high fuel consumption.

Cleaning the Fuel Strainer

Clean the fuel strainer if it contains dust or water. Remove dust or water in the strainer cap and wash it in gasoline. Securely fasten the fuel strainer cap so that fuel will not leak. Check the fuel strainer every 200 hours of operation or once a month.

Check Oil Level

Check the crankcase oil level prior to each use, or when the fuel tank is filled. Insufficient oil may cause severe damage to the engine. Make sure the generator is level. The oil level must be between the two notches on the dipstick as shown in Figure 32, page 43.

Replacing Oil Filter

1. Detach the oil filter cartridge with a filter wrench.
2. Apply a film of oil to the gasket for the cartridge.
3. Screw in the cartridge by hand. When the gasket is in contact with the seal surface, tighten the cartridge one or two more times by hand.
4. After the oil cartridge has been replaced, the engine oil will drop slightly. Run the engine for a while and check for leaks before adding more oil if needed. Clean excessive oil from engine.

Replacing Fuel Filter

1. Replace the fuel filter cartridge with new one every 400 hours or so.
2. Apply fuel oil thinly over the gasket and hand-tighten the cartridge into position.
3. Vent any air.
4. **Fuel Injection Nozzle**
5. Use an injection nozzle tester to check the static injection starting pressure and the fuel spray conditions.
6. Abnormal fuel consumption will lead to a lowered output and blackish exhaust smoke. The required injection starting pressure should be 14.7MPa (150kg/cm², 2130psi).

Feed Pump Strainer Cleaning

The strainer is incorporated in the feed pump inlet side joint bolt. Clean the strainer with compressed air and rinse it in the fuel oil.

Flushing Out Radiator and Replacing Coolant

1. Open both cocks located at the crankcase side and at the lower part of the radiator and drain coolant. Open the radiator cap while draining. Remove the overflow tank and drain.
2. Check hoses for softening and kinks. Check clamps for signs of leakage.
3. Flush the radiator by running clean tap water through radiator until signs of rust and dirt are removed. **DO NOT** clean radiator core with any objects, such as a screwdriver.
4. Tighten both cocks and replace the overflow tank.
5. Replace with coolant (see page 44, Table 14 for mixture).
6. Close radiator cap tightly.

CAUTION :



Allow engine to cool when flushing out radiator. Flushing the radiator while hot will damage radiator.

Valve Clearance Check

1. In order to bring No. 1 or No. 4 cylinder to top dead center in the compression stroke, align the notched line on the crank pulley with TDC mark on the timing gear case cover.
2. Do the adjustment on the circle marked valves in the below table where No. 1 cylinder is at the center in the compression stroke.
3. After adjustment started from either piston top center, turn the crankshaft 360° to align the notched line with the TDC mark to do the adjustment again on the remaining valve. See Table 16 and Figure 55 for valve arrangement.

Injection Timing Check and Adjustment

1. Bring No. cylinder to the top dead center on the compression stroke.
2. Turn the crankshaft pulley clockwise (viewed at engine front) and align the notched line on the crank pulley with the TDC mark on the timing gear case cover.

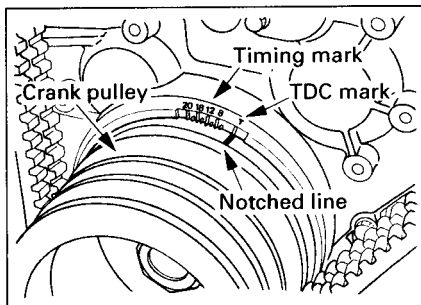


Figure 58. Valve Adjustment

NOTE:

Take necessary precautions to prevent dust and foreign particles in the pump interior when timing adjustments are made.

3. Remove the timing check hole cover at the front of injection pump to check the alignment between the pointer “a” on the injection pump gear lock plate and the projected area mark “b” on the timing gear case.
4. If “a” and “b” are in alignment, the timing is set correctly. If not, follow nos. 1-3 until the “a” and “b” are aligned.
5. Reversely turn the crankshaft pulley counterclockwise viewed at the engine front about 30° crank angle.
6. Remove No. 1 injection pipe from the engine.
7. Remove the injection pump No. 1 delivery valve holder, delivery valve and spring and reinstall the delivery valve holder on the original place.
8. Delivery valve holder tightening torque: 39~44Nm(29~33lbf.)
9. Slowly turn the crankshaft pulley clockwise and at the same time continue to feed the fuel with pumping the Feed pump. When the fuel stop to flow out from No. 1 delivery valve holder, stop pumping.
10. Observe and make sure which mark (injection starting angle line) on the timing gear case cover is aligning with the notched line on the crank pulley.
11. The timing line shows the injection starting crank angle of the engine.
12. The injection starting crank angle should be at the 14° timing mark.

**Table 15. Valve Adustment
(I=Inlet; E=Exhaust)**

Cylinder No.	1		2		3		4	
Valve Arrangement	I	E	I	E	I	E	I	E
When No. 1 is at top dead center in the compression stoke	X	X	X			X		
When No. 4 is at top dead center in the compression stroke				O	O		O	O

INSPECTION / MAINTENANCE		10 Hrs DAILY	250 Hrs	500 Hrs	1000 Hrs
ENGINE	Check Engine Fluid Levels	X			
	Check Air Cleaner	X			
	Check Battery Acid Level	X			
	Check Fan Belt Condition	X			
	Check for Leaks	X			
	Check for Loosening of Parts	X			
	Replace Engine Oil and Filter *1		X		
	Clean Air Filter		X		
	Drain Bottom of Fuel Tank		X		
	Clean Unit, Inside and Outside		X		
	Change Fuel Filter *2			X	
	Clean Radiator and Check Coolant Protection Level			X	
	Replace Air Filter Element				X
	Change Corrosion Resistor				X
	Check all Hoses and Clamps				X
Clean Inside of Fuel Tank				X	
GENERATOR	Measure Insulation Resistance Over 3M ohms		X		

*1 Replace engine oil and filter at 100 hours, first time only.

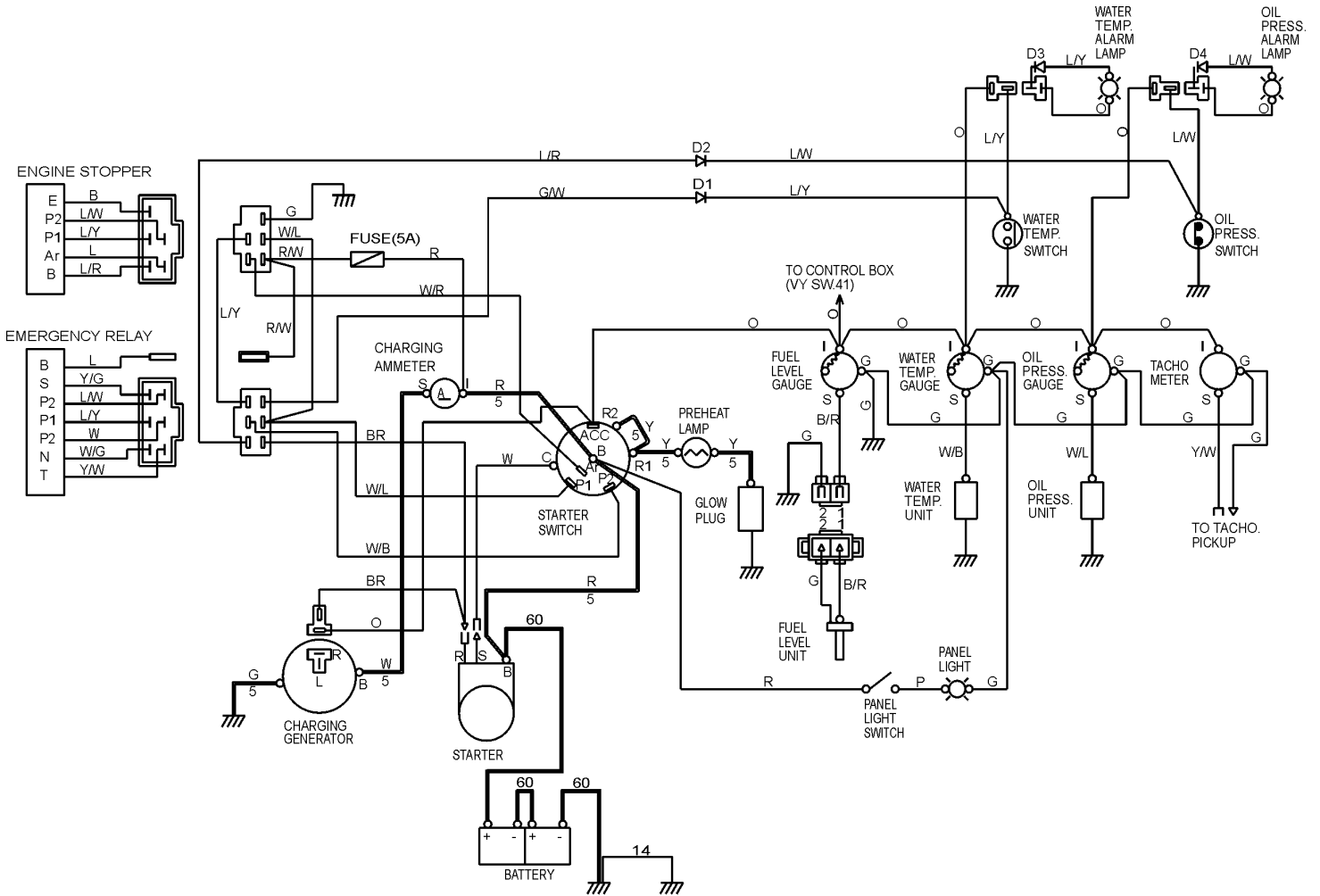
*2 Replace fuel filter at 250 Hours, first time only.

Generator Storage

For storage of the generator for over 30 days, the following is required:

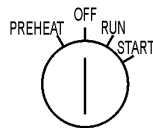
- Fill the fuel tank completely.
- Completely drain the oil from the crankcase and refill with fresh oil.
- Clean all external parts of the generator with a cloth.
- Cover the generating set and store in a clean, dry place.

DCA-60SSI2 — ENGINE WIRING DIAGRAM



COLOR CODE TABLE

CODE/ WIRE COLOR			
B	BLACK	R	RED
L	BLUE	W	WHITE
BR	BROWN	Y	YELLOW
G	GREEN	LB	LIGHT BLUE
GR	GRAY	LG	LIGHT GREEN
V	VIOLET	O	ORAGNE
P	PINK		



KEY CONNECTION DIAGRAM

	B	R-1	ACC	R-2	C	Ar	P-1	P-2
OFF	●					●	●	
PREHEAT	●	●				●	●	
RUN	●		●			●	●	
START	●			●	●	●	●	

DCA-60SSI2 — TROUBLESHOOTING (ENGINE)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, use the tables shown for

diagnosis based on the Engine Troubleshooting (Table 16). If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 16. ENGINE TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine does not start.	No fuel?	Replenish fuel.
	Air in the fuel system?	Bleed system.
	Water in the fuel system?	Remove water from fuel tank.
	Fuel pipe clogged?	Clean fuel pipe.
	Fuel filter clogged?	Clean or change fuel filter.
	Excessively high viscosity of fuel or engine oil at low temperature?	Use the specified fuel or engine oil.
	Fuel with low cetane number?	Use the specified fuel.
	Fuel leak due to loose injection pipe retaining nut?	Tighten nut.
	Incorrect injection timing?	Adjust.
	Fuel cam shaft worn?	Replace.
	Injection nozzle clogged?	Clean injection nozzle.
	Injection pump malfunctioning?	Repair or replace.
	Seizure of crankshaft, camshaft, piston, cylinder liner or bearing?	Repair or replace.
	Compression leak from cylinder?	Replace head gasket, tighten cylinder head bolt, glow plug and nozzle holder.
	Improper valve timing?	Correct or replace timing gear.
	Piston ring and liner worn?	Replace.
Excessive valve clearance?	Adjust.	
Starter does not run.	Starter malfunctioning?	Repair or replace.
	Wiring disconnected?	Connect wiring.

TABLE 16. ENGINE TROUBLESHOOTING (CONTINUED)

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine revolution is not smooth.	Fuel filter clogged or dirty?	Clean or change.
	Air cleaner clogged?	Clean or change.
	Fuel leak due to loose injection pipe retaining nut?	Tighten nut.
	Injection pump malfunctioning?	Repair or replace.
	Incorrect nozzle opening pressure?	Adjust.
	Injection nozzle stuck or clogged?	Repair or replace.
	Fuel over flow pipe clogged?	Clean.
	Governor malfunctioning?	Repair.
Either white or blue exhaust gas is observed.	Excessive engine oil?	Reduce to the specified level.
	Piston ring and liner worn or stuck?	Repair or replace.
	Incorrect injection timing?	Adjust.
	Deficient compression?	Adjust top clearance.
Either black or dark gray exhaust gas is observed.	Overload?	Lessen the load.
	Low grade fuel used?	Use the specified fuel.
	Fuel filter clogged?	Clean or change.
	Air cleaner clogged?	Clean or change.
	Deficient nozzle injection?	Repair or replace the nozzle.
Deficient output.	Incorrect injection timing?	Adjust.
	Engine's moving parts seem to be seizing?	Repair or replace.
	Uneven fuel injection?	Repair or replace the injection pump.
	Deficient nozzle injection?	Repair or replace the nozzle.
	Compression leak?	Replace head gasket, tighten cylinder head bolt, glow plug and nozzle holder.

DCA-60SSI2 — TROUBLESHOOTING (GENERATOR/ENGINE)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, use the tables shown for diagnosis based on the Engine and Radiator Troubleshooting (Table 7). If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 17. GENERATOR TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
No Voltage Output	AC Voltmeter defective?	Check output voltage using a voltmeter.
	Is wiring connection loose?	Check wiring and repair.
	Is AVR defective?	Replace if necessary.
	Defective Rotating Rectifier?	Check and replace.
Low Voltage Output	Is engine speed correct?	Turn engine throttle lever to "High".
	Is wiring connections loose?	Check wiring and repair.
	Defective AVR?	Replace if necessary.
High Voltage Output	Is wiring connections loose?	Check wiring and repair.
	Defective AVR?	Replace if necessary.
Circuit Breaker Tripped	Short Circuit in load?	Check load and repair.
	Over current?	Confirm load requirements and reduce.
	Defective circuit breaker?	Check and replace.
	Over current Relay actuated?	Confirm load requirement and replace.

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.

Items Found In the “Items Number” Column

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

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

DCA-60SSI2 W/ISUZU 6BG1 DIESEL ENGINE 1 TO 3 UNITS

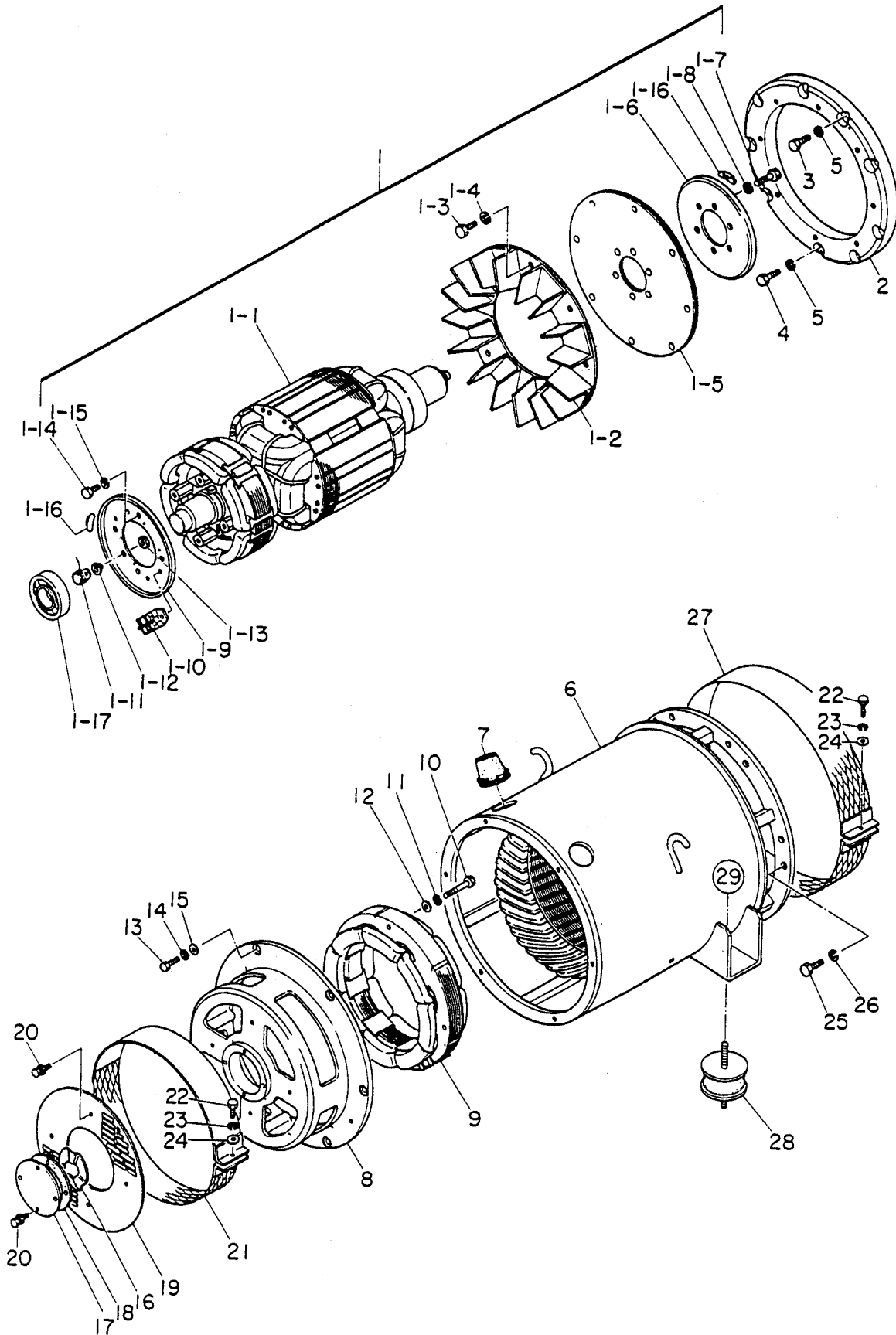
<u>Qty.</u>	<u>P/N</u>	<u>Description</u>
1	0601805869	CIRCUIT BREAKER
1	0601820671	AUTOMATIC VOLTAGE REGULATOR
1	0601840073	RHEOSTAT VOLTAGE REGULATOR
1	0601840121	KNOB REHOSTAT
1	0602013901	RADIATOR HOSE, UPPER
1	0602013160	RADIATOR HOSE, LOWER
5	1878100753	OIL FILTER
5	X132400240	FUEL FILTER
5	0602040193	ELEMENT, AIR
1	0602122200	UNIT OIL PRESSURE
1	0602123204	UNIT WATER PRESSURE
1	0601810244	BULB, ALARM LAMP
1	0601808507	TRANSDUCER WATT METER
1	8972322520	FAN BELT
1	1823100080	STARTER SWITCH
3	KEYISUZUF	KEY, STARTER SWITCH

NOTE

**Part number on this Suggested Spare
Parts list may supercede/replace the
P/N shown in the text pages of this
book.**

DCA-60SSI2 --- GENERATOR ASSY.

GENERATOR ASSY.



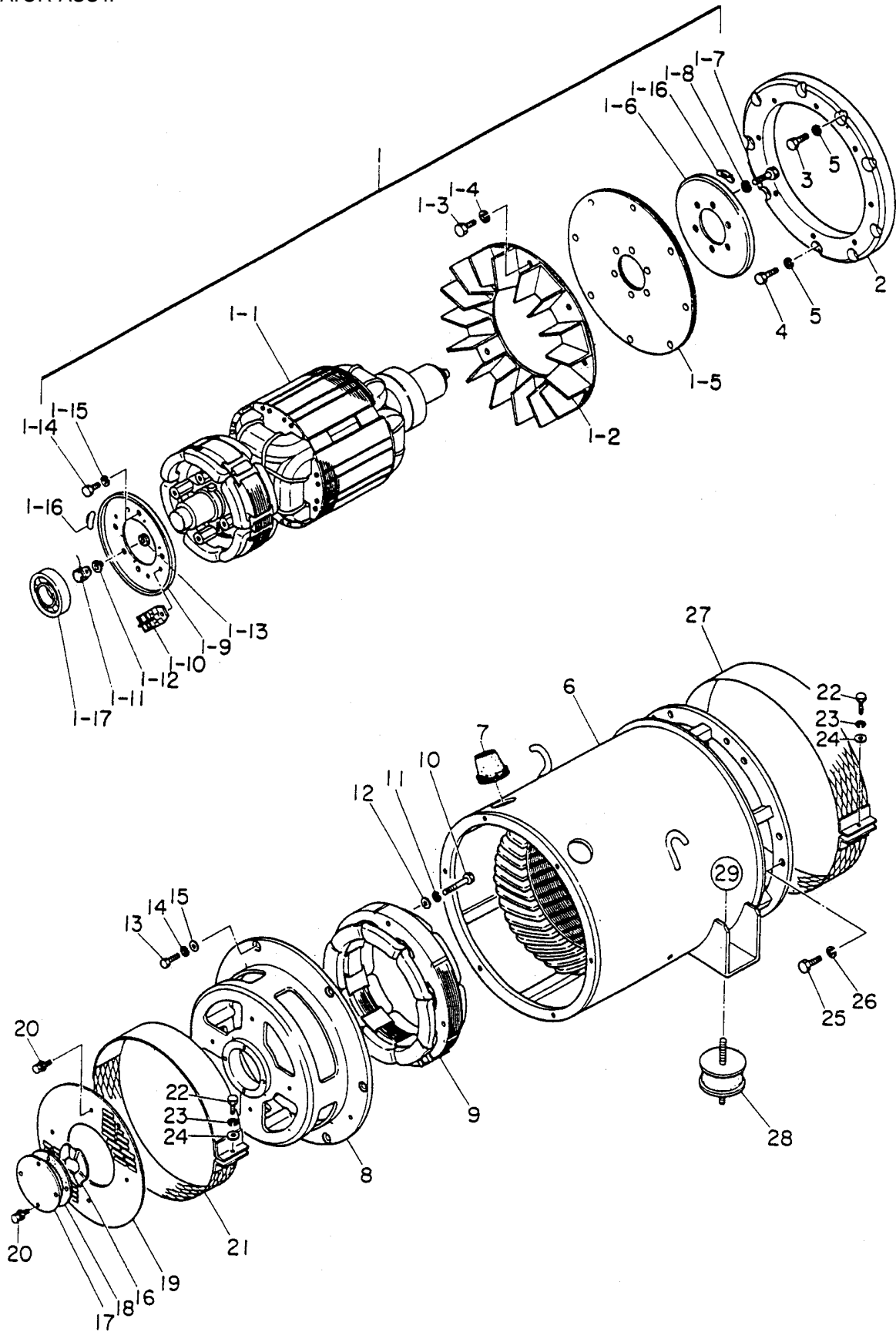
DCA-60SSI2 --- GENERATOR ASSY.

GENERATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
1	8081000302	ROTOR ASSY.	1	UP TO S/N3621172
1	8081000312	ROTOR ASSY.	1	FROM S/N3621173~
1-1		FIELD ASSY.	1	
1-2	8051070003	FAN	1	
1-3	0010310030	HEX. HEAD BOLT	8	UP TO S/N3621172
	0012110035	HEX. HEAD BOLT	8	S/N3621173~
1-4	030210250	LOCK WASHER	8	REPLACES 0042510000
1-5	8041611004	COUPLING DISK	4	
1-6	8041015003	BALANCING PLATE	1	
1-7	0010310025	HEX. HEAD BOLT	6	REPLACES 0010310025
1-8	0042610000	LOCK WASHER	6	
1-6	8001026013	SET PLATE RECTUFER	1	
1-10	0601821349	RECTIFIER	2	PT3610
1-11	0601822601	SURGER ABSORBER	1	ERZM14JK621A
1-12	8001020004	INSULATOR WASHER	1	
1-13	8001020504	INSULATOR WASHER	1	
1-14	0010108020	LOCK WASHER	4	
1-15	0040008000	LOCK WASHER	4	
1-16	0601000209	BALANCING WEIGHT KIT	1	
1-17	0070806309	BEARING	1	6309DU; UP TO S/N3621172
1-17	0071906310	BEARING	1	6310DDU; S/N3621173~
2	8051614003	COUPLING RING	1	
3	8051653004	REAMER BOLT	2	
4	012010030	HEX. HEAD BOLT	7	REPLACES 0012110030
5	0042510000	LOCK WASHER	9	REPLACES 0042510000
6	8081340503	STRATOR ASSY.	1	
7	0845041904	GROMMET	2	
8	8041315202	END BRACKET	1	UP TO S/N362172
8	8041315202	END BRACKET	1	S/N362173~
9	8041350013	FIELD ASSY. EXCITER	1	
10	0010308065	HEX. HEAD BOLT	4	
11	0042608000	LOCK WASHER	4	
12	031108160	PLAIN WASHER	6	REPLACES 0041208000
13	0010108025	HEX. HEAD BOLT	6	
14	0040008000	LOCK WASHER	6	
15	0041208000	PLAIN WASHER	6	
16	0601000003	WAVE WASHER	1	BWW6309; UP TO S/N3621172
17	8041310014	COVER, BEARING	1	UP TO S/N3621172
	8041310024	COVER, BEARING	1	S/N3621173~
18	8041312004	GASKET, BEARING	1	UP TO S/N3621173
	8041310014	GASKET, BEARING	1	S/N3621173~

DCA-60SSI2 --- GENERATOR ASSY.

GENERATOR ASSY.



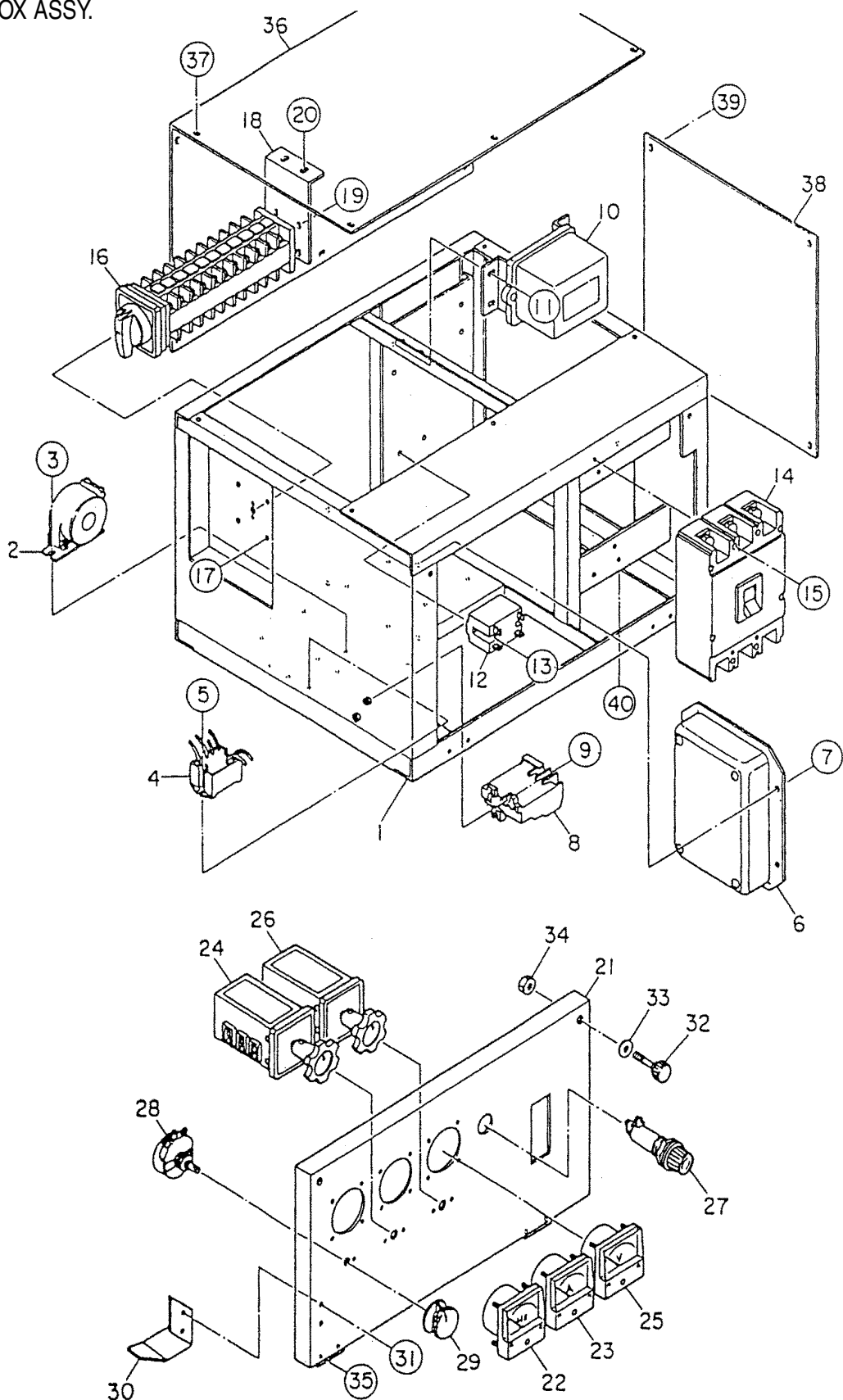
DCA-60SSI2 --- GENERATOR ASSY.

GENERATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
19	8041331014	COVER, END BRACKET	1	
20	0105050616	HEX. HEAD BOLT	8	REPLACES 0017106012
21	8001333003	COVER, END BRACKET	1	
22	0010106030	HEX. HEAD BOLT	2	
23	0040006000	LOCK WASHER	2	
24	952404470	PLAIN WASHER	2	REPLACES 0041206000
25	015091025	HEX. HEAD BOLT	6	REPLACES 0010310025
26	030210250	LOCK WASHER	6	REPLACES 0042510000
27	8051332003	COVER, FAN	1	UP TO S/N3621172
	8051332014	COVER, FAN	1	S/N3621173~
28	0605000010	RUBBER SUSPENSION		
29	0030012000	HEX. NUT	4	
	0040012000	LOCK WASHER	4	

DCA-60SSI2 --- CONTROL BOX ASSY.

CONTROL BOX ASSY.



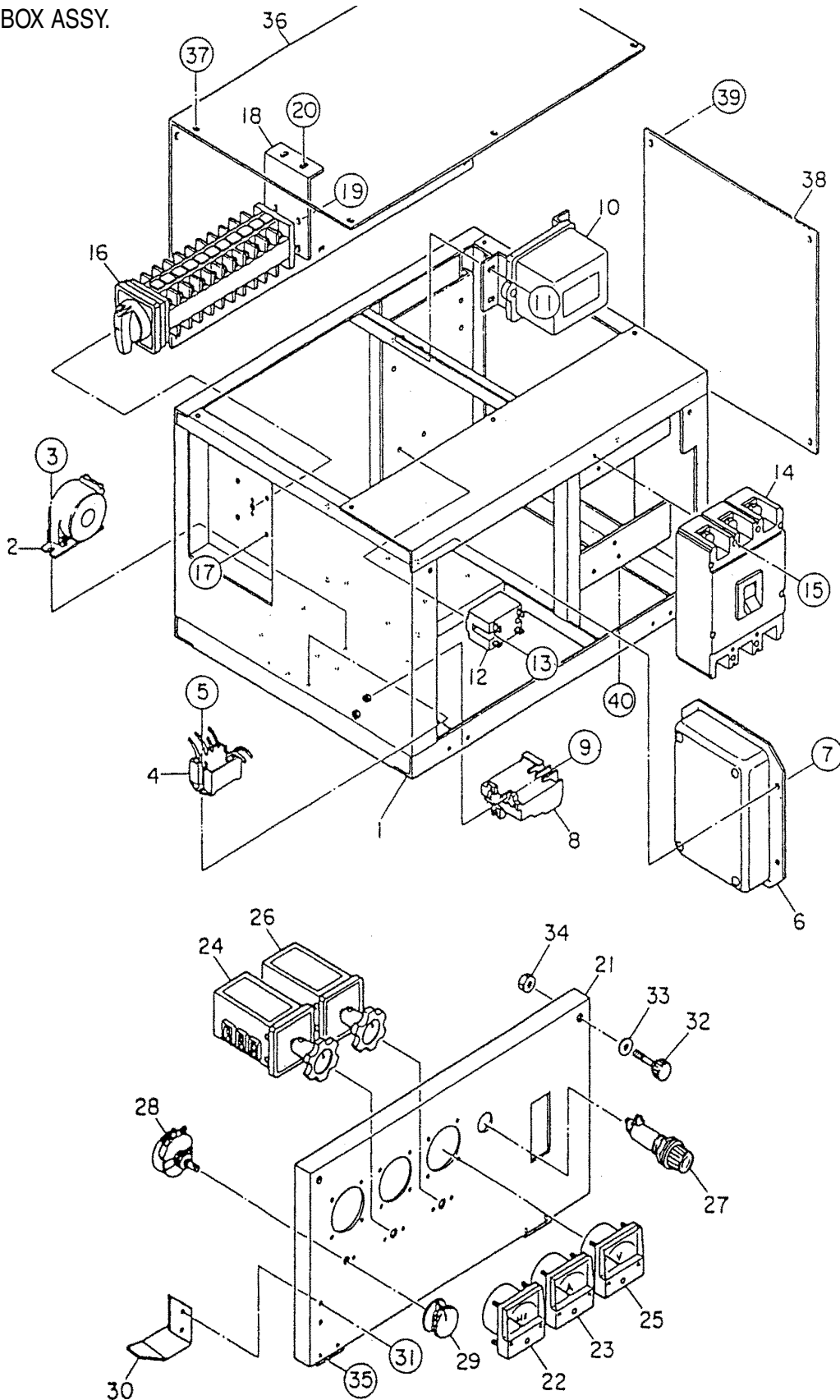
DCA-60SSI2 --- CONTROL BOX ASSY.

CONTROL BOX ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
1	8081812502	CONTROL BOX	1	UP TO S/N3646800
	B4214000002	CONTROL BOX	1	S/N3646801~
2	0601801143	CURRENT TRANSFORMER, AMMETER.....	3	CT-3.5MR 100/5A
3	0027104010	MACHINE SCREW	6	
4	0601823860	RELAY UNIT	2	MSA9013
5	0027104016	MACHINE SCREW	4	
6	0601820628	AUTOMATIC VOLTAGE REGULATOR	1	NTA5A2D; UP TO S/N3656070
	0601820671	AUTOMATIC VOLTAGE REGULATOR	1	NTA5A2DB; S/N3656071~
7	0027105012	MACHINE SCREW	4	
8	0601820853	OVER CURRENT RELAY	1	THK20KP; UP TO S/N3656070
	0601820892	OVER CURRENT RELAY	1	THN20HZKP; S/N3656071~
9	0027104016	MACHINE SCREW	4	
10	0602200405	EMERGENCY RELAY	1	ISUZU 1825500730
11	0027106016	MACHINE SCREW	4	
12	0601823706	RELAY	1	HE1AAHE1112 DC24V
13	0027104016	MACHINE SCREW	2	
14	0601805352	CIRCUIT BREAKER	1	KM203150AT; UP TO S/N3646800
14	0601805869	CIRCUIT BREAKER	1	NY203A 150AT; S/N3646801~
15	0021004020	MACHINE SCREW	4	
	0040004000	LOCK WASHER	4	
	031104080	PLAIN WASHER	4	REPLACES 0041204000
16	M1923100004	SELECTOR SWITCH	1	REPLACES 8010153104
17	0020004010	MACHINE SCREW	4	REPLACES 0021104010
18	8051839504	BRACKET, SELECTOR SWITCH	1	
19	0021003010	MACHINE SCREW	4	
20	0017106016	HEX. HEAD BOLT	2	
	020106050	HEX. NUT	2	REPLACES 0030006000
21	7451822503	CONTROL PANEL	1	UP TO /SN3646800
	7451822513	CONTROL PANEL	1	S/N36463801~
22	0601800460	FREQUENCY METER	1	PAK60 220V 45~65Hz
23	0601800784	AC AMMETER	1	PSK60 0~100A --200A
24	0601801040	CHANGE-OVER SWITCH, AMMETER	1	SL2AS
25	0601800212	AC VOLTMETER	1	REPLACES 0601800217 PCK60 0~600V
26	0601801041	CHANGE-OVER SWITCH, VOLTMETER	1	SL2VS
27	0601810072	PILOT LAMP	1	LP132DC 220V
	0601810261	BULB	1	T13
28	0601840073	VOLTAGE REGULATOR	1	RA20A2SE102BJ 2W 1k OHM
29	0601840121	KNOB	1	

DCA-60SSI2 --- CONTROL BOX ASSY.

CONTROL BOX ASSY.



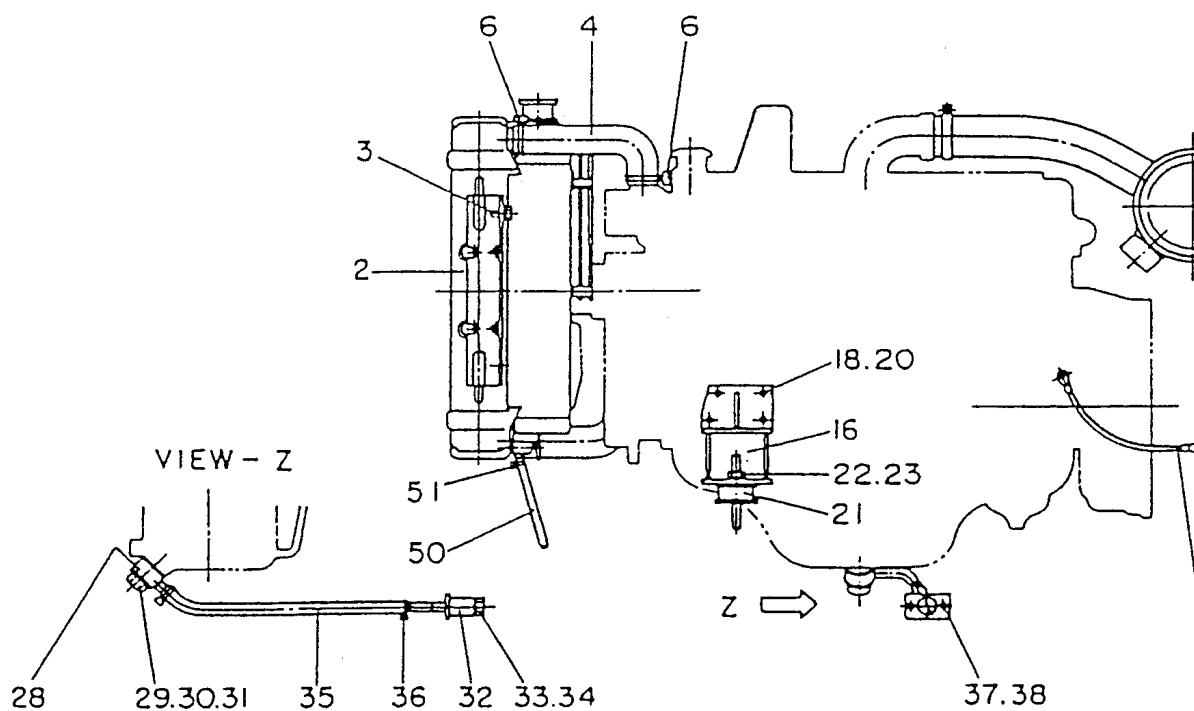
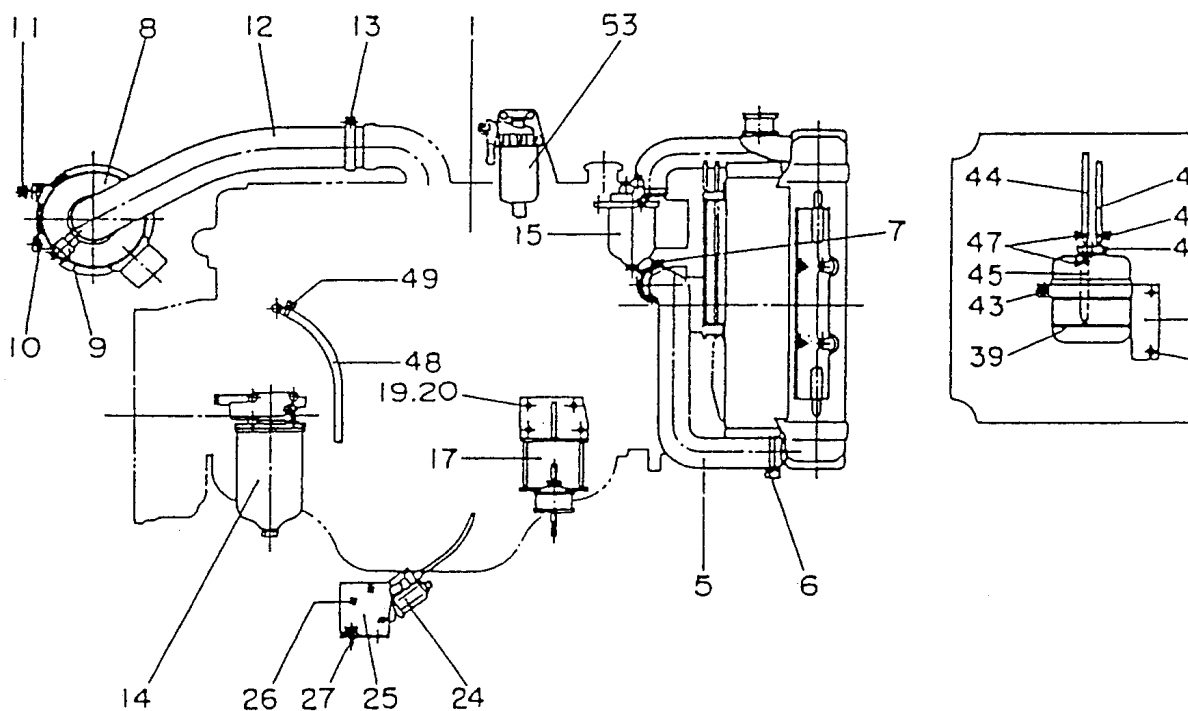
DCA-60SSI2 --- CONTROL BOX ASSY.

CONTROL BOX ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
30	3331824003	STOPPER, CONTROL PANEL	1	
31	0027105016	MACHINE SCREW	2	
	0030005000	HEX. NUT	2	
32	0805001304	SET SCREW	2	UP TO S/N3655377
	0845056404	SET SCREW	2	S/N3655378~
33	031108160	PLAIN WASHER	2	REPLACES 0041208000
34	020108060	HEX. NUT	2	REPLACES 0030008000
35	0027105010	MACHINE SCREW	4	
36	8081814503	COVER	1	
37	0017106016	HEX. HEAD BOLT	11	
38	8081814604	SIDE PANEL	1	
39	0017106016	HEX. HEAD BOLT	4	
40	011208025	HEX. HEAD BOLT	4	REPLACES 0017108025

DCA-60SSI2 ENGINE AND RADIATOR ASSY.

ENGINE AND RADIATOR ASSY.



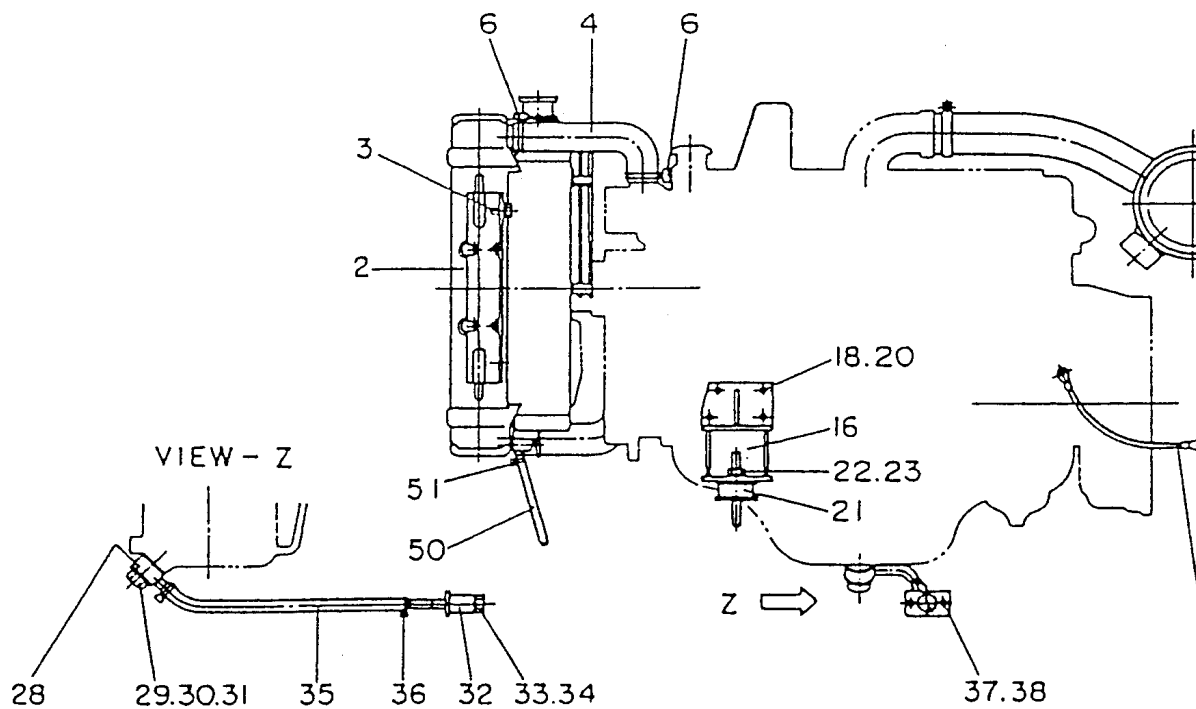
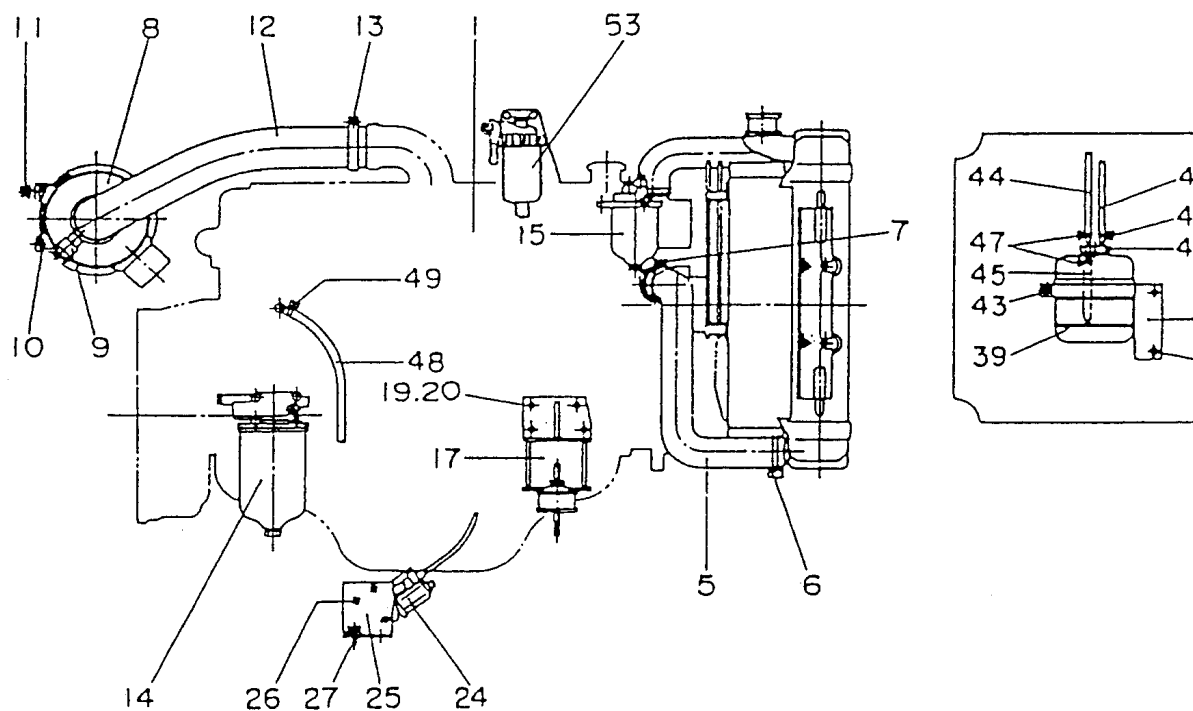
DCA-60SSI2 ENGINE AND RADIATOR ASSY.

ENGINE AND RADIATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
1	0602000100	ENGINE	1	ISUZU 6BD1; UP TO S/N3656070
	B4924200114	ENGINE	1	ISUZU A6BD1; S/N3656071~
2	0602010802	RADIATOR	1	H190110000
3	0017108020	HEX. HEAD BOLT	6	
4	0602013901	RADIATOR HOSE	1	B400008
5	0602013160	RADIATOR HOSE	1	B400007
6	0602014302	HOSE BAND	3	
7	06020143303	HOSE BAND	1	
8	0602040090	AIR CLEANER	1	FWG088006
	0602040193	ELEMENT, AIR CLEANER	1	P104972
9	0602040690	DUST INDICATOR	1	RBX002252
10	0602040598	BAND, AIR CLEANER	2	AAH008263
11	0017108020	HEX. HEAD BOLT	4	
12	7452032303	HOSE, AIR CLEANER	1	
13	0605515008	HOSE BAND	2	
14	0602041106	ELEMENT, OIL FILTER	1	1878100751
15	0602042106	ELEMENT, FUEL FILTER	1	988511911; UP TO S/N3656070
	X132400240	ELEMENT, FUEL FILTER	1	S/N3656071~; REPLACES 1132400791
16	3345112403	ENGINE FOOT	1	
17	3345112503	ENGINE FOT	1	
18	0010710025	HEX. HEAD BOLT	7	
19	0030610000	HEX. NUT	1	
20	0040010000	LOCK WASHER	8	
21	060500009	RUBBER SUSPENSON	4	
22	0040012000	LOCK WASHER	4	
23	0030112000	HEX. NUT	4	
24	1819001931	ENGINE STEOPPER	1	REPLACES 0602210803 & 1819000161
25	7452215104	BRACKET, ENGINE STOPPER	1	
26	0027106016	MACHIEN SCREW	3	
27	00171080220	HEX. HEA BOLT	2	

DCA-60SSI2 ENGINE AND RADIATOR ASSY.

ENGINE AND RADIATOR ASSY.



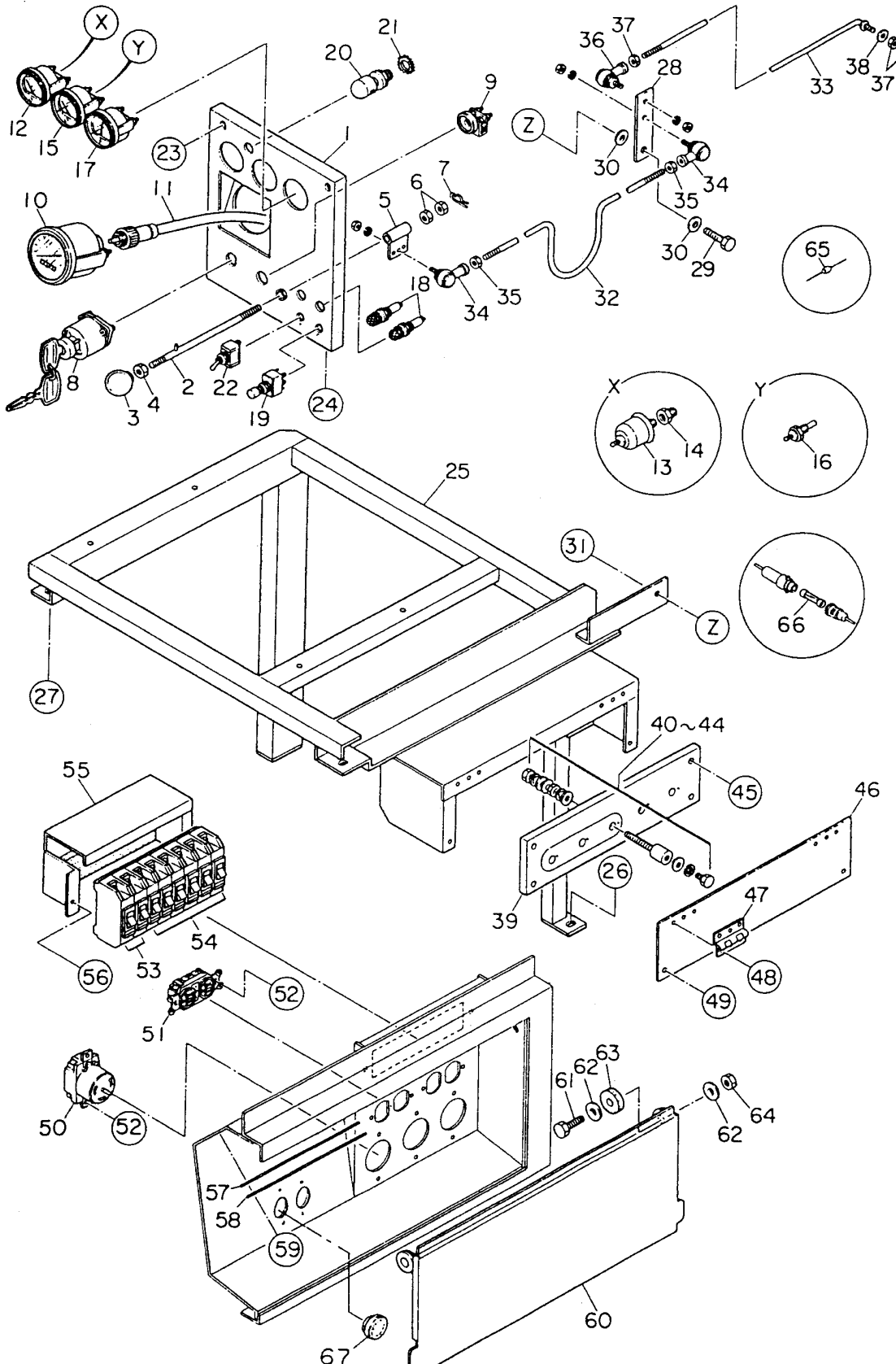
DCA-60SSI2 ENGINE AND RADIATOR ASSY.

ENGINE AND RADIATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
28	74522051104	DRIAN JOINT	1	
29	0805013704	PACKING, OIL PAN SIDE	1	
30	0805014204	PACKING	1	
31	3362054104	JOINT BOLT	1	
32	3362051003	DRIAN GOINT	1	
33	0802024004	PACKING	1	
34	0802010204	PLUG1		
35	7452053104	DRINAG HOSE	1	
36	0605515158	HOSE BAND	2	
37	0017108020	HEX. HEAD BOLT	2	
38	0030008000	HEX. NUT	2	
39	0845031303	RESERVE TANK	1	
40	0802081104	CAP, RESERVE TANK	1	
41	7452082504	BRAKET, RESERVE TANK	1	
42	0017108020	HEX. HEAD BOLT	2	
43	0017106025	HEX. HEAD BOLT	1	
44	0199500470	HOSE	1	
45	0199500175	HOSE	1	
46	0193602000	HOSE	1	
47	0605515013	HOSE BAND	4	
48	0193100950	HOSE	1	
49	0605515007	HOSE BAND	1	
50	0193800850	HOSE	1	
51	0605515019	HOSE BAND	1	
52	7452220404	EARTH CABLE	1	
53	8970209410	FILTER	1	REPLACES 9581541441

DCA-60SSI2 --- ENGINE OPERATING PANEL ASSY.

ENGINE OPERATING PANEL ASSY.



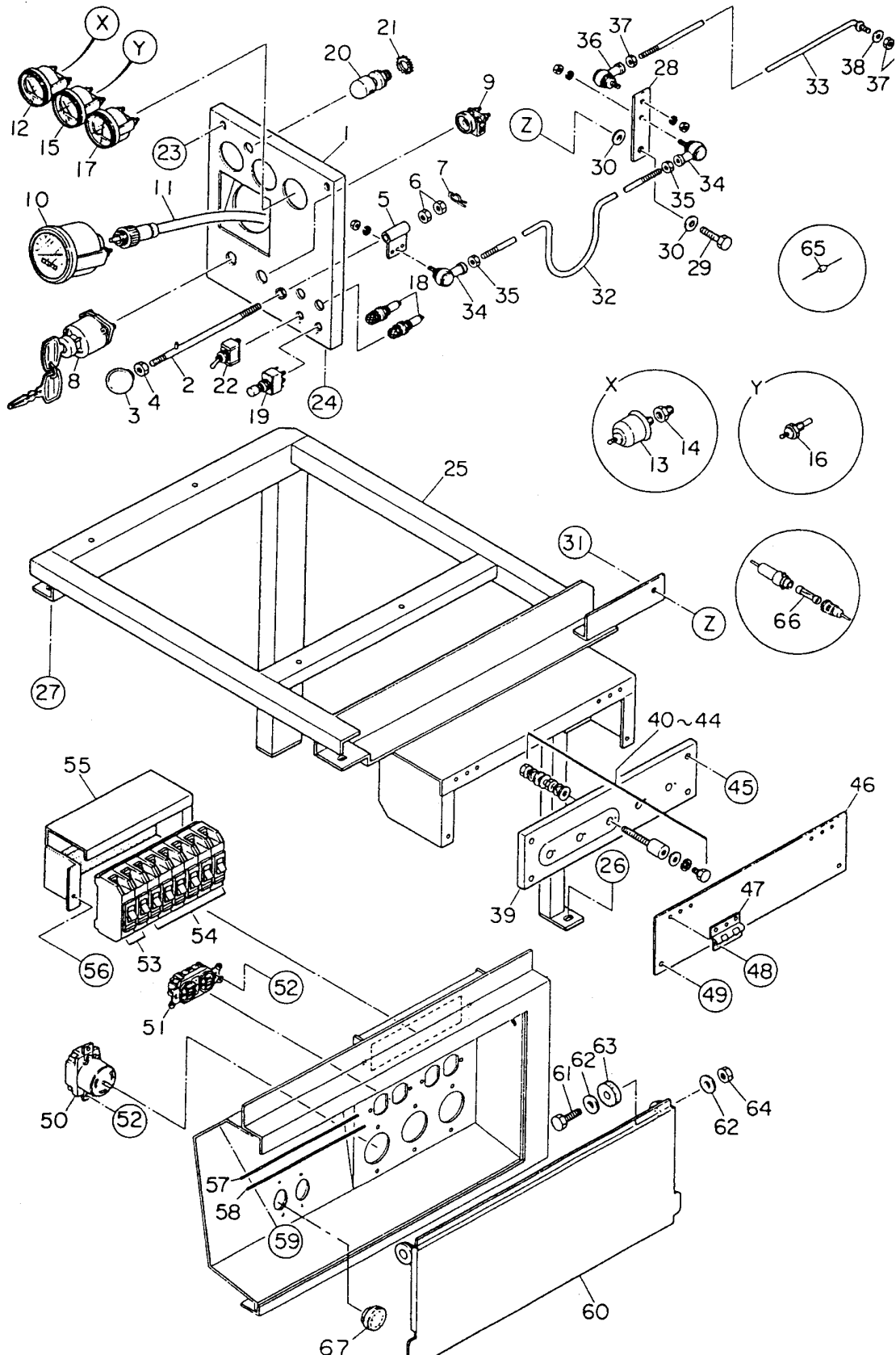
DCA-60SSI2 --- ENGINE OPERATING PANEL ASSY.

ENGINE OPERATING PANEL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
1	7452111103	OPERATING PANEL	1	
2	7452142014	SLIDE BAR	1	
3	0601840190	KNOB	1	REPLACES 0805012904
4	020108060	HEX. NUT	1	REPLACES 0036003000
5	7452140504	BRACKET, GOVERNOR ROD	1	
6	020108060	HEX. NUT	2	REPLACES 0030008000
7	0605010503	SNAP PIN	1	
8	1823100080	STARTER SWITCH	1	REPLACES 06021000004
	KEYISUZUF	KEY, STARTER SWITCH	1	
9	1814020031	PREHEAT LAMP	1	REPLACES 9825300430
10	0602120054	TACHOMETER	1	25000KX4110
11	0602120154	CABLE, TACHOMETER	1	621000KA6710L=1150
12	0602122060	OIL PRESSURE GAUGE	1	4200KX1410
13	0602122200	UNIT, OIL PRESSURE	1	53000AC0101
14	0131300000	STREET SOCKET	1	UP TO S/N3623457
14	9099022380	STREET SOCKET	1	S/N3623458~; REPLACES 0603306350
15	0602123061	WATER TEMPERATURE GAUGE	1	51400KA1200
16	0602123204	UNIT, WATER TEMPERATURE	1	41400KA1200
17	0602121052	CHARGING AMMETER GAUGE	1	43000KV0300
18	0602103091	ALARM LAMP	2	REPLACES 0602103090
	0601810244	BULB	2	
19	0601830420	SWITCH, LAMP CHECK	1	SB61A
20	0601810120	PANEL LIGHT	1	DL31000
	0601810214	BULB	1	REPLACES 0601810201
21	0040520000	TOOTHED LOCK WASHER	1	
22	0601830710	SWITCH, PANEL LIGHT	1	S301T
23	011008040	HEX. HEAD BOLT	2	REPLACES 0010008040
	0040008000	LOCK WASHER	2	
	031108160	PLAIN WASHER	2	REPLACES 0041208000
24	011008020	HEX. HEAD BOLT	2	REPLACES 0017108020
25	8085312103	SUPPORT LEG	1	
26	0017110025	HEX.HEAD BOLT	2	
27	011208025	HEX. HEAD BOLT	2	REPLACES 0017108025
	020108060	HEX. NUT	2	REPLACES 0030008000
28	7452183004	LINK, GOVERNOR ROD	1	
29	0105091025	HEX. HEAD BOLT	1	REPLACES 0010010025
30	031110160	PLAIN WASHER	2	REPLACES 0041210000
31	020310080	HEX. NUT	1	REPLACES 0030010000
32	7452182014	GOVERNOR ROD	1	
33	7452152004	GOVERNOR ROD	1	
34	0602180106	BALL JOINT	2	
35	020108060	HEX. NUT	2	REPLACES 0030008000

DCA-60SSI2 --- ENGINE OPERATING PANEL ASSY.

ENGINE OPERATING PANEL ASSY.



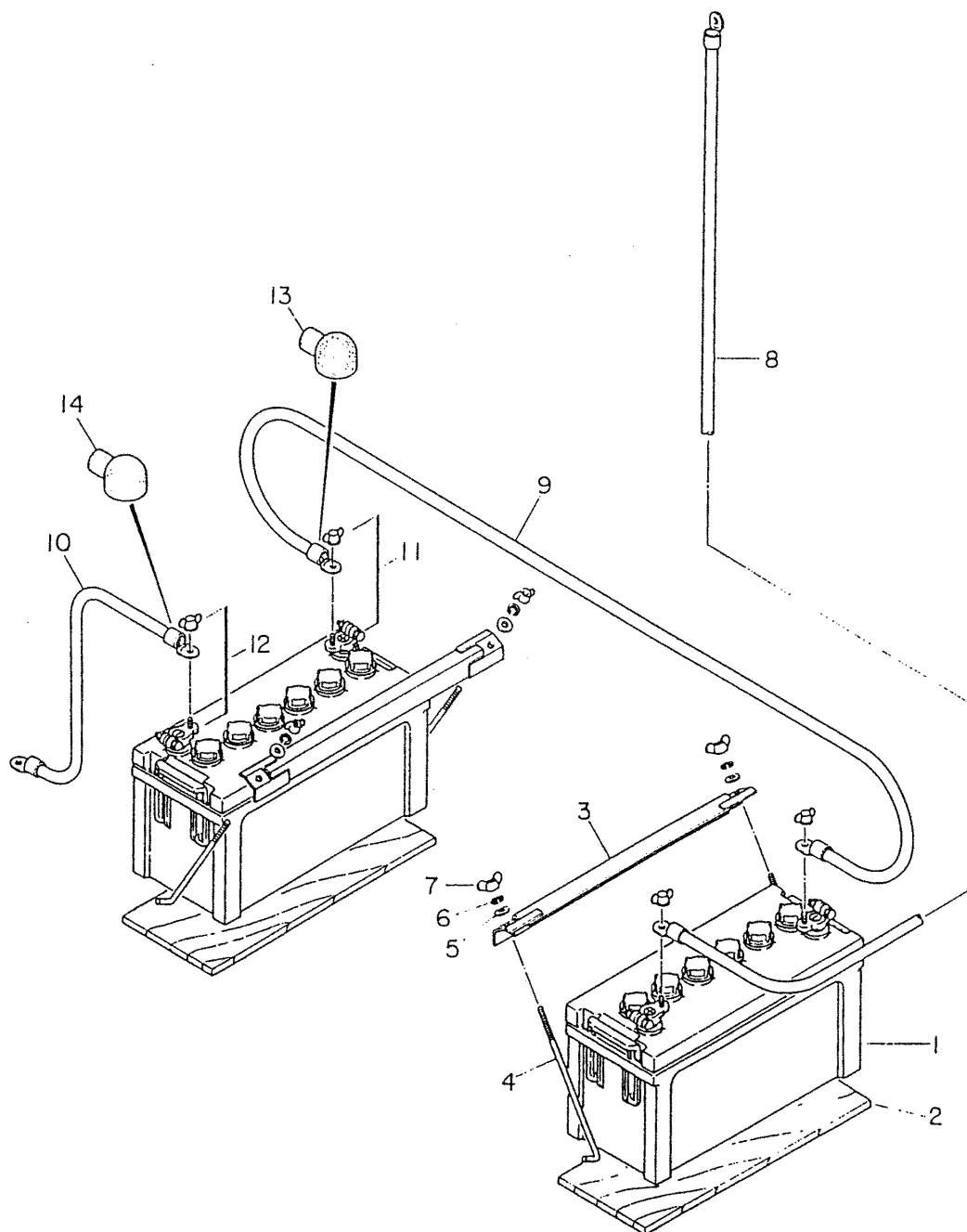
DCA-60SSI2 --- ENGINE OPERATING PANEL ASSY.

ENGINE OPERATING PANEL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
36	0602180108	BALL JOINT	1	
37	020106050	HEX. NUT	3	REPLACES 0030006000
38	952404470	PLAIN WASHER	1	REPLACES 0041206000
39	8111860103	SET BOARD, OUPUT TERMINAL	1	
40	0801830204	OUTPUT TERMINAL	5	
41	0801830704	HEX. HEAD BOLT	5	
42	0039312000	HEX. NUT	10	
43	0040012000	LOCK WASHER	15	
44	0041412000	PLAIN WASHER	20	
45	011208030	HEX. HEAD BOLT	5	REPLACES 0017108030
46	8081865504	COVER, OUTPUT TERMINAL	1	
47	0605010051	HINGE	2	
48	0027103016	MACHINE SCREW	12	
	0207003000	HEX. NUT	6	
49	0017106016	HEX. HEAD BOLT	2	
50	0601811034	RECEPTACLE	2	REPLACES 0601812565; CS6369 250V 50A;
51	0601811030	RECEPTACLE	2	UP TO S/N3627236; 5-20R 125V0 20A
	0601812598	RECEPTACLE	1	S/N3627237~;GF53 OEM 125V 20A
52	0027103010	MACHINE SCREW	10	
	0207003000	HEX. NUT	10	REPLACES 0030003000
	S8413	PLAIN WASHER	10	REPLACES 0041203000
53	0601805306	CIRCUIT BREAKER	2	UP TO S/N3627236; KM51 265V 40A
	0601804887	CIRCUIT BREAKER	2	S/N3627237~;REPLACES 0601805313 KM51 265V 20A
54	0601805840	CIRCUIT BREAKER	3	KM52 265V 50A
55	8081816303	BRACKET, CIRCUIT BREAKER	1	
	0222100200	RUBBER SHEET	1	
56	0017106016	HEX. HEAD BOLT	2	
57	8085182004	RUBBER COVER	1	
59	011206020	HEX. HEAD BOLT	6	REPLACES 0017106020
60	8081865303	COVER, RECEPTACLE	1	
61	12212045	HEX. HEAD BOLT	2	REPLACES 0010012045
62	031112230	PLAIN WASHER	4	REPLACES 0041612000
63	0805009804	RUBBER WASHER	2	
64	0030012000	HEX. NUT	2	
65	0601820015	RECTIFER	4	IS2762
66	0601802133	FUSE	1	5A
67	0601851780	GROMMET	2	S/N3700638~

DCA-60SSI2 --- BATTERY ASSY.

BATTERY ASSY.



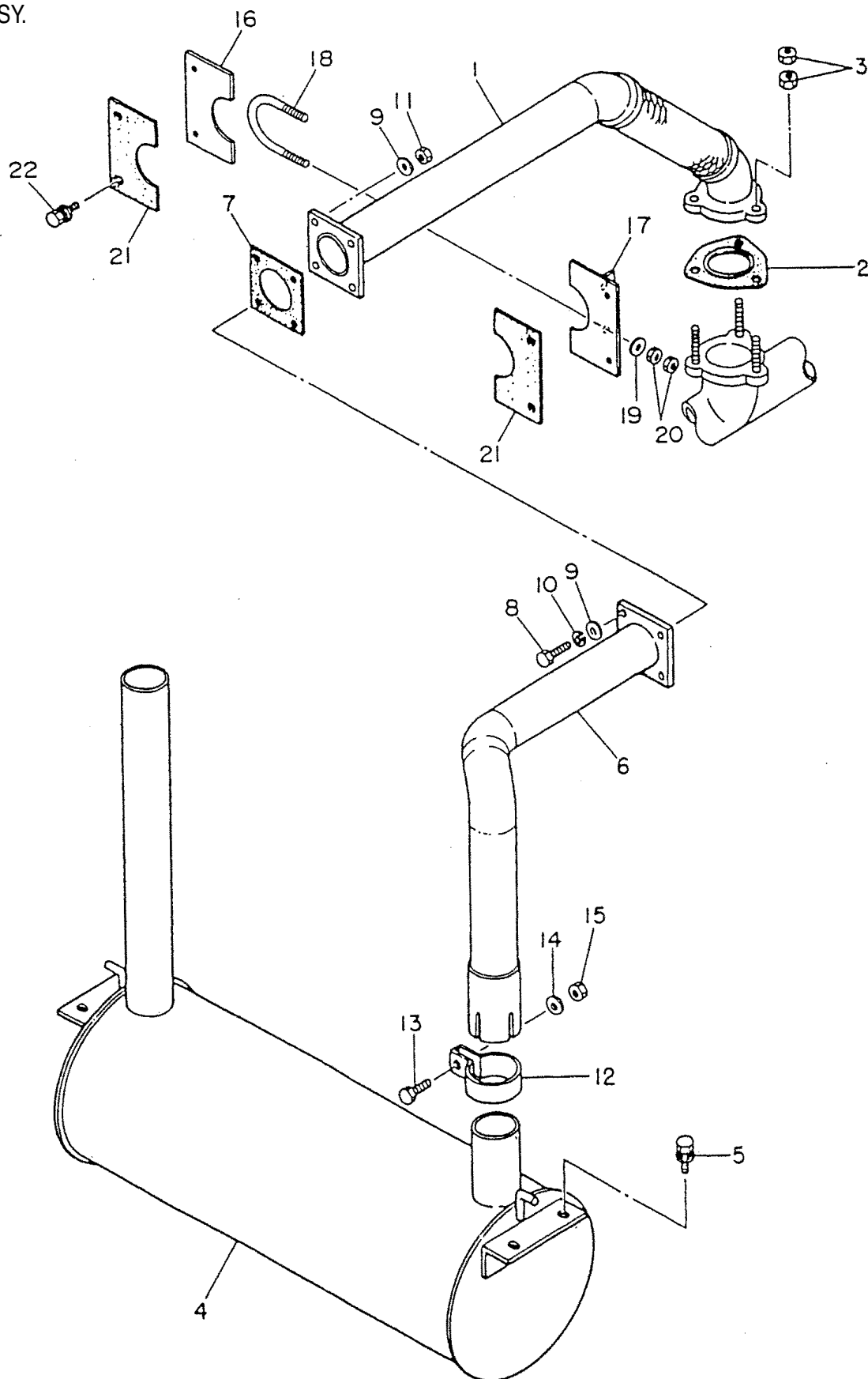
DCA-60SSI2 --- BATTERY ASSY.

BATTERY ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
1	0168409541	BATTERY	2	95E41R
2	0805003904	BATTERY SHEET	2	
3	0805004004	BATTERY BAND	2	
4	0805002904	BATTERY BOLT	4	
5	031108160	PLAIN WASHER	4	REPLACES 0041208000
6	0040008000	LOCK WASHER	4	
7	0037808000	WING NUT	4	
8	0215260065	BATTERY CABLE	1	
9	0211160180	BATTERY CABLE	1	
10	0215860100	BATTERY CABLE	1	
11	0602220310	TERMINAL ASSY (+)	2	
	0208008000	WING NUT	2	
12	0602220311	TERMINAL ASSY (-)	2	
	0208008000	WING NUT	2	
13	0845040414	TERMINAL CAP	2	
14	0845041304	TERMINAL CAP	2	

DCA-60SSI2 --- MUFFLER ASSY.

MUFFLER ASSY.



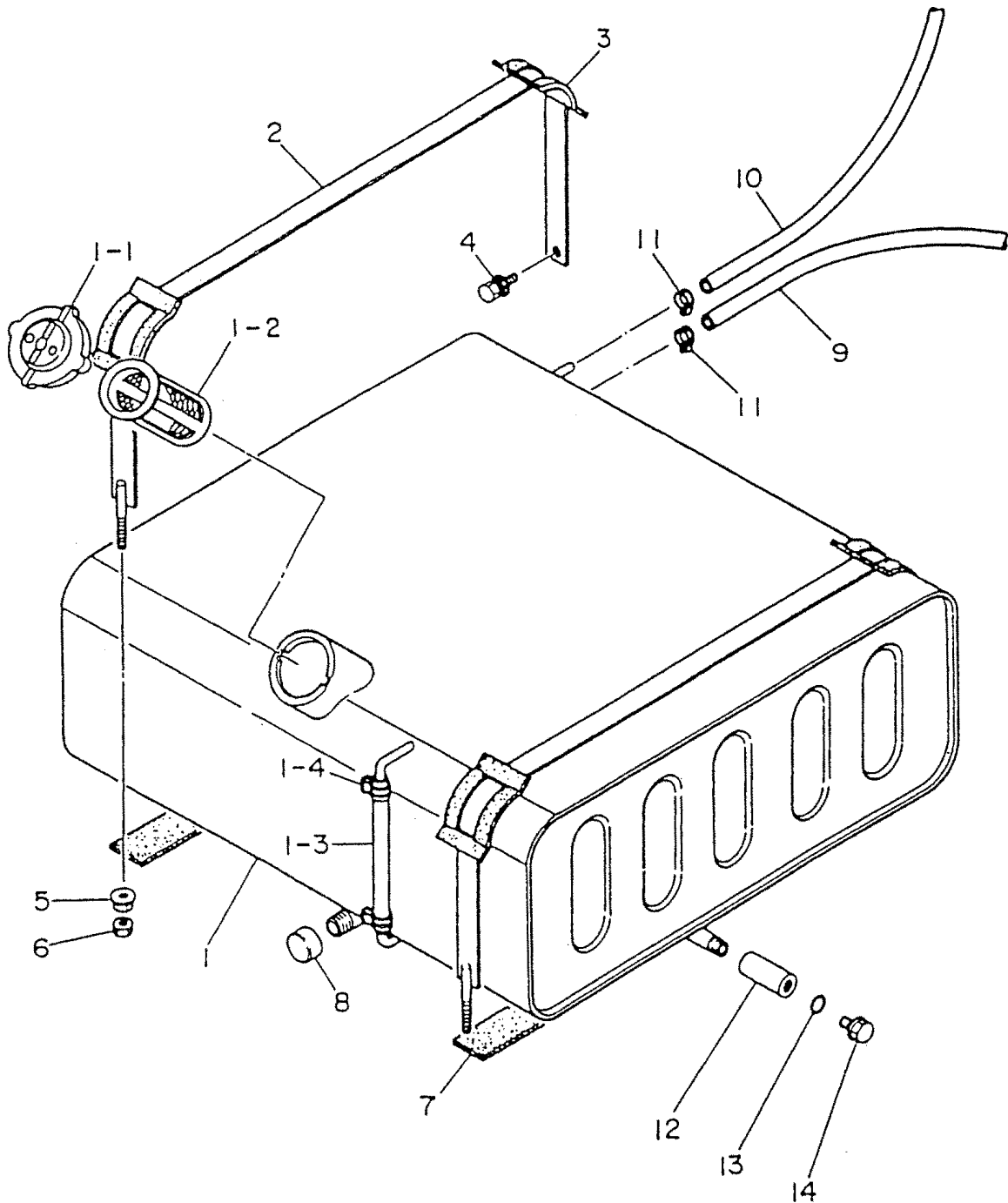
DCA-60SSI2 --- MUFFLER ASSY.

MUFFLER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
1	8082330303	EXHAUST PIPE	1	
2	1141450690	GASKET	1	REPLACES 9221160010
3	9091103100	HEX. NUT	6	REPLACES 9091103100
4	3802311122	MUFFLER	1	
5	012210020	HEX. HEAD BOLT	4	REPLACES 0017110020
6	7452330303	EXHAUST PIPE	1	
7	B4334200404	GASKET	1	
8	011008035	HEX. HEAD BOLT	4	REPLACES 0010108035
9	031108160	PLAIN WASHER	4	REPLACES 0041208000
10	0040008000	LOCK WASHER	4	
11	0030008000	HEX. NUT	4	
12	1382320003	PIPE BAND	1	
13	011208030	HEX. HEAD BOLT	1	REPLACES 0010008030
14	031108160	PLAIN WASHER	1	REPLACES 0041208000
15	020108060	HEX. NUT	1	REPLACES 0030008000
16	3342354104	COVER	1	
17	3342354004	COVER	2	
18	3342328104	PIPE CLAMPER	1	
19	031108160	PLAIN WASHER	2	REPLACES 0041208000
20	020108060	HEX. NUT	4	REPLACES 0030008000
21	3342359004	COVER SHEET	2	
22	011208025	HEX. HEAD BOLT	4	REPLACES 0017108025

DCA-60SSI2 --- FUEL TANK ASSY.

FUEL TANK ASSY.



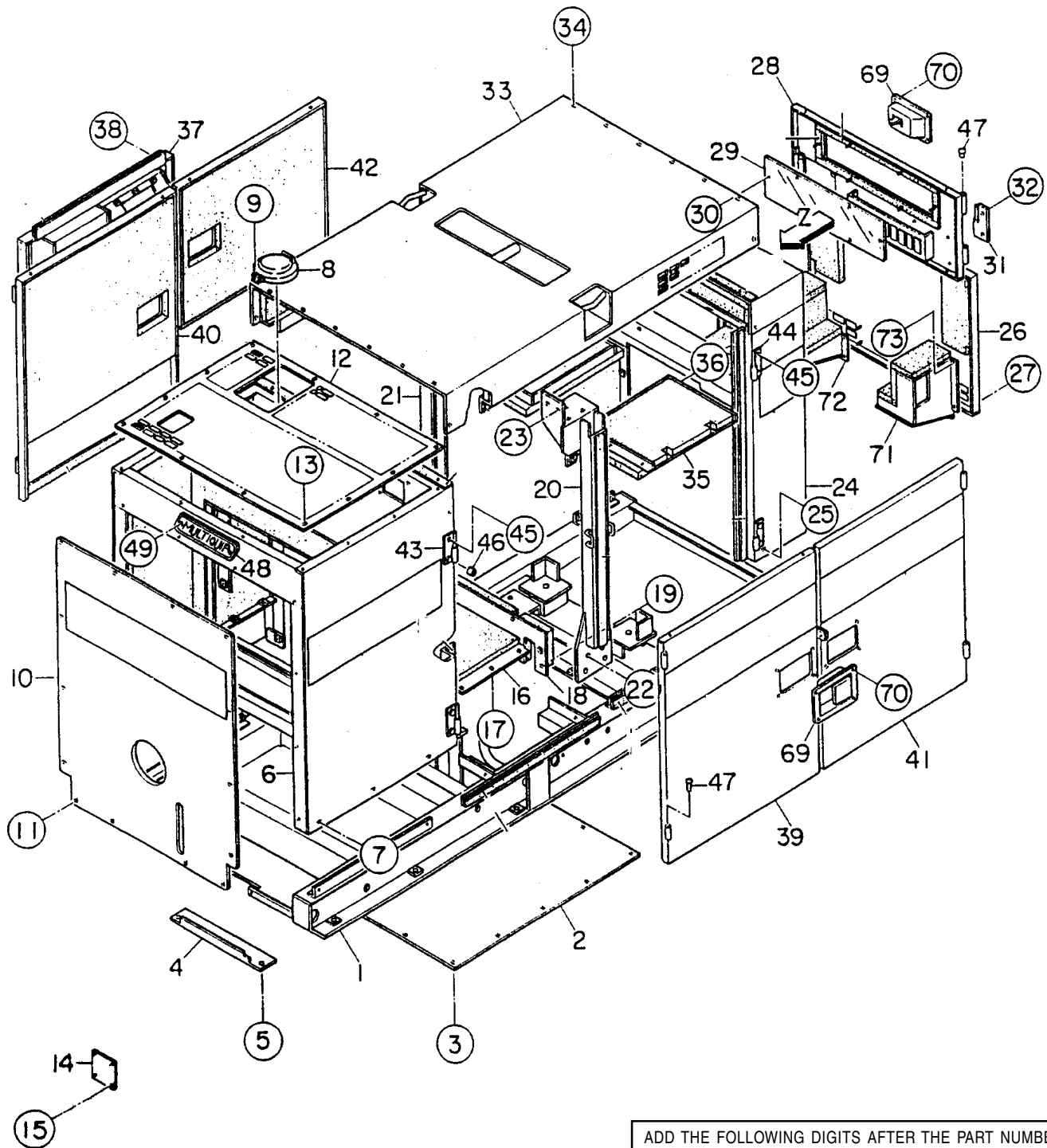
DCA-60SSI2 --- FUEL TANK ASSY.

FUEL TANK ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
1	7455510303	FUEL TANK	1	
1-1	0810105004	CAP, FUEL TANK	1	
1-2	0810105400	FUEL FILTER	1	
1-3	0193100255	FUEL GAUGE HOSE	1	
1-4	0605515079	HOSE BAND	2	
2	7455523304	TANK BAND	2	
3	0805003414	PAD, TANK BAND	4	
4	011008020	HEX. HEAD BOLT	2	REPLACES 0017108020
5	0207008000	HEX. NUT	2	REPLACES 0207008000
6	020108060	HEX. NUT	2	REPLACES 0030008000
7	0222100200	TANK SHEET	4	
8	0131906000	CAP	1	
9	0191301150	SUCTION HOSE	1	
10	0191300670	RETURN HOSE	1	
11	0605515109	HOSE BAND	4	
12	0845032204	DRAIN JOINT	1	UP TO S/N3653118
	0845047504	DRAIN JOINT	1	S/N3653119~
13	0150000018	O RING	1	
14	0802011104	PLUG	1	

DCA-60SSI2 --- ENCLOSURE ASSY.

ENCLOSURE ASSY.



UP TO S/N3656070

ADD THE FOLLOWING DIGITS AFTER THE PART NUMBER
WHEN ORDERING ANY PAINTED PANEL TO
INDICATE COLOR OF UNIT:

1-ORANGE	5-BLACK
2-WHITE	6-CATERPILLAR YELLOW
3-SPECTRUM GRAY	7-CATO GOLD
4-SUNBELT GREEN	8-RED

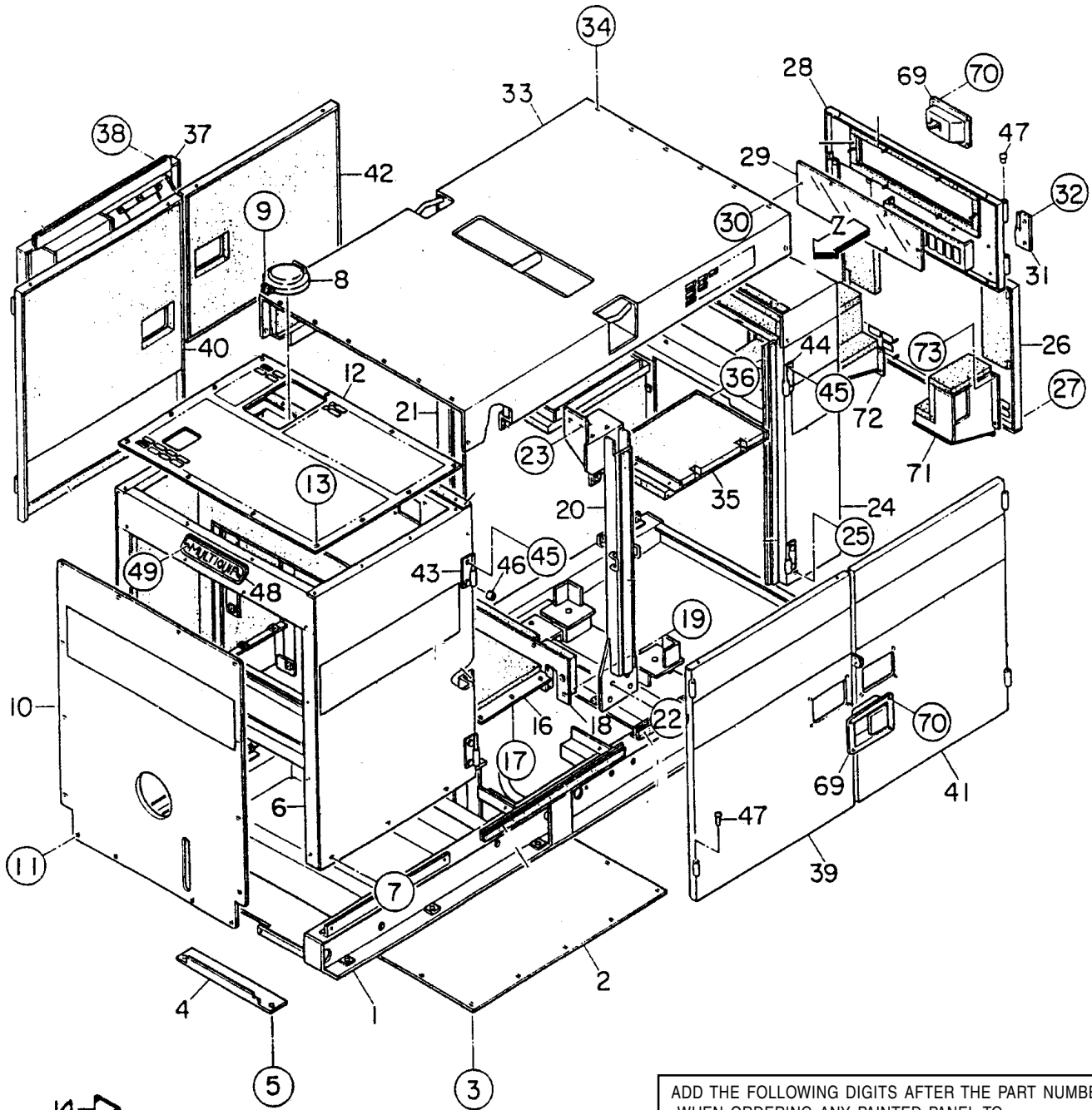
THE SERIAL NUMBER MAY BE REQUIRED.

ENCLOSURE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
1	7455111112	BASE	1	
2	7455116004	FLOOR PANLE	1	
3	0017108020	HEX. HEAD BOLT	12	
4	7455116504	COVER	1	
5	0017108020	HEX.HEAD BOLT	2	
6	7455121012	FRONT FRAME	1	UP TO S/N3656070
	7455121022	FRONT FRAME	1	S/N3656071~
	7455109203	ACOUSTIC SHEET	1	
7	0017108020	HEX. HEAD BOLT	6	
8	0800251201	FILLER COVER	1	
9	0027106016	MACHINE SCREW	2	
10	7455125503	COVER, FRONT FRAME	1	
	7455109304	ACOUSTIC SHET	1	
11	0017108020	HEX. HEAD BOLT	16	
12	7455125304	COVER, FRONT FRAME	1	
13	00171080220	HEX. HEAD BOLT	12	
14	3385155104	COVER	2	UP TO S/N3656070
15	0017106020	HEX. HEAD BOLT	8	UP TO S/N3656070
16	7455125104	COVER, FRONT FRAME	1	
	7455109404	ACOUSTIC SHEET	1	
17	0017108020	HEX. HEAD BOLT	4	
18	7455125704	COVER, FRONT FRAME	1	
	7455109504	ACOUSTIC SHEET	1	
19	0017108020	HEX. HEAD BOLT	4	
20	7455132013	CENTER FRAME	1	UP TO S/N3656070
	B4434300003	CENTER FRAME	1	S/N3656071~
21	7455132213	CENTER FRAME	1	UP TO S/N3656070
	B4434300103	CENTER FRAME	1	S/N3656071~
22	0010114040	HEX. HEAD BOLT	8	UP TO S/N3656070
	0030014000	HEX. NUT	8	UP TO S/N3656070
	0040014000	LOCK WASHER	8	UP TO S/N3656070
	0041214000	PLAIN WASHER	16	UP TO S/N3656070
22	0010124040	HEX. HEAD BOLT	8	S/N3656071~
	0030014000	HEX. NUT	1	S/N3656071~
	0040014000	LOCK WASHER	8	S/N3656071~
	0041214000	PLAIN WASHER	9	S/N3656071~
23	0010112030	HEX. HEAD BOLT	10	
	0040012000	LOCK WASHER	10	
	0041212000	PLAIN WASHER	10	
24	7455141122	REAR FRAME	1	UP TO S/N3656070
	B4444000102	REAR FRAME	1	S/N3656071 TO 3700637
	B4444000112	REAR FRAME	1	S/N3700638~
	7455109603	ACOUSTIC SHEET	1	
25	0017108020	HEX. HEAD BOLT	4	
26	7455155003	COVER, REAR FRAME	1	UP TO S/N3656070
	B4444300203	COVER, REAR FRAME	1	S/N3656071~
	7455109713	ACOUSTIC SHEET	1	

DCA-60SSI2 --- ENCLOSURE ASSY.

ENCLOSURE ASSY.



UP TO S/N3656070

ADD THE FOLLOWING DIGITS AFTER THE PART NUMBER
WHEN ORDERING ANY PAINTED PANEL TO
INDICATE COLOR OF UNIT:

1-ORANGE	5-BLACK
2-WHITE	6-CATERPILLAR YELLOW
3-SPECTRUM GRAY	7-CATO GOLD
4-SUNBELT GREEN	8-RED

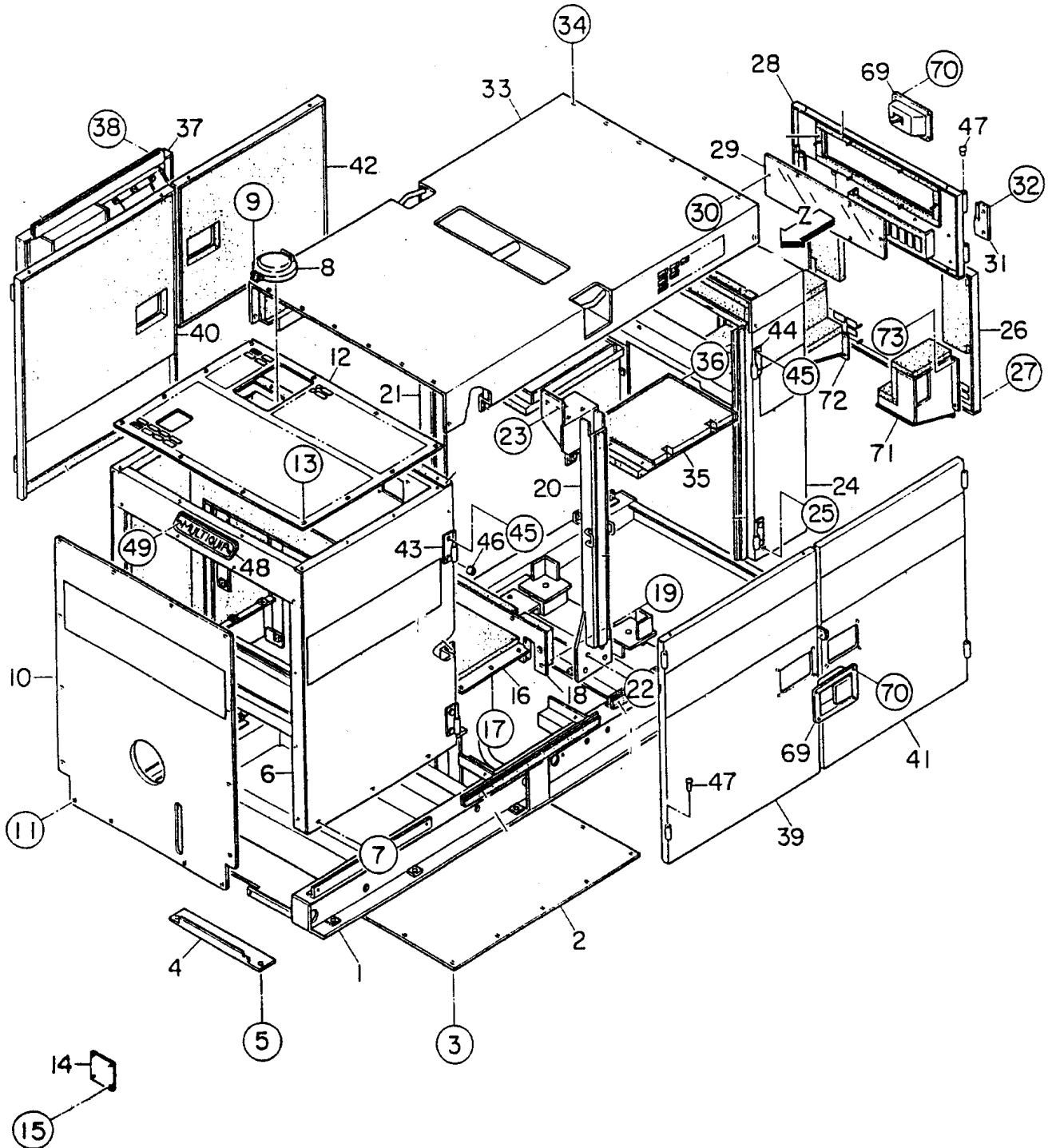
THE SERIAL NUMBER MAY BE REQUIRED.

ENCLOSURE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
27	0010108040	HEX. HEAD BOLT	8	
	0040008000	LOCK WASHER	8	
	0041208000	PLAIN WASHER	8	
28	7455143113	DOOR, REAR FRAME	1	UP TO S/N3656070
	B4444200203	DOOR, REAR FRAME	1	S/N3656071 TO 3700637
	B4444200213	DOOR, REAR FRAME	1	S/N3700638~
29	3805147104	WINDOW PLATE	1	
30	0021006020	MACHINE SCREW	6	
	0030006000	HEX. NUT	6	
	0040006000	LOCK WASHER	6	
	0041206000	PLAIN WASHER	6	
31	0845028303	HINGE	2	UP TO S/N3656070
	0845047204	HINGE	2	S/N656071~
32	0017108025	HEX. HEAD BOLT	4	
33	7455161012	ROOF PANEL	1	
	7455109803	ACOUSTIC SHEET	1	
34	0017108020	HEX. HEAD BOLT	16	
35	7455165004	GUIDE PANEL, AIR	2	
	7455109904	ACOUSTIC SHEET	2	
36	0017108020	HEX. HEAD BOLT	8	
37	8085181202	SPLASHER PANEL	1	UP TO S/N3627236
	8085181212	SPLASHER PANEL	1	S/N3627237 TO 3700637
	8085181222	SPLASHER PANEL	1	S/N3700638~
38	0010108055	HEX. HEAD BOLT	6	
	0040008000	LOCK WASHER	6	
	0041208000	PLAIN WASHER	6	
39	7455171413	SIDE DOOR	1	UP TO S/N3656070
	B4454000703	SIDE DOOR	1	S/N3656071 TO 3700637
	B4454000713	SIDE DOOR	1	S/N3700638~
	7455105104	ACOUSTIC SHEET	1	UP TO S/N3656070
	B4494100104	ACOUSTIC SHEET	1	S/N3656071~
40	7455171513	SIDE DOOR	1	UP TO S/N3656070
	B4454000803	SIDE DOOR	1	S/N3656071 TO 3700637
	B4454000813	SIDE DOOR	1	S/N3700638~
	7455105204	ACOUSTIC SHEET	1	UP TO S/N3656070
	B4494100204	ACOUSTIC SHEET	1	S/N3656071~
41	7455171613	SIDE DOOR	1	UP TO S/N3656070
	B4454000903	SIDE DOOR	1	S/N3656071 TO 3700637
	B4454000913	SIDE DOOR	1	S/N3700638~
	7455105304	ACOUSTIC SHEET	1	UP TO S/N3656070
	B4494300204	ACOUSTIC SHEET	1	S/N3656071~
42	7455171723	SIDE DOOR	1	UP TO S/N3656070
	B4454001003	SIDE DOOR	1	S/N3656071 TO 3700637
	B4454001013	SIDE DOOR	1	S/N3700638~
	7455105414	ACOUSTIC SHEET	1	UP TO S/N3656070
	B4494300304	ACOUSTIC SHEET	1	S/N3656071~

DCA-60SSI2 --- ENCLOSURE ASSY.

ENCLOSURE ASSY.



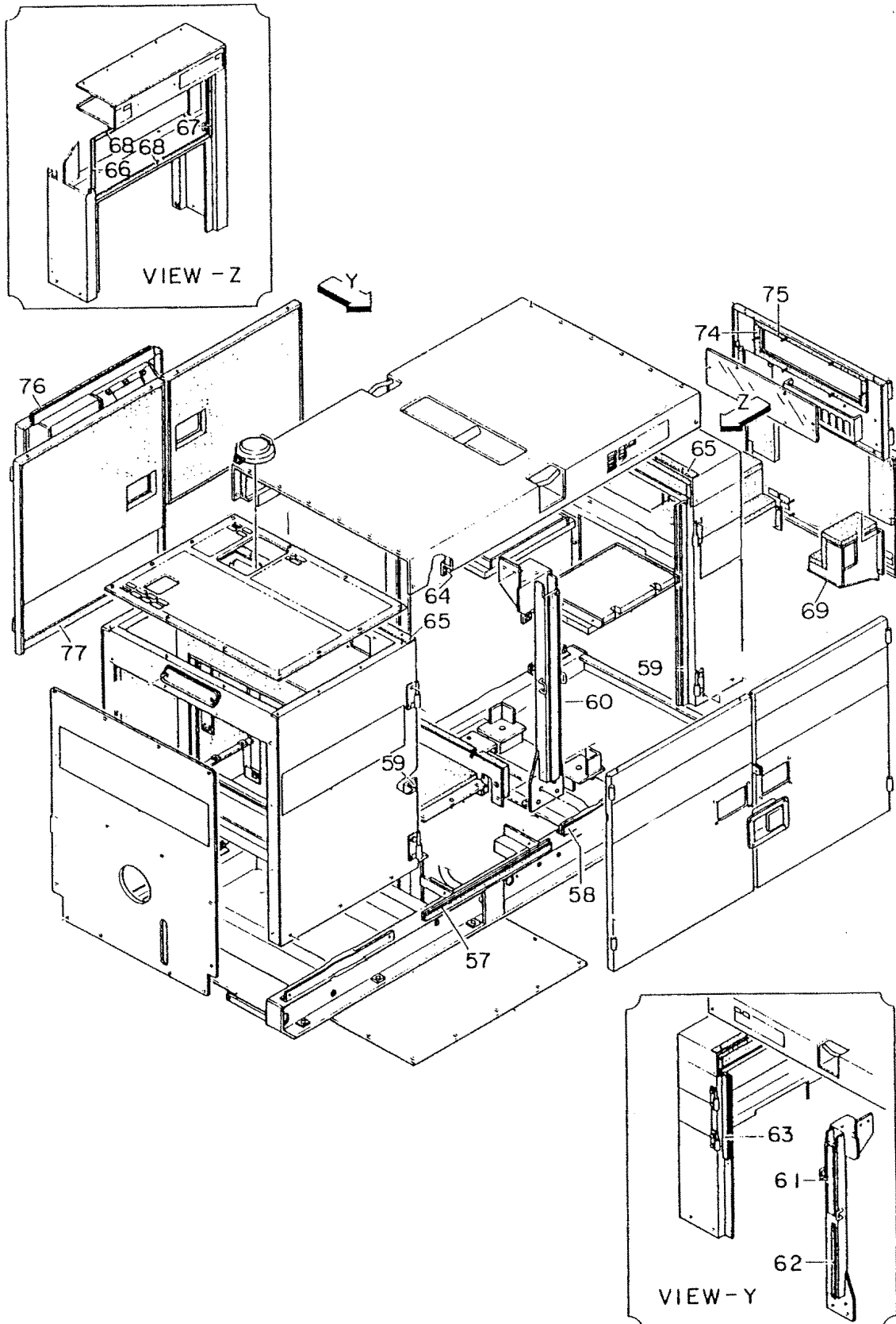
UP TO S/N3656070

ENCLOSURE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
43	0845028203	HINGE	4	UP TO S/N3656070
	0845046904	HINGE	4	S/N3656071~
44	0845028304	HINGE	4	UP TO S/N3656070
	0845047004	HINGE	4	S/N3656071~
45	0017108025	HEX. HEAD BOLT	16	
	0601850097	RUBBER CUSHION	8	
47	0845031504	CAP	10	
48	6360510003	EMBLEM	2	UP TO S/N3660480
	0600500090	EMBLEM	2	S/N3660481~
49	0021106020	MACHINE SCREW	4	
69	0825007362	DOOR HANDLE	5	S/N3656071~
70	0221806015	MACHINE SCREW	20	S/N3656071~
71	B4444800004	DUCT	1	S/N3656071~
	7455109713	ACOUSTIC SHEET	1	
72	B4444800104	DUCT	1	S/N3656071~
	7455109713	ACOUSTIC SHEET	1	
73	0207006000	HEX. NUT	10	S/N3656071~

DCA-60SSI2 --- RUBBER SEAL ASSY.

RUBBER SEAL ASSY.



DCA-60SSI2 --- RUBBER SEAL ASSY.

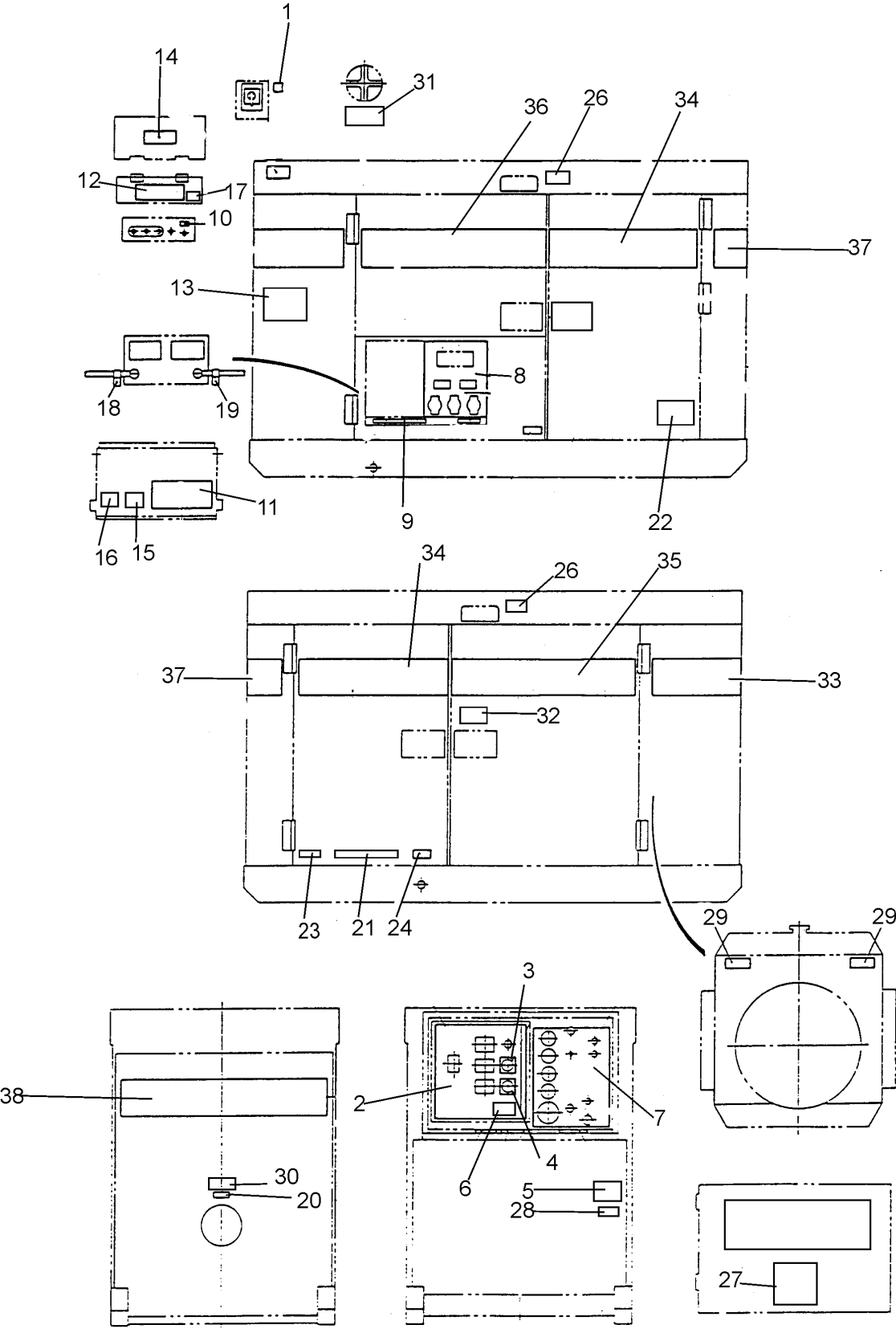
RUBBER SEAL ASSY. UP TO S/N3656070

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
57	7455104104	RUBBER SEAL	2	
58	7455104204	RUBBER SEAL	2	
59	7455104304	RUBBER SEAL	3	
60	7455104404	RUBBER SEAL	1	
61	7455104514	RUBBER SEAL	1	
62	7455104614	RUBBER SEAL	1	
63	7455104714	RUBBER SEAL	1	
64	7455104804	RUBBER SEAL	2	
65	7455104904	RUBBER SEAL	2	
66	0225100365	RUBBER SEAL	1	
67	0220100365	RUBBER SEAL	1	
68	0220200750	RUBBER SEAL	2	

RUBBER SEAL ASSY. S/N3656071~

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
57	0229200668	RUBBER SEAL	2	
58	0228900665	RUBBER SEAL	1	
59	0228900890	RUBBER SEAL	3	
60	0228900890	RUBBER SEAL	1	
61	0228900555	RUBBER SEAL	1	
62	0228800335	RUBBER SEAL	1	
63	0228900555	RUBBER SEAL	1	
64	0228901465	RUBBER SEAL	1	
65	0229200900	RUBBER SEAL	2	
66	0228800365	RUBBER SEAL	1	
67	0228800325	RUBBER SEAL	1	
68	0228800780	RUBBER SEAL	2	
74	0278100120	RUBBER SEAL	2	..... SN3700638~
75	0228100560	RUBBER SEAL	1	..... S/N3700638~
76	0228900670	RUBBER SEAL	2	..... S/N3700638~

DECAL ASSY.

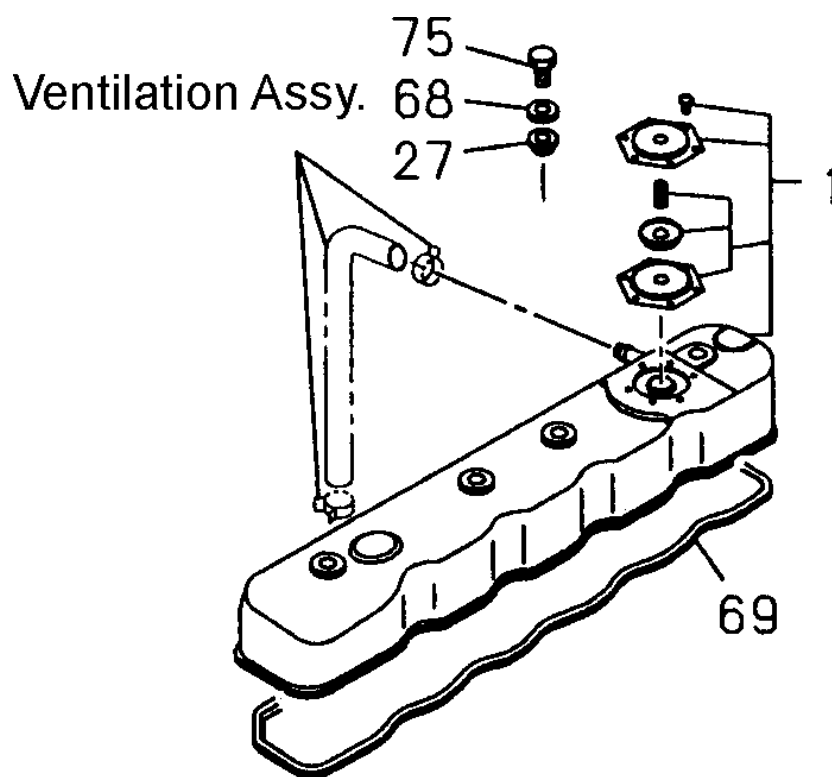


DECAL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>ITEM</u>	<u>QTY.</u>	<u>REMARKS</u>
1	B9521100504	DECAL; CAUTION	1	B92110050
2	B4551005902	DECAL; CONTROL PANEL	1	B45100590
3	0800520904	PLATE; AMMETER CHANGE-OVER SWITCH	1	N2438
4	0800520804	PLATE; VOLTAGE CHANGE-OVER SWITCH	1	N2439
5	B9521100404	DECAL; SAFETY INSTRUCTION	1	B92110040
6	B9531100604	DECAL; WARNING	1	B93110060
7	3340670002	DECAL; OPERATING PANEL	1	S2361A
8	8050670113	DECAL; RECEPTABLE & CIRCUIT BREAKER	1	S3349A
9	B1551001604	DECAL; NOTE	1	B15100160
10	0840614104	DECAL; GROUND MARK	1	S2635
11	0840619904	DECAL; CAUTION	1	S2731
12	0840627103	DECAL; CABLE JOINING	1	S3245
13	8080670514	DECAL; CAUTION	1	S3696B
14	B9531100604	DECAL; WARNING ELECTRIC SHOCK HAZARD ...	1	B93110060
15	B9511100404	DECAL; WARNING ELECTRIC SHOCK HAZARD ...	1	B91110040
16	B9531100504	DECAL; WARNING ELECTRIC SHOCK HAZARD ...	1	B93110050
17	B9511100304	DECAL; WARNING	1	B91110030
18	0800689404	DECAL; +	1	S2090
19	0800689504	DECAL; -	1	S2091
20	1320620904	DECAL; DIESEL FUEL	1	S1756
21	1320610603	DECAL; WATER, OIL	1	S1760
22	6360610304	DECAL; WATER	1	S1880
23	6360620004	DECAL; FUEL DRAIN PLUG	1	S1883
24	6360620204	DECAL; OIL DRAIN PLUG	1	S1885
25	0840627304	DECAL; WARNING	1	S3247
26	1320621504	DECAL; SUPPORT HOOK	2	S2257
27	0840625902	DECAL; MQ	1	S3057
28	B9504200004	DECAL; WARNING ENGINE EXHAUST	1	B90420000
29	B9504000404	DECAL; WARNING MOVING PARTS	2	M90400040
30	B9504500004	DECAL; WARNING DIESEL FUEL	1	B90450000
31	B9504100104	DECAL; WARNING HOT COOLANT	1	B90410010
32	B9504000304	DECAL; CAUTION HOT PARTS	1	B90400030
33	7450630703	STRIPE	1	REPLACES B4561100103
34	7450631104	STRIPE	2	UP TO S/N3656070
	B4561100403	STRIPE	2	S/N3656071~
35	7450631304	STRIPE, LEFT SIDE	1	UP TO S/N3656070
	B4561100503	STRIPE	1	S/N3656071~
36	7450631504	STRIPE, RIGHT SIDE	1	UP TO SN3656070
	B4561100604	STRIPE	1	S/N3656071~
37	7450630904	STRIPE	2	UP TO S/N3656070
	B4561100304	STRIPE	2	S/N3656071~
38	7450630303	STRIPE	1	UP TO S/N3656070
	B4561100003	STRIPE	1	S/N3656071~
50	7450630303	STRIPE	1	UP TO S/N3656070

ISUZU 6BG1 — CYLINDER HEAD COVER ASSY.

CYLINDER HEAD COVER ASSY.



ISUZU 6BG1 — CYLINDER HEAD COVER ASSY.

CYLINDER HEAD COVER ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1111803500	CYLINDER HEAD COVER	1	
27	9111790300	GASKET	4	
68	9111791050	CAP NUT WASHER	4	
69	1111730550	GASKET	1	
75	8943401920	NUT	4	

ISUZU 6BG1 — CYLINDER HEAD ASSY.

CYLINDER HEAD ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1111106142	CYLINDER HEAD ASSY.	1	INCL. ITEMS W/*
2	1111411960	GASKET	1	
4*	5117210010	VALVE GUIDE	12	
5A*	1117150540	INLET SEAT	6	
5B*	1117110430	EXHAUST SEAT	6	
7A*	1096000051	SEALING CUP, OD=45	1	
7B*	9111291280	SEALING CUP, OD=20	3	
7C*	5112190150	SEALING CUP, OD=32	3	
7D*	5096000130	SEALING CUP, OD=12.3	6	
7E*	1096000160	SEALING CUP, OD=25	5	
7F	9111296010	SEALING CUP, OD=12.5	5	
9	9041108250	STUD, M8X25 L=37	3	
10	1825130430	GLOW PLUG	6	REPLACES 9825139289
11A	5197320011	CONNECTOR, L=236	1	
11B	5197320021	CONNECTOR, L=354	1	
12	9117776221	HANGER	1	
14	9096300260	STUD, M8X86 L=99	12	
41A	0286810200	BOLT, M10X20 FLANGE	3	
41B	0208014250	BOLT, M14X25	1	
54	9098301630	STUD, M8X83 L=96	4	
56	1093000180	STUD, M8X40 L=58	12	
81*	9096600340	PLUG, OD=11.9	6	
112	9099167550	CLIP	1	
113	0280806100	BOLT, M6X10 FLANGE	1	
117	9091505140	WASHER	1	
120A	1090701010	BOLT, M12X113	20	
120B	1090701000	BOLT, M12X100	6	
168	5117770551	HANGER	1	

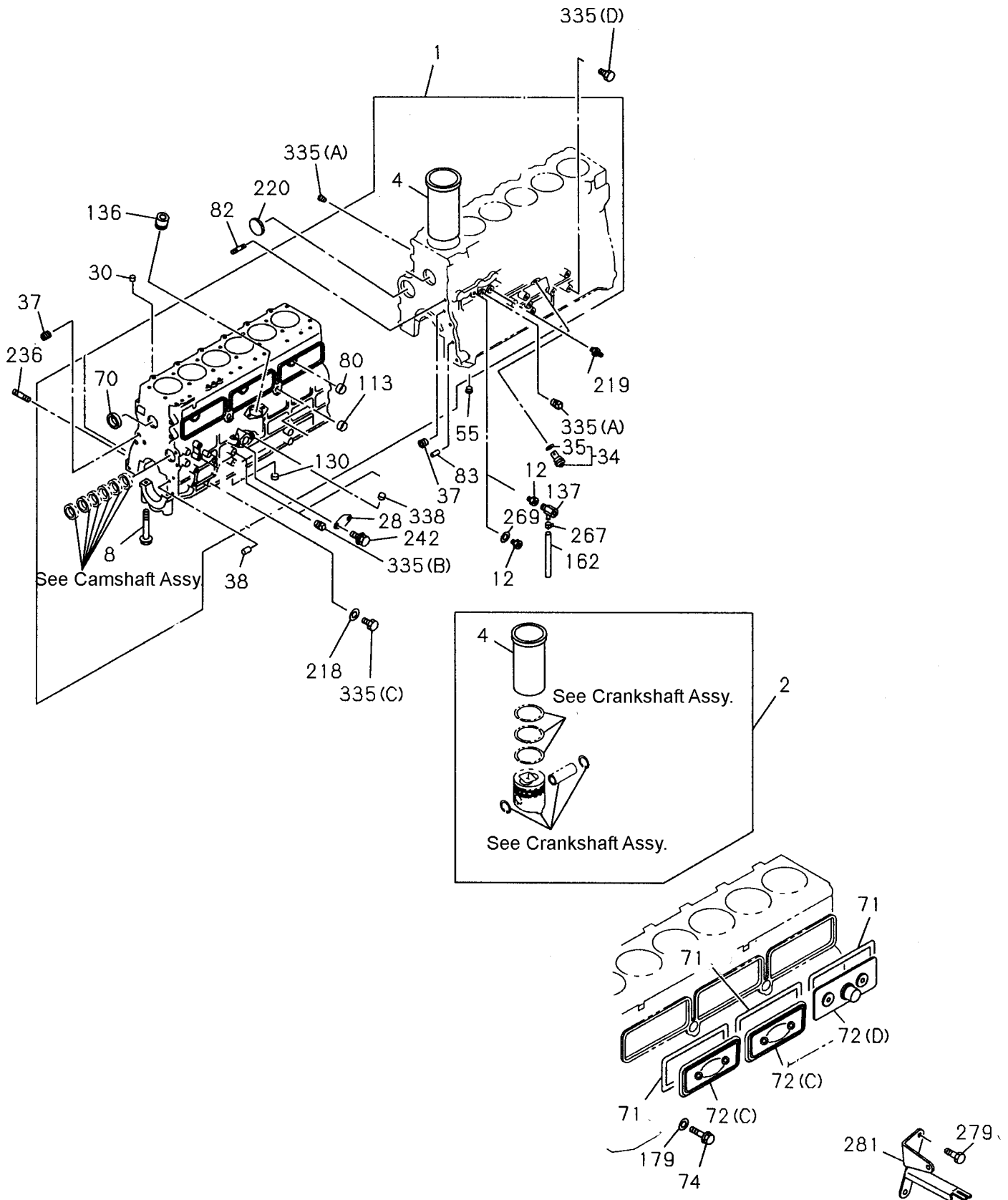
ISUZU 6BG1 — CYLINDER BLOCK ASSY.

CYLINDER BLOCK ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1112103408	CYLINDER BLOCK	1	INCL. ITEMS W/*
2	1878116900	LINER, GRADE=1	6	UP TO DEC. 98; INCL. ITEMS W/#
	1878119420	LINER, GRADE=1	6	FROM JAN. 99~
	1878116910	LINER, GRADE=2	6	UP TO DEC. 98
	1878119430	LINER, GRADE=2	6	FROM JAN. 99~
	1878116920	LINER, GRADE=3	6	UP TO DEC. 98
	1878119440	LINER, GRADE=3	6	FROM JAN. 99~
	1878116930	LINER, GRADE=4	6	UP TO DEC. 98
	1878119450	LINER, GRADE=4	6	FROM JAN. 99~
4*#	1112612480	LINER, OD GRD=1 ID GRD=AX	6	UP TO DEC. 98
	1112613820	LINER, OD GRD=1 ID GRD=AX	6	FROM JAN. 99~
	1112612490	LINER, OD GRD=1 ID GRD=CX	6	UP TO DEC. 98
	1112613830	LINER, OD GRD=1 ID GRD=CX	6	FROM JAN. 99~
	1112612500	LINER, OD GRD=2 ID GRD=AX	6	UP TO DEC. 98
	1112613840	LINER, OD GRD=2 ID GRD=AX	6	FROM JAN. 99~
	1112612510	LINER, OD GRD=2 ID GRD=CX	6	UP TO DEC. 98
	1112613850	LINER, OD GRD=2 ID GRD=CX	6	FROM JAN. 99~
	1112612520	LINER, OD GRD=3 ID GRD=AX	6	UP TO DEC. 98
	1112613860	LINER, OD GRD=3 ID GRD=AX	6	FROM JAN. 99~
	1112612530	LINER, OD GRD=3 ID GRD=CX	6	UP TO DEC. 98
	1112613870	LINER, OD GRD=3 ID GRD=CX	6	FROM JAN. 99~
	1112612540	LINER, OD GRD=4 ID GRD=AX	6	UP TO DEC. 98
	1112613880	LINER, OD GRD=4 ID GRD=AX	6	FROM JAN. 99~
	1112612550	LINER, OD GRD=4 ID GRD=CX	6	UP TO DEC. 98
	1112613890	LINER, OD GRD=4 ID GRD=CX	6	FROM JAN. 99~
8*	1090004691	BOLT, M16X119	14	
12	1096660360	CONNECTOR	1	
28	1112191630	COVER	1	
30	8941480790	PIN, OD=16	2	
34	8970233390	VALVE	1	
35	5096230350	GASKET	1	
37	1096050681	PLUG	2	
38	1097400780	PIN, OD=10 L=50	1	
55	1096050660	PLUG, PT 3/8 T=8.0	1	
70*	1096000520	SEALING CUP, OD=60	2	
71	8943673681	GASKET	3	
72C	8970285250	COVER	2	
72D	9112916051	COVER	1	
74	8943675301	BOLT, M8X56 FLANGE	6	
80*	1096000121	CUP, OD=32	3	
82	5093000231	STUD, M14X44 L=65	1	
83	9081510180	PIN, OD=10 L=18	2	

ISUZU 6BG1 — CYLINDER BLOCK ASSY.

CYLINDER BLOCK ASSY.



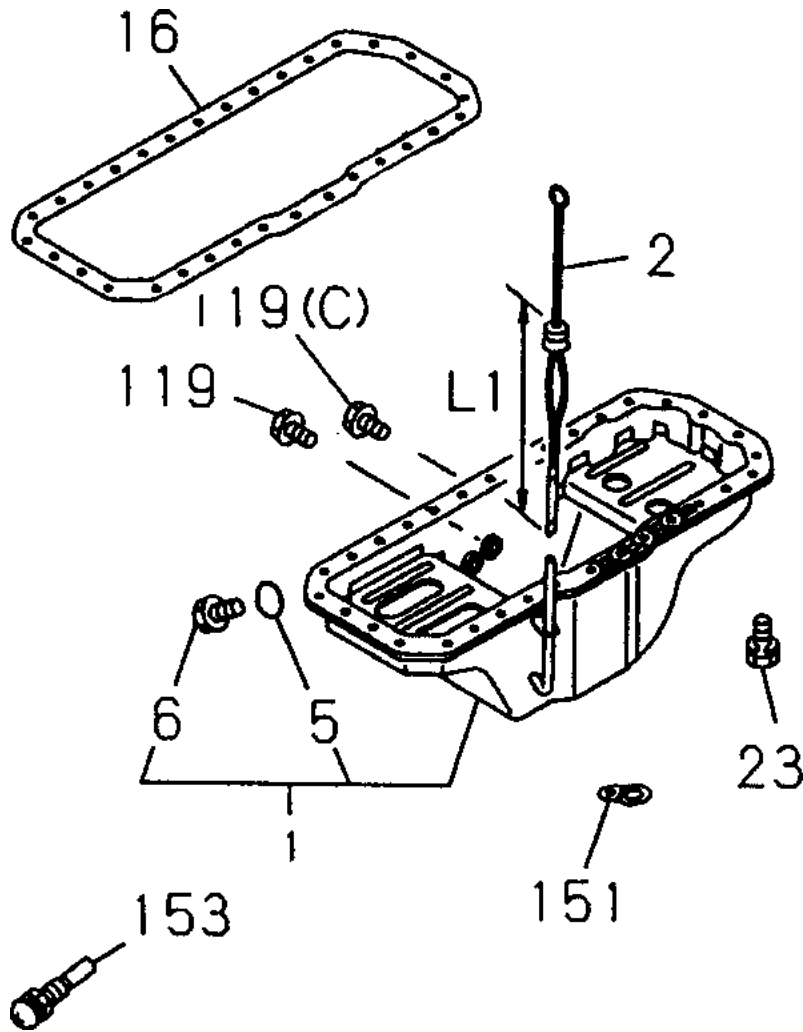
ISUZU 6BG1 — CYLINDER BLOCK ASSY.

CYLINDER BLOCK ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
113*	5112190140	CUP, OD=28	2	
130*	5112570011	DOWEL	1	
136	9112246021	BUSHING	1	
137	1096800240	DRAIN COCK	1	
162	9099147010	HOSE, L=900 S.B. L=10000	1	
179	9095720080	GASKET	6	
218	9095714120	GASKET	1	..... UP TO MAR. 98
	9095720140	GASKET	1	..... FROM APR. 98~
219	5096540130	NIPPLE	1	
220	9098600190	PLUG	1	
236	1093000530	STUD, M10X18.5 L=33	1	
242	0286808200	BOLT, M8X20 FLANGE	2	
267	8970157540	CLIP	1	
269	1096301150	GASKET	1	
279	0286810200	BOLT, M10X20 FLANGE	2	
281	5197890030	BRACKET	1	
335A	5096050180	PLUG, RIGHT SIDE	8	
335B	1096050791	PLUG, LEFT SIDE	1	
335C	9992023140	PLUG, LEFT SIDE	1	
335D	9992023120	PLUG, RIGHT SIDE	1	
338	5111290030	SEALING CUP, OD=15.6	1	

ISUZU 6BG1 — OIL PAN AND LEVEL GAUGE ASSY.

OIL PAN AND LEVEL GAUGE ASSY.



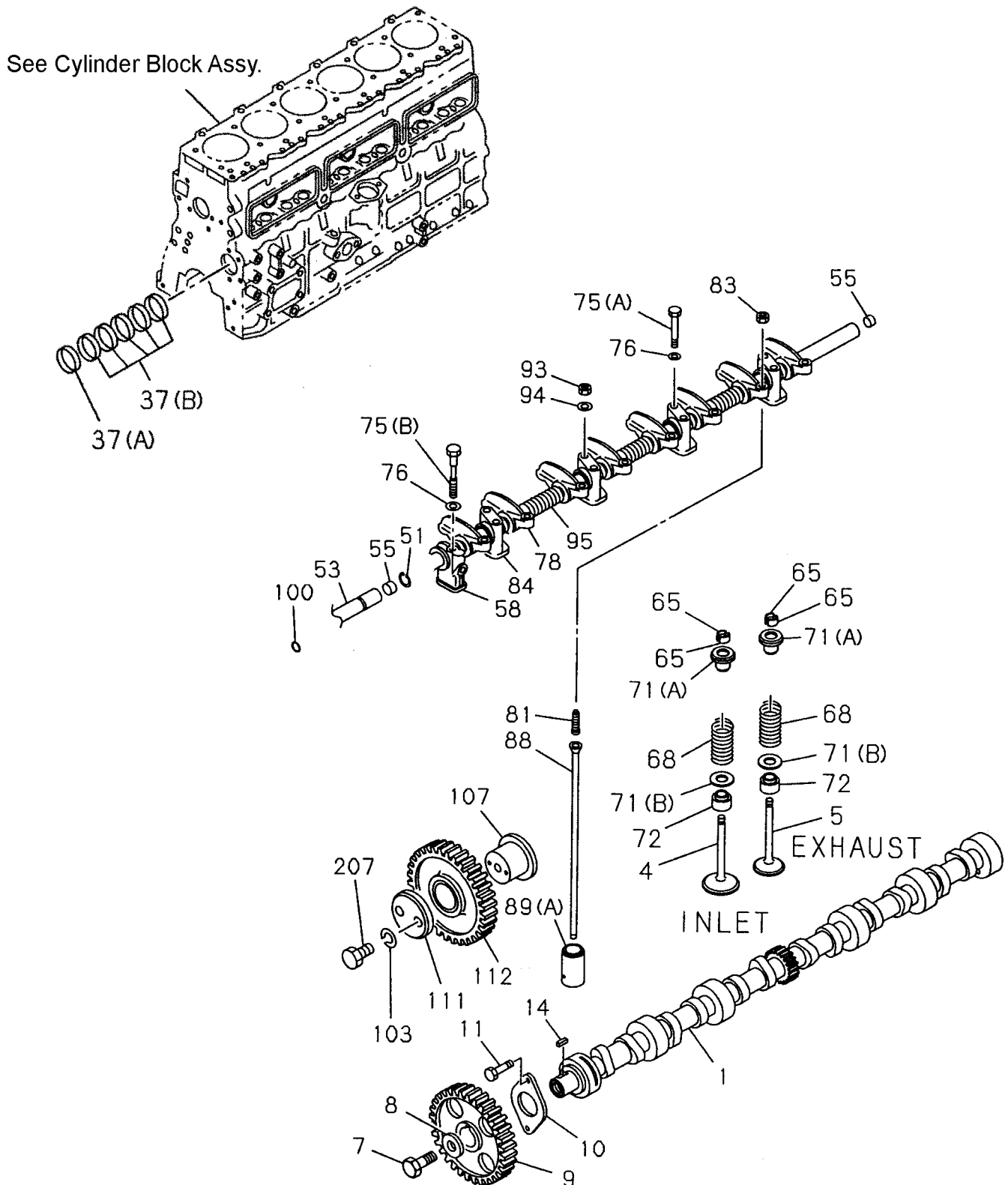
ISUZU 6BG1 — OIL PAN AND LEVEL GAUGE ASSY.

OIL PAN AND LEVEL GAUGE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1113604421	OIL PAN ASSY.	1	INCL. ITEMS W/*
2	1117602000	GAUGE	1	
5*	1096230570	GASKET	1	
6*	9096620120	PLUG	1	
16	1113671000	GASKET	1	
23	0500408180	BOLT, M8X12 W/LOCK WASHER	32	
119C	9992023240	PLUG, M24X12	1	
	9992023160	PLUG; M16X12	1	
120	9095714240	GASKET, ID=24.5	1	
	9095714160	GASKET, ID=16.5	1	
151	9112290700	CLIP	1	
153	9831514320	THERMOMETER	1	

ISUZU 6BG1 — CAMSHAFT AND VALVE ASSY.

CAMSHAFT AND VALVE ASSY.



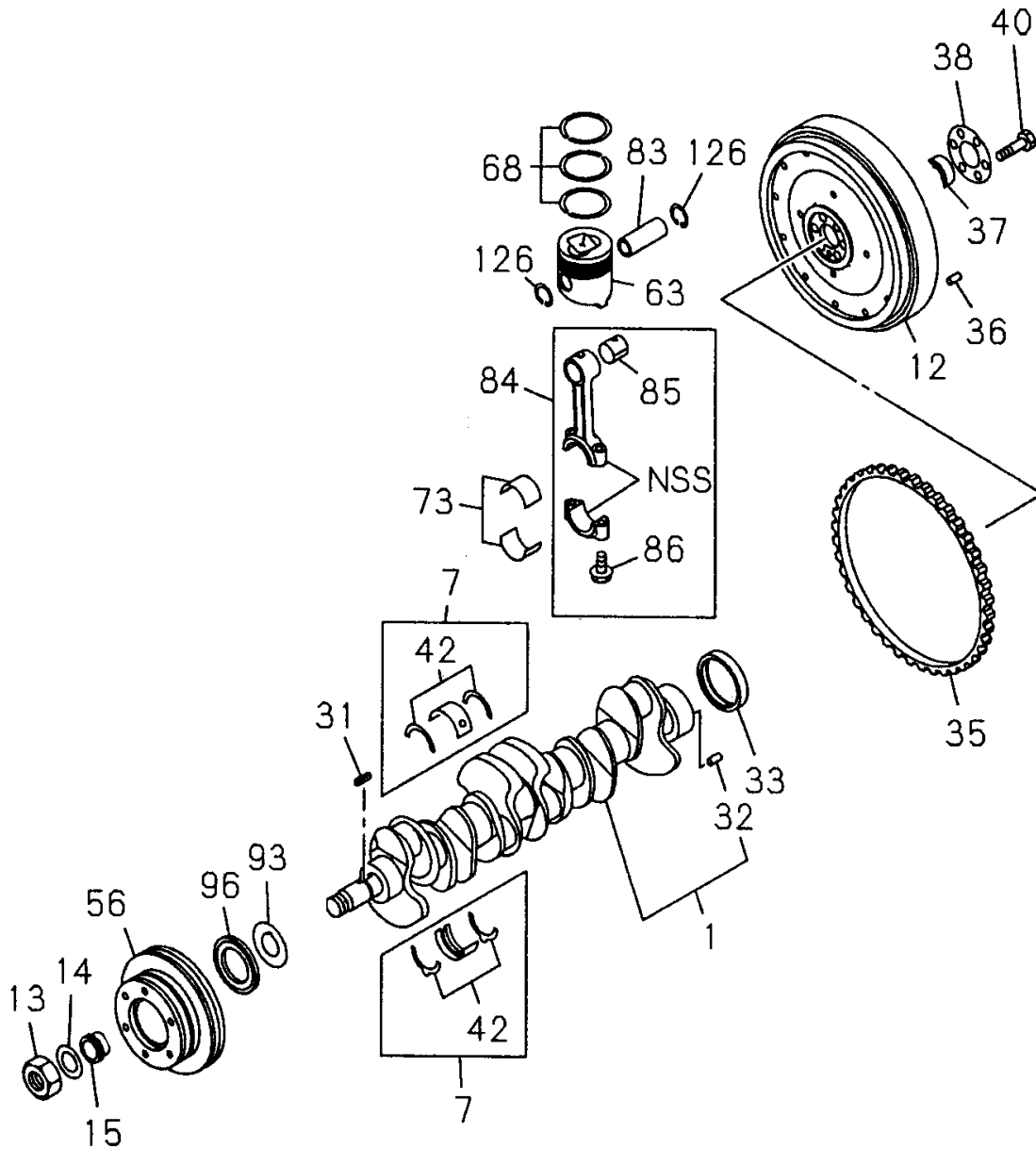
ISUZU 6BG1 — CAMSHAFT AND VALVE ASSY.

CAMSHAFT AND VALVE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1125140050	CAMSHAFT	1	
4	1125510830	VALVE, INLET	6	
5	1125520251	VALVE, EXHAUST	6	
7	9920614280	BOLT, M14X28	1	
8	9098518503	WASHER, ID=14.5	1	
9	1125220162	GEAR, Z=50	1	
10	9116810150	THRUST PLATE	1	
11	0500408250	BOLT, M8X25 W/LOCK WASHER	2	
14	9080307130	KEY	1	
37A	9116110480	METAL	1	
37B	9116130350	METAL	5	
51	9091800190	SNAP RING	1	
53	1126210621	ROCKER ARM SHAFT	1	
55	9126260050	PLUG	2	
58	5126280120	BRACKET	1	
65	5126560060	SPLIT COLLAR	24	
68	1125610990	VALVE SPRING	12	
71A	8941145790	SPRING SEAT	12	
71B	5125630010	SPRING SEAT	12	
72	1125690150	SEAL	12	
75A	1090005670	BOLT, M8X65	8	
75B	9096021480	BOLT, M8X65	1	
76	9098514300	WASHER	9	
78	1126111180	ROCKER ARM	12	
81	9126160420	SCREW	12	
83	9091115080	ADJ. SCREW LOCK NUT	12	
84	9126281050	BRACKET	6	
88	1125750360	PUSH ROD	12	
89	5125710032	TAPPET VALVE	12	
93	1094001160	NUT	4	
94	9095814300	WASHER	4	
95	1095803350	SPRING	5	
100	5096230600	GASKET	1	
103	9091505100	WASHER	2	
107	9125310300	SHAFT	1	
111	5125350011	COLLAR	1	
112	8941339373	GEAR	1	
207	0108110550	BOLT, M10X55	2	

ISUZU 6BG1 — CRANKSHAFT, PISTON AND FLYWHEEL ASSY.

CRANKSHAFT, PISTON AND FLYWHEEL ASSY.



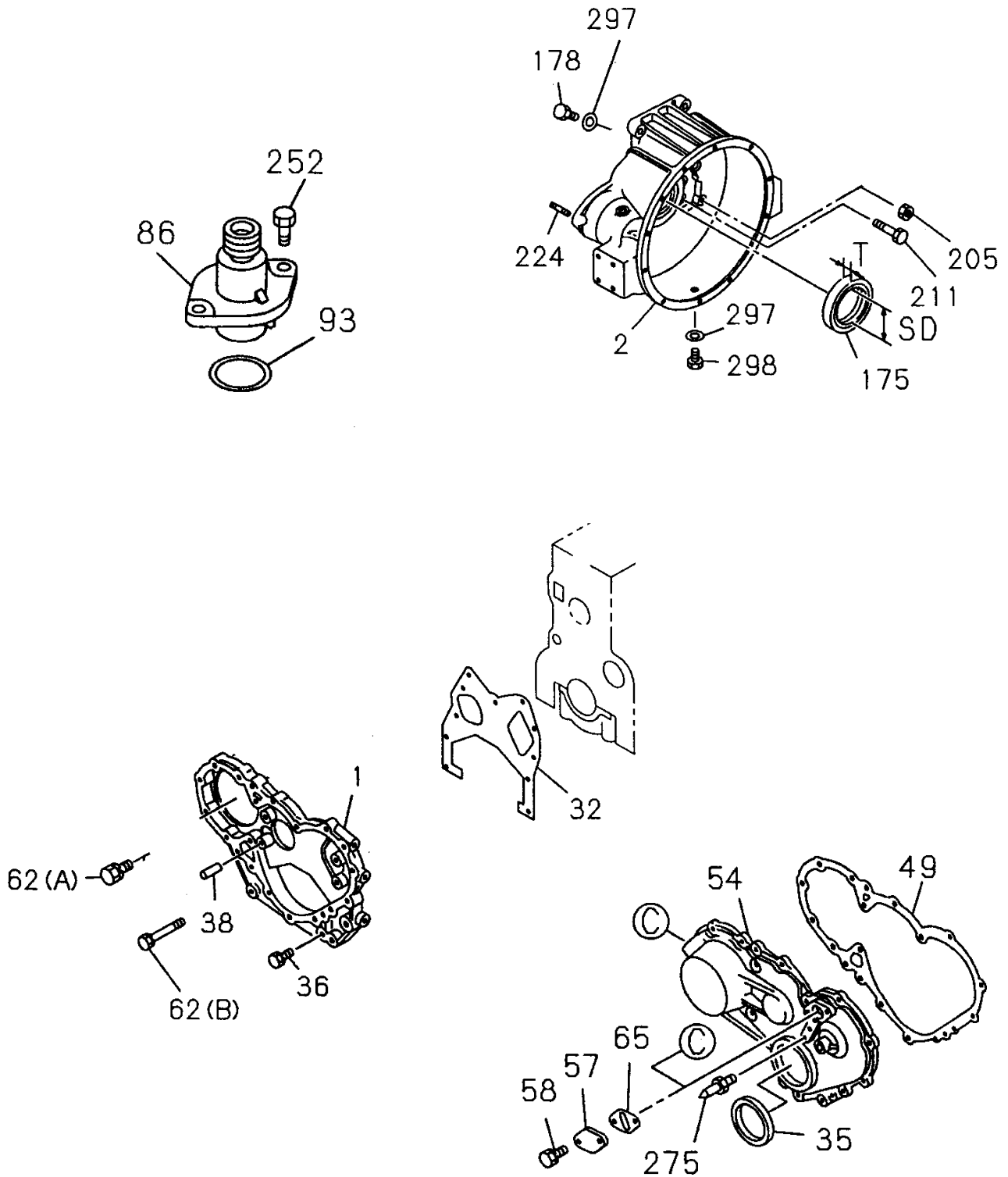
ISUZU 6BG1 — CRANKSHAFT, PISTON AND FLYWHEEL ASSY.

CRANKSHAFT, PISTON AND FLYWHEEL ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1123104480	CRANKSHAFT	1	INCL. ITEMS W/*
7	1115100742	METAL KIT	1	INCL. ITEMS W/#
12	5123310642	FLYWHEEL	1	
13	9098401071	NUT	1	
14	9098514310	WASHER	1	
15	9123790450	BUSHING	1	
28	8971379101	GEAR, Z=25	1	
31	5097380010	FEATHER KEY	1	
32*	9081512200	PIN	1	
33	5123190032	RING	1	
35	9123336070	GEAR, Z=129	1	
37	1098002140	BEARING	1	
38	5123360081	WASHER	1	
40	9098013340	BOLT	6	
42#	1116800012	WASHER	2	
56	5123712092	PULLEY, 2-GROOVE	1	
63	1121117690	PISTON, STD. GRD=AX	6	
	1121117700	PISTON, STD. GRD=CX	6	
68	1121211011	RING SET	6	
73	9122716080	METAL SET	6	
83	9122116040	PISTON PIN	6	
84	1122301041	CONNECTOR ARM ASSY.	6	INCL. ITEMS W/%
85%	1122510270	BUSHING	6	
86%	1122350271	BOLT, M20X49.5	12	
93	1123620031	THROWER	1	
96	5123620031	DUST THROWER	1	
126	8941075751	SNAP RING	12	

ISUZU 6BG1 — TIMING GEAR AND FLYWHEEL HOUSING ASSY.

TIMING GEAR AND FLYWHEEL HOUSING ASSY.



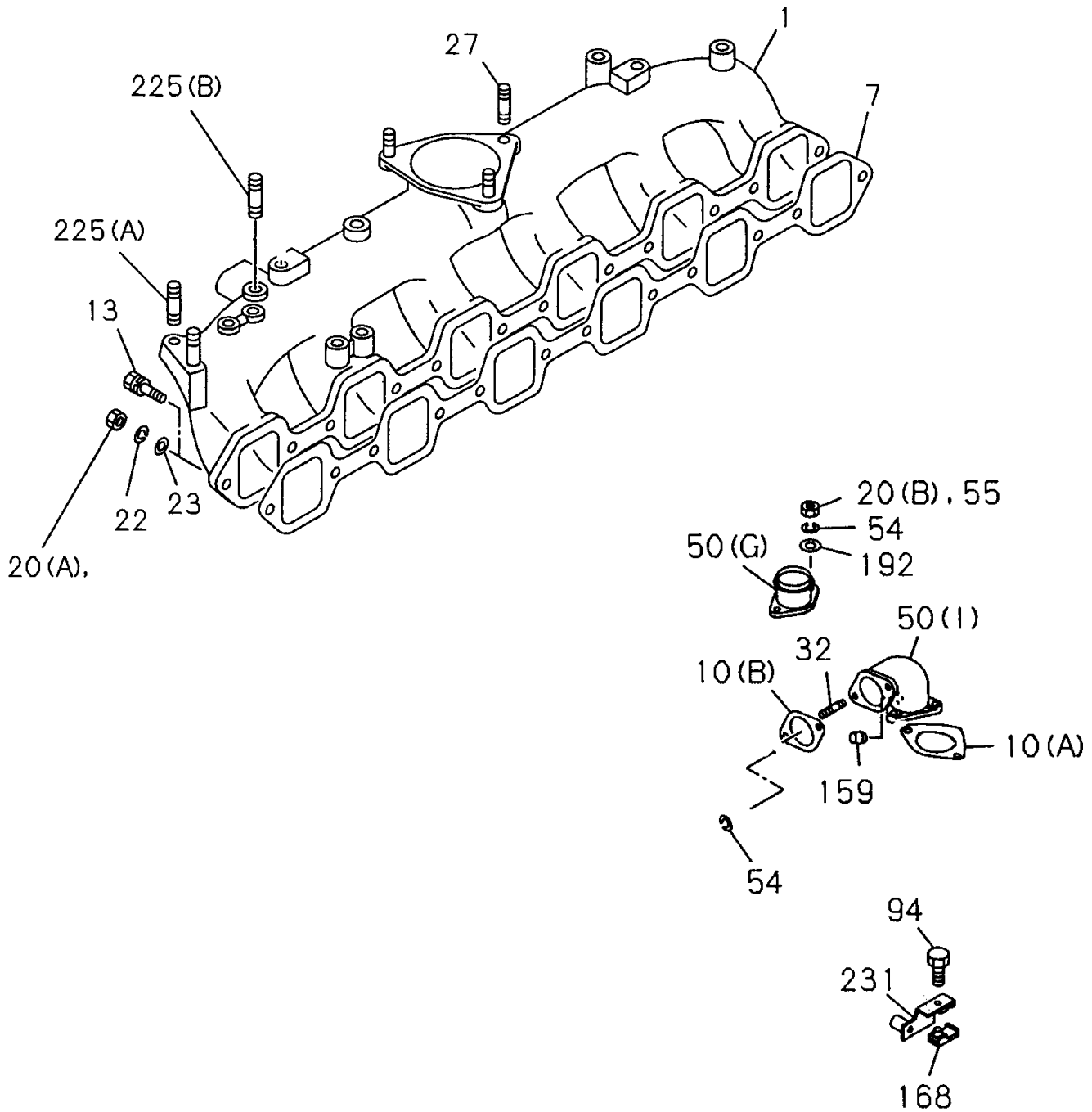
ISUZU 6BG1 — TIMING GEAR AND FLYWHEEL HOUSING ASSY.

TIMING GEAR AND FLYWHEEL HOUSING ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	5113110113	TIMING GEAR CASE	1	
2	8943213304	FLYWHEEL HOUSING	1	
32	8943706710	GASKET	1	
35	1096254380	SEAL	1	
36	0280808450	BOLT, M8X45 FLANGE	2	
	0286808200	BOLT, M8X20 FLANGE	4	
38	9081510180	PIN, OD=10 L=18	1	
49	8970222160	GASKET	1	
54	1113210790	COVER	1	
57	5113210090	TIMING COVER	2	
58	0280806120	BOLT, M6X12 FLANGE	4	
62A	0286808250	BOLT, M8X25 FLANGE	7	
62B	0280808500	BOLT, M8X50 FLANGE	5	
65	8970276011	GASKET	2	
86	9839101012	ELBOW	1	
93	1096234650	GASKET	1	
175	1096254391	SEAL	1	
178	8943218380	PLUG	1	
205	0911602140	NUT	1	
211	0500408250	BOLT, M8X25 W/LOCK WASHER ..	7	REPLACES 0288914450
224	9944112350	STUD, M12X35 L=53	3	
252	0286808200	BOLT, M8X20 FLANGE	2	
275	5113270090	POINTER	1	
297	9095714160	GASKET	1	
298	9992023160	PLUG	1	

ISUZU 6BG1 — INLET MANIFOLD ASSY.

INLET MANIFOLD ASSY.



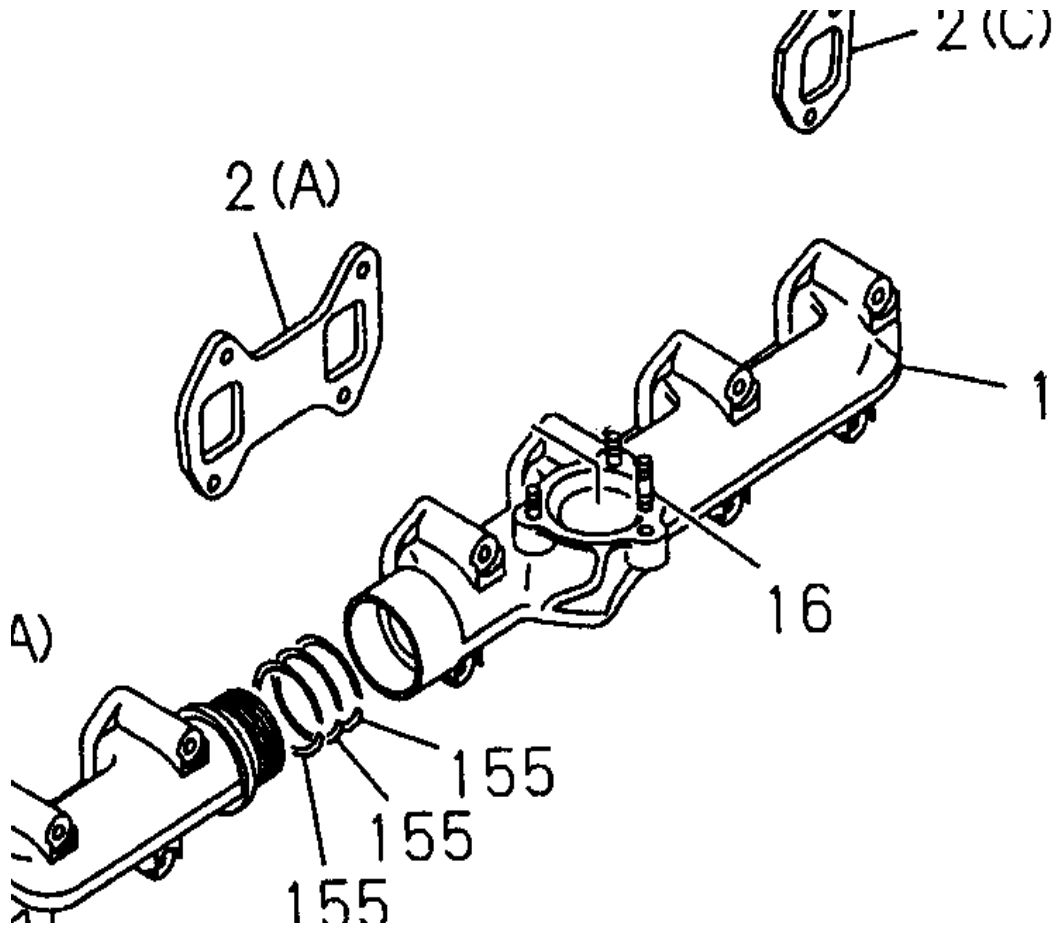
ISUZU 6BG1 — INLET MANIFOLD ASSY.

INLET MANIFOLD ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1141121842	INLET MANIFOLD	1	
7	1141150610	GASKET	1	
10A	1141150590	GASKET	1	
10B	1096370610	GASKET	1	
13	0501408280	BOLT, M8X28	9	..... W/LOCK AND PLAIN WASHER
20A	9091104080	NUT, M8	3	
20B	0911501080	NUT, M8 FLANGE	3	
22	9091505080	LOCK WASHER	3	
23	9091605080	PLAIN WASHER	3	
27	9040108200	STUD, M8X20 L=36	3	
27A	9040108450	STUD, M8X45 L=61	3	
32	9044110250	STUD, M10X25 L=40	2	
50G	1141123150	PIPE	1	
50I	1141126310	PIPE	1	
54	9091505100	LOCK WASHER	2	
55	9091104100	NUT	2	
94	0500406300	BOLT, M6X30	1	..... W/LOCK WASHER
159	8941640270	PIPE	1	
168	1154192151	CLIP	1	
225A	9044110280	STUD, M10X28 L=43	2	
225B	5093000290	STUD, M10X18 L=33	2	
231	1154192162	STAY	1	

ISUZU 6BG1 — EXHAUST MANIFOLD ASSY.

EXHAUST MANIFOLD ASSY.



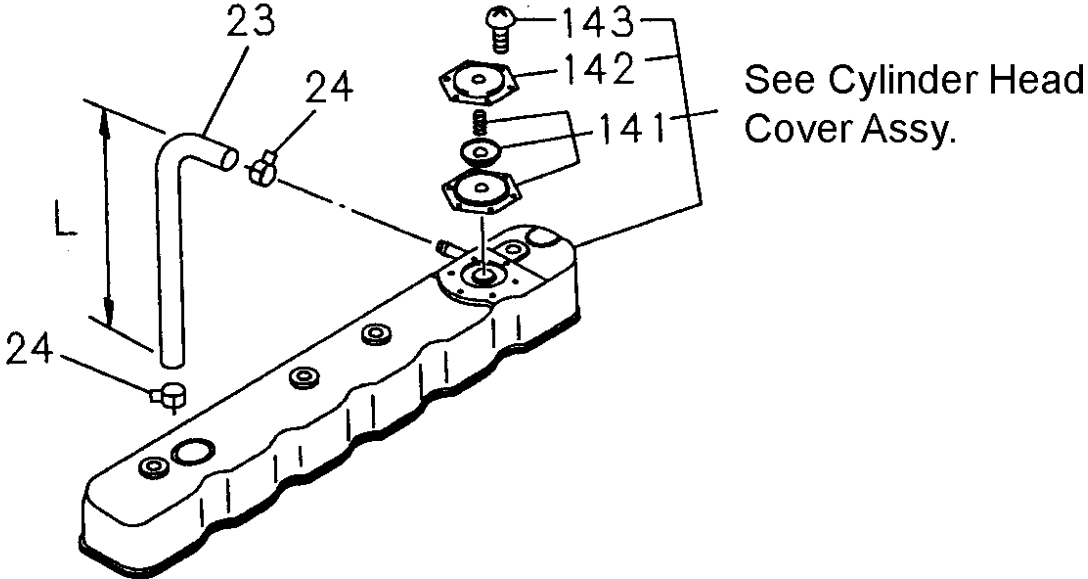
ISUZU 6BG1 — EXHAUST MANIFOLD ASSY.

EXHAUST MANIFOLD ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1A	9141412761	EXHAUST MANIFOLD	1	
1B	9141418030	EXHAUST MANIFOLD	1	
2C	1141451140	GASKET	6	UP TO MAR. 99
2A	8944046100	GASKET	3	FROM APR. 99~
16	9044110300	STUD, M10X30 L=45	3	
18	9098445650	NUT	12	
155	9141496530	RING	3	

ISUZU 6BG1 — VENTILATION ASSY.

VENTILATION ASSY.



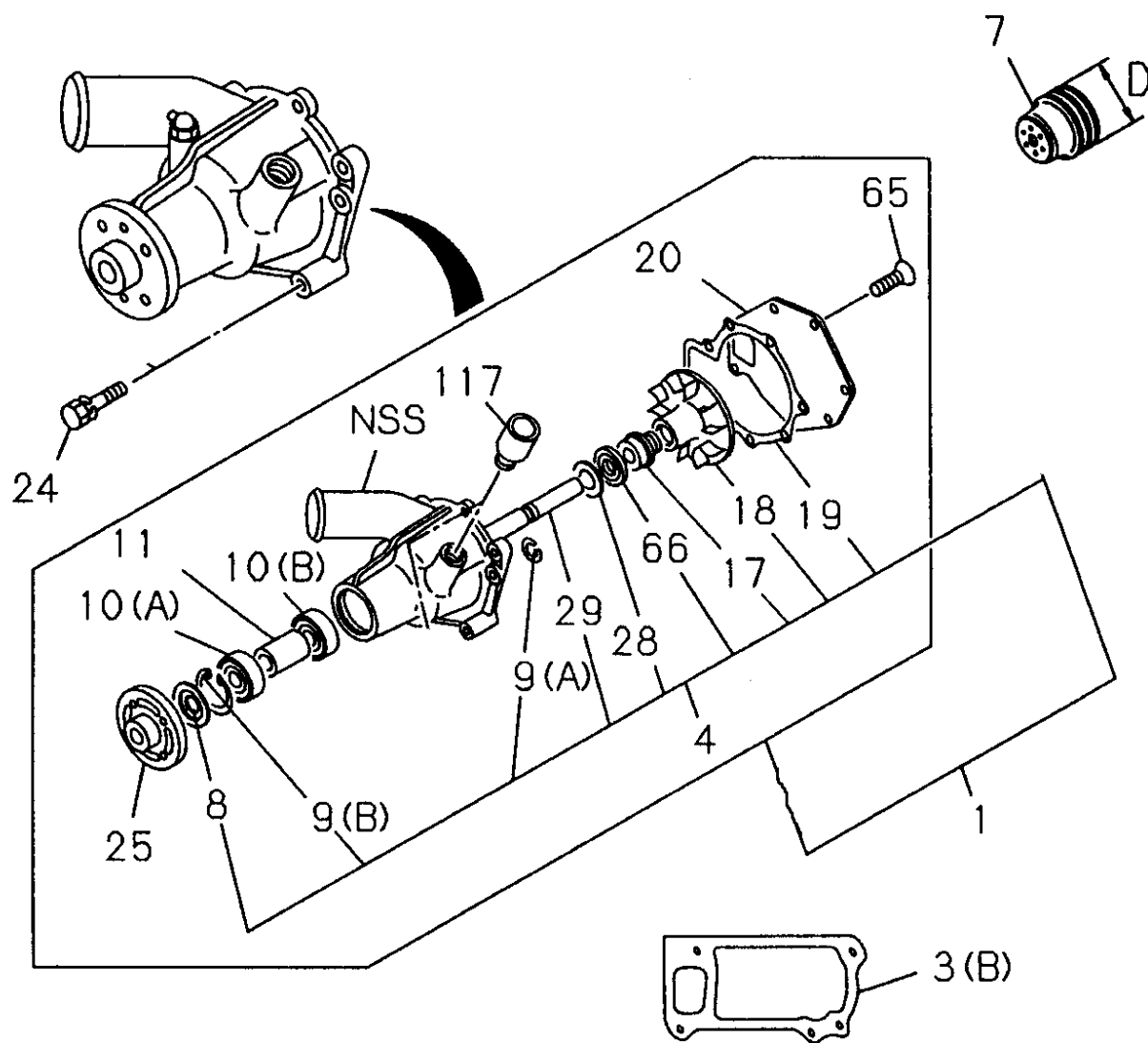
ISUZU 6BG1 — VENTILATION ASSY.

VENTILATION ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
23	1093607520	HOSE, L=240	1	
24	1097070841	CLIP, ID=20	2	
141	8941101110	DIAPHRAGM ASSY.	1	
142	1143620020	COVER	1	
143	9934905100	SCREW, M5X10 PANHEAD	6	

ISUZU 6BG1 — WATER PUMP AND CORROSION RESISTOR ASSY.

WATER PUMP AND CORROSION RESISTOR ASSY.



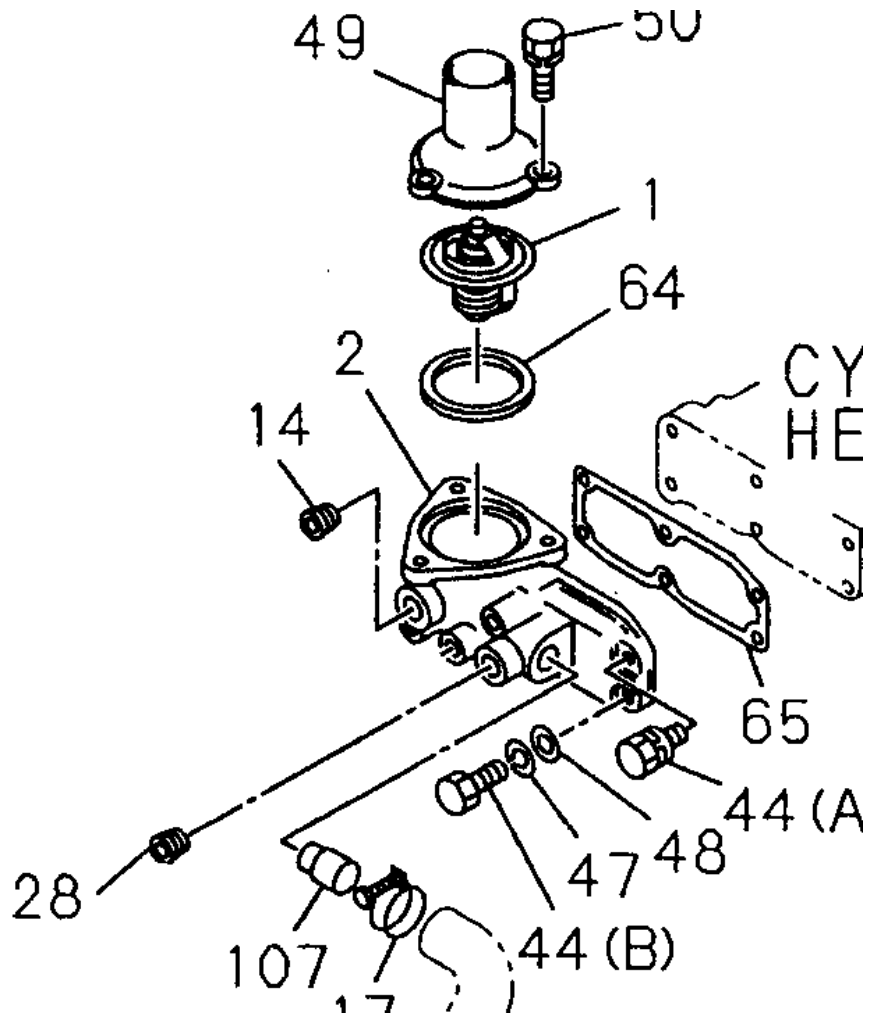
ISUZU 6BG1 — WATER PUMP AND CORROSION RESISTOR ASSY.

WATER PUMP AND CORROSION RESISTOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1136500180	PUMP ASSY	1	INCL. ITEMS W/*
3	8943706610	GASKET	1	
4*	1878112530	REPAIR KIT	1	INCL. ITEMS W/#
7	5136410381	PULLEY, 2-GROOVE, D=173	1	UP TO MAR. 99
	1136411870	PULLEY, 2-GROOVE, D=173	1	FROM APR. 99~
8*#	5136390010	THROWER	1	
9A*#	9099521430	SNAP RING	1	
9B*	9091801520	SNAP RING	1	
10A*	5098000510	BEARING	1	
10B*	5098000500	BEARING	1	
11*	5136340020	SPACER	1	
17*#	5136200062	SEAL UNIT	1	
18*#	9136218020	IMPELLER	1	
19*#	9136136130	GASKET	1	
20*	9136128020	COVER	1	
24*	0280810700	BOLT, M10X70 FLANGE	1	
	0280810500	BOLT, M10X50	2	
	0286810350	BOLT, M10X35	1	
25*	5136420072	CENTER	1	
28*#	1095030700	WASHER	1	
29*#	1136310740	SHAFT	1	
65*	9030908200	SCREW	3	
66*#	5096250550	SEAL	1	
117*	1096601192	CONNECTOR	1	

ISUZU 6BG1 — THERMOSTAT AND HOUSING ASSY.

THERMOSTAT AND HOUSING ASSY.



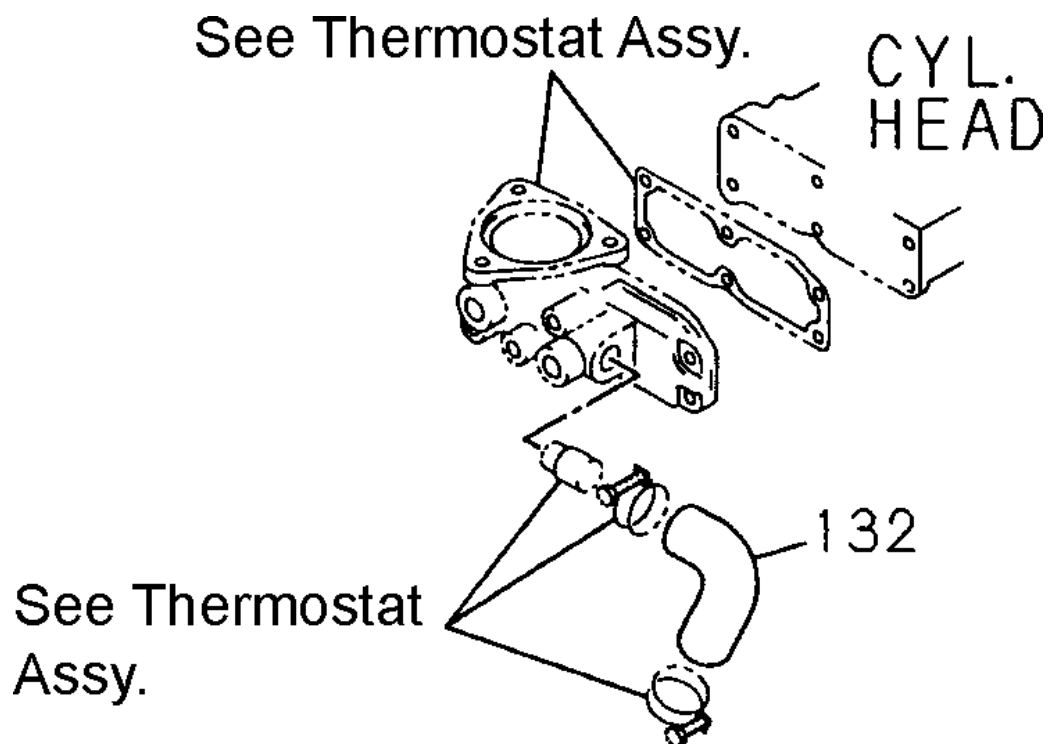
ISUZU 6BG1 — THERMOSTAT AND HOUSING ASSY.

THERMOSTAT AND HOUSING ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1137700700	THERMOSTAT	1	
2	5137160260	HOUSING	1	
14	9096640050	PLUG, PT 3/4	1	
17	5097040460	CLIP	2	
28	9096620340	HEATER PLUG, M25	1	
44A	0286810350	BOLT, M10X35	3	
44B	0108060950	BOLT, M10X95	3	
47	9091505100	LOCK WASHER	3	
48	9091605100	PLAIN WASHER	3	
49	1137130370	PIPE	1	
50	0501408250	BOLT, M8X25	3	..... W/LOCK AND PLAIN WASHER
64	1137430160	GASKET	1	
65	113740130	GASKET	1	
107	5137210152	PIPE	1	

ISUZU 6BG1 — ENGINE WATER PIPING ASSY.

ENGINE WATER PIPING ASSY.



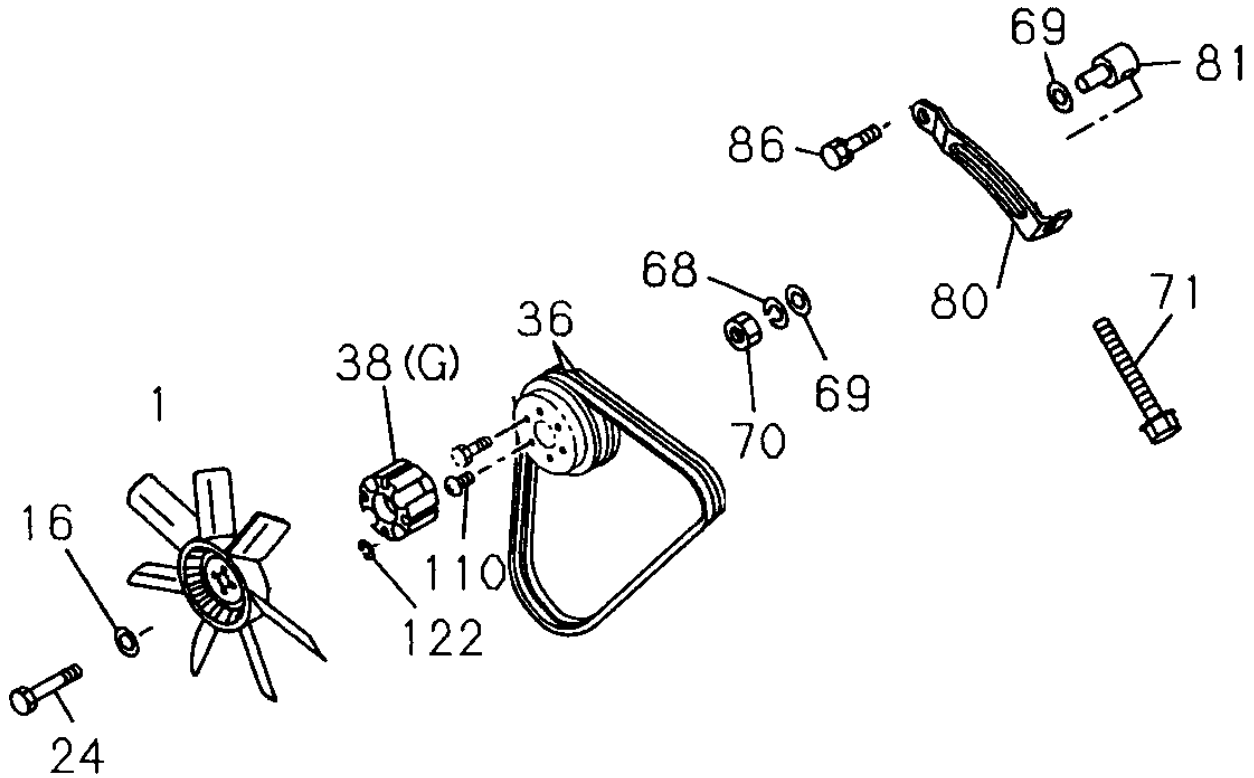
ISUZU 6BG1 — ENGINE WATER PIPING ASSY.

ENGINE WATER PIPING ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
132	8971380860	HOSE	1	

ISUZU 6BG1 — FAN AND FAN BELT ASSY.

FAN AND FAN BELT ASSY.



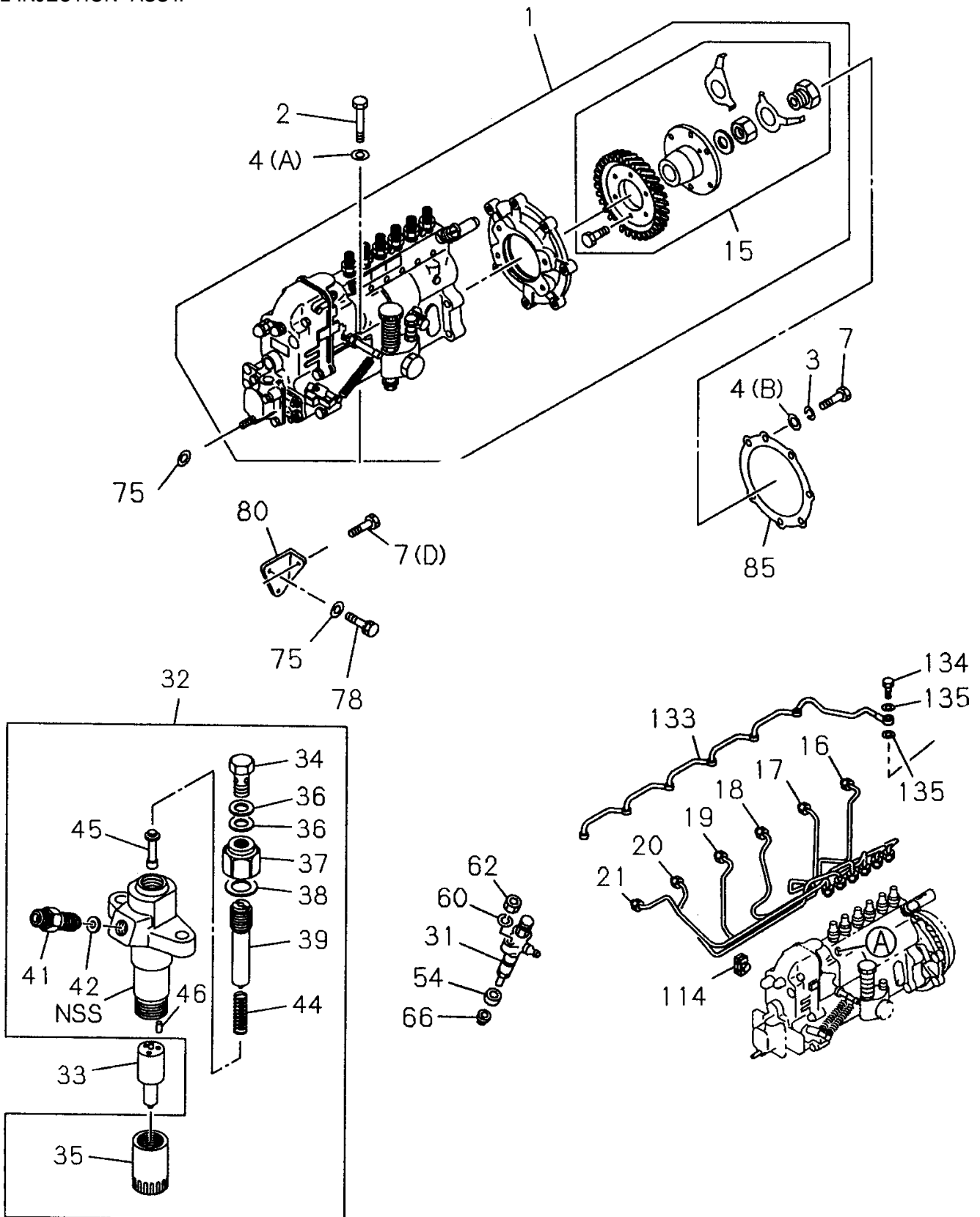
ISUZU 6BG1 — FAN AND FAN BELT ASSY.

FAN AND FAN BELT ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	8944838971	FAN, D=550-7 BLOW	1	
16	9091647080	PLAIN WASHER	4	
24	1090440730	BOLT	4	
36	1136712260	BELT, L=1246 2 PIECE SET	1	
38A	8944340750	SPACER, T=51.7	1	
38G	1136420470	SPACER, T=61	1	
68	9091505120	LOCK WASHER	1	
69	9091607120	PLAIN WASHER	2	
70	9991104120	NUT	1	
71	1090091141	BOLT, M10X155	1	
80	1136741181	ADJ. PLATE	1	
81	1136741610	SLIDING PIECE	1	
86	0286810250	ADJ. BOLT, M10X25 FLANGE	1	
110	9034906100	SCREW, M6X10	2	
122	9091505080	LOCK WASHER	4	

ISUZU 6BG1 — FUEL INJECTION ASSY.

FUEL INJECTION ASSY.



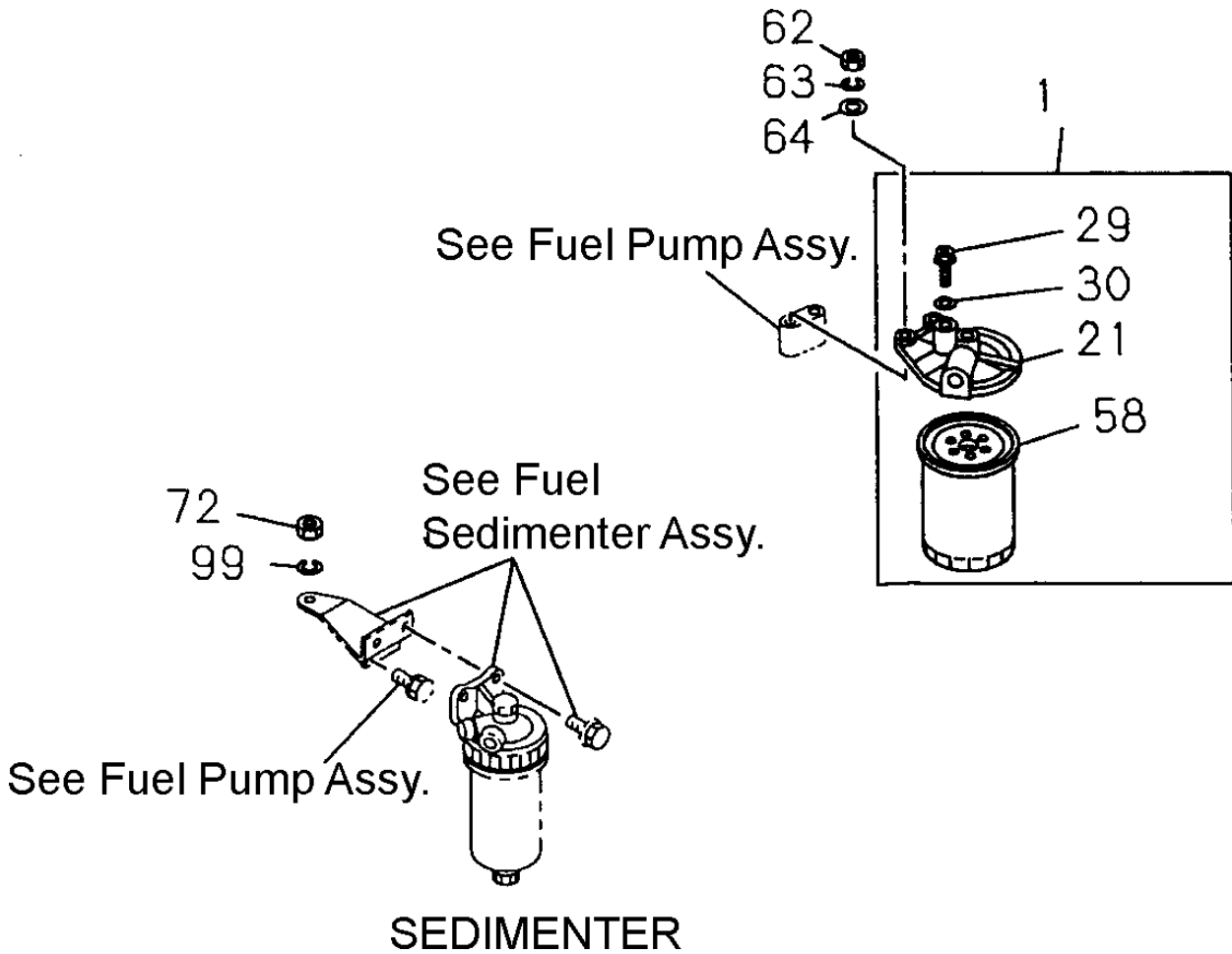
ISUZU 6BG1 — FUEL INJECTION ASSY.

FUEL INJECTION ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1156032880	FUEL INJ. PUMP ASSY.	1	INCL. ITEMS W/*
2	0108108750	BOLT, M8X75	4	
3	9091505080	LOCKWASHER	7	
4A	9098519340	WASHER	4	
4B	9091605080	WASHER	7	
7C	0108108600	BOLT, M8X60	7	REPLACES 0108058600
7D	0500410250	BOLT, M10X25	1	W/LOCKWASHER
15*	1157801720	COUPLING ASSY.	1	
16	1154151831	PIPE, INJ. NO. 1	1	
17	1154151841	PIPE, INJ. NO. 2	1	
18	1154151851	PIPE, INJ. NO. 3	1	
19	1154151861	PIPE, INJ. NO. 4	1	
20	1154151871	PIPE, INJ. NO. 5	1	
21	1154151881	PIPE, INJ. NO. 6	1	
31	1153002912	NOZZLE ASSY.	6	
32	8970161471	HOLDER ASSY.	6	INCL. ITEMS W/#
33	5153110270	NOZZLE	6	
34#	1096750371	BOLT	6	
35#	1153320170	NUT	6	
36#	1096300820	GASKET, ID=8 OD=13.2	12	
37#	5153320060	NUT	6	
38#	5153390600	GASKET	6	
39#	8941695030	SCREW	6	
41#	8943203080	CONNECTOR	6	
42#	5153390030	GASKET	6	
44#	5153430050	SPRING	6	
45#	8941695020	PUSH ROD	6	
46#	9153470030	PIN	12	
54	9153390510	COVER	6	
60	9091505080	LOCKWASHER	12	
62	9091104080	NUT	12	
66	5153150030	GASKET	6	
75	9091607100	PLAIN WASHER	3	
78	0500410200	BOLT, M10X20	2	W/PLAIN WASHER
80	1197511200	BRACKET	1	
85	8943706750	GASKET	1	
114	9154196120	CLIP	6	
133	1154124711	PIPE	1	
134	1096750371	BOLT	1	
135	1096300820	GASKET, ID=8.2 OD=13.2	2	

ISUZU 6BG1 — FUEL FILTER AND BRACKET ASSY.

FUEL FILTER AND BRACKET ASSY.



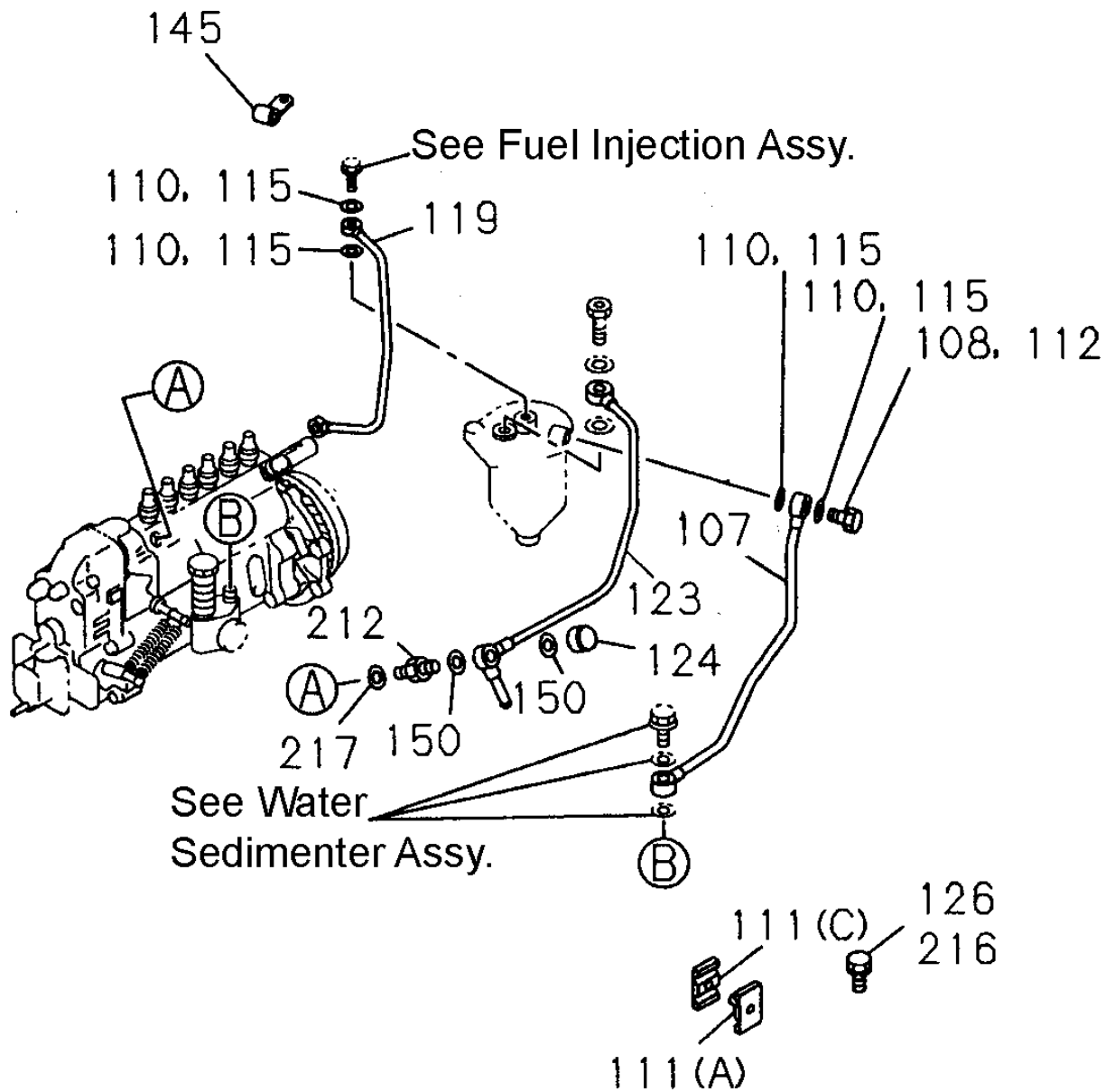
ISUZU 6BG1 — FUEL FILTER AND BRACKET ASSY.

FUEL FILTER AND BRACKET ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1132007011	FUEL FILTER ASSY.....	1	INIICL. ITEMS W/*
21*	1132121080	COVER	1	
29*	1132600470	VALVE	1	
30*	1096300850	GASKET	2	
58*	1132400691	ELEMENT	1	
62	9091104100	NUT	2	
63	9091505100	LOCK WASHER	2	
64	9091605100	PLAIN WASHER	2	
72	9091105100	NUT, M10	2	
99	9091505100	LOCK WASHER	2	

ISUZU 6BG1 — FUEL PUMP AND PIPE ASSY.

FUEL PUMP AND PIPE ASSY.



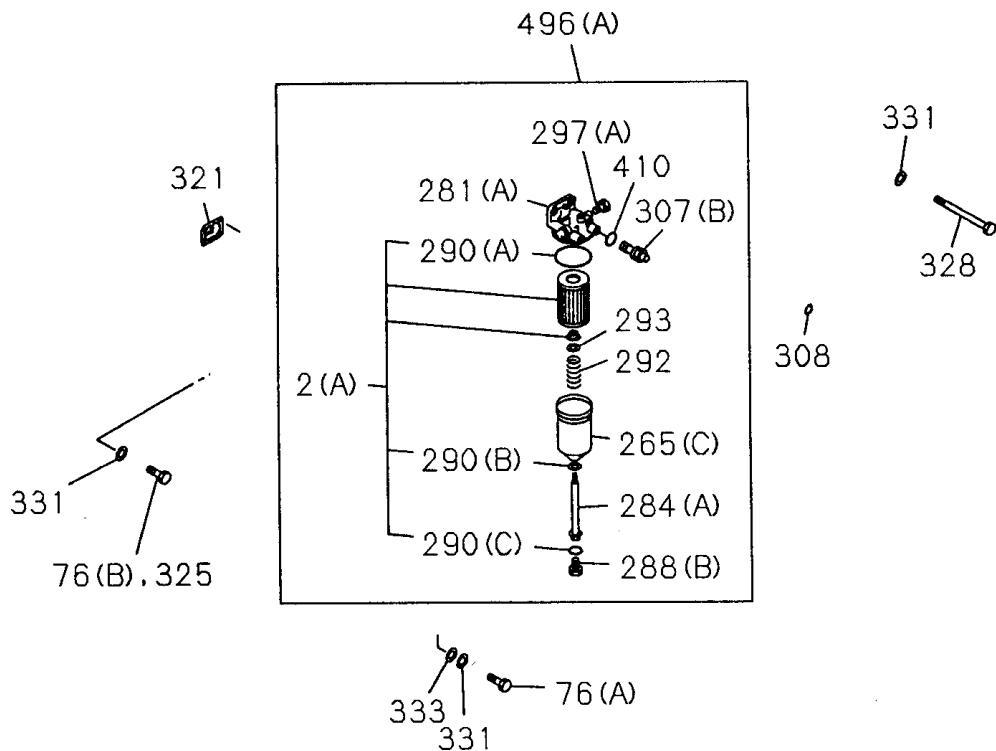
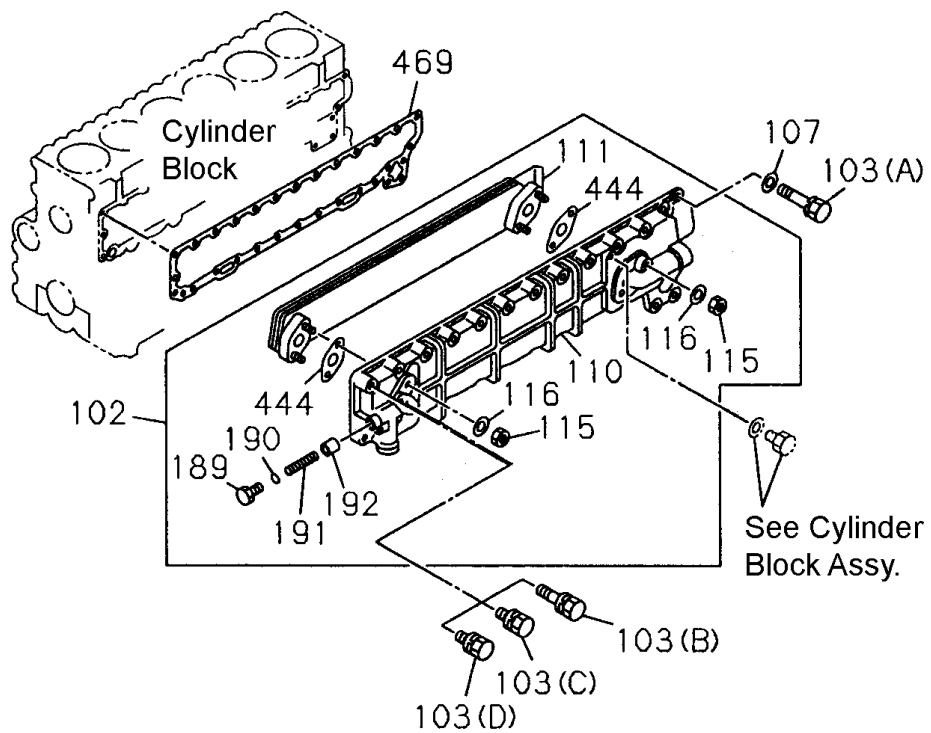
ISUZU 6BG1 — FUEL PUMP AND PIPE ASSY.

FUEL PUMP AND PIPE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
107	1154142940	PIPE	1	
108	1096750860	BOLT	1	
110	1096300850	GASKET	2	
111A	5097091030	CLIP, W/TUBE L=48	3	
111C	5097091040	CLIP, W/OUT TUBE L=45	3	
112	1096750860	BOLTM14X27	1	
115	1096300850	GASKET, ID=14.2 OD=19.2	2	
119	1154142950	PIPE	1	
123	1154142962	PIPE	1	
124	1094680021	NUT	1	
126	0500406300	BOLT M6X30	2	W/LOCK WASHER
145	9095245550	CLIP, ID=6	1	
150	1096300850	GASKET, ID=14.2 OD=19.2	2	
212	1132600011	OVERFLOW VALVE	1	
216	0500406300	BOLT, M6X30	1	W/ LOCK WASHER
217	1096300850	GASKET, ID=14.2 OD=19.2	1	

ISUZU 6BG1 — OIL COOLER AND OIL FILTER ASSY.

OIL COOLER AND OIL FILTER ASSY.



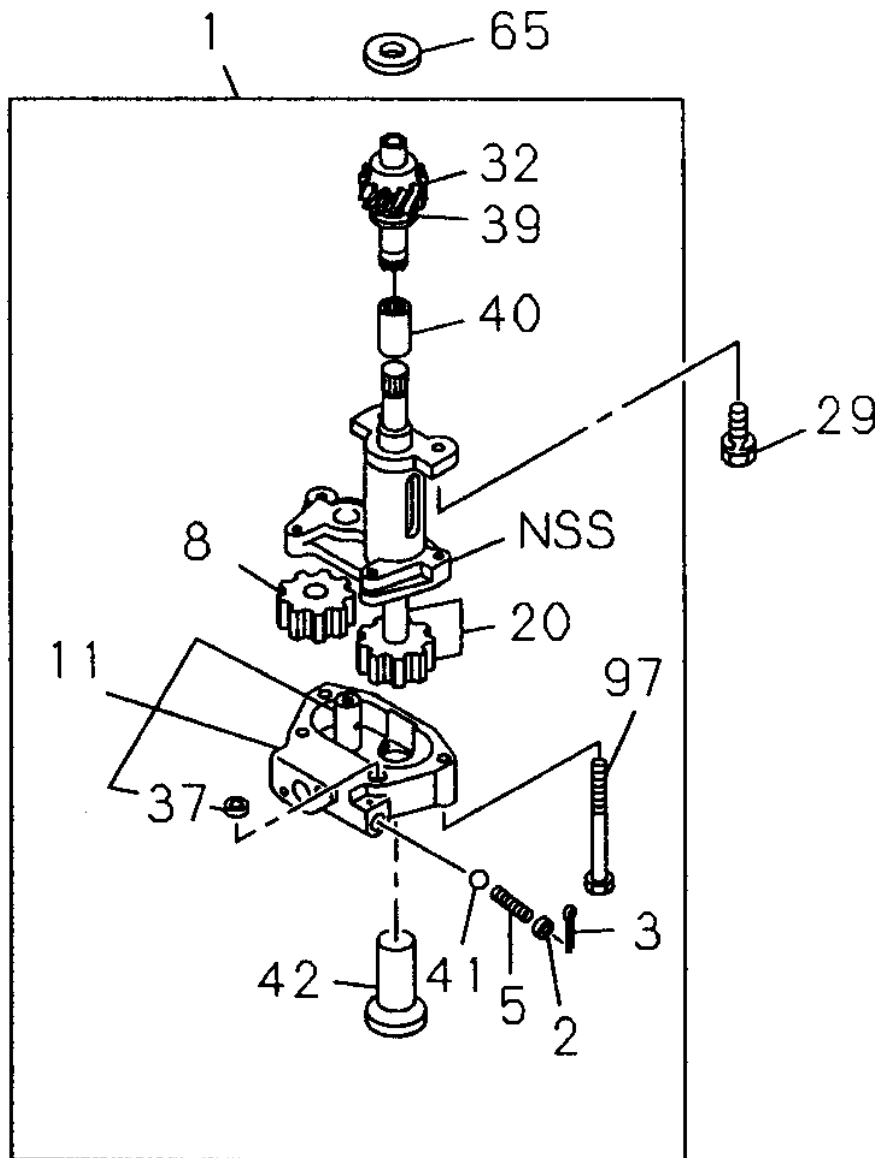
ISUZU 6BG1 — OIL COOLER AND OIL FILTER ASSY.

OIL COOLER AND OIL FILTER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
2	1878100752	OIL FILTER ELEMENT	1	INCL. ITEMS W/%
76A	9098009281	BOLTM10X145	2	
76B	0286810350	BOLT, M10X35	2	
102	1217002491	OIL COOLER ASSY.	1	INCL. ITEMS W/*
103A	8942059861	BOLT, M8X65	1	
103B	0501408450	BOLT, M8X65	10	W/LOCK AND PLAIN WASHER
103C	0501408280	BOLT. M8X28	15	W/LOCK AND PLAIN WASHER
103D	1090300910	BOLT, M8X20	2	W/PLAIN WASHER
107	9091605080	PLAIN WASHER	3	
110*	1112810281	BODY	1	
111*	1112820180	CORE	1	
115*	9091114100	NUT	4	
116*	9091645100	PLAIN WASHER	4	
189*	9132630100	PLUG	1	
190*	9095622150	GASKET	1	
191*	5095800920	BYPASS SPRING	1	
192*	5112880010	BYPASS VALVE	1	
196	5096050170	PLUG	2	
265#	5132110100	BODY	1	
281#	5132120212	COVER	1	
284#	1132310420	BOLT	1	
288#	109000105	PLUG, M10	1	
290A%#	9099203110	GASKET	1	
290B%#	9099206940	GASKET, ID=15.5	1	
290C%#	1096230550	GASKET, ID=9.8	1	
292	9099412830	SPRING	1	
293	9132390250	SEAT	1	
297	9098621610	PLUG	1	
307	5132600061	VALVE	1	
309	1096231630	GASKET	1	
321	8943706700	GASKET	1	
328	8941486171	BOLT	1	
331	9091605100	PLAIN WASHER	2	
333	9095720100	GASKET, ID=10.2 OD=19	2	
410	1096231630	GASKET	1	
444*	1112820140	GASKET	2	
469	112820200	GASKET	1	
496	5132000726	OIL FILTER ASSY.	1	INCL. ITEMS W/#

ISUZU 6BG1 — OIL PUMP AND OIL STRAINER ASSY.

OIL PUMP AND OIL STRAINER ASSY.



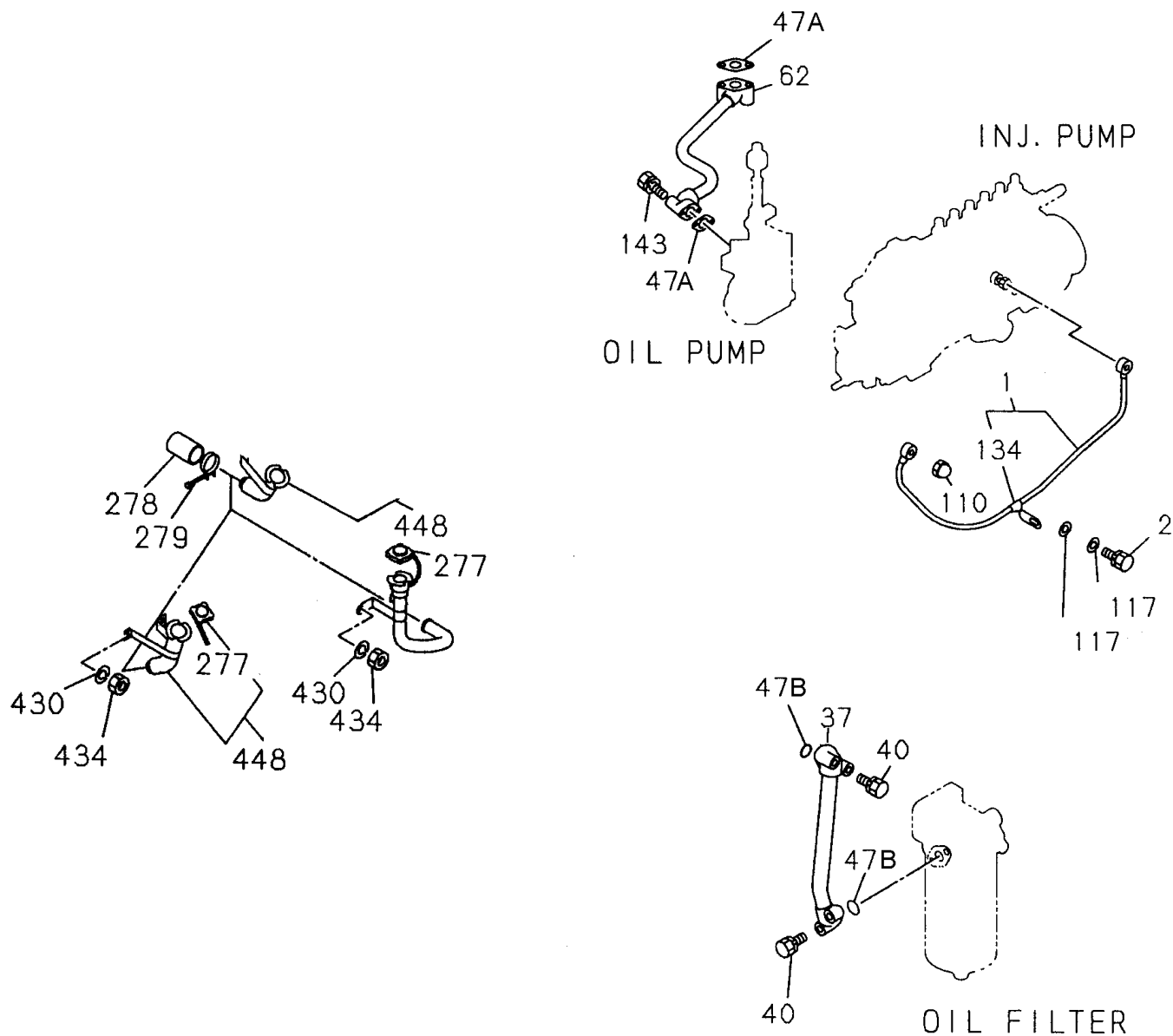
ISUZU 6BG1 — OIL PUMP AND OIL STRAINER ASSY.

OIL PUMP AND OIL STRAINER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1131002770	OIL PUMP ASSY.....	1	INCL. ITEMS W/*
2*	5131650040	SEAT	1	
3*	9081140300	PIN	1	
5*	5095800980	SPRING	1	
8*	5131250010	GEAR	1	
11*	1131130470	COVER ASSY.	1	
20*	5131210050	GEAR	1	
29	0286810250	BOLT, M10X25 FLANGE	2	
32*	1131280180	PINION	1	
37*	1131190030	DOWEL	1	
39*	9131190100	COLLAR	1	
40*	1131230160	COUPLING	1	
41*	5098430030	BALL	1	
42*	1131401160	STRAINER	1	
65	9131190100	COLLAR	1	
97*	1090440470	BOLT, M8X60	4	

ISUZU 6BG1 — OIL AND VACUUM PIPING ASSY.

OIL AND VACUUM PIPING ASSY.



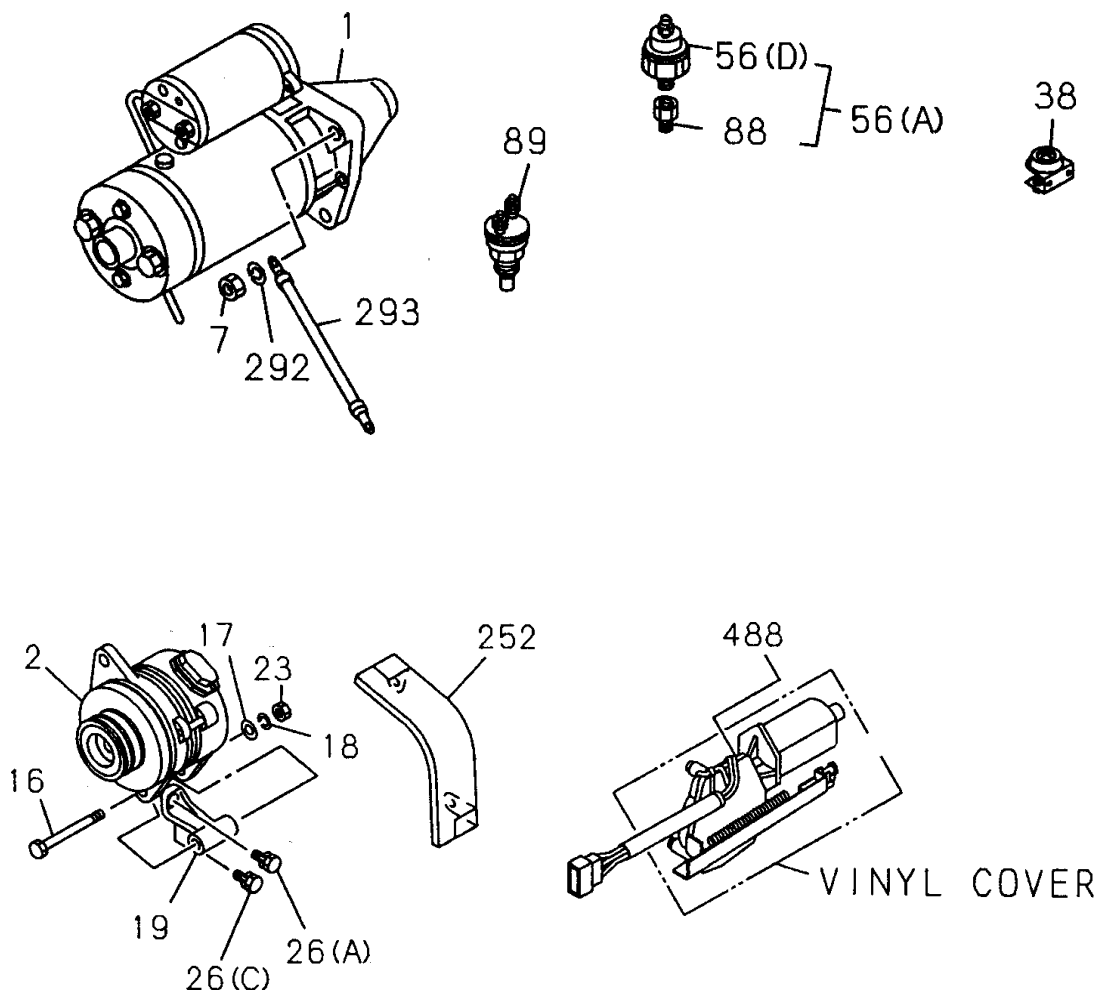
ISUZU 6BG1 — OIL AND VACUUM PIPING ASSY.

OIL AND VACUUM PIPING ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	5133112050	PIPE	1	INCL. ITEMS W/*
2	1096750770	BOLT, M10X21	1	
37	5133111190	PIPE	1	
40	0286808400	BOLT, M8X40 FLANGE	4	
47A	9099211880	GASKET, ID=18	2	
47B	1096234620	GASKET, ID=22.8	2	
62	1133115322	PIPE	1	
110	9098440220	NUT	1	
117	1096300830	GASKET, ID=10.2	2	
134*	9099171051	CLIP	1	
143	0280808400	BOLT, M8X40 FLANGE	4	
277#	1117500241	CAP	1	
278	9099129760	HOSE	1	
279	9099155531	CLIP	2	
430	9091505080	LOCKWASHER	1	
434	9091104080	NUT	1	
448	1117402011	FILLER	1	INCL. ITEMS W/#

ISUZU 6BG1 — ELECTRICAL CONTROL ASSY.

ELECTRICAL CONTROL ASSY.



ISUZU 6BG1 — ELECTRICAL CONTROL ASSY.

ELECTRICAL CONTROL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1811001911	STARTER ASSY.	1	
2	1812003650	GENERATOR ASSY.	1	
7	9991104120	NUT	3	
16	1090001331	BOLT, M14X135	1	
17	9091605140	PLAIN WASHER	1	
18	9091505140	LOCKWASHER	1	
23	9991104140	NUT	1	
26A	0280810250	BOLT, M10X25 FLANGE	1	
26C	0286810350	BOLT, M10X35	2	
38	9825300430	RESISTOR	1	
56A	5831510030	SWITCH	1	INCL. ITEMS W/*
56D*	9827200690	SWITCH	1	
88*	9099022380	ADAPTER	1	
89	8971256010	SWITCH	1	
252	1197190362	COVER	1	
292	9091505120	LOCKWASHER	3	
293	9829322110	CABLE	1	
488	1819001931	STOPPER	1	

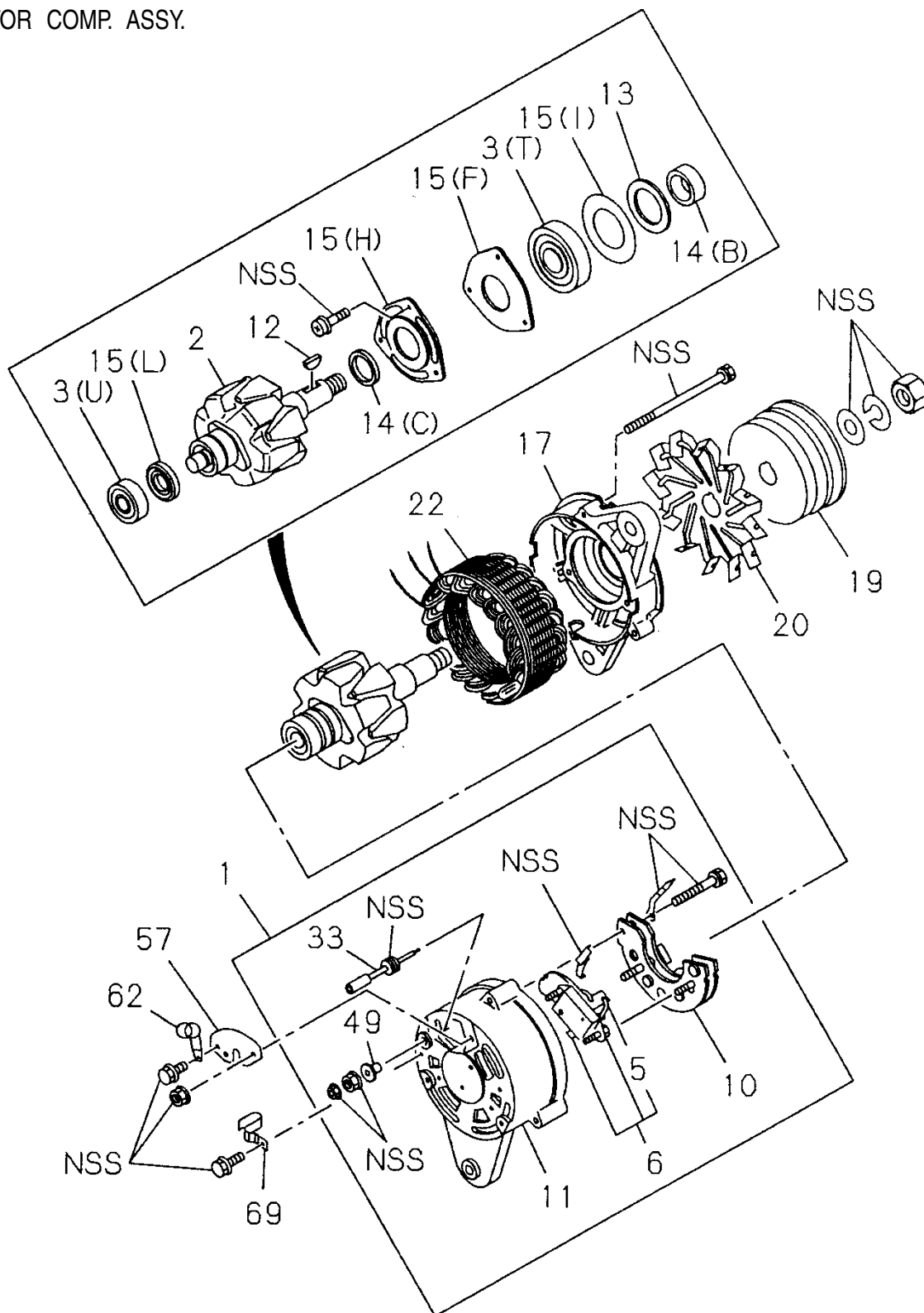
ISUZU 6BG1 — STARTER COMP. ASSY.

STARTER COMP. ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1811293640	SEAL KIT	1	INCL. ITEMS W/1
2	1811230250	CASE	1	INCL. ITEMS W/%
3%	1811293970	METAL	1	
4	5811291420	COVER	1	
5	5811291440	CLIP	2	
6	5811291450	STOPPER	1	
8	1811130260	BRACKET	1	
9&	1811293860	BEARING	1	
10	1811230240	SHAFT	1	INCL. ITEMS W/&
11A	5811291600	WASHER	1	
11B	5811291590	WASHER	2	
11C	5811291580	WASHER	1	
12	1811130730	BRACKET	1	
15	1811160440	WIRE	1	
16	1811210370	ARMATURE	1	INCL. ITEMS W/#
17A#	1811293950	BEARING	1	UP TO MAR. 95
	5811291550	BEARING	1	FROM APR. 95~
17B#	1811293850	BEARING	1	UP TO MAR. 95
	1811291960	BEARING	1	FROM APR. 95~
18	5811291560	WASHER	2	
19	1811293960	COIL	1	
20*	1811160420	BRUSH, +	2	
21*	1811170140	SPRING	2	
22*	1811180360	HOLDER	1	
23*	1811150620	COVER	1	
27A	1811293870	BOLT	3	
27B	5811292140	BOLT	2	
28	1811270310	LEVER	1	
29	1811291850	PIN	1	
30	5811291470	PLATE	1	
31	5811510360	SWITCH	1	
50*	1811160430	BRUSH, -	2	
54	5811220160	CLUTCH	1	
57	1811150610	COVER ASSY.	1	INCL. ITEMS W/*
59	5811291500	TERMINAL	1	
60	5811291460	PLUNGER	1	
61	5811291480	CONTACT	1	
62	9821161400	BUSHING	1	
63	5811180190	HOLDER	1	
64A	9821161420	WASHER	1	
64B	5811291510	WASHER	2	
65	5811291490	RING	2	
77	1812291140	WASHER	2	
78	1811293840	TERMINAL	1	
80	1811291840	NUT	1	
86	1825530230	RELAY	1	UP TO MAR. 95
	1825530370	RELAY	1	FROM APR. 95~

ISUZU 6BG1 — ALTERNATOR COMP. ASSY.

ALTERNATOR COMP. ASSY.



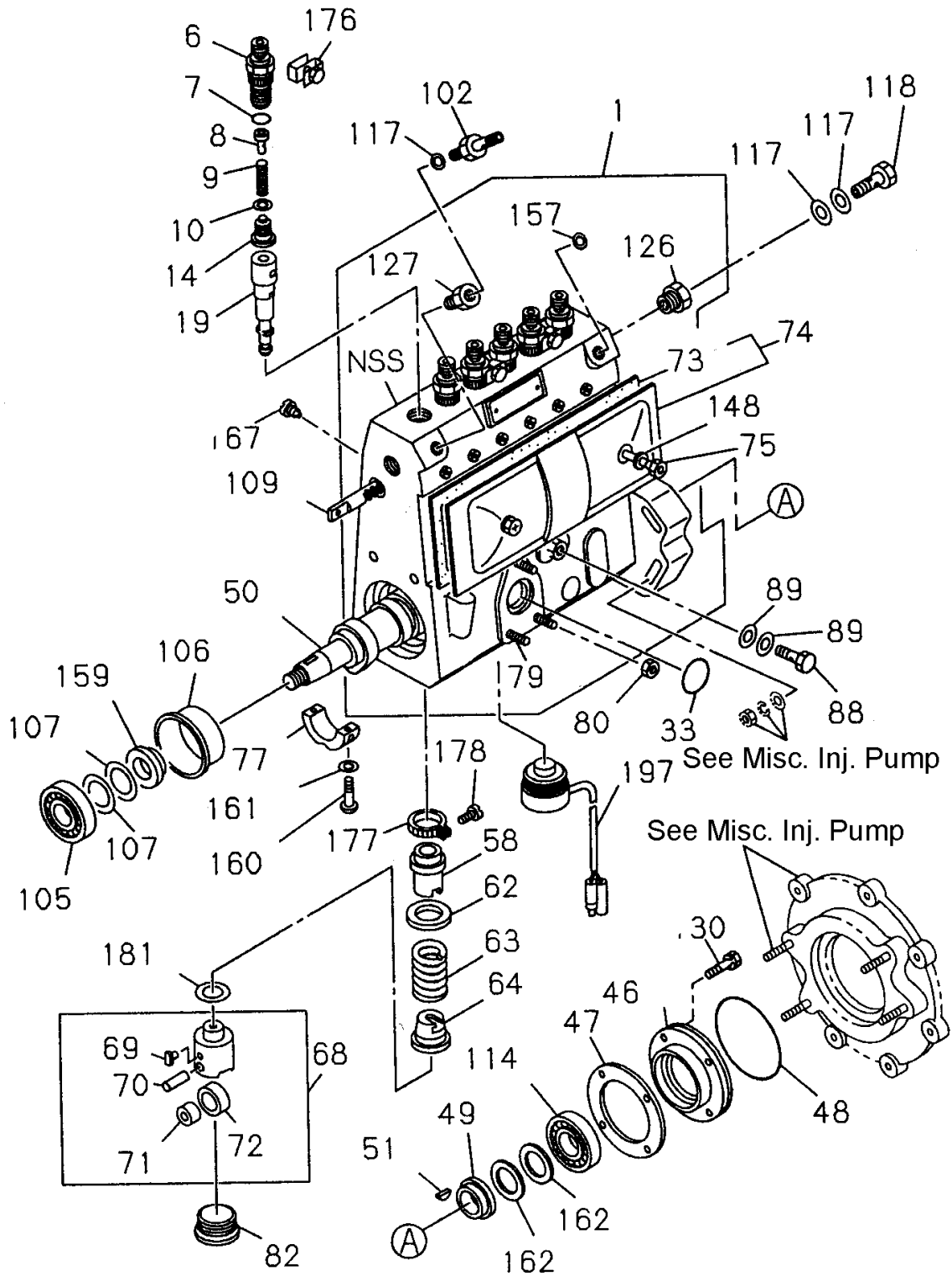
ISUZU 6BG1 — ALTERNATOR COMP. ASSY.

ALTERNATOR COMP. ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1812142290	REAR COVER	1	..... INCL. ITEMS W/#
2	1812210720	ROTOR	1	
3T	1812292250	BEARING	1	
3U	8941730540	BEARING	1	
5	1812170620	HOLDER	1	
6#	1812700070	REGULATOR ASSY.	1	
10#	1812170690	RECTIFIER	1	
11#	1812142240	COVER	1	
12	9822158670	KEY	1	
13	1812293830	GASKET	2	
14B	1812295270	COLLAR	1	
14C	1812295430	COLLAR	1	
15H	1812295130	RETAINER	1	
15F	1812293760	RETAINER	1	
15I	1812295260	RETAINER	1	
15L	8941730600	RETAINER	1	
17	1812130670	FRONT COVER	1	
19	1812220550	PULLEY	1	
20	1812230090	FAN	1	
22	1812110900	STATOR	1	
33#	1812295560	WIRE	1	
49#	8941730610	BUSHING	1	
57	1812295440	COVER	1	
62	1812291220	CLIP	1	
69	1812295160	CLIP	1	

ISUZU 6BG1 — INJ. PUMP COMP. ASSY.

INJ. PUMP COMP. ASSY.



ISUZU 6BG1 — INJ. PUMP COMP. ASSY.

INJ. PUMP COMP. ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	5156110250	HOUSING	1	INCL. ITEMS W/*
6*	5156440170	HOLDER	6	
7*	1096230520	GASKET	6	
8*	5156290450	STOPPER	6	
9*	5156430010	SPRING	6	
10*	1156490010	GASKET	6	
14*	5156410010	VALVE	6	
19*	1156310690	PLUNGER ASSY.	6	
33	1096230130	GASKET	1	
46	1156192430	COVER	1	
48	5156191560	GASKET	14	
49	9812250470	RING	1	
50*	5156210250	CAMSHAFT	1	
51	5196190490	KEY	1	
62	9812350150	SEAT	6	
63	5156430090	SPRING	6	
64	9812350210	SET	6	
68	9812212230	TAPPET	6	INCL. ITEMS W/#
69#	5156190410	GUIDE	6	
70#	9812222200	PIN	6	
71#	1156290010	BUSHING	6	
72#	1156220030	ROLLER	6	
73*%	1157299600	GASKET	1	
74	1156120500	COVER	1	INCL. ITEMS W/%
75*	1156190030	SCREW	2	
77	1156190330	BEARING	1	
79*	9812151150	STUD	3	
80	8941711100	NUT	3	
82	5156191360	PLUG	6	
88	1156190920	BOLT	1	
89	1157190930	GASKET	2	
105	9000906770	BEARING, NSK	1	
	5098000380	BEARING, NTN	1	
107	5156290150	SHIM	AR	T=0.10
	5156290160	SHIM	AR	T=0.12
	5156290170	SHIM	AR	T=0.14
	5156290180	SHIM	AR	T=0.16
	5156290190	SHIM	AR	T=0.18
	5156290200	SHIM	AR	T=0.50
	5156290380	SHIM	AR	T=1.00
	9812250330	SHIM	AR	T=0.30
	5156190390	SHIM	AR	T=0.70
	5156290900	SHIM	AR	T=1.40
	1156390880	SHIM	AR	T=2.40
109*	5156370030	RACK	1	
114	5098000380	BEARING, NTN	1	
	9000906770	BEARING, NSK	1	
117	1096300850	GASKET, ID=14.2 OD=19.2	2	
118	1157590110	BOLT	1	
126*	9812350170	ADAPTER	1	
127*	5156190440	ADAPTER	1	
130	9019006140	SCREW, M6X14	4	W/LOCK WASHER
148*	9812151440	GASKET	2	
115	1156190240	BOLT	1	

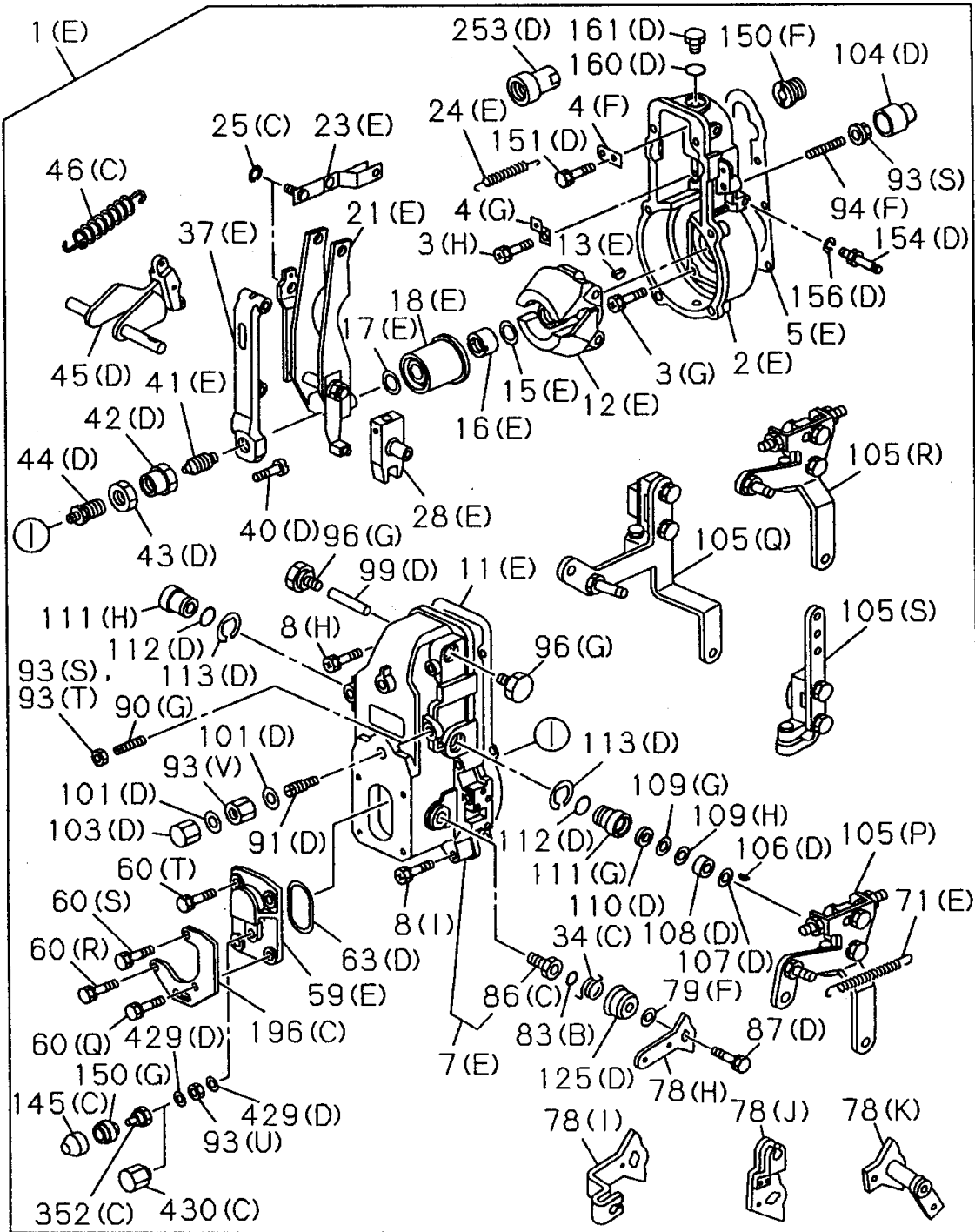
ISUZU 6BG1 — INJ. PUMP COMP. ASSY.

NJ. PUMP COMP. ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
157*	8941445880	GASKET	1	
159	9812250470	RING	1	
160	9884100660	SCREW	2	
161	9812250430	GASKET	2	
162	5156290150	SHIM	AR	T=0.10
	5156290160	SHIM	AR	T=0.12
	5156290170	SHIM	AR	T=0.14
	5156290180	SHIM	AR	T=0.16
	5156290190	SHIM	AR	T=0.18
	5156290200	SHIM	AR	T=0.50
	5156290380	SHIM	AR	T=1.00
	9812250330	SHIM	AR	T=0.30
	5156190390	SHIM	AR	T=0.70
	5156290900	SHIM	AR	T=1.40
	1156390880	SHIM	AR	T=2.40
167*	1156390030	BOLT	1	
176	5156250010	PLATE	3	
177	9812250570	PINION	6	
178	9812350030	SCREW	6	
181	5156190340	SHIM	AR	T=0.30
	5156190350	SHIM	AR	T=0.40
	5156190360	SHIM	AR	T=0.50
	5156190010	SHIM	AR	T=0.60
	5156190020	SHIM	AR	T=0.70
	5156190030	SHIM	AR	T=0.80
	5156190040	SHIM	AR	T=0.90
	5156190050	SHIM	AR	T=1.00
	5156190070	SHIM	AR	T=1.10
	5156190080	SHIM	AR	T=1.20
	5156190090	SHIM	AR	T=1.30
	5156190100	SHIM	AR	T=1.40
	5156190110	SHIM	AR	T=0.55
	5156190120	SHIM	AR	T=0.65
	5156190130	SHIM	AR	T=0.75
	5156190150	SHIM	AR	T=0.85
	9812350420	SHIM	AR	T=0.95
	9812350430	SHIM	AR	T=1.05
	9812350440	SHIM	AR	T=1.15
	9812350450	SHIM	AR	T=1.25
	5156191060	SHIM	AR	T=1.50
	5156191070	SHIM	AR	T=1.60
	5156190250	SHIM	AR	T=0.20
	5156190260	SHIM	AR	T=0.25
	5156190270	SHIM	AR	T=0.35
	5156190370	SHIM	AR	T=0.45
	5156191080	SHIM	AR	T=1.35
	5156191090	SHIM	AR	T=1.45
	5156191100	SHIM	AR	T=1.55

ISUZU 6BG1 — GOVERNOR COMP. ASSY.

GOVERNOR COMP. ASSY.



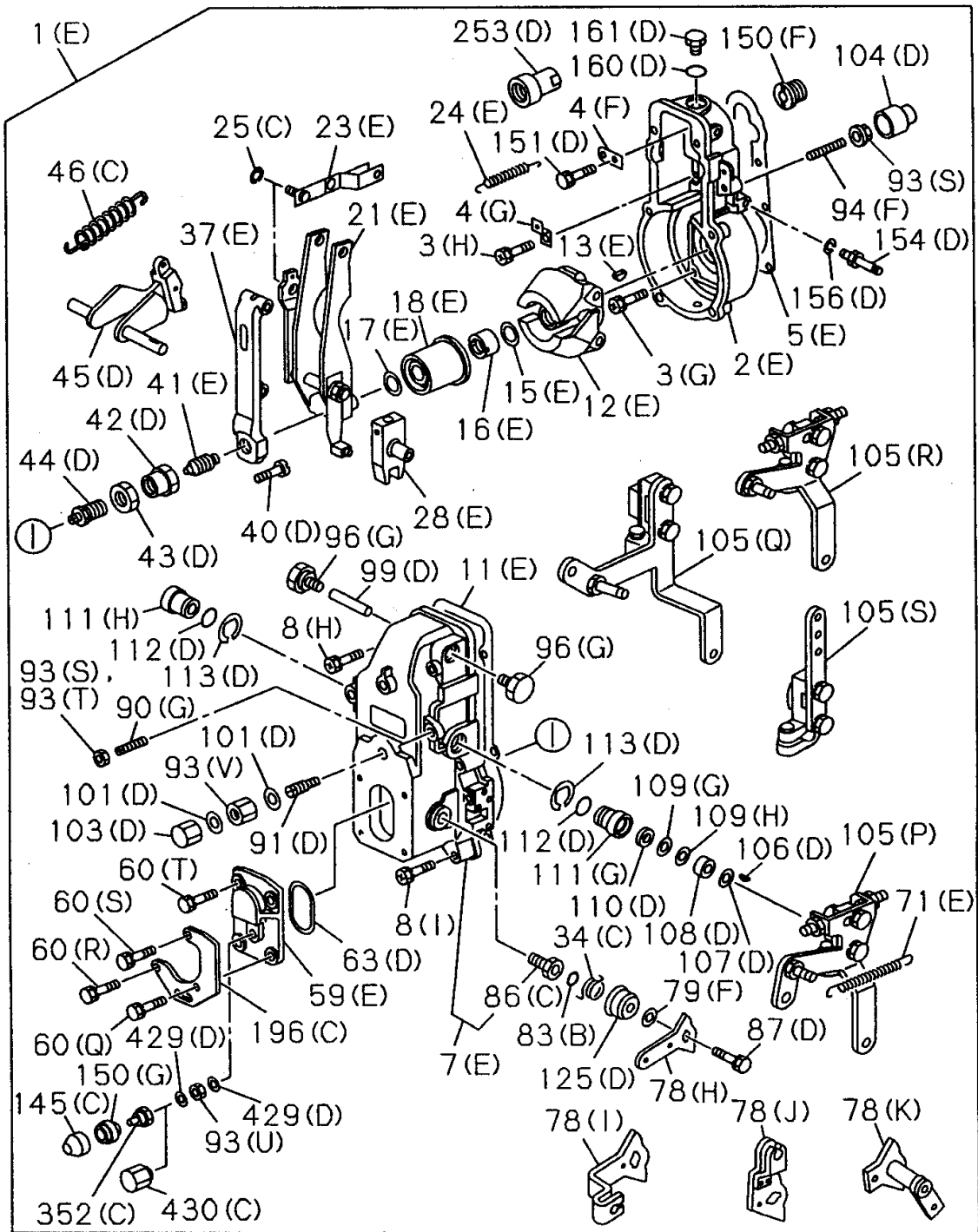
ISUZU 6BG1 — GOVERNOR COMP. ASSY.

GOVERNOR COMP. ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1157300480	GOVERNOR ASSY.	1	INCL. ITEMS W/*
2*	5157210040	HOUSING	1	
3*	5157290270	BOLT, M6X15	6	
4*	8913253970	PLATE	1	
5*	1157290010	GASKET	1	
7*	5157210220	COVER	1	INCL. ITEMS W/#
8H*	5157290540	BOLT	2	
8I*	5157290330	BOLT	4	
11*	1157290020	GASKET	1	
12*	1157220210	FLYWEIGHT ASSY.	1	
13*	5196190490	KEY, 16MM	1	
15*	5157290340	LOCK WASHER	1	
16*	9813250860	NUT	1	
17*	9813250880	SHIM	AR	T=0.20
	9813255510	SHIM	AR	T=0.40
	9813255520	SHIM	AR	T=0.60
	9813255530	SHIM	AR	T=1.00
	5157292860	SHIM	AR	T=0.50
	5157292870	SHIM	AR	T=1.50
	1157298910	SHIM	AR	T=2.00
	1157298920	SHIM	AR	T=3.00
	1157298930	SHIM	AR	T=4.00
18*	5157190080	SLEEVE	1	
21*	5157250330	LEVER ASSY.	1	
23*	1157250110	LING	1	
24*	9813222350	SPRING	1	
25*	9091854040	SNAP RING	1	
28*	5157250420	LEVER	1	
34*	1157232120	SPRING	1	
37*	8970267520	LEVER ASSY.	1	
40*	1157291010	SCREW	1	
41*	8944707560	SPRING CAPSULE	1	
43*	9008130230	NUT	1	
45*	1157256680	LEVER ASSY.	1	
59*	1157210230	COVER	1	
60Q*	1156192820	BOLT	2	
60S*	5157291670	BOLT	1	
63*	9813919070	GASKET	1	
71*	5157230880	SPRING	1	
78*	1157254490	LEVER	1	
79*	1157292940	SHIM	AR	T=0.20
	1157292950	SHIM	AR	T=0.25
	1157292960	SHIM	AR	T=0.30
	1157292970	SHIM	AR	T=0.35
	1157292980	SHIM	AR	T=0.40
	1157292990	SHIM	AR	T=0.50
83*	9813919060	SEAL	1	
86*#	9813254290	BUSHING	1	
87*	9019006160	BOLT	1	

ISUZU 6BG1 — GOVERNOR COMP. ASSY.

GOVERNOR COMP. ASSY.



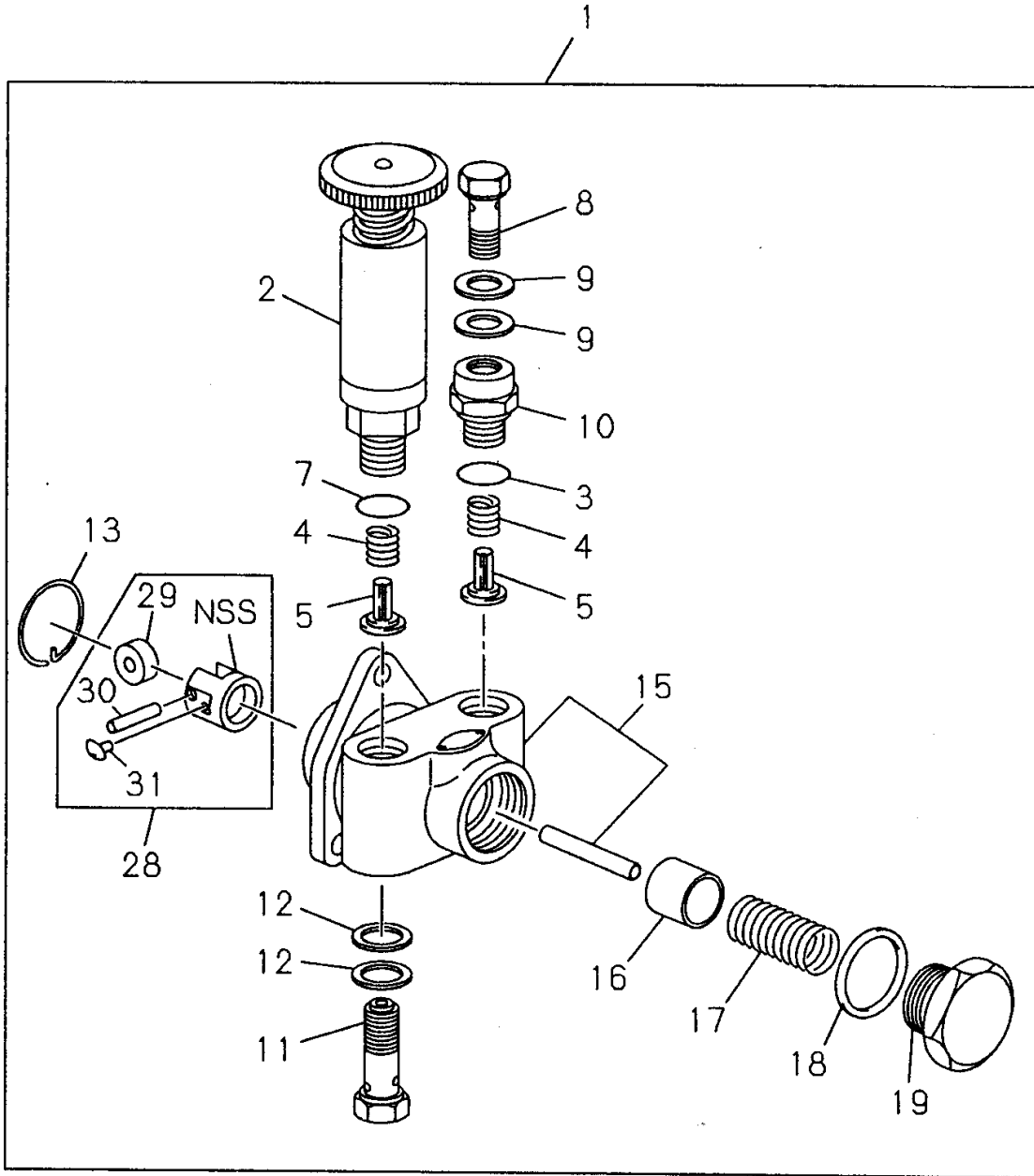
ISUZU 6BG1 — GOVERNOR COMP. ASSY.

GOVERNOR COMP. ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
90*	5157291230	SCREW	1	
918*	8944278480	SPRING CAPSULE	1	
93S*	9844100270	NUT	1	
93T*	1157790580	NUT	1	
93U*	1157790400	NUT	1	
93V*	1157296890	NUT	1	
94*	1157795020	SCREW	1	
96*	5157290530	PLUG	2	
99*	9813250620	PIN	1	
101*	8941445880	GASKET	2	
103*	1157290920	NUT	1	
104*	8971796700	CAP	1	
105*	1157259210	LEVER	1	
106*	9813250300	KEY, 13MM	1	
107*	9813254880	WASHER	AR	
108*	1157293010	COLLAR	1	
109*	1157290990	SHIM	1	
	9813251730	SHIM	AR	
110*	1157290980	SEAL	1	
111G*	8970242390	BUSHING	1	
111H*	8970242400	BUSHING	1	
112*	9813212050	GASKET	2	
113*	9091854150	RING	2	
158*	9813252100	CAP	1	
145*	1157795650	CAP	1	
150F*	9813150650	ADAPTER	1	
150G*	1157795670	ADAPTER	1	
151*	9019008180	BOLT, M8X18	1	..... W/LOCK WASHER
154*	1157795620	BOLT	1	
156*	1835794920	WASHER	1	
160*	1157290150	GASKET	1	
161*	1157290380	PLUG	1	
196*	1157791910	BRACKET	1	
253*	1157296360	LIMITER	1	
352*	1157795640	CAP NUT	1	
429*	5157290990	GASKET	2	

ISUZU 6BG1 —FEED PUMP ASSY.

FEED PUMP ASSY.



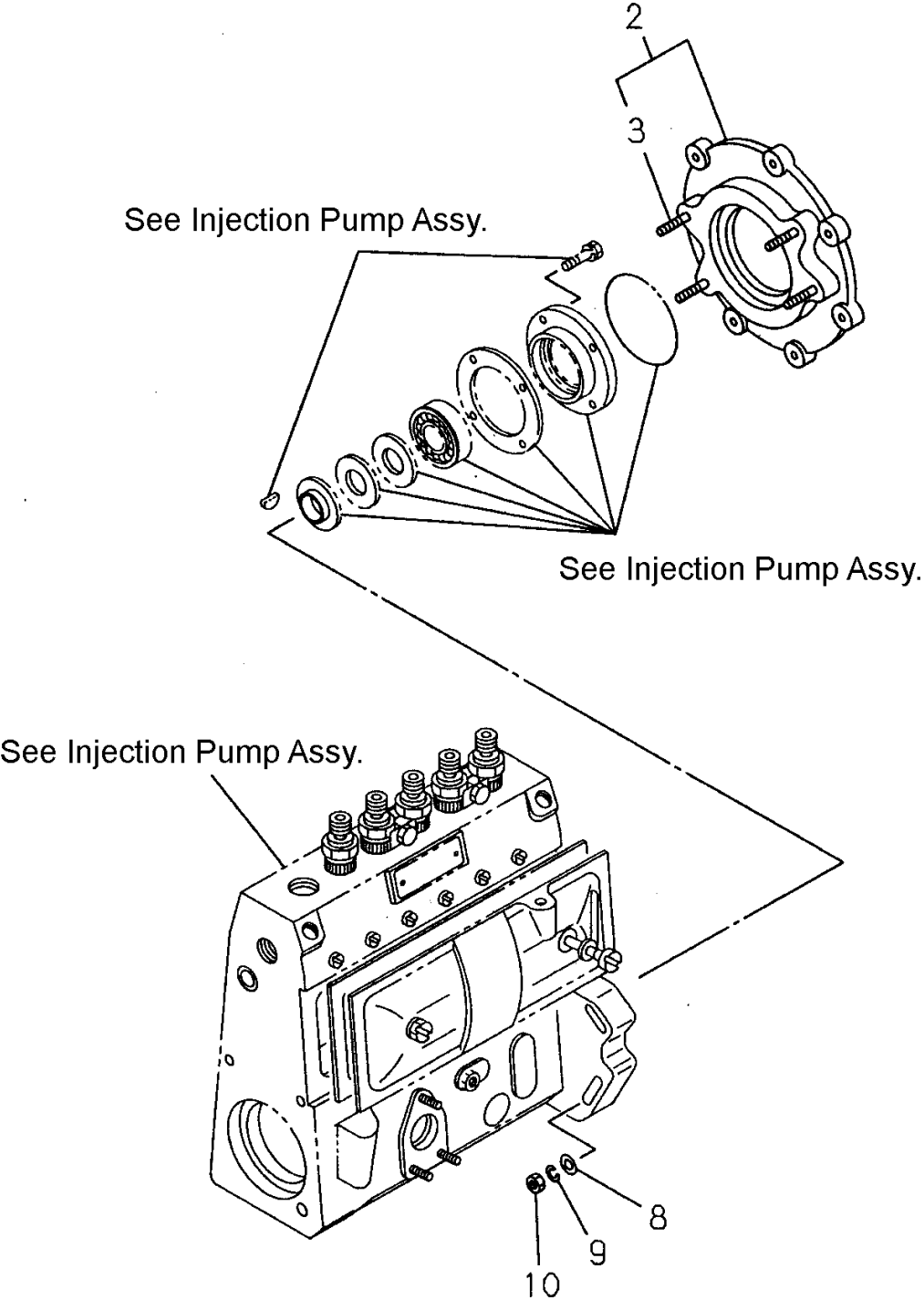
ISUZU 6BG1 — FEED PUMP ASSY.

FEED PUMP ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1157501620	PUMP ASSY.	1	INCL. ITEMS W/*
2*	1157610060	PUMP	1	
3*	1196230160	GASKET	1	
4*	9813517020	VALVE SPRING	2	
5*	1157550020	PUMP VALVE	2	
7*	1196230160	GASKET	2	
10*	1157590030	ADAPTER	1	
11*	1096750630	BOLT	1	
12*	1096300850	GASKET	2	
13*	9813550250	SNAP RING	2	
15*	5157510120	HOUSING	1	
16*	9813512050	PISTON	1	
17*	9813513020	SPRING	1	
18*	9813550350	GASKET	1	
19*	8941711850	PLUG	1	
28*	5157540010	TAPPET ASSY.	1	
29*	9813514030	ROLLER	1	
30*	9813514100	PIN	1	
31*	1157590020	GUIDE	2	

ISUZU 6BG1 — MISC. INJECTION PUMP ASSY.

MISC. INJECTION PUMP ASSY.

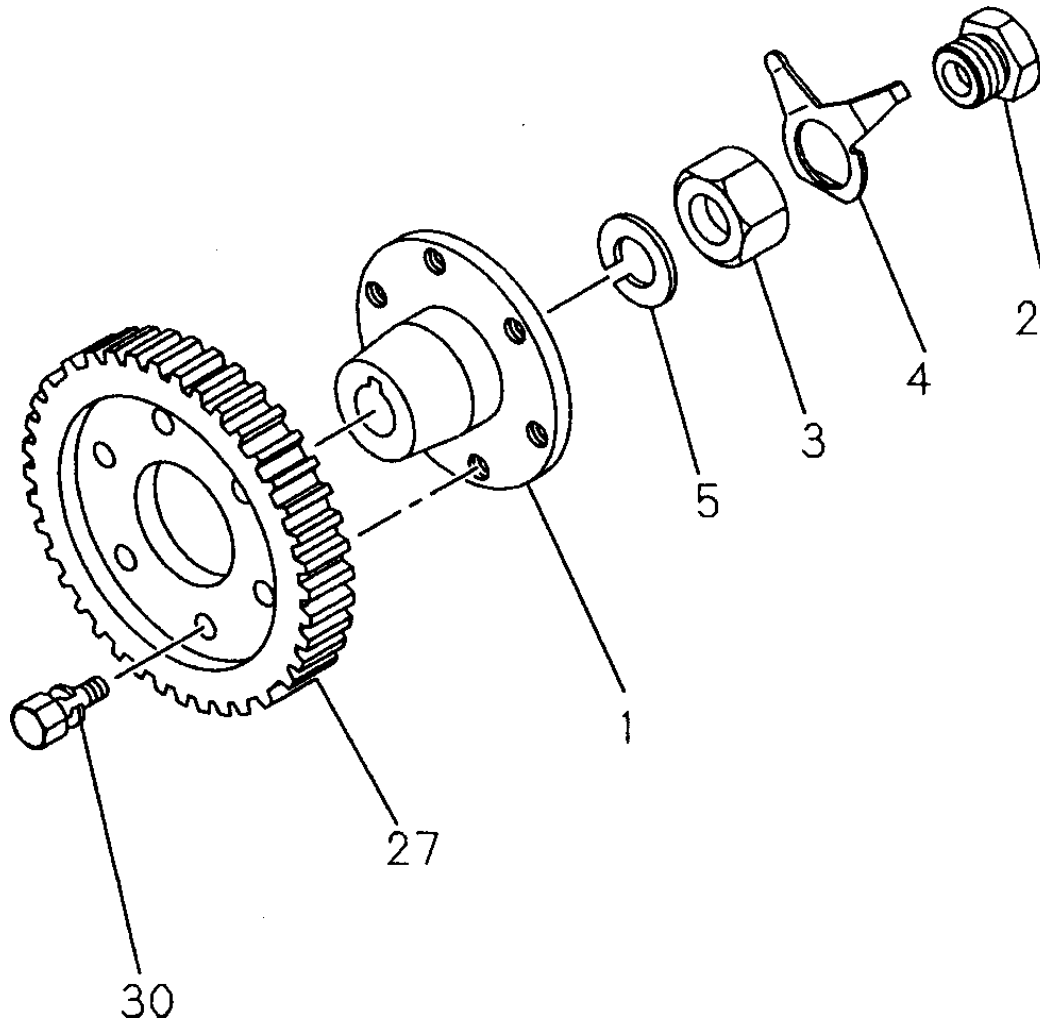


ISUZU 6BG1 — MISC. INJECTION PUMP ASSY.

MISC. INJECTION PUMP ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
2	1197510490	BRACKET	1	INCL. ITEM W/*
3*	9041010300	STUD	4	
8	9091645100	PLAIN WASHER	4	
9	9091506100	LOCKWASHER	4	
10	5156390020	NUT	4	

COUPLING ASSY.

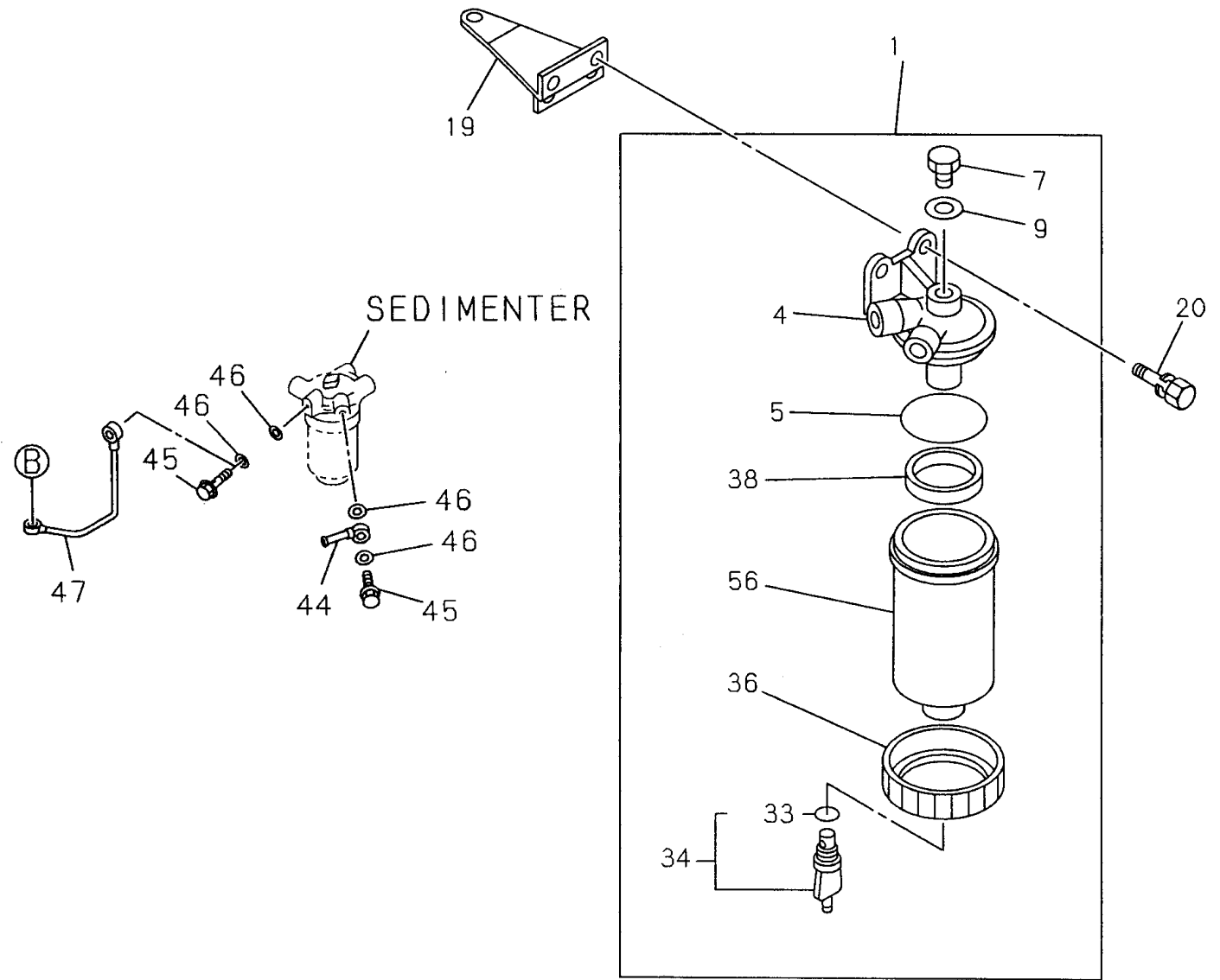


COUPLING ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	5157810030	COUPLING	1	
2	9096620070	BOLT	1	
3	9884105020	NUT	1	
4	1156192470	PLATE	1	
5	5156190480	WASHER	1	
27	1125240150	GEAR	1	
30	8944575170	BOLT	6	

ISUZU 6BG1 — WATER SEDIMENTER ASSY.

WATER SEDIMENTER ASSY.



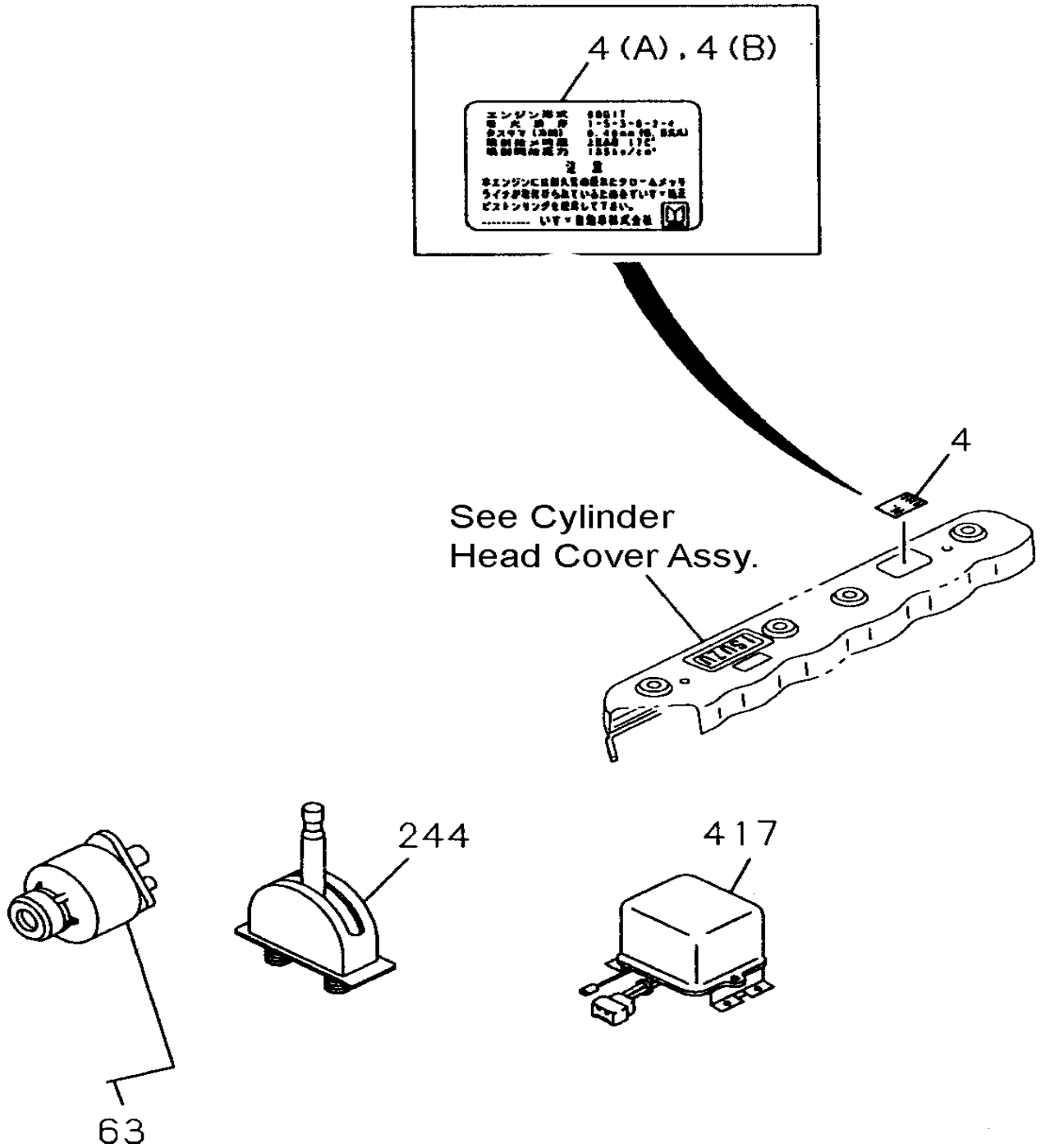
ISUZU 6BG1 — WATER SEDIMENTER ASSY.

WATER SEDIMENTER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1132008410	FUEL SEDIMENTER	1	INCL. ITEMS W/*
4*	5132120591	COVER	1	
5*	5096230700	GASKET	1	
7*	5132190200	PLUG	1	
9*	5096300240	GASKET	1	
19	1197550921	BRACKET	1	
20	0280808250	BOLT, M8X25 FLANGE	2	
33*#	8944163770	WASHER	1	
34*	8944537460	PLUG	1	INCL. ITEMS W/#
36*	5132190221	RING	1	
38*	5132190210	FLOAT	1	
44	5154112231	PIPE	1	
45	1096750860	BOLT, M14X27	2	
46	1096300850	GASKET	4	
47	1154143741	PIPE	1	
56*	1132112110	CASE	1	

ISUZU 6BG1 — SWITCH AND RELAY ASSY.

SWITCH AND RELAY ASSY.



ISUZU 6BG1 — SWITCH AND RELAY ASSY.

SWITCH AND RELAY ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
4	1858886780	LABEL, ENGINE MAINT.	1	
63	1823100080	SWITCH ASSY.	1	
244	1823200010	BATTERY SWITCH	1	
417	1825500732	EMERGENCY RELAY	1S	

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 listed in the parts price book 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 5 working days from notification, pending instructions. If a reply is not received within 5 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 \$20.00 to \$50.00 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 here under 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. A part 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.

PARTS AND OPERATION MANUAL

HERE'S HOW TO GET HELP

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

PARTS DEPARTMENT

800/427-1244 or 310/537-3700

FAX: 800/672-7877 or 310/637-3284

SERVICE DEPARTMENT

800/835-2551 or 310/537-3700

FAX: 310/638-8046

WARRANTY DEPARTMENT

800/835-2551 or 310/537-3700

FAX: 310/638-8046

MAIN

800/421-1244 or 310/537-3700

FAX: 310/537-3927

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800-427-1244
FAX: 800-672-7877

SERVICE DEPARTMENT:

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

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