

# Owner's Manual

## JNSZ800MV

READ THIS MANUAL CAREFULLY.  
IT CONTAINS IMPORTANT SAFETY INFORMATION.

MINIMUM  
RECOMMENDED  
OPERATOR AGE:

# 16



### FOR OFF-ROAD USE ONLY

This vehicle is designed and manufactured for off-road use only.

USA only:

It does not conform to federal motor vehicle safety standards, and operation on Public streets, roads, or highways is illegal.



## WORLDWIDE

*Team Joyner Middle East*

*Team Joyner Canada*

*Team Joyner Germany*

*Team Joyner Spain*

*Team Joyner Italy*

*Team Joyner China*

*Team Joyner United Kingdom*

### Liability Release of Joyner Recreational Vehicles

#### Warranty Disclosure

#### Warranty Parts Order Form

#### Service Record

### Preventative Maintenance and Service Log

1. Liability Release needs to be signed by the dealer and purchaser then faxed back to Joyner at 480-813-6379
2. Service Record Form must be filled out and signed off by the dealer and the purchaser and faxed back to Joyner to activate warranty.
3. Pre Delivery Inspection is to be completed by a qualified technician. It must be initialed and signed off by the technician. At the same time, the consumer needs to initial off and confirm that each item of the 120 point check is operational.
4. Customer Sign Off must be initiated by customer after receiving PDI with dealership and confirming the vehicle is fully operational.
5. Operator Maintenance should be conducted by an individual that has knowledge of vehicle and has completely read and understand the operator's manual.

#### Effective 3-15-08

All warranty claims must be processed through an authorized Joyner dealer. A copy of all documentation must be on file with Team Joyner USA, Inc.

Protect your vehicle and your safety. Follow the schedule listed within.

**[WWW.TEAMJOYNERUSA.COM](http://WWW.TEAMJOYNERUSA.COM)**

Toll Free 1-866-441-6363

**After completing assembly and PDI Fax to 480-813-6379**

• 1510 W. Bell De Mar Dr. Tempe, AZ. 85283 • Phone: 480.813.6363 • Fax: 480.813.6379 •



This release covers Joyner vehicles, dealers, and all affiliates of Castle Financial Corporation.

## Liability Release of Joyner Recreational Vehicles

Please Initial and Sign

- 1) Jumping the vehicle can cause serious damage to the drive train (axle, transmission, suspension)
- 2) Injury or death can result from jumping vehicle. Do not jump.
- 3) I understand that the roll bars are cosmetic and a roll over could cause death or serious injury. The seller is not liable for death or injury.
- 4) I have inspected all machines for any cosmetic damage and found them to be satisfactory. I further understand that cosmetic damage is NOT covered by any factory warranty and unless noted here are deemed acceptable by me.
- 5) Off-roading is dangerous. Death or injury could occur. The seller is not liable for injury or death.
- 6) I understand all sales are final and that there is no right of rescission, no option for return or exchange for any vehicle purchased; and that the titled and registered machines were effectively purchased when I signed the title application.
- 7) I understand the warranty is 90 days manufacturer defect only. Parts are covered but no labor.
- 8) I understand that although some lending institutions do not require insurance, state law DOES require liability insurance and a driver's license. I also understand that some of the products offered by the dealer constitute insurance and a separate policy would have to be purchased from an outside source to protect my purchase and fulfill state requirements.
- 9) I have also been shown the VIN number for each machine and they match this form and all paperwork received.
- 10) I understand that I have only 72 hours to notify the seller of any issues to the paperwork of the vehicle. After 72 hours it will be accepted by the purchaser.
- 11) Off Road use only. Driving on paved roads can cause axle or transmission damage. Both times terms qualify, this is not a limited slip differential. Injury or death can occur from operating a non-DOT vehicle on public roads.
- 12) Promise to pay - by signing this contract buyer agrees to pay Seller the "Total Due."
- 13) **Time of Essence:** Time is the essence of this contract. Seller's acceptance of partial payments shall not in any manner modify the terms of this contract and such acceptance shall not be construed as a waiver of any subsequent defaults on Buyer's part nor shall it waive the "time is of the essence" provision.
- 14) **Notice:** Any notice required to be given to Buyer shall be deemed reasonable notification if (1) mailed by ordinary mail, postage prepaid, to Buyer's mailing address as shown on this contract or to Buyer's most recent address as shown by a "notice of change of address" on file with Seller; whether or not such notice is actually received by Buyer, or (2) if given in any other manner which results in Buyer's actual receipt of such notice.
- 15) **Bad Check:** If Buyer pays Seller with a check that is dishonored or unpaid for any reason, Seller may, at Seller's sole option, terminate this contract and take the vehicle, or make claims against Buyer on the check. In addition, Seller will charge a \$25 returned check charge plus any actual charges assessed by Seller's financial institution resulting from such returned check.
- 16) **Attorney Fees:** If it is necessary for Seller to take legal action to enforce any of Seller's rights under this contract, Buyer agrees to pay to the extent permitted by law, the Seller's reasonable attorney's fees and court costs.
- 17) **General:** This contract is governed by applicable federal law and the laws of the state of Arizona. Any provisions found to be invalid shall not invalidate the remainder hereof. Waiver of any default shall not constitute waiver or any subsequent default. All words used herein shall be construed to be of such gender and number as the circumstances require. The contract shall be binding upon Buyer's heirs, personal representatives, successors and assigns and shall inure to the benefit of Seller's successors and assigns. This contract constitutes the entire agreement between the parties with respect to the subject matter herein, and may not be altered or amended unless made in writing and duly executed by the seller.
- 18) **Check Deposit:** If Buyer fails or refuses to accept delivery of any Vehicle or product or fails to comply with this contract, Seller may keep any cash deposit as liquidated damages, to the extent not prohibited by law. The deposit may also be used to reimburse Seller for any expenses and losses Seller incurs or suffers as a result of Buyer's failure or refusal to accept delivery of the Vehicle or product or to comply with this contract. Such expenses and losses may include Seller's reasonable attorney's fees.
- 19) **Non-Delivery:** Seller is not liable for failure to deliver or for delay in delivering the Vehicle or other product where such failure or delay is due, in whole or in part, to any cause beyond Seller's control or without Seller's fault or negligence.
- 20) **Risk of Loss Insurance:** The risk of loss to the vehicle or any other items covered by this invoice passes to Buyer upon delivery of the vehicle or other goods to the Buyer at the address set forth on this invoice for shipment to Buyer or such other place of receipt designated by the Buyer. Buyer is responsible for maintaining its own theft and liability insurance coverage for the vehicle.
- 21) **Age:** Buyer represents and warrants to Seller that buyer is over the age of majority and is fully competent to enter into this contract. Buyer acknowledges that Seller is relying on this representation in entering into and performing this contract.
- 22) **Limitation of Damages:** It is understood and agreed that Seller's liability and Buyer's sole remedy, whether in contract, under any warranty, in tort (including negligence) in strict liability or otherwise shall not exceed the return of the amount of the purchase price paid by the Buyer, and under no circumstances shall Seller be liable for any special, incidental, punitive or consequential damages, including, but not limited to, property damage, damage to or loss of equipment, lost profits or revenue, costs of renting replacements and other additional expenses, even if Seller has been advised of the possibility of such damages.
- 23) **No liability for Buyer's negligence:** Seller shall not be liable for any damages, losses or expenses as a result of Buyer's negligence, whether deemed active or passive and whether or not any such negligence is the sole cause of any such damage, loss or expense.
- 24) **Conditions of Sale:**
- 25) It is the responsibility of the Buyer to insure the safety and safe operation of all items sold to Buyer.
- 26) The mechanical fitness of the machine is the sole responsibility of the Buyer and operator.
- 27) Buyer acknowledges that there are dangers and risks inherent in the operation and use of all off-road vehicles, including but not limited to the danger and risk of collision with natural and man-made objects and with other vehicles and recreational users. Buyer understands that personal injury, death, dismemberment, or property damage can occur from any type of operation of an off-road recreational vehicle. Buyer accepts and assumes full responsibility for all such dangers and risks and the possibility of personal injury, death, property damage, or loss resulting therefrom and from unsafe operation.
- 28) It is highly recommended that the Buyer or operator of this vehicle: (i) wear a helmet and safety belts at all times during operation of the vehicle and (ii) attend a safety course in operating ATV's, Dirt Bikes, UTV's, or Dune Buggies.

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_

Dealer Signature \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_

Vehicle \_\_\_\_\_ VIN # \_\_\_\_\_ Year \_\_\_\_\_

•1510 W. Bell De Mar Dr. Tempe, AZ 85283 • Phone: 480.813.6363 • Fax: 480.813.6379 •

Must be on file to order parts



## Team Joyner USA Limited Manufacturer's Defect Warranty

Team Joyner USA hereby warrants that new Joyner Off-Road Vehicle purchased from an authorized Joyner dealer worldwide including the United States, Middle East, Europe, Canada, Germany, Spain, or wherever Joyner recreational vehicles are sold by an authorized dealer will be free from defects in material and workmanship for the period of time stated herein, subject to certain stated limitations. Purchasing a Joyner vehicle from a non-authorized Joyner dealer will be without a warranty.

The Period of Warranty for Joyner Off-Road Vehicles shall be ninety (90) days from the date of purchase. The warranty can be voided during the 90 days if found that you have violated any of the below requirements.

During the Period of the Warranty any authorized Joyner dealer will evaluate, repair or replace any part adjudged defective by Joyner due to faulty workmanship or material from the factory. Parts used in warranty repairs will be warranted for the balance of the product's warranty period. All parts replaced under warranty become property of Team Joyner USA. Warranty only covers defective parts, no labor is included. Consumer will pay Joyner dealer direct for any labor charges.

General Exclusions from this warranty that will void the entire warranty shall include any failures caused by:

- a. Competition or racing use.
- b. Installation of parts or accessories that is not qualitatively equivalent to genuine Joyner parts.
- c. Abnormal strain, neglect, or abuse.
- d. Lack of proper maintenance.
- e. Accident or collision damage.
- f. Modification to original parts.
- g. Damage due to improper transportation.
- h. Adjustments from operations.
- i. Damage caused by exceeding travel of vehicle.
- j. Altering the vehicle in any manner.
- k. Placing additional seats.
- l. Turbo chargers and super chargers.
- m. Adding electrical devices that cause electrical failure.
- n. Damage caused by debris; rocks, riverbed, trees, etc.
- o. Damage caused by rollovers due to improper operation of vehicle.
- p. Climbing beyond the capacity of the vehicle.
- q. Operating differential lockers in excess speed of 20 mph.
- r. Abuse and improper operations.
- s. Increasing size of the tire or wheel from the Joyner standard tire and wheel package.
- t. Towing an additional vehicle using a winch for other uses other than pulling the vehicle it is attached to.

Specific Exclusions from this warranty shall include parts replaced due to normal wear or routine maintenance, such as spark plugs, oil, oil filter, air filter, brake shoes, CV Joints, CV Boots, Universal Joints, Cables, water damage to electrical equipment, clutches pressure plates and transmission gear from neglect or miss shifting.

The Customer's Responsibility under this warranty shall be to:

1. Operate and maintain the off road vehicle as specified in the appropriate owner's manual;
2. Give notice to an authorized Joyner dealer of any all apparent defects within ten (10) days after delivery, and make the machine available at that time for inspection and repairs at such dealer's place of business.
3. To operate to the intent of the vehicle use
4. Not to travel in and out of water that is more than twelve (12) inches deep.
5. To not operate at any time in salt water.
6. Not to jump the machine in any manner.
7. To follow all local and state safety regulations.
8. Not to alter the vehicle in any manner.
9. Not to install any additional seating.
10. To check all bolts and nuts prior to any ride.
11. Properly clean and protect the cosmetics of the vehicle.

Additional Warranty Requirements:

1. An authorized Joyner dealer to perform a break in service at ten (10) hours or two hundred and fifty (250) miles whichever comes first. There must be a record that this has been conducted by an authorized dealer in order to obligate Joyner to use the warranty on the vehicles or parts.
2. A record of complete operator maintenance must be kept and at any time a Joyner dealer may request this record to qualify the repair under warranty.
3. All fluid must be changed per the operator's manual. On all transmission or engine failures, this record will be requested.
4. Pre-Delivery Inspection (PDI)  
On each Joyner vehicle a pre delivery inspection form is required. A Joyner dealer is required to perform his procedure with the consumer signing off on all items of the PDI form. It is the Joyner dealer's responsibility to ensure and sign off on the vehicle to its mechanical fitness and make sure all safety equipment is installed.



correctly. The dealer, during their pre delivery inspection is required to use Tamper Proof paint in red, orange, or white to ensure all nuts and bolts are tightened to specifications. The form can be downloaded at [www.teamjoynerusa.com](http://www.teamjoynerusa.com) or request them to be FedExed to you. It is also the consumer's responsibility that the dealer has performed this procedure. Consumers must, within ten (10) days after accepting the vehicle, notify Joyner at 1-866-441-6363 or email [POI@teamjoynerusa.com](mailto:POI@teamjoynerusa.com) or fax to 480-613-6379 in writing that the dealer failed to properly deliver the vehicle to you on an authorized pre delivery inspection form. Failure to properly notify Joyner of this can void the warranty or cause serious injury, death, dismemberment, or damage to the vehicle. Joyner is not responsible for the fitness of the vehicle or the safety of the vehicle if the POI is not performed by the dealer.

**Warranty Notification Procedures-**

Joyner will only accept warranty claims on its prescribed form with an authorized dealer signing off that in fact the part should be covered under warranty. This form must be e-mailed or faxed in signed by a dealer. A current POI form must be on file with Joyner with a dealer's signature and consumer signature accepting delivery of the vehicle order and agreeing to the mandatory liability releases. If dealer determines that the part is not under warranty, you have ten (10) days to dispute this in writing to dealer and Joyner. Consumers can not order warranty parts only authorized Joyner dealerships can.

**Safety-** You should acknowledge that you are entering a very hazardous sport and you could be injured, dismembered, or even lose your life. This could occur from operation failure to completely conduct operator's maintenance or failure to have your vehicle properly delivered to you on an authorized dealer Joyner POI form. It is not the responsibility of Joyner or any of its affiliates to ensure your vehicle will not cause you to be injured, dismembered, or even loss of life. You, without any guaranty of warranty, enter into full awareness of the hazards. It is recommended that you wear proper protection to include Helmet, safety belt, safety netting over doorways and even hand and arm restraints to keep your full body inside the vehicle in case of a roll over. Joyner can not be responsible for any losses of life, limbs, or serious injury. It is recommended that you attend an off road safety course prior to operating this vehicle, or you have agreed to take all responsibilities of operator and passengers.

This warranty is not transferable

**Emission Control System Warranty** - Team Joyner USA also warrants to the ultimate purchaser and each subsequent purchaser of each 2006 and later model Joyner off road vehicles covered by this warranty that the vehicle is designed, built, and equipped so as to conform at the time of sale with all U.S. emissions standards applicable at the time of manufacture and that it is free from defects in materials and workmanship which would cause it not to meet these standards within the period listed immediately below. Failures other than those resulting from defects in material or workmanship which arise solely as a result of owner abuse and/or lack of proper maintenance are not covered by this warranty.

All models-thirty (30) months from the original purchase date.

If at anytime the emission related parts have been altered or removed, or the removal of the certificate that is fixed to the vehicle, the warranty will be null and void. This vehicle must conform to the regulations per EPA and CA Air Resource Board.

Team Joyner USA makes no other warranty of any kind, expressed or implied. All implied warranties of merchantability and fitness for a particular purpose which exceed the obligations and time limits stated in this warranty are hereby disclaimed by Team Joyner USA and excluded from this warranty.

Some States do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Also excluded from this warranty is any incidental or consequential damages including loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**Authorized Dealership**

**Team Joyner USA**  
1510 W. Bell De Mar Dr  
Tempe, AZ 85242  
1-866-441-6363

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City, State, Zip \_\_\_\_\_  
Phone \_\_\_\_\_  
Signature \_\_\_\_\_

**Parts Order Form**  
**Warranty Claim Form**  
**www.teamjoynerusa.com**  
**90 Day Manufacturer Defects Only**  
**Fax# (480) 813-6379**  
**Email: parts@teamjoynerusa.com**

OFFICE USE ONLY

**Parts Department**

Date Received: \_\_\_\_\_  
 Date Processed: \_\_\_\_\_  
 Date Shipped: \_\_\_\_\_  
 Order Complete  
 Yes ☐ No ☐  
 Invoiced to Factory  
 Yes ☐ No ☐

**W/P- 3971**

**Order Date**

**Dealer:** \_\_\_\_\_  
**Contact Name:** \_\_\_\_\_  
**Address:** \_\_\_\_\_  
**City:** \_\_\_\_\_ **ST:** \_\_\_\_\_ **Zip:** \_\_\_\_\_  
**Phone:** \_\_\_\_\_

**Customer Name:** \_\_\_\_\_  
**Address:** \_\_\_\_\_  
**City:** \_\_\_\_\_ **ST:** \_\_\_\_\_ **Zip:** \_\_\_\_\_  
**Phone:** \_\_\_\_\_

SALE DATE	DELIVERY DATE	YEAR	MODEL	VIN#	COLOR

**SYMPTOMS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

QTY	ITEM #	PG. #	PART #	DESCRIPTION	COST	TOTAL	WARRANTY YES OR NO

Payment Method: Cash ☐ Check ☐ Visa ☐ Mastercard ☐ Discover ☐

Drivers License # \_\_\_\_\_ ST: \_\_\_\_\_ EXP: \_\_\_\_\_  
 Card# \_\_\_\_\_ EXP: \_\_\_\_\_ ZIP: \_\_\_\_\_ CVC# \_\_\_\_\_  
I authorize Team Joyner USA to charge my credit card.  
 Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**SUBTOTAL:** \_\_\_\_\_

**TAX:** \_\_\_\_\_

**SHIPPING COST:** \_\_\_\_\_

**SHIPPING IS NOT INCLUDED ON PARTS ORDERS**

Shipping Method: Ground ☐ 2Day ☐ Overnight ☐ Rush Service \$25 Fee ☐

Dealers Signature: \_\_\_\_\_ Date Submitted: \_\_\_\_\_  
Print Name Sign

Exceeding the capability of the machine can cause damage and will not be covered under warranty. Abuse or misuse will not be covered under warranty. The 90 day manufacturers warranty is for defective parts only, not parts that become inoperative from use.

It is the purpose of this form to determine that the customer is qualified for warranty parts. Please note that the following parts are not covered under warranty and are considered as wear parts.

CLUTCH CABLE, THROTTLE CABLE, CLUTCH, BRAKE PADS, MUFFLERS, SHOCKS, LIGHT BULBS, DIRT IN FUEL TANK, DIRT IN CARBURETOR, DAMAGE FROM JUMPING OR EXCEEDING TRAVEL OF MACHINE, THERMOSTAT, TIRE S AND WHEELS, ELECTRICAL PARTS SUCH AS: ALTERNATOR, VOLTAGE REGULATOR

OFFICE USE ONLY

**APPROVED or DECLINED BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_  
 Yes ☐ No ☐ Yes ☐ No ☐ PRINT NAME SIGN

**REMARKS:** \_\_\_\_\_

Operational Failure ☐ Out of Warranty Period ☐ Operational Wear ☐ Pictures Required/Retrieve Part ☐

**PDI MUST BE ON FILE TO PROCESS**

**WE ONLY ACCEPT FAX OR  
 EMAIL ORDERS FOR PARTS-NO  
 PHONE ORDERS!**

**NO ORDERS WILL BE  
 PROCESSED WITH  
 INCOMPLETE  
 INFORMATION**

**TOTAL:** \_\_\_\_\_

**Fax to 480-813-6379**

**No warranty parts can be ordered if not on file  
authorized pre-paid service program at a participating dealership near you.**

Vehicle Information	
Model	Year
Vin #	Color

	Date	Sign off	Miles	Remarks	Name	Phone	Date
Assembly							
EPA and CARB stickers							
Pre Delivery Inspection							
Customer Sign Off							
10 hour or 250 miles							
40 hour or 250 miles							
40 hour or 500 miles							
80 hour or 750 miles							
120 hour or 1000 miles							

Summary Sheets	
Date	Date
_____	_____
_____	_____
_____	_____
_____	_____

Date	Date	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____


Dealership Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone \_\_\_\_\_

**This activates Warranty**

**Date of Purchase** \_\_\_\_\_  
**Customer Signature** \_\_\_\_\_  
*By signing you have agreed to all liability releases and understand warranty.*




# Preventative Maintenance and Service Log


 120 Point Check	Dealership Responsibilities			Recommended Authorized Joynner Dealer or Service Center				Operators Responsibilities Also check prior to each ride			
	Assembly	Pre Delivery Inspection	Customer Initials	10 hour or 250 miles	40 hour or 500 miles	80 hours or 750 miles	120 hours or 1000 miles	Weekly	Monthly	Quarterly	Yearly
Engine											
1) Drive Belt				TA	TA	TA	TA		TA	TA	TA
2) Tighten Bolts On Engine				TA	TA	TA	TA	TA	TA	TA	TA
3) Engine Oil				RC	LF	LF	RC	LF	LF	LF	RC
4) Exhaust				TA	TA	TA	TA	TA	TA	TA	TA
5) Air Filter				RC	LF	LF	RC	LF	LF	LF	RC
6) Manifold Bolts				TA	TA	TA	TA			TA	TA
7) Pulley Bolts				TA	TA	TA	TA	TA	TA	TA	TA
8) Engine Mounts				TA	TA	TA	TA	TA	TA	TA	TA
9) Engine Breather Tube				IC	IC	IC	IC	IC	IC	IC	IC
10) Carburetor				TA	TA	TA	TA	TA	TA	TA	TA
11) All Nuts And Bolts				TA	TA	TA	TA	TA	TA	TA	TA
Transmission											
12) Transmission Fluid				RC	LF	LF	RC	LF	LF	LF	RC
13) Clutch Pedal				LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA
14) Clutch							RC				RC
15) Shifter				LF/TA	LF/TA	LF/TA	LF/TA			LF/TA	LF/TA
16) Transmission Function				IC	IC	IC	IC		IC	IC	IC
17) Clutch Mount				TA	TA	TA	TA	TA	TA	TA	TA
18) Shifter Cables				LF/TA	LF/TA	LF/TA	LF/TA			LF/TA	LF/TA
19) Transmission Mounts				TA	TA	TA	TA	TA	TA	TA	TA
20) All Nuts And Bolts				TA	TA	TA	TA	TA	TA	TA	TA
Ignition											
21) Coil				IC	IC	IC	IC	IC	IC	IC	IC
22) Distributor For Ignition				IC	IC	IC	IC	IC	IC	IC	IC
23) Plug Wires				IC	IC	IC	IC	IC	IC	IC	IC
24) Throttle Choke Cable				LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA
25) Idle				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA
26) All Nuts And Bolts				IC	IC	IC	IC	IC	IC	IC	IC

IC= Inspect And Clean, TA: Tighten And Adjust If Needed, LF= Lubricate And Fill, RC= Replace Or Change

After completing make a copy for your records and fax to 480-813-6379


	Dealership Responsibilities			Recommended Authorized Joynar Dealer or Service Center						Operators Responsibilities Also check prior to each ride			
	Assembly	Pre Delivery Inspection	Customer Initials	10 hour or 250 miles	40 hour or 500 miles	80 hours or 750 miles	120 hours or 1000 miles	Weekly	Monthly	Quarterly	Yearly		
Cooling System				IC/LF	IC/LF	IC/LF	RC	IC/LF	IC/LF	IC/LF	RC		
27) Coolant Level				IC	IC	IC	IC	IC	IC	IC	IC		
28) Coolant Hose And Clamps				TA	TA	TA	TA	TA	TA	TA	TA		
29) Radiator Mount Bolts				TA	TA	TA	TA	TA	TA	TA	TA		
30) Radiator Cap				IC	IC	IC	RC	IC	IC	IC	RC		
31) Fan				TA	TA	TA	TA	TA	TA	TA	TA		
32) Hose Clamps													
Fuel System				TA	TA	TA	TA	TA	TA	TA	TA		
33) Fuel Tank Cover				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA		
34) Breathe Hose And Joint				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	RC		
35) Fuel Hose				TA	TA	TA	TA	TA	TA	TA	TA		
36) Fuel Hose Clamps				IC	IC	IC	IC	IC	IC	IC	IC		
37) Fuel Tank				IC	IC	RC	IC	IC	IC	IC	RC		
38) Fuel Filter				TA	TA	TA	TA	TA	TA	TA	TA		
39) Fuel Regulator				IC	IC	IC	RC		IC	IC	RC		
40) Fuel Pump													
Drive Train				IC	IC	IC	IC	IC	IC	IC	IC		
41) Axles				IC	IC	IC	IC	IC	IC	IC	IC		
42) Cv Joint				IC	IC/LF	IC	RC	IC	IC	IC	RC		
43) Drive Shaft				LF	LF	LF	LF	LF	LF	LF	LF		
44) Cv Bouts				IC	IC	IC	RC	IC	IC	IC	RC		
45) Spindle				TA	TA	TA	TA	TA	TA	TA	TA		
46) Bearings				IC/LF	IC/LF	IC/LF	RC	IC	IC	IC	RC		
47) Castle Nuts				TA	TA	TA	TA	TA	TA	TA	TA		
48) Cotter Pins				RC	RC	RC	RC	RC	RC	RC	RC		
49) Differential Front				TA	TA	TA	TA	TA	TA	TA	TA		
50) Differential Front Cable				TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF		
51) Front Gear Oil				RC	LF	RC	LF	LF	LF	RC	RC		

IC= Inspect And Clean, TA: Tighten And Adjust If Needed, LF= Lubricate And Fill, RC= Replace Or Change


	Dealership Responsibilities			Recommended Authorized Joyner Dealer or Service Center					Operators Responsibilities Also check prior to each ride			
	Asse mbly	Pre Delivery Inspection	Customer Initials	10 hour or 250 miles	40 hour or 500 miles	80 hours or 750 miles	120 hours or 1000 miles	Weekly	Monthly	Quarterly	Yearly	
52) Differential Breather Tub Front				IC	IC	IC	IC	IC	IC	IC	IC	
53) Differential Rear				TA	TA	TA	TA	TA	TA	TA	TA	
54) Differential Rear Cable				TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	
55) Differential Breather Tub Rear				IC	IC	IC	IC	IC	IC	IC	IC	
56) Rear Gear Oil				RC	LF	RC	LF	LF	LF	RC	RC	
57) Axle Nuts				TA	TA	TA	TA	TA	TA	TA	TA	
58) Wheel Studs Nuts				TA	TA	TA	TA	TA	TA	TA	TA	
59) Ball Joint Bolts				TA	TA	TA	TA	TA	TA	TA	TA	
60) 4x4 Lockers				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	
Brakes												
61) Brake Pads				IC	IC	IC	RC	IC	IC	IC	RC	
62) Brake Fluid Level				LF	LF	LF	RC	LF	LF	LF	RC	
63) Rotors				IC	IC	IC	IC	IC	IC	IC	IC	
64) Calipers				IC/TA	IC/TA	IC/TA	IC/TA	IC	IC/TA	IC/TA	IC/TA	
65) Brake Lines				IC	IC	IC	IC	IC	IC	IC	IC	
66) Master Cylinder				IC/TA	IC/TA	IC/TA	IC/TA	IC	IC/TA	IC/TA	IC/TA	
67) Brake Pedal				LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	
68) Emergency Brake				IC	IC	IC	IC	IC	IC	IC	IC	
69) Emergency Brake Cable				LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	
70) Emergency Brake Pads				IC	IC	IC	RC	IC	IC	IC	RC	
71) Emergency Brake Fluid				LF	LF	LF	RC	LF	LF	LF	RC	
72) Three Way Brake Valve				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	
73) All Nuts And Bolts				TA	TA	TA	TA	TA	TA	TA	TA	
74) Wire And Plugs				IC	IC	IC	IC	IC	IC	IC	IC	
Electrical												
75) Battery				IC/LF	IC/LF	IC/LF	RC	IC/LF	IC/LF	IC/LF	RC	
76) motor				IC	IC	IC	IC	IC	IC	IC	IC	
77) Starter				IC	IC	IC	IC	IC	IC	IC	IC	

IC= Inspect And Clean, TA: Tighten And Adjust If Needed, LF= Lubricate And Fill, RC= Replace Or Change



	Dealership Responsibilities			Recommended Authorized Joyner Dealer or Service Center							Operators Responsibilities Also check prior to each ride			
	Assembly	Pre Delivery Inspection	Customer Initials	10 hour or 250 miles	40 hour or 500 miles	80 hours or 750 miles	120 hours or 1000 miles	Weekly	Monthly	Quarterly	Yearly			
78) Connection				IC	IC	IC	IC	IC	IC	IC	IC			
79) Voltage Regulator				IC	IC	IC	IC	IC	IC	IC	IC			
80) Gauge's				IC	IC	IC	IC	IC	IC	IC	IC			
81) Lighting				IC	IC	IC	IC	IC	IC	IC	IC			
82) All Nuts And Bolts				TA	TA	TA	TA	TA	TA	TA	TA			
83) Horn				IC	IC	IC	IC	IC	IC	IC	IC			
Suspension														
84) Tires				IC	IC	IC	IC	IC	IC	IC	IC			
85) Tire Air Pressure				TA	TA	TA	TA	TA	TA	TA	TA			
86) Wheels And Bearing				LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA	LF/TA			
87) A-Arms				TA	TA	TA	TA	TA	TA	TA	TA			
88) Swing Arms				TA	TA	TA	TA	TA	TA	TA	TA			
89) Shocks Rear				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA			
90) Tighten Nuts On The Hub And Wheel				TA	TA	TA	TA	TA	TA	TA	TA			
91) Shock Bolts				TA	TA	TA	TA	TA	TA	TA	TA			
92) A-Arm Bolts				TA	TA	TA	TA	TA	TA	TA	TA			
93) Tie Rod				TA	TA	TA	TA	TA	TA	TA	TA			
94) Ball Joint				TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF			
95) Heim Joints				TA	TA	TA	TA	TA	TA	TA	TA			
96) Shocks Front				TA	TA	TA	TA	TA	TA	TA	TA			
97) Nitrogen				TA	TA	TA	TA	TA	TA	TA	TA			
98) All Nuts And Bolts				TA	TA	TA	TA	TA	TA	TA	TA			
Steering														
99) Steering Wheel				TA	TA	TA	TA	TA	TA	TA	TA			
100) Steering Box				TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF			
101) Steering Rod Bolts				TA	TA	TA	TA	TA	TA	TA	TA			
102) Ball Joints				TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF	TA/LF			
103) Rod Ends				TA	TA	TA	TA	TA	TA	TA	TA			
104) Heim Joint				TA	TA	TA	TA	TA	TA	TA	TA			
105) All Nuts And Bolts				TA	TA	TA	TA	TA	TA	TA	TA			

IC= Inspect And Clean, TA: Tighten And Adjust If Needed, LF= Lubricate And Fill, RC= Replace Or Change

	Dealership Responsibilities			Recommended Authorized Joyner Dealer or Service Center					Operators Responsibilities Also check prior to each ride			
	Assembly	Pre Delivery Inspection	Customer Initial	10 hour or 250 miles	40 hour or 500 miles	80 hours or 750 miles	120 hours or 1000 miles	Weekly	Monthly	Quarterly	Yearly	
Chassis												
106) Welds				IC	IC	IC	IC	IC	IC	IC	IC	
107) Roll Bar Connection				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	
108) Floor Panels				TA	TA	TA	TA	TA	TA	TA	TA	
109) Skid Plates				TA	TA	TA	TA	TA	TA	TA	TA	
110) Winch Function				IC	IC	IC	IC	IC	IC	IC	IC	
111) Winch Mount				TA	TA	TA	TA	TA	TA	TA	TA	
112) Seat Belts				TA	TA	TA	TA	TA	TA	TA	TA	
113) Seat Belt Mounts				TA	TA	TA	TA	TA	TA	TA	TA	
Cosmetics												
114) Body Kits				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	
115) Hood				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	
116) Dump Bed				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	
117) Safari Rack				IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	IC/TA	
118) Light Bar Rack				TA	TA	TA	TA	TA	TA	TA	TA	
119) Dash Panel				TA	TA	TA	TA	TA	TA	TA	TA	
120) Seats				TA	TA	TA	TA	TA	TA	TA	TA	

IC= Inspect And Clean, TA: Tighten And Adjust If Needed, LF= Lubricate And Fill, RC= Replace Or Change

Warranty can be voided by Joyner or dealership if the proper maintenance and service has not been conducted

The service record must be faxed in when requesting warranty parts effective 2-15-08. No exceptions!!!!

Fax 480-813-6379

Release of liability required to be on file to order parts.

We reserve the right at any time to not sell or supply parts to the dealer or consumer for any reason.

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# **OWNER'S MANUAL**

## **1.FOREWORD**

Thank you for choosing our Off highway recreational vehicle. We hope you will have fun with it. Before you drive the Off highway recreational vehicle, please read through this Owner's Manual carefully as it contains important safety and maintenance information. Failure to follow the warnings contained in this manual can result in serious injuries.

Be sure to follow the recommended maintenance schedule and service your kart accordingly. Preventive maintenance is extremely important to the longevity of your Off highway recreational vehicle.

We hope you will have a pleasant experience with our products and thanks again for choosing US.

## 2.A FEW WORDS ABOUT SAFETY


In order to keep everyone safe, you must take responsibility for the safe operation of your Off highway recreational vehicle.

To help you make informed decisions about safety, we have provided operating procedures and other information on labels and in this manual. This information alerts you to potential hazards that could hurt you or others.

It is not practical or possible to warn you about all hazards associated with operating or maintaining a Off highway recreational vehicle. You must use your own good judgment.

You will find important safety information in a variety of forms, including:

Safety Labels - On the Off highway recreational vehicle.

Safety Messages – Preceded by a safety alert symbol  and one of two signals: WARNING, or CAUTION.

These signal words mean:



Physical harm may result from failure to adhere to the instructions that are described within the WARNING labels.

Safety Headings---It means important safety reminders or important safety precautions.

Safety Section --- It means Off highway recreational vehicle safety.

Instructions --- how to use this Off highway recreational vehicle correctly and safely.

This entire manual is filled with important safety information----please read it carefully.

### **3.IMPORTANT SAFETY INFORMATION**

Your Off highway recreational vehicle will provide you with many years of service and pleasure. Providing you take responsibility for your own safety and understand the challenges you can meet while driving.

There is much that you can do to protect yourself when you drive. You'll find many helpful recommendations throughout this manual. The following are a few that we consider most important.

#### **Follow the Age Recommendation**

It is strongly recommended that no one under the age of 16 be permitted to drive this Off highway recreational vehicle without adult supervision.

#### **Always Wear a Helmet**

It's a proven fact: helmets significantly reduce the number and severity of head injuries. Always wear an approved motorcycle helmet. We also recommend that you wear eye protection, sturdy boots, gloves, and other protective gear.

#### **Drive Off-Road Only**

Your Off highway recreational vehicle is designed and manufactured for off-road use only. The tires are not made for pavement, and the Off highway recreational vehicle does not have some features required for use on public roads.

#### **Take Time to Learn & Practice**

Even if you have derived other Off highway recreational vehicle, take time to become familiar with how this Off highway recreational vehicle works and handles. Practice in a safe area until you build your skills and get accustomed to this Off highway recreational vehicle's size and weight.

Because many accidents involve inexperienced or untrained drivers, we urge all drivers to take a training course approved by the Off highway recreational vehicle Safety Institute. Check with your dealer for more information on training courses.

#### **Be Alert for Off-Road Hazards**

The terrain can present a variety of challenges when you drive off-road. Continually "read" the terrain for unexpected turns, drop-offs, rocks, ruts, and other hazards. Always keep your speed low enough to allow time to see and react to hazards.

#### **Drive within Your Limits**

Pushing limits is another major cause of Off highway recreational vehicle accidents. Never drive beyond your personal abilities or faster than conditions warrant. Remember that alcohol, drugs, fatigue, and inattention can significantly reduce your ability to make good judgments and drive safely.

#### **Don't Drink and drive**

Alcohol and driving don't mix. Even one drink can reduce your ability to respond to changing conditions, and your reaction time gets worse with every additional drink. So don't drink and drive, and don't let your friends drink and drive either.

#### **Never run your Off highway recreational vehicle indoors.**

The exhaust from the engine contains a tasteless, odorless and poisonous gas called carbon monoxide.



**Keep away from moving parts of the Off highway recreational vehicle**

The operator of the Off highway recreational vehicle should never place their hands or other parts of their body near any moving part of the Off highway recreational vehicle. Failure to adhere to this warning will cause physical harm to your body.

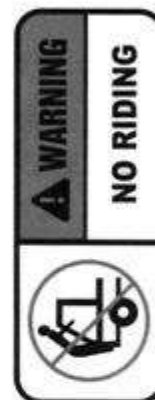
**Skidding or Sliding**

The terrain surface can be a major factor affecting turns, Skidding a turn is more likely to occur on slippery surfaces such as snow, ice, mud and loose gravel. If you skid on ice, you may lose all directional control. To avoid skidding on slippery terrain, keep you speed low and drive carefully.

## 4.SAFETY LABELS

This section presents some of the most important information and recommendations to help you drive your Off highway recreational vehicle safely. Spend a few moments to read these pages.

The labels are considered permanent parts of the Off highway recreational vehicle. If a label comes off or becomes hard to read, contact your dealer for warning labels replacements.



## 5. ARE YOU READY TO DRIVE?

Before each drive, you need to make sure you and your Off highway recreational vehicle are both ready to drive. To help get you prepared, this section discusses how to evaluate your driving readiness, what items you should check on your Off highway recreational vehicle, and adjustments to make for your comfort, convenience, or safety.

**Before you drive your Off highway recreational vehicle for the first time, we urge you to:**

- Read this owner's manual and the labels on your Off highway recreational vehicle carefully.
- Make sure you understand all the safety messages.
- Know how to operate all the controls.
- Have adult present if under 16 years old.

**Before each drive, be sure:**

- You feel well and are in good physical and mental condition.
- You are wearing an approved motorcycle helmet (with chin strap tightened securely), eye protection, and other protective clothing.
- You don't have any alcohol or drugs in your system.

### Protective Apparel

For your safety, we strongly recommend that you always wear an approved motorcycle helmet, eye protection, boots, gloves, long pants, and long-sleeved shirt or jacket whenever you drive.

Although complete protection is not possible, wearing proper wear can reduce the chance of injury when you drive.

The following suggestions will help you choose the proper driving wear.

- Helmets and Eyes Protection

Your helmet is your most important piece of driving gear because it offers the best protection against head injuries. A helmet should fit your head comfortably and securely.

- An open-face helmet offers some protection, but a full-face helmet offers more. Regardless of the style, look for a DOT (Department of Transportation) sticker in any helmet you buy. Always wear a face shield or goggles to protect your eyes and help your vision.



Operating this Off highway recreational vehicle without wearing an approved motorcycle helmet, eye protection, and protective clothing could increase your chances of head and/or eye injury, possibly death in the event of severe accident.

Always wear approved motorcycle helmet that fits properly and wear eye protection (goggles or face shield), gloves, boots, long-sleeved shirt or jacket and long pants.

- Additional Driving Wear

In addition to a helmet and eye protection, we also recommend:

1. Sturdy off-road motorcycle boots to help protect your feet, ankles, and lower legs  
Off-road motorcycle gloves to help protect your hands.
2. Driving pants with knee and hip pads, a driving jersey with padded elbows, and a chest/shoulder protector.

## Drive Training

Developing your driving skills is an on-going process. Even if you have derived other Off highway recreational vehicles, take time to become familiar with how this Off highway recreational vehicle works and handles. To build skills, practice driving the Off highway recreational vehicle in a safe area, do not drive in rough terrain until you get accustomed to the Off highway recreational vehicle's controls, and feel comfortable with its size and weight.



### WARNING

Operating Off highway recreational vehicle without proper instruction could increase your risk of an accident, which could lead to serious injury or death.



### WARNING

Attempt supporting with your hands to the ground when the Off highway recreational vehicle turning over could lead to serious injury or death.

Never support with your hands to ground when the Off highway recreational vehicle will turn over.

## Age Recommendation

It is strongly recommended that no one under the age of 16 be permitted this Off highway recreational vehicle without adult supervision.



### WARNING

A child driving a Off highway recreational vehicle that is not recommended for his/her age could lose Off highway recreational vehicle control and result in severe injury or death.

A child under 16 should have adult supervision when operate on the Off highway recreational vehicle.

## No Alcohol or Drugs

Alcohol, drugs and Off highway recreational vehicles don't mix. Even a small amount of alcohol can impair your ability to operate a Off highway recreational vehicle safely. Likewise, drugs-even if prescribed by a physician-can be dangerous while operating a Off highway recreational vehicle. Consult your doctor to be sure it is safe to operate a vehicle after taking medication.



### WARNING

Operating this Off highway recreational vehicle after alcohol or drugs can seriously affect your judgment, cause you to react more slowly, affect your balance and perception, and could result in serious injury or death.

Never consume alcohol or drugs before or while operating this Off highway recreational vehicle.

## 6.IS YOUR VEHICLE READY TO DRIVE?

Before each drive, it is important to inspect your Off highway recreational vehicle and make sure any problems are away. A pre-drive inspection is necessary, not only for safety, but also for comfort. Because any a breakdown, or even a flat tire, can be a major inconvenience.

If your Off highway recreational vehicle has overturned or has been involved in a collision, do not drive it until your dealer has inspected your Off highway recreational vehicle, There may be damages or other problems you cannot see.



Improperly maintaining this Off highway recreational vehicle or failing to correct a problem before driving can cause a crash in which you can be seriously hurt even die.

Always perform a pre-drive inspection before every drive and correct each problem.

### Pre-drive Inspection

Check the following items before you get on the Off highway recreational vehicle:

- Engine Oil

Check the oil level and add oil if needed. Check for leaks.

- Fuel

Check the fuel level and add fuel if needed. Also make sure the fuel fill cap is securely fastened. Check for leaks.

- Tires

Use a gauge to check the air pressure. Adjust if needed. Also look for signs of damages or excessive wear.

- Nuts & Bolts

Check the wheels to see that the axle nuts are tightened, Use a wrench to make sure all accessible nuts; bolts, and fasteners are tight.

- Under body & Exhaust System

Check for and remove any dirt, vegetation or other debris that could be fire hazard or interfere with the proper operation of the Off highway recreational vehicle.

- Air Cleaner Housing Drain Tube

Check for deposits in the drain tube. If necessary, clean the tube and check the air cleaner housing.

- Leaks, Loose Parts

Walk around you Off highway recreational vehicle and look for anything that appears unusual, such as a leak or loose cable.

- Lights

Make sure the headlight; brake light and taillight are working properly.



- Throttle  
Check the free play and adjust if needed. Press the throttle to make sure it moves smoothly without sticking, and snaps back automatically when it is released.
- Brakes  
Press the brake pedal several times, check for proper brake pedal free play. Make sure there is no brake fluid leakage.
- Steering Wheel  
Check that the wheels turn properly as you turn the steering wheel.
- Cable  
Check the cable housing for wear. Check the fittings for looseness. Replace or tighten as needed.
- Tie rod  
Check the tie rod housing for wear. Check the fittings for looseness. Replace or tighten as needed.

## 7.SAFE DRIVING PRECAUTIONS

### Off-Road Use Only

Your Off highway recreational vehicle and its tires are designed and manufactured for off-road use only, not for pavement. Driving on pavement can affect handling and control. You should not drive your Off highway recreational vehicle on pavement.



#### **WARNING**

Operating this Off highway recreational vehicle on paved surfaces may seriously affect handling and control of the Off highway recreational vehicle, and may cause the vehicle to go out of control.

Never operate the Off highway recreational vehicle on any paved surfaces, including sidewalks, driveways, parking lots and streets.

When driving off-road, also remember to always obey local off-road driving laws and regulations. Obtain permission to drive on private property. Avoid posted areas and obey “no trespassing” signs.

You should never drive your Off highway recreational vehicle on public streets, roads or highways, even if they are not paved. Drivers of street vehicles may have difficulty seeing and avoiding you, which could lead to a collision. In many states it is illegal to operate Off highway recreational vehicles on public streets, roads and highways.



#### **WARNING**

Operating this Off highway recreational vehicle on public streets, roads or highways can cause collision with other vehicle.

Never operate this Off highway recreational vehicle on any public streets, roads or highways, even dirt or gravel one.

### Keep Hands and Feet on Controls

Always keep both hands on the steering wheel and both feet on the foot controls. When driving your Off highway recreational vehicle. It is important to maintain your balance and to control of the Off highway recreational vehicle. Removing hands or foot away from the controls can reduce your ability to react control of the kart.



#### **WARNING**

Removing hand from Steering wheel or feet from foot controls during operation can reduce your ability to control the Off highway recreational vehicle or could cause you to lose your balance and fall off the Off highway recreational vehicle.

Always keep both hand on the steering wheel and both feet on the foot controls of your Off highway recreational vehicle during operation.

## Control Speed

Driving at excessive speed increases the chance of an accident. In choosing a proper speed, you need to consider the capability of your Off highway recreational vehicle, the terrain, visibility and other operating conditions, plus your own skills and experience.



Operating this Off highway recreational vehicle at excessive speeds increases your chances of losing control of the Off highway recreational vehicle, which can result in an accident.

Always drive at a speed that is proper for your Off highway recreational vehicle, the terrain, visibility and other operating conditions, and your experience.

## Use Care on Unfamiliar or Rough Terrain

Before driving in a new area, always check the terrain thoroughly. Don't drive fast on unfamiliar terrain or when visibility is limited. (It's sometimes difficult to see obstructions like hidden rocks, bumps, or holes in time to react).



Failure to use extra care when Operating this Off highway recreational vehicle on unfamiliar terrain could result in the Off highway recreational vehicle overturning or going out of control.

Go slowly and be extra careful when operating on unfamiliar terrain. Always be alert to changing terrain conditions when operating the Off highway recreational vehicle.

Never drive past the limit of visibility. Maintain a safe distance between your Off highway recreational vehicle and other off-road vehicles. Always exercise caution and use extra care on rough, slippery and loose terrain.



Failure to use extra care when operating on excessively rough, slippery or loose terrain could cause loss of traction or vehicle control, which could result in an accident, including an overturn.

Do not operate on excessively rough, slippery or loose terrain until you have learned and practiced the skills necessary to control the Off highway recreational vehicle on such terrain. Always be especially cautious on these kinds of terrain.

## Do Not Perform Stunts

You should always operate your Off highway recreational vehicle in a safe and reasonable manner. When driving, always keep all four wheels on the ground.



Attempting wheelies, and other stunts increases the chance of an accident, including an overturn.

Never attempt stunts, such as wheelies or jumps. Don't try to show off.

## 8.SPECIFICATIONS

### DIMENSIONS

Overall Length-----	113 in. (2880mm)
Overall Width -----	68in. (1740mm)
Overall Height -----	67in. (1700mm)
Wheelbase -----	82 in. (2090mm)
Front Track -----	58 in. (1475mm)
Rear Track -----	58in.(1470mm)
Ground Clearance -----	12 1/2in. (320mm)

### ENGINE

Type -----	3-Bore, 4-Stroke, Liquid-cooled
Bore x Stroke -----	72mmx66.5mm
Displacement -----	812cc
Corrected compression ratio -----	9.5:1
Carburetor -----	Electric Fuel Injection
Output Maximum Power -----	37KW
Maximum Torque -----	70NW
Starting -----	Electric
Ignition -----	C.D.I
Lubrication -----	Force & Splash
Transmission -----	manual clutch, 4 shift/Reverse
Fuel type -----	RQ93 (unleaded)
Engine oil-----	SAE-10W/30
Gear oil-----	GL-4 75W/90

### CAPACITIES

Maximum load -----	200kg
Fuel tank -----	36L
Engine oil -----	2900ml
Gear oil -----	2000ml
Coolant -----	5500ml
Starting -----	<5s
Climbing -----	20°-25°
Battery -----	12V45Ah
Head Light -----	12V 55/55W/Both
Tail Light -----	12V10W/5W/21W/Both
Spot light -----	12V35W/Four
Main Fuse -----	50A
Brake Track -----	< 7m @ 20miles/h
Top speed -----	60miles/h (or limited as customers require)

### CHASSIS

Front, Rear brake -----	Hydraulic disc, right foot control
Front tire -----	25x8-12
Rear tire -----	25x11-12
Front tire -----	27x8-12(Option)
Rear tire -----	27x11-12(Option)
Front Suspension -----	Independent Dual A-Arm
Rear Suspension -----	Longitudinal Control Arm
Final Drive -----	shaft driven

### TIRE PRESSURE

Front -----	70kpa 0.7kg/c m² 10psi
Rear -----	70kpa 0.7kg/c m² 10psi

### WEIGHT

Net Weight -----	500kg
------------------	-------

Warranty (factory limited scope) -----	90 Days
----------------------------------------	---------



## 9. OPERATION INSTRUCTION

**WARNING-**Do not attempts to start or operate the engine until completely familiar with the location and use of each control necessary to operate this vehicle. Operator must know how to stop this machine before starting and driving it.

### Control pedal

1) **Accelerator Pedal:** Changes engine rpm and vehicle ground speed. Press down on the accelerator pedal with your foot to increase speed and let up on the pedal to decrease speed. (See figure 1)



### WARNING

Each time prior to starting the engine, check the throttle assembly to ensure that when pedal is pushed all the way forward the assembly is working smoothly and returns to idle when released. Do not operate if pedal or engine throttles linkage fail to return to idle. If unable to correct the problem through lubrication, adjustment or replacement of worn parts, contact your dealer for assistance.

- 2) **Brake Pedal:** Applying pressure to the brake pedal instead of the accelerator pedal with your foot will slow down and/or stop the vehicle. Riding or resting your foot on the pedal unnecessary will wear the brakes out prematurely. (See figure 1)
- 3) **Clutch Pedal:** Applying pressure to the clutch pedal with your left foot will make gearbox to declutch and let up the pedal to clutch. (See figure 1)

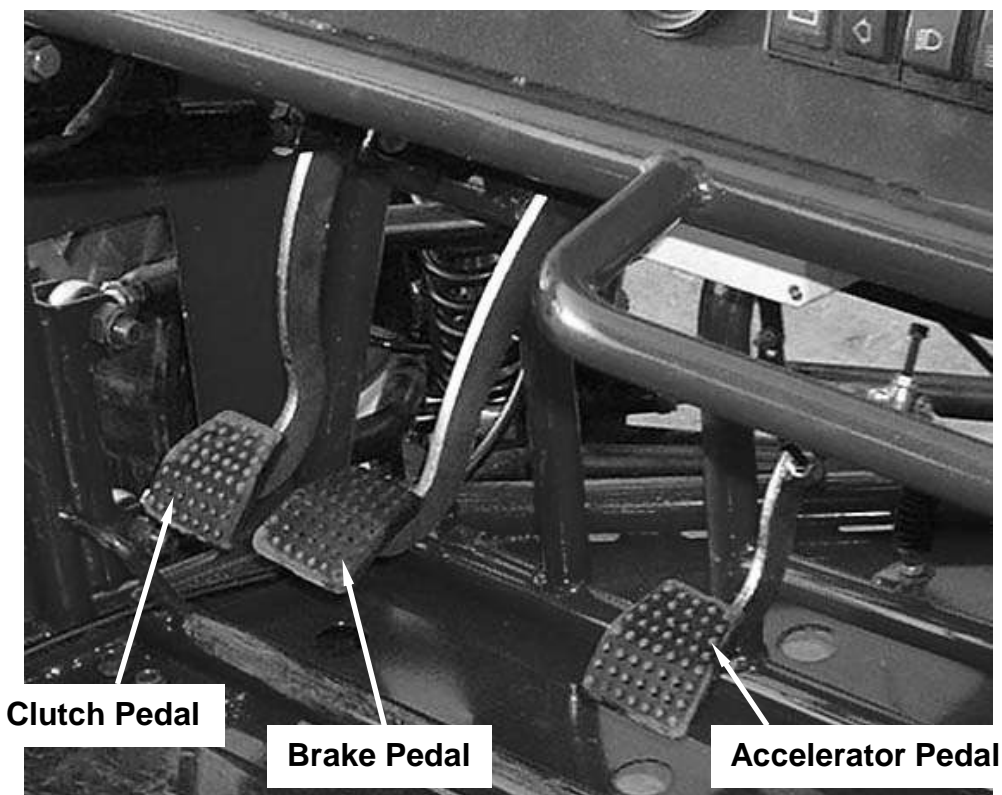


FIGURE 1

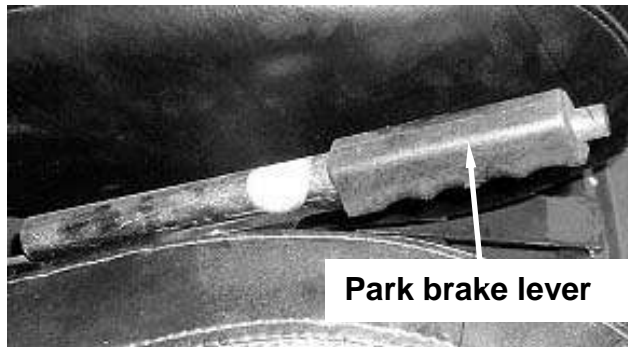
### Park brake lever and shift selector

4) **Park Brake Lever:** Sets and releases the park brakes. Do not drive vehicle with park brake lever set. (See figure 2)

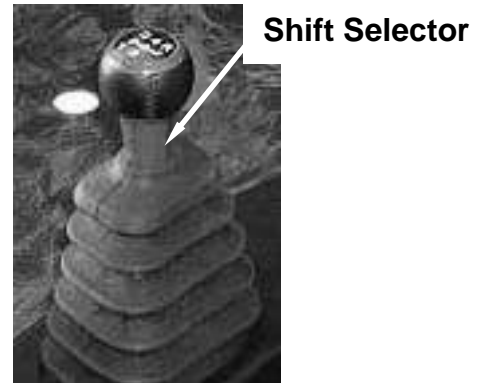
- Set park brakes: pull-up on the park brake lever until the lever is tight.
- Release park brakes: Pull-up on the park brake lever, depress the release button and push the lever

5) **Shift Selector:** Changes trans-axle gears from neutral to forward or reverse. Always start engine in neutral. (See figure 3)

- Pull up on shift selector collar and move lever to position “1” “2” “3” “4”, the vehicle will move forwards at different speed.
- Pull up on shift selector collar and move lever to center position to place trans-axe in neutral.
- Pull up on shift selector collar and move lever to position “R”, the vehicle will move backwards.



**FIGURE 2**



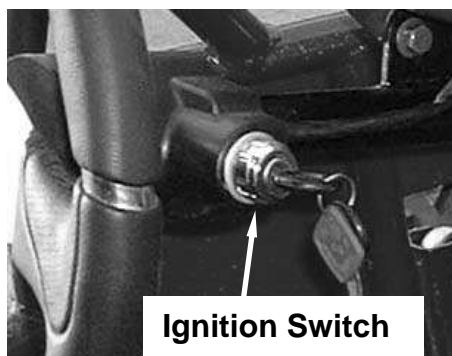
**FIGURE 3**

### Switch

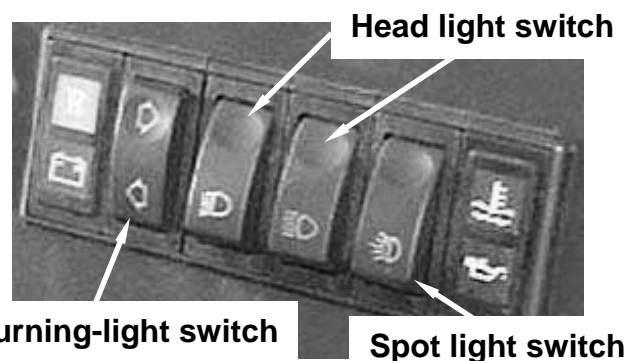
6) **Ignition Switch:** Pull firmly up on the park brake lever with your hand until the lever is tight. Set shift selector in neutral. Insert the key into key-switch, turn the key clockwise, and release the key when the engine starts. (Warning: Don't crank starter more than 5 seconds at one time). (See figure 4)

7) **Turning-light switch:** control the turning- light. Press the top of button down and the right turning light work; Press the bottom of button down and the left turning light work; Set the button in neutral while moving in line. (See figure 5)

8) **Head light switch:** control the headlight far beam or lower beam. Press the lower-beam button down and the head light work as lower beam, the far-beam button and work as far beam. (See figure 5)



**FIGURE 4**



**FIGURE 5**

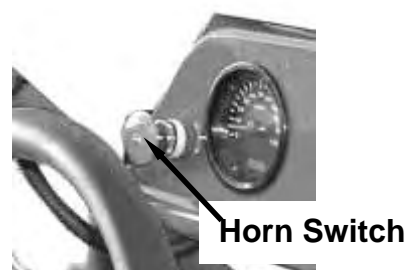
9) **Park Brake Light switch:** control the 4 turning lights on or off. Pull the park-brake-light switch out and the 4 turning lights illuminate together. (See figure 6)

10) **Horn Switch:** control the horn. Press the horn button down and hold, the horn buzz. (See figure 7)

11) **Spot light switch:** control the 4 spot- lights on or off.



**FIGURE 7**



**FIGURE 6**

## Indicating and gauges

12) **Speedometer**: Indicates the speed vehicle is moving at. It warns you to drive at proper speed. (See figure 8)

13) **Tachometer**: Indicates the RPM of engine. (See figure 8)

14) **Coolant temperature indicator**: indicate the temperature of coolant, if the temperature is above  $120^{\circ}\text{C}/248^{\circ}\text{F}$ . Stop engine immediately. Check coolant lever and add if low, see authorized JOYNER dealer if temperature indicator stay on and overflow tank is full of coolant. (See figure 8)

15) **Voltmeter**: Indicates battery is charging. Check battery if voltmeter registers a charge that is lower than normal. See your authorized JOYNER dealer if battery is good and voltmeter still register low charge (See figure 8)

16) **Fuel level gauge**: The fuel gauge displays approximately how much fuel you have in the fuel tank. Always park the vehicle on level ground to get an accurate reading. The fuel tank is empty when the fuel gauge-needle points to 0 and full when the needle points to 1. (See figure 8)

17) **Oil pressure gauge**: Indicates oil pressure. If the needle point to red area, stop engine immediately. Check oil level and add if low. See authorized Joyner dealer if needle stays on and engine is full of oil. (See figure 8)

18) **Reverse gear light**: indicate reverse gear engaged if illuminated. (See figure 9)

19) **Battery charge light**: If indicator light is on, stop and check battery or charging. If it is off, indicate battery is charging. (See figure 9)

20) **Coolant temperature light**: indicate coolant temperature is above  $120^{\circ}\text{C}$ . (See figure 9)

21) **Oil pressure light**: Indicates low/high oil pressure when illuminated, see authorized JOYNER dealer if necessary. (See figure 9)

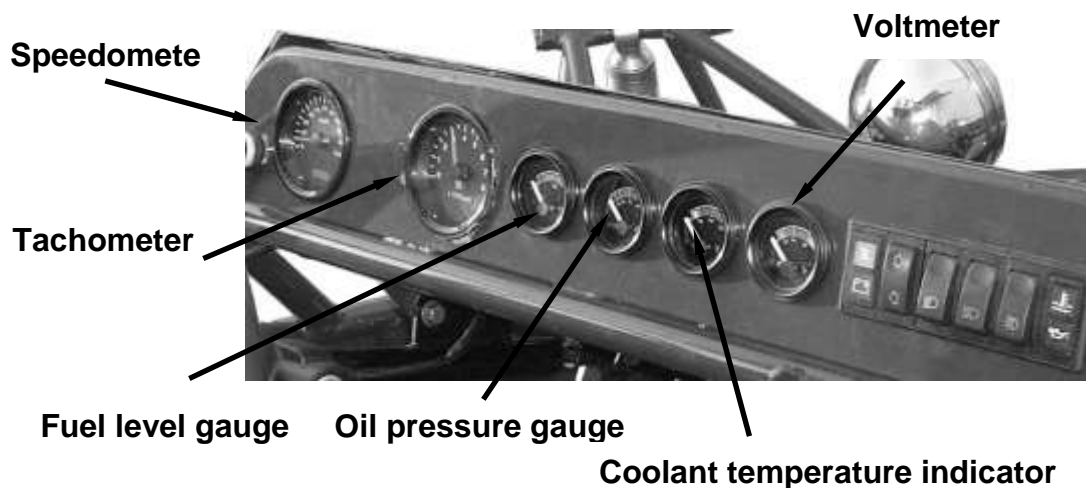


FIGURE 8



FIGURE 9

## Passengers

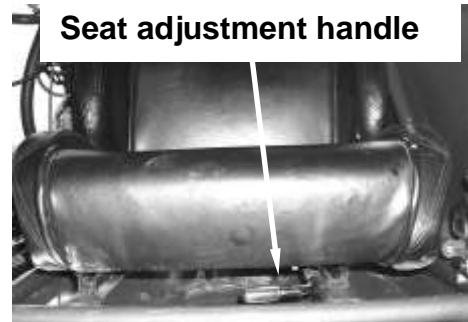
The vehicle allows for two riders only. Make sure you brief your passenger on proper safety procedures like keeping hands, arms, feet and other bodily appendages inside the vehicle. Passengers should only be transported in factory-supplied seating.

Operator and passenger are responsible for deciding if their situation warrants using Seat Belts.

## Seat

The seats must always be securely fastened in the position which best affords the operator control of the foot pedals, steering wheel, and the remote stop button. (See figure 10)

- a. Pull seat adjustment handle upward to disengage seat slide.
- b. Move seat to desired position.
- c. Be sure seat adjustment handle snaps back into place and that seat is locked into position.



**FIGURE 10**



### **WARNING**

Before attempting to adjust the seat ensure that engine of the Off highway recreational vehicle is stopped.



### **WARNING**

Never operate this Off highway recreational vehicle when the provided seat is not securely fastened, to do so could result in a strong possibility of severe personal injury or loss of life. Before attempting to adjust the seat ensure that engine of Off highway recreational vehicle is stopped.



## 10.MAINTENANCE

### Chassis Maintenance

#### 1. Tire Maintenance

Use only tires recommended by Joyner. It is important for your safety and the safety of others that the tires have correct air pressure. Check air pressure in four tires before each use. Visually inspect tires for loss of air throughout each day of operation. See Tire inflation Chart below for correct tire pressure.

Tire Inflation Chart	
Tire	Inflation PSI
Front Tires	15
Rear Tires	15

#### 2. Shift Adjustment

After a long time of use, it is necessary to adjust the shift cable to make shift clear, screw the thin nut show in the following figure clockwise or counter clockwise to move the shift cable at a proper position where you can shift clearly and smoothly, and then tighten the shin nut.(See figure 11,12)

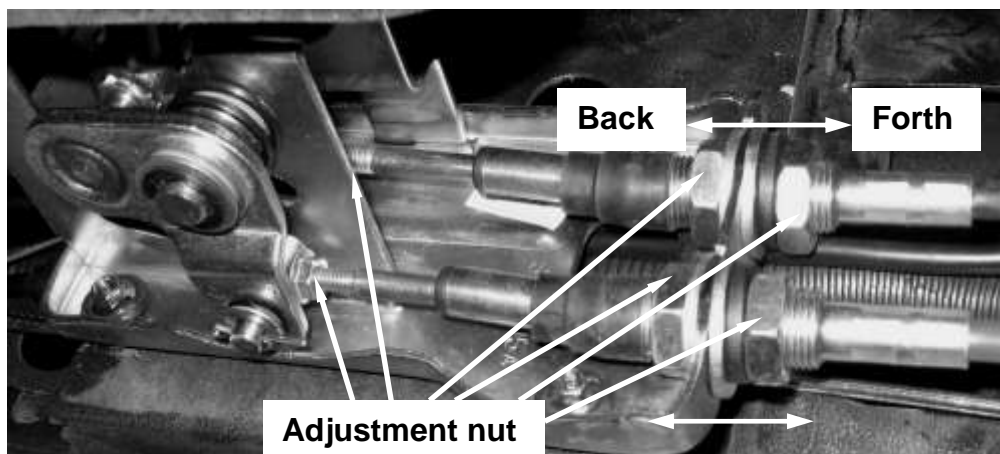


FIGURE 11

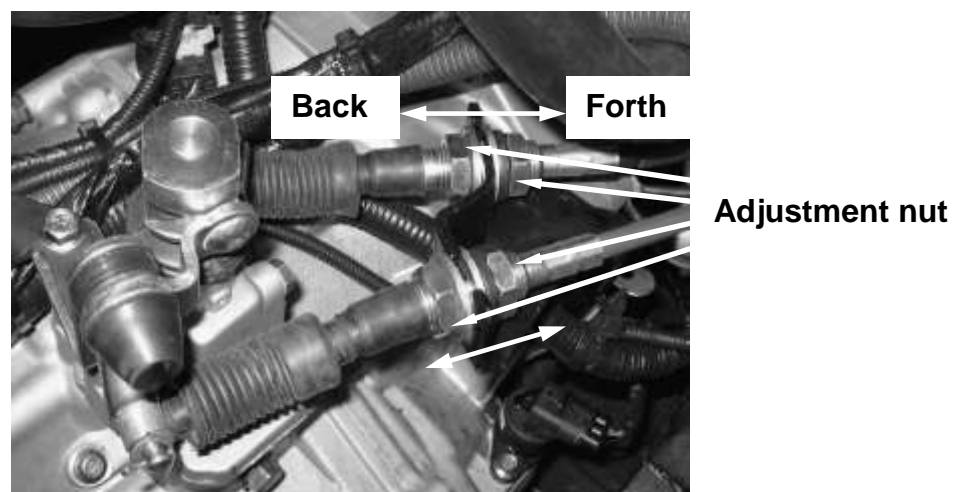
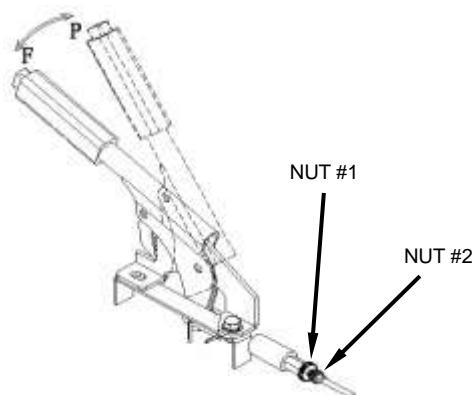


FIGURE 12

### 3. Parking Adjustment

Pull the park brake lever up so that the unit can engage park brake. To release the unit, press button on front end of parking lever then push the parking lever to the bottom. Adjust the parking cable if necessary. (See figure 13)



**FIGURE 13**

### 4. Break-in

The first month is most important in the life of your vehicle. Proper operation during this break-in period will help assure maximum life and performance from your new vehicle. The following guidelines explain proper break-in procedures.

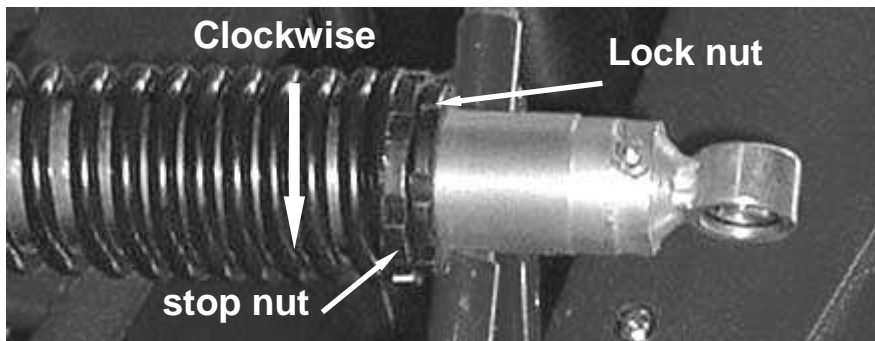
- 4.1. After the engine starts, the engine is not allowed in high speed in the neutral gearshift.
- 4.2. Drive vehicle from stop to low speed slowly.
- 4.3. Avoid braking strongly.
- 4.4. Do not exceed the vehicle speed on the below schedule.

The speed of vehicle	The first 1000 km		
Max speed in each gear	1 <sup>st</sup>	Gear	25km/h
	2 <sup>nd</sup>	Gear	45km/h
	3 <sup>rd</sup>	Gear	70 km/h
	4 <sup>th</sup>	Gear	90km/h

### 5. Shock Absorber Adjustment

After a long time of use, it is necessary to adjust the spring as following: **(See figure 14)**

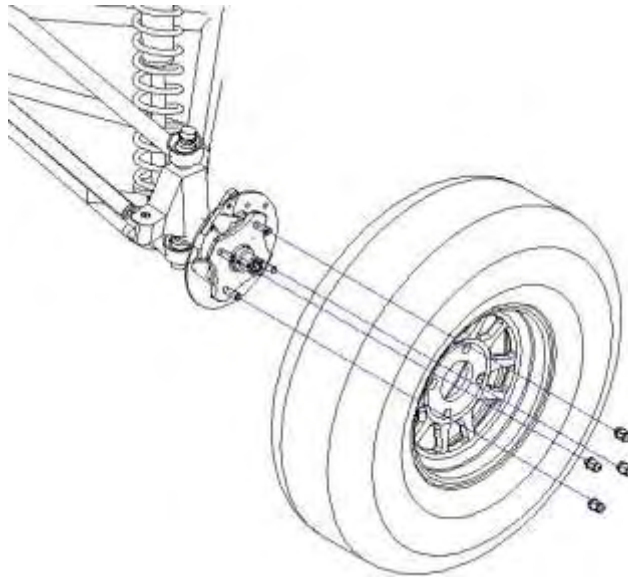
- 5.1. Loosen the lock nut with a shock absorber wrench (by Joyner);
- 5.2. Screw the stop-nut clockwise, and the tension of shock spring will increase; decrease as screw to left.
- 5.3. If necessary, inflate with nitrogen, control the pressure lower than **0.8MP /116PSI**.



**FIGURE 14**

## 6. Front Wheel Replacement

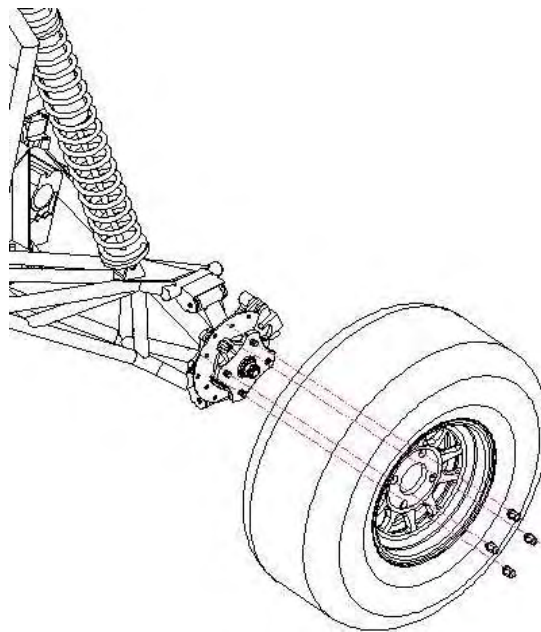
Do not disassemble the center castle nuts when you replace the front wheels (See Fig. 15). Tighten the nuts after replacing the wheels.



**FIGURE 15**

## 7. Rear Wheel Replacement

Do not disassemble the center castle nuts when you replace the rear wheels (See Fig. 16). Tighten the nuts after replacing the wheels.



**FIGURE 16**

## 8. Clutch replacement

Remove two bolts, and demount Starter-assembly carefully. (See Fig. 17-20)



FIGURE 17

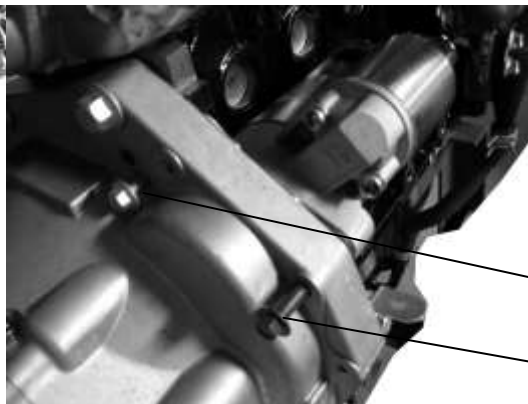


FIGURE 18



FIGURE 20



FIGURE 19

2. Remove four bolts on the transmission case, lay down these carefully. **Caution:** When fix the four bolts in the transmission case; you must tighten them according to the prescribed torque **45-55N.M.** (See Fig. 21-24)



FIGURE 22

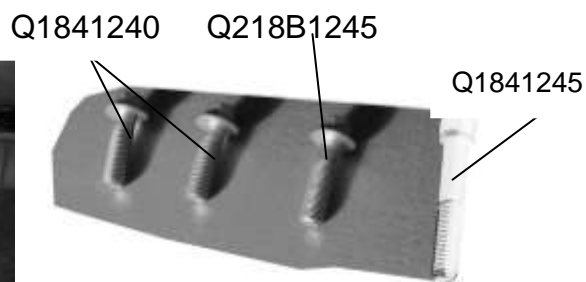
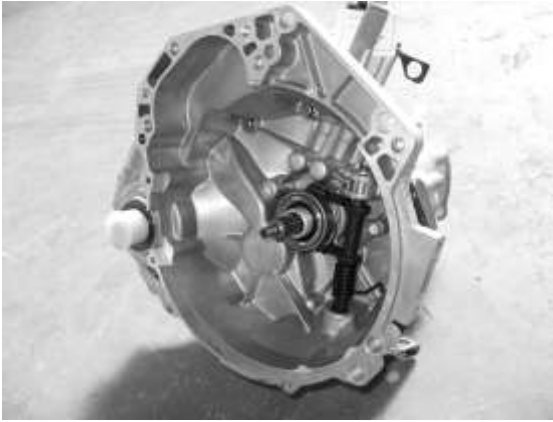
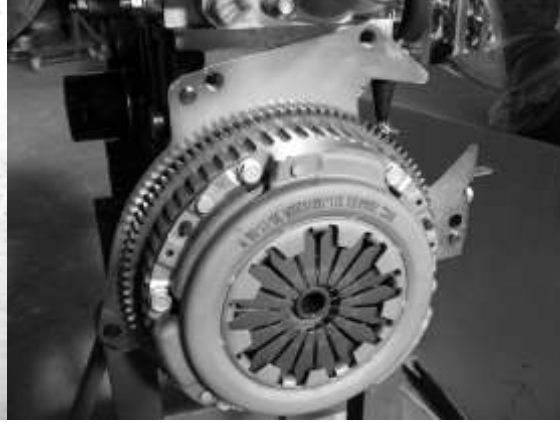


FIGURE 21



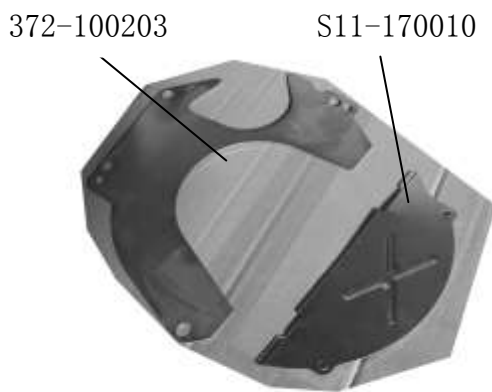


**FIGURE 23**



**FIGURE 24**

3. Remove upper steel cushions and lower steel cushion. (See Fig. 25-26)



**FIGURE 25**



**FIGURE 26**

4. Insert a spine-shaft into the hole of the Clutch assy , remove the six bolts on the Clutch pressure plate, now It's clear. **Caution:** When fix the six bolts in the Clutch pressure plate; you must tighten them according to the prescribed **torque 28 N.M.** (See Fig. 27-31)



**FIGURE 27**

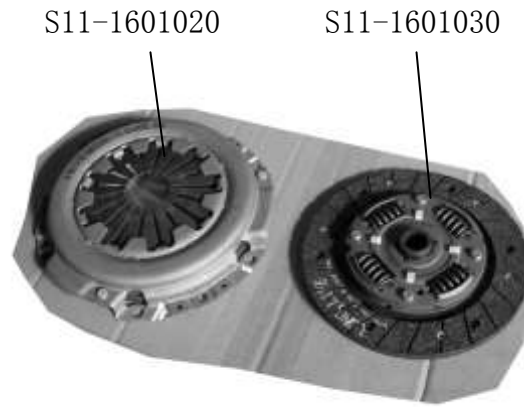


**FIGURE 28**

Spline-shaft



**FIGURE 29**



**FIGURE 30**



**FIGURE 31**

5. Insert a spline-shaft into the hole of the Clutch assy , fix the six bolts on the Clutch pressure plate , tighten them according to the prescribed **torque 28 N.M** . (See Fig. 32-33)



**FIGURE 32**

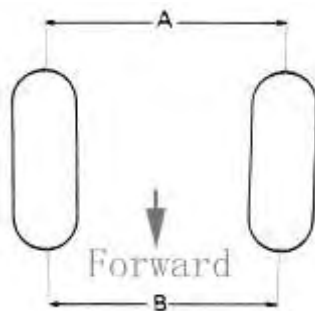


**FIGURE 33**

6. Fix parts according to reverse operation to the disassembly.

## 9. Front Wheel Alignment

- 9.1. Put the vehicle on level ground.
- 9.2. The “toe-in” of the front wheels should be 0.63 inches. To check alignment, measure distance A and B between the centerline (CL) of the wheels. The proper toe-in dimension A should be 0.63 inches greater than dimension B.
- 9.3. To adjust the alignments, loose the lock nuts on both sides of Front Tie Rods. To make Dimension B smaller, turn the rod to the left. Turn the rod to the right to make Dimension B larger. After adjusted to desired length, tighten the lock nut against the rod end. Recheck the dimensions for proper alignment.



**FIGURE 34**

## 10. Cleaning Instructions

Keep your Off highway recreational vehicle clean. With a clean rag, wipe off any dirt and oil from around controls. Wipe off any spilled fuel and oil. Keep the engine clean of foreign object and be sure to check that air intake fan is free of debris for proper cooling.

## 11. Off highway recreational vehicle Lubrication

Lubricate vehicle every 90 days of use, Apply several drops of oil in specific points.

## 12. Storage Instruction

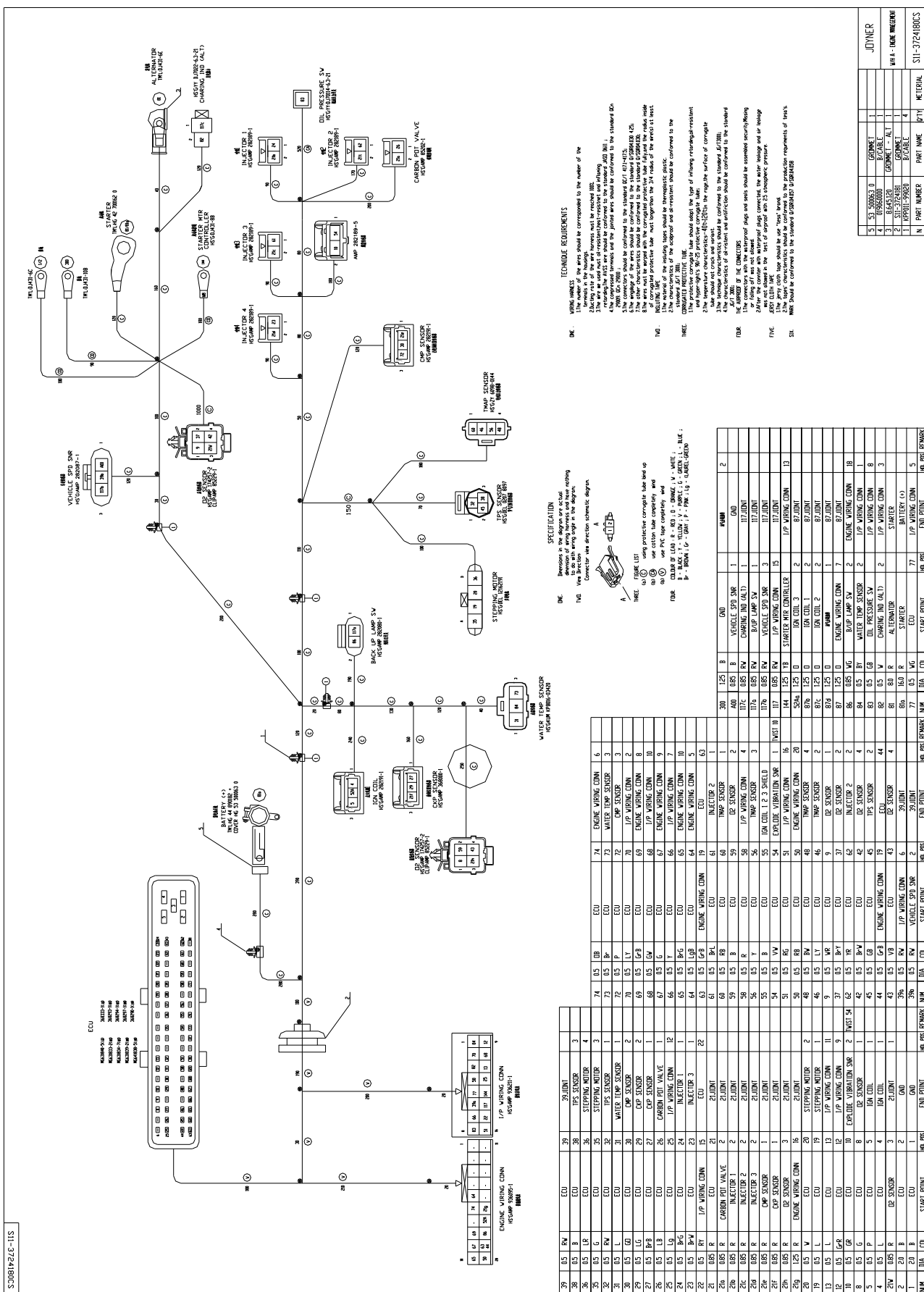
In the event your Off highway recreational vehicle is not to be operated for periods in excess of 30 days or at the end of each driving season prepare for storage as follows:

- 12.1. Drain fuel tank by allowing engine to run out of fuel, or use a fuel stabilizer.
- 12.2. Lubricate engine cylinder by removing the spark plug and pour one ounce of clean lubricating oil through the spark plug hole into the cylinder. Crank the engine slowly to spread oil and replace spark plug.
- 12.3. Do not save or store gasoline over winter. Using old gasoline, which has deteriorated from storage, will cause hard starting and affect engine performance.

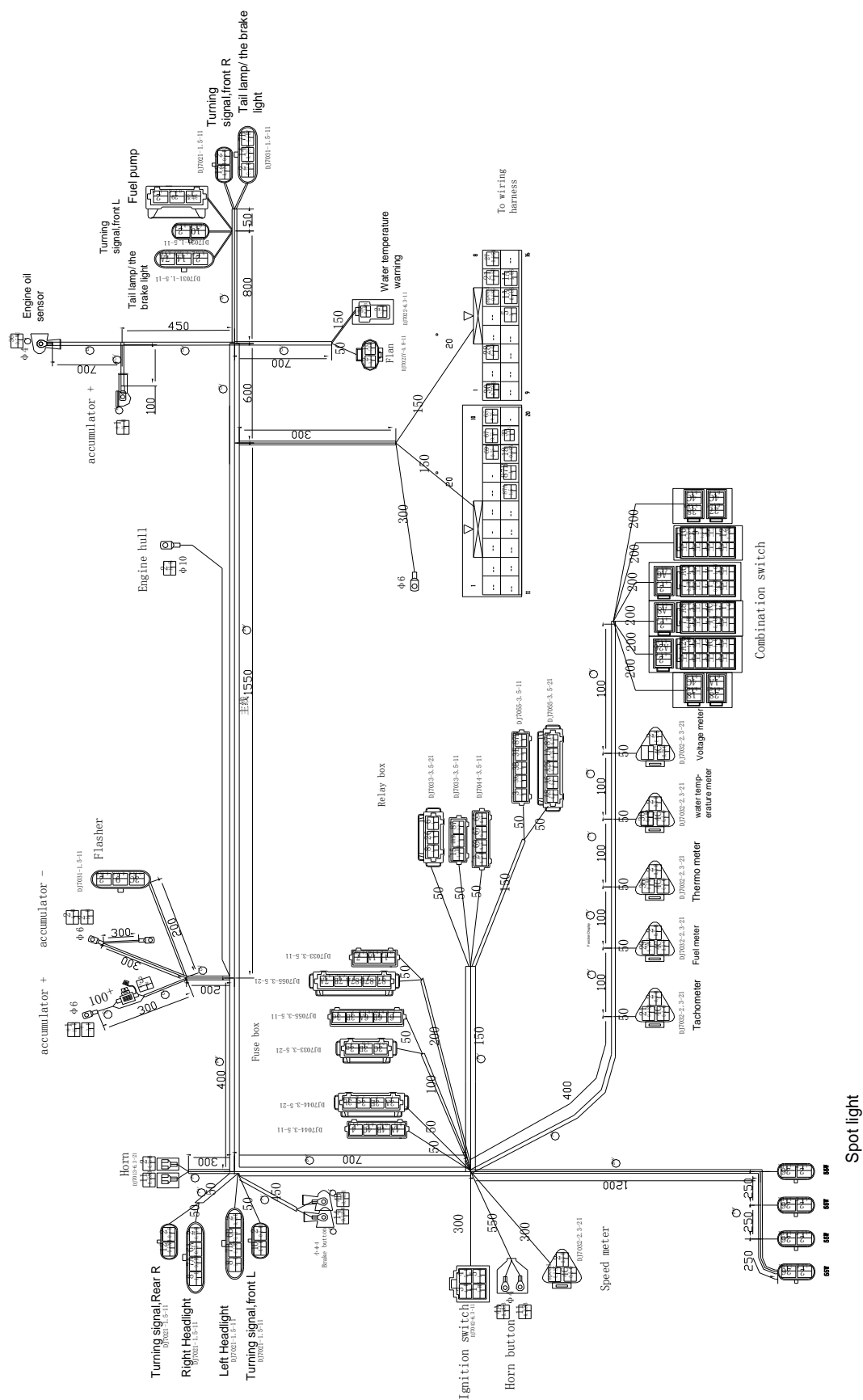


**Do not drain fuel while engine is hot. Be sure to move Off highway recreational vehicle outside before draining fuel.**

### 13.ENGINE WIRING DIAGRAM



## 14.MAIN WIRING DIAGRAM





## Engine maintenance

### 1. Service Air Filter

Service air filter every 80 hours

NOTE: Service more often under dusty conditions.

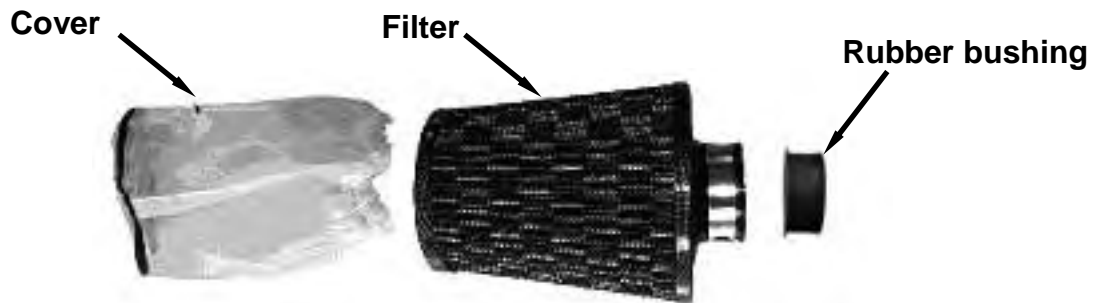


FIGURE 35

Remove filter cover (**See Fig. 35**). Check the filter cover and the air filter, if the filter cover and the air filter are dusty, please clear the filter cover and replace with a new air filter.

## 2. Engine Lubrication

### 2.1 Engine oil replacement

You must change the oil in the crankcase after the first 10 hours of operating of your new engine and after 40 hours of use thereafter. That will insure proper lubrication of internal parts and prevent costly repairs due to excessive wear. (See Fig. 36-38)



FIGURE 36

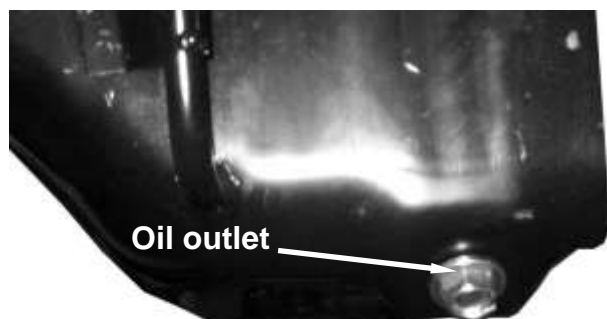


FIGURE 38

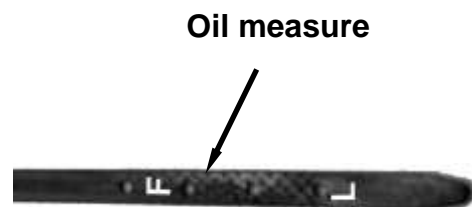


FIGURE 37

- 2.1.1. With the engine warm, put the vehicle on the level ground.
  - 2.1.2. Shut down the engine, put a collecting oil plate under the engine oil outlet. Let the engine oil out fully (**see Fig. 38**).
  - 2.1.3. Tighten the engine oil outlet plug.
  - 2.1.4. Remove the oil filler cap (**see Fig. 36**), fill oil (SAE 10W/30-50 ) about 3.86 liters to the engine.
  - 2.1.5. Pull out the engine oil dip stick (**see Fig. 36**), confirm the corrective oil level in the crankcase (**see Fig. 37**).
- 2.2. Check engine oil and recharge**
- 2.2.1. If the color of engine oil changes, you need to replace the engine oil as above.
  - 2.2.2. Check the engine oil level; charge from 2.1.4 as above if the oil level is lower than “L”,

### 3. Transmission lubrication

#### 3.1.Oil replacement

You must change the oil in the transmission refer to preventative maintenance log after the first 10 hours of operating of your new engine and after 40 hours of use thereafter. That will insure proper lubrication of internal parts and prevent costly repairs due to excessive wear (See Fig. 39).



**FIGURE 39**

**Oil inlet**

- 3.1.1. Put the vehicle on the level ground.
- 3.1.2. Shut down the engine, put a collecting oil plate under the transmission oil outlet. Loosen the oil outlet plug in the transmission. Let the transmission oil out fully (**see Fig. 36、 38**).
- 3.1.3. Remove the iron dust plug, this plug has a magnet on it. Iron dust caused by moving parts will stick to the plug. Clean the iron dust from this dust plug (**see Fig. 38**).
- 3.1.4. Tighten the transmission oil outlet plug and the iron dust plug(**see Fig. 38**).
- 3.1.5. Remove the plug (**see Fig. 39**), fill oil (API 80(75) W-90 GL-3/ GL-5 Gear Oil ) about 2.0 liters.

#### 3.2. Check transmission oil

If the color of transmission oil changes, you need to replace oil. Replace transmission oil as above.

### 4. Engine Coolant

#### 4.1. Add Coolant

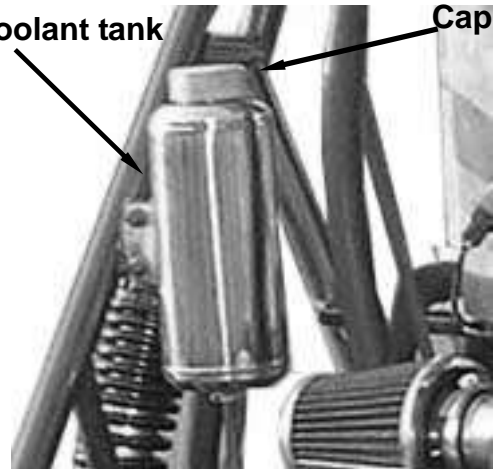
You must check the coolant for level and leaks. If it is low, you need to refill coolant into the radiator (approximately 6000 ml). The lack of coolant will cause the engine to overheat.

This can cause engine damage. (See Fig. 40)

The coolant should always be topped up, since the coolant can evaporate.



**FIGURE 40**



**FIGURE 41**

- 4.1.1. Put the vehicle on level ground.
- 4.1.2. Turn the coolant cap counterclockwise and open the cap **(see Fig. 40)**.
- 4.1.3. Pour fresh coolant to filler neck, Start the engine at idle.
- 4.1.4. Increase the engine rev's a few times.
- 4.1.5. Repeat 2,3,4 till the coolant is at neck and no bubbles come up.
- 4.1.6. Refit the coolant cap, turn it clockwise and tighten it.
- 4.1.7. Turn the reserve coolant case cap counterclockwise and open the cap **(see Fig. 41)**.
- 4.1.8. Pour fresh coolant of the specified type into the reserve coolant tank till the coolant reaches 2/5 to 3/5 of the reserve coolant tank volume.
- 4.1.9. Close the reserve coolant case cap, turn it clockwise and tighten it.



**Opening the radiator cap while the engine is hot can be hazardous. Opening the radiator cap can spray the high temperature coolant in your eyes, face and any parts of your body. This can result in severe injury.**

**Never open the radiator cap while the engine is hot.**



## WARNING

New and used coolant can be hazardous.  
Children and pets may be harmed by new or used coolant.  
Continuous or brief contact with coolant may be dangerous for your health.

Keep new and used coolant away from the children and pets. To minimize your exposure to new and used coolant, wear a long sleeve shirt and moisture-proof gloves (such as dishwashing gloves) when you change coolant. If coolant contacts your skin, wash thoroughly with soap and water. Wash any clothing or rags if wet with coolant. Recycle or properly dispose of used coolant.



## WARNING

Harm or damage may occur if using coolant does not meet the specification that is 50% standard green coolant and 50% distill water.

### 5. Idle Speed

#### 5.1. Adjustment

Never make unnecessary adjustments. The factory recommended settings are correct for most applications. It's not necessary to disassemble the screw unless the idle speed needs to adjustment. (See Fig. 43)

Warm up the engine (5~10min)

- 5.2. Connect the tachometer; adjust the throttle to limit the idle speed. The standard value is (800-900RPM).
- 5.3. Adjust the screw and adjust the idle speed to an ideal value.
- 5.4. Repeat step 5.2 until the RPM of engine stables.



FIGURE 42

## 6. ENGINE MECHANICAL SYSTEMS

### 372 mechanical systems


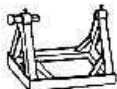

#### Forewords

In order to help the technical servicing personnel to have correct understanding and good command of the JNSZ800MV vehicle, and to master the skills for fast repairs and rational maintenance, a special edition of the “372 Engine Mechanics Division” is compiled and published.

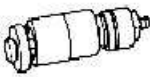

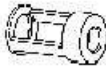


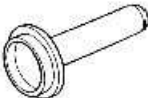

This Manual gives a detailed description on the dismounting, installation, checks and tests, adjustments and diagnoses, technical standards and specifications for adjustments and diagnoses of various parts and components as well as subsystems of 372 engines. This Manual is published by Joyner Co., Ltd.


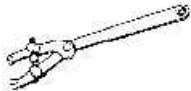

## Chapter 1 Special tools


### 1. Special tools for maintenance:

	Outer appearance	Code and Name	Purpose
S		Auxiliary devices for engine dismounting and checks	Mounting onto engine dismounting and check stand
		Engine dismounting and check stand	Dismounting and installing engine
		Clockwise belt wheel wrench	Camshaft clockwise belt wheel dismounting



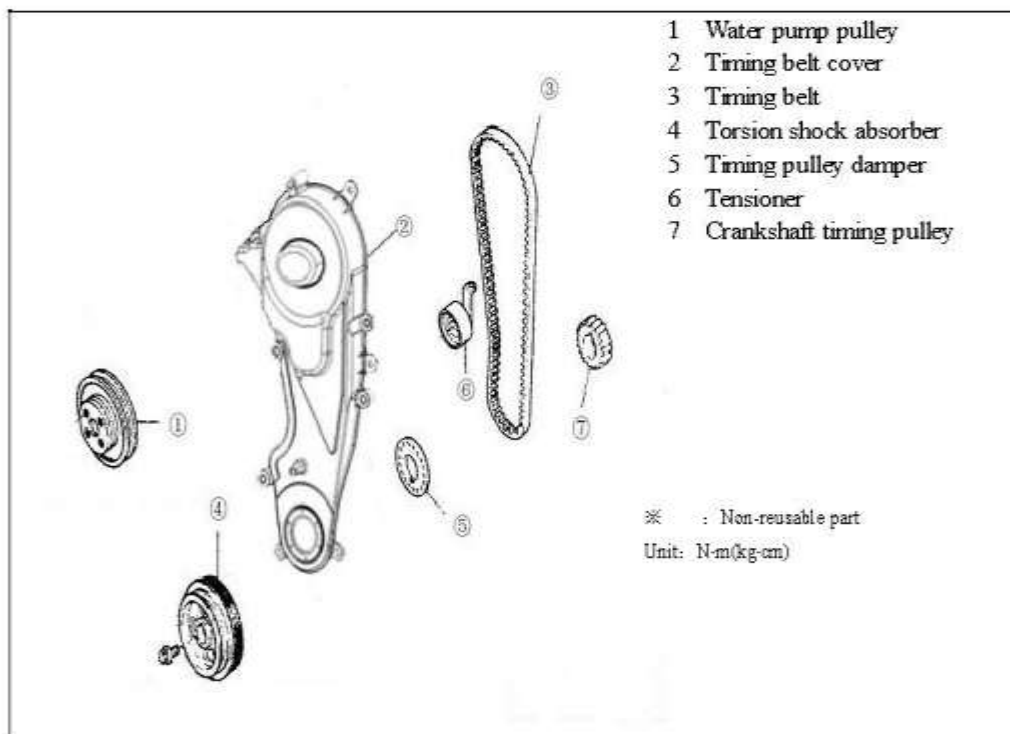
S     T		Spring bush pulling and removing device	Installing crankshaft oil seal
		Valve locking block removal device	Dismounting and installation of valve spring locks
		Auxiliary tools	
		Flying wheel fixture	Dismounting and installation of crankshaft
		Valve guiding pipe punch	Removing and installation of valve guiding pipe
		Shaft oil seal replacer	
		Oil seal stand screw driver	

	Outer appearance	Code and Name	Purpose
		Crankshaft belt wheel fixture	<b>Remove and install</b> crankshaft belt wheel
		Wrench	Remove and install camshaft slave gear wheel
			Replace valve spacing adjust washer

		Water pump pulley assembly wrench	water pump Assembly
Measuring tools	Clearance gauge, calipers, Micrometer, ruler, centesimal meter, cylinder gauge, pressure meter, torque wrench		
Tool	Piston ring dismounting device		
Oils	Engine lubricating oil, bond		

## Chapter 2 Timing Belt Service

### 1. Configuration diagram



Remove torsional vibration damper.

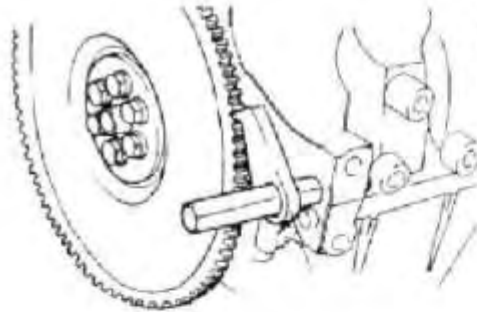


Remove water pump pulley.

Remove the water pump pulley according to the illustration.

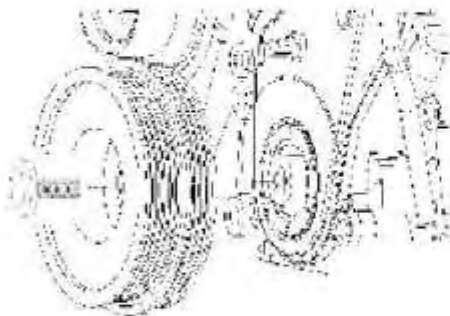


Remove it with screwdriver and wrench according to the illustration.



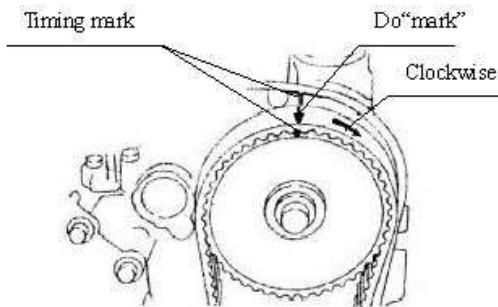
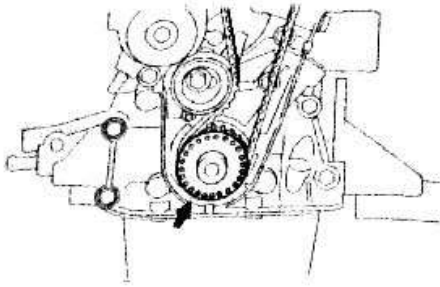
Remove torsional vibration damper

(1) Fix the flywheel and prevent the gear ring from rotating.



(2) Remove bolt of torsional vibration damper.

Remove timing cover cap  
 Torque:  $6\pm 1\text{N.m}$   
 Remove timing pulley damper

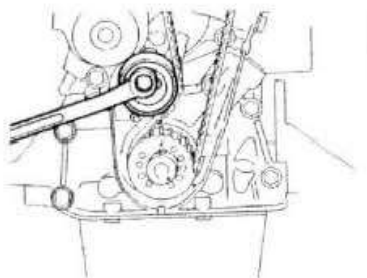
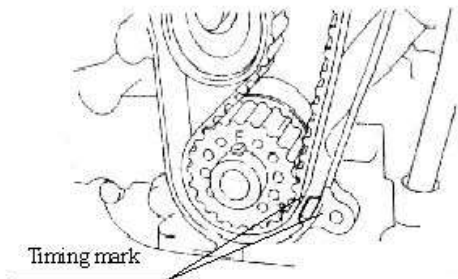


Remove the tensioner

- (1) Carry out the operation at the upper thrust point of compression of the first cylinder piston
- (2) After removing the timing cover cap, turn the bolt and rotate the timing gear clockwise with wrench, align timing mark of camshaft timing gear with the cam mark of camshaft cover cap;

Attention: You can rotate the engine clockwise only, after installing the pulley,  
 Before removal, make a arrow mark on the position of timing mark, assemble according to original state.

- (3) Make sure that the crankshaft timing pulley wheel mark is aligned with the mark of the oil pump.



- (4) Remove the tensioner bolt, and take off the tensioner

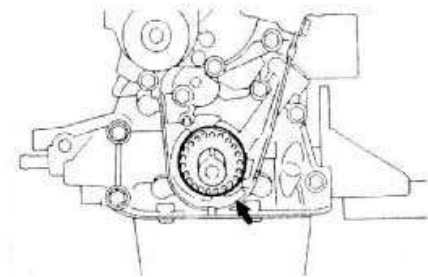
Remove the timing belt.

**[Caution]** It is absolutely not allowed to use screw driver or some other sharp-edged tools to remove the belt.

Attention: Pay attention to the following points while using timing belt:

- Don't bend the belt even at a small angle, otherwise it will result in rope fracture inside the belt.
- - Service life of belt is short, don't pollute the belt with grease and water.
- You have no choice but rotate the engine clockwise after installing the belt.

2.7 Remove the crankshaft timing gear



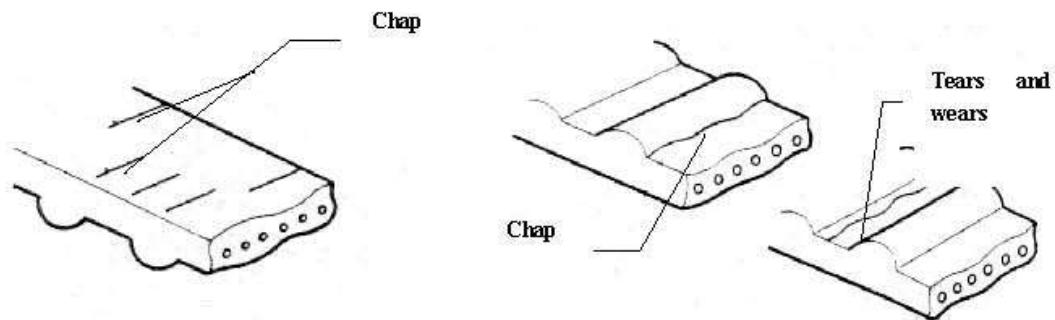


3 Make careful and detailed checks on the timing belt. Replace with new parts if any of the conditions shown in the figure occurs.

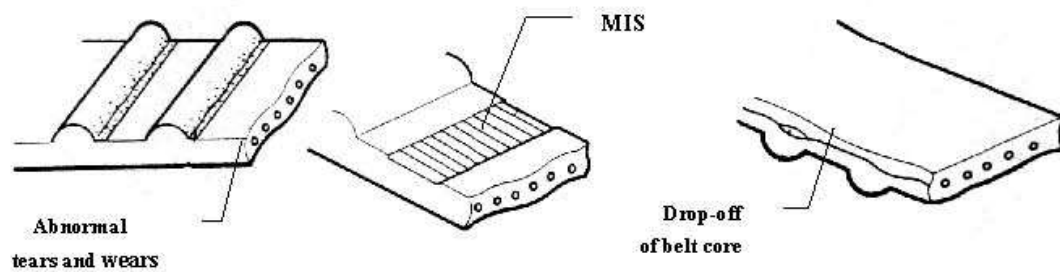
3.1 Cracks on the back side rubber;

3.2 Cracks of teeth roots, cracks clearing off the fabric lining layer;

3.3 Tears and wears of fabric lining layer, missing rear teeth, broken teeth, etc.



3.4 Abnormal tears and wears on belt sides



3.5 Even if the damages on the outer appearance can not be confirmed, the belt should be replaced under any of the following circumstances:

3.5.1 If the water in the water pump is leaked, which makes it necessary to refill the water continuously;

3.5.2 There are much oil stains on the belt, the belt should be replaced for the rubber will be damaged when it is expanded;

3.6 Specifications and model of the timing belt

Part number	372-1007081
Belt wide	2 5 .3mm

### 3.7 Timing belt tensioner

Turn the belt tensioner supporting stand bolts to see if there are any abnormal sound. Check to see if there are any damages on the contacting surface of the belt.

Specifications and model of the timing belt tensioner

Part number	372-1007030
Wide	2 7 . 0 mm
Outside diameter	φ50mm

### 3.8 Check to see if there are any damages on the outer appearance

Specifications and model of clockwise pulley

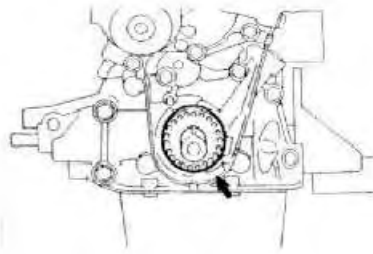
Item	Model	E F
		G L 、 Z L 、 G S 、 Z S
Diameter of camshaft timing gear (mm)		φ110.7 <sup>+0.1</sup> <sub>-0.2</sub>
Diameter of crankshaft timing gear (mm)		φ54.65 <sup>+0.7</sup> <sub>-0.13</sub>

### 3.9 Baffle of crankshaft timing gear

Check to see if there is any deformation

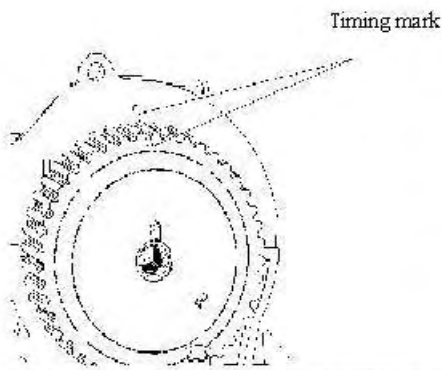
Standard size of crankshaft timing gear:

Wide	28.6mm
------	--------



#### 4. Installation

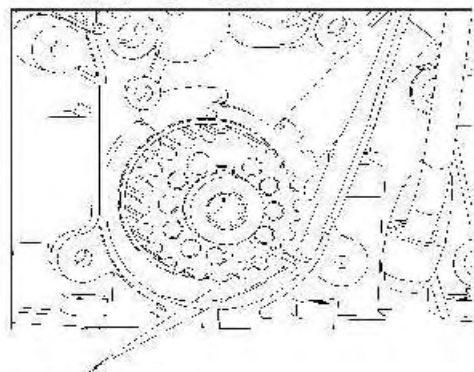
##### 4.1 Installation of crankshaft timing gear



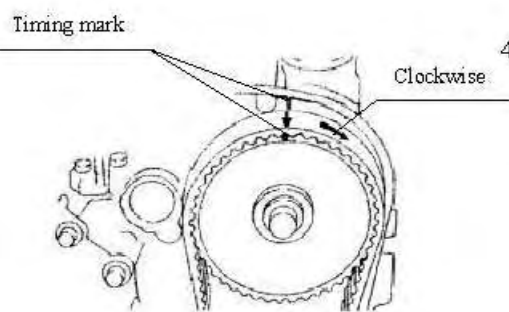
##### 4.2 Installation of timing belt

###### 4.2.1 On the upper thrust point of the first cylinder compression

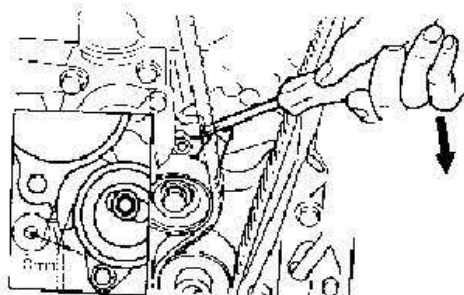
Place the camshaft timing gear around the front end of the air exhaust camshaft so as to make the positioning groove on the gear be aligned with the positioning pin on the end surface of the camshaft. Then use screws to fix the clockwise gear, with the torque of  $100 \pm 5\text{N.m}$ .



4.2.2 Make sure that the punched mark on the crankshaft clockwise pulley is aligned with the mark of the oil pump.



###### 4.2.3 Install timing pulley accordingly.

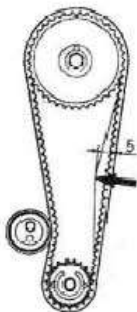


#### 4.3 Install the tensioner

##### 4.3.1 Adjust the tension of the timing belt

①As shown in the figure, make the space between the edge of the stretching wheel and the water pump case arc to be about 8mm;

②Tighten the bolt of the stretching wheel with a torque of  $25 \pm 3\text{N.m}$ . Use a screwdriver to swing the stretcher toward the right.



③ Turn the crankshaft for two circles towards the engine rotating direction, so that the camshaft pulley and the crankshaft pulley matches the clockwise marks respectively.

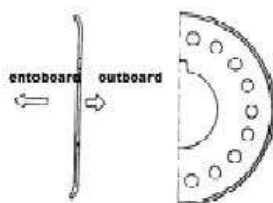
④ Use hands to press down for about 5mm. The force for pressing the clockwise belt is about:

[Reference]

20~30 N

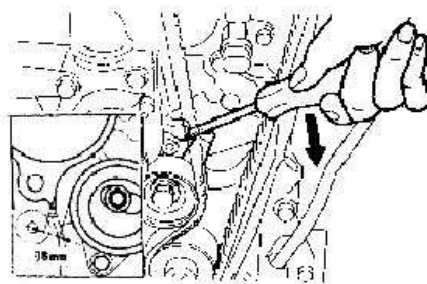
Notice: When the deflection of the timing belt fails to meet the specifications, the key is to adjust the above-mentioned stretcher fastening bolt by widening the spacing.

Tighten the S/A fixing bolt of the stretcher with the specified torque of  $25 \pm 3\text{N.m}$



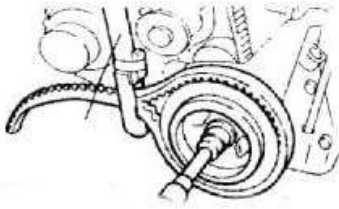
#### 4 Install the baffle of the crankshaft timing pulley

[Attention] Install the baffle towards the direction shown in the right figure.



5 Install the timing cover cap

torque :  $6 \pm 1 \text{ N.m}$

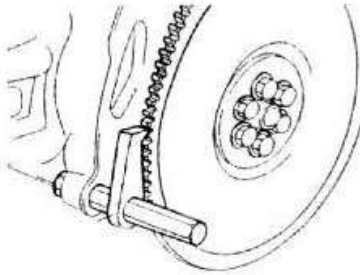


6 Install the torsional vibration damper (use SST)

1 ) When there is not a flying wheel,

① Fix a part of the crankshaft pulley.

② Pay attention not to make the gear belt moving, tighten the bolt according to the specified torque **torque**  $98.0 \pm 10 \text{ N.m}$  ( $10 \pm 1 \text{ kgm}$ )



2 ) When there is a flying wheel,

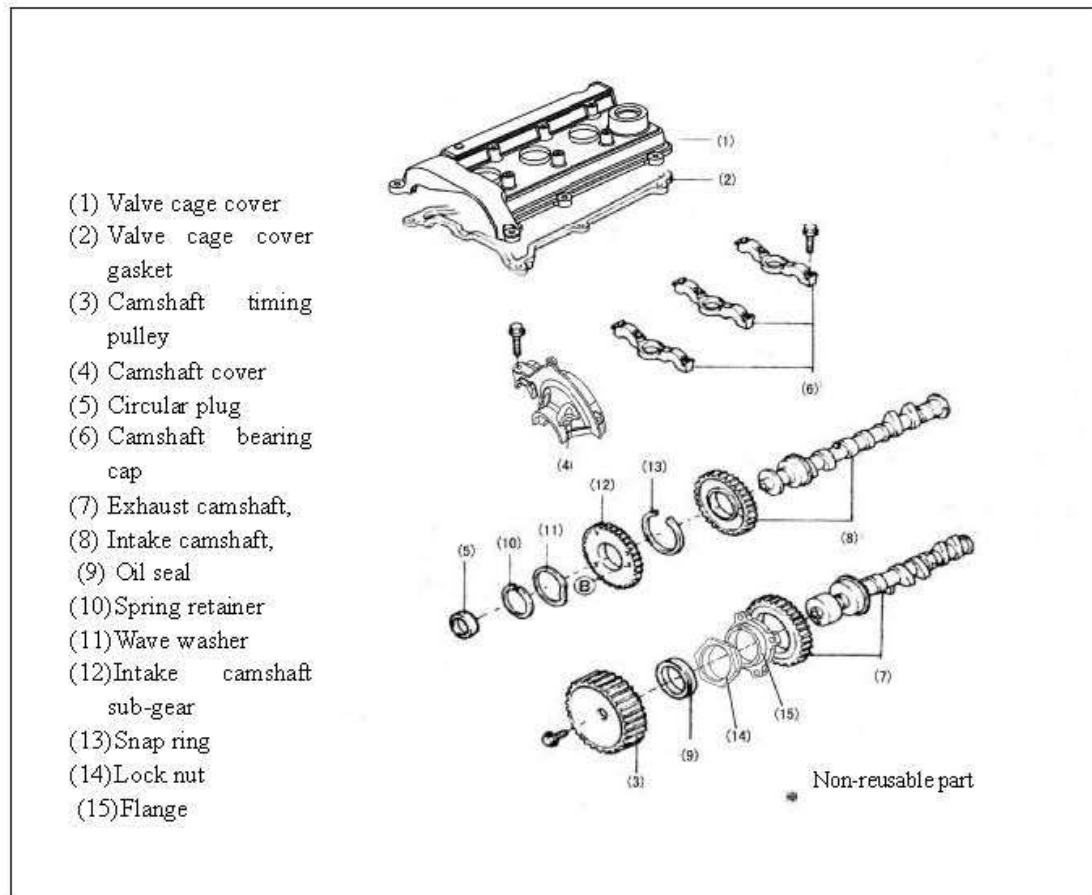
① Fix the flywheel to prevent the tooth ring from turning

② Then tighten bolt of torsional vibration damper.



## Chapter 3 Camshaft Service

### 3-1.Diagram (Removal and installation order for timing belt)



### 3-2 Removal

① Remove cylinder

head cover assembly

Remove the valve chamber cover cap bolt from two sides to the centre symmetrically.

② Remove valve chamber cover gasket

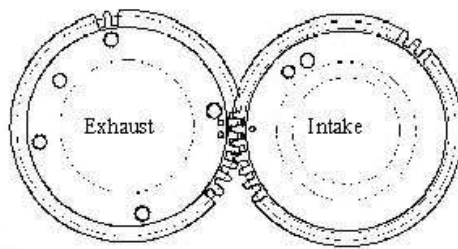
2 Routine check of valve

valve clearance standard:

Valve clearance	IN	0.18±0.05
	EX	0.25±0.05

3 Dismount the camshaft clockwise gear

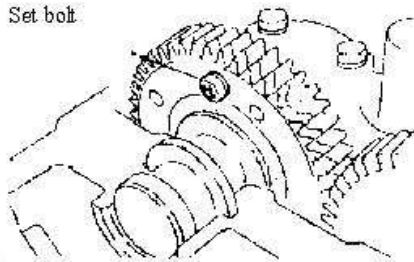
**Attention:** You must prevent the camshaft from rotating.



#### 4 Removal of camshaft cover cap and camshaft bearing cover

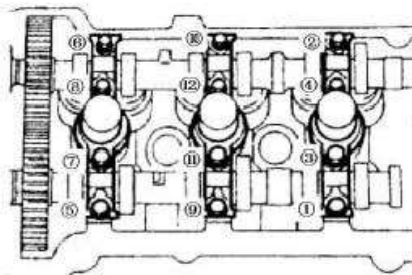
(1) Align the marks on the camshaft gears as shown in the right figure.

Set bolt



(2) Use bolt to position the master and slave gears on the air inlet camshaft, as shown in the right figure.

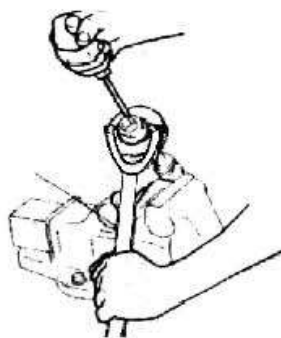
**Attention** In order to eliminate the radial force, keep the camshaft in the leveled position before dismounting it  
(to avoid possible damages caused by excessive radial forces)



(3) Remove the bolts in the sequence shown in the right figure;

Remove the camshaft bearing cover

(4) Remove the spark plug



(5) Remove the camshaft slave gear. Use the special tool as shown in the right figure.

Clip the camshaft tightly, and turn the gear, to keep the bite state of master and slave gear; remove the fixing bolts of slave gear.

**Attention** Do not damage the surface of the camshaft.

(6) Use tensioning apparatus to remove the bearing use elastic snap ring, remove wave washer and teethed ring.

### 3-3 Camshaft

1 Use the caliper to measure the height of the camshaft. If it is below the specified limits, make proper replacement.

Camshaft

Unit: mm

Item	Model	EF	
		ZL、RL	GL、GS、ZS
Standard	IN	$\phi 23.0^{+0.02}_{-0.033}$	
	EX	$\phi 23.0^{+0.02}_{-0.033}$	
Limit	IN	$\phi 22.9$	
	EX	$\phi 22.9$	

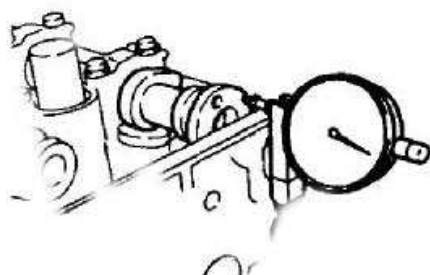
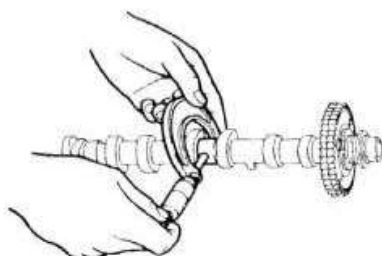
2 Checks on camshaft axial clearance

(1) When the axial spacing is measured with a clipper to be larger than the benchmark value, the camshaft is to be replaced.

The air inlet camshaft axial clearance is 0.1~0.170mm.

The air exhaust camshaft axial spacing is 0.1 ~ 0.173mm.

Limits for operation: 0.18mm

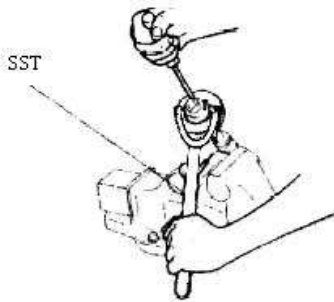


### 3-4 Cleaning

1、Clear off the spark plug carbon accumulation with a metal brush.

### 3-5 Installation

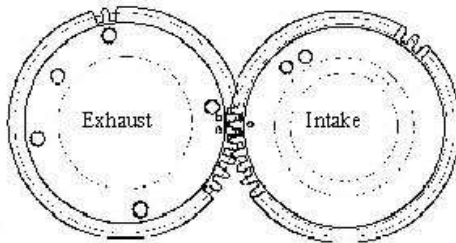
- ① Fix the two  $\phi 6$  holes of the camshaft gear S/A.
- ② Turn the slave gear to the right, match the mark hole on the slave gear with the mark on the master gear, or align the marks on the slave gear with the mark on the master gear; then fix the slave gear with bolt. (thread: M5; pitch: 0.8)



#### 2. Installation of the camshaft

**Attention** Size of the axial clearance of the camshaft

- (1) Smear lubricating oil at the camshaft gear section and the cylinder cover axial diameter section.
- (2) Fix the camshaft slave gear by roughly adjusting on the cylinder cover.
- (3) It is necessary to measure the size of axial clearing of camshaft.

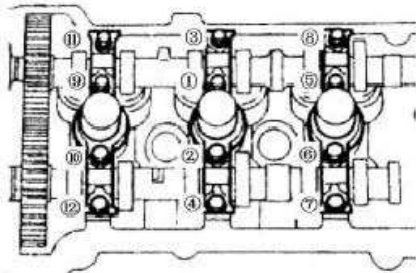


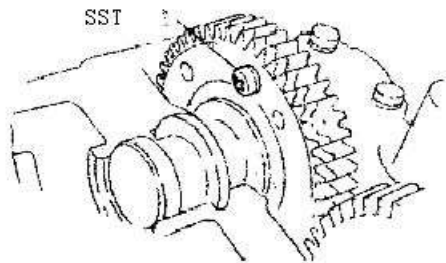
- (4) Install camshaft, the timing mark must be aligned shown as the right figure.

- (5) Smear lubricating oil on the camshaft assembly, the gears and the cylinder head axial diameter section.

3 Tighten the camshaft bearing cap shown as right figure.

4 Remove the bolt for fixing the slave gear of the camshaft assembly.



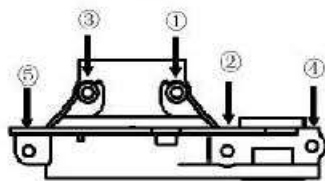


#### 5 installation of camshaft head cap

Smear the fluid sealant on the camshaft head cap section (with oil groove) shown as the right figure.



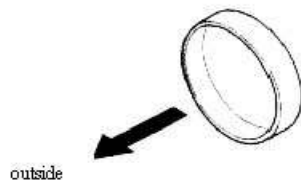
Tighten the bolts according to the sequences shown as the right figure with the specified torques.



#### 6 After smearing oil in the plug cap hole and assembling surface of the plug, use SST to press the plug lid

**Attention** Install the plug lid shown as the right illustration.

Keep unbiased with cylinder head end surface after pressing.



#### 7 Smear engine oil on the oil seal installation port of cylinder head, camshaft oil seal edge of blade and outside ring, use M10 bolt (length 50-60 mm) and SST press the cylinder, lower 1mm than the end surface of the cylinder head.

**Attention** Under the condition of use the oil seal repeatedly, press here with engine oil adhesive agent  
- The oil seal should not be pressed inclining to one side.

#### 8 Installation of the timing gear of camshaft

After smearing the fluid sealant, use SST to prevent rotating, tighten the timing gear bolt of camshaft according to regulated torque of  $100 \pm 5 \text{ N.m}$ .

### 9 Installation of valve chamber cover cap

(1) The used base facing the cylinder cover of the timing belt cover must be cleaned thoroughly.

(2) Install the new base correctly into the groove of the

valve cage cover cap

(3) Install valve cage cover cap to cylinder head from two sides to the centre symmetrically according to the regulated torque of  $6 \pm 1 \text{ N.m}$ .

1 Use feeler gauge to check the throttle clearance.

**Attention** Make sure to measure the clearance between basic circle of cam and valve adjusting gasket.

Standard of valve clearance :

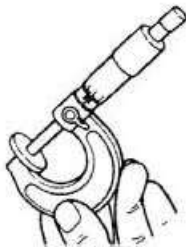
valve	IN	$0.18 \pm 0.05$
spacing	EX	$0.25 \pm 0.05$

2 When it is beyond the benchmark value, the adjustment washer has to be replaced and the clearance should be adjusted.

**Attention** The valve number that goes beyond the

benchmark value has to be recorded, and the result of measurements should be recorded as well

(1) Use a caliper to measure and adjust the thickness of the separation cushion.



2.18	2.40	2.62
2.20	2.42	2.64
2.22	2.44	2.66
2.24	2.46	2.68
2.26	2.48	2.70
2.28	2.50	2.72
2.30	2.52	2.74
2.36	2.58	2.80
2.34	2.56	2.78
2.32	2.54	2.76
2.38	2.60	

(2) Select proper separation cushion on the basis of the throttle thrusting rod benchmark values.

① IN

Selected cushion thickness = removed cushion thickness + (measured throttle spacing - 0.18mm)

EX

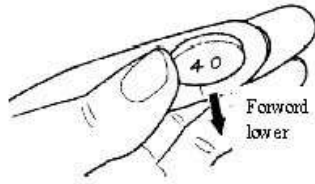
Selected cushion thickness = removed cushion thickness +

(measured throttle spacing - 0.25mm)

[Reference] there are 32 kinds of shim is thickness, shown as the illustration

(7) Use the selected adjusting gasket to adjust the



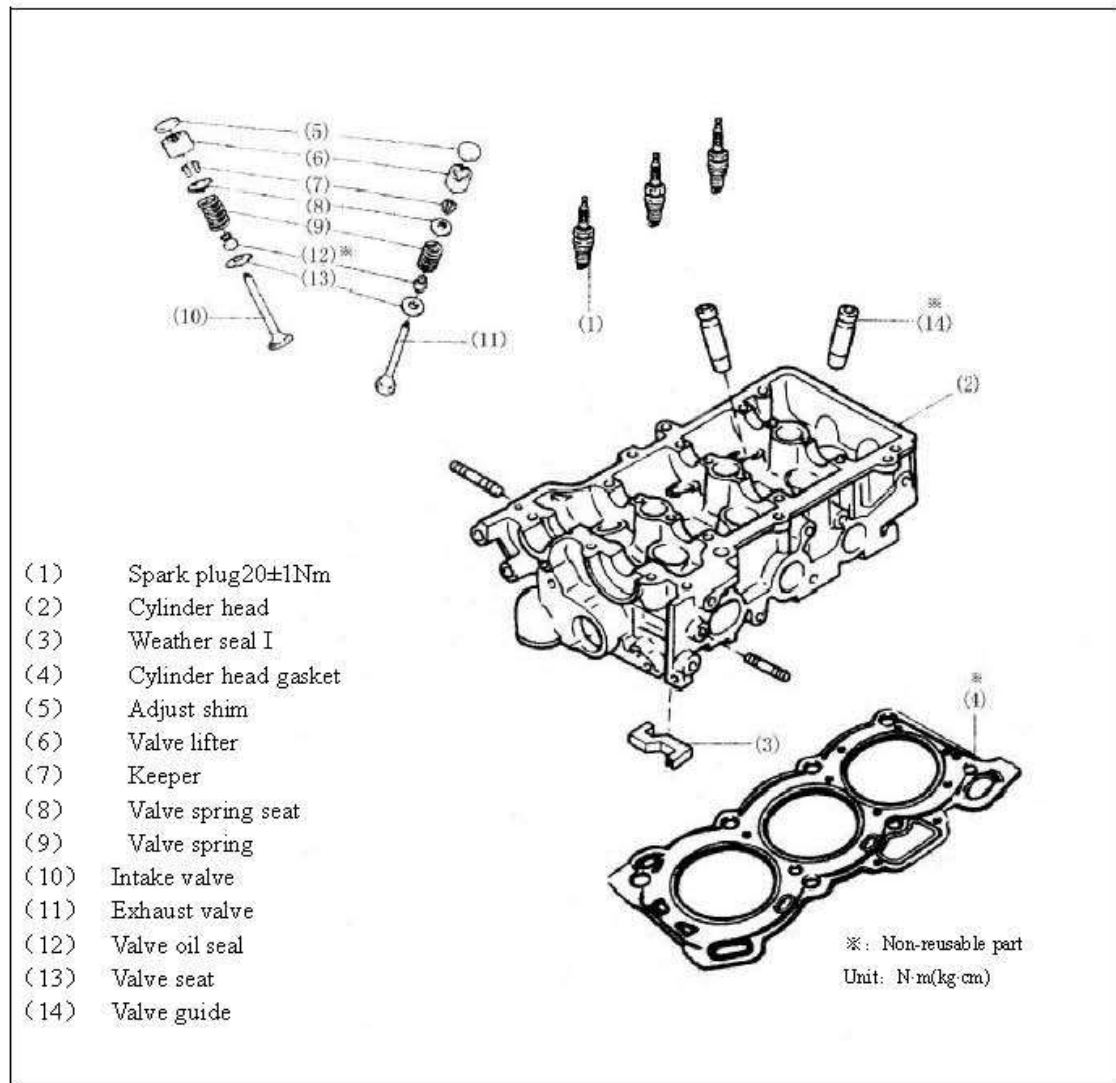


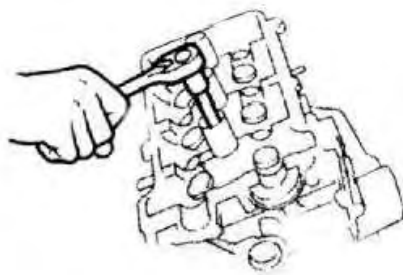
throttle clearance.

**Attention** Install the feeler with the identification mark facing downwards.

#### 4. Cylinder head

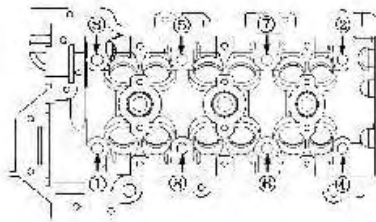
4-1 Configuration diagram (Do the following operations in the procedures for the dismantling and installation of the camshaft)





## 4-2 Dismounting

### 1. Removal of spark plug



2 There are 8 cylinder cover bolts. In the process of removing the cylinder, please follow the sequences shown as the right illustration, loosen the bolts one by one evenly and gently.



SST for valve oil seal

3 Removal of the cylinder dustproof sealing and cylinder cover base.

**Attention** The cylinder cushion can not be used repeatedly.

4 Removal of throttle adjusting separation cushion and valve thrusting rod

5 Use special tools to remove the valve spring locking block, throttle spring stand, valve spring, IN valve and EX valve

6 Removal of valve oil seal and valve spring washer

## 4-3 Clearing

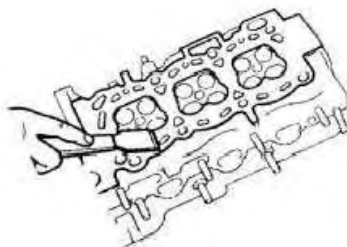
1 The accumulated carbon residue covered on the valve must be cleared.

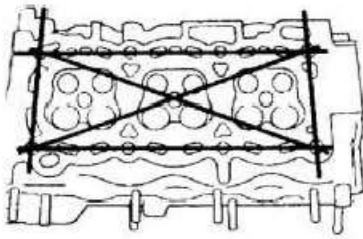
2 Use scraper to clear the cylinder cover, the air inlet and exhaust branching pipe surfaces and bottoms

### **Attention**

Do not damage the cylinder cover surface by scraping during the process of clearing.

Do not drop filth into the air inlet and the water channel.





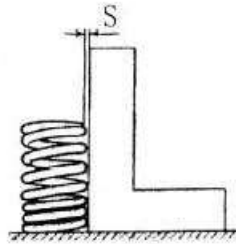
#### 4-4 Routine checks

##### 4-4-1 Cylinder cover

1 Use the straight knife sharp edge ruler to measure the levelness at various points as shown in the figure.

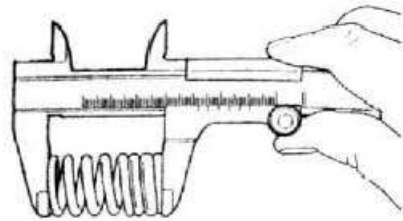
Cylinder cover 0.10mm

Air inlet branching pipe surface 0.10 mm



2 Use a square ruler to measure the right angle of the valve spring. Replace the spring if it fails to meet the specifications.

[Limit] 1.2mm



3 Measure the free state of spring

[Benchmark value] 37mm

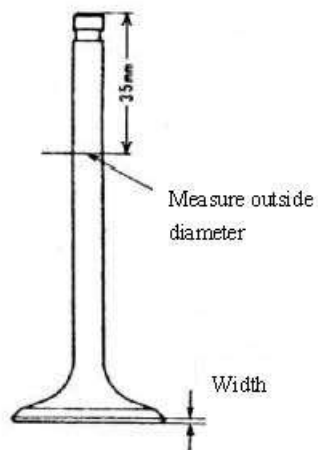
#### 4-4-3 Throttle

Routine checks on throttles

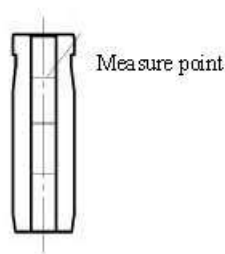
1. Check to see if there are some deformations, obvious tears and wears

Routine check list on valve

Unit: mm



item		standard	limit
wide	IN	0.85~1.41	—
	EX	1.07~1.36	—
Width of valve top	IN	1.0±0.2	0.75
	EX	1.0±0.2	0.75

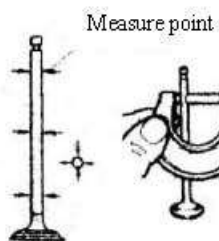


(2) Checks on the clearance between the throttle guiding pipe and throttle thrusting rod

1 Use a dial gauge to measure the inner diameter of the throttle guiding pipe, and use a caliper to measure the outer diameter.

a) Work out the differences of the measured values. If it is above the specified limits, the throttle or the guiding pipe must be replaced.

**Attention** : The measurement points are shown as the figure. Work out the clearance of the final torn and worn section



item		standard	limit
Valve guide Inside diameter(mm)		$\phi 5.0$	—
Valve stem outside diameter (mm)		$\phi 5.0$	—
Spacing (mm)	IN	0.056 ~ 0.020mm	0.07
	EX	0.066 ~ 0.030mm	0.08



(2) Replacement of valve guide

a) Heat the cylinder cover to 80—100 degrees C with hot water

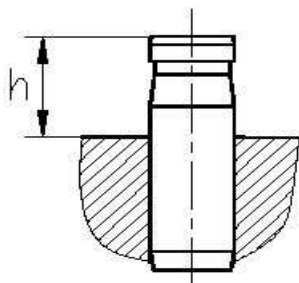
b) Use special tools to drive in the valve guiding pipe to the position as shown in the right figure from the side of the combustion chamber.

**Attention** : The removed guiding pipe cannot be used

repeatedly. The air intake and exhaust valve guiding pipes should not be mixed up in installation.

c) Use special tools to drive in the new valve guiding pipe to the position as shown in the right figure.

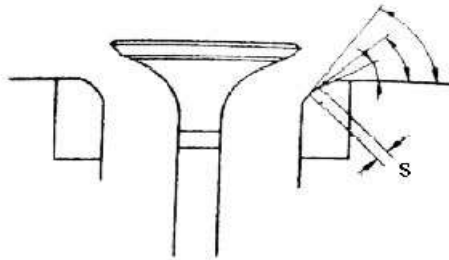
**Attention** : In the process of driving in the guiding pipe into the cylinder cover, the operation should be carried out slowly until the pipe gets to the proper position. No excessive driving should be exerted. Pay attention to the specifications in the operation.



Model Item	EF	
	GL,ZL,RL,GS,ZS	
Height (mm)	IN	13.71±0.25
	EX	12.11±0.25

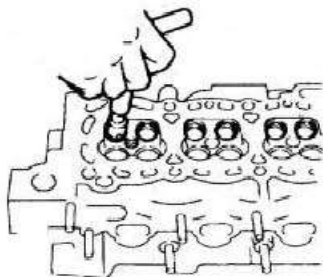
#### Driving in depth of throttle guiding pipe

Use reamer to grind the inner diameter to achieve the standard value of the clearing.



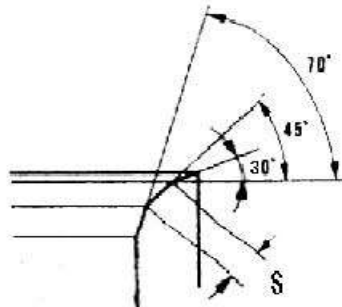
#### (3) Valve mating surface

- a) Smear thin layer of red lead powder on the valve mating surface. Do not turn the valve, and gently drive it in. Check the mating condition and the width of mating line.

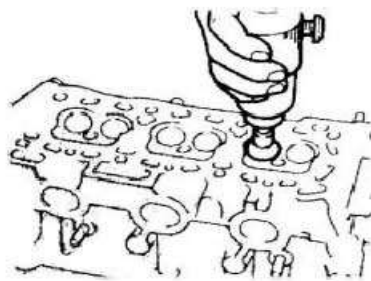


#### Correction of valve base stand ring

Attention Signs of breaking or cracking should not appear on the correction surface. Take it out slowly after the correction is completed.

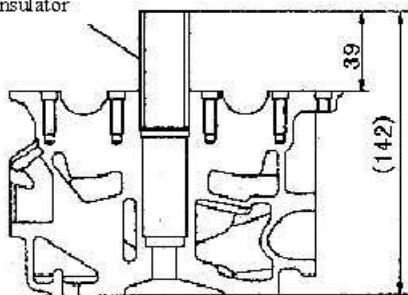


- 1、 Use a 45 degree cone as the mating benchmark value.
- 2、 Check the mating position of the throttle. If it is in the center of the valve, the position is the best one. If not, proper corrections have to be made.
- 3、 Make conic cutting at the center of the mating position with 70 degrees toward inwards and 30 degrees outwards.



4 Use polishing agent to grind and polish the throttle sealing.

Spark plug insulator



#### 4-5 Assemble of cylinder head

##### 4-5-1 Cylinder head

Pay attention to the following instructions in the process of assembling for the other accessories on the cylinder cover.

##### (1) Spark plug insulator

1 Put the spark plug insulator in the corresponding hole on the cylinder head with special use auxiliary tools, smear fluid sealant before pressing, pressing height is shown as the illustration:

**Attention** Pay attention that the vertical degree of its

pressing depth and the cylinder head top surface;

The insulator should not be deformed while being pressed; otherwise, it is easy for the valve chamber cover cap to leak.

##### 4-6 Installation

1. Installation of valve spring washer and valve oil sealing

(1) Cover auxiliary tools on the valve rod head, smear oil on the outer circle of the auxiliary roundness and inside of new valve oil seal, install it on the illustrated position, pull out the auxiliary tools of valve oil seal.

**[Reference]** Insert the oil sealing up to the dimension as shown in the right figure.

2 Installation of IN and EX

3 Assembling of valve springs

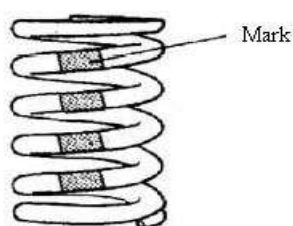
**Attention** It is for you to distinguish the different suppliers by means of paintings on the valve spring, valve spring of same engine should have the same identification paint marking.

Sub stool

valve

Oil sealing

Spring bottom plate





4 Install the locking blocks for the valve spring stands.

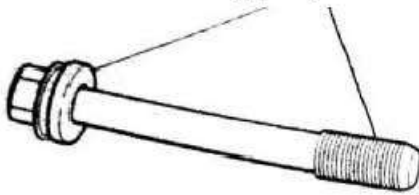
**Warning**

·Protective eye glasses must be worn in the process of this operation to protect the eyes.

·Beware of the flying spring and other objects

Upon completion of the installation of the throttle springs and throttle spring stands, use special tools to install the locking blocks for the throttle spring stands.

Apply oil position



5 Installation of the throttle thrusting rod and throttle spacing by adjusting the separation cushions

6 Install the cylinder cover base, make identification of the marks for the front and rear directions.

7 Assembling of dustproof sealing strip and cylinder cover

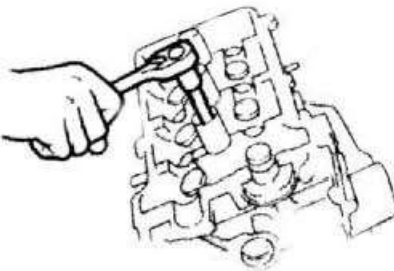
a) Apply lubricating oil at the threads and grooves of the bolts.

b) The tightening of the cylinder bolts should follow the sequence as shown in the right figure. The tightening is to be carried out in 2—3 operations till the torque meets the specifications. The torque for the first tightening operation is  $30 \pm 2 \text{ N.m}$ ; the torque for the second tightening operation is  $50 \pm 3 \text{ N.m}$ ; and the torque for the third tightening operation is  $70 \pm 3.5 \text{ N.m}$ .

**[Torque]**  $70 \pm 3.5 \text{ N.m}$

① Installation of the spark plug

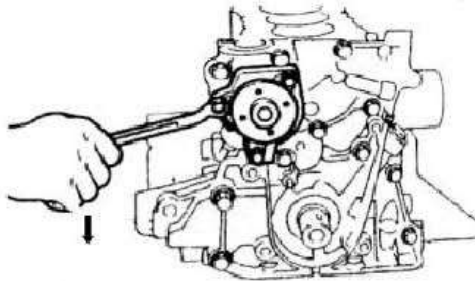
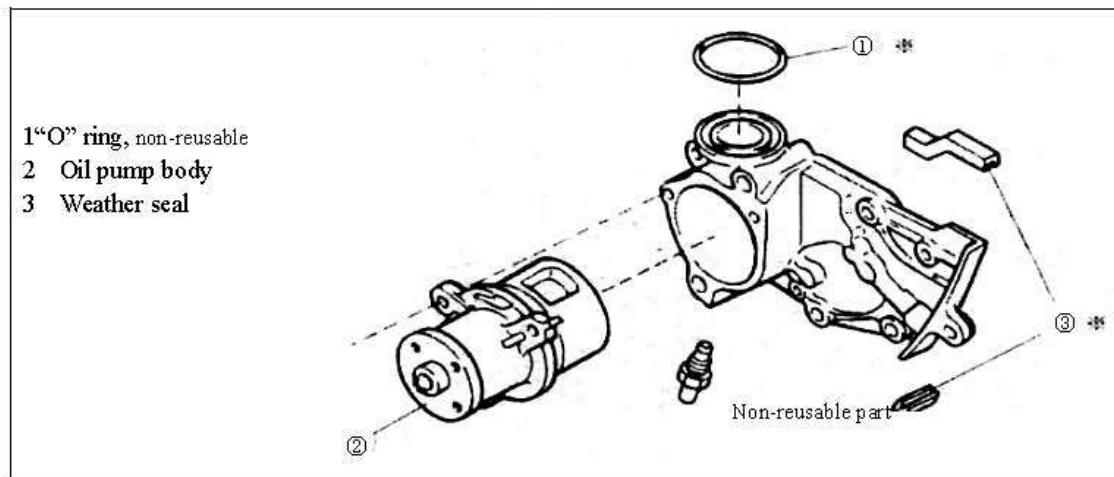
**[Torque]**  $20 \pm 1 \text{ N.m}$



**Attention:** The tools should be placed vertically, so as not to make the spark plug insulator become deformed, otherwise it is easy to leak oil.

## 5. Water pump

5-1 Configuration diagram (the dismounting and assembling of the cylinder body should be done in the following procedures)



### 5-2 Dismounting

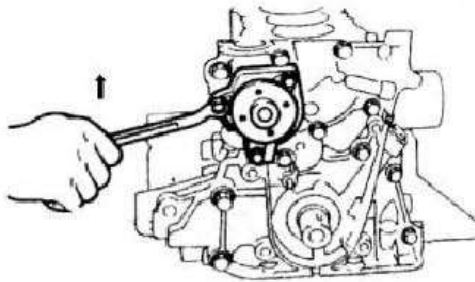
1. Dismounting and removal of O-shaped ring
2. Removing the three bolts and dismount the water pump principal body.
- 3 Removal of the dustproof sealing stripe

### 5-3 Clearing

- 1 .Clearing of the mating surface of the water pump

### 5-4 Routine checks

- 1 .Check to see if there are any deformation or damages
2. Use a hand wrench to see if the turning is OK, and if it is smoothly lubricated?

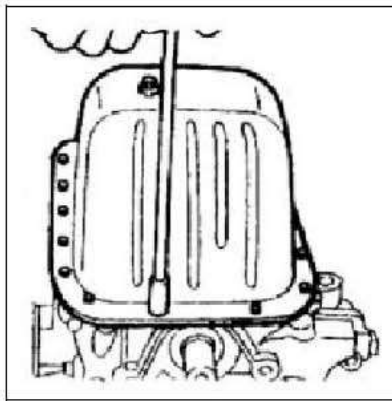
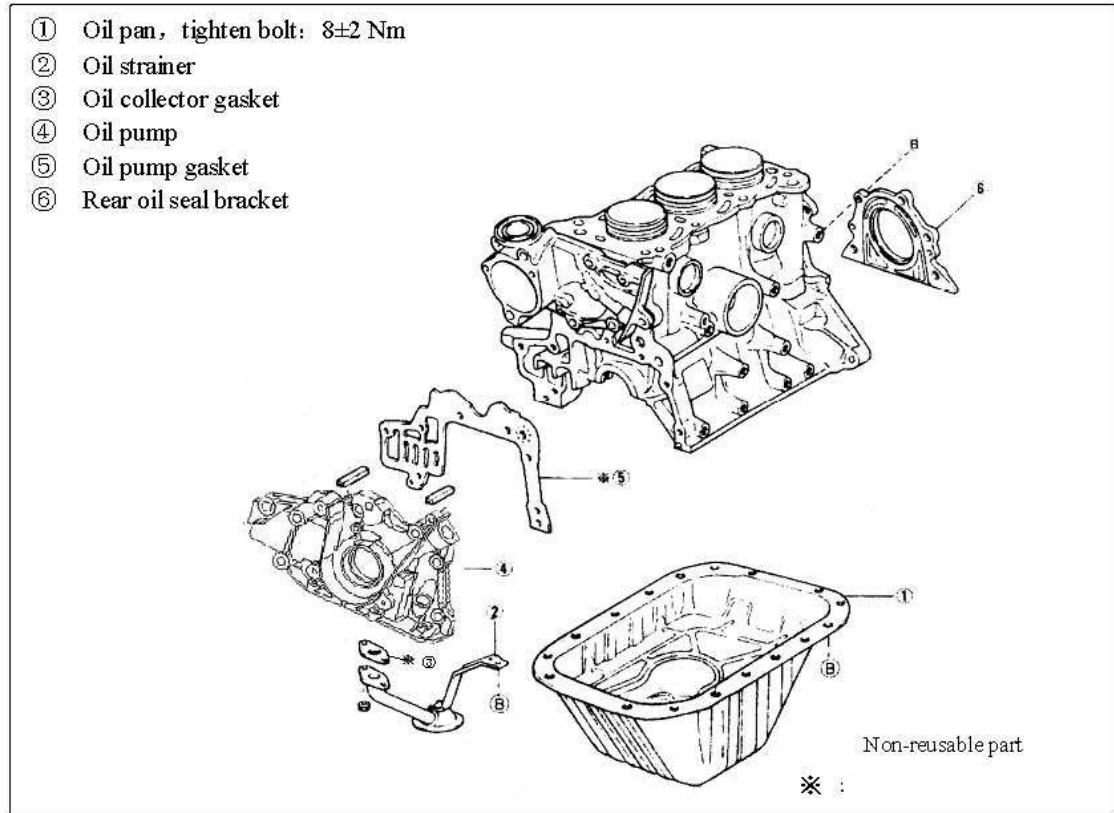


### 5-5 Installation

- 1 Install the dustproof sealing stripes
- 2 Install the water pump principal body  
Tighten with a torque of  $25 \pm 1.5 \text{ N.m}$
- 2 Install the new O-rings

## 6. Oil pump

6-1 Configuration diagram (The dismounting and installation of the lubricating oil pump should be carried out according to the following procedures).

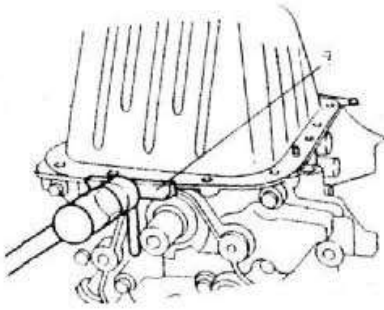


### 6-2 Dismounting

1 The engine being turned upside down on the dismounting frame, take off the bolts.

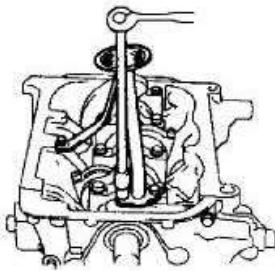
- 2 Remove the oil pan from the cylinder body.

**Attention** Do not make the oil pan flange section to be deformed.

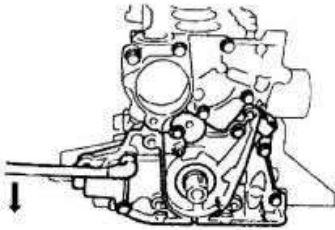


- 3 Remove the oil collecting filter and its flange

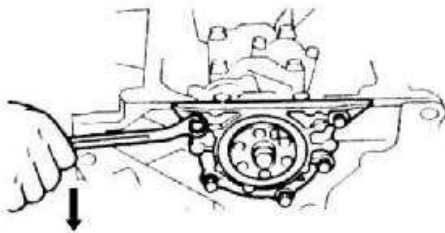
**Attention** The filter flange is not reusable.

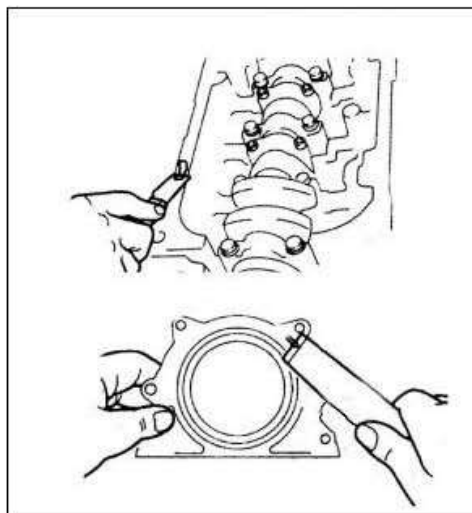


- 4 Dismount the oil pump assembly and oil pump cushion



- 5 Dismounting of oil seal stand





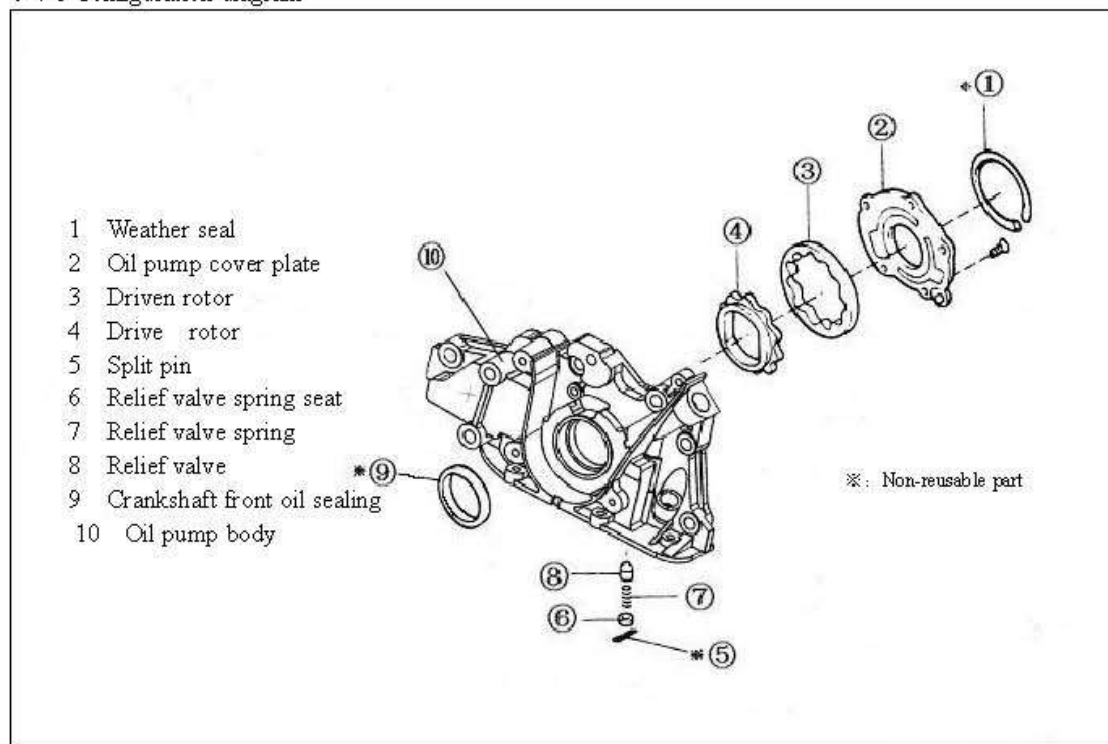
### 6-3 Clearing

1. For the mating surfaces of the oil bottom case, oil pump and oil seal stands,
  2. For the mating surfaces of the rear oil seal stand and oil pump
- scraper and chipping chisel or some other tools may be used to clear the used ones.

**Attention** Do not drop the residues into the cylinder body.

### 6-4 Disintegration and assembling of oil pump

#### 6-4-1 Configuration diagram



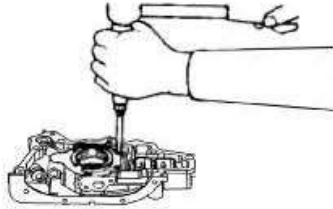
## 6-4-2 Disintegration

### 1. Weather seal

**Attention** The weather seal are not reusable.

### 2 Remove the oil pump cover

Attention: The bolt is assembled with glue, loosen it with screw driver according to the illustrations

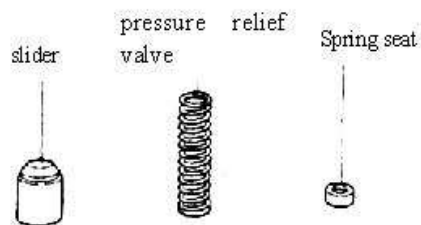
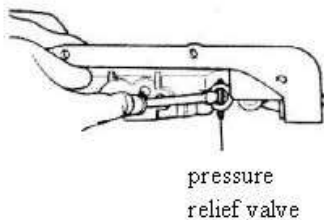


### 3 Remove the driven and drive rotor of the oil pump

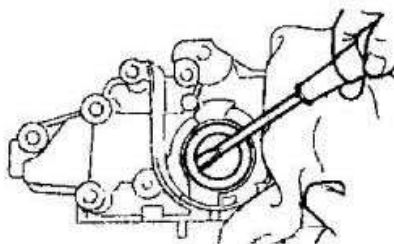
### 4. Take off the split pin

**Attention** The split pins are not reusable.

Attention: Pay attention not to make the spring and spring seat sending forth and dropping suddenly, while taking off the open pins.



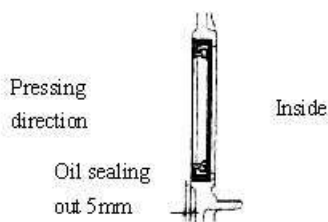
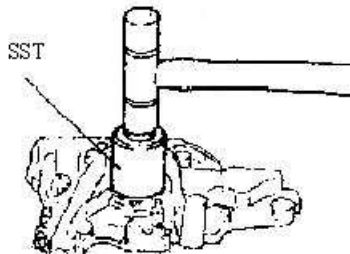
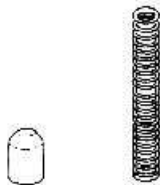
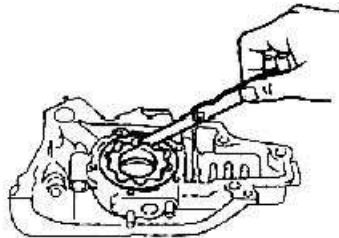
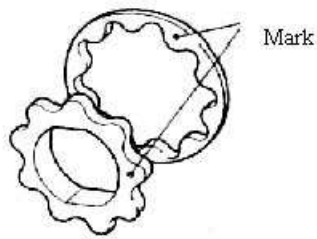
### 5. Removal of the oil pump pressure relief valve spring stand, spiral spring, oil pump pressure relief valve



### 6. Removal of the front oil seal of the crankshaft

**Attention** The removed oil seals are not reusable.





### 6-4-3 Routine checks

#### (1) Checks on lubricating oil pump spacing

1. Follow the mark on the interior and exterior gears of the oil pump to place it into the lubricating oil pump body on the cylinder body.

2. Use a feeler to measure the clearance between the interior gear and the exterior gear

**[Benchmark]** 0.05-0.18mm(average of 9 points)

**[Limit]** 0.35 mm

1. Use a feeler to measure the clearance between the rotator and the pump body

**[Benchmark]** 0.10-0.181mm

**[Limit]** 0.25mm

#### (2) Routine checks on the pressure relief valve

- 1 Remove the pressure relief valve, there should be no visible tears, wears and scrapes on the pressure relief valve

### 6-4-4

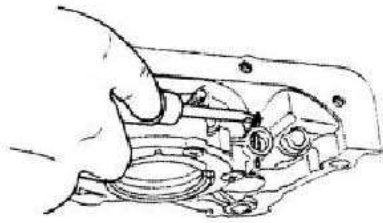
- 1 After smearing lubricating oil on the lips of the new

T-shaped oil seals, use SST to make the assembly.

### **Attention**

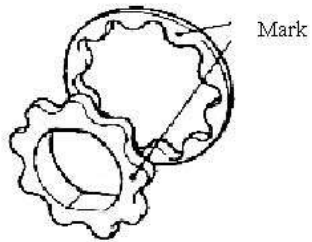
·Use new oil seal.

·The exposed part of the outer edge of the oil seal after being pressed in should be less than 0.5mm.

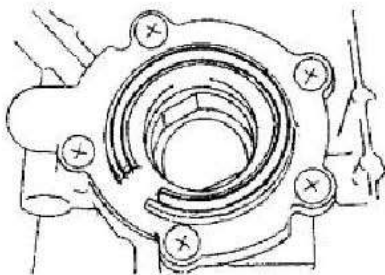


2. Assembling of the oil pump pressure relief valve and split pins

**Attention** The split pins are not reusable.



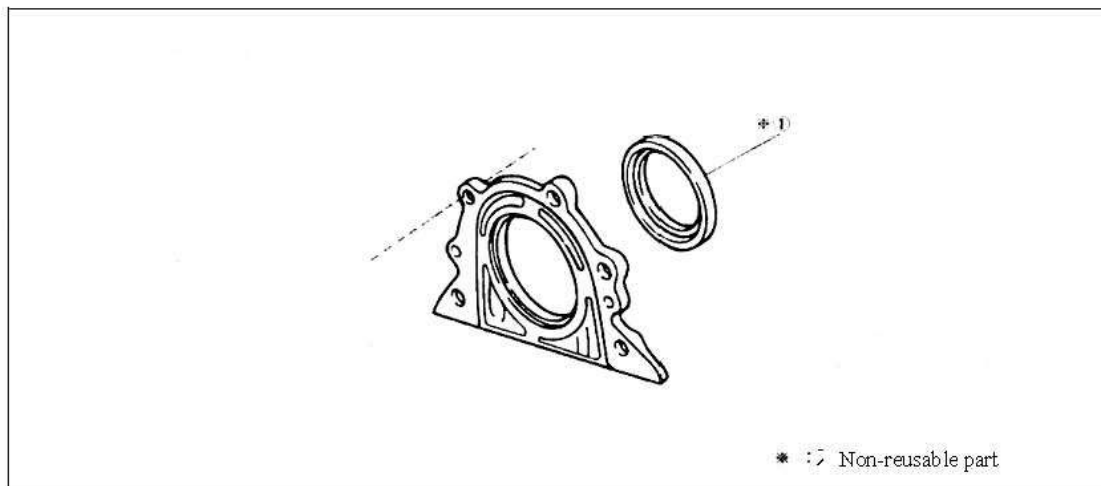
3. The marks of the exterior and interior gears of the lubricating oil pump should be on the visible side when being assembled into the pump body.

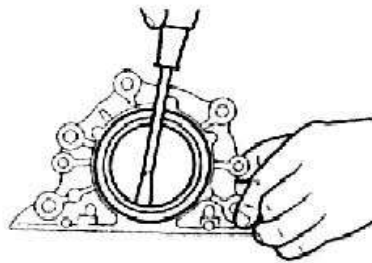


4 The new weather seal should be put inside the oil pump cover groove.

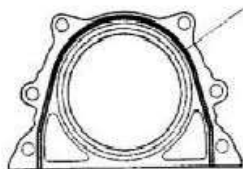
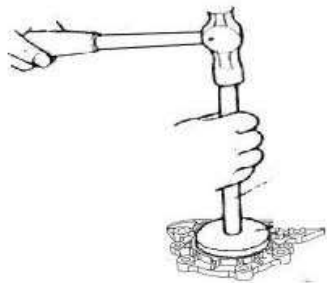
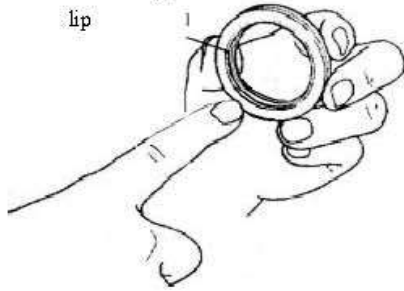
## 6-5 Disintegratin and assembling of oil seal

### 6-5-1 Configuration diagram





Oil sealing  
lip



## 5-2 Disintegration

1. Use a flat screwdriver to remove the rear oil seal.

**Attention** The oil seals are not reusable.

## 6-5-3 Checks

Check to see if the tears and wears of the lip section of the oil seals are within the normal conditions, and if there are any damages in outer appearance.

## 6-5-4 Assembling

Smear lubricating oil on the new oil seal lip section.

2. Install the oil seal shown as the right figure.

## 6-6 Assembling

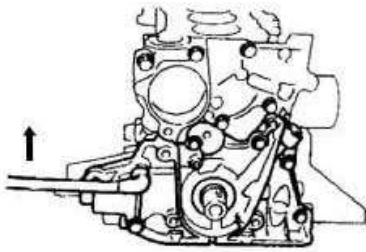
1. Assembling of the oil sealing stands

(1) Smear oil sealing silica on the oil sealing stands shown as the right figure.

**[Grease]** Letai 5699

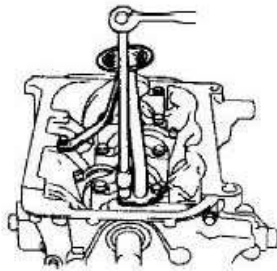
**Attention** The liquid sealing silica is to be smeared to the mating section of the oil seal stands and cylinder body surface, with a width of 3—4mm.

**[Torque]**  $25 \pm 1.5 \text{ N.m}$



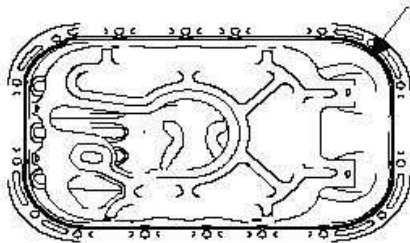
2. Assembling of new oil pump washer,  
oil pump assembly

**[Torque]**  $20 \pm 1.5 \text{ N.m}$



3. Installation of new lubricating oil  
collecting and filtering device, oil pump  
collecting and filtering device

**[Torque]**  $6 \pm 1 \text{ N.m}$



4. Assembling of oil pan

(1) Clear the mating surface with the  
cylinder body

(2) Apply sealing silica before assembling

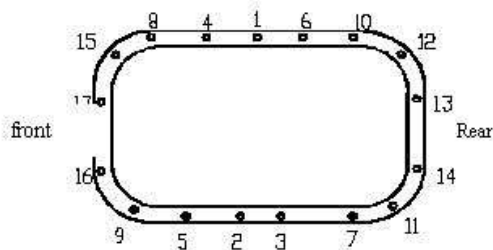
[Grease] Letai 5699

**Attention**

•The liquid cushion with silica line  
diameter of

$\phi 3-4 \text{ mm}$ , without any broken section

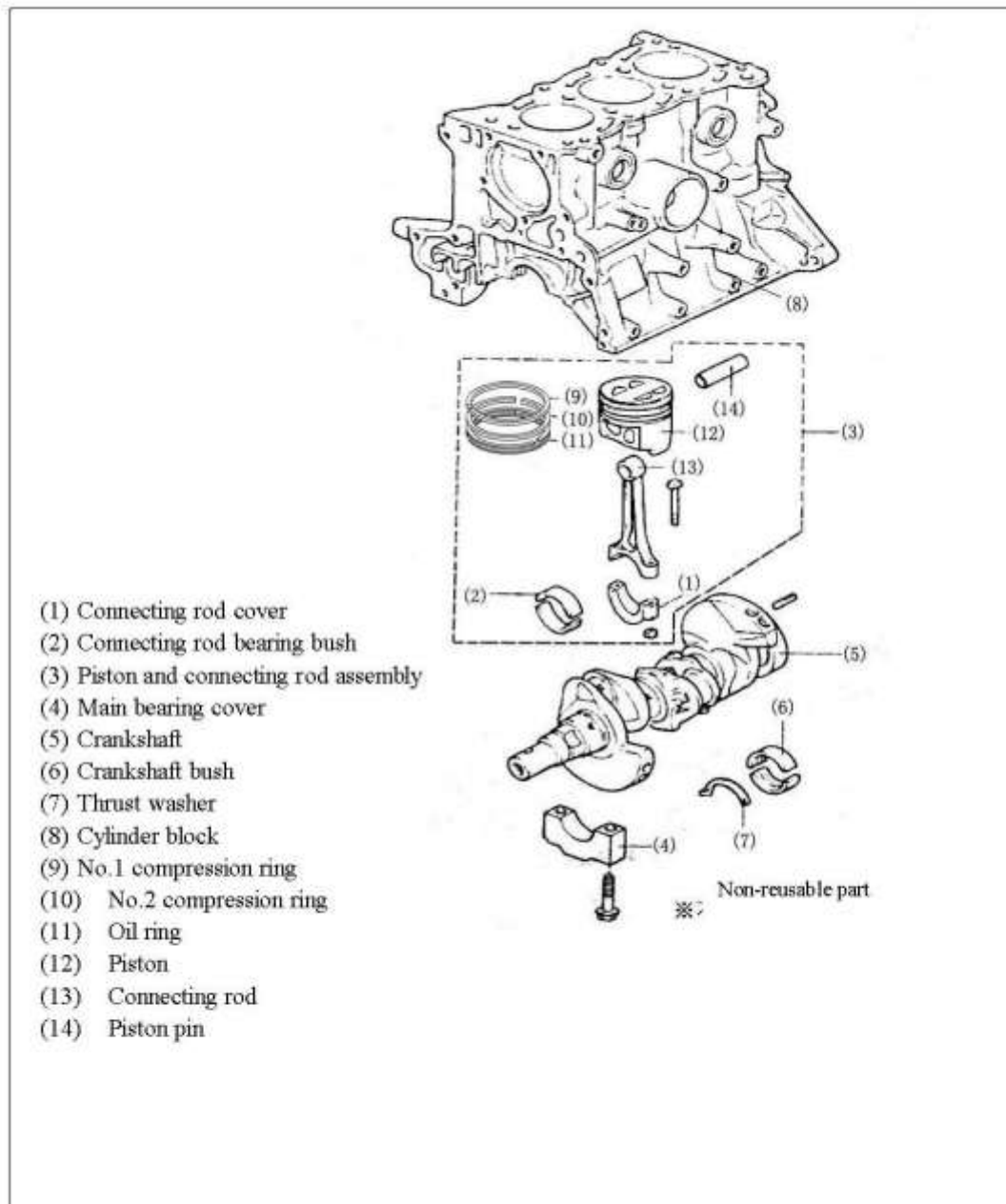
•Make the assembly in 15 minutes  
after the application of silica

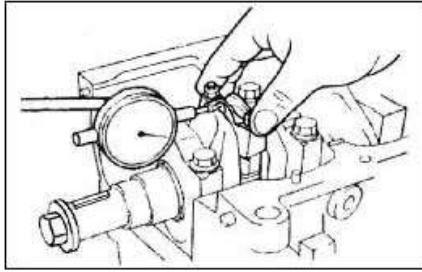


(3). Tighten in the sequence shown in the  
right figure with the torque of  $6 \pm 1 \text{ N.m}$  from the  
centre to the two sides

## 7. Crankshaft connecting rod mechanism

7-1 Configuration diagram (Dismount and assemble the oil pump in the follow sequence)



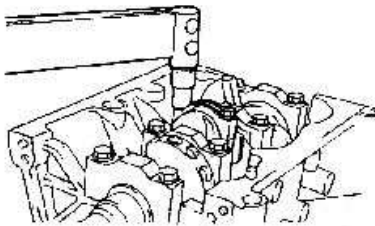


## 7-2 Disintegration of crankshaft connecting rod mechanism

- 1、Check the connecting rod axial clearance
  - (1) Use centimeter or feeler to measure axial spacing

**[Benchmark]:** 0.15-0.24mm

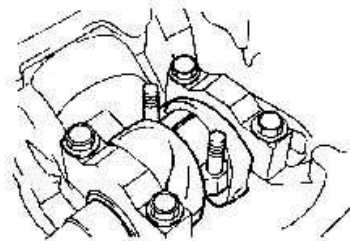
**[Limit]:** 0.30mm



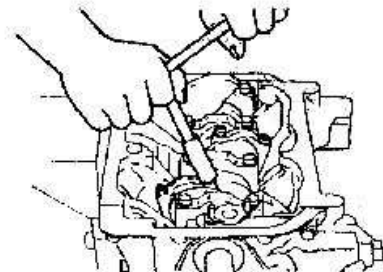
- 2、Check the connecting rod bush vertical clearance
  - (2) Remove the bush cover

**[Attention]** Parts and components of various cylinders should be placed in good order.

- (3) Clean the bush and axle diameter

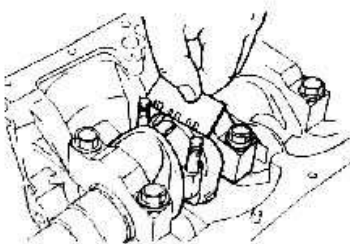


- (4) Place clearance gauge on the connecting bearing diameter.



- (5) Tighten bush cover according to regulated torque

**[torque]:**  $40 \pm 2 \text{ N.m}$



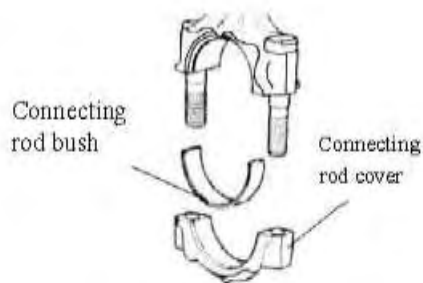
**[Attention]** Do not turn the crankshaft

- (6) Remove the bush cover, measure the maximum width of the spacing ruler

**[Benchmark]:** 0.020-0.044 mm

**[Limit]:** 0.07 mm



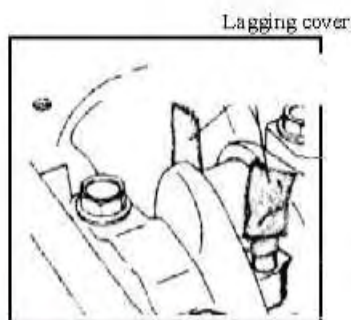


(6) Replace the bush if width is beyond the limit.

**Attention**

In replacing the bushes, you should use the products of same brand and from the same manufacturer, which can accord with the request of clearings.

3. Removal of connecting rod bearing cover and connecting rod bush



(1) The threaded section of the connecting rod bolt is to be equipped with protective sleeve to prevent from scraping the cylinder hoe and crankshaft connecting rod axle diameter. Then knock the piston connecting rod out with the handle of a hammer.

**Attention**

Put the parts and components of various cylinders in good order.



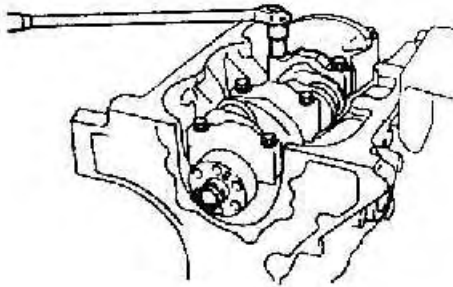
(2) Use a caliper to measure the crankshaft axial clearance. If the axial clearance is above the limits, it is needed to replace the axial thrust washer or the crankshaft.

**[Benchmark]:** 0.089-0.211mm

**[Limit]:** 0.30mm

item	Benchmark value
Thickness of thrust face	1.9-0.11 0.03

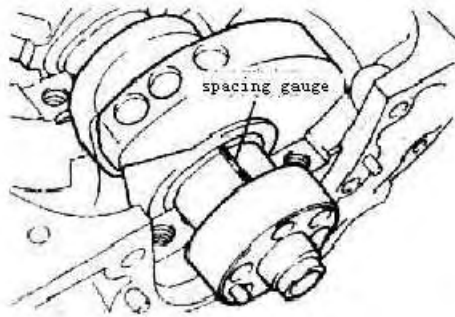
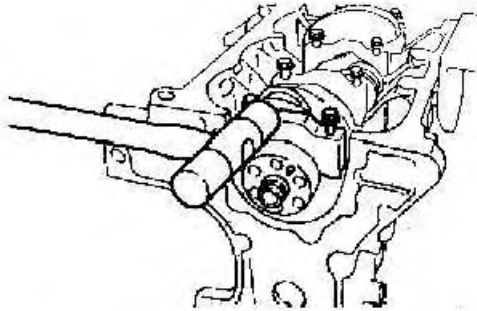




4 Remove the main bush of the crankshaft, the crankshaft, the crankshaft bush, and the axial thrust plate of crankshaft

**Check the radial clearance of the crankshaft**

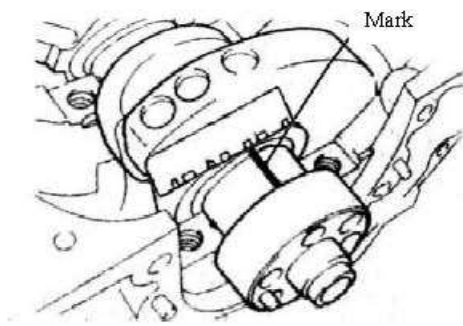
- (1) Remove the crankshaft bearing cover, use a resin hammer to knock the bearing cover off gently.
- (2) Clean the inside of the bushes, the inside of the bearing cover, the cylinder walls, the axle diameter, etc. Make thorough checks for any tears and wears as well as other damages.



- (3) Use a clearance gauge to adjust the **radial clearance** of the crankshaft, tighten the bolts of bearing bush cover with specified torque. **[Torque]**

70±3.5N.m

Attention Tighten the bolts of the crankshaft bearing cover in three times to the regulated value, in the sequence as shown in the right figure. Attention: Don't turn the crankshaft after tightening ,because of the clearance gauge.

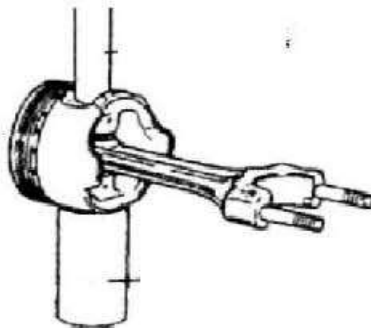


(4) Remove the bearing cover and measure the maximum width of the spacing. If it goes beyond the limit, replace the bush.

**[Benchmark]:** 0.025-0.069mm

**[Limit]:** 0.10mm

## 5 Disassembling of connecting rod assembly of the piston

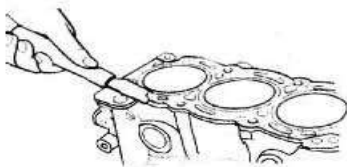


(1). Use the piston ring pliers to remove the primary ring, the secondary ring and the oil ring

**Attention** Do not mix up the pistons and piston rings for each unit of assembly.

(2). Use SST to remove the piston, connecting rod and piston pin.

① Remove the piston pin to take off the piston and the connecting rod by using SST.

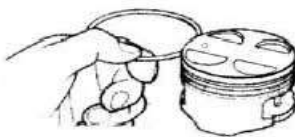


## 7-3 Clearing

### 7-3-1 Cylinder body

**Warning** Wear eye glasses during the clearing operation to protect your eyes.

1. Use flat chisel to clear the cylinder body, the cylinder cover, the oil bottom casing, the oil pump and the oil seal.



### 7-3-2 Piston

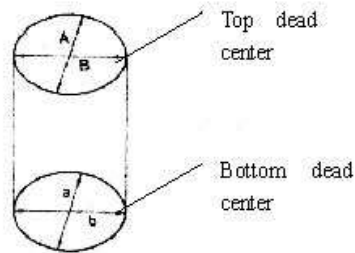
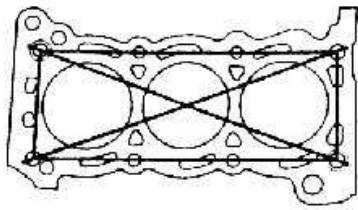
**Warning** Wear eye glasses in the process of

cleaning to protect your eyes.

1. Use the old ring to clean the accumulated carbon in the ring groove.

2. Clean the accumulated carbon at various parts with detergents.

**Attention** Do not use metal brush or some other hard substance to do the cleaning.



## 7-4 Routine checks

### 7-4-1 Cylinder block

1. Checks on the levelness of cylinder top surface  
(1). Use a ruler and feeler to do the measurements of the six parts as shown in the right figure.

**[Limit]** 0.08mm

2. The use of cylinder meter: Measure the values at the parts as shown in the right figure and work out the maximum value and the minimum value. Replace the cylinder body or do the boring of the cylinder if the values exceed the limits.

**[Limit]** 0.03mm

**[Reference]** Circularity: A-B or a-b

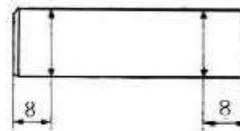
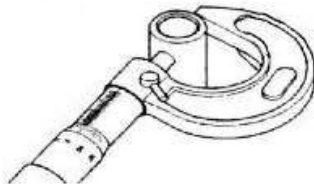
Cylindricity: A-a or B-b

**[Reference]** Cylinder standard diameter:  
 $\phi 72.00-72.01\text{mm}$

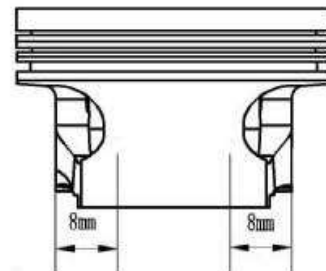
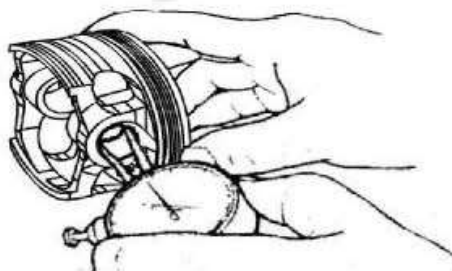
### 7-4-2 Piston

1. Check the clearance between the piston pinholes.

(1) Use a caliper to measure the positions of the piston shown in the following figure, with the maximum value as the size of the piston pin diameter.



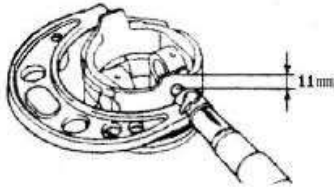
(2) Use the inner diameter centimeter to measure the positions of the piston hole diameter shown as the following figure, take the minimum value as the size of the pinhole diameter.



(3) Work out the clearance on the basis of the size difference between the hole diameter and the pin diameter. Replace the piston pin or the piston if the result exceeds the benchmark value.

**[Benchmark]** 0.004-0.009mm

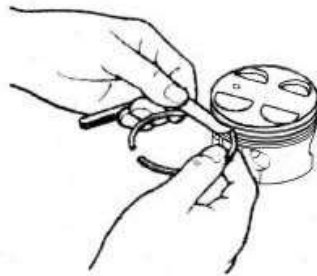
**[Limit]** 0.015mm



### 1. Measurement of the piston diameter

(1) Make the measurement at the position 11mm below the piston skirt and along the vertical direction of the piston pin.

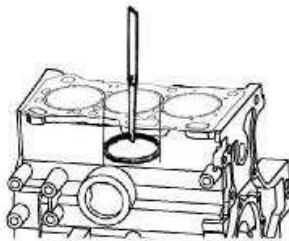
**[Benchmark]**  $\phi 72 \begin{smallmatrix} -0.013 \\ -0.025 \end{smallmatrix}$



### 2. Check the clearance between the piston ring and the ring groove

(1) Use a feeler to measure the rings

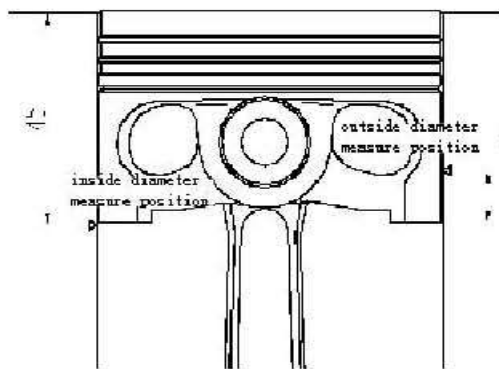
	Benchmark(mm)	Limit (mm)
Primary ring	0.03~0.06	0.12
Secondary ring	0.03~0.06	0.11



### 3. Check the clearance of piston ring ends

(1) Put the piston ring in the position which is 45 mm under the cylinder hole top surface, in order to make the piston ring keep flattened, you can press the piston ring with piston top surface, then use a piston gauge to measure the open clearance.

	Benchmark(mm)	Limit (mm)
Primary ring	0.25-0.40	0.65
<b>Secondary ring</b>	0.35~0.50	0.65
Oil ring	0.20~0.70	1.00



7-4-3 Check the clearance between the piston and the cylinder wall

1. The positions for measuring the inner diameter of the cylinder and the piston skirt are as shown in the right figure. Replace and repair the piston or the cylinder body, or bore the cylinder if the measured results exceed the limits

**[Benchmark]** 0.018~0.03

**[Limit]** 0.10

**[Reference]** The clearance between the piston and the cylinder hole is subject to the innermost diameter of cylinder in vertical direction minus the maximum outer diameter of the piston.

2. After the replacement of the piston or the cylinder body, it is needed to confirm the clearance of the replaced cylinder once again.

Datum: 0.018~0.030

#### 7-4-4 Crankshaft

1. Check the coaxiality of the main shaft diameter

(1) Use the centimeter to measure the coaxiality. Replace the crankshaft if the measurement result exceeds the limit.

**[Limit]** 0.03mm

**[Attention]** The bending value should be 1/2 of the

fluctuation for one circle of turning the crankshaft.

2. Check the tears and wears of the crankshaft

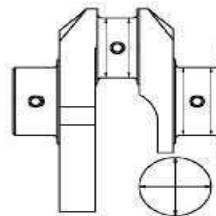
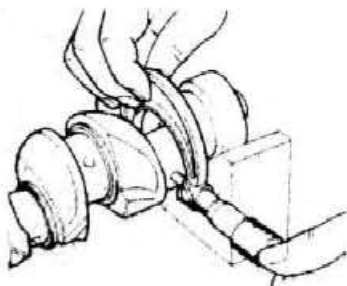
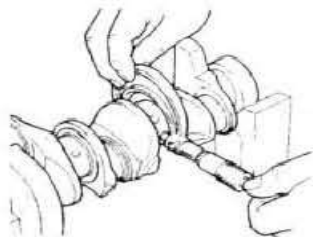
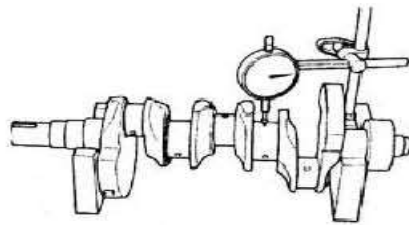
(1) Use a caliper to measure the shaft diameter, and work out the circularity and cylindricity.

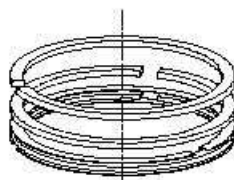
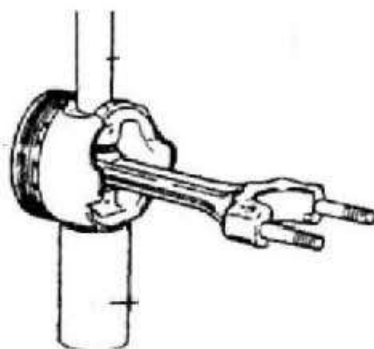
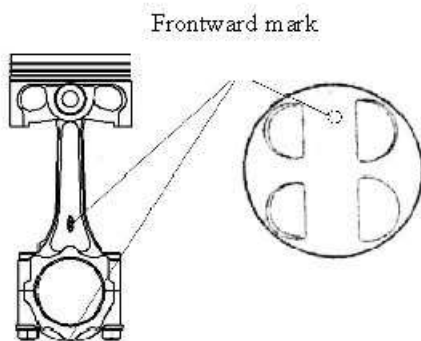
**[Limit]** 0.005mm

(2) Use a caliper to measure the connecting rod diameter, and work out the circularity and cylindricity.

**[Limit]** 0.004mm

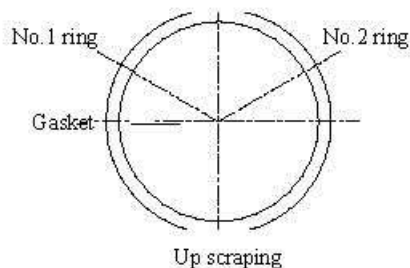
the measuring position is shown as the figure,





From up  
to down:  
No.1 ring  
No.2 ring  
Oil ring

Ring open angle Down scraping



#### 7-4-5 Assembly of the crankshaft connecting rod mechanism

##### 1. Assembly of the piston and connecting rod

( 1 ) Use special tools to assemble the piston, connecting rod and piston pin in the following specified procedures.

① Smear lubricating oil to the connecting rod pin hole, and make the assembly according to the marks for the same unit and in the indicated direction.

② Make the installation shown as the right figure.

③ Make adjustments and installation of the piston and the connecting rod shown as the right figure.

④ After smearing lubricating oil to the piston pin, use pressurizing device to assemble the piston and the connecting rod.

##### Attention

- Pay attention to the assembling direction when pressing in the piston pin;
- The small bit of connecting rod should be heated to 300℃ while pressing the piston pin in the piston.
- Exert pressure in the process of pressing by assuring the alignment of the pin.

(2) Side face with marks should be upright, install steel belt assembly oil ring (gasket ring, down scraper and upper scraper), then install the secondary ring, then install the primary ring

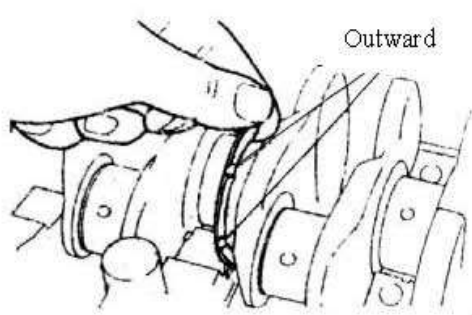
Open degree of every ring is shown as the illustration:



3 The crankshaft main bearing cover. Assemble the crankshaft, shaft bush, shaft body and thruster according to the following instructions.

(1) The protruding thrust block on the bush should match the groove on the cylinder body for installation.

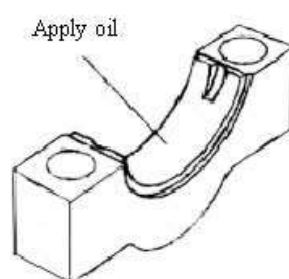
**Attention** Use the bush made by the same manufacturer.



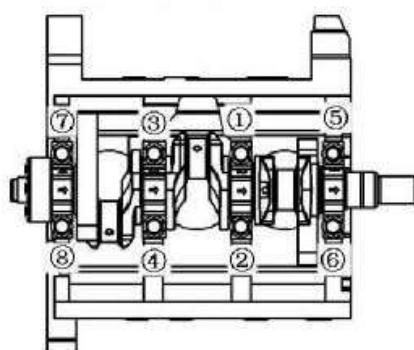
(2) Smear lubricating oil on this side (upper side) of the crankshaft before installing it.

The side thrust chip with oil sink should face outward (crankshaft handle) for installation on the cylinder body bearing stand.

**Attention** Smear lubricating oil on the side of the oil sink.



(3) Smear lubricating oil on the friction side opposite to the contact of the bush lower parts. Install the parts according to the forward induction mark on the crankshaft bearing cover.

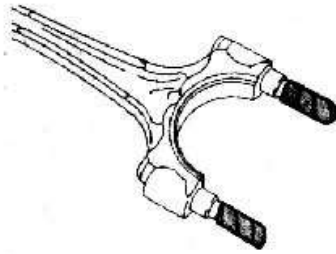


(4) After applying the lubricating oil, tighten the bolts in the sequence shown as the right figure for 2—3 cycles with the specified torque.

**[Torque]**  $70 \pm 3.5 \text{ N.m}$

(5) Rotate the crankshaft after assembling, you should rotate it with ease, the torque should be less than 1Nm

**Attention:** The torque of crankshaft rotating should be less than 1Nm;(The torque is for installing the crankshaft only, not for installing the piston connecting rod)

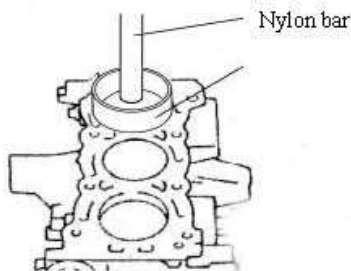


4. Assemble the piston connecting rod Ay, connecting rod bush and connecting rod bearing cover according to the following instructions.

(1) The openings of the air ring and oil ring should match the specified direction.

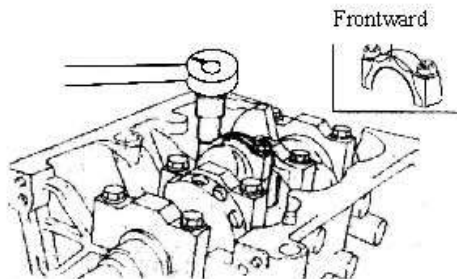
(2) Use nylon sleeves for the bolts of the connecting rod to prevent from scraping the cylinder hole and axial diameter

(3) Apply lubricating oil to the piston I, the connecting rod and the surfaces of the other related moving parts.



(4) Make sure the frontward indication mark on the piston. Should be frontward and assemble the piston connecting rod Ay with SST.

**Attention** The cylinder number on the piston connecting rod Ay should be identical to the cylinder number.



(5) Assemble the connecting rod bearing cover and bush according to the following instructions.

① Smear a little lubricating oil on the bolt and screw nut stand before they are mounted according to the indication mark.

② Tighten the left and right screw nuts alternately for a couple of times with the specified torque.

**[Torque]:**  $40 \pm 2 \text{ N.m}$

**Attention** The connecting rod and the rod bush should be bought from the same supplier.

## 7. ELECTRIC INJECTION SYSTEM

### Chapter 1 the principle for EFI and actuator

#### 1. Intake air pressure and intake Temperature sensor

Usage: Measure 0.1~0.2bar pressure in manifold and intake air temperature to supply load information for engine.

Constitution and principle: The sensor consists of two sensors, MAP and IAT, which mounted on steady pressure well.

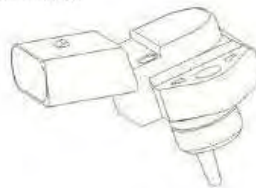
MAP: consists of one silicon chip that etched a film on the chip. There are 4 piezoelectric resistances that consist of a Wheatstone bridge. The information processing circuit is also on the chip. The chip consists of closed reference space with a metal shell. The air absolute pressure in the space is nearly to zero. In this way, a micro electric-mechanic system is formed. The active face of the chip is endured a pressure nearly to zero, and MAP pressure applies on the back of the chip through a connecting pipe. The thickness of the chip is only several microns ( $\mu\text{m}$ ) so the change of MAP pressure will result the mechanical deformation for the chip together with 4 resistances to change their resistance. The voltage signal that is linearity with pressure is formed after processing by information processing circuit in the chip.

Intake air temperature sensor: IAT is a resistor with NTC. Like coolant temperature sensor, the resistance decreased with the temperature increasing. ECU in engine monitors the change of intake air temperature (corresponding in series circuit).

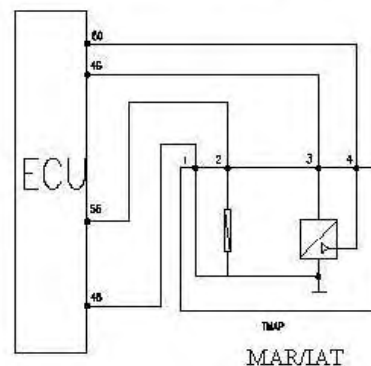
Diagnosis: The open, short or wear of sensor could be judged by the rear electronic unit of MAP.

ECU will judge the malfunction of sensor if the output signal exceeds the signal outside the output response. For example, if the intake air pressure is higher or lower than the limit, ECU will judge the

sensor is malfunction (The intake air pressure is below lower limit in starting, but ECU can judge starting condition), "CHECK ENGINE" light will be on at the same time and engine will run at malfunction mode. (The light will on not for all malfunctions).



MAP/ IAT



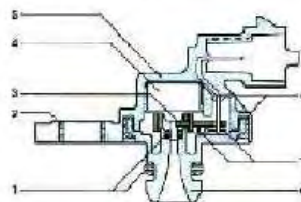
The circuit for MAP/IAT

Pins: No.1 Ground

No.2 Output temperature signal

No.3 To 5V

No.4 Output pressure signal



The section plane of MAP/IAT

1.Seal 2.Stainless steel bush 3.PCB plate 4.Sensor  
5.Shell 6.Support 7.Welding connection 8.Felt connection

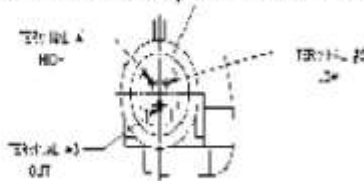
## 2. TPS

**Usage:** TPS is used to supply Throttle angle signal. According to this signal, ECU will receive engine load signal and working condition signal such as starting, idle, back up, partial load, and full load) as well as acceleration and deceleration signal.

**Constitution and principle:** TPS is an angle sensor with linear output. It consists of 2 arc slide resistors and 2 slide arms. The shaft of arm and throttle shaft connect to one axes. When running throttle, arm run together and slides on resistor. Output UP as output voltage. So it is an angle potentiometer. ECU use  $UP/US$  as ratio to avoid the fluctuate of sensor value caused by engine voltage fluctuate.

**Diagnosis:** ECU check if throttle angle exceeds the up limit or lower Limit of output signal. If so, ECU will judge TPS malfunction, engine will run at malfunction mode, MIL will on (Impinge sensor or dirty will cause engine malfunction).

**Install:** Screw torque for bolts: 1.5Nm-2.5Nm



Out view of TPS

Pins: 1. Volt output 2. Signal ground 3. Signal output

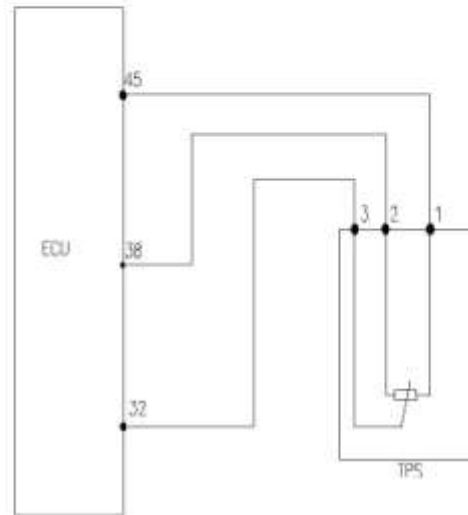


Diagram of TPS

## 3. CTS TF-W

**Usage:** CTS is used to supply Coolant temperature information for the ignition timing and fuel inject pulse width control on engine start, idle, normal running.

**Constitution and principle:** CTS is a temperature sensitive resistor with NTC. The resistance decreases with coolant temperature increase, but it is not linear relationship. The resistor is enclosed in copper bush. The change of resistance is transformed into changing voltage to ECU by a voltage distribute circuit to monitor the change of coolant temperature.

**Diagnosis:** When coolant temperature is over up limit, or below lower limit, MIL is on, engine run at malfunction mode. ECU control ignition and fuel inject according to set temperature. Fan runs at high speed.

Limit data:  $2.5 \pm 5\% K \Omega$

Hint: Screw torque:  $15 \pm 2 Nm$

Hint: There are 2 sensors in vehicle. One is single pin water temperature and supply coolant temperature signal for coolant temperature meter; The other is double pins and supply the temp signal to ECU.

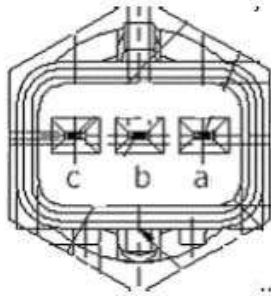
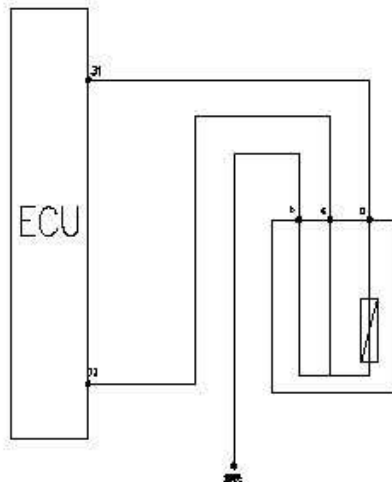


Diagram of CTS

Pins: There are 3 pins that could be interconverted.

- EFI coolant temperature signal pin, resistance is  $2.45K\ \Omega$  at  $20^{\circ}C$ .
- Instrument water temperature signal pin, resistance is  $0.05K\ \Omega$  at  $80^{\circ}C$ .
- Signal ground



Circuit diagram of CTS

Hint: There are 1 coolant temperature sensor with 3 lines on it. One is power line, two are signal lines which one to ECU and the other to instrument.

output AC voltage signal.

Because the frequency of vibration caused by engine knock is much higher than normal frequency of engine vibration signal, so ECU can distinguish knock and unknock signals after filtering the signal of KS. When engine load, speed and coolant temperature exceed sill value, and not set KS malfunction information record, the signal of KS will be used to close loop control for knocking. When the control is actuated, the signal of KS will input to ECU for integral after amplify and filter.

When certain integral value in crank angle exceeds sill value, ECU will consider the knock happens, and reduce 1 degree of ignitionadvanced-angle. If knock happens on next cycle, ECU will reduce 1 degree of ignitionadvanced-angle again; If no knocks happen in next cycles, ECU will resume the angle to normal value.

Diagnosis: ECU monitors each sensor, actuator, power amplifier and check circuit. KS will mark malfunction position once following situations happen:

- KS malfunction
- KS control data process circuit malfunction
- Cylinder identification signal is untrustable
- After KS marks the malfunction position, knock

close loop control will shut off and reduce a commutation angle for ignition advanced-angle stored in ECU. When wrong frequency is below set value, malfunction position will resume.

Hint: Screw torque  $20\pm5Nm$

#### 4. KS

Usage: Supply knock signal to ECU for knock control.

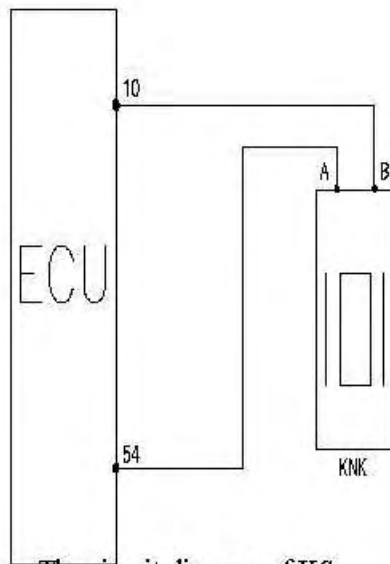
Constitution and principle:

KS is vibration acceleration sensor mounted on engine. The sense element is a piezoelectricity element. The vibration of cylinder is transformed to piezoelectrical crystal through mass block in sensor. The pressure of crystal produce voltage on two polar faces and change vibration signal into





KS with cable



The circuit diagram of KS

Pins: pin 1 and pin 2 connect ECU

The shield wire of sensor is folded on outside of signal wire.

## 5. Oxygen sensor

**Usage:** The sensor is used to supply the information that if oxygen is superfluous after the fuel in cylinder burnt completely in intake air. ECU uses the information to close-loop control for quantitative fuel and transforms or purifies three venomous ingredients such as HC, CO and NO<sub>x</sub> in catalyzer.

**Constitution and principle:** The sense element is a ceramic pipe with bores. The outside of pipe is surrounded by exhaust of engine, and inside is touched with atmosphere. The pipe wall is one kind of solid electrolyte with electric heating pipe in it to heat ceramic body to 300 C° for ceramic body to work. The oxygen ion can pass pipe freely.

The concentration difference is transformed into electric differential with this feature to form electric signal. If mix air is richer, electric differential and output voltage are higher; if mix air is leaner, electric difference and output voltage are lower.

The working voltage of sensor fluctuates between 0.1-0.9V with 5-8 times per 10 seconds. Sensor is aging if the frequency is below this value and needs replacing. The sensor cannot be repaired.

**Trouble diagnosis:** ECU monitors each sensor, actuator, power amplifier and check circuit. ECU will mark the malfunction position for oxygen sensor once one of following situations happen:

Battery voltage is not trustable.

MAP signal is not trustable.

Injector driver is fault.

After marking malfunction position for oxygen sensor, fuel ration close-loop control will shut off and will carry on according to basic inject time stored in ECU.

**Install hint:** The screw torque of sensor is

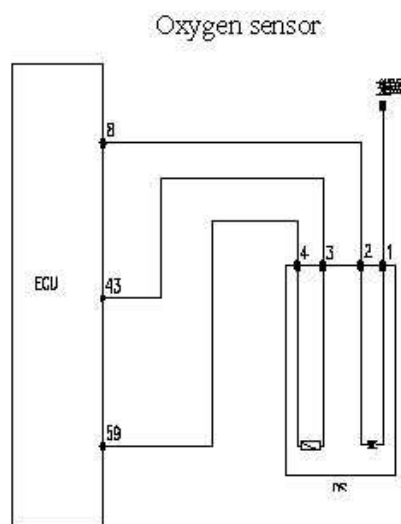
50-60Nm. Smear anticorrosive oil on sensor after replacing.



actuator such as injector and ignition coil to control engine operation.

Constitution: There are shield shell and PC board in ECU. Many electronic control units are interated on the board to control EFI system

Install: ECU is double connector type and is fixed under instrument panel by screws. Series 372 only use one connector with 81pins.



The diagram of oxygen sensor

Oxygen sensor connects with cable. The other end os cable is electric connector. There is asbestos Cover on outside.

Pins on connector:

No.1: Connect heat source (+)/white

No.2: Connect heat source (-)/white

No.3: Connect signal (-)/gray

No.4: Connect signal (+)/black

The heat coil of sensor is controlled by ECU. When sensor is heated to certain temperature, ECU will cut current to the coil and stop heating. (when open or short heating coil, ECU will find malfunction information and MIL will on. Engine will run under malfunction mode in some working conditions).

## 6. ECU

Usage: ECU is central part of electronic control system. Sensors supply every signal for ECU. After calculation, ECU will control the action of



ECU pins:

1. Battery ground	29. CKP input	57. Not used
2. Battery ground	30. CMP ground	58. A/C apply
3. Ignition coil 3	31. Coolant temperature signal	59. O <sub>2</sub> ground
4. Ignition coil 1	32. TPS input	60. IAT ground
5. Ignition coil 2	33. Not used	61. Injector of cylinder 2
6. Can-bus low	34. Not used	62. Not used
7. Can-bus high	35. Step motor B+	63. ECU power (+12V BAT)
8. O <sub>2</sub> sensor signal output	36. Step motor B-	64. High speed fan relay control
9. Not used	37. Not used	
10. KS signal output	38. TPS ground	65. High Speed fan relay control output
11. Not used	39. Speed signal	66. Engine speed input signal
12. Evaporator temperature sensor input	40. Not used	67. Main relay control output
13. Evaporator temperature sensor ground	41. Not used	68. A/C relay control output
14. Not used	42. Not used	69. Fuel pump relay output
15. Not used	43. O <sub>2</sub> sensor	70. Trouble lamp
16. Not used	44. ECU power (+12V BAT)	71. Not used
17. Not used	45. TPS power supply (+5V)	
18. Not used	46. IAT power supply (+5V)	
19. Step motor A+	47. Not used	72. CKP input
20. Step motor A-	48. IAT ground	73. Coolant temperature sensor ground
21. Main relay power supply	49. Not used	74. Power steering pressure switch signal
22. Ignition switch power supply	50.	75. Not used
23. No.3 injection nozzle	51. Not used	76. Not used
24. No.1 injection nozzle	52. Not used	77. Diagnostic (K wire)
25. Not used	53. Not used	78. Not used
26. Canistor relay	54. KS ground	79. Not used
27. CKP ground	55. Ignition coil ground	80. Not used
28. Not used	56. IAT signal	81. Not used

## 7. Fuel pump

**Usage:** Fuel pump feeds fuel with certain pressure and quantity to engine. The temperature and voltage have great influence on pump.

**Constitution and principle:** The pump consists of DC motor, vane motor and cover (together with stop return valve, leak valve and anti-electromagnetism interference elements). The pump and motor

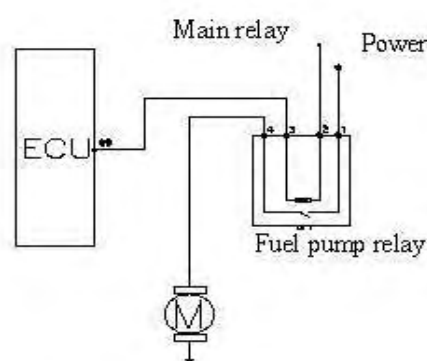
are mounted on same shaft and sealed in same shell. Pump and motor in shell are surrounded by fuel for radiation and lubrication. Battery supplies voltage to pump through pump relay. The relay only switches on pump circuit during engine starting and running. When engine stops for malfunction, pump will stop automatically. The maximum pressure on outlet of pump is decided by leak valve. Series 372 use non-return fuel system and fuel pressure

regulator is mounted on pump assembly. The regulator adjusts pump pressure to 380kPa to adapt the requirement for system operation.

**Note:** The temperature of fuel has great influence on pump function. When working under high temperature for a long time, the pump pressure will drop rapidly if fuel temperature is over certain value. If engine cannot be heat started, please check carefully whether the high temperature working function is good.



Fuel pump



The diagram of fuel pump

Pins: There are 2 pins on pump to connect pump relay. Marks “+” and “-” are cut on the shell of pump.

## 8. Injector

**Usage:** Injector injects atomized fuel to engine in specified time according to instruction of ECU.

**Constitution and principle:** ECU sends pulses to injector coil to form magnetic field force. When the force increased enough to overcome the resultant force of spring pressure, weight of needle valve and friction, needle valve begins to lift and inject process starts. The maximum lift height of needle valve does not exceed 0.1mm. When inject pulses stop, needle valve closes again by the pressure of return spring.

Install hint: The injector must use suitable connector.

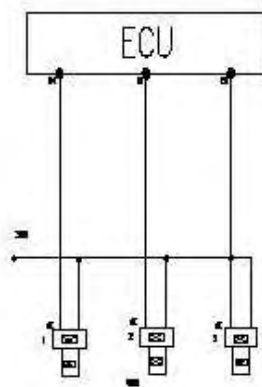
**Note:** For long stopped vehicle, please check carefully if the fuel cohered blocks injector.

In order to mounting easily, recommend to smear non-silicon clear oil on the surface of O-ring connected with fuel distribution pipe. Pay attention to not pollute internal injector and injector hole by oil. Install injector to the seat vertically to injector seat, and then clamp injector on the seat by clip.

**Diagnosis:** S11 EFI system does not diagnose the injector itself, but diagnoses for injector driver. When injector driver is short to battery voltage or overload, short to ground or open, ECU will mark malfunction position. Oxygen sensor close-loop control and self-study pre-control will shut off. The last self-study data is effective. After troubleshooting, malfunction position resumes.



Injector



The diagram of injector

**Pins:** There are 2 pins on each injector. One of pins marked (+) on side of shell connects pin 87 on pump relay, and another connects pin 23,24 or 61 on ECU.

### 9. Step motor DLA

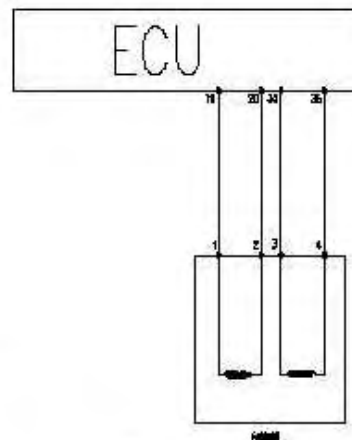
**Function:** Step motor with idle actuator offers by-pass intake air channel. When throttle closes, air will enter engine through the channel. ECU can regulate the section of channel to adjust mass airflow and adjust inject fuel amount. When engine works, ECU will control step motor according to different working conditions to change the operation of engine.

**Constitution and principle:** Step motor is a micro motor that consists of several steel stators and one rotor. A coil is reeled on each stator. Rotor is a permanent magnet with a nut on the center. All stator coils is always connected with electricity. If changing current direction in one coil, rotor will turn a degree. When current direction in each stator coil is changed in suitable order, revolving field is formed to run rotor in certain direction.

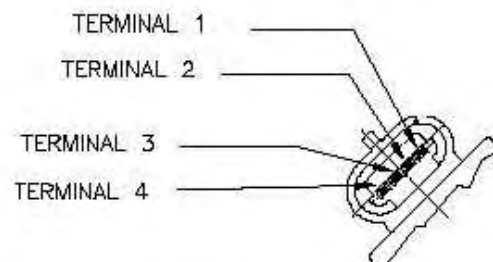
**Diagnosis:** ECU can monitor the short or open of two coils for step motor and lights MIL. Engine runs at malfunction mode. Some time use test can find the steps changing, but engine still does not work normally. Please check if intake air pressure changes to confirm is the piston of step motor works.



Step motor



The diagram of step motor



**Pins:**

Pin1: Connect pin 19 on ECU.

Pin2: Connect pin 20 on ECU.

Pin3: Connect pin 35 on ECU.

Pin4: Connect pin 36 on ECU.

Pin 1 and pin 2 are on one coil and pin 3 and



pin 4 are on the other. The resistances in both coils are same. Please confirm if the resistance is in standard values.

#### 10. Ignition coil ZSK-ROV Function:

Ignition coil transforms low voltage on primary coil into high voltage on secondary coil and produces spark through spark plug to light fuel-air mix in cylinder. Independent ignition: There are 3 ignition coils on vehicle. ECU will control the ground of these coils according to the signal of crank position and cam position to control ignition of engine.

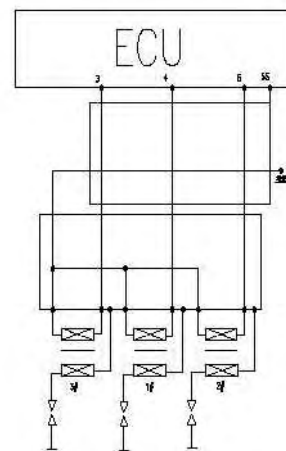
**Constitution and principle:** Ignition coil consists of primary coil, secondary coil, iron core and shell. When battery voltage supplies on primary coil, the coil is charged. Once ECU cuts off the return loop of primary coil, charging stops. The high voltage is induced in secondary coil at same time.

**Diagnosis:** ECU does not have diagnosis function for ignition coil. So if ignition coil is fault, malfunction code does not exist. It can judge if the coil works normally only by checking resistance of ignition coil. Usually, ignition coil produces more heat during the working, but over heat of coil will result in increasing for coil resistance. It will cause unstable running and automatically stopping work for engine.

Primary coil: 0.47 ohms.  
Secondary coil: 8 ohms.



The out view of ignition coil( for 372, there 3 such coils)



The diagram of ignition coil( without distributor)

**Pins:** There are 2 pins on low voltage side of coil. Pin marked (+) connects battery and the other connects ECU.

#### 11. Canister control valve

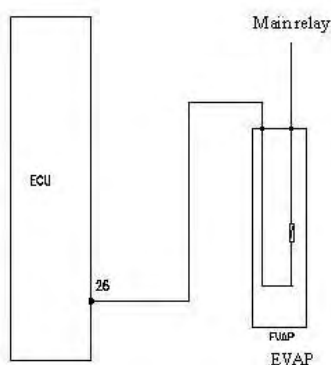
**Usage:** The valve is used to control flux to clean canister. The valve is controlled by ECU according to engine load, lasting time and frequency of pulses. The fuel vapor in canister will accumulate to leak fuel for environmental pollution. The function of canister solenoid is to open the solenoid to pass superfluous vapor into intake air pipe to be in combustion.

**Constitution and principle:** The valve consists of magnetic coil, iron core and valve body. There is filter on inlet. Mass flow through the valve is related with the frequency of electric pulses that put out to control valve by ECU and with the pressure differential between inlet and outlet. If no pulses, canister control valve will close. ECU controls the electrify time for canister solenoid to indirectly control the mass flow of clearing air.

**Diagnosis:** ECU does not have diagnosis function for canister control valve, but can diagnoses canister control valve driver. When canister control valve driver is short to battery voltage or over load, short to ground and open, the basic self-study of fuel metering close-loop control is shut off. If canister solenoid is fault, engine will be unstable idle or over high idle.



Out view of canister control valve



The diagram of canister control valve

TEV-2

Pins: There 2 pins on canister control valve. One connects pin 87 on main relay and the other connects pin 26 on ECU.

## 12. Steel fuel distribution pipe assembly

**Usage:** To store and distribute fuel and return superfluous fuel into fuel tank. Injector and fuel pressure regulator are mounted on the tank to offer stable pressure circumstance to balance the fuel pressure and amount of fuel for smooth running of engine.

**Constitution:** Series 372 fuel distribution pipe assembly consists of injector and fuel supply pipe assembly. Since system does not use return fuel control, there is no fuel pressure regulator.

**Install request:** Clamp in/out fuel pipe and rubber hose with clip. The type of clip should be matched with rubber hose to insure the seal between in/out fuel pipe and the hose.

**Diagnosis:** Usually, fuel supply pipe assembly is seldom to be fault. Mostly bad installing causes the fuel leakage. Pay more attention during installation. Don't install the seal or o-ring that are used.



Fuel distribution pipe assembly



## Chapter 2 Basic principle for diagnosis of EFI

### (1) Fault information record

ECU continually detect the sensors, actuator, related circuit, MIL and battery voltage as well as ECU itself, and carry on reliability test for sensor output signal, actuator drive signal and internal signal such as oxygen close loop control, knock control, idle control and battery voltage control. Once the malfunction in one point is found, or one signal is not true, ECU will set the malfunction information record on RAM memory. The record exists as malfunction code form and displays as the order of malfunction code appearing. Malfunction can be divided as stable malfunction or temporary malfunction such as the fault caused by short-lived, harness open or bad contact for connectors according to the frequency

### (2) Malfunction statuses

If the lasting time for one malfunction detected exceeds stable time settled, ECU will consider it as a stable fault and stores it as "stable malfunction". If it disappears, ECU will store it as "temporary malfunction" or "not existing". If it is detected again, it will be "temporary malfunction", but the existing history malfunction does not influence the normal use of engine.

### (3) Malfunction types

- Short to positive pole of battery.

- Short to ground.

- Open (In the case of up or down resistors, ECU will identify the open fault in input terminal as short between input terminal and battery positive pole or short to ground).

### (4) Limp drive home

For some important faults detected, if their lasting time exceeds the setting stable time, ECU will apply some software methods, for example, to close some control function of oxygen sensor close loop control and set substitute value for some unbelievable value. At the moment, through the working condition of engine is not so good, but the vehicle can be drive home. In this way, vehicle can drive home or service station for repairing to void stop on road. Once the fault is detected disappears, the normal values will be used again.

### (5) Warning

All 372 of MS200 system vehicles equip MIL. When some important parts such as ECU, MAP, TPS, ECT, KS, O<sub>2</sub>, phase sensor, injector, idle actuator, 2 drive poles of step motor, canister control valve, fan relay are fault, ECU will turn MIL on and warning until the faults disappear.

### (6) Fault read out

The malfunction information records can be read out from ECU by tester, or be read by flashing malfunction codes. If the faults relate the function of fuel/air mix ratio regulator,



engine will read malfunction information records after running at least 5 minutes.

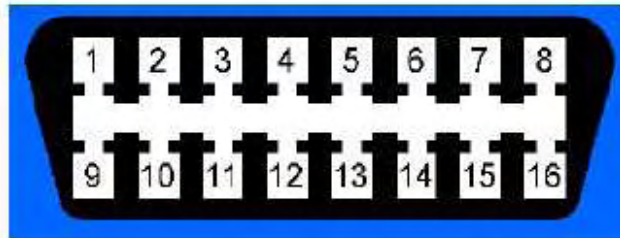


Fig. 3-1 ISO 9141-2 Standard diagnosis connector

The diagnosis connector install under glove box of assistant driving side

#### **(7) Clear malfunction code**

When eliminate the faults, DTC should be cleared. There are 2 methods:

Clear DTC by using tester with the order of "clear DTC" .

Remove ECU terminals or battery terminals to clear DTC outside of RAM.

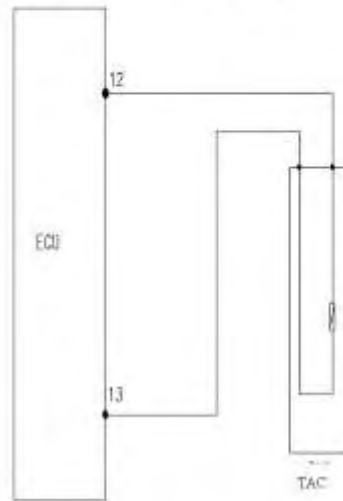
#### **(8) Finding faults**

Getting above DTC means only to know the faults position, but not the real fault because the reason for one fault may be the electric or mechanical one such as sensor, ECU or actuator damage, or open circuit or short circuit or even mechanical damage.

Fault is internal, but the appearances are various. Firstly use tester or flashing light to check if existing any DTC, and trouble clearing accord to DTC, then find the reason of fault according to engine symptom.



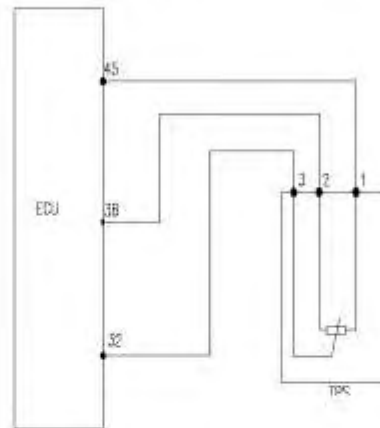
### A/C evaporator outlet temperature sensor



**The diagram for A/C evaporator temperature sensor**

No.	Operation steps	Test results	Next step
1	Turn on ignition key.		Next
2	Pull out connector of A/C evaporator temperature sensor, measure if the volt between 2 pins is 5V with multimeter.	Yes	Next
		No	4
3	Check any open or short between 2 pins with multimeter.	Yes	Replace sensor
		No	Replace ECU
4	ECU and harness, check any open or short between pin 12 and 13 of ECU and pin (1) and (2) of sensor with multimeter.	Yes	Repair or replace harness
		No	Replace ECU

### TPS



**The diagram of TPS**

No.	Operation steps	Test results	Next step
1	Turn on ignition key.		Next
2	Pull out connector of TPS, measure if the volt between pin (1) and (2) of sensor is 5V with multimeter.	Yes	Next
		No	5
3	Measure the resistance between pin (1) and (2) of sensor if in 1.6 to 2.4k with multimeter.	Yes	Next
		No	Replace sensor
4	Run slowly TPS from one end to another and check any open or short between pin (1) and (3), or check if the resistance jump.	Yes	Replace sensor
		No	Replace ECU
5	Connect commutator between ECU and harness, check any open or short between pin 45,38,32 of ECU and pin (1) ,(2)and (3) of sensor with multimeter.	Yes	Repair or replace harness
		No	Replace ECU

# KS

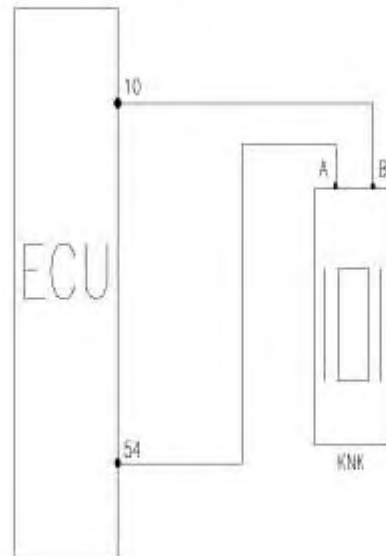


Diagram for KS

No.	Operation steps	Test results	Next step
1	Turn off ignition key, engine nor run.		Next
2	Pull out connector of KS sensor, measure if the resistance between pin 1, pin 2 of sensor is over 1M with multimeter.	Yes	Next
		No	Replace sensor
3	Slightly knock around sensor with small hammer and check if any AC signals putout between pin1 and pin2 of sensor.	Yes	Next
		No	Replace sensor
4	Turn on ignition key but engine not run		Next
	Connect adaptor between ECU and harness and check any open or short between pin 10,54 of ECU and pin A and pin B of sensor with multimeter.	Yes	Repair or replace harness
		No	Replace ECU

## MAP/IAT

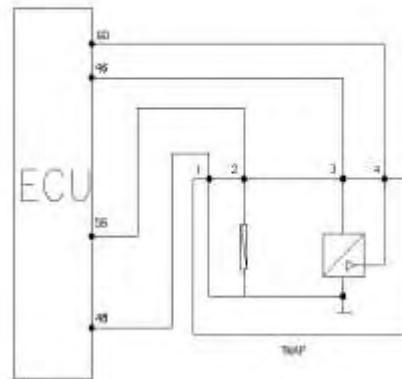
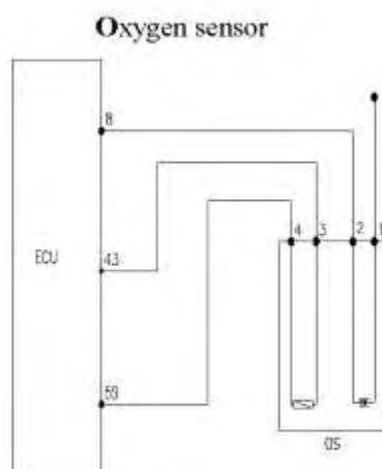


Diagram of MAP and IAT

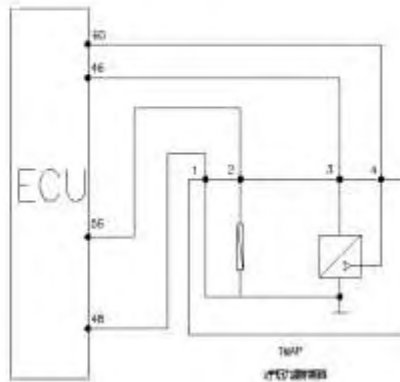
No.	Operation steps	Test results	Next step
1	Turn on ignition key.		Next
2	Pull out the connectors on harness of MAP and IAT and check if the voltage between pin1 and pin 3 of sensor is 5V with multimeter.	Yes	4
		No	Next
3	Connect the commutator between ECU and harness, check if open or short between pin 48, pin 46, pin 60 of ECU and pin 1, pin 3, pin 4 of sensor separately with multimeter.	Yes	Repair or replace harness
		No	Next
4	Turn on ignition key but engine not run		Next
5	Put on N shaft and run engine in idle. Step down accelerate pedal to fully open. Check if the voltage between pin 4 and pin 1 of sensor (pin 6, pin 48 of ECU) is increasing to 4V with multimeter.	Yes	Replace ECU
		No	Replace ECU or sensor



The diagram of oxygen sensor

No.	Operation steps	Test result	Next step
1	Turn on ignition key.		Next
2	Put out the connector on oxygen sensor and check if the voltage between pin 1 and pin 2 is 12 V.	Yes	Next
		No	4
3	Check if the resistance between pin 1 and pin 2 on oxygen sensor is from 6 to 25.	Yes	Replace ECU
		No	Replace sensor
4	Check if the fuse in oxygen sensor heating circuit is burn out.	Yes	Replace fuse
		No	Next
5	Check if open or short between pin 1 on sensor and pin 87 on fuel pump relay, check open or short between pin 2 and pin 59.	Yes	Repair or replace harness
		No	Next
6	Insert the connector of oxygen sensor harness. Put N shaft and run engine in idle to normal coolant temperature.		Next
7	Put out the connectors of oxygen sensor from harness. Check if output 0.1-0.9V voltage between pin 4 (+) and pin 3 (-)	Yes	Next
		Yes	Repalce sensor
8	Connect the adaptor between ECU and harness. Check if open or short between pin 43, pin 59 on ECU and pin 3, pin 4 separately	Yes	Repair or replace harness
		No	更换 ECU Replace ECU

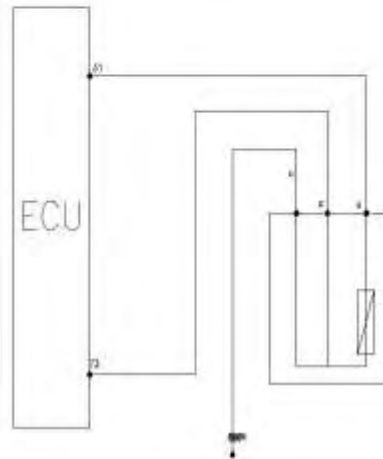
### DTC 18 IAT



The diagram of MAP and IAT

No.	Operation Steps	Test result	Next step
1	Turn on ignition key.		Next
2	Put out the connectors on MAP and IAT harness. Check if the voltage between pin 1 and pin 2 is 5 V.	Yes	Next
		No	4
3	Check if the resistance between pin 1 and pin 2 is suit to the temperature ( see related parts in this manual).	Yes	Replace ECU
		No	Replace sensor
4	Connect the adaptor between ECU and harness. Check if open or short between pin 48, pin 46, pin 56 on ECU and pin 1, pin 3, pin 2 separately.	Yes	Repair or replace harness
		No	Replace ECU

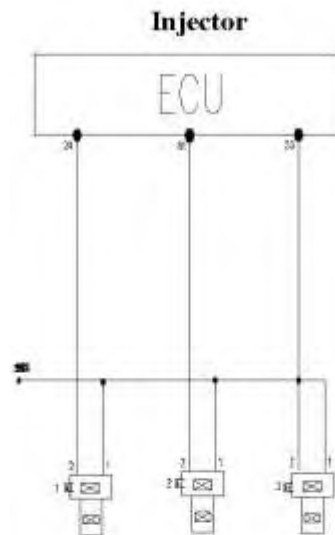
### Coolant temperature sensor



The diagram of CTS

No.	Operation steps	Test result	Next step
1	Turn on ignition key.		Next
2	Put out the connector on CTS harness, check if the voltage between pin a and pin c is 5V.	Yes	Next
		No	4
3	Check if the resistance between pin a and pin c is suit to the temperature (see related parts in this manual).	Yes	Replace ECU
		No	Replace sensor
4	Connect the adaptor between ECU and harness. Check if open or short between pin 73, pin 31 on ECU and pin a, pin c separately.	Yes	Repair or replace harness
		No	Replace ECU





The diagram of injector

No.	Operation steps	Test result	Next step
1	Turn on ignition key without engine run.		Next
2	Put out al connectors on injector harness; connect two probes of multimeter on pin 1 and engine ground.		Next
3	Turn on ignition key. See if the display on multimeter is 12 V for 1 second once turning on the key.	Yes	Repeat step 2
		Yes	6
		No	Next
4	Use multimeter to check if open or short between pin 87 on pump relay output and pin 1 on each injector.	Yes	Repair or replace harness
		No	Next
5	Repair or replace pump replay, main repalay and circuit.	Yes	Repair or replace harness
6	Connect the commutator between ECU and harness. Check if open or short between pin 24, pin 61, pin 23 on ECU and pin 2 on each injector separately.	No	Next
7	Use multimeter to check if resistance between pin 1 and pin 2 on injector is 12—16V in 20°C.	Yes	Repeat step 7
		Yes	Next
		No	Replace injector
8	Reinsert all injector connector. Put N shaft and run engine in idle. Put out each injector connector in turn and check if the vibration of engine picks up hereby.	Yes	Repeat step 8
		No	Replace ECU

### Canistor control driver

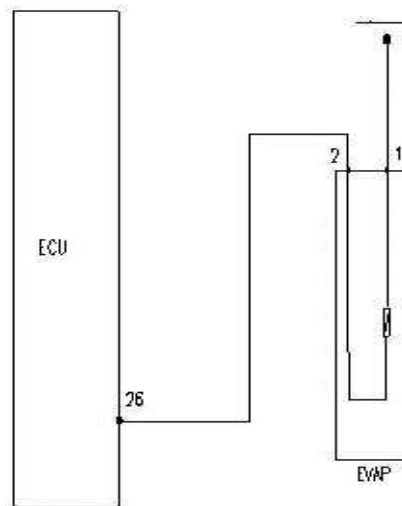


Diagram of canister control valve

No.	Operation steps	Test result	Next step
1	Run engine in idle to normal coolant temperature.		Next
2	Put out the connector on canister valve and check if the voltage between two pins is 12 V.	Yes	Next
		No	5 (Check live wire)
3	Reinsert connector of canister valve harness. Run engine to 1500 RPM. Touch valve with hand and check if any slightly vibration or impact on valve.	Yes	Next
		No	7 (Check ground wire)
4	Use multimeter to check if resistance between pin 1 and pin 2 is 22—30.	Yes	Replace ECU
		No	Replace canister control valve
5	Use multimeter to check if open or short between pin 87 on main relay and pin 1 on valve.	Yes	Repair or replace harness
		No	Next
6	Repair or replace main relay and circuit.		
7	Shut off engine. Connect commutator between ECU and harness. Use multimeter to check if open or short between pin 26 on ECU and pin 2 on valve.	Yes	Repair or replace harness
		No	Replace ECU

### Canistor control driver

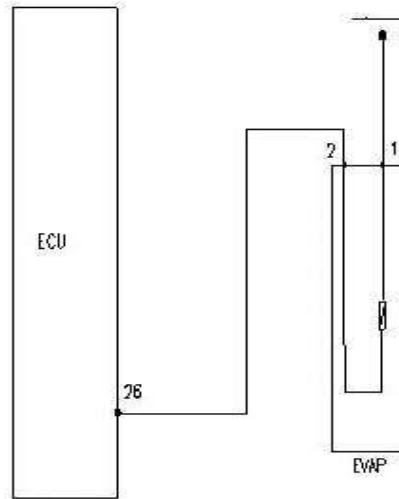
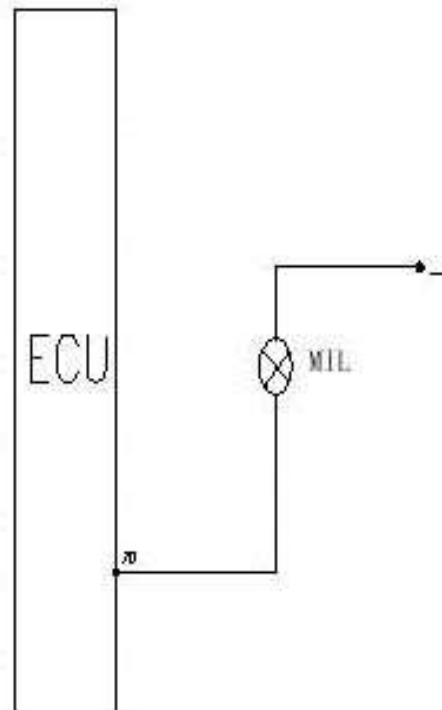


Diagram of canister control valve

No.	Operation steps	Test result	Next step
1	Run engine in idle to normal coolant temperature.		Next
2	Put out the connector on canister valve and check if the voltage between two pins is 12 V.	Yes	Next
		No	5 (Check live wire)
3	Reinsert connector of canister valve harness. Run engine to 1500 RPM. Touch valve with hand and check if any slightly vibration or impact on valve.	Yes	Next
		No	7 (Check ground wire)
4	Use multimeter to check if resistance between pin 1 and pin 2 is 22—30.	Yes	Replace ECU
		No	Replace canister control valve
5	Use multimeter to check if open or short between pin 87 on main relay and pin 1 on valve.	Yes	Repair or replace harness
		No	Next
6	Repair or replace main relay and circuit.		
7	Shut off engine. Connect commutator between ECU and harness. Use multimeter to check if open or short between pin 26 on ECU and pin 2 on valve.	Yes	Repair or replace harness
		No	Replace ECU

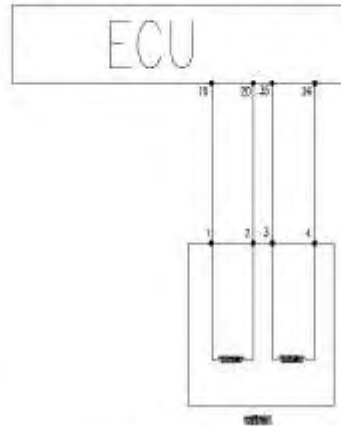
### MIL driver



The diagram of MIL

NO.	Operation steps	Test result	Next step
1	Turn on ignition key		Next
2	Remove instrument panel. Put out MIL bulb. Use multimeter to check if the voltage in MIL socket is 12 V.	Yes	Next
		No	5 (Check live wire)
3	Use multimeter to check if MIL bulb is good.	Yes	Next
		No	Replace bulb.
4	Connect the commutator between ECU and harness. Check if open or short between pin 70 on ECU and input connector of MIL.	Yes	Repair or replace harness
		No	Replace ECU
5	Check if the fuse in oxygen heating circuit is burn out.	Yes	Replace fuse
		No	Next
6	Use multimeter to check if open or short between pin 87 on main relay and pin 1 on MIL socket.	Yes	Repair or replace harness
		No	Next
7	Repair or replace main relay and circuit.		

### No. 1 and No.2 coil driver in step motor



The diagram of idle actuator/step motor

No.	Operation steps	Test results	Next step
1	Turn on ignition key but engine not run.		Next
2	Put out the connector on step motor and check if the resistance between pin 1 and pin 2 as well as pin 3 and pin 4 is 40—80.	Yes	Next
		No	Replace idle actuator
3	Use multimeter to check if the resistance between pin 1 and pin 2 as well as Pin 3 and pin 4 are infinite.	Yes	Next
		No	Replace bulb or actuator
4	Use multimeter to check if voltages between pin 1 and pin 2 as well as pin 3 and pin 4 are 12V.	Yes	Replace actuator
		No	Next
5	Connect commutator between ECU and harness. Use multimeter to check if open or short between pin 19, pin 20, pin 35, pin 36 on ECU and pin 1, 2, 3, 4 on step motor.	Yes	Repair or replace harness
		No	Replace ECU

#### 6. The diagnosis steps according to engine symptoms

Before beginning diagnosis steps according to engine symptoms, the primary checking should be carried out:

- (1) Make any abnormal situation for ECU and MIL (except vehicle without MIL).
- (2) Use diagnoses instrument or flashlight to check to insure no any malfunction information records.
- (3) Use diagnoses instrument to check the idle data on heated engine of EFI system to insure everything is OK.
- (4) Make sure the symptoms that driver told exist and check the exact position of symptom.

Then begin appearance check:

Check if clear or firm on harness ground.

Check if any rupture, twist in bulb or if connect correctly.

Check if any bottleneck in bulb.

Check if any stave or damage on intake air pipe.

Check if the seal between throttle body and manifold is good.

Check if any rupture, aging on secondary wire in ignition system or connect correctly.

Check if the connection of wires is correct or any loose/bad contact on connector.

#### 1) Engine does not run or run slowly on start

No.	Operation steps	Test step	Next step
1	Check if the voltage between two poles on battery is 10—12.5 V.	Yes	Next
		No	Repair or replace battery
2	Turn on ignition key. Check if the voltage on positive poles of battery connected with the key is 10—12.5 V.	Yes	Next
		No	Repair poles or replace wires
3	Keep ignition key on start position. Check if the voltage on positive pole of starter connected with ignition key is 8V.	Yes	Next
		No	Replace bulb, replace actuator, repair or replace ignition key
4	Keep ignition key on start position. Check if the voltage on positive pole of starter is 8V.	Yes	Next
		No	Repair poles or replace wires
5	Use multimeter to check if open or short for starter.	Yes	Repair or replace start motor
		No	Next
6	Check if engine blocks for bad lubrication.	Yes	Trouble shooting
		No	Next
7	If in winter, check if the resistance of starter is too big that resulted by wrong lubricant or gear oil.	Yes	Replace suitable oil
		No	Repair or replace timing belt

**2) Engine can run but cannot start successfully (without distributor)**

No.	Operation steps	Check step	Next step
1	Turn on ignition key. Use tester to check if malfunction information record exists.	Yes	Eliminate trouble
		No	Next
2	Pull out cylinder wire and connect ignition plug with the electrode 5—10mm from engine body. Run engine with starter and check if high voltage ignition in blue and white appears.	Yes	8
		No	Next
3	Check if the resistance of high voltage wire is normal (about 16k/ m. For exact data, please touch manufacture).	Yes	Next
		No	Repair or replace high voltage wire
4	Check if any ignition coil damage or crack.	Yes	Replace
		No	Next
5	Check if any loose or damage for identification ring in ignition coil.	Yes	Replace
		No	Next
6	Check if ignition coil is normal.	Yes	Next
		No	Replace
7	Check if ignition coil connector is good,	Yes	Next
		No	Connect plug
8	Turn on ignition key. Check if fuel pump relay and fuel pump can work for 3 seconds.	Yes	Next
		No	Repair fuel pump circuit
9	Connect fuel pressure gauge valve. Short pin 30 on fuel pump relay and pin 87 to start fuel pump. Check if fuel pressure is 300 kPa.	Yes	Next
		No	13
10	Pull out fuel distribution pipe together with injector. Pull out injector connector on harness. Supply 12V voltage directly from battery to injector. Check if injector can inject fuel.	Yes	12
		No	Next
11	Re-check if injector can inject fuel after cleaning.	Yes	Next
		No	Replace injector
12	Check If fuel deterioration or containing water.	Yes	Replace fuel oil
		No	18
13	Check if fuel pressure below 300kPa.	Yes	Next
		No	17

14	Shut off fuel gauge valve. Connect ignition key again to run fuel pump for 3 seconds. Check if fuel pressure can be set up.	Yes	Next
		No	16
15	Check if fuel pipe is leaked or blocked.	Yes	Repair or replace fuel inlet
		No	Replace fuel pump
16	Check returning fuel pipe is blocked or curving.	Yes	Repair or replace oil return pipe
		No	Replace fuel pressure regulator
17	Connect commutator between ECU and harness. Check if voltage exists on pin 1,2. Check if the positive source on above pins and ground wires of pin 22,44,63 on ECU are normal.	Yes	Next
		No	Repair or replace harness
18	Check if intake air system parts are leakage.	Yes	Repair
		No	Next
19	Check if MAP or IAT are blocked.	Yes	Repair or replace
		No	Next
20	Check if CTS is normal.	Yes	Next
		No	Repair or replace
21	Check if engine cannot start because mechanical reason such as cylinder head spacing and cylinder leakage.	Yes	Eliminate mechanical malfunction
		No	Replace ECU

### 3) Heat start difficult

No.	Operation steps	Test results	Next step
1	Turn on ignition key. Use tester to check if malfunction information record exists.	Yes	Eliminate trouble
		No	Next
2	Connect fuel pressure gauge valve. Short pin 30 on fuel pump relay and pin 87 to start fuel pump. Check if fuel pressure is 250—300 kPa.	Yes	Next
		No	9
3	Disconnect fuel pipe. Shut off ignition key. After 1 hour, check if pressure in fuel system can keep 150—200 kPa.	Yes	Next
		No	Repair fuel system leak



4	Connect fuel pipe. Use returning fuel blocker to block returning fuel pipe and shut off fuel pressure gauge valve. Shut off ignition key. After 1 hour, check if pressure in fuel system can keep 150—200 kPa.	Yes	Replace fuel pressure regulator
		No	Next
5	Check if injector and fuel pipe leaks fuel.	Yes	Replace injector and oilpipe
		No	Next
6	Pull out coolant temperature sensor connector and run engine. Check if engine can start.	Yes	Check coolant temperature and circuit
		No	Next
7	Connect adaptor between ECU and harness. Check if voltage exists on pin 1,2. Check if the positive source on above pins and ground wires of pin 22,44,63 on ECU are normal.	Yes	Next
		No	Repair or replace harness
8	Replace fuel and heat start engine again. Check if engine can start.	Yes	Harness
		No	Replace ECU
9	Check if fuel pipe is blocked or curving, or if fuel pump regulator can work normally.	Yes	Next
		No	Repair or replace
10	Use multimeter to check if voltages between two ends of fuel pump connector exists.	Yes	Next
		No	Repair or replace fuel pump relay and leading line
11	Check if fuel pump resistance is correct.	Yes	Next
		No	Replace fuel pump
12	Check if fuel pump is blocked.	Yes	Replace fuel pump
		No	Replace ECU

#### 4) RPM is normal but difficult in starting

No.	Operation steps	Test results	Next step
1	Turn on ignition key. Use tester to check if malfunction information record exists.	Yes	Eliminate malfunction
		No	Next
2	Check if air filter is through.	Yes	Next
		No	Replace
3	Check if MAP pressure is 35—65 kPa in idle after start.	Yes	Next
		No	Eliminate intake system leak

4	Step down throttle slightly and check engine can start easily.	Yes	Replace or check throttle valve and idle pass
5	Connect fuel pressure gauge valve. Short pin 30 on fuel pump relay and pin 87 to start fuel pump. Check if fuel pressure is 250—300 kPa.	Yes	Next
		No	9
6	Use special connector to supply 12 V voltage from battery to injector and check if injector works normally.	Yes	8
		No	Next
7	Re-check if injector can inject fuel after cleaning.	Yes	Next
		No	Replace injector
8	Replace fuel. Check If fuel deteriorates or containings water.	Yes	Replace fuel
		No	14
9	Check if fuel pressure below 250kPa.	Yes	Next
		No	13
10	Shut off fuel gauge valve. Connect ignition key again to run fuel pump for 3 seconds. Check if fuel pressure can be set up.	Yes	Next
		No	12
11	Open fuel gauge valve, use return fuel blocker to clamp fuel pipe for no returning fuel. Check if fuel pressure can be set up soon.	Yes	Replace fuel pressure regulator
		No	Repair and replace injector or fuel pipe
12	Connect fuel pessure gauge valve. Short pin 30 on fuel pump relay and pin 87 to start fuel pump. Check if fuel pressure is 250—300 kPa	Yes	Repair and replace fuel pipe
		No	Replace fuel pump
13	Check returning fuel pipe is blocked or curving.	Yes	Repair or replace returning fuel pipe
		No	Replace fuel prassure regulator
14	Pull out idle actuator connector before coolant temperature reaches 35℃ and check if engine speed is degressive.	Yes	Next
		No	Repair or replace idle actuator
15	Turn on ignition key. Check voltages on following pins are normal: 12 V for pin 27 and zreo for pin 14 and 19.	Yes	Next
		No	Check harness or connector
16	Run engine in idle. When coolant temperature reaches normal, ground pin 51 and check if ignition advance angle is 6.75 crank angle.	Yes	Next
		No	Adjust ignition advance angle

17	Check if cylinder compressed pressure is normal.	Yes	Next
		No	Trouble shooting
18	Check if MAP and IAT blocks.	Yes	Repair or replace
		No	Next
19	Check if coolant temperature sensor is normal.	Yes	Replace ECU
		No	Repair or replace

#### 5) Cold start difficult

No.	Operation steps	Check results	Next step
1	Turn on ignition key. Use tester to check if malfunction information record exists.	Yes	Eliminate malfunction
		No	Next
2	Use multimeter to check if coolant temperature sensor is normal. Or link 1.5k resistors between pin 45 and pin 30 on ECU to replace coolant temperature sensor for starting engine. If engine can start, coolant temperature sensor is normal.	Yes	Next
		No	Replace sensor
3	Turn on ignition key. Check if voltages on following pins are normal: 12 V for pin 27 and zero for pin 14 and 19.	Yes	Next
		No	Check harness
4	Check if air filter is through.	Yes	and connector
		Yes	Next
5	Check if MAP pressure is 35—65 kPa in idle after start.	No	Replace
		Yes	Next
		No	Eliminate intake system malfunction
6	Step down throttle slightly and check engine can start easily.	Yes	Check throttle and idle pass
		No	Next
7	Pull out idle actuator connector before coolant temperature reaches 35°C and check if engine speed is degressive.	Yes	Next
		No	Repair or replace idle actuator
8	Connect fuel pressure gauge valve. Ground pin 86 on fuel pump relay. Turn on ignition key to run fuel pump relay and fuel pump to check if fuel pressure is 250—300kPa.	Yes	Next
		No	12
9	Use special connector to supply 12 V voltages from battery to injector and check if injector works normally.	Yes	11
		No	Next
10	Re-check if injector can inject fuel after cleaning.	Yes	Next
		No	Replace injector

11	Check If fuel deteriorates or containings water.	Yes	Replace fuel
		No	17
12	Check if fuel pressure below 250kPa.	Yes	Next
		No	16
13	Shut off fuel gauge valve. Connect ignition key again to run fuel pump for 3 seconds. Check if fuel pressure can be set up.	Yes	Next
		No	15
14	Open fuel gauge valve, use return fuel blocker to clamp fuel pipe for no returning fuel. Check if fuel pressure can be set up soon.	Yes	Replace fuel pressure regulator
		No	Repair or replace injector and fuel pipe
15	Check if fuel pipe is leaked or blocked.	Yes	Repair or replace intake fuel pipe
		No	Replace fuel pump
16	Check returning fuel pipe is blocked or curving.	Yes	Repair or replace returning fuel pipe
		No	Replace fuel pressure regulator
17	Check if cylinder compressed pressure is normal.	Yes	Next
		No	Troble shooting
18	Check if intake air system is leak.	Yes	Repair
		No	Next
19	Check if MAP and IAT blocks.	Yes	Repair or replace
		No	Replace ECU

#### 6) Unstable idle at any situation

1	Turn on ignition key. Use diagnostic equipment to check if malfunction information record exists.	Yes	Eliminate malfunction
		No	Next
2	Check if EWD3 idle actuator or step motor actuator blocked.	Yes	Repair or replace idle actuator
		No	Next
3	Turn on ignition key. Connect adaptor between ECU and harness. Check if voltages on pin 31,56 ( output signal for IAT and ECT), pin 19,20,35,36 (output signal for stepmotor) and pin19, 35 (for EWD3) are normal.	Yes	Check harness and connector
		No	Next

3	Shut off engine. Check if air filter is through	Yes	Next
		No	Replace
4	Check if MAP pressure is 35—65 kPa at idle	Yes	Next
		No	Eliminate intake system leak
5	Connect fuel pressure gauge valve. Short pin 30 and pin 87 of fuel pump relay to start fuel pump. Check if fuel pressure is 300 kPa.	Yes	Next
		No	9
6	Use special connector to supply 12 V voltages from battery to injector and check if injector works normally.	Yes	8
		No	Next
7	Re-check if injector can inject fuel after cleaning.	Yes	Replace
		No	Replace injector
8	Check if fuel is degenerative or containing water	Yes	Replace fuel
		No	14
9	Check if fuel pressure blowe 250kpa	Yes	Next
		No	13
10	Shut off fuel gauge valve. Connect ignition key again to run fuel pump for 3 seconds. Check if fuel pressure can be set up.	Yes	Next
		No	12
11	Open fuel gauge valve, use return fuel blocker to clamp fuel pipe for no returning fuel. Check if fuel pressure can be set up soon.	Yes	Replace fuel pressure regulator
		No	Repair and replace injector or fuel pipe
12	Check if fuel inlet is leak or block	Yes	Repair or replace fuel inlet
		No	Replace fuel pump
13	Check if return fuel pipe is block or curving.	Yes	Repair or replace return fuel pipe
		No	Replace fuel pressure regulator
14	Pull out coolant temperature sensor and check if engine is normal	Yes	Replace coolant temperature sensor
		No	Next
15	Check if cylinder compression pressure of engine is normal	Yes	Next
		No	Trouble shooting
16	Check if the resistance of secondary wire is normal (about 16k/ m. For exact data, please touch manufacture). *	Yes	Next
		No	Replace

18	Check if sensor holes on MAP and IAT block.	Yes	Cleaning
		No	Next
19	Run engine in idle. After coolant temperature reaches actuating temperature for closed loop control, check if oxygen sensor works normally.	Yes	Next
		No	Check oxygen sensor and harness
20	Check if intake air system leaks.	Yes	Eliminate leak
		No	Next
21	Check if cylinder pressure is normal.	Yes	Next
		No	Trouble shooting

**7) Unstable idle at heat engine**

1	Turn on ignition key. Use diagnostic equipment to check if malfunction information record exists.	Yes	Eliminate malfunction
		No	Next
2	Check if air filter is through.	Yes	Next
		No	Replace
3	Check if MAP pressure is 35—65 kPa at idle in heating engine process.	Yes	Next
		No	Eliminate intake system malfunction
4	Shut off engine, turn on ignition key. Connect commutator between ECU and harness. Check if voltages on pin 31, 56 (output signal for IAT and ECT) is normal.	Yes	Next
		No	Check
5	Pull out idle actuator connector before heat engine finish and check if engine speed is normal	Yes	Next
		No	Replace idle actuator
6	Check if coolant temperature sensor is normal	Yes	Next
		No	Replace

**8) Unstable idle after heat engine**

1	Turn on ignition key. Use diagnostic equipment to check if malfunction information record exists	Yes	Eliminate malfunction
		No	Next
2	Turn on ignition key. Connect adaptor between ECU and harness. Check if voltages on pin 60,56,31,43(output signal for MAP, IAT, CTS and oxygen sensor) and pin 19,20,35,36 (output to idle actuator) are normal	Yes	Next
		No	Repair or replace harness

3	Shut off engine. Check if air filter is through	Yes	Next
		No	Replace
4	Check if MAP pressure is 35—65 kPa at idle	Yes	Next
		No	Eliminate intake system leak
5	Connect fuel pressure gauge valve. Short pin 30 and pin 87 of fuel pump relay to start fuel pump. Check if fuel pressure is 300 kPa.	Yes	Next
		No	9
6	Use special connector to supply 12 V voltages from battery to injector and check if injector works normally.	Yes	8
		No	Next
7	Re-check if injector can inject fuel after cleaning.	Yes	Replace
		No	Replace injector
8	Check if fuel is degenerative or containing water	Yes	Replace fuel
		No	14
9	Check if fuel pressure blowe 250kpa	Yes	Next
		No	13
10	Shut off fuel gauge valve. Connect ignition key again to run fuel pump for 3 seconds. Check if fuel pressure can be set up.	Yes	Next
		No	12
11	Open fuel gauge valve, use return fuel blocker to clamp fuel pipe for no returning fuel. Check if fuel pressure can be set up soon.	Yes	Replace fuel pressure regulator
		No	Repair and replace injector or fuel pipe
12	Check if fuel inlet is leak or block	Yes	Repair or replace fuel inlet
		No	Replace fuel pump
13	Check if return fuel pipe is block or curving.	Yes	Repair or replace return fuel pipe
		No	Replace fuel pressure regulator
14	Pull out coolant temperature sensor and check if engine is normal	Yes	Replace coolant temperature sensor
		No	Next
15	Check if cylinder compression pressure of engine is normal	Yes	Next
		No	Trouble shooting
16	Check if the resistance of secondary wire is normal (about 16k/ m. For exact data, please touch manufacture). *	Yes	Next
		No	Replace



17	Check if any ablation damage or crack on ignition coil.	Yes	Replace
		No	Next
18	Check if spark plug is normal	Yes	Replace ECU
		No	Replace spark plug

#### 9) Unstable idel or switch off

1	Turn on ignition key.Use diagnostic equipment to check if malfunction information record exists	Yes	Eliminate malfunction
		No	Next
2	Turn on A/C switch. Turn on ignition key.Connect commutator between ECU and harness. Check if pin 50 and 58(A/C switch) have signal input	Yes	Next
		No	Repair A/C circuit
3	Check if A/C system pressure, magnetic clutch of compressor and A/C pump are normal	Yes	Next
		No	Repair or replace
4	Turn on ignition key. Check if voltage on pin19, 20,35,36(output to idle actuator) are normal	Yes	Next
		No	Check control circuit
5	Remove stepmotor and check if stepmotor is jamming or does not work flexibly	Yes	Repair or replace stepmotor
		No	Next
6	Turn engine and open A/C .Check if idle actuator is normal	Yes	Replace ECU
		No	Replace idle actuator

#### 10) Periodicity unstable(ECU needs self-study again)

1	Turn on ignition key. Use diagnostic equipment to check if malfunction information record exists	Yes	Eliminate malfunction
		No	Next
2	Check if air filter is through °	Yes	Next
		No	Replace
3	Check if intake pressure is 35—65 kPa in idle	Yes	Next
		No	Repair
4	Run engine in idle. Shut off each cylinder one by one and check if engine speed is dropping or fluctuates.	Yes	7
		No	Next

5	Turn on ignition key. Connect commutator between ECU and harness. Check if voltages on pin 48,60,45,28(output signal for MAP, IAT, CTS and oxygen sensor), 1, 2(ground), 22 (ignition switch) and pin 19,20,35,36(output to idle actuator) are normal	Yes	Next
		No	Rpair or replace harness
6	Run engine in idle. After coolant temperature reaches normal, check if ignition advance angle is normal	Yes	Next
		No	Adjust ignition advance angle
7	Check if sensor holes on MAP and IAT block.	Yes	Cleaning
		No	Next
8	Check if fuel is degenerative or containing water	Yes	Replace fuel
		No	Next
9	Use special connector to supply 12 V voltages from battery to injector and check if injector works normally.	Yes	Next
		No	Repair harness and injector
10	Check if the resistance of secondary wire is normal	Yes	Next
		No	Replace
11	Check if any ablation damage or crack on ignition coil	Yes	Replace
		No	Next
12	Check if spark plug is normal	Yes	Replace ECU
		No	Replace spark plug

#### 11) Idle is too high (ECU needs self-study again)

1	Turn on ignition key.Use diagnostic equipment to check if malfunction information record exists °	Yes	Eliminate malfunction
		No	Next
2	Check if throttle pedal bracing wire is blocked or too tight	Yes	Adjust or replace
		No	Next
3	Check if canister control valve, fuel pressure regulator, PCV vacuum pipe and vacuum power-assisted hose of braking system are good	Yes	Repair or replace
		No	Next
4	Step down brake pedal and check if idle is too high while engine idle running and in neutral.	Yes	Next
		No	6
5	Clamp vacuum power-assisted hose and check if idle is normal	Yes	Repair or replace vacuum actuator

		No	Next
6	Clamp PCV vacuum hose and check if idle is normal	Yes	Replace PVC
		No	Next
7	Clamp canister control valve hose and check if idle is normal	Yes	Replace canistor control valve
		No	Next
8	Check if idle actuator is not flexibly or blocked	Yes	Repair or replace
		No	Next
9	Check if intake pipe have leak	Yes	Repair or replace
		No	Next
10	Check if sealed washer of injector is good	Yes	Next
		No	Replace sealing washer
11	Check if MAP and IAT are good	Yes	Replace ECU
		No	Replace sensor

## 12) Speed of engine is low or switch off while speeding up

1	Turn on ignition key. Use diagnostic equipment to check if malfunction information record exists °	Yes	Eliminate malfunction
		No	Next
2	Check if air filter is through	Yes	Next
		No	Replace
3	Check if speed is normal at idle	Yes	Next
		No	Next
4	Check if intake pressure is 35—65 kPa in idle	Yes	Next
		No	Repair
5	Run engine in idle. After coolant temperature reaches normal, check if ignition advance angle is normal	Yes	Next
		No	Adjust ignition advance angle
6	Connect fuel pessure gauge valve. Short pin 30 on fuel pump relay and pin 87 to start fuel pump. Check if fuel pressure is 300 kPa	Yes	Next
		No	10
7	Use special connector to supply 12 V voltages from battery to injector and check if injector works normally.	Yes	9
		No	Next
8	Re-check if injector can inject fuel after cleaning.	Yes	Next
		No	Replace injector
9	Check if fuel is deterirate or containing water	Yes	Replace fuel

	"	No	15
10	Check if fuel pressure below 250kPa.	Yes	Next
		No	14
11	Shut off fuel gauge valve. Connect ignition key again to run fuel pump for 3 seconds. Check if fuel pressure can be set up.	Yes	Next
		No	13
12	Open fuel gauge valve, use return fuel blocker to clamp fuel pipe for no returning fuel. Check if fuel pressure can be set up soon "	Yes	Replace fuel pressure regulator
		No	Replace and repair injector or fuel pipe
13	Check if fuel pipe is leaked or blocked.	Yes	Repair or replace fuel inlet
		No	Replace fuel pump
14	Check returning fuel pipe is blocked or curving.	Yes	Repair or replace returning fuel pipe
		No	Replace fuel pressure regulator
15	Turn on ignition key. Connect commutator between ECU and harness. Check if voltages on pin 32( output signal for TPS) ,pin 38 (ground connection)and pin 45( for 4.5-5V power of sensor) are normal.	Yes	Next
		No	Repair or replace harness
16	Check if ignition coil, distributor, secondary wire and spark plug are normal	Yes	Replace ECU
		No	Repair or replace relate unit

### 13) Speeding up is slow

1	Turn on ignition key. Use diagnostic equipment to check if malfunction information record exists	Yes	Eliminate malfunction
		No	Next
2	Shout off engine. Check if air filter is through	Yes	Next
		No	Replace
3	Check if speed is narmal in idle	Yes	Next
		No	Refer to trouble shooting of idle system
4	Check if intake pressure is 35—65 kPa in idle	Yes	Next
		No	Repair
5	Turn on ignition key. Connect commutator between ECU and harness. Check if voltages on	Yes	Next

	between ECU and harness. Check if voltages on pin 32(output signal for TPS), pin38 (ground connection) and pin 45(4.5-5V power for sensor) are normal.	No	Repair or replace
6	Run engine in idle. After coolant temperature reaches normal, check if ignition advance angle is normal	Yes	Next
		No	Adjust ignition advance angle
7	Connect fuel pressure gauge valve. Short pin 30 on fuel pump relay and pin 87 to start fuel pump. Check if fuel pressure is 300 kPa	Yes	Next
		No	11
8	Use special connector to supply 12 V voltages from battery to injector and check if injector works normally.	Yes	10
		No	Next
9	Re-check if injector can inject fuel after cleaning.	Yes	Next
		No	Replace injector
10	Check if fuel is degenerative or containing water	Yes	Replace fuel
		No	16
11	Check if fuel pressure below 250kPa.	Yes	Next
		No	15
12	Shut off fuel gauge valve. Connect ignition key again to run fuel pump for 3 seconds. Check if fuel pressure can be set up.	Yes	Next
		No	14
13	Open fuel gauge valve, use return fuel blocker to clamp fuel pipe for no returning fuel. Check if fuel pressure can be set up soon	Yes	Replace pressure regulator
		No	Repair and replace injector or fuel pipe
14	Check if fuel pipe is leaked or blocked.	Yes	Repair or replace fuel pipe
		No	Replace fuel pump
15	Check returning fuel pipe is blocked or curving.	Yes	Repair or replace fuel pipe
		No	Replace pressure regulator
16	Check if exhaust system and TWC is blocked	Yes	Replace or cleaning
		No	Replace ECU

#### 14) Poor performance of acceleration and power lessness

1	Check if exist malfunction as following: clutch	Yes	Repair
---	-------------------------------------------------	-----	--------

	slipping, air pressure of tire is low, braking drag, size of tire and four-wheeled alignment are wrong	No	Next
2	Check if throttle can full-open	Yes	Next
		No	Repair or replace throttle
3	Turn on ignition key. Use diagnostic equipment to check if malfunction information record exists.	Yes	Eliminate malfunction
		No	Next
4	Run engine in idle. After coolant temperature reaches normal, check if ignition advance angle is normal.	Yes	Next
		No	Adjust ignition advance angle
5	Turn on ignition key. Connect commutator between ECU and harness. Check if voltages on pin 48, 60, 45, 28 (output signal for MAP, IAT, CTS and oxygen sensor), 1, 2 (ground), 22 (ignition switch) and pin 19, 20, 35, 36 (output to idle actuator) are normal	Yes	Next
		No	Repair or replace harness
6	Check if intake pressure is 35—65 kPa in idle after start	Yes	Next
		No	Repair
7	Connect fuel pressure gauge valve. Short pin 30 on fuel pump relay and pin 87 to start fuel pump. Check if fuel pressure is 300 kPa	Yes	Next
		No	11
8	Use special connector to supply 12 V voltages from battery to injector and check if injector works normally.	Yes	10
		No	Next
9	Re-check if injector can inject fuel after cleaning.	Yes	Next
		No	Replace injector
10	Check if fuel is degenerative or containing water	Yes	Replace fuel
		No	16
11	Check if fuel pressure below 250 kPa.	Yes	Next
		No	15
12	Shut off fuel gauge valve. Connect ignition key again to run fuel pump for 3 seconds. Check if fuel pressure can be set up.	Yes	Next
		No	14
13	Open fuel gauge valve, use return fuel blocker to clamp fuel pipe for no returning fuel. Check if fuel pressure can be set up soon.	Yes	Replace pressure regulator
		No	Repair and replace injector or fuel pipe
14	Check if fuel pipe is leaked or blocked.	Yes	Repair or replace fuel inlet
		No	Replace fuel pump

15	Check returning fuel pipe is blocked or curving.	Yes	Repair or replace returning fuel pipe
		No	Replace pressure regulator
16	Check if the date of MAP or IAT are normal °	Yes	Next
		No	Replace sensor
17	Check if ignition coil, distributor, high voltage wire and spark plug are normal	Yes	Next
		No	Replace or adjust
18	Check if A/C system has malfunction.	Yes	Check A/C system
		No	Replace ECU

#### 15) A/C system malfunction

1	Check if there is full refrigerant and check if A/C belt, A/C clutch, pressure switch are normal	Yes	Next
		No	Eliminate malfunction
2	Turn on A/C switch in engine idle. Check if A/C thermistor is malfunction	Yes	Eliminate malfunction
		No	Next
3	Turn on A/C switch. Connect commutator between ECU and harness. Check if output signal for ECU pin 50 and 58(A/C switch) is normal	Yes	Next
		No	Check harness
4	If the vehicle is low-level control, check if A/C can working when turn off A/C.	Yes	Replace bulb or repair harness
		No	Next
5	Check if output low-level for ECU pin 68(connect earthing terminal of A/C relay pullin coil)	Yes	Repair A/C relay and harness
		No	Replace ECU

#### 8. Precaution for service

1) Precaution for service EFI

(1) Controller removal request

Remove controller before welding or painting

Turn off ignition switch when removing controller to avoid

Don't remove power wires from battery when engine running or electric appliance is in using



Don't start engine with high current

Note that the ambient temperature of controller could not exceed 80°C

(2) Clean request: Please observe following regulations:

Put removed parts on clean place and cover them with suitable cloth

Only allowed to pull out or insert each harness or tester harness after ignition switch turns off

Make sure the connection for connecting wires when measuring voltage or ground for electronic control system

Removing power wires from battery or pulling out controller connector will cause losing the information for diagnosis and self-study stored in memory

(3) Precaution for fuel system service

When removing or installing fuel pump in fully or partial full fuel tank, pay attention to:

Mounting equipment that could absorb leaked fuel on tank outlet before operation

Avoid skin touch with fuel directly

Completely clean the connecting part and around before loose it

To prevent fuel spray, put a piece of dishcloth on the connecting part

Cover or block out the opened part if it is not be used at once

Take out parts only before installing. Don't use the parts without package

Don't damage O-ring during installing injector. Smear a little lubricant on o-ring for better fitting

Don't use compressed air or move vehicle when opening system.

2) Safety precaution

In order to avoid personal hurt or damage injector and ignition unit, pay attention to:

Don't touch or pull out ignition harness if engine is running or starting

Pull out harness connector if engine is starting by starter motor (for example in the situation of checking compressed air).

# DEALER PRE-DELIVERY INSPECTION



## TEAM JOYNER USA

www.teamjoynerusa.com



### DEALER PRE-DELIVERY INSPECTION

1245 N. Mondel Dr. • Gilbert, AZ 85233  
Ph: 480-813-6363 • Fax: 480-813-6379

This form registers warranty

This form registers warranty

#### SOLD TO:

Customer Name \_\_\_\_\_

We have determined that your vehicle is safe to operate

☐ YES ☐ NO

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Email \_\_\_\_\_ Contact Person \_\_\_\_\_ Phone \_\_\_\_\_

Phone \_\_\_\_\_ Name \_\_\_\_\_ Fax \_\_\_\_\_ Cell \_\_\_\_\_

Technician \_\_\_\_\_ Supervisor \_\_\_\_\_

SALE DATE:			DELIVERY DATE:			YEAR:			MAKE:			VIN #:			COLOR:		
ITEM	OPERATIONAL		ITEM	OPERATIONAL		ITEM	OPERATIONAL		ITEM	OPERATIONAL		ITEM	OPERATIONAL		ITEM	OPERATIONAL	
Paint	Yes	No	Carburetor	Yes	No	Mirror	Yes	No	Rear Diff	Yes	No	Wheel Bearings	Yes	No	Blindings	Yes	No
Lug Nuts	Yes	No	Throttle Cable	Yes	No	Battery	Yes	No	Fuel Lines	Yes	No	Steering Wheel	Yes	No	Clutch	Yes	No
Axle Nuts	Yes	No	Choke Cable	Yes	No	Ignition	Yes	No	Gas	Yes	No	Brake Pedal	Yes	No	EPA Sticker	Yes	No
Tie Rods	Yes	No	Emergency Brake	Yes	No	Gauges	Yes	No	Engine Oil	Yes	No	Carb Sticker	Yes	No	Oil Vent System	Yes	No
Axles	Yes	No	Charging System	Yes	No	Switches	Yes	No	Transmission Fluid	Yes	No						
CV Joint	Yes	No	Tires/Wheels	Yes	No	Fluids	Yes	No	Gear Oil	Yes	No						
Seats	Yes	No	Cooling System	Yes	No	Gas	Yes	No	Shock Oil	Yes	No						
Seat Belts	Yes	No	Winches	Yes	No	Engine Oil	Yes	No	Coolant Fluid	Yes	No						
Wiring Harness	Yes	No	A Arms	Yes	No	Transmission Fluid	Yes	No	Brake Fluid	Yes	No						
Brakes	Yes	No	Swing Arms	Yes	No	Gear Oil	Yes	No	Front Diff	Yes	No						
Brake Lines	Yes	No	Shocks	Yes	No	Shock Oil	Yes	No									
Brake Pads	Yes	No	Steering Boy	Yes	No	Coolant Fluid	Yes	No									
Shifter	Yes	No	Lights	Yes	No	Brake Fluid	Yes	No									
Throttle Pedal	Yes	No	Horn	Yes	No												

#### REMARKS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Dealer Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Email \_\_\_\_\_ Contact Person \_\_\_\_\_ Phone \_\_\_\_\_

Phone \_\_\_\_\_ Name \_\_\_\_\_ Fax \_\_\_\_\_ Cell \_\_\_\_\_

Dealers Signature \_\_\_\_\_ Date \_\_\_\_\_

I agree to terms and conditions \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

This form registers warranty

\_\_\_\_\_ Jumping the vehicle can cause serious damage to the drive train (axle, transmission, suspension).

\_\_\_\_\_ Injury or death can result from jumping vehicle. Do Not Jump.

\_\_\_\_\_ I understand that the roll bars are cosmetic and a roll over could cause death or serious injury. The seller is not liable for death or injury.

\_\_\_\_\_ I have inspected all machines for any cosmetic damage and found it/them to be satisfactory. I further understand that cosmetic damage is NOT covered by any factory warranties and unless noted here are deemed accepted by me.

\_\_\_\_\_ Sand dunning or desert riding is dangerous. Death or injury could occur. The seller is not liable for injury or death.

\_\_\_\_\_ I understand all sales are final and that there is no right of rescission, no option for return or exchange for any vehicle purchased, and that the titled and registered machines were effectively purchased when I signed the title application.

\_\_\_\_\_ I understand the warranty is 90 day manufacture defect only with the following not covered: axles, electrical batteries, light bulbs, clutches, turbo cartridges, carburetor cleaning, piston rings that are scorched from one revving, rims/tires, bearings.

\_\_\_\_\_ I understand that although some lending institutions do not require insurance, state law DOES require liability insurance and a driver's license. I also understand that none of the products offered by the dealer constitutes insurance and a separate policy would have to be purchases from an outside source to protect my purchase and fulfill state requirements.

\_\_\_\_\_ I have been shown the VIN number for each machine and they match this form and all paperwork received.

\_\_\_\_\_ I understand that I have only 72 hours to notify the seller of any issues to the paperwork or the vehicle.

\_\_\_\_\_ Off Road use only. Driving on paved roads can cause axle or transmission damage. Both tires turn equally, this is not a limited slip differential. Injury or death can occur form operating a non DOT vehicle on public roads.

\_\_\_\_\_ Turbo systems, system lessen life of engine, over revving the engine to increase boost of turbo can cause engine damage. This will not be covered under warranty.

#### ADDITIONAL TERMS AND CONDITIONS OF SALE

1. PROMISE TO PAY. By signing this contract, Buyer agrees to pay Seller the "TOTAL DUE".
2. TIME OF ESSENCE. Time is of the essence of this contract. Sellers acceptance of partial payments shall not in any manner modify the terms of this contract and such acceptance shall not be construed as a waiver of any subsequent defaults on Buyer's part nor shall it waive the "time is of the essence" provision.
3. NOTICE. Any notice required to be given to Buyer shall be deemed reasonable notification if ( I ) mailed by ordinary mail, postage prepaid, to Buyer's mailing address as shown on this contract or to Buyer's most recent address as shown by a "notice of change of address" on file with Seller, whether or not such notice is actually received by buyer, or ( II ) if given in any other manner which results in Buyer's actual receipt of such notice.
4. BAD CHECK. If Buyer pays Seller with a check that is dishonored or unpaid for any reason, Seller may at Seller's sole option, terminate this contract and retake the vehicle, or make claims against Buyer on the check. In addition, Seller will charge Buyer a \$25 returned check charge plus any actual charges assessed by Seller's financial institution resulting from such returned check.
5. ATTORNEYS FEES. If it is necessary for Seller to take legal action to enforce any of seller's rights under this contract, Buyer agrees to pay to the extent permitted by law, the seller's reasonable attorneys fees and court costs.
6. GENERAL. This contract is governed by applicable federal law and the laws of the State of Arizona. Any provisions found to be invalidate the remainder hereof, Waiver of any default shall not constitute waiver of any subsequent default. All words used herein shall be construed to be of such gender and number as the circumstances require. The contract shall be binding upon Buyer's heirs, personal representatives, successors and assigns and shall inure to the benefit of Seller's successors and assigns. This contract constitutes the entire agreement between the parties with respect to the subject matter herein, and may not be altered or amended unless made in writing and duly executed by Seller.
7. CASH DEPOSIT. If Buyer fails or refuses to accept delivery of any Vehicle or product or fails to comply with this contract, Seller may keep any cash deposit as liquidated damages, to the extent not prohibited by law. The deposit may also be used reimburse Seller for any expenses and losses Seller incurs or suffers as a result of Buyer's failure or refusal to accept deliver of the Vehicle or product or to comply with this contract. Such expenses and losses may include Seller s reasonable attorney's fees.
8. NON-DELIVERY. Seller is not liable for failure to deliver or for delay in delivering the Vehicle or

other product where such failure or delay is due, in whole or in part, to any cause beyond Seller's control or without Seller's fault or negligence,

9. RISK OF LOSS, INSURANCE. The risk of loss to the Vehicle or any other items covered by this invoice passes to Buyer upon delivery of the Vehicle or other goods to Buyer at the address set forth on this invoice for shipment to Buyer or such other place of receipt designated by Buyer. Buyer is responsible for maintaining its own theft and liability insurance coverage for the Vehicle.
10. AGE. Buyer represents and warrants to Seller that Buyer is over the age of majority and is fully competent to enter into this contract. Buyer acknowledges that Seller is relying on this representation in entering into and performing this contract.

#### ADDITIONAL TERMS AND CONDITIONS OF SALE

1. PROMISE TO PAY. By signing this contract, Buyer agrees to pay Seller the "TOTAL DUE".
2. TIME OF ESSENCE. Time is of the essence of this contract, Seller's acceptance of partial payments shall not in any manner modify the terms of this contract and such acceptance shall not be construed as a waiver of any subsequent defaults on Buyer's part nor shall it waive the "time is of the essence" provision.
3. NOTICE. Any notice required to be given to Buyer shall be deemed reasonable notification if ( I ) mailed by ordinary mail, postage prepaid, to Buyer's mailing address as shown on this contract or to Buyer's most recent address as shown by a "notice of change of address" on file with Seller, whether or not such notice is actually received by Buyer, or ( II ) if given in any other manner which results in Buyer's actual receipt of such notice.
4. BAD CHECK. If Buyer pays Seller with a check that is dishonored or unpaid for any reason, Seller may at Seller's sole option, terminate this contract and retake the vehicle, or make claims against Buyer on the check. In addition, Seller will charge Buyer a \$25 returned check charge plus any actual charges assessed by Seller's financial institution resulting from such returned check.
5. ATTORNEYS FEES. If it is necessary for Seller to take legal action to enforce any of Seller's rights under this contract. Buyer agrees to pay to the extent permitted by law, the seller's reasonable attorney's fees and court costs.
6. GENERAL. This contract is governed by applicable federal law and the laws of the State of Arizona. Any provisions found to be invalid shall not invalidate the remainder hereof. Waiver of any default shall not constitute waiver of any subsequent default. All words used herein shall be construed to be of such gender and number as the circumstances require. The contract shall be binding upon Buyer's heirs, personal representatives, successors and assigns and shall inure to the benefit of Seller's successors and assigns. This contract constitutes the entire agreement between the parties with respect to the subject matter herein, and may not be altered or amended unless made in writing and duly executed by Seller.
7. CASH DEPOSIT. If Buyer fails or refuses to accept delivery of any Vehicle or product or fails to comply with this contract, Seller may keep any cash deposit as liquidated damages, to the extent not prohibited by law. The deposit may also be used to reimburse Seller for any expenses and losses Seller incurs or suffers as a result of Buyer's failure or refusal to accept delivery of the Vehicle or product or to comply with this contract. Such expenses and losses may include Seller's reasonable and loses Seller incurs or suffers as a result of Buyer's failure or refusal to accept delivery of the Vehicle or product or to comply with this contract .Such expenses and losses may include Seller's reasonable attorney's fees.
8. NON-DELIVERY. Seller is not liable for failure to deliver or for delay in delivering the vehicle or other product where such failure or delay is due. In whole or in part, to any cause beyond Seller's control or without Seller's fault or negligence.
9. RISK OF LOSS: INSURANCE. The risk of loss to the vehicle or any other items covered by this invoice passes to Buyer upon delivery of the vehicle or other goods to Buyer at the address set forth on this invoice for shipment to Buyer or such other place of receipt designated by Buyer. Buyer is responsible for maintaining its own theft and liability insurance coverage for the vehicle.

AGE. Buyer represents and warrants to Seller that Buyer is over the age of majority and is fully competent to enter into contact. Buyer acknowledges that Seller is relying on this representation in entering into performing this contract.

# **Manual**

## **JNSZ800MV**

**READ THIS MANUAL CAREFULLY.  
IT CONTAINS IMPORTANT SAFETY INFORMATION.**

**MINIMUM  
RECOMMENDED  
OPERATOR AGE:**

# **16**



### **FOR OFF-ROAD USE ONLY**

**This vehicle is designed and manufactured for off-road use only.**

**USA only:**

**It does not conform to federal motor vehicle safety standards, and operation on Public streets, roads, or highways is illegal.**

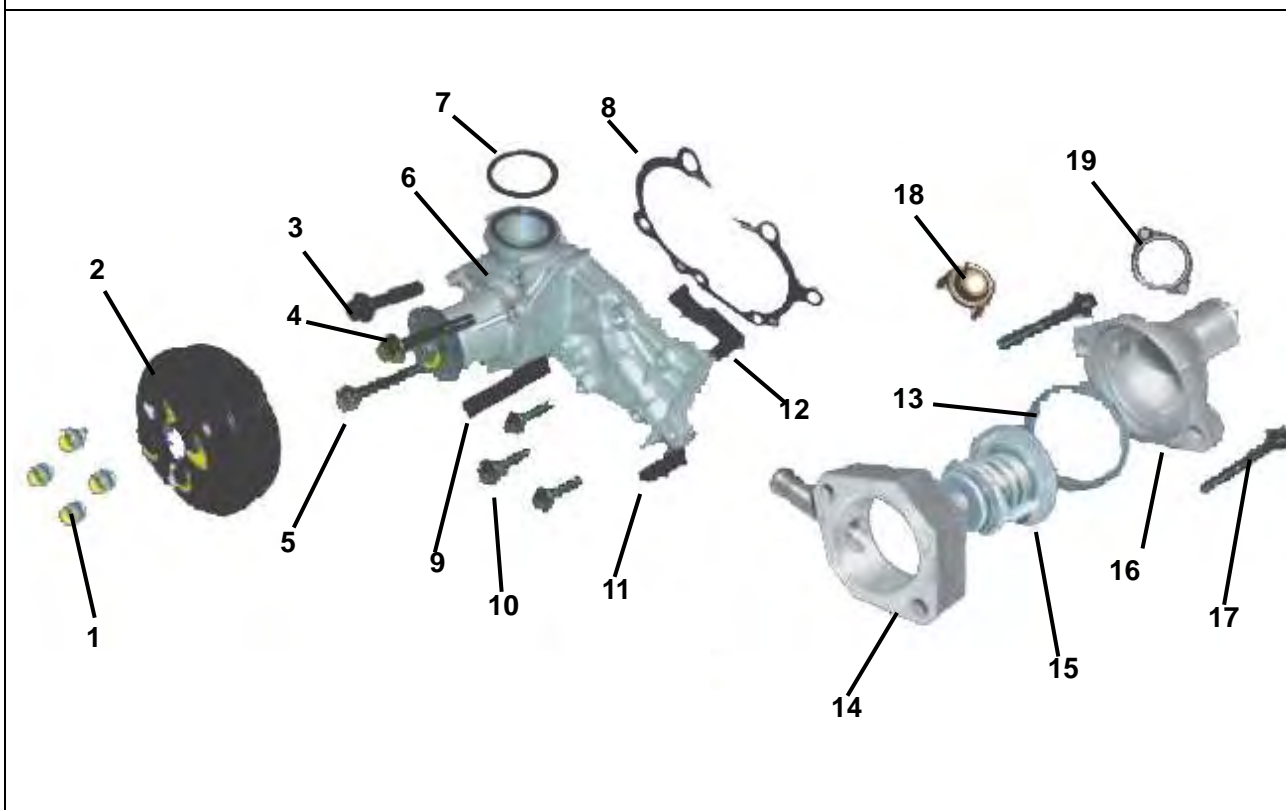
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6.Attach the rear suspension arm.....	198
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7.Attach driver shaft.....	200
8.Attach rear shock absorber.....	201
9.Attach rear wheel.....	202
10.Attach rear bumper bar.....	203
11.Attach of spotlight and aluminum roof rack .....	204
12.Check vehicle .....	205

# PARTS MANUAL

## 1.ENGINE

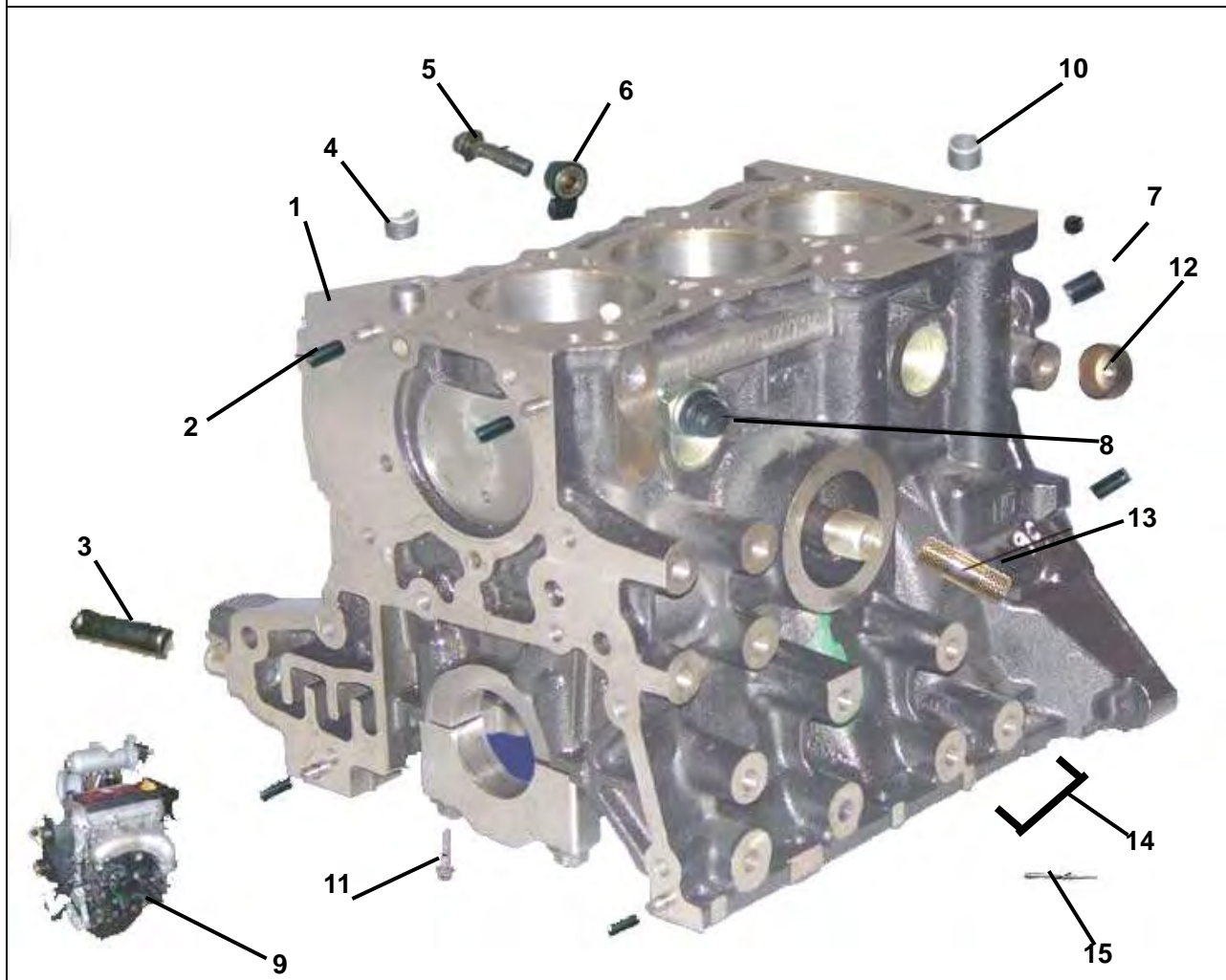
### 1.COOLING SYSTEM



No	Part number	Name	Quantity
1	Q1400612	HEXAGON HEAD BOLT	4
2	372-1307014	WATER PUMP PULLEY	1
3	Q1840840	HEXAGON FLANGE BOLT	1
4	Q1840855	BOLT (M8X55)	1
5	Q1840865	HEXAGON FLANGE BOLT	1
6	372-1307010	WATER PUMP SET	1
7	372-1307015	'O' RING	1
8	372-1307041	WATER PUMP WASHER	1
9	372-1307018	SEAL STRIP 2	1
10	Q1840825	BOLT	3
11	372-1307019	SEAL STRIP 3	1
12	372-1307012	SEAL STRIP 1	1
13	50- "O"	'O' RUBBER RING	1
14	372-1306016	SEAT - THERMOSTAT OUTER	1
15	372-1306020	THERMOSTAT ASSY	1
16-1	372-1306001	SEAT - THERMOSTAT	1
17	Q1840850	HEXAGON FLANGE BOLT	2
18	372-1306012	SEAT - THERMOSTAT INNER	1
19	372-1306018	SEAT - THERMOSTAT	1

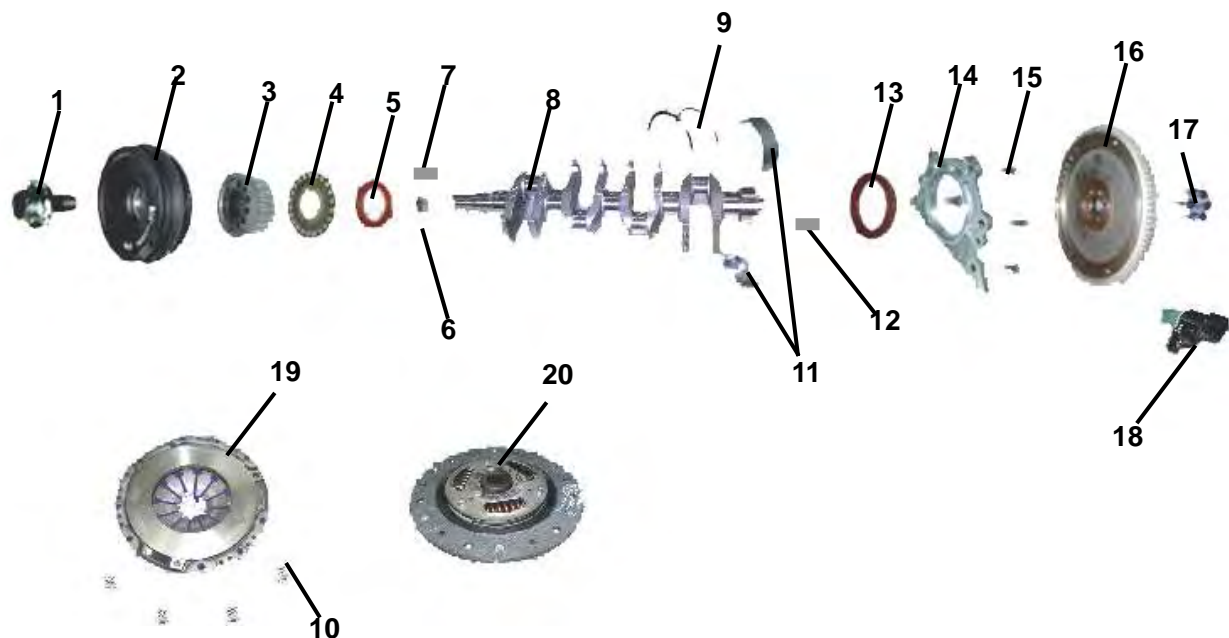


## 2.CYLINDER BLOCK



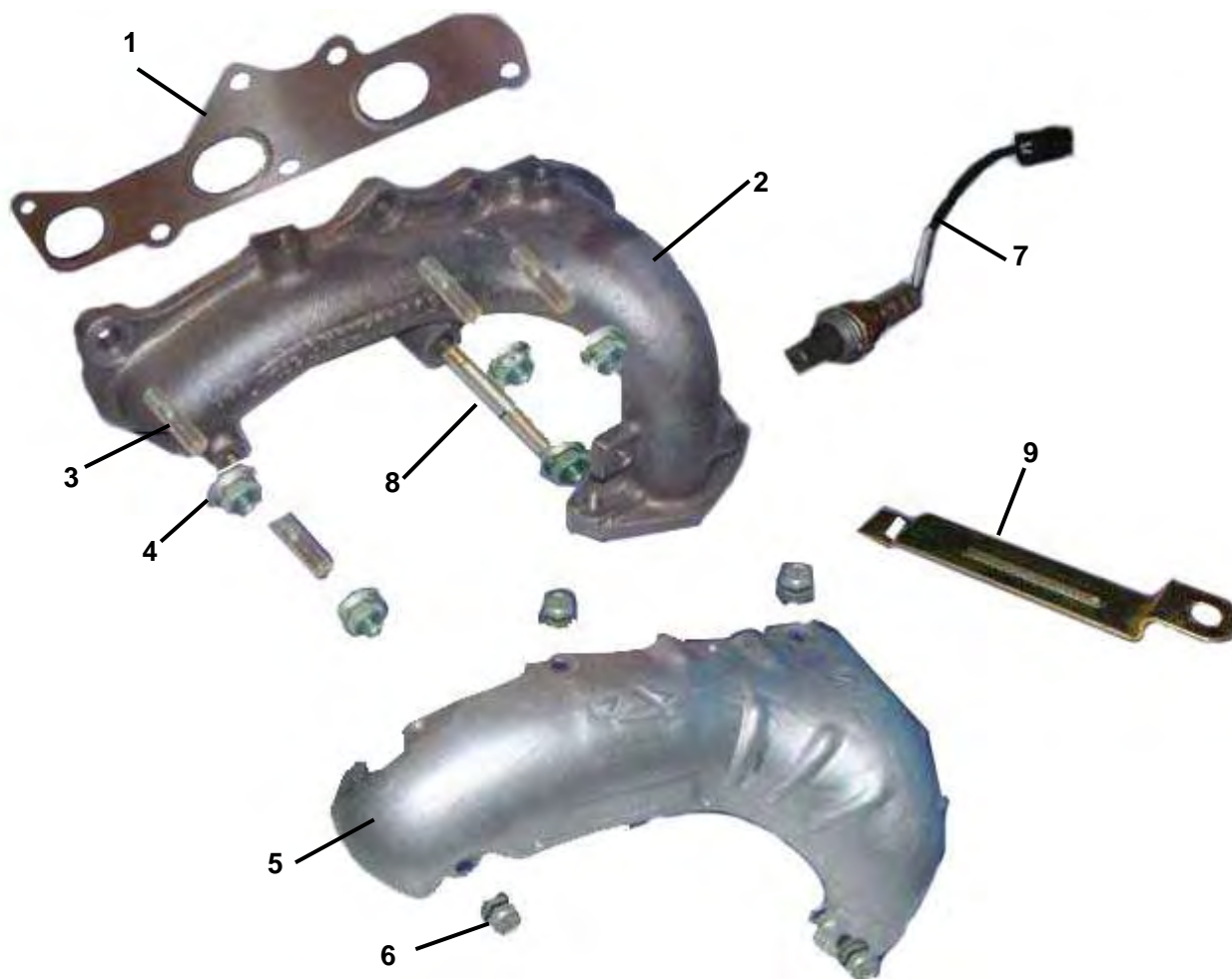
No	Part number	Name	Quantity
1	372-1002010	CYLINDER BLOCK ASSY	1
2	372-1002037	POSITION PIN	6
3	372-1002046	CRANKCASE VENTILATION PIPE	1
4	372-1002044	CYLINDER HEAD SEAL PLUG	2
5	Q1840830	HEXAGON FLANGE BOLT	1
6	372-1002060	KNOCK SENSOR	1
7	372-1002036	POSITION PIN	2
8	372-1002070	OIL PRESSURE SWITCH	0
9	372-1000410	ENGINE ASSY	1
10	11G10GB308	BALL - STEEL	1
11	372-1002023	BOLT - MAIN BEARING CAP	8
12	372-1002045	CAP - OIL CONTROL	1
13	372-1012021	CONNECTOR - OIL FLITER	1
14	372-1014110BA	PIPE - CRANKCASE VENTILATION	1
15	372-1014130BA	PIPE(3) - CRANKCASE VENTILATION	1

### 3.CRANKSHAFT



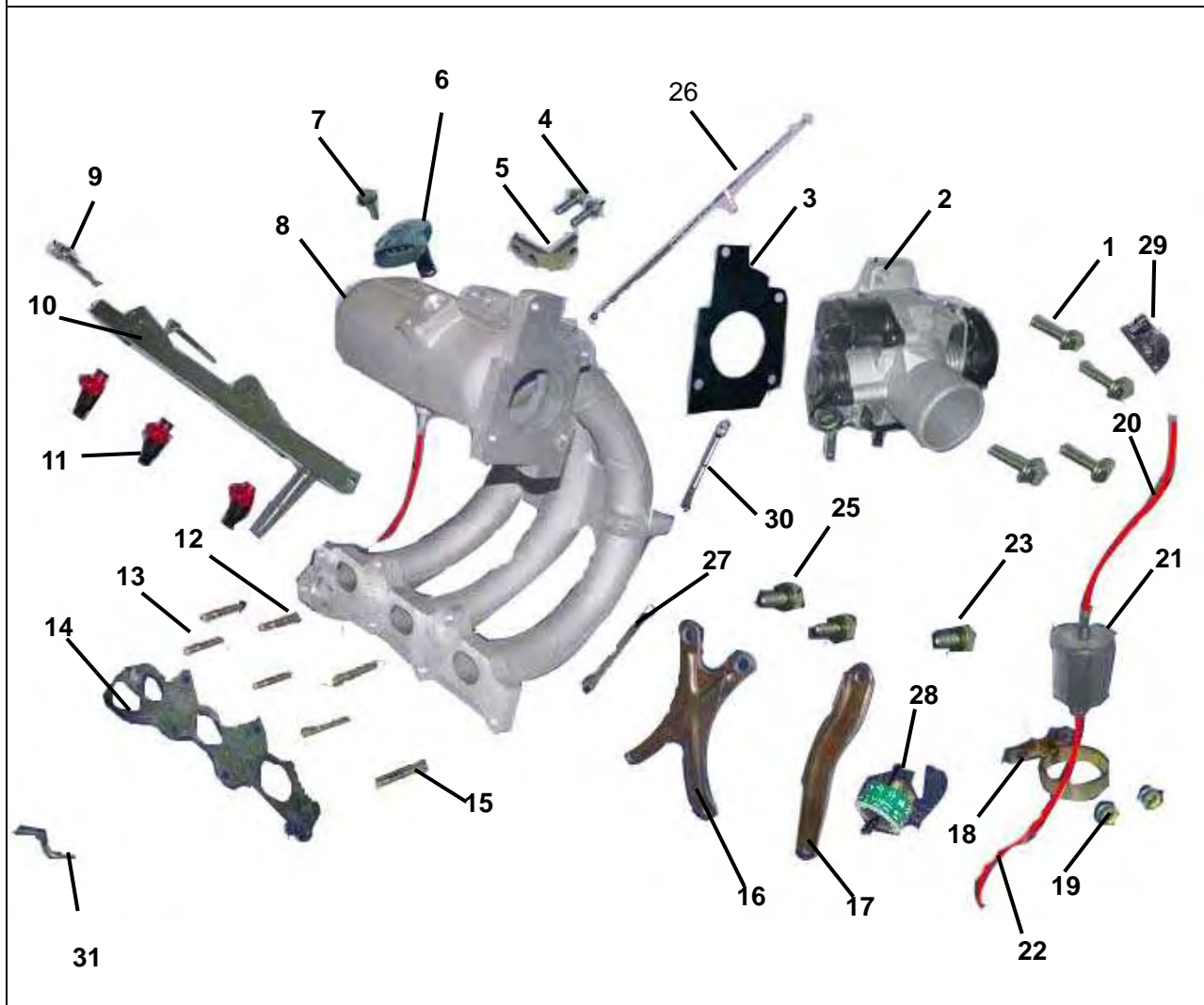
No	Part number	Name	Quantity
1	372-1005031	PULLEY BOLT	1
2	372-1005040	TORSION SHOCK ABSORBER ASSY	1
3	372-1005018	CRANKSHAFT TIMING GEAR	1
4	372-1005017	TOOTHED BELT BAFFLE	1
5	372-1005015	CRANKSHAFT FRONT OIL SEAL	1
6	372-1005033	NEEDLE BEARING	1
7	372-1005032	WOODRUFF KEY	1
8	372-1005010	CRANKSHAFT ASSY	1
9	372-1005016	STOPPER PLATE	2
10	S11-1601101	COVER SET BOLT	4
11	372-1DF1005010	BEARING - CRANKSHAFT	4
12	372-1005036	PIN - DOWEL	1
13	372-1005030	REAR OIL SEAL	1
14	372-1005021	REAR OIL SEAL BRACKET	1
15	Q1840820	HEXAGON FLANGE BOLT	5
16	372-1005050	FLYWHEEL ASSY	1
17	372-1005054	LOCK-FLY WHEEL BOLT	6
18	S11QZ-QZWZCGQ	CRANKSHAFT POSITION SENSOR	1
19	S11-1601020	COVER SET	1
20	S11-1601030	DRIVEN DISK ASSY	1

#### 4.EXHAUST MANIFOLD



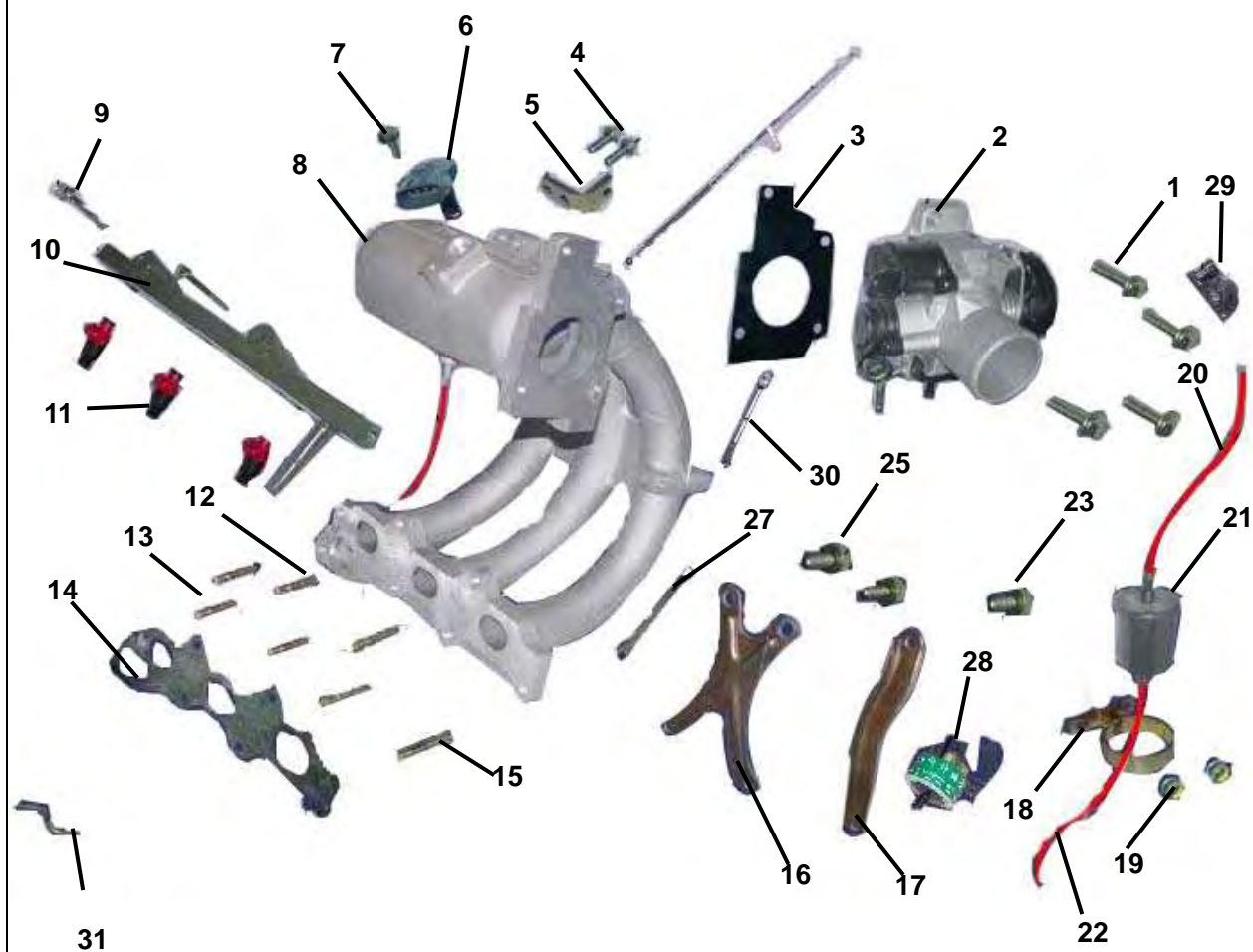
No	Part number	Name	Quantity
1	372-1008033	EXHAUST MANIFOLD WASHER	1
2	SQR7080PQQG-PQQG	EXHAUST MANIFOLD	1
3	Q1200825F3	STUD	4
4	Q33008	HEXAGON NUT	6
5	372-1008044	HEAT INSULATOR	1
6	Q1460612	HEXAGON HEAD BOLT	4
7	S11-1205110	OXYGEN SENSOR	1
8	Q1200835F3	STUD	1
9	S11-3724863	OXYGEN SENSOR BRACKET	1

## 5.INTAKE SYSTEM



No	Part number	Name	Quantity
1	Q1420625	HEXAGON HEAD BOLT	4
2	372-1107011CA	BODY - THROTTLE	1
3	372-1107012	THROTTLE BODY WASHER	1
4	Q1840620	HEXAGON FLANGE BOLT	2
5	372-1008043	ACCELERATOR PULLING WIRE BRACKET	1
6	S11-1109411	INTAKE TEMPERATUREAND PRESSURE SENSOR	1
7	Q1400416	HEXAGON HEAD BOLT	1
8	372-1008013	MANIFOLD - AIR INTAKE	1
9	Q1420645	HEXAGON HEAD BOLT	2
10	S11-1112030	OIL RAIL	1
11	S11-1112010	INJECTOR ASSY	3
12	Q1200835F3	STUD	2
13	Q1200828F3	STUD	4
14	372-1008021	INTAKE MANIFOLD GASKET	1
15	Q1200840F3	STUD	1

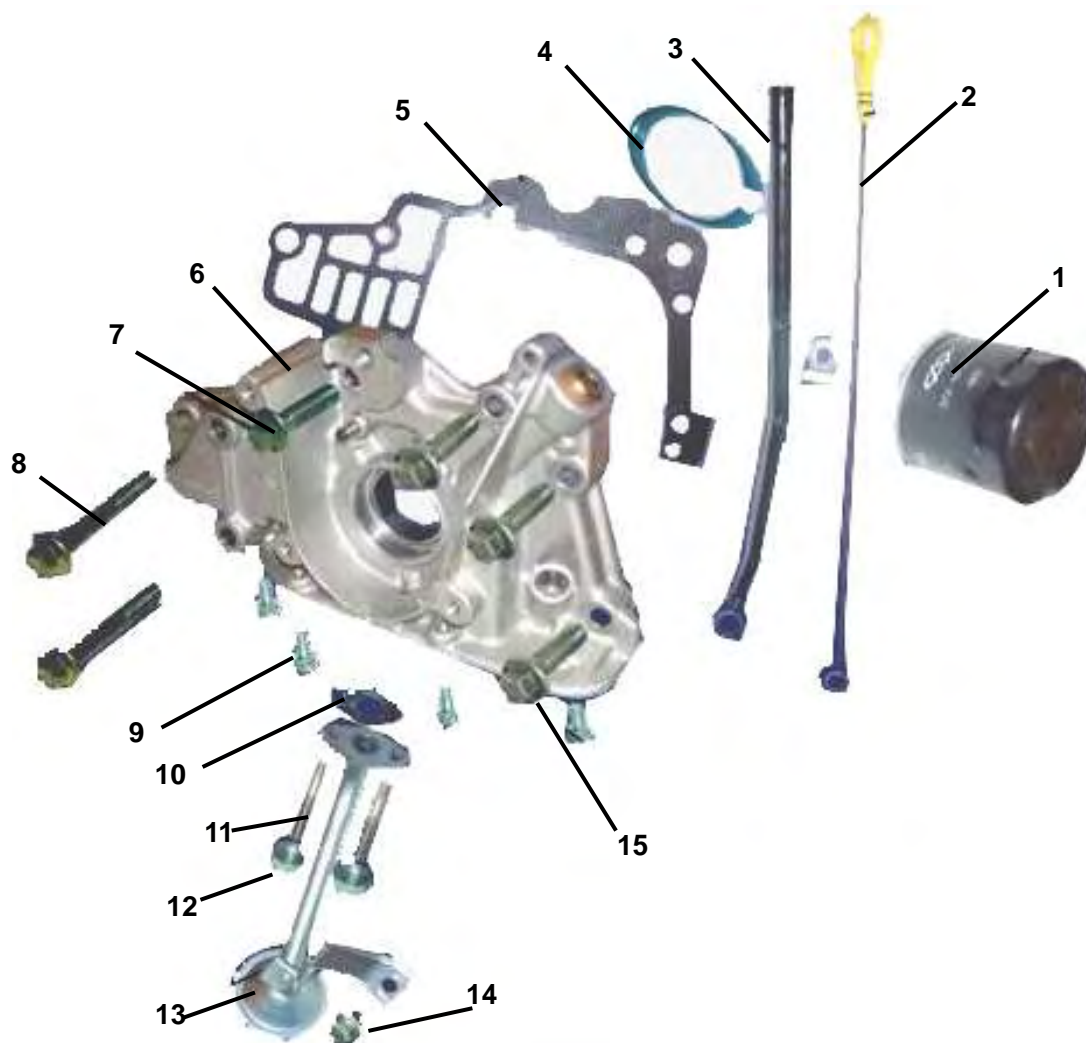
## 5.INTAKE SYSTEM



No	Part number	Name	Quantity
16	372-1008041	INTAKE MANIFOLD FRONT BRACKET	1
17	372-1008042	INTAKE MANIFOLD REAR BRACKET	1
18	372-1014150	FIXING CLAMP	1
19	Q1400612	HEXAGON HEAD BOLT	2
10	372-1014120	CRANKCASE VENTILATION PIPE (2)	1
21	372-1014140	OIL-GAS SEPARATOR ASSY	1
22	372-1014110	CRANKCASE VENTILATION PIPE (1)	1
23	Q1840816	HEXAGON FLANGE BOLT	2
24	372-1014130	CRANKCASE VENTILATION PIPE (3)	1
25	Q1840820	HEXAGON FLANGE BOLT	2
27	372-1008082EA	BRACKET - INLET MANIFOLD	1
28	372-1014140AB	SEPARATOR - TEMPERATURE SELFCONTROL	1
29	372-1107051	SENSOR - THROTTLE POSITION	1
30	S11-1008020FA	BRACKET - THROTTLE	1
31	S11-1109416BA	HOSE- PVC VALVE TO AIR INTAKE PIPE	1

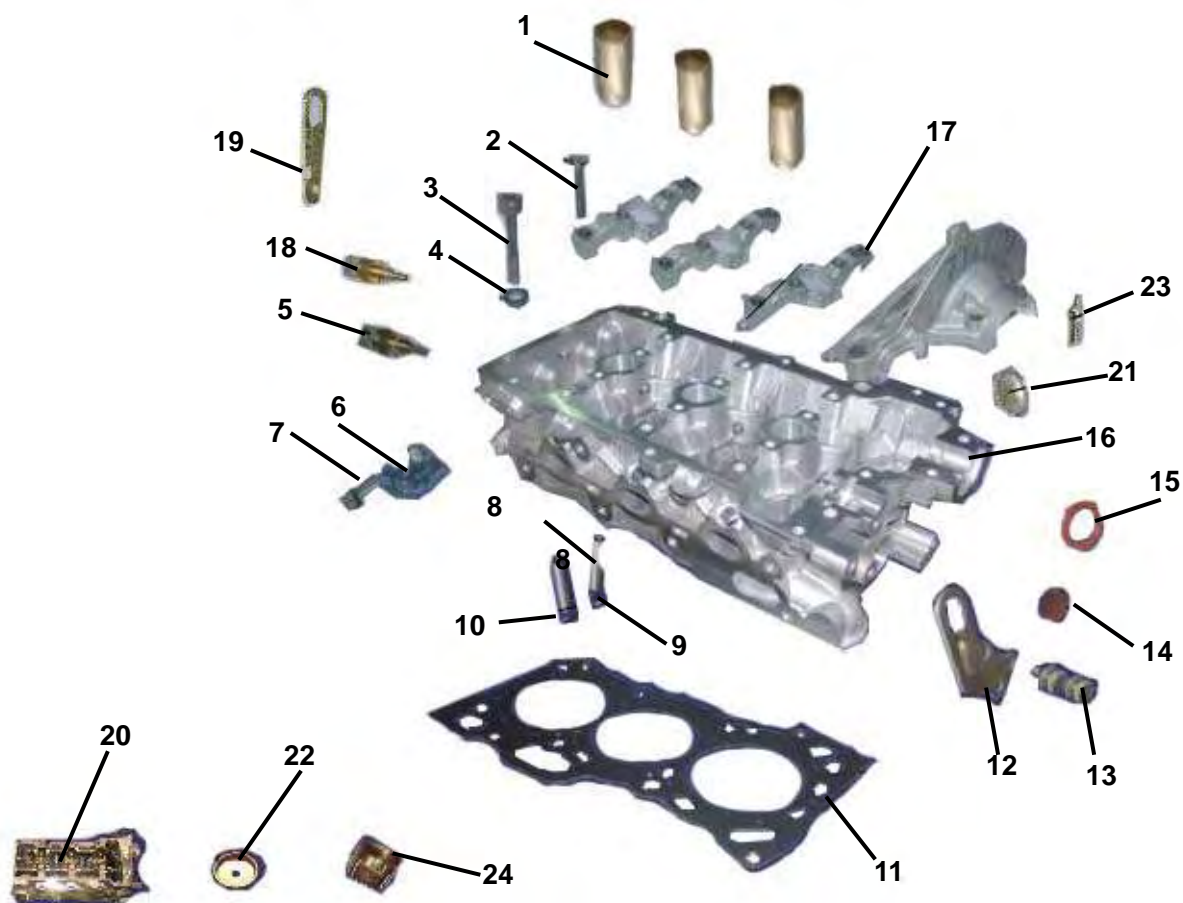


## 6.LUBRICATING DEVICE



No	Part number	Name	Quantity
1	372-1012010	OIL FILTER	1
2	372-1009130	OIL DIP STICK	1
3	372-1009120	OIL DIP STICK PIPE	1
4	372-1011055	SEAL STRIP	1
5	372-1011021	OIL PUMP GASKET	1
6	372-1011030	OIL PUMP ASSY	1
7	Q1840825	BOLT	1
8	Q1840855	BOLT (M8X55)	2
9	Q1420612	HEXAGON HEAD BOLT	17
10	372-1010017	OIL STRAINER WASHER	0
11	Q1200616	STUD	2
12	Q33006	HEXAGON NUT	2
13	372-1010010	OIL STRAINER ASSY	1
14	Q1840610	HEXAGON FLANGE BOLT	1
15	Q1840830	HEXAGON FLANGE BOLT	3

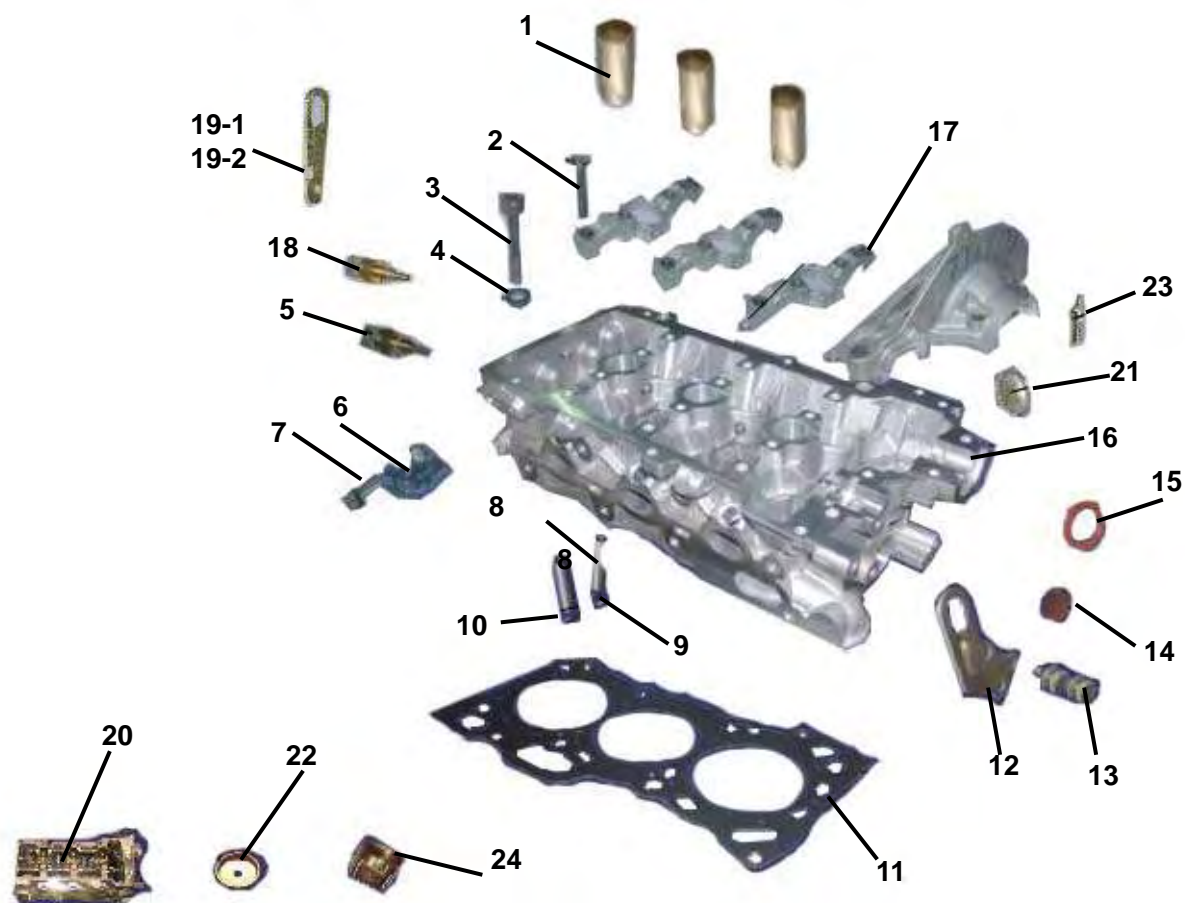
## 7.CYLINDER HEAD



No	Part number	Name	Quantity
1	372-1003074	SPARK PLUG SLEEVE	3
2	Q1400638	HEXAGON HEAD BOLT	17
3	372-1003051	CYLINDER HEAD BOLT	8
4	372-1003052	CYLINDER HEAD BOLT WASHER	8
5	S11-3808013	WATER TEMP. SENSOR	1
6	S11-1003069	CAMSHAFT POSITION SENSOR	1
7	Q1400816	HEXAGON HEAD BOLT	1
8	372-1003023	GUIDE - VALVE	12
9	372-1003022	EXHAUST VALVE SEAT INSERT	6
10	372-1003021	INTAKE VALVE SEAT INSERT	6
11	372-1003040	CYLINDER HEAD GASKET	1
12	372-1003202	FRONT TRUNNION	1
13	Q1840816	HEXAGON FLANGE BOLT	2
14	372-1003067	BLOCK COVER	1
15	372-1003066	CAMSHAFT OIL SEAL	1
16	372-1003010	CYLINDER HEAD	1



## 7.CYLINDER HEAD



No	Part number	Name	Quantity
17	372-1003063	CAMSHAFT BEARING CAP POSITION COVER	8
18	S11-3808010	WATER TEMP. SENSOR	0
19-1	372-1003201	HANGER - REAR ENGINE	0
19-2	372-1003201BA	HANGER - REAR ENGINE	1
20	372-1003001	HEAD ASSY - CYLINDE	1
21	372-1003024	PLUG - BOWL SHAPE	1
22	372-1003028	PLUG	1
23	372-1003038	STUD	1
24	372-1003076	BUSH - WATER PROOF	1

## 8.COVER-VALVE CHAMBER



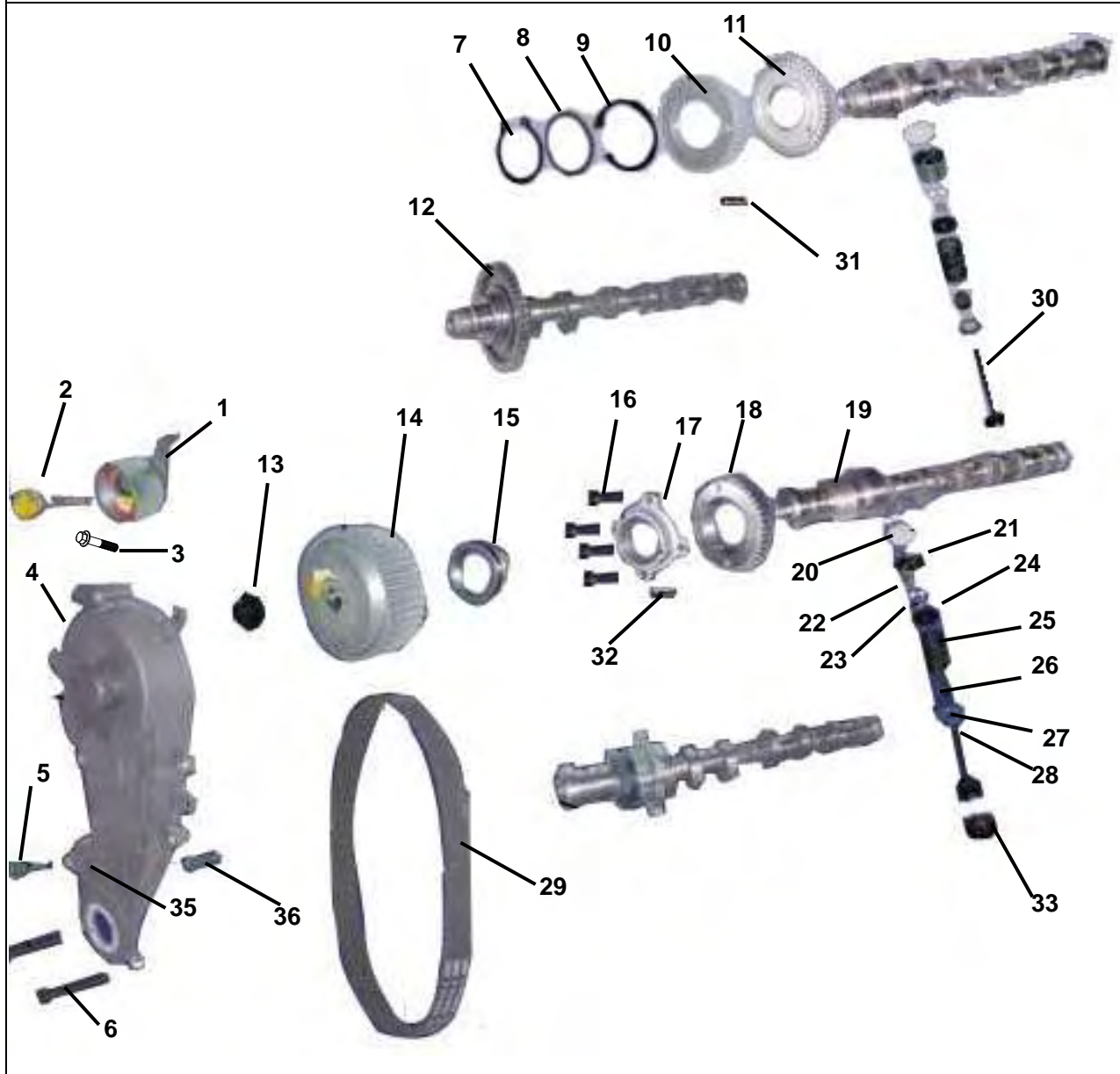
No	Part number	Name	Quantity
1	372-1003090	OIL CAP	1
2	Q2540616	SCREW	6
3	372-1003075	ENGINE TRIMING COVER ASSY	1
4	372-1003030	COVER ASSY - ROCKER	1
5	372-1003036	CYLINDER HEAD COVER GASKET	1
6	Q1460625	HEXAGON HEAD BOLT	5

## 9.OIL PAN



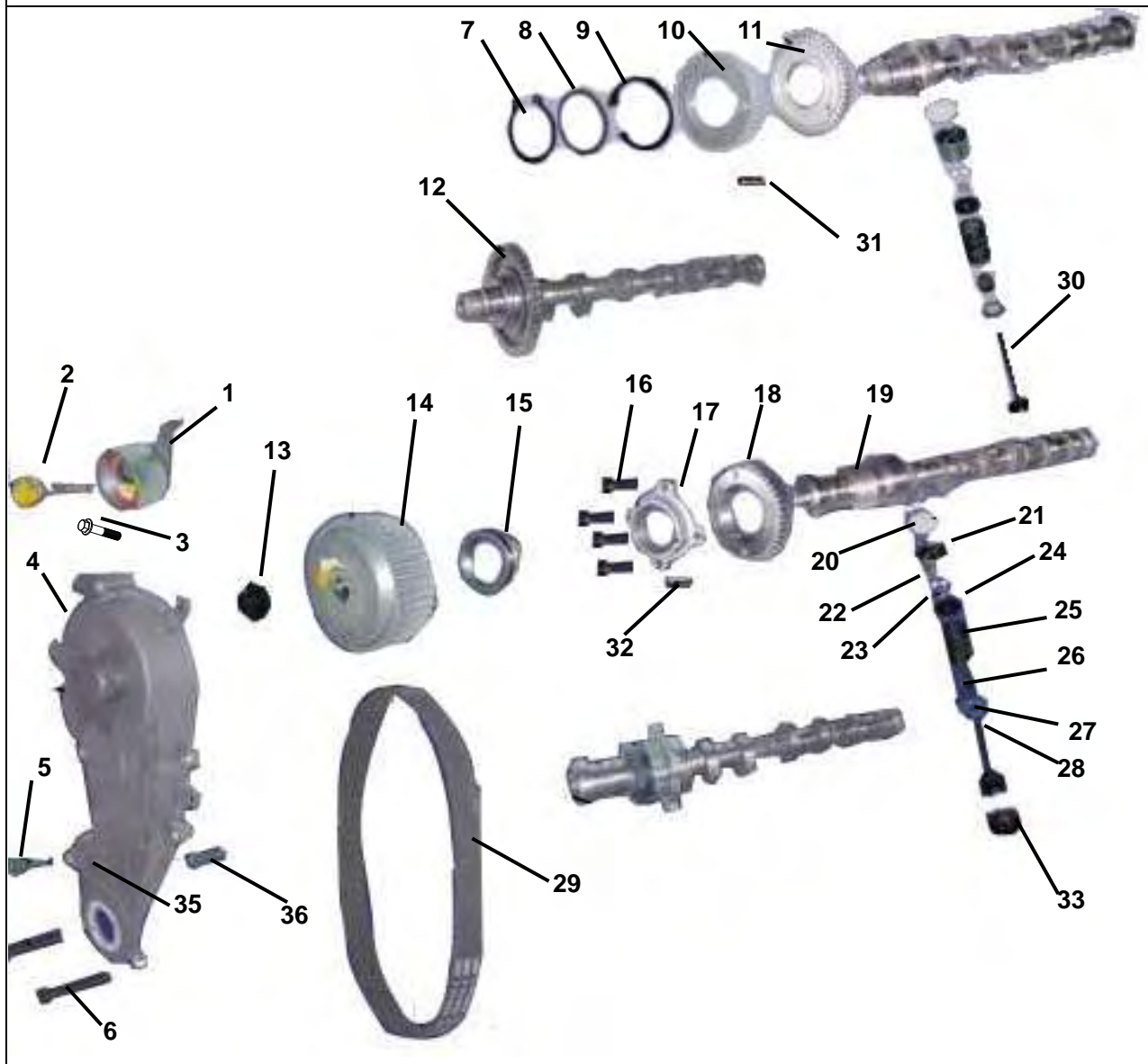
No	Part number	Name	Quantity
1	372-1009010	OIL PAN ASSY	1
2	Q1420612	HEXAGON HEAD BOLT	17
3	372-1009017	OIL PLUG WASHER	1
4	372-1009014	DRAIN PLUG	1

## 10. VALVE MECHANISM



No	Part number	Name	Quantity
1	372-1007030	TENSIONING PULLEY	1
2	Q1401045	HEXAGON HEAD BOLT	1
3	Q1400616	HEXAGON HEAD BOLT	3
4	372-1007040	TIMING GEAR COVER	1
5	Q1460625	HEXAGON HEAD BOLT	2
6	Q1460650	HEXAGON HEAD BOLT	2
7	Q43140	SHIELD-SHAFT SPRING RING	1
8	372-1006032	SADDLE FLIP WASHER	1
9	372-1006031	DRIVE RING	1
10	372-1006041	GEAR ( SUB ) - INTAKE CAMSHAFT	1
11	372-1006030	GEAR ( MAIN ) - INTAKE CAMSHAFT	1
12	372-1006020	CAMSHAFT ASSY - INTAKE	1
13	372-1006071	HEXAGON FLANGE BOLT	1
14	372-1006066	TIMING BELT SPROCKET	1
15	372-1006064	LOCK-CLUTCH HUB NUT	1
16	Q2180620	INNER HEXGON HEAD BOLT	4

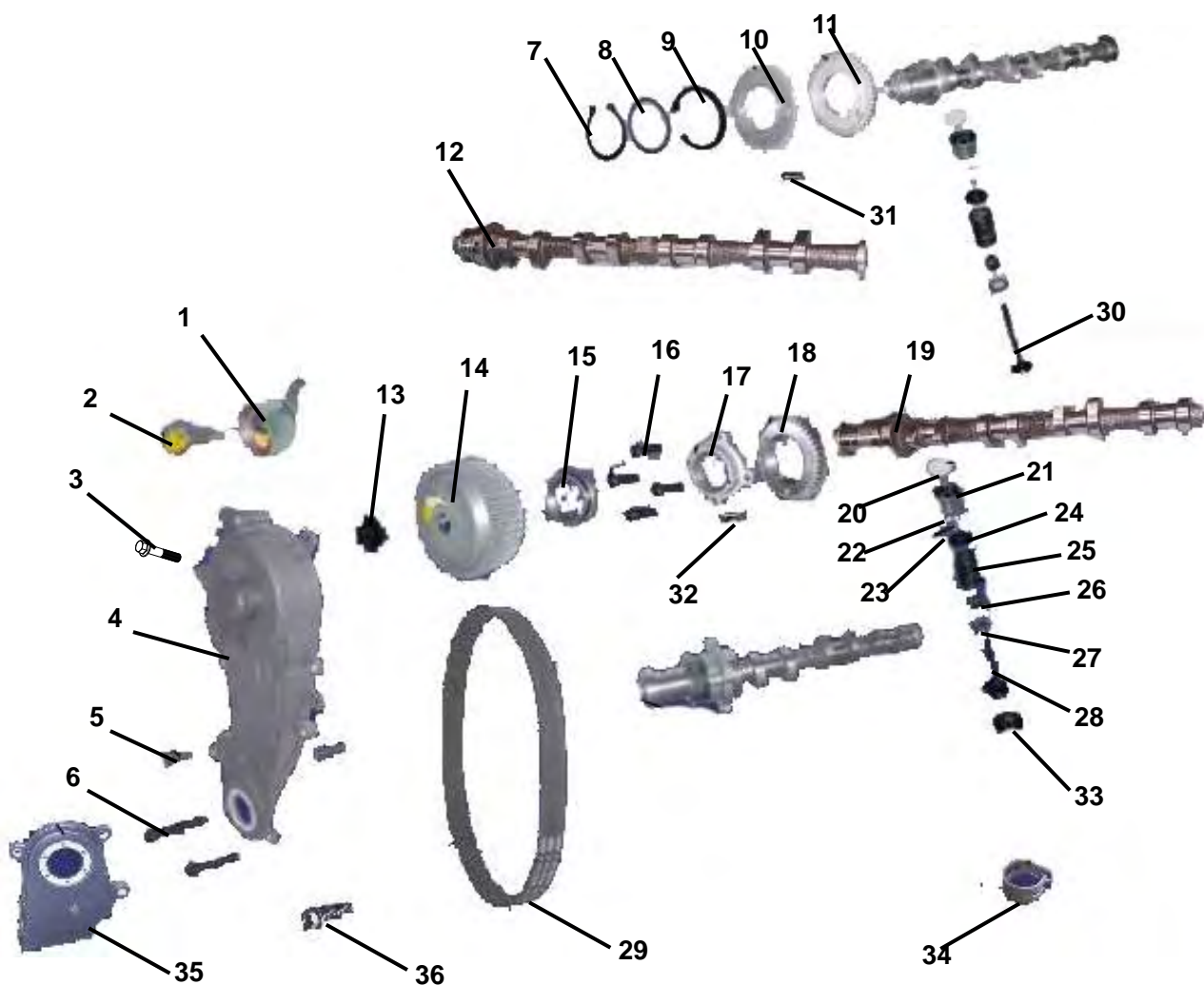
## 10. VALVE MECHANISM



No	Part number	Name	Quantity
17	372-1006063	COUPLING FLANGE	1
18	372-1006062	EXHAUST CAMSHAFT GEAR	1
19	372-1006060	CAMSHAFT ASSY - EXHAUST	1
20	372-1007017	ADJUSTMENT WASHER	12
21	372-1007018	VALVE LIFTER	12
22	372-1007019	VALVE LOCK BLOCK	24
23	372-1007021	EDDY SLEEVE	12
24	372-1007014BA	UPPER VALVE SPRING SEAT	12
25	372-1007013	VALVE SPRING	12
26	372-1007020	VALVE SEAL	12
27	372-1007016	LOWER VALVE SPRING SEAT	12
28	372-1007012	EXHAUST VALVE	6
29	372-1007081	TOOTHED TIMING BELT	1
30	372-1007011	INLET VALVE	1
31	372-1006042	PIN - GEAR	1
32	372-1006067	PIN - STOPPER	1
33	372-1007014	SEAT - VALVE SPRING UPPER	1

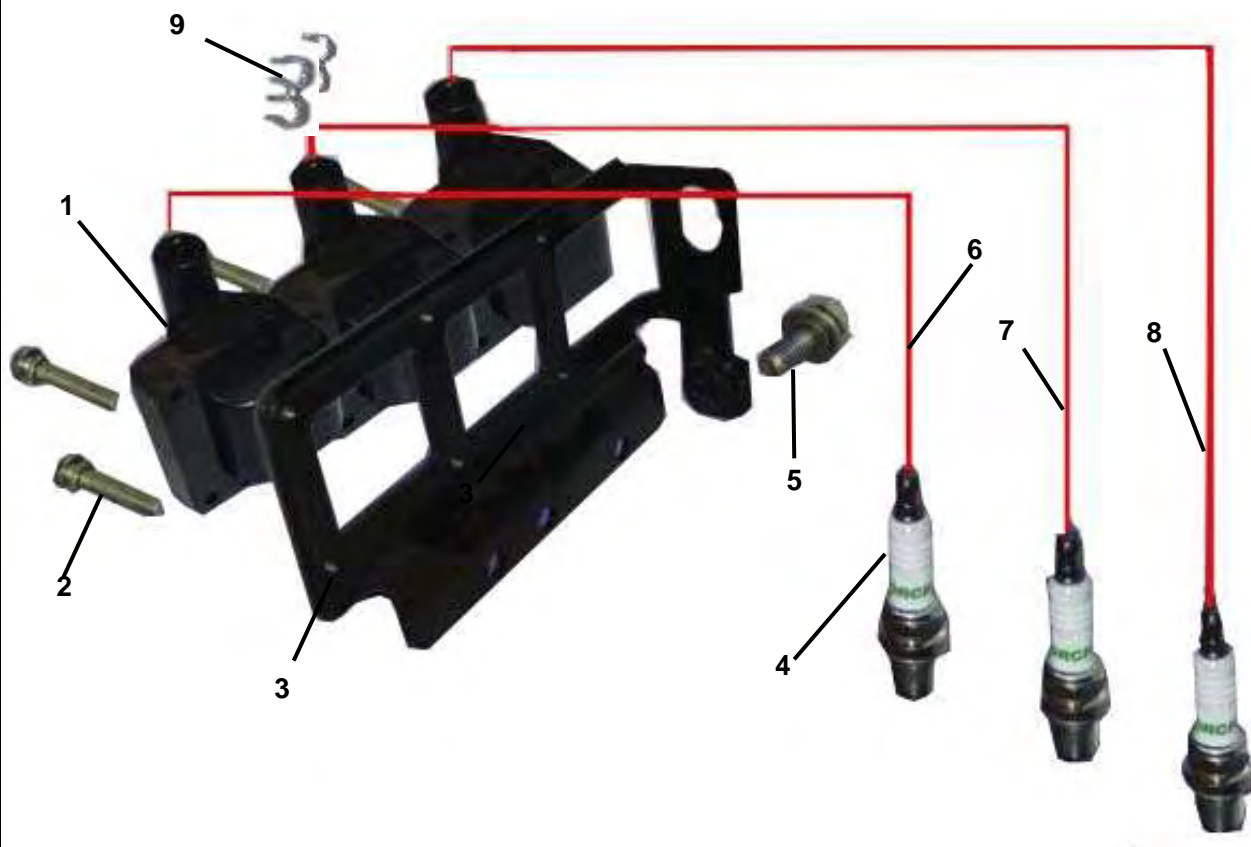


## 10. VALVE MECHANISM



No	Part number	Name	Quantity
33	372-1007014	UPPER VALVE SPRING SEAT	1
34	Q673B155	CLAMP	1
35	472-1007042	LOWER TIMING GEAR COVER	1
36	480-1011062	BOLT	1

## 11.IGNITION DEVICE



No	Part number	Name	Quantity
1	S11-3705100	IGNITION COIL	3
2	Q2320525	SCREW AND WASHER UNIT	6
3	S11-3705001	IGNITION COIL BRACKET	1
4	S11-3707100	SPARK PLUG	3
5	Q1460820	HEXAGON HEAD BOLT	1
6	S11-3707040	HI. TENSION CORD NO. 3	1
7	S11-3707030	HI. TENSION CORD NO. 2	1
8	S11-3707020	HI. TENSION CORD NO. 1	1
9	S11-3724183	CLIP	0

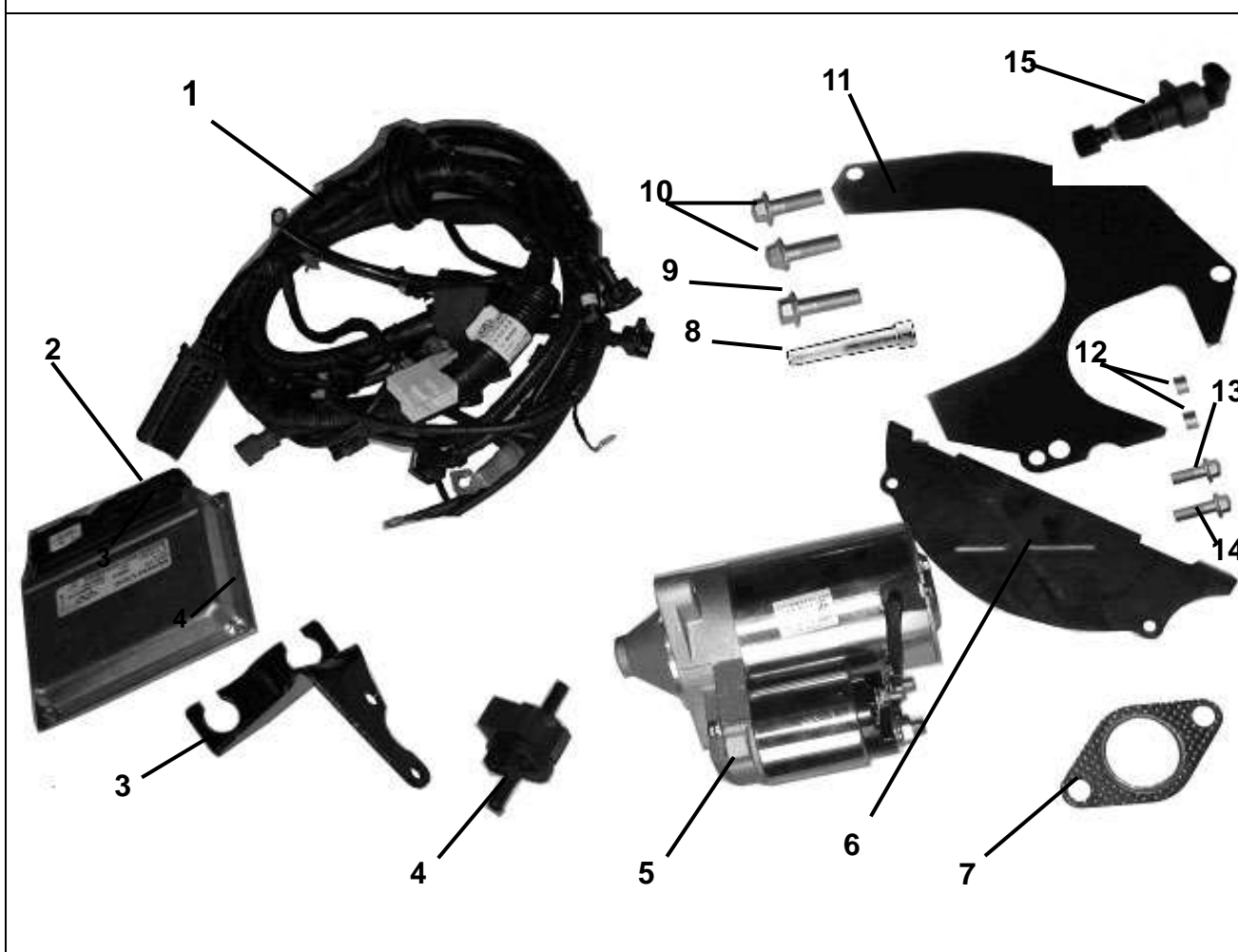


## 12.PISTON AND CONNECTING ROD DEVICE



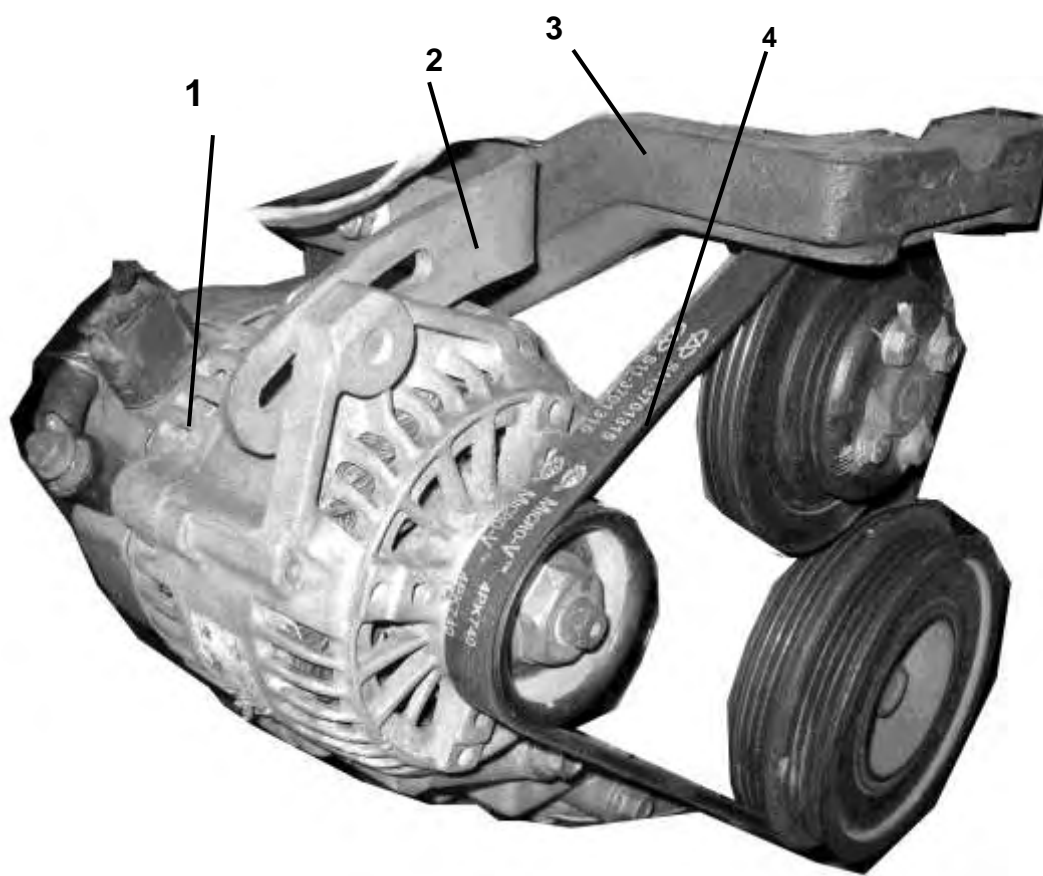
No	Part number	Name	Quantity
1	372-1DE1004030	RING ASSY - PISTON	1
2	372-1004031	PISTON PIN	3
3	372-1004021	PISTON	3
4	372-1004110	CONNECTING ROD ASSY	3
5	372-1DF1004110	BEARING - CONNECTING ROD	6

### 13. OTHER ACCESSORY 1



No	Part number	Name	Quantity
1	S11-3724180CA	Engine Harness	1
2	S11-3605010BA-1	372 ECU	1
3	SV1100.05.02.01.00	Shifter Bracket	1
4	S11-1206211	carbon can PCV	1
5	S11-3708110BA	Starter	1
6	S11-1700103	lower Steel cushion	1
7	S11-1200011CA	Single Exhaust Gasket	1
8	Q1841245	Hex socket head bolt M12*45	1
9	Q218B1245	Bolt 12*45	1
10	Q1841240	Bolt 12*50	2
11	372-1002030	Upper steel cushion	1
12	S11-3708111	locating dowel	2
13	Q1840845	Bolt 8*45	2
14	Q1840850	Bolt 8*50	1
15	S11-3802020	Electric odometer sensor assy	1

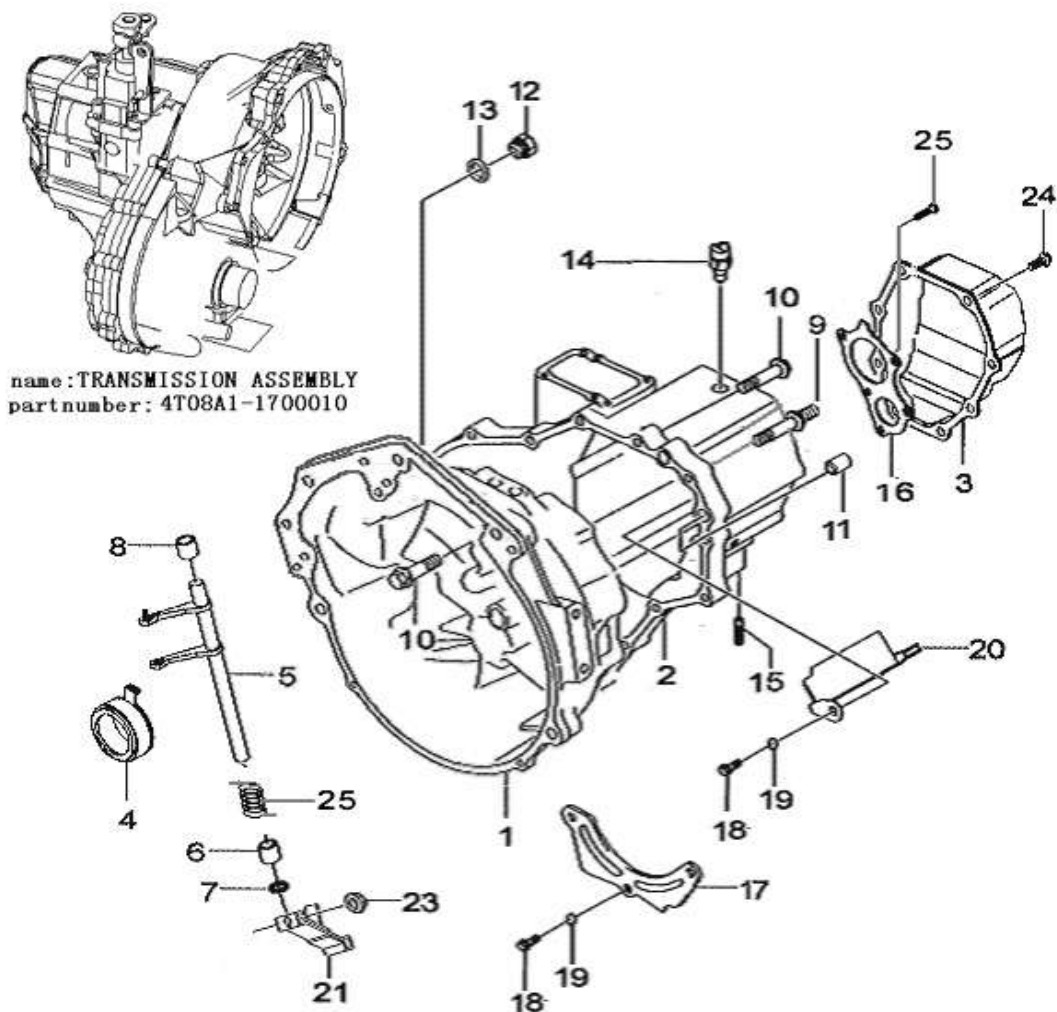
## 14. OTHER ACCESSORY 2



No	Part number	Name	Quantity
1	S11-3701110BB	Alternator	1
2	S11-3701211BA	Alternator bracket	1
3	S11-1001415BA	Rear bracket	1
4	S11-3701315	V-ribbed belt	1

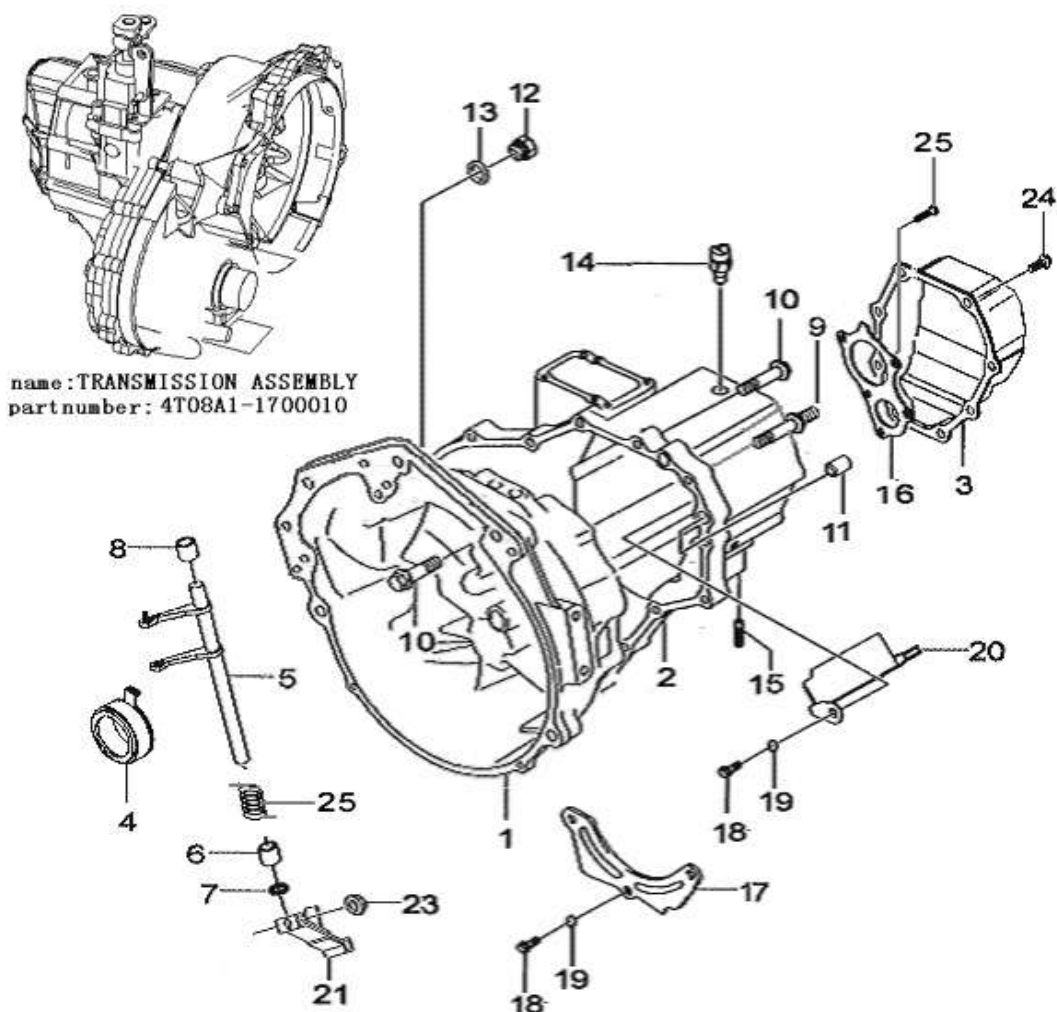
## 2. TRANSSMISSION

### 1.CASE&ACCESSORY



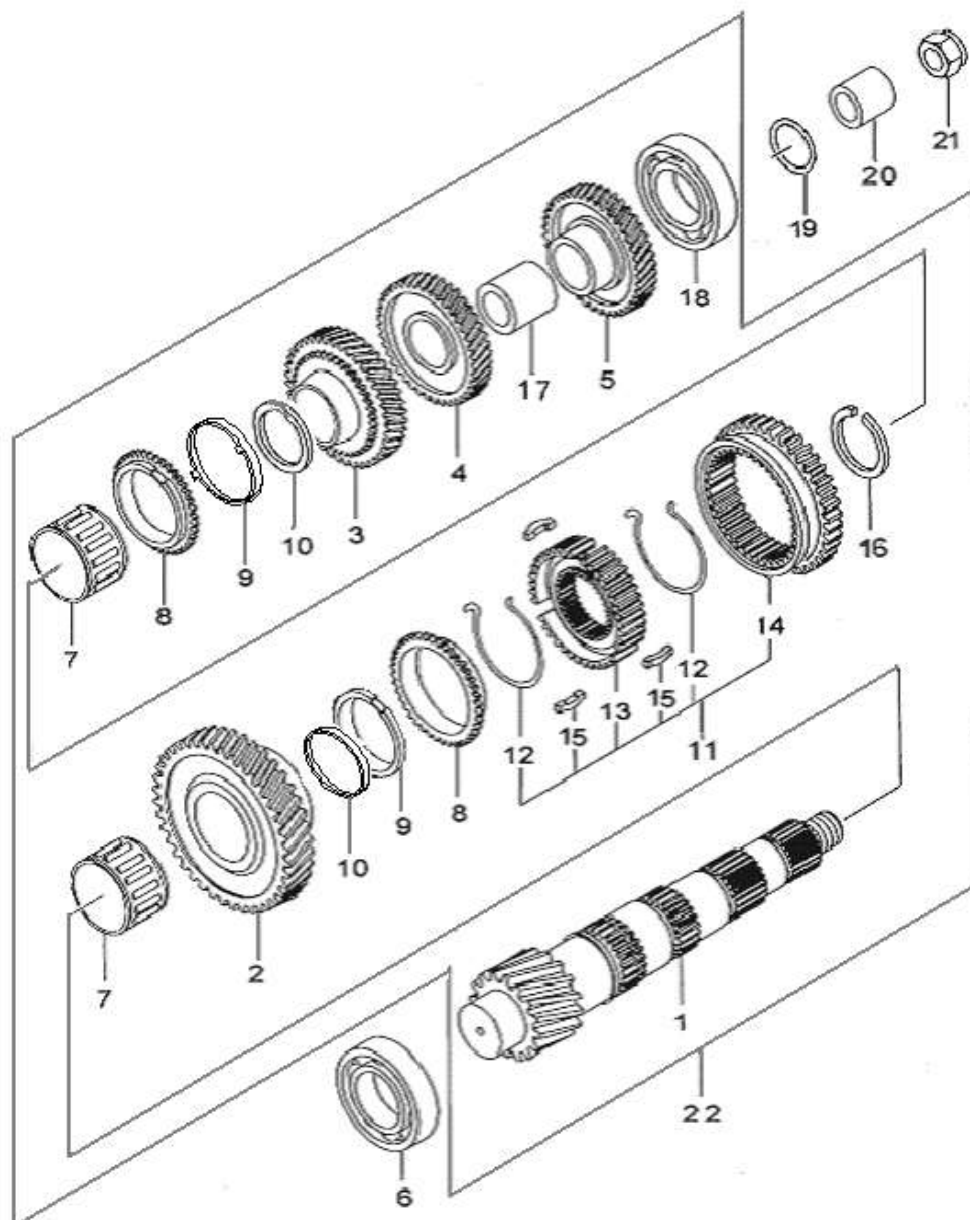
No	Part number	Name	Quantity
1	QR512-1701101	CLUTCH CASE	1
2	4T08A1-1701111	TRANSMISSION CASE	1
3	5T07-1701020	SIDE COVER	1
4	5T07-1702010	DECLUTCH BEARING	1
5	5T07-1702020A	DECLUTCH FORK	1
6	5T07-1702004	CLUTCH FORK 2 SLEEVE	1
7	5T07-1702030	CLUTCH FORK SEAL	2
8	5T07-1702001	CLUTCH FORK 1 SLEEVE	1
9	QR512-1701103	DOUBLE-SCREW ROD	2
10	5789-AM8X40	BOLT AM8x40	12
11	5T07-1701001	LOCATING PIN	2
12	5T07-1701002	OIL PLUG SCREW	1

## 1.CASE&ACCESSORY



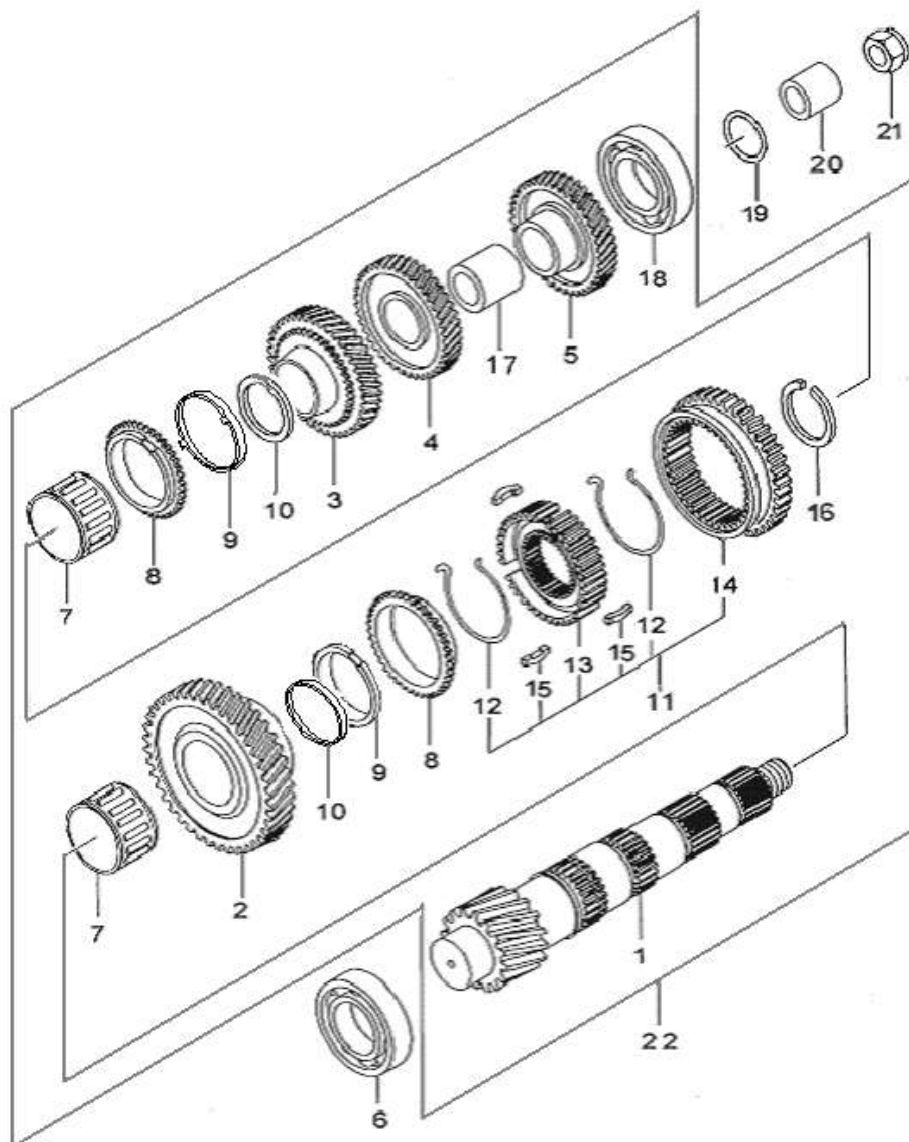
No	Part number	Name	Quantity
13	5T07-1701003	SCREW PLUG WASHER	2
14	5T07-3729010	BACK-UP LIGHT SWITCH	1
15	5T07-1701058A	DOUBLE-SCREW ROD	1
16	5T07-1701009	BEARING STOP PLATE	1
17	5T07-1701004	OIL-STOP PLATE	1
18	5789-AM6X12	AM6×12/BOLT AM6X12	2
19	7246-W6	6/WASHER 6	4
20	5T07-1701400	OIL GROOVE	1
21	5T07-1702080A	CLUTCH ROCKER	1
22	5789-AM8X35	AM8×35/BOLT AM8X35	1
23	6177-M8	NUT M8	1
24	5T07-1701603	SIDE COVER BOLT	8
25	QR512-1602113	DECLUTCH RELEASE SPRING	1

## 2.COUNTERSHAFT



No	Part number	Name	Quantity
1	4T08A-1701401	COUNTERSHAFT	1
2	QR512-1701410	FIRST GEAR	1
3	4T08A1-1701420	SECOND GEAR	1
4	4T08A1-1701441	THIRD GEAR	1
5	4T08A1-1701461	FOURTH GEAR	1
6	5T07-1701610	FRONT OUTPUT SHAFT BEARING	1
7	5T07-1701240	NEEDLE BEARING.1ST GEAR&2ND GEAR	2
8	QR512-1701439	OUTER RING.SYNCHRONIZER.1ST GEAR&2ND GEAR	2
9	QR512-1701406	MID RING.SYNCHRONIZER.1ST GEAR&2ND GEAR	2
10	QR512-1701435	INNER RING.SYNCHRONIZER.1ST GEAR&2ND GEAR	2
11	QR512-1701430	SYNCHRONIZER.1ST GEAR&2ND GEAR	1

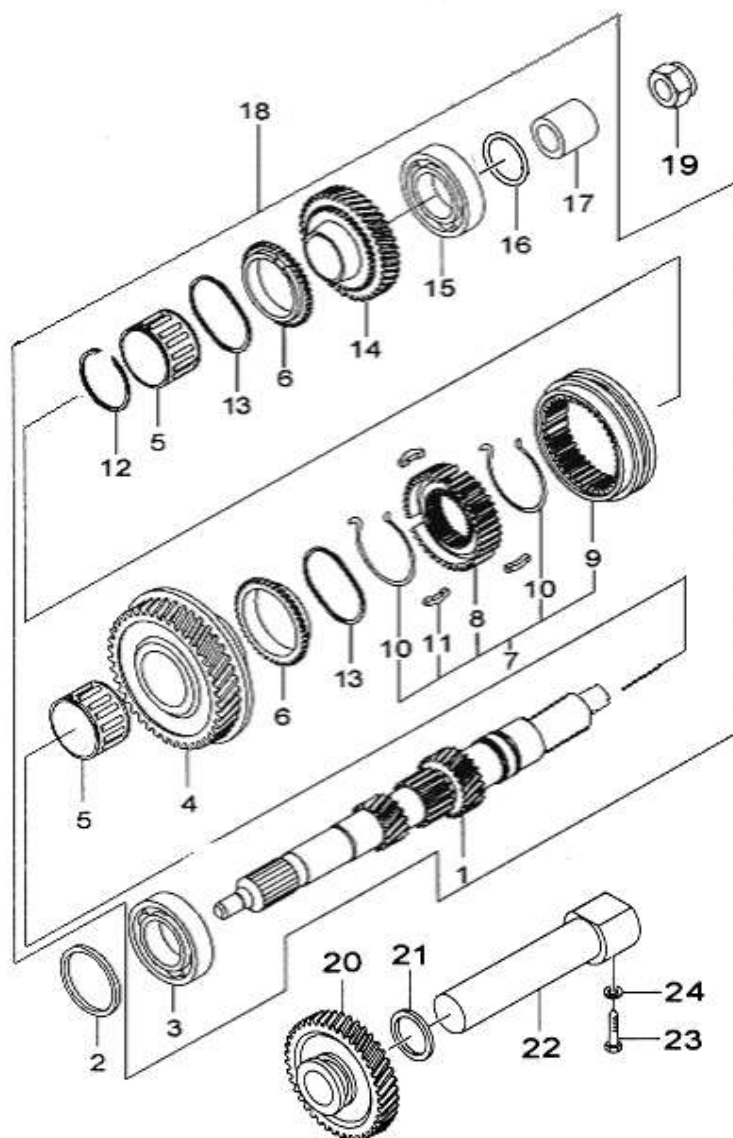
## 2.COUNTERSHAFT



No	Part number	Name	Quantity
12	QR512-1701433	SYNCHRONIZER SPRING.1ST GEAR&2ND GEAR	2
13	QR512-1701434	GEAR-HUB.SYNCHRONIZER.1ST GEAR&2ND GEAR	1
14	QR512-1701431	GEAR-SLEEVE.SYNCHRONIZER.1ST GEAR&2ND GEAR	1
15	QR512-1701432	GUIDE BLOCK.SYNCHRONIZER.1ST GEAR&2ND GEAR	3
16	5T07-1701205	RETAINER.SYNCHRONIZER.1ST GEAR&2ND GEAR	1
17	5T07-1701202	SPACER.3RD GEAR&4TH GEAR	1
18	5T07-1701250	OUTPUT SHAFT REAR BEARING.	1
19	QR512-1701187	ADJUSTING WASHER. OUTPUT SHAFT.REAR BEARING	Demand
20	4T08A-1701402	COUNTERSHAFT SLEEVE	1
21	MQC4-1701219	COUNTERSHAFT NUT	1
22	4T08A1-1701400	COUNTERSHAFT ASSY	1

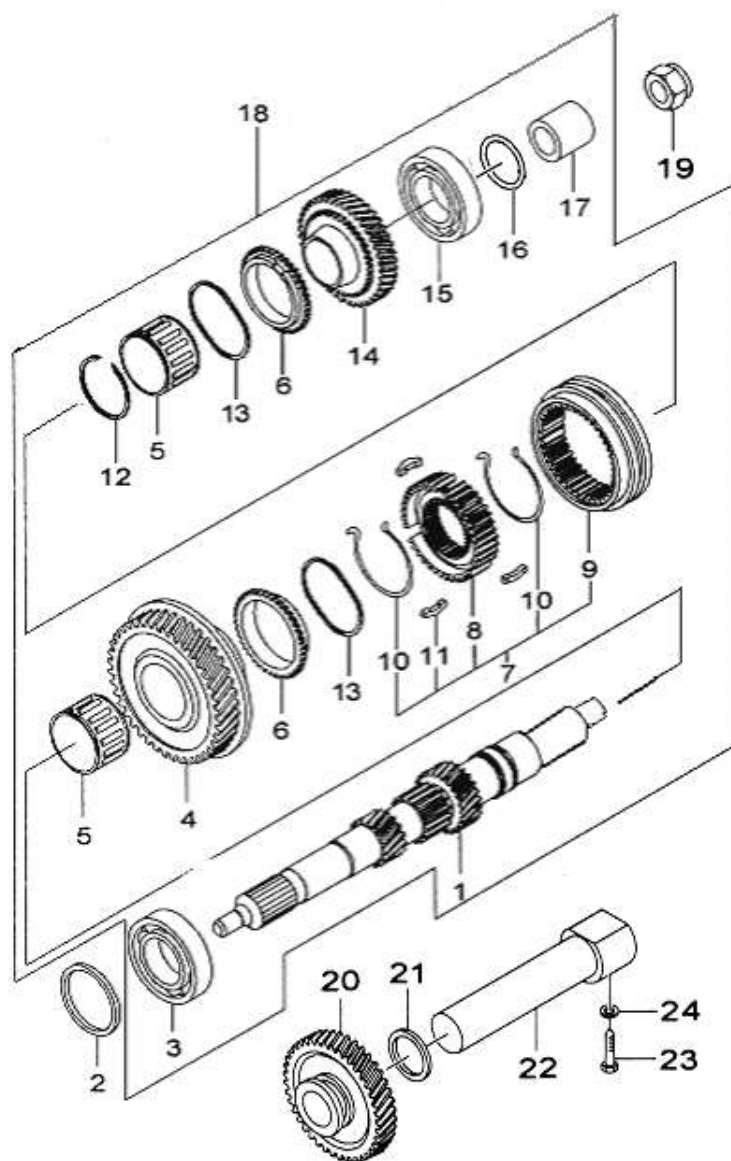


### 3.INPUT SHAFT ASSY



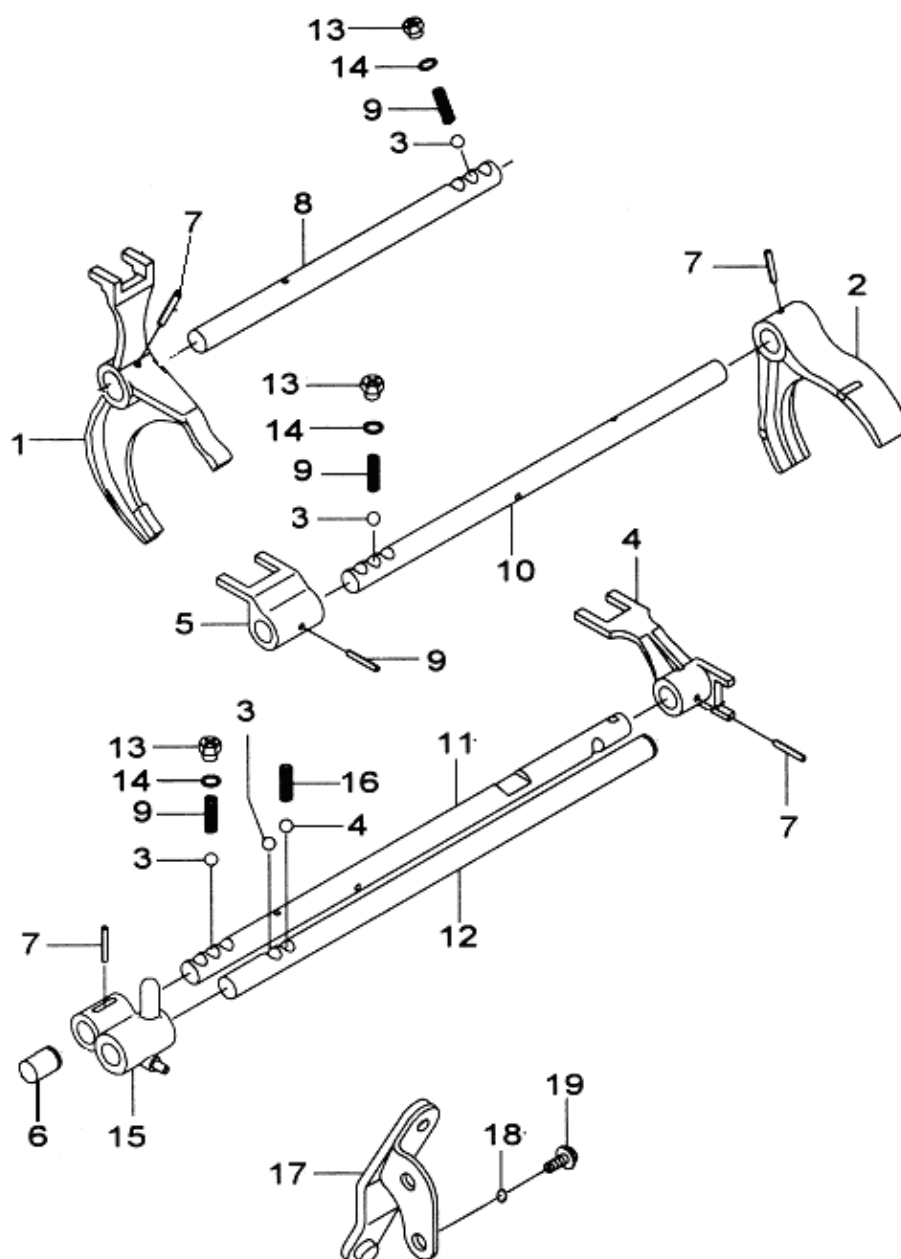
No	Part number	Name	Quantity
1	4T08A1-1701201	INPUT SHAFT	1
2	5T07-1701080	INPUT SHAFT SEAL	1
3	4T08-1701130	BEARING 6204/YA/P63	1
4	4T08A1-1701240	DRIVE GEAR ASSY.3RD GEAR	1
5	5T07-1701150	NEEDLE BEARING.3RD GEAR&4TH GEAR	2
6	QR512-1701257	SYNCHRONIZER RING.3RD GEAR&4TH GEAR&5TH GEAR	2
7	QR512-1701250	SYNCHRONIZER ASSY.3RD GEAR&4TH GEAR	1
8	QR512-1701252	GEAR-HUB.SYNCHRONIZER. 3RD GEAR&4TH GEAR	1
9	QR512-1701251	SYNCHRONIZER GEAR-SLEEVE. 3RD GEAR&4TH GEAR	1
10	QR512-1701254	SPRING.SYNCHRONIZER.3RD GEAR&4TH GEAR&5TH GEAR	1
11	QR512-1701253	SYNCHRONIZER GUIDE BLOCK . 3RD GEAR&4TH GEAR	3
12	5T07-1701103	SYNCHRONIZER RETAINER. 3RD GEAR&4TH GEAR	1

### 3.INPUT SHAFT ASSY



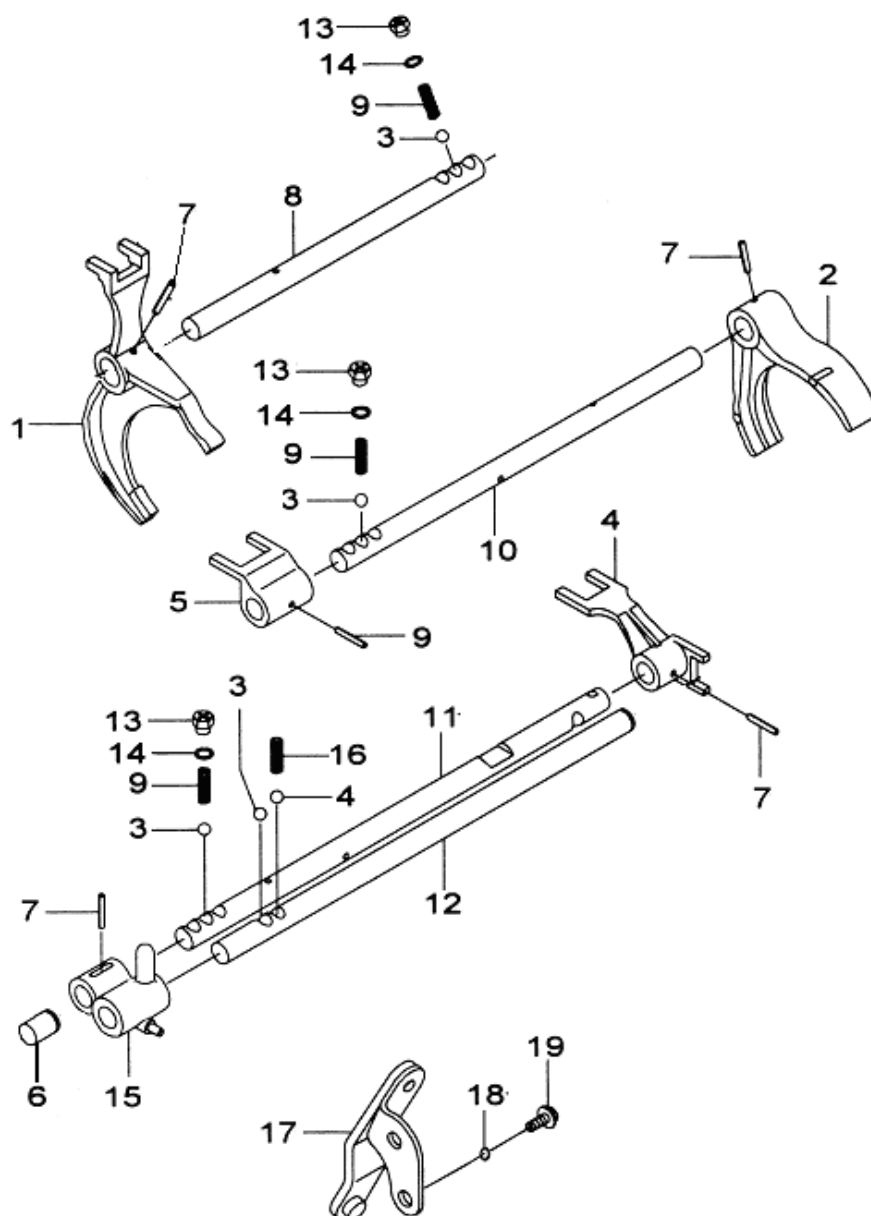
No	Part number	Name	Quantity
13	QR512-1701258	SYNCHRONIZER WAVEFORM WASHER RING	2
14	4T08A1-1701260	DRIVING GEAR .4TH GEAR	1
15	5T07-1701110	BACK BEARING/INPUT SHAFT	1
16	QR512-1701287	ADJUSTING WASHER. BACK BEARING/INPUT SHAFT	Demand
17	4T08A-1701202	INPUT SHAFT SLEEVE	1
18	4T08A1-1701200	INPUT SHAFT ASSY	1
19	QR512-1701298	SYNCHRONIZER.5TH GEAR NUT	1
20	QR512-1701710	IDLE GEAR	1
21	5T07-1701053	REVERSING IDLE GEAR RETAINER	1
22	5T07-1701061A	REVERSING IDLE GEAR SHAFT	1
23	5T07-1701057A	REVERSING IDLE GEAR BOLT	1
24	5T07-1701052	REVERSE-GREAR SHAFT WASHER	1

#### 4.SHIFT FORK& SHIFT- FORK SHAFT



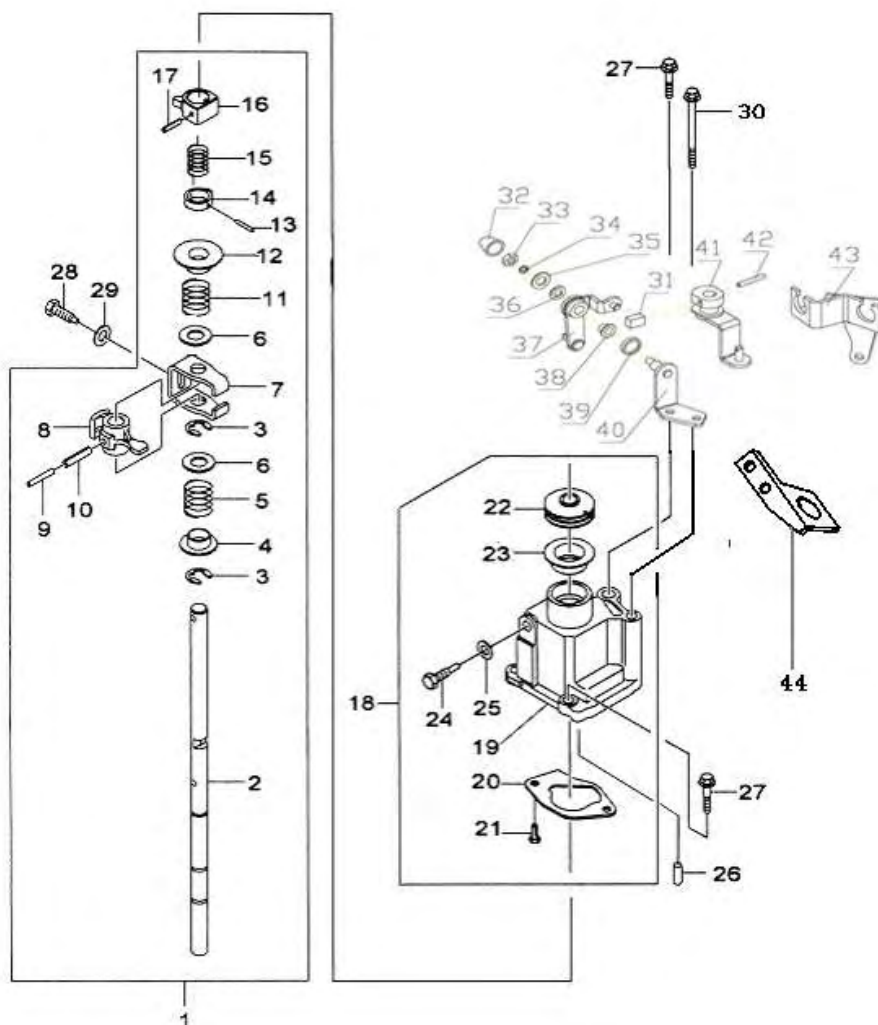
No	Part number	Name	Quantity
1	QR512-1702311	SHIFT FORK.1ST GEAR&2ND GEAR	1
2	5T07-1702041A	SHIFT FORK.3RD GEAR&4TH GEAR	1
3	308-7.9375	STELL BALL 7.9375	6
4	5T07-1702042A	SHIFT FORK.5TH GEAR	1
5	5T07-1702061A	SHIFT FORK.3RD GEAR&4TH GEAR	1
6	4T08A-1702042A	STOP BLOCK	1
7	QR512-1702231	PIN 4.5X20	1
8	QR512-1702411	SHIFT-FORK SHAFT.1ST GEAR&2ND GEAR	1
9	5T07-1702067	SHIFT SHAFT SPRING	3

#### 4.SHIFT FORK& SHIFT- FORK SHAFT



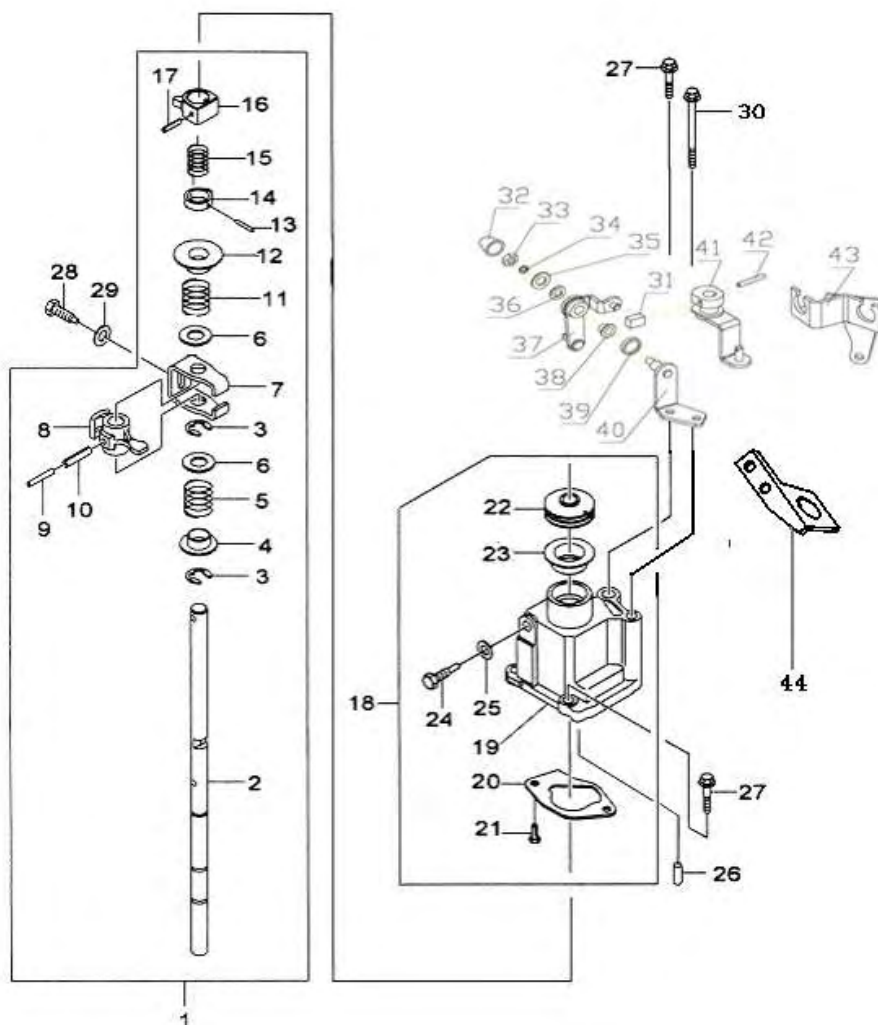
No	Part number	Name	Quantity
10	QR512-1701421	SHIFT SHAFT.3RD GEAR&4TH GEAR	1
11	QR512-1702431	SHAFT. SHIFT FORK.5TH GEAR	1
12	QR512-1702441	SHAFT. SHIFT FORK.REVERSE GEAR	1
13	5T07-1702234	SHIFT-FORK SHAFT SCREW PLUG	3
14	5T07-1702233	SCREW PLUG.SHIFT-FORK SHAFT WASHER	3
15	QR512-1702341	SHIFT-FORK PIN.REVERSE GEAR	1
16	5T07-1702068	SHIFT BLOCK SPRING	1
17	5T07-1702050A	SHIFT ARM	1
18	93-W8	WASHER 8	2
19	5T07-1702232A	SHIFT ARM BOLT	2

## 5.SHIFT CONTROL MACHANISM



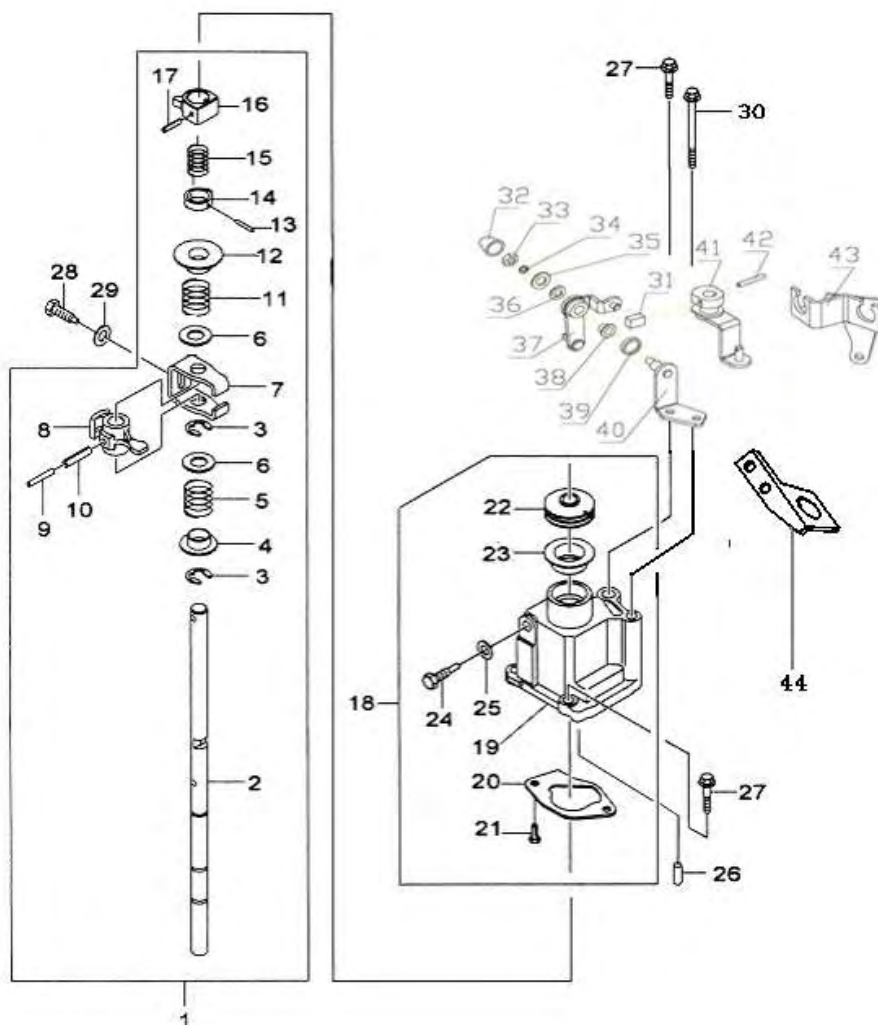
No	Part number	Name	Quantity
1	5T07-1702100A	SHIFT-SELECT SHAFT ASSY	1
2	5T07-1702101A	SHIFT-SELECTING SHAFT	1
3	QR512-1702214	STOP PLATE.SHIFT INTERLOCK SNAP RING	3
4	5T07-1702102	RELEASE-SPRING SEAT.1ST GEAR&2ND GEAR	1
5	5T07-1702103	RELEASE-SPRING.1ST GEAR&2ND GEAR	1
6	5T07-1702104	STOP PLATE SPRING	2
7	5T07-1702107A	SHIFT INTERLOCK STOP PLATE	1
8	5T07-1702105A	SHIFT-SELECT ARM.	1
9	QR512-1702113	SPRING PIN 3.5X28	1
10	5T07-1702106	PIN.SHIFT-SELECT ARM.	1
11	5T07-1702114A	RELEASE-SPRING.5TH GEAR&REVERSE GEAR	1
12	5T07-1702112	RELEASE-SPRING SEAT.5TH GEAR&REVERSE GEAR	1
13	879.1-P3X22	PIN 3X22	1
14	5T07-1702108A	SEAT.REVERSE GEAR SPRING	1

## 5.SHIFT CONTROL MACHANISM



No	Part number	Name	Quantity
15	5T07-1702109A	LIMITING SPRING.REVERSE GEAR	1
16	QR512-1702111A	LIMITING CAM.REVERSE GEAR	1
17	879.1-2000	PIN 5X22	1
18	QR512-1702070	GUIDE CASE ASSY. SHIFT-SELECT SHAFT	1
19	QR512-1702071	GUIDE CASE. SHIFT-SELECT SHAFT	1
20	5T07-1702072	RELEASE SPRING.5TH@REVERSE STOP PLATE	1
21	5789-AM6X12	BOLT AM6X12	2
22	QR512-1702227	SHIFT-SELECT SHAFT OIL SEAL	1
23	5T07-1702062	SHIFT-SELECT SHAFT ANTI-DUST COVER	1
24	5T07-1702073	LIMITING BOLT.REVERSE GEAR	1
25	QR512-1702229	LIMITING BOLT.REVERSE GEAR WASHER	1
26	119-P6X12	PIN B 6X12	2
27	5789-AM8X25	BOLT AM 8X25	4
28	5T07-1702065A	LIMITING BOLT.SHIFT	1

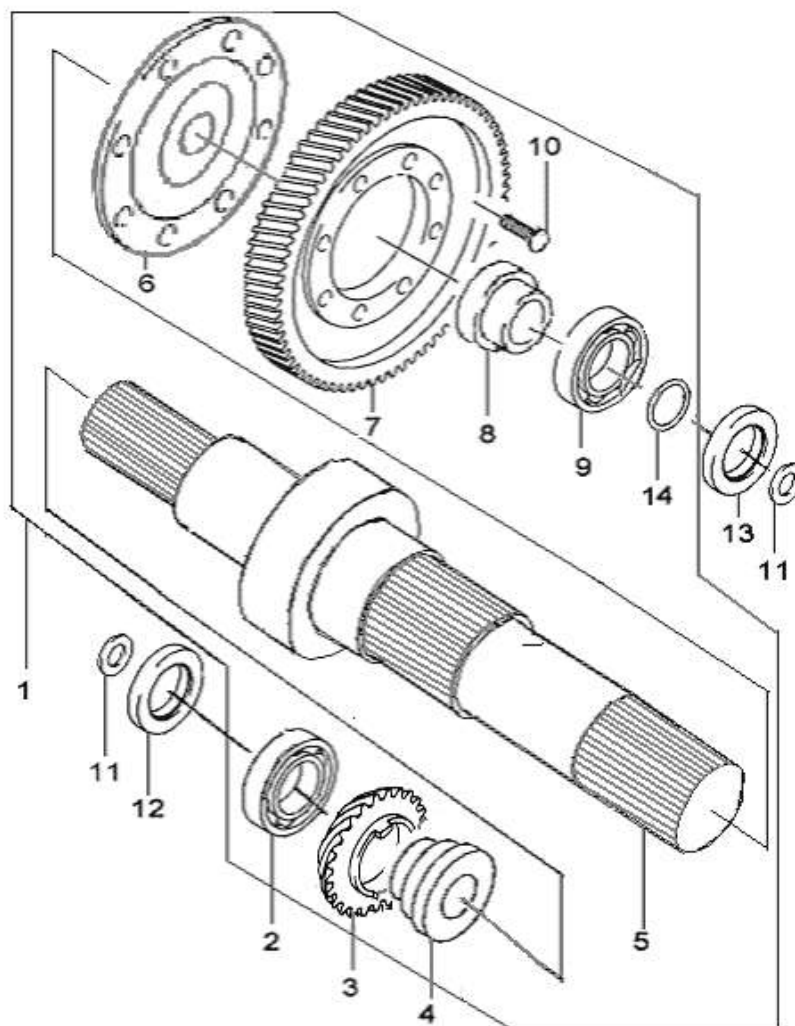
## 5.SHIFT CONTROL MACHANISM



No	Part number	Name	Quantity
29	QR512-1702229	STOP SCREW.REVERSE GEAR WASHER	1
30	5789-AM8X80	BOLT AM 8X80	1
31	5T07-1702063	SHIFT PUSHING BLOCK	1
32	5T07-1702062	ANTI-DUST COVER.SHIFT-SELECT SHAFT	1
33	6170-M8	NUT M8	1
34	93-SW8	Spring washer 8	1
35	5T07-1702046	SHIFT ARM BIG WASHER	1
36	5T07-1702045	SHIFT ARM SMALL WASHER	1
37	SV1100.05.02.02.00	SHIFT ARM.COMP	1
38	SV1100.05.02.00.03	Copper bush	1
39	5T07-1702047	ANTI-DUST WASHER.SHIFT ARM	1
40	5T07-1702220	SHIFT ARM SUPPORT	1
41	SV1100.05.02.04.00	SHIFT ARM COMP	1
42	879.1-P5X28	PIN 5X28	1
43	SV1100.05.02.01.00	Shifter bracket	1
44	QR512-1701656	LIFTING HOOK	1

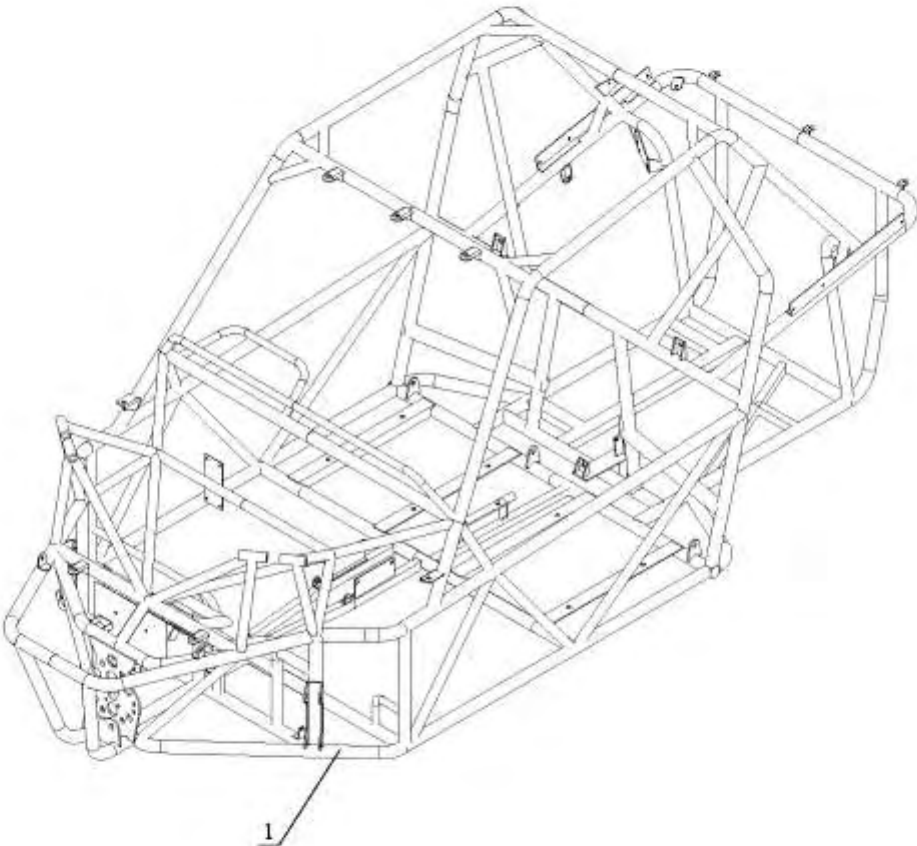


## 6.DRIVEN GEAR ASSY.SPEED REDUCER

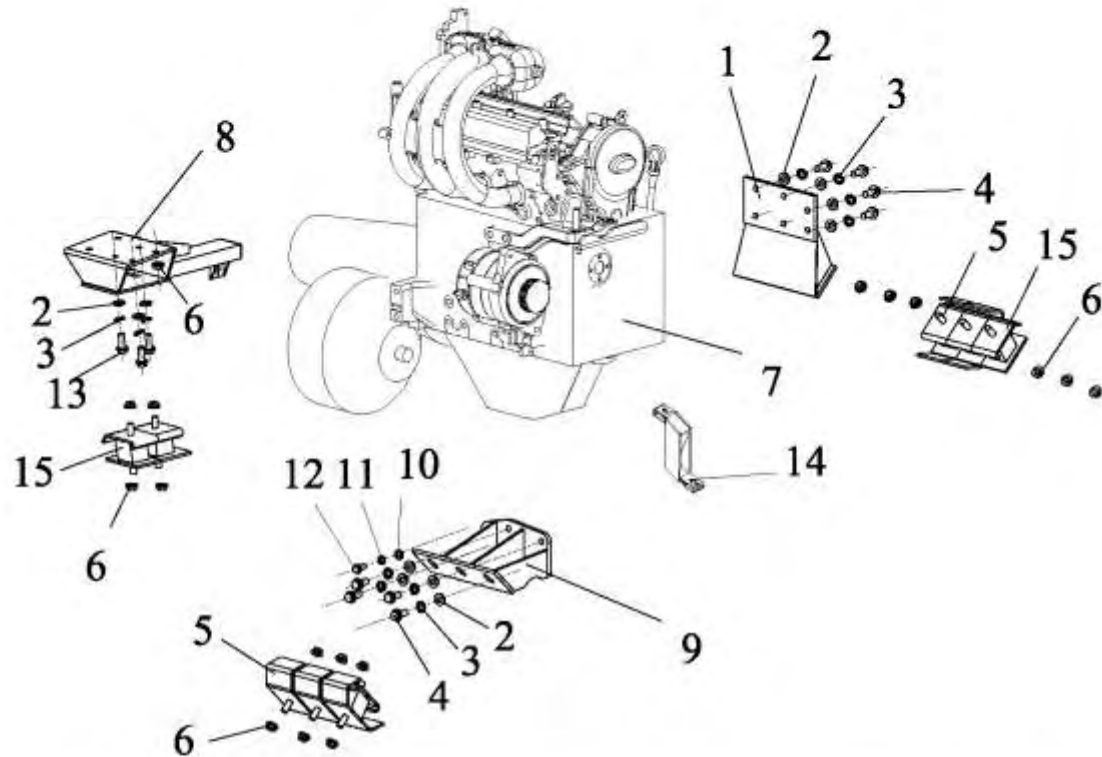


No	Part number	Name	Quantity
1	4T08A-1701600	DRIVEN GEAR ASSY.SPEED REDUCER	1
2	5T07-1701310	DIFFERENTIAL FRONT BEARING	1
3	QR512-1701604	ODOMETER DRIVING GEAR	1
4	4T08A-1701602	OUTPUT SHAFT FRONT BEARING	1
5	4T08A-1701601	OUTPUT SHAFT	1
6	4T08A-1701603	CONNECTING DISC	1
7	4T08A-1701604	SPEED REDUCER DRIVEN GEAR	1
8	4T08A-1701605	OUTPUT SHAFT REAR BEARING	1
9	5T07-1701320	DIFFERENTIAL REAR BEARING	1
10	5T07-1701309	FLANGE BOLT	8
11	MQC4-2303016	RETAINER RING	2
12	5T07-1701090	DIFFERENTIAL RIGHT SEAL	1
13	5T07-1701010	DIFFERENTIAL LEFT SEAL	1
14	QR512-1701605	DIFFERENTIAL RIGHT SEAL ADJUSTING WASHER	Demand

3.CHASSIS

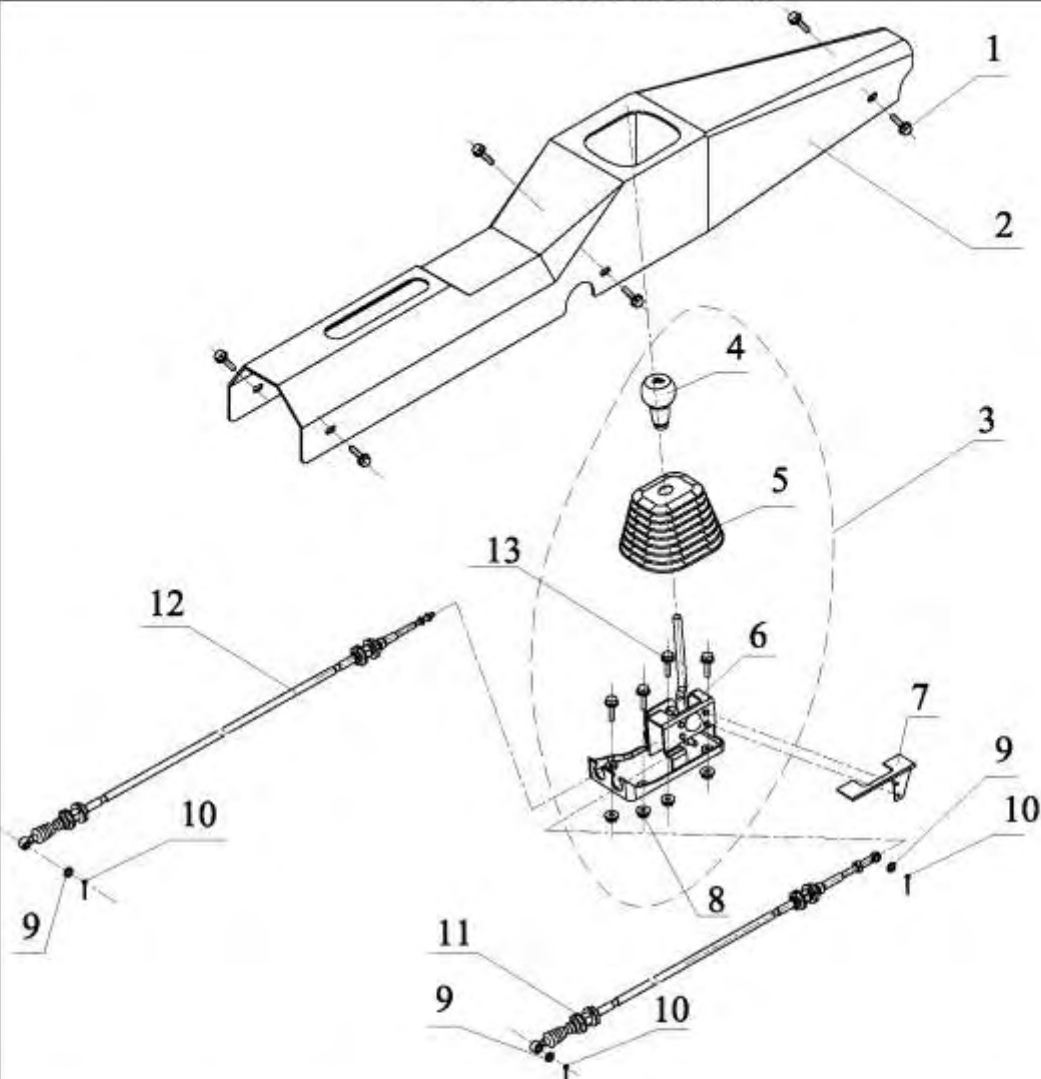
Frame			
			
No.	Code name	Description	Q' ty
1	MV800.01.00.00.00	Frame component	1

# Engine mount assy



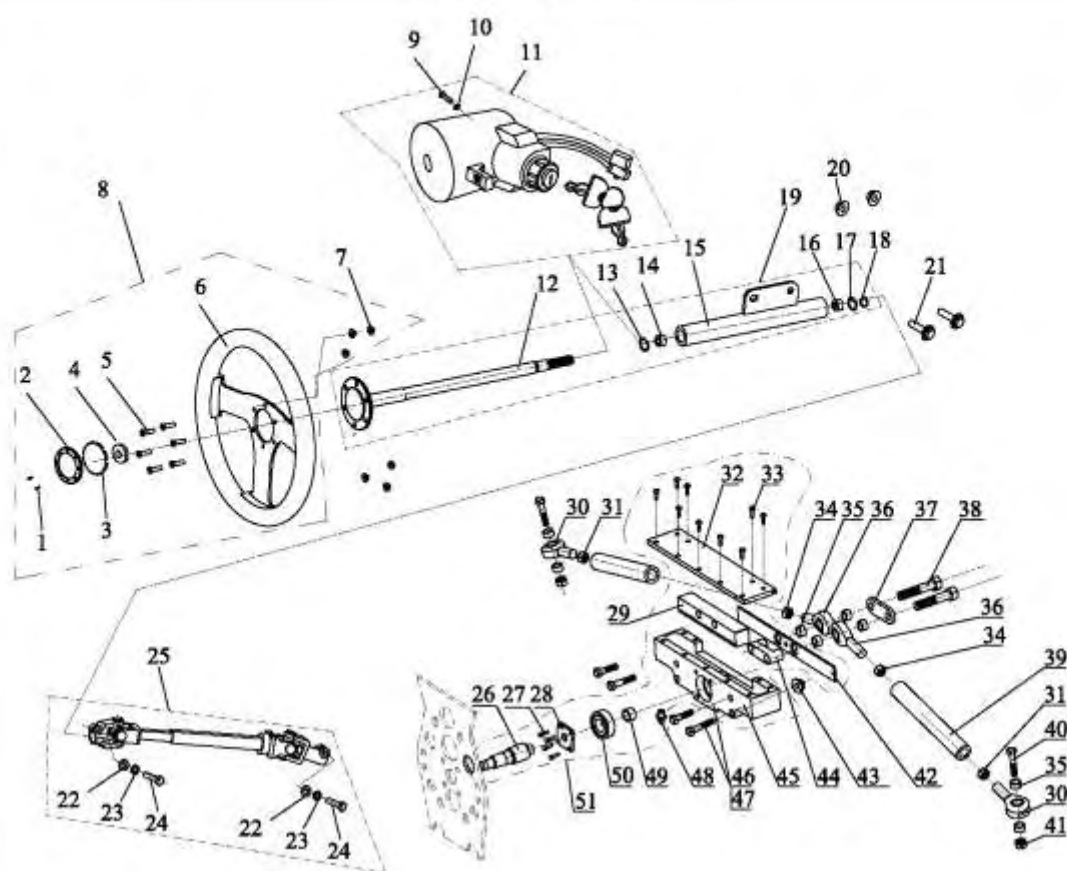
No.	P/N	ENGLISH	Q' ty
1	SV800.04.01.02.00	front engine mount	1
2	95-WØ10	washer Ø10 (11*20*2)	13
3	93-SWØ10	spring washer Ø10	13
4	5787-M10*1.5*30	bolt-washer M10*1.5*30	10
5	D650.04.01.00.01	engine rubber bumper	4
6	6177.1-M10X1.25	nut-washer M10x1.25	17
7	SV800.04.01.05.00	engine(372)	1
8	MV800.04.01.03.00	left engine mount	1
9	SV1100.04.01.04.00	rear engine mount	1
10	95-WØ8	washer Ø8	1
11	93-SWØ8	spring washer Ø8	1
12	5787-M8*30	bolt-washer M8*30	1
13	5787-M10*1.25*30	bolt-washer M10*1.25*30	3
14	SV800.04.01.06.00	clutch action arm	1
15	D650.04.01.00.01A	small engine rubber bumper	3

## Gear-shift mechanism



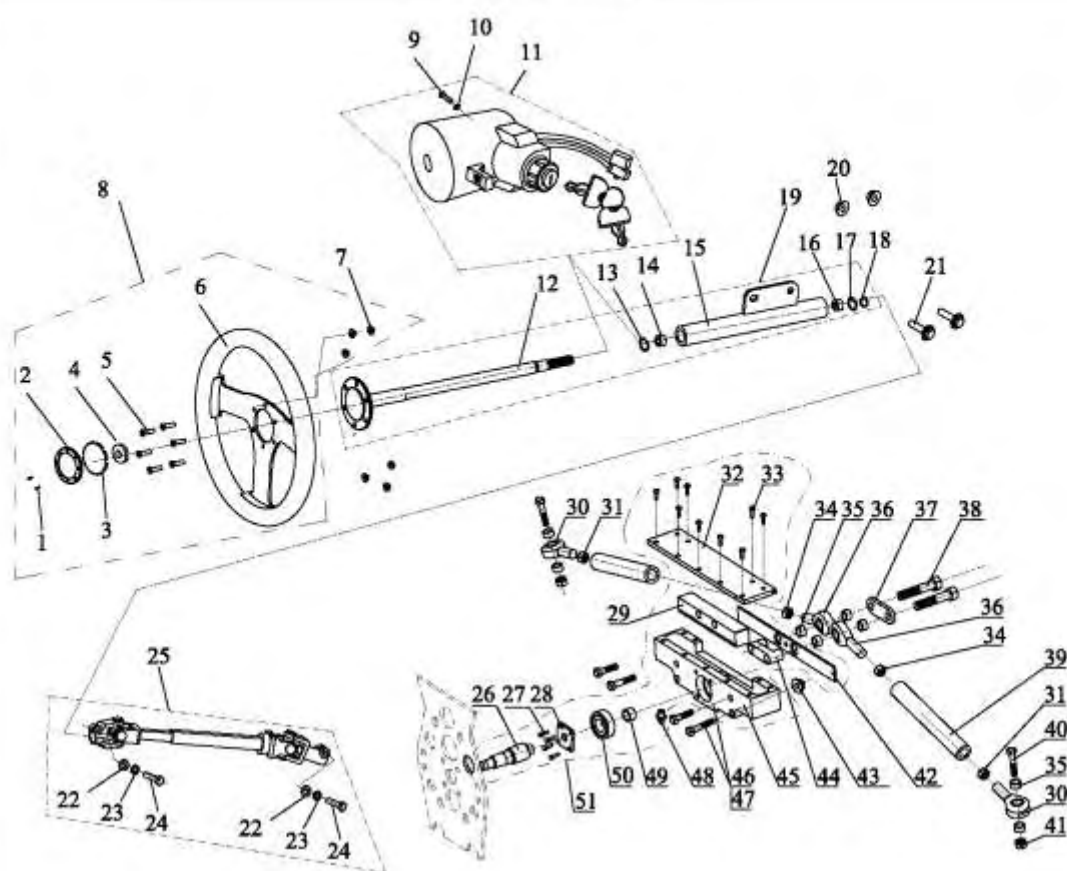
No.	Code name	Description	Q' ty
1	5787-M6*12	M6*12 bolt	6
2	MV800.05.02.00.01	plastic cover	1
3	S650.05.02.01.00	shifter control assembly	1
4	S650.05.02.01.01	rubber shifter indicator	1
5	S650.05.02.01.02	rubber shifter cover	1
6	S650.05.02.01.03	control framework	1
7	SV800.04.01.04.05	orientation metal sheet	1
8	6170-M6	M6 nut(m=5.2)	4
9	848-WØ8	washer Ø8(Ø8.4*Ø15*1.6)	3
10	91-PØ2*25	cotter pin Ø2*25	3
11	MV800.05.02.03.00	shifter soft shaft 2	1
12	MV800.05.02.02.00	shifter soft shaft 1	1
13	5787-M6*25	M6x25 bolt	4

## Steering assy



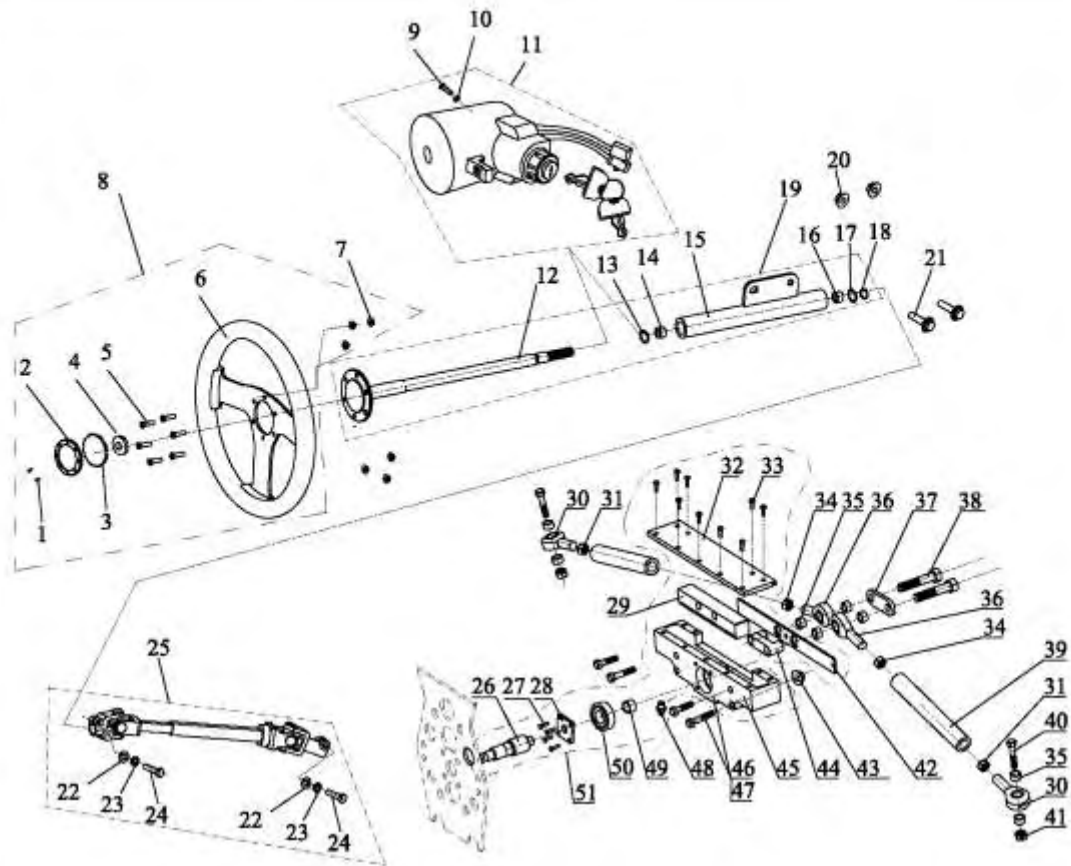
No.	Code name	Description	Q' ty
1	70-M4*16	bolt M4*16	2
2	DI250.03.01.00.01	plastic cover	1
3	DI250.03.01.00.02	rubber cover	1
4	DI250.03.00.00.02	rubber block	1
5	818-M6*20	M6*20 screw	6
6	DI250.03.01.00.03	steering wheel	1
7	6177.1-M6	M6 self-locking nut	6
8	DI250.03.01.00.00	steering wheel subassembly	1
9	819.1-M6*10	bolt M6*10	1
10	6172.1-Φ6	Ø6 spring shim	1
11	N650.06.00.18.00	integrated ignition switch	1
12	D650.05.01.01.01	steering wheel shaft	1
13	893.2-CΦ26	internal circlip Ø26	1
14	276-61902	61902 bearing	1
15	D650.05.01.01.02	steering column housing	1
16	276-61803	61803 bearing	1
17	893.2-CΦ28	internal circlip Ø28	1

## Steering assy



No.	Code name	Description	Q' ty
18	894.1-CØ15	external circlip Ø15	1
19	D650.05.01.01.00	steering column assy	1
20	6177.1-M10*1.25	M10*1.25 nut	2
21	5787-M10*1.25*25	M10*1.25*25 bolt	2
22	96-WØ8	Ø8 washer(8.4*24*2)	2
23	93-Ø8	Ø8 spring shim	2
24	5782-M8*25	M8*25 bolt	2
25	D800.05.01.02.00	steering universal rod	1
26	D800.05.01.03.02	steering gear shaft	1
27	5787-M8*20	M8*20 bolt	4
28	D800.05.01.03.05	bearing cover	1
29	D800.05.01.03.04	gear rack	1
30	D800.05.01.00.01	rod end bearingPOSA12LH	2
31	6172.1-M12*1.75	jam nut M12*1.75LH	2
32	D800.05.01.03.03	capping plate	1
33	2672-M6*12	socket head screw M6*12	9
34	6172.1-M12*1.75	jam nut M12*1.75	2

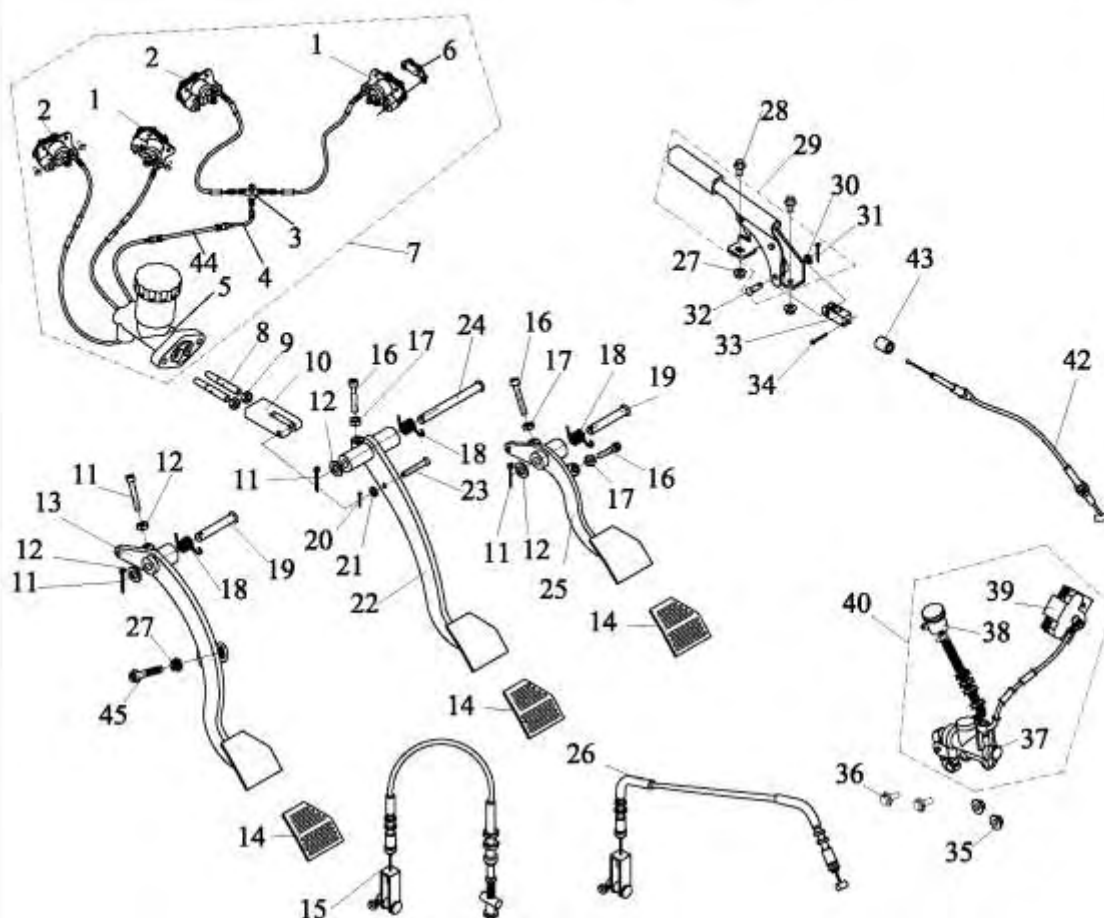
## Steering assy



No.	Code name	Description	Q' ty
35	D800.05.01.00.03	spacer sleeve	4
36	D800.05.01.00.02	rod end bearingPOSA12	2
37	D800.05.01.00.04	baffle plate	1
38	5782-M12*1.25*80	M12*1.25*80 bolt	2
39	N650.05.01.04.00	steering cross rod	2
40	5787-M12*1.5*60	M12*1.5*60 bolt	2
41	6177.1-M12*1.5	M12x1.5 nut	2
42	D800.05.01.03.07	dust guard plate	1
43	6177.1-M10*1.25	M10*1.25 nut	2
44	D800.05.01.03.06	bracket	1
45	D800.05.01.03.01	socket	1
46	5787-M10*1.5*10	bolt M10*1.5*10	2
47	5787-M10*1.25*75	bolt M10*1.25*75	2
48	D800.05.01.03.08	adding oil screw	1
49	D800.05.01.03.10	oiliness bearing 14c7*18*12	1
50	D800.05.01.03.09	ball bearing 20*42*12	1
51	D800.05.01.03.00	steering gear box	1

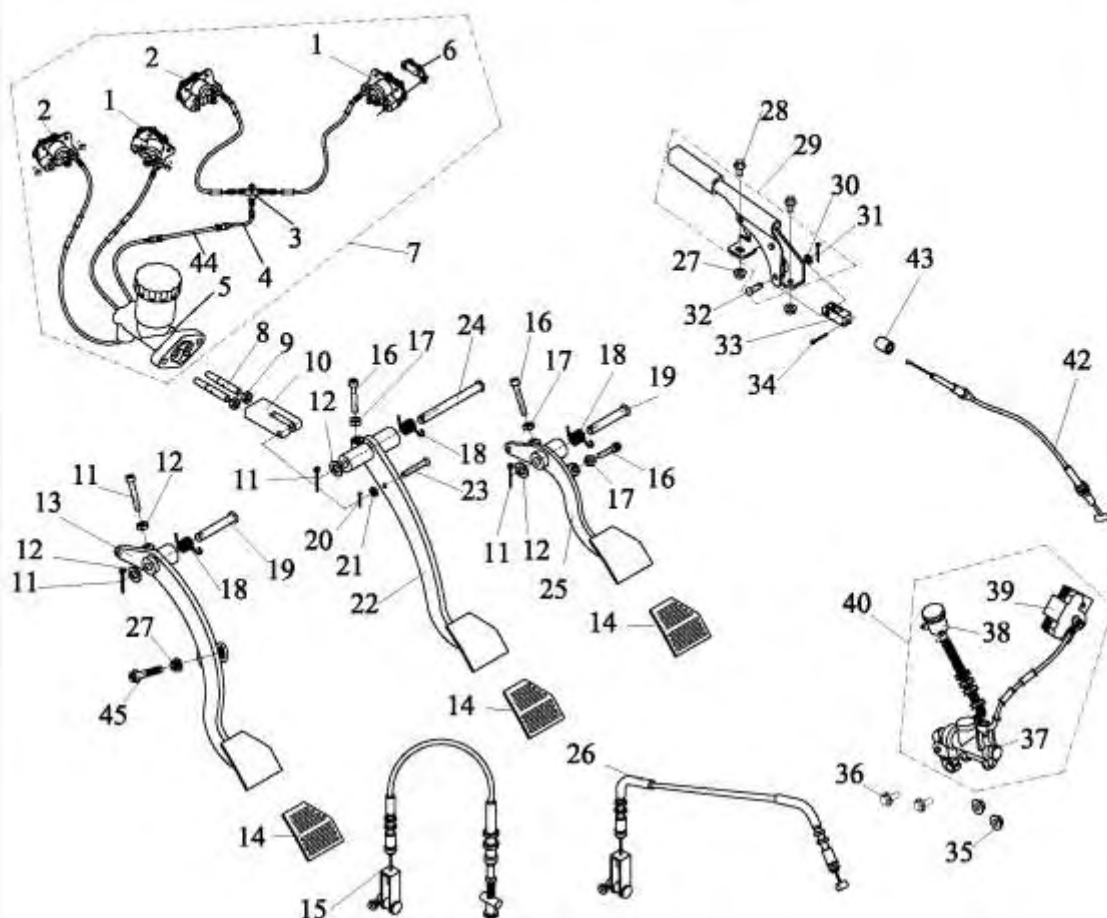


## Throttle and park assy



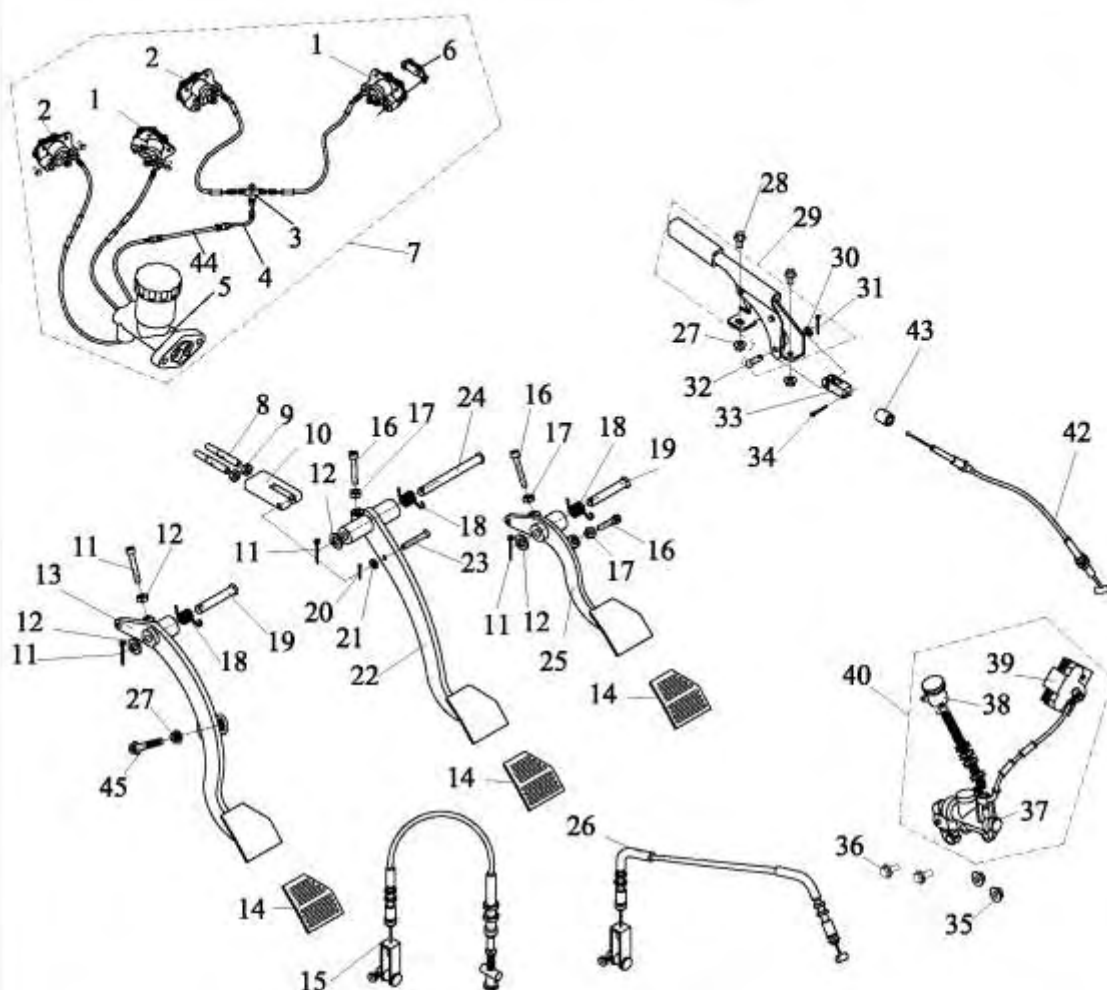
No.	Code name	Description	Q' ty
1	SV800.07.01.01.01	disc brake with floating caliper,front	2
2	SV800.07.01.01.02	disc brake with floating caliper,rear	2
3	D650.07.01.01.01	hydraulic threeway valve	1
4	SV800.07.01.01.04	hydraulic brake hose	1
5	D650.07.01.01.02	hydraulic master cylinder	1
6	SV800.07.01.01.03	hydraulic brake pads	8
7	MV800.07.01.01.00	four calliper hydraulic brake assy	1
8	D650.07.01.00.04	pushing bar	2
9	6172.1-M8	M8 nut	2
10	D650.07.01.00.03	push rod holder	1
11	91-P3.2*30	cotter pin 3.2*30	3
12	95-WΦ10	Ø10 washer(Ø10.5*Ø18*Ø1.6)	3
13	SV1100.07.04.02.00	clutch pedal	1
14	D650.07.01.00.05	pedal rubber cover	3
15	MV800.07.04.01.00	clutch cable	1

## Throttle and park assy



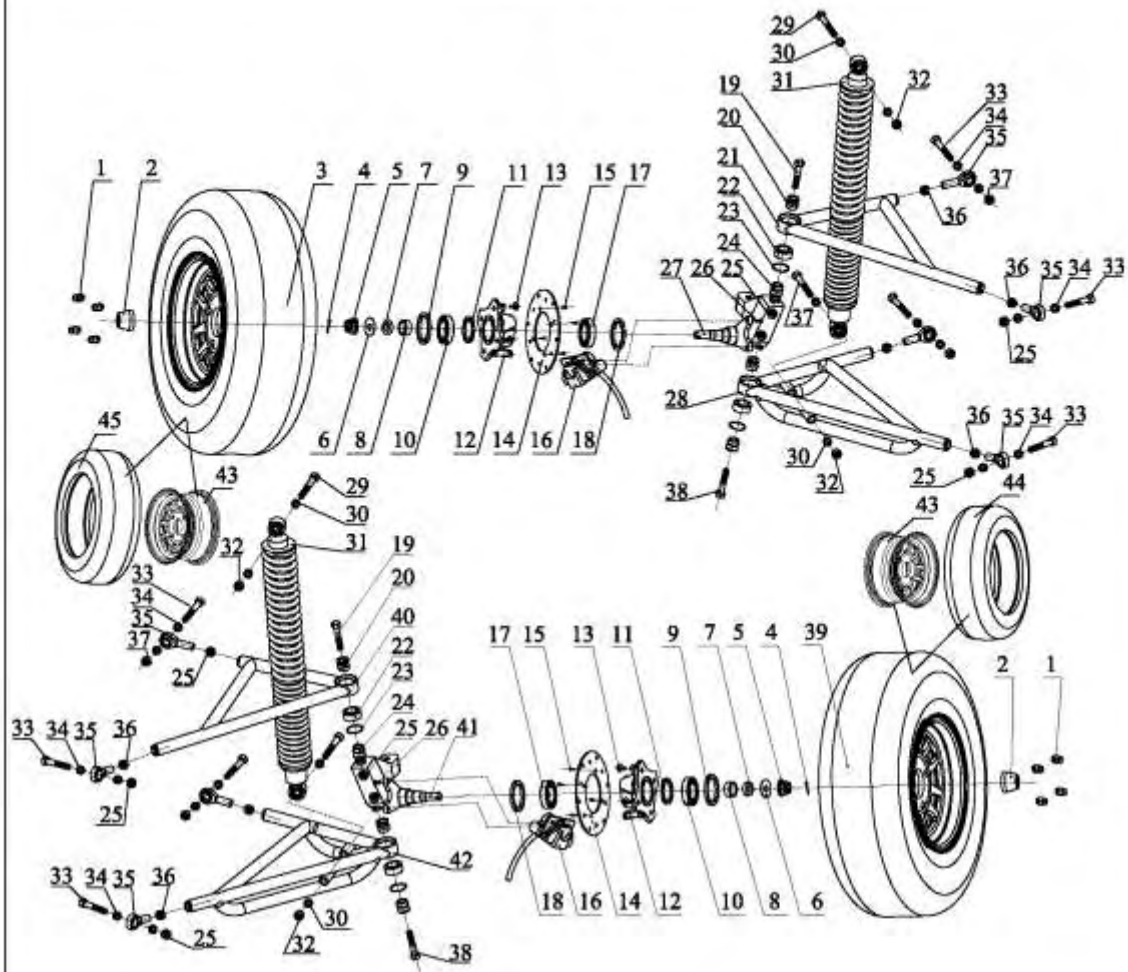
No.	Code name	Description	Q' ty
16	70.1-M6*55	M6*55 socket head bolt	4
17	6170-M6	M6 nut(m=5.2)	4
18	D250.10.003	spring	3
19	D650.07.03.00.01	Ø10*60 pin roll	2
20	91-PØ2*25	cotter pin Ø2*25	1
21	95-WØ6	Ø6 washer	1
22	D800.07.01.02.00	brake bar	1
23	D650.07.01.00.01	Ø6*40 pin roll	1
24	D650.07.01.00.02	Ø10*105 pin roll	1
25	D800.07.03.02.00	throttle pedal	1
26	MV800.07.03.01.00	throttle cable	1
27	6177.1-M8	M8 nut	3
28	5787-M8*20	M8*20 bolt	2
29	D650.07.02.01.00	park assy	1
30	848-WØ8	Ø8 washer	1

## Throttle and park assy



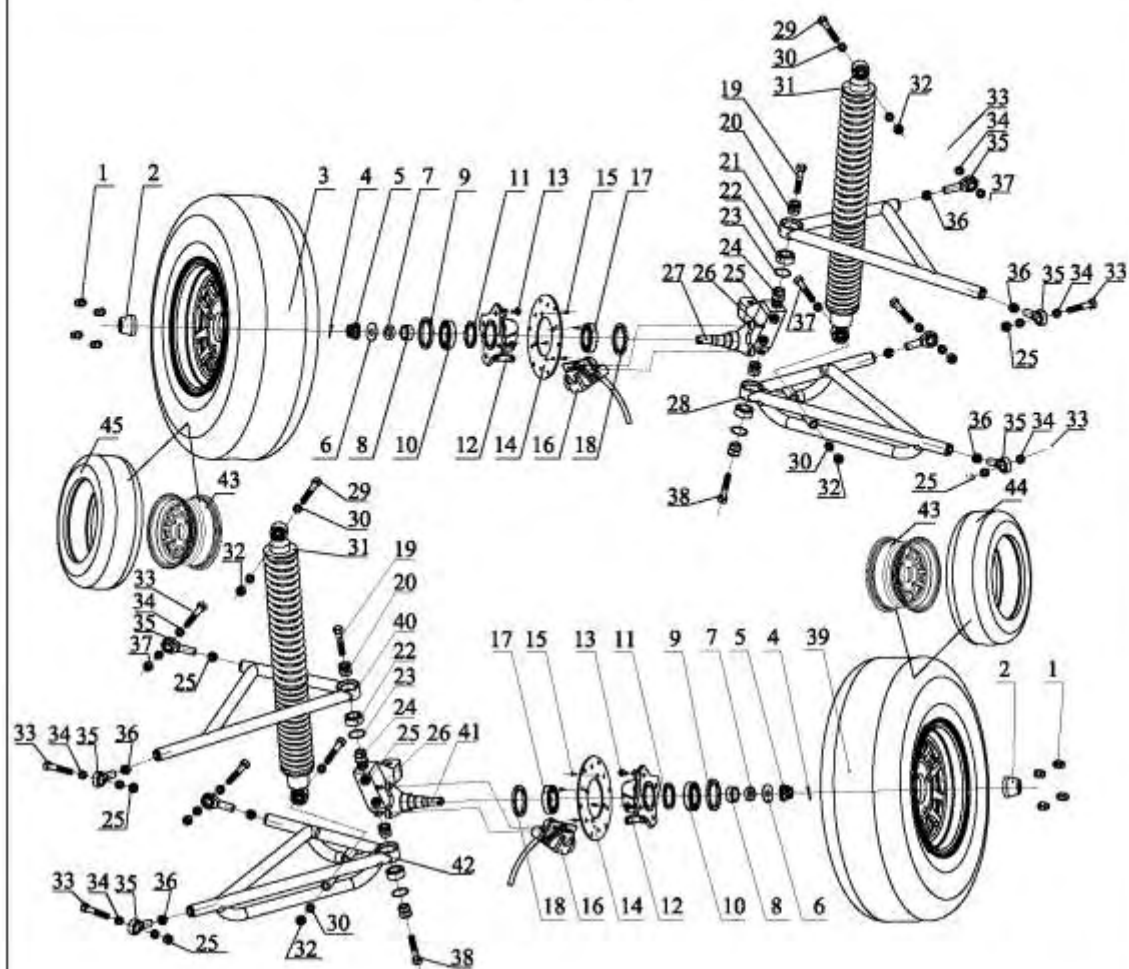
No.	Code name	Description	Q' ty
31	91-P3.2*30	cotter pin 3.2*30	1
32	D650.07.02.01.01	axle 8*24	1
33	D650.07.02.00.01	parking brake connection	1
34	91-P3.2*30	cotter pin 3.2*30	1
35	D650.07.02.02.00	M8 self-locking nut	2
36	D650.07.02.00.02	bolt-washer M8*30	2
37	D650.07.02.03.03	single hydraulic pump	1
38	D650.07.02.03.02	single hydraulic oil cup	1
39	D650.07.02.03.01	single hydraulic caliper	1
40	MV800.07.02.03.00	single hydraulic park brake assy	1
42	MV800.07.02.02.00	park brake cable	1
43	D800.07.02.00.01	steel bush	1
44	SV800.07.01.01.05	copper braking hose	1
45	5787-M8X55	flange bolt m8x55	1

# FRONT HOUSING



No.	Code name	Description	Q' ty
1	S650.03.02.00.02	M12*1.5 wheel nut	8
2	JD0360010	dustproof rubber cover	2
3	D650.03.01.01.00H	left wheel(25*8-12)(F938)	1
4	91-P4x40	cotter pin 4X40	2
5	9457-M18*1.5	front axle nut-castle M18*1.5	2
6	D800.03.01.00.10	front axle washer	2
7	D650.03.01.00.08	spacer sleeve	2
8	D800.03.01.00.07	axle bush	2
9	D800.03.01.00.08	seal(30*52*8 )	2
10	D800.03.01.00.04	ball bearing (25X52X15)	2
11	D800.03.01.00.06	spacer sleeve	2
12	D800.03.01.00.01A	front hub	2
13	D650.03.02.00.03A	knurled screw M12*1.5	8
14	D650.03.02.00.05	brake disc	2
15	D650.03.02.00.08	brake disc bolt M6	8

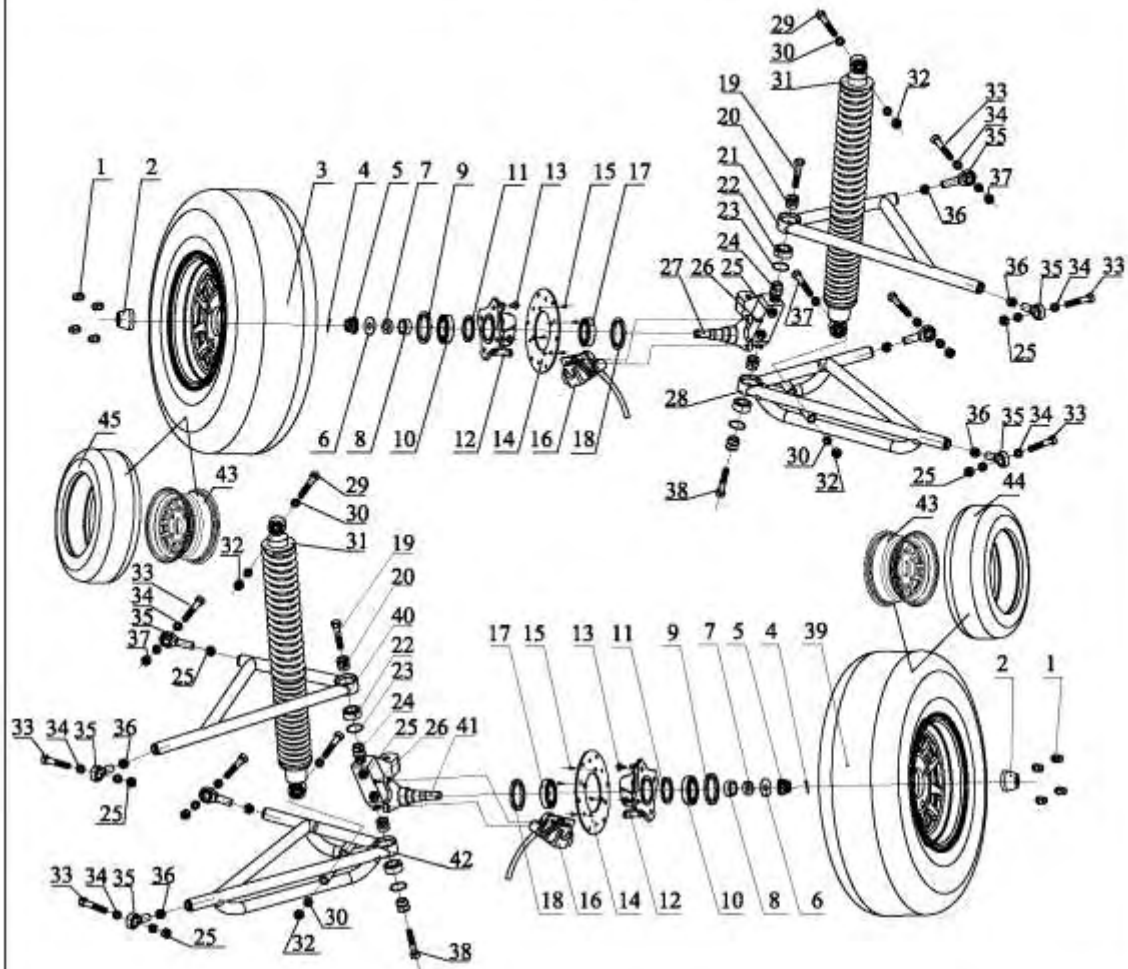
# FRONT HOUSING



No.	Code name	Description	Q' ty
16	SV800.07.01.01.01	brake calliper	1
17	D800.03.01.00.05	bearing (30*62*16 )	2
18	D800.03.01.00.09	seal (40x62x7)	2
19	5782-M16*2*85	bolt M16*2*85	2
20	D800.02.01.00.02	bushing	8
21	N650.02.01.02.00	upper suspension arm,FL	1
22	D800.02.01.00.01	radial bearing(42X20X16X25)	4
23	893.2-CΦ42	internal circlipΦ42	4
24	D800.02.01.00.02	bushing	8
25	6185.1-M16*2	nut M16*2	12
26	5787-M8*20	bolt M8*20	4
27	D800.03.01.00.02A	front left wheel axle	1
28	N650.02.01.01.00	suspension arm,lower,FL	1
29	5782-M15*1.5*190	M15*1.5*190 bolt	2
30	D800.02.03.00.03	front spacer shock sleeve	8

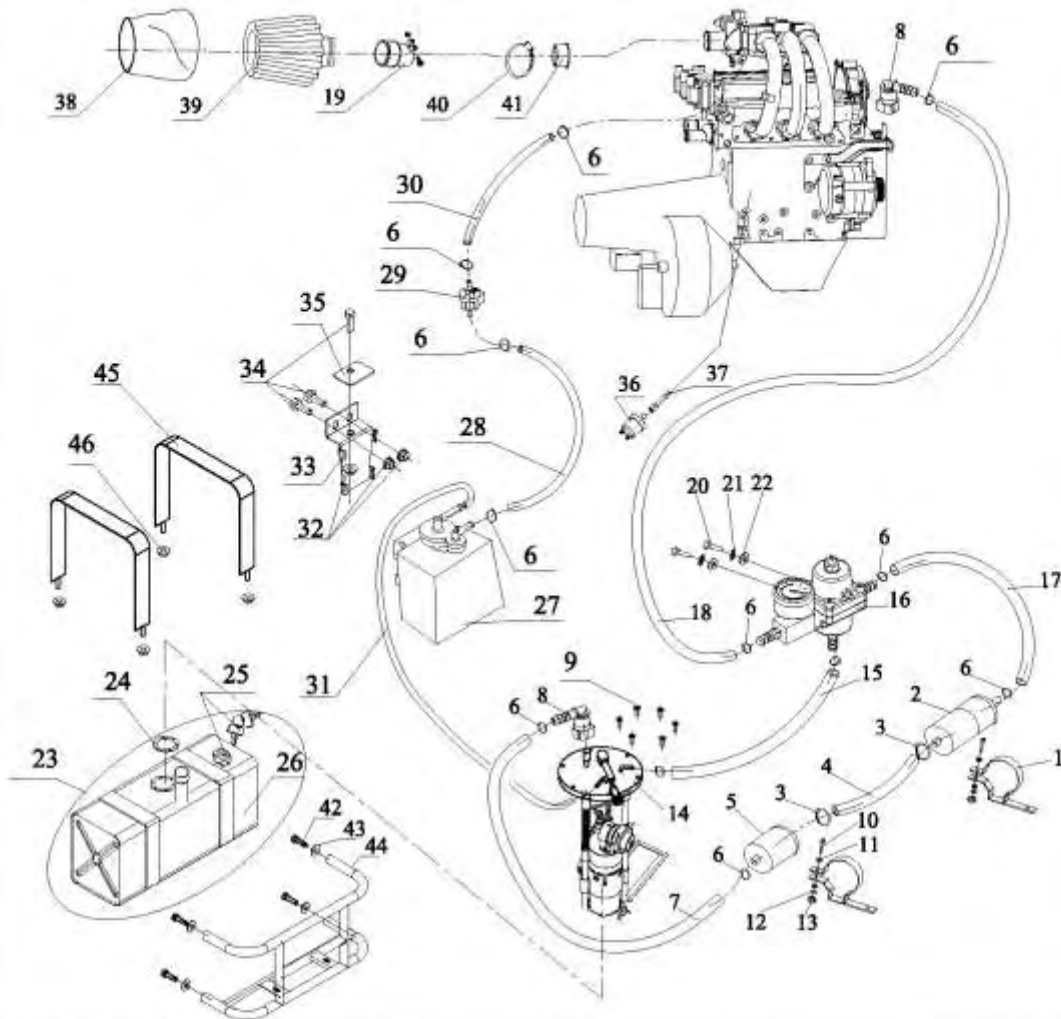


# FRONT HOUSING



No.	Code name	Description	Q' ty
31	MV800.02.03.01.00	front shock absorber	2
32	6185.1-M15*1.5	self-locking nut M15*1.5	4
33	5782-M16*2*65	bolt M16*2*65	8
34	D800.02.01.00.04	suspension arm spacer	16
35	D800.02.01.00.03	rod end bearing M16*2	4
36	6172.1-M16*2	thin nut M16*2	8
37	5782-M15*1.5*210	bolt M15*1.5*210	2
38	5782-M16*2*95	bolt M16*2*95	2
39	D650.03.01.02.00H	right wheel(25*8-12)(F938)	1
40	N650.02.01.03.00	upper suspension arm,FR	1
41	D800.03.01.00.03A	front right wheel axle	1
42	N650.02.01.04.00	lower suspension arm,FR	1
43	S650.03.01.01.01	front rim 12*6	2
44	D650.03.01.01.02H	front tire 25*8-12,R	1
45	D650.03.01.01.02H	front tire 25*8-12,L	1

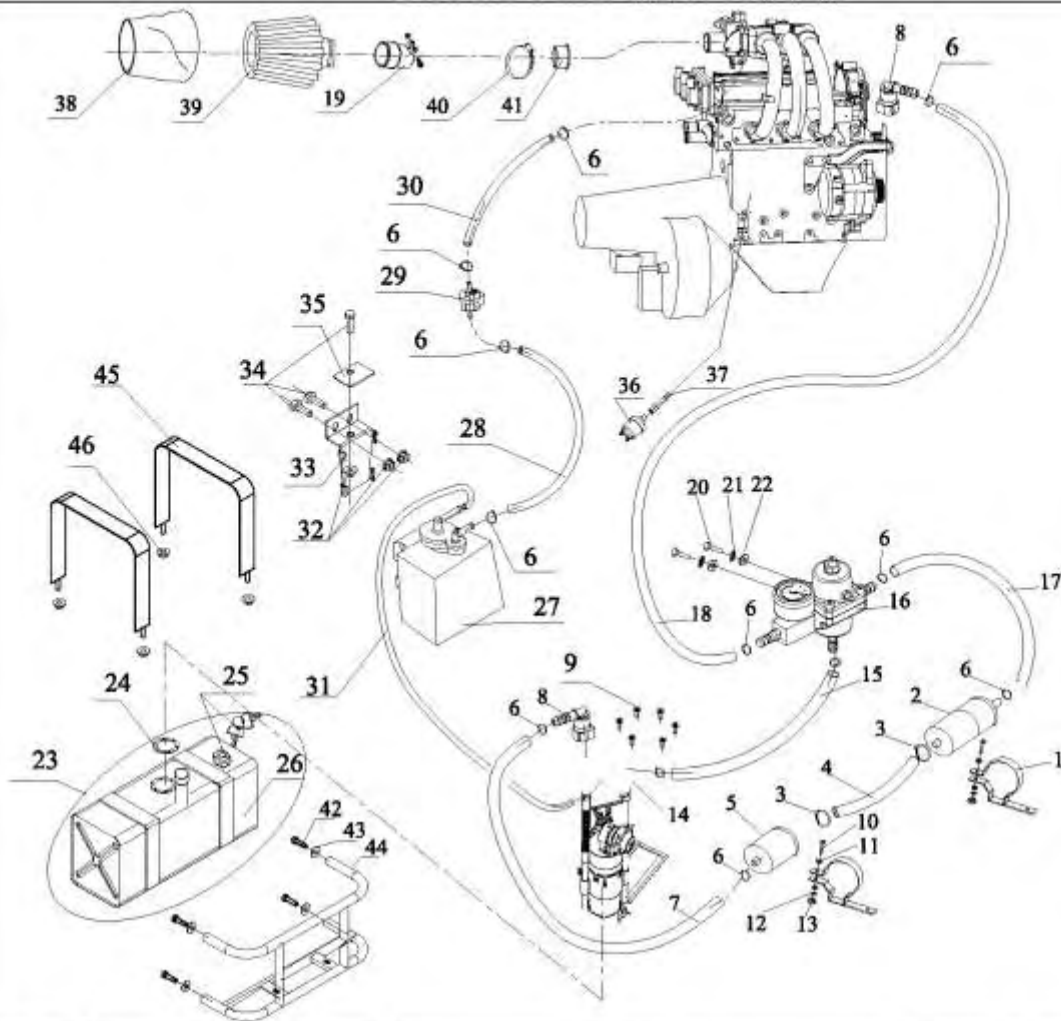
## Fuel tank and gasoline pump



No.	Code name	Description	Q' ty
1	D650.04.03.00.10	fuel filter clip	2
2	D1600.04.03.02.00	fuel pump	1
3	D1600.04.02.00.06	hoop (16-25)	2
4	SV1100.04.03.00.05	fuel pipe (φ16xφ24X75)	1
5	D650.04.03.00.05	fuel filter	1
6	D650.04.03.00.04	hoop (10-16)	10
7	SV1100.04.03.00.06	fuel pipe (φ8xφ15X580)	1
8	D1600.04.03.00.03	fuel pipe connector (7.95)	2
9	818-M5*8	M5*8 cross groove head screw	6
10	818-M6*60	M6*60 cross groove head screw	1
11	95-WΦ6	washer Φ6	4
12	93-SWΦ6	spring washer Φ6	2
13	41-M6	hex nut M6	2
14	SV1100.04.03.02.00	fuel level meter	1
15	SV1100.04.03.00.08	fuel pipe(φ8xφ15X310)	1

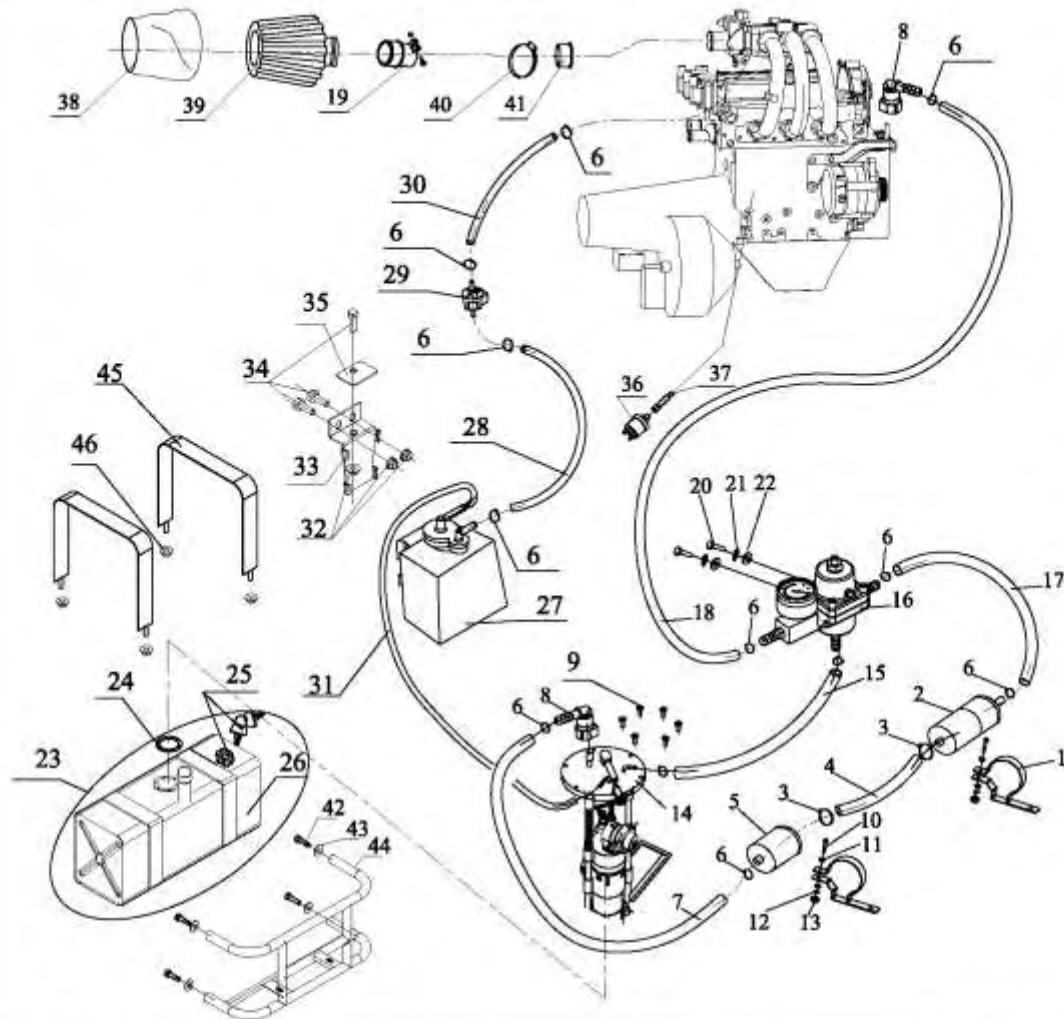


## Fuel tank and gasoline pump



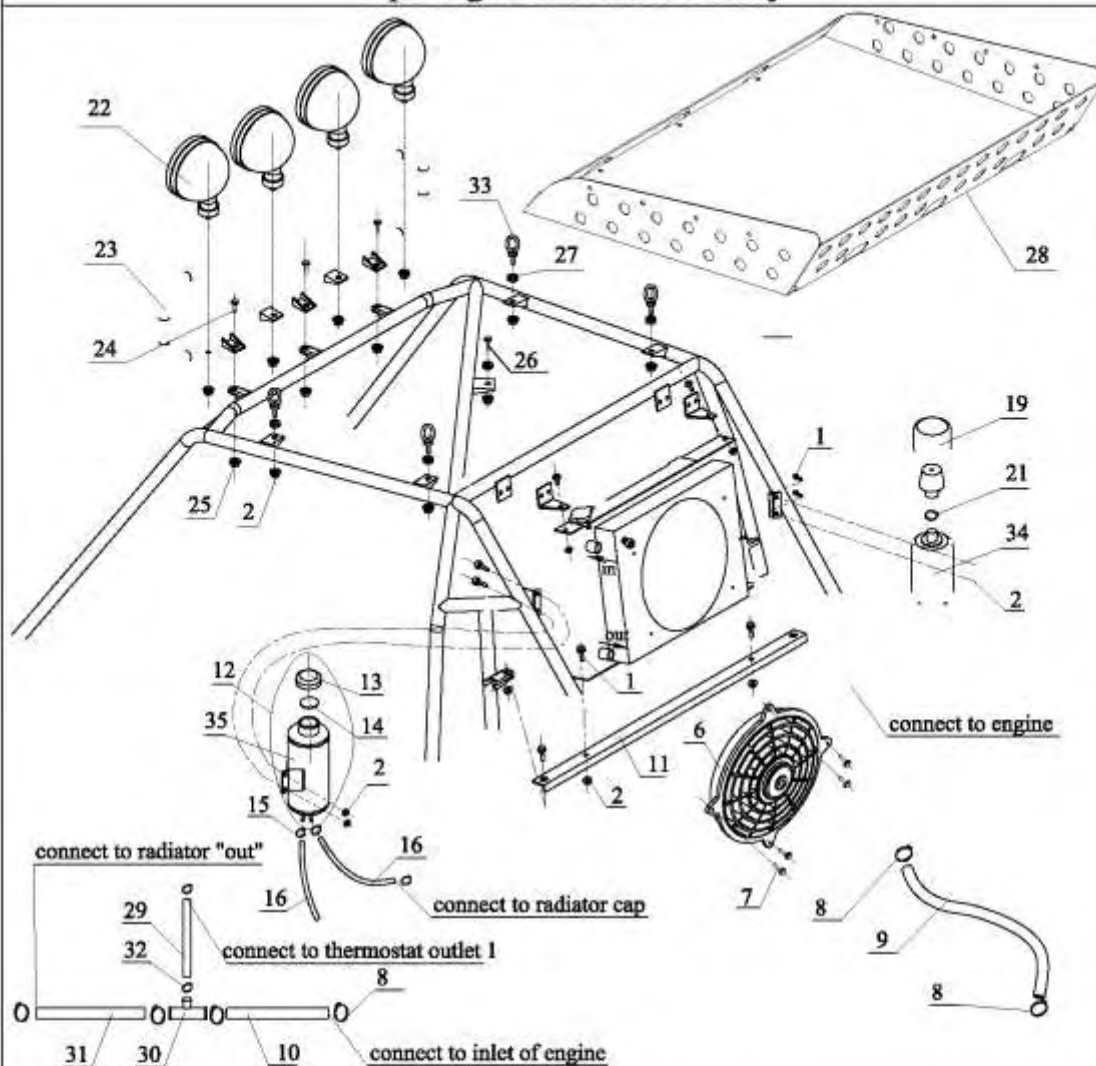
No.	Code name	Description	Q' ty
16	D1600.04.03.03.00	fuel press adjuster	1
17	SV1100.04.03.00.09	fuel hose(φ8xφ15X310)	1
18	SV1100.04.03.00.10	fuel hose (φ8xφ15X650)	1
19	SV800.04.05.02.00	air cleaner bracket	1
20	5782-M4X40	bolt M4X10	2
21	93-SWΦ4	spring washer Φ4	2
22	95-WΦ4	washer Φ4	2
23	MV800.04.03.01.00	fuel tank assy	1
24	D1600.04.03.01.05	rubber washer	1
25	D1600.04.03.01.04	fuel tank cap with key	1
26	MV800.04.03.01.01	fuel tank	1
27	D650.04.06.01.00A	carbon can	1
28	SV1100.04.03.00.11	fuel pipe (φ8xφ15X310)	1
29	S11-1206211	Pressure Control Valve (PCV)	1
30	SV1100.04.03.00.12	fuel hose(φ8xφ15X650)	1
31	SV1100.04.03.00.07	fuel hose (Ø4XØ8)	1

## Fuel tank and gasoline pump



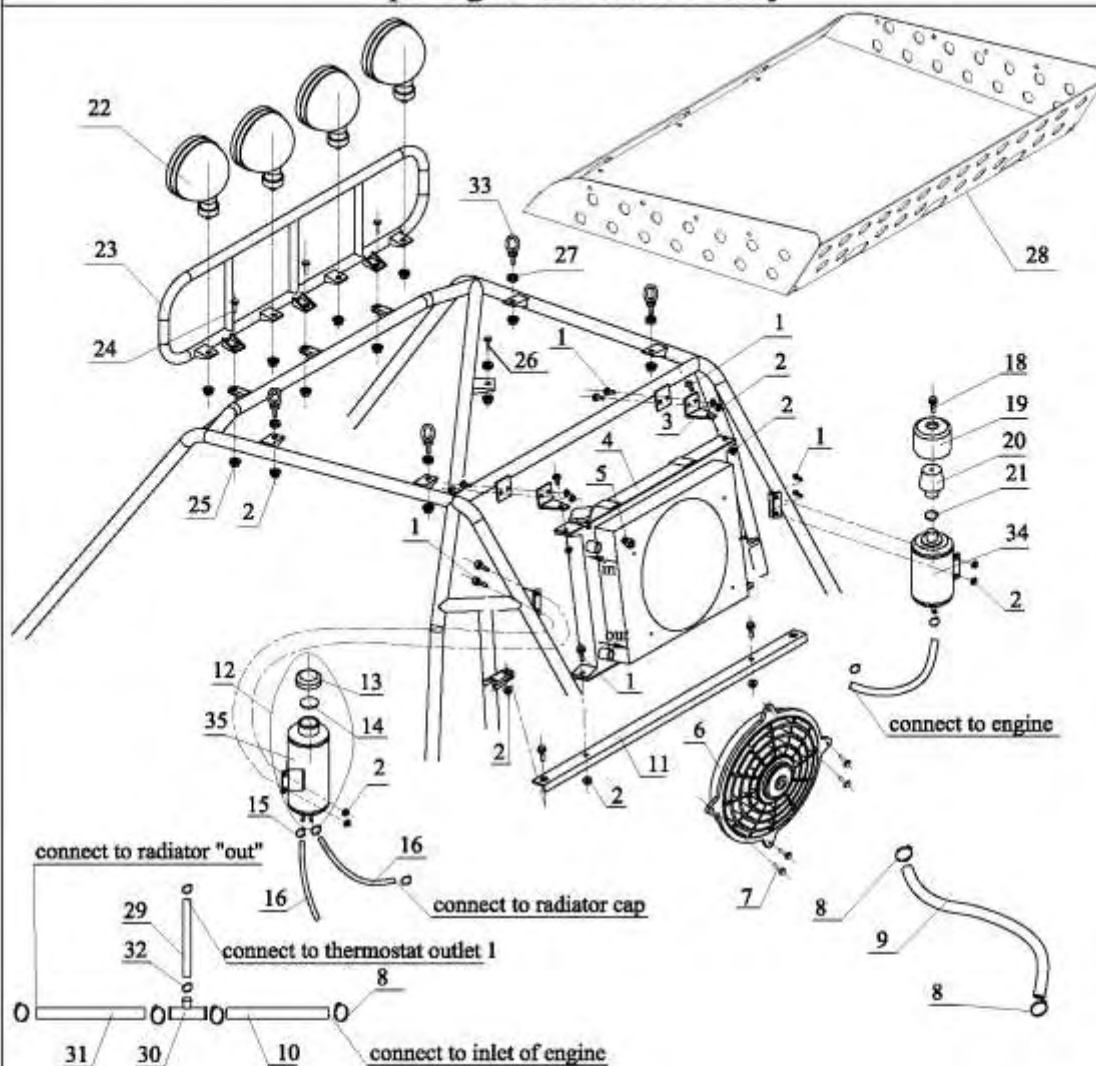
No.	Code name	Description	Q' ty
32	6177.1-M6	washer nut M6	3
33	D650.04.06.00.01	carbon can bracket	1
34	5787-M6*16	bolt-washer M6*16	2
35	D650.04.06.00.02	carbon can plate	1
36	MV800.06.04.00.01	oil pressure sensor	1
37	SV800.04.07.00.02	connecting pipe	1
38	N650.04.05.03.00	air cleaner jacket	1
39	N650.04.05.01.00	air cleaner	1
40	N650.04.05.00.01	hoop (65-82)	1
41	SV800.04.05.00.02	air cleaner rubber sleeve	1
42	70.1-M12*30	M12*30 socket head screw	4
43	97.1-WΦ12	washer φ12 (φ13*φ24*2.5)	4
44	MV800.01.02.01.00	rear bumper bar	1
45	D800.04.03.02.00	fuel tank strap	2
46	6177.1-M10*1.5	nut-washer M10*1.5	4

## Spot lights and radiator assy



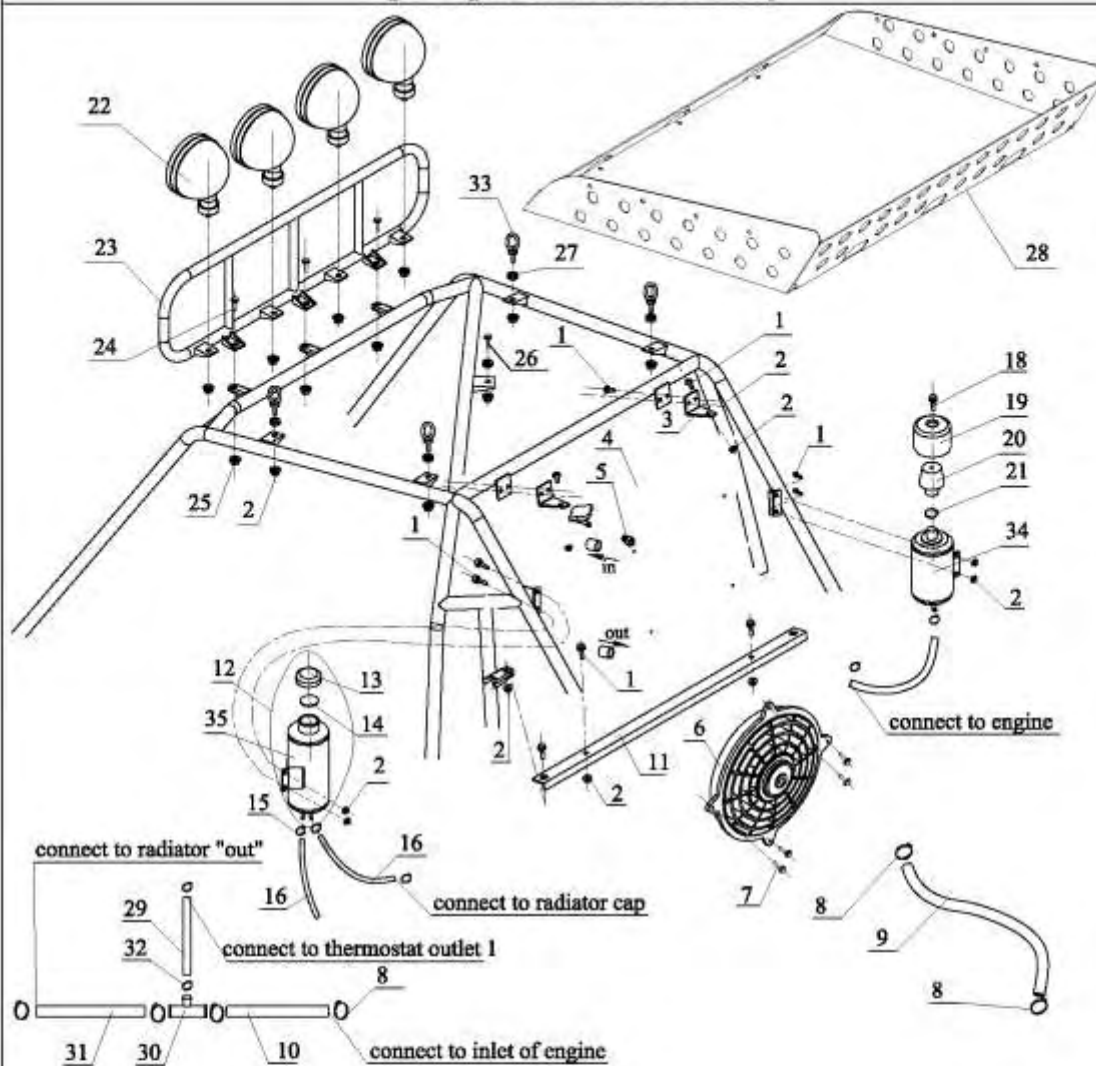
No.	Code name	Description	Q' ty
1	5787-M8*20	bolt-washer M8*20	14
2	6177.1-M8	self-locking nut M8	18
3	D800.01.02.00.05	aluminium radiator bracket	2
4	D800.04.02.03.00	aluminium radiator	1
5	D800.04.02.04.00	temperature detect switch(TDS)	1
6	D1600.04.02.02.00	radiator fan	1
7	5787-M6*20	bolt-washer M6*20	4
8	D650.04.02.00.03	water tube hoop(25-38)	6
9	D650.04.02.00.02	engine water outlet hose	1
10	D650.04.02.00.01	engine water inlet hose 1	1
11	D800.01.02.00.06	underlying board	1
12	D800.04.02.02.00	reserve tank	1
13	D800.04.02.00.01	cap of reserve tank	1
14	D800.04.02.00.02	reserve tank airproof washer	1

## Spot lights and radiator assy



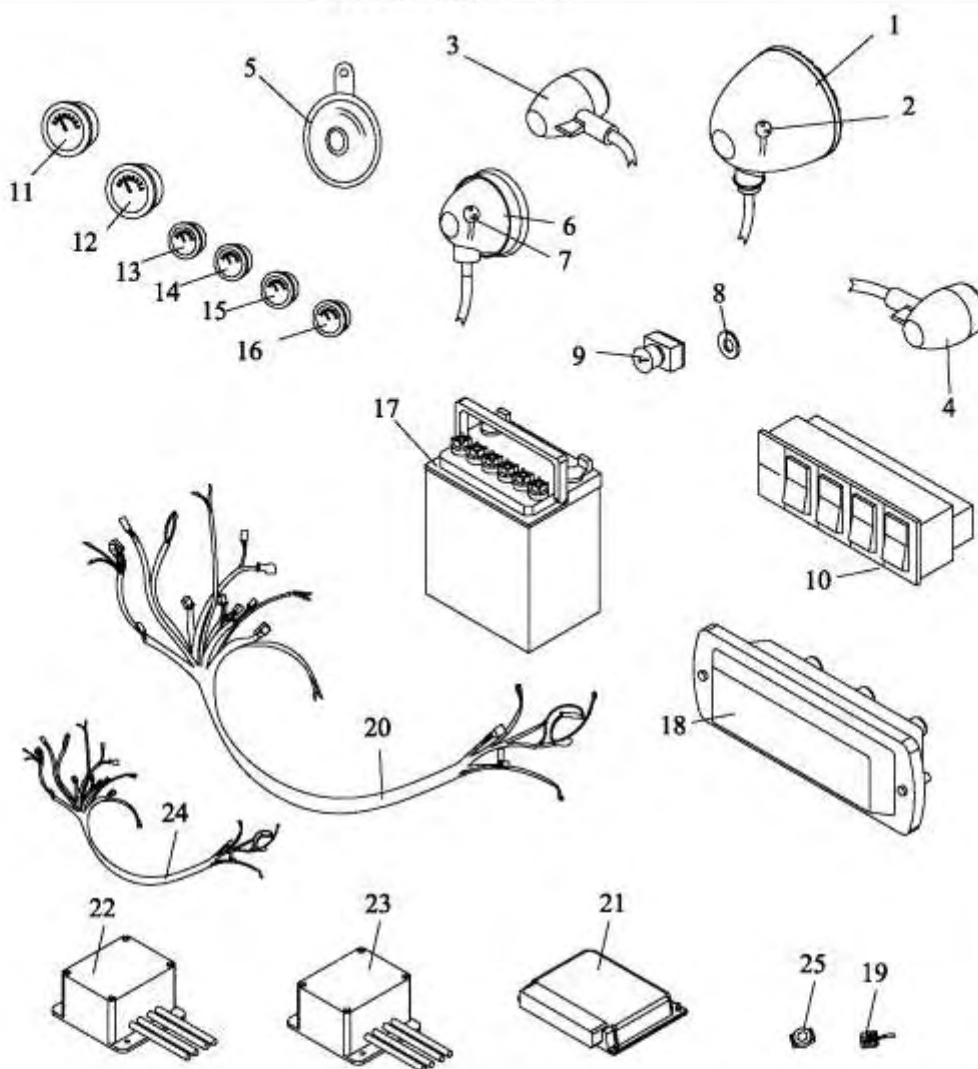
No.	Code name	Description	Q' ty
15	D650.04.03.00.04	hoop(10-16)	7
16	D25009004	radiator connecting tube	2
18	5787-M6*16	bolt-washer M6*16	1
19	D650.04.07.00.03	oil separator cover	1
20	D650.04.07.00.02	oil separator air filter	1
21	SV800.04.07.00.01	hoop(21-38)	1
22	D1600.06.10.00.00	spotlight	4
23	MV800.99.99.04.00	spotlight mount	1
24	5787-M10*20	bolt-washer M10*20	3
25	6177.1-M10	self-locking nut M10	3
26	5787-M8*45	bolt-washer M8*45	1
27	D1600.01.02.00.07	spacer	4
28	MV800.99.99.01.00	aluminium roof rack	1

## Spot lights and radiator assy



No.	Code name	Description	Q' ty
29	SV1100.04.02.00.04	hose.small cycle	1
30	SV1100.04.02.00.01	steel 3-way.small cycle	1
31	SV1100.04.02.00.01-2	engine water inlet hose 2	1
32	SV800.04.07.00.01	hoop(16-25)	2
33	D1600.08.01.00.06	loop M10	4
34	D650.04.07.00.01	oil separator tank	1
35	D800.04.02.00.03	reserve tank	1

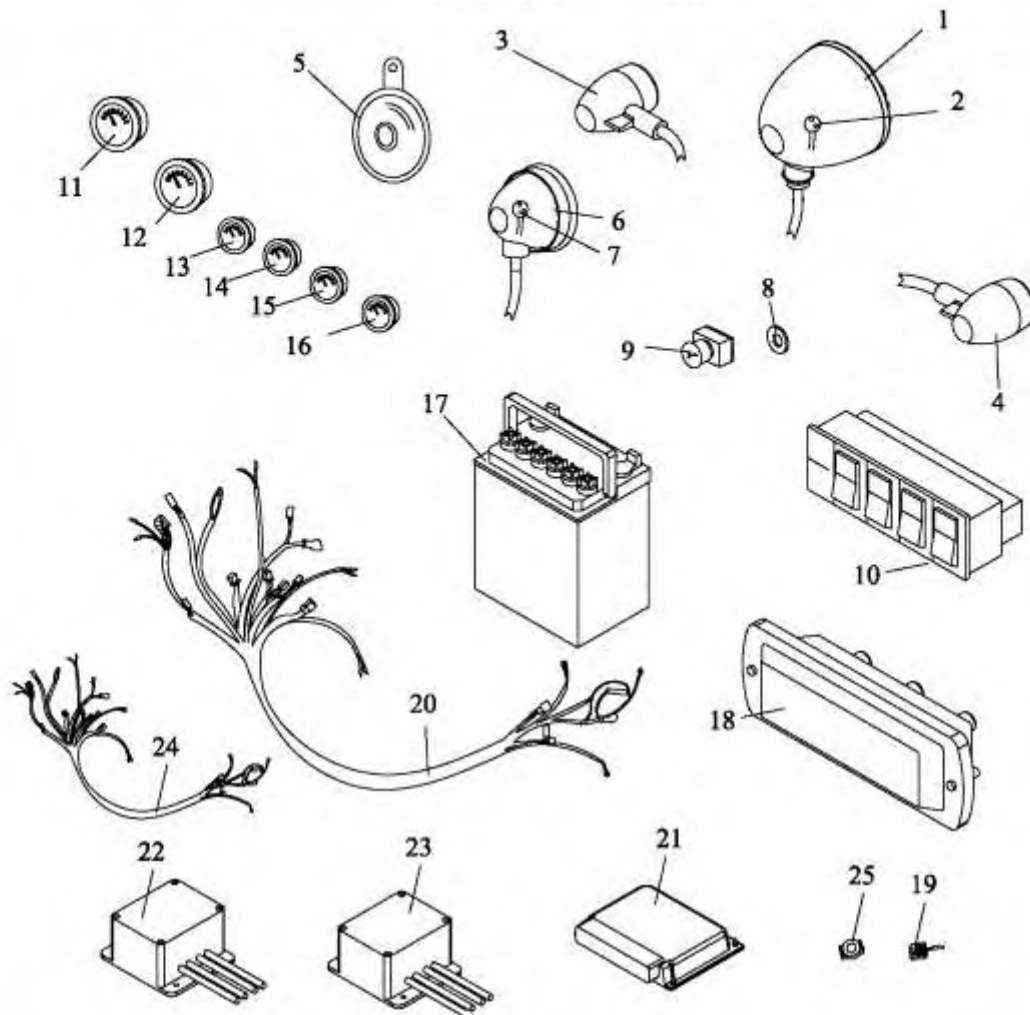
## Electric appliance



No.	Code name	Description	Q' ty
1	D1600.06.11.00.00	headlight	2
2	D1600.06.11.00.01	bulb of headlight	2
3	D650.06.00.05.00	left turn light,front	1
4	D650.06.00.15.00	right turn light,front	1
5	D650.06.00.09.00	horn	1
6	D1600.06.10.00.00	spot light	4
7	D1600.06.10.00.01	bulb of spot light(35w)	4
8	JD0460003	washer	1
9	DS250.10.00.00.05	horn button	1
10	D1600.06.03.00.00	combination switch	1
11	MV800.06.02.00.00	speedometer	1
12	D1600.06.05.00.00	tachometer	1



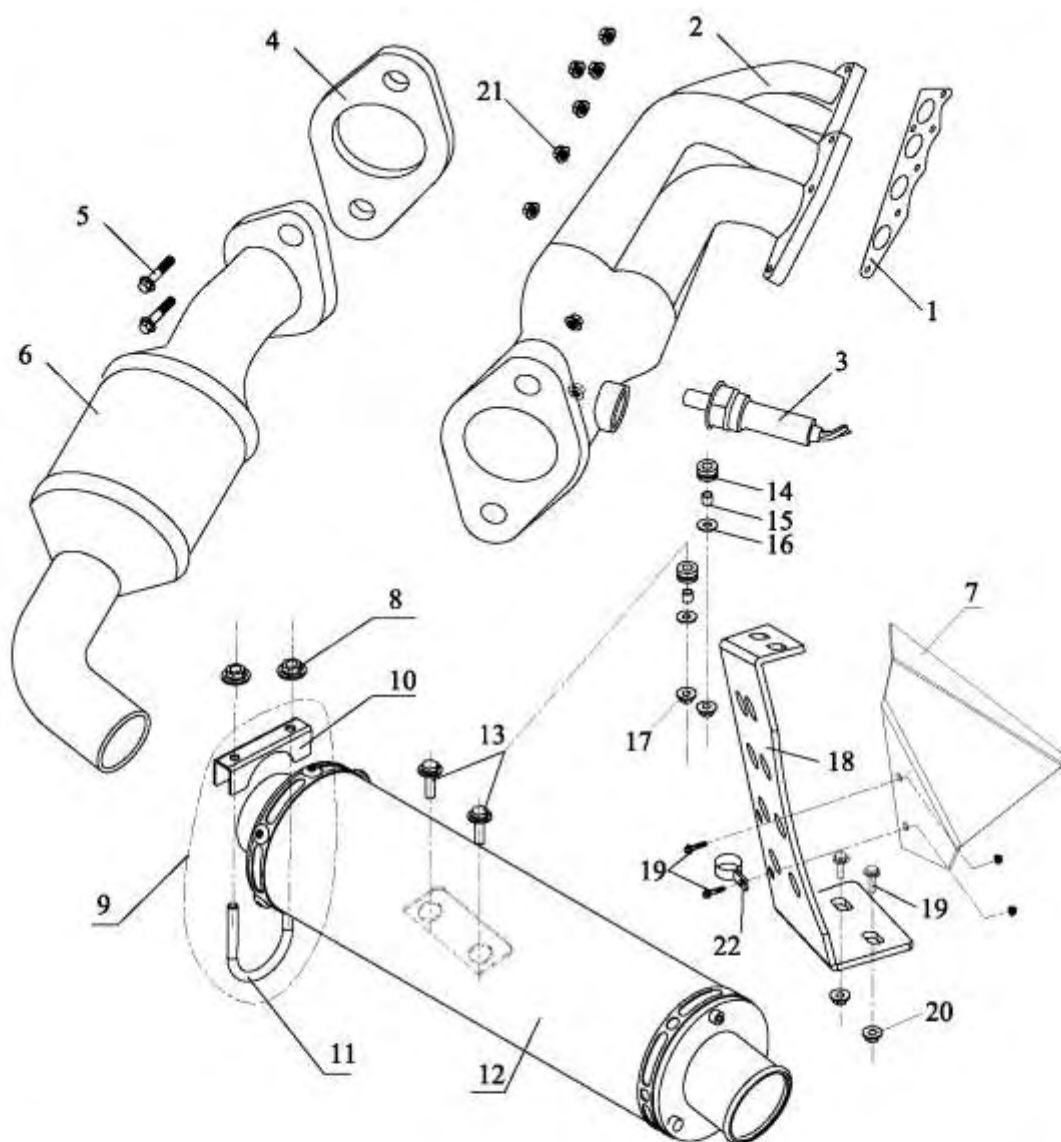
## Electric appliance



No.	Code name	Description	Q' ty
13	MV800.06.03.00.00	coolant temperature indicator	1
14	D1600.06.09.00.00	voltmeter	1
15	D1600.06.06.00.00	fuel level gauge	1
16	D1600.06.07.00.00	oil pressure gauge	1
17	D1600.06.02.00.00	battery (45AH)	1
18	D800.06.00.00.12	compound tail light	2
19	D25007914A	flash apparatus	1
20	MV800.06.01.00.00	electric cable	1
21	S11-3605010BA	ECU	1
22	MV800.06.01.00.01	fuse box	1
23	MV800.06.01.00.02	relay box	1
24	S11-3724180CA	engine cable	1
25	D25007924	flasher coat	1

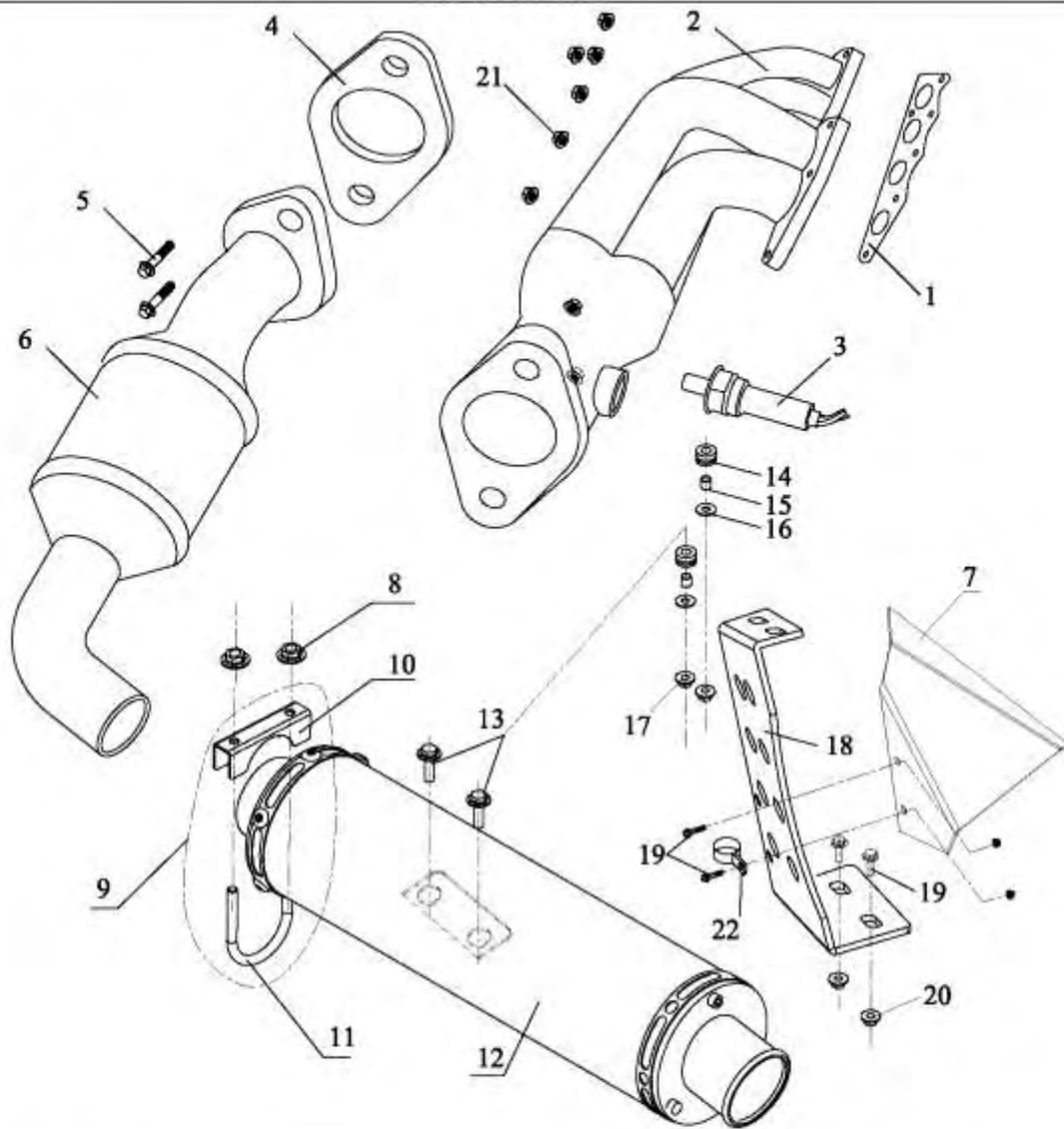


# MUFFLER



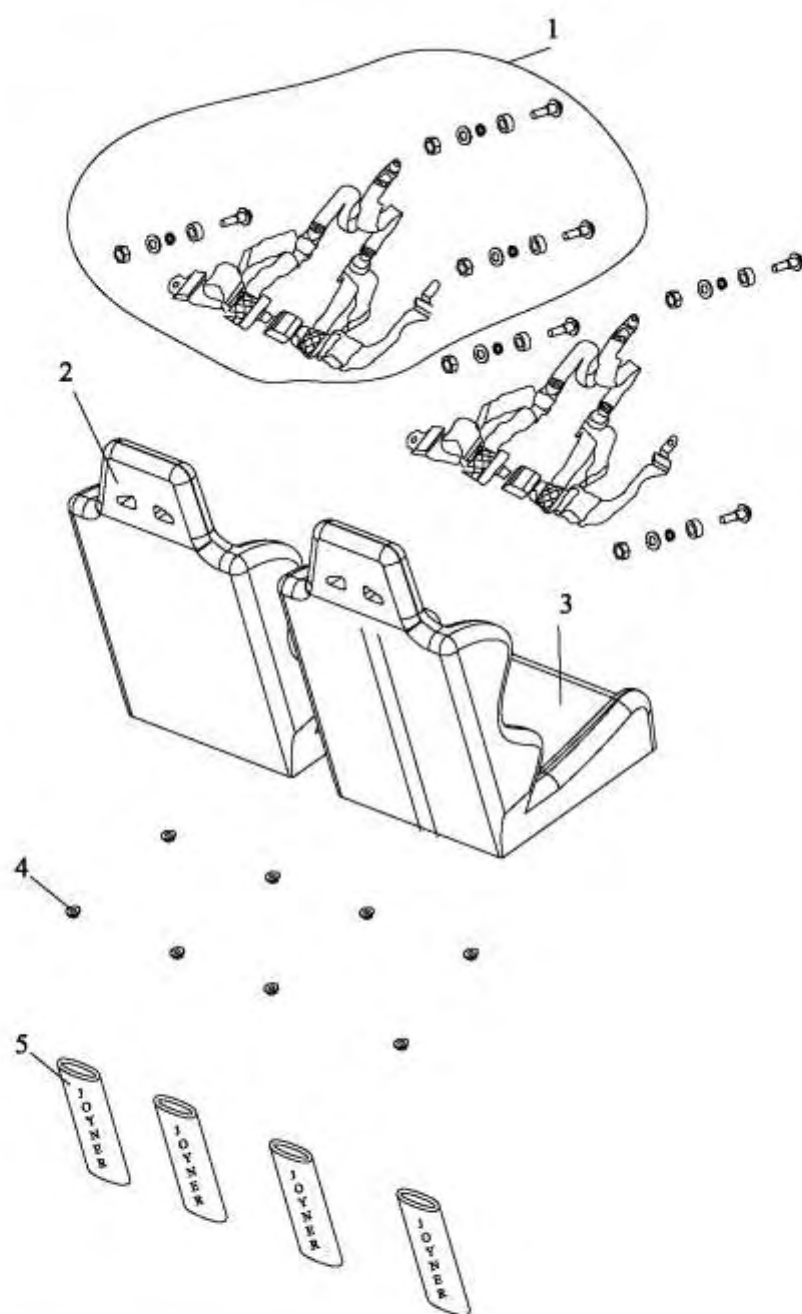
No.	Code name	Description	Q' ty
1	372-1008033	exhaust manifold gasket	1
2	MV800.04.04.03.00	exhaust manifold	1
3	S11-1205110	oxygen sensor	1
4	SV1100.04.04.04.00	seal washer	1
5	5787-M8x35	nut-washer	6
6	MV800.04.04.02.00A	catalac convertor	1
7	MV800.01.02.00.05	guide board 1 for cooling	1
8	6177.1-M8	self-locking nut M8	2
9	D650.04.04.00.08	U clamp	1
10	D650.04.04.00.08-1	U clamp mount	1

# MUFFLER



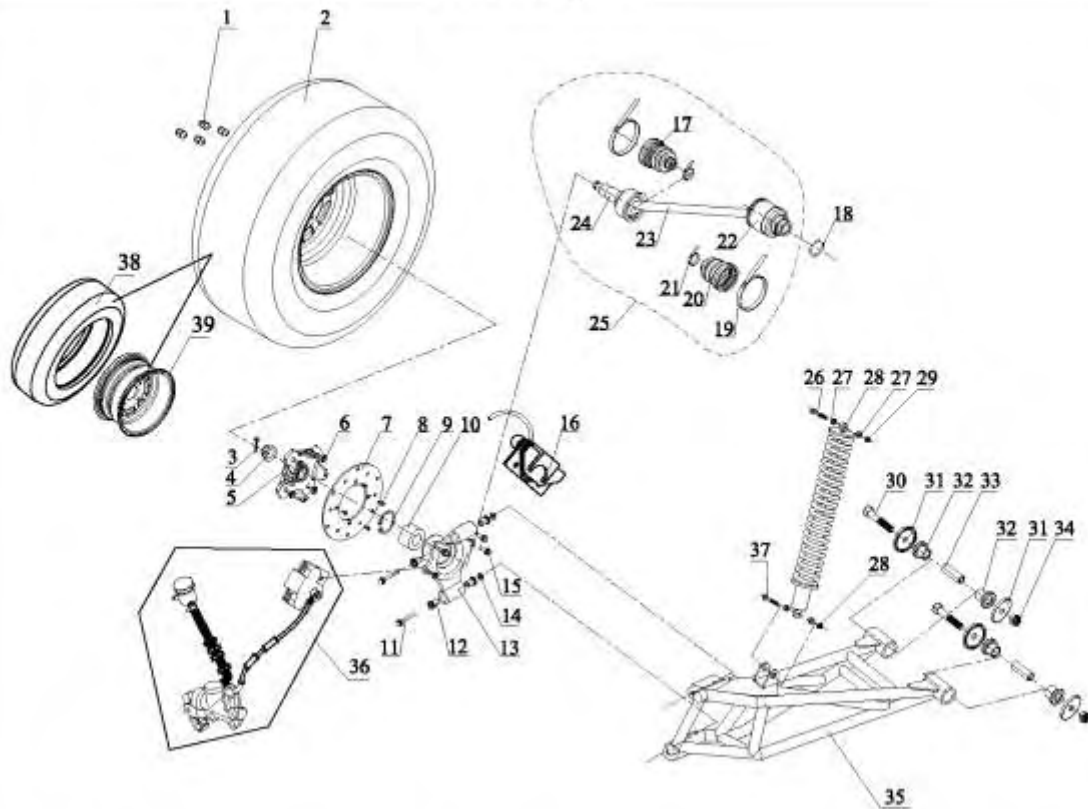
No.	Code name	Description	Q' ty
11	D650.04.04.00.08-2	U clamp screw rod	1
12	D650.04.04.01.00B	long muffler	1
13	5787-M8*30	bolt-washer M8*30	2
14	JD1910002A	rubber cover,muffler	2
15	JD1910002	spacer	2
16	96-WØ8*24*2	washer Ø8*24*2	2
17	6177.1-M8	M8 self-locking nut	2
18	MV800.04.04.00.10	muffler bracket	1
19	5787-M8*25	bolt-washer M8*25	4
20	6177.1-M8	M8 self-locking nut	2
21	6177.1-M8	nut-washer M8	6
22	SV800.01.02.00.06	wire clamp	1

# seat and safety belt



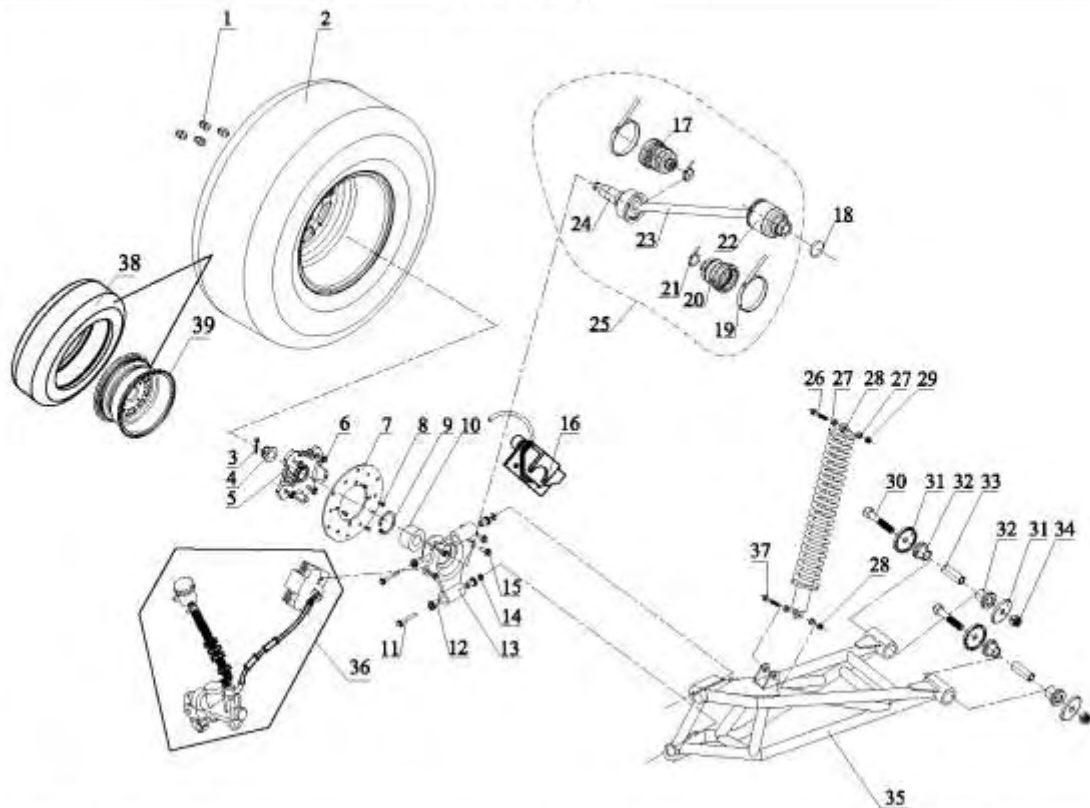
No.	Code name	Description	Q' ty
1	D650.08.01.00.01	safty belt	2
2	D650.08.01.03.00	seat , left	1
3	D650.08.01.04.00	seat , right	1
4	6177.1-M10*1.25	nut M10*1.25	8
5	D650.08.01.00.13	safty belt tube	4

# Rear susp,left



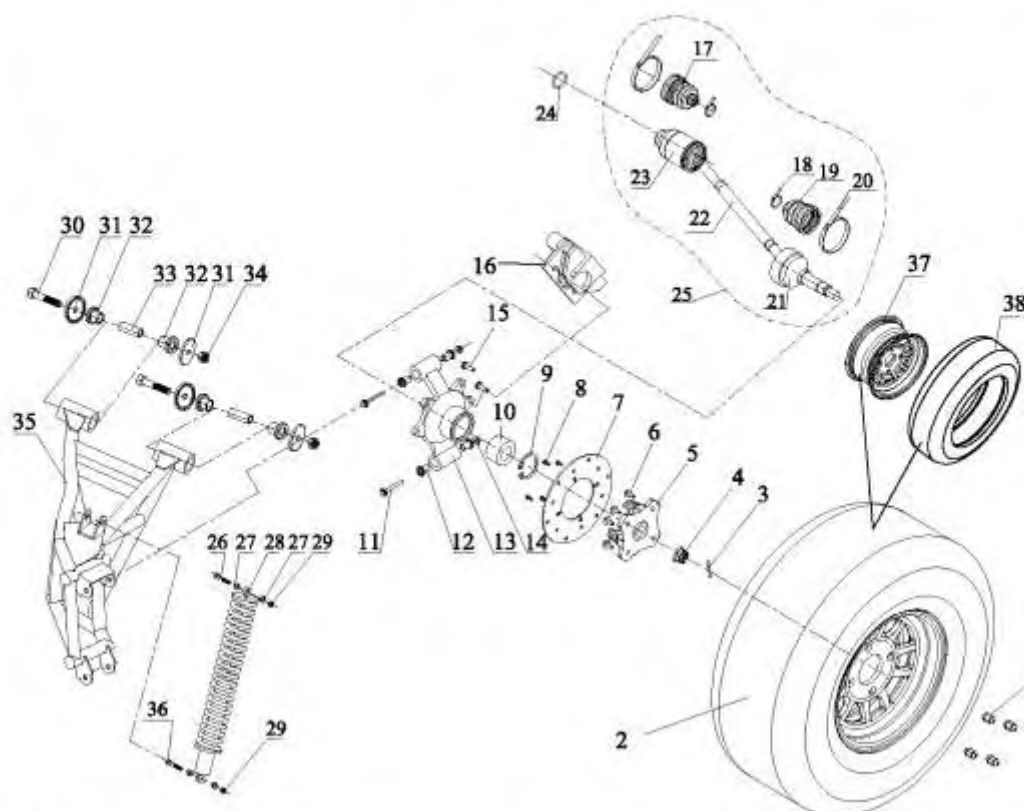
No.	Code name	Description	Q' ty
1	S650.03.02.00.02	wheel nut M12*1.5	4
2	D650.03.02.01.00H	BL(F938) wheel(25*11-12)	1
3	91-P4*40	cotter pin 4*40	1
4	D650.03.02.00.06	rear shaft slotted nut M22*1.5	1
5	D650.03.02.00.04A	disk base	1
6	D650.03.02.00.03A	M12*1.5 bolt	4
7	D650.03.02.00.05	brake disk	1
8	D650.03.02.00.08	brake disk M6 bolt	4
9	893.2-C55	internal circlip55	1
10	D650.03.02.00.07	bearing(Ø30*Ø50*32)	1
11	5787-M12*1.5*100*25	M12*1.5*100*25 bolt	2
12	D800.02.02.00.01	bush ring	4
13	D650.03.02.00.01	bearing block	1
14	6177.1-M12*1.5	M12*1.5 nut	2
15	5787-M8*20	M8*20 bolt	4
16	SV800.07.01.01.02	brake calliper	1
17	N650.03.02.01.03	outer boot seal	1
18	2303016	steel cable baffle ring	1
19	N650.03.02.01.02	BIG band	2

# Rear susp,left



No.	Code name	Description	Q' ty
20	N650.03.02.01.04	inner boot seal	1
21	N650.03.02.01.01	SMALL band	2
22	N650.03.02.01.06	end motion type inboard joint	1
23	MV800.03.02.01.05	solid bar,left	1
24	N650.03.02.01.07	fixed enter type outboard joint	1
25	MV800.03.02.01.00	left drive shaft	1
26	5782-M15*1.5*80*30	M15*1.5*80*30bolt	1
27	D800.02.03.00.03	spacer sleeve	4
28	N650.02.03.02.00	rear shock absorber	1
29	6185.1-M15*1.5	M15*1.5 nut	2
30	5787-M16*2*125	M16*2*125 bolt	2
31	D800.02.02.00.03	grease seal Ø46	4
32	D800.02.02.00.02	powdered spacer sleeve	4
33	D800.02.02.00.04	spacer sleeve	2
34	6177.1-M16*2	M16*2 nut	2
35	N650.02.02.02.00A	rear suspension arm,left	1
36	MV800.07.02.03.00	single hydraulic park brake assy	1
37	5782-M15*1.5*65*25	M15*1.5*65*25bolt	1
38	S650.03.02.01.01	rear rim 12*8	1
39	D650.03.02.01.02H	rear tire 25X11-12,L	1

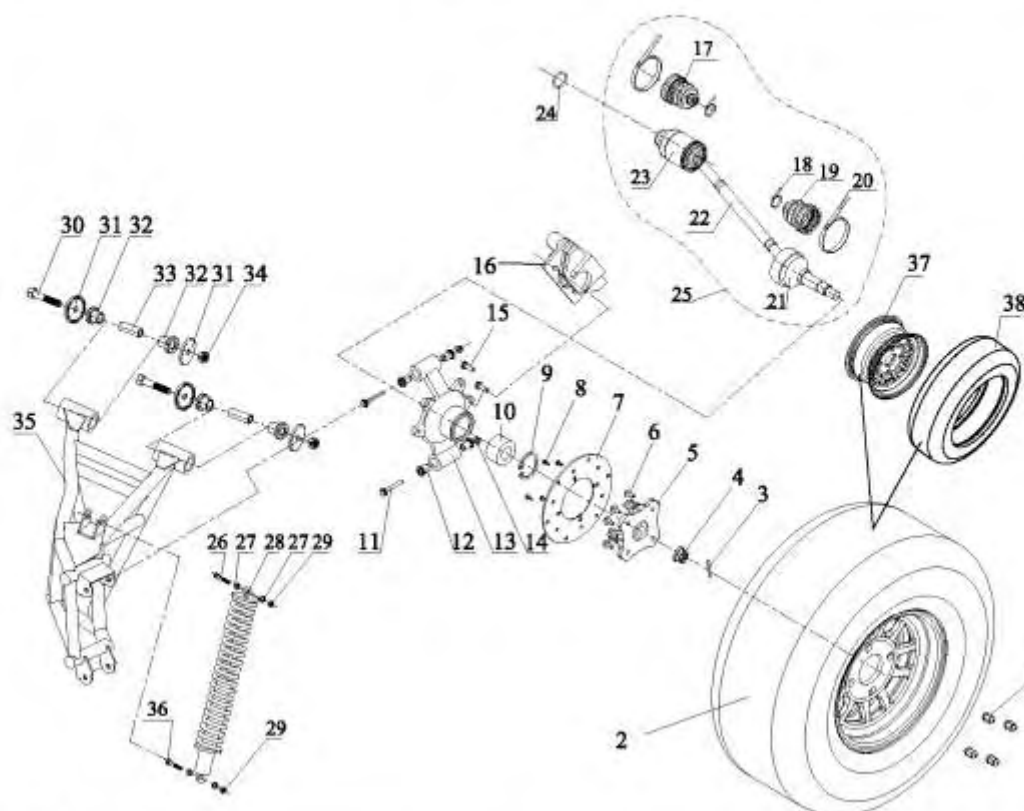
## Rear susp,right



No.	Code name	Description	Q' ty
1	S650.03.02.00.02	wheel nut M12*1.5	4
2	D650.03.02.04.00H	wheel(25*11-12),BR(F938)	1
3	91-P4*40	cotter pin 4*40	1
4	D650.03.02.00.06	rear shaft slotted nut M22*1.5	1
5	D650.03.02.00.04A	disk base	1
6	D650.03.02.00.03A	M12*1.5 bolt	4
7	D650.03.02.00.05	brake disk	1
8	D650.03.02.00.08	brake disk M6 bolt	4
9	893.2-C55	internal circlip55	1
10	D650.03.02.00.07	bearing(Ø30*Ø50*32)	1
11	5787-M12*1.5*100*25	M12*1.5*100*25 bolt	2
12	D800.02.02.00.01	bush ring	4
13	D650.03.02.00.01	bearing block	1
14	6177.1-M12-1.5	M12-1.5 nut	2
15	5787-M8*20	M8*20 bolt	2
16	SV800.07.01.01.01	brake calliper	1
17	N650.03.02.01.04	inner boot seal	1
18	N650.03.02.01.01	SMALL band	2
19	N650.03.02.01.03	outer boot seal	1



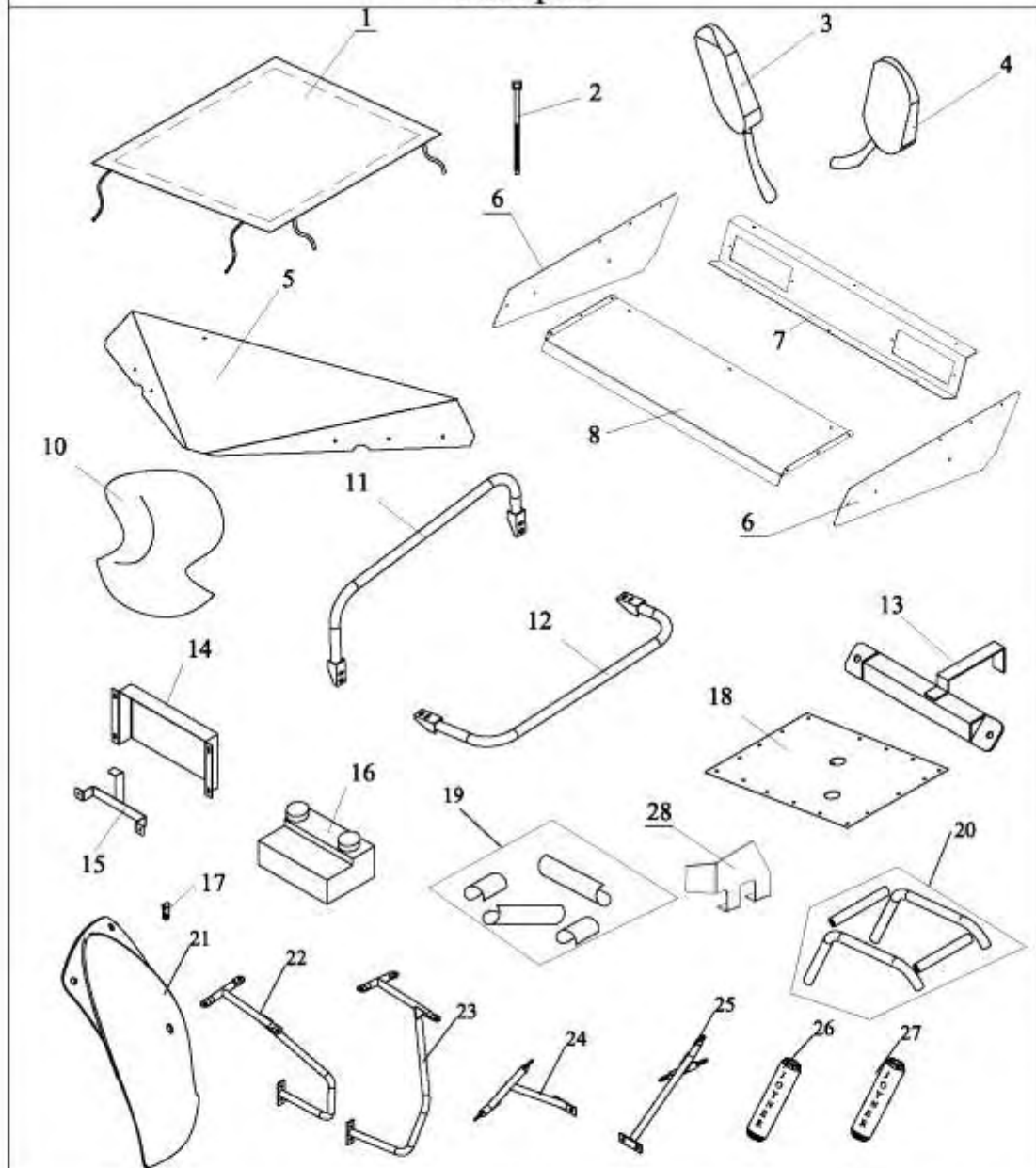
## Rear susp,right



No.	Code name	Description	Q' ty
20	N650.03.02.01.02	big band	2
21	N650.03.02.01.07	fixed enter type outboard joint	1
22	N650.03.02.02.05	solid bar,right	1
23	N650.03.02.01.06	end motion type inboard joint	1
24	2303016	steel cable baffle ring	1
25	N650.03.02.02.00	right drive shaft	1
26	5782-M15*1.5*80	M15*1.5*80 bolt	1
27	D800.02.03.00.03	spacer sleeve	4
28	N650.02.03.02.00	rear shock absorber	1
29	6185.1-M15*1.5	M15*1.5 nut	2
30	5787-M16*2*125	M16*2*125 bolt	2
31	D800.02.02.00.03	grease seal Ø46	4
32	D800.02.02.00.02	powdered spacer sleeve	4
33	D800.02.02.00.04	spacer sleeve	2
34	6177.1-M16*2	M16*2 nut	2
35	N650.02.02.01.00A	rear suspension arm,right	1
36	5782-M15*1.5*65*25	M15*1.5*65*25bolt	1
37	S650.03.02.01.01	rear rim 12*8	1
38	D650.03.02.01.02H	rear tire 25X11-12,R	1

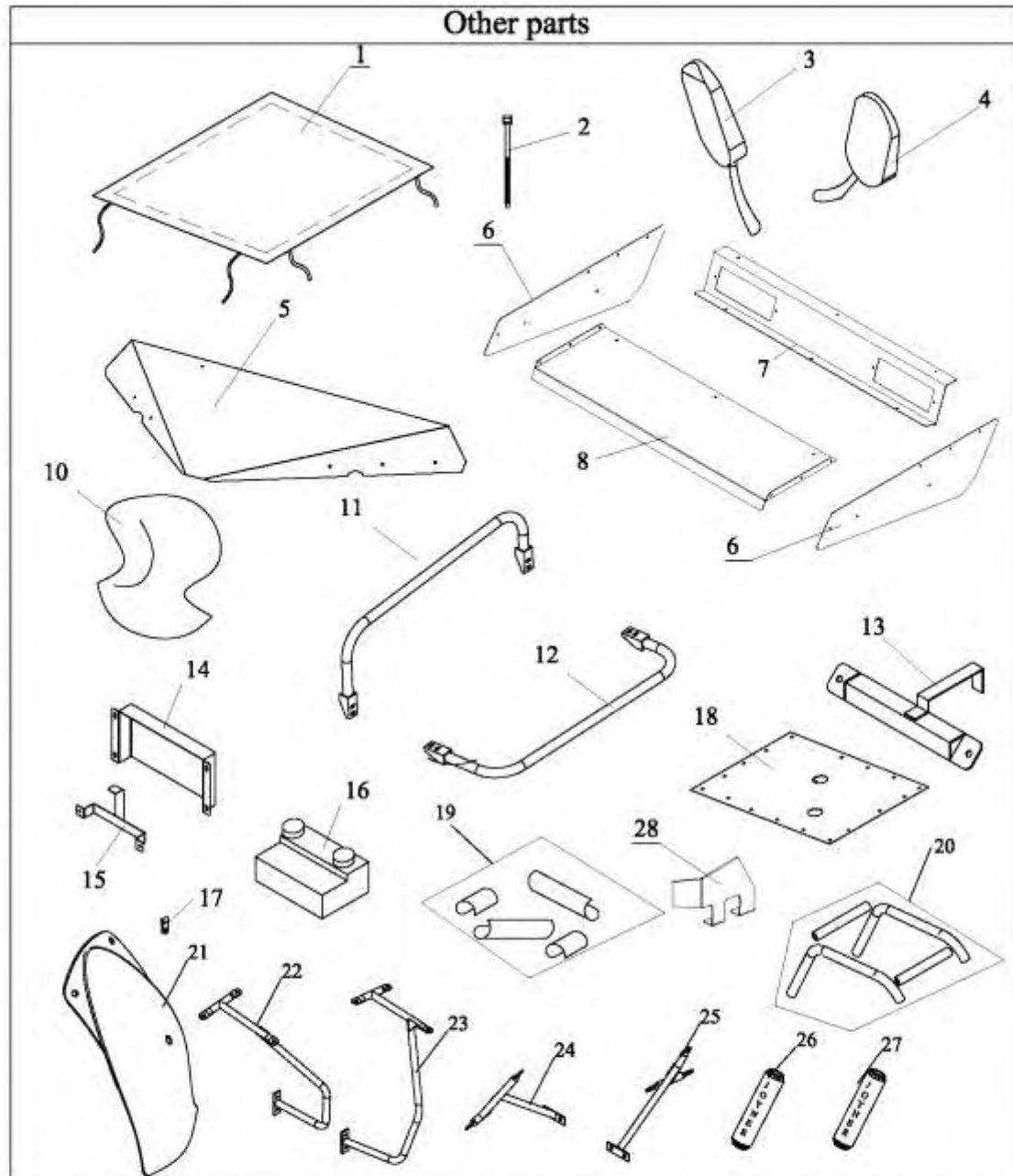


# Other parts



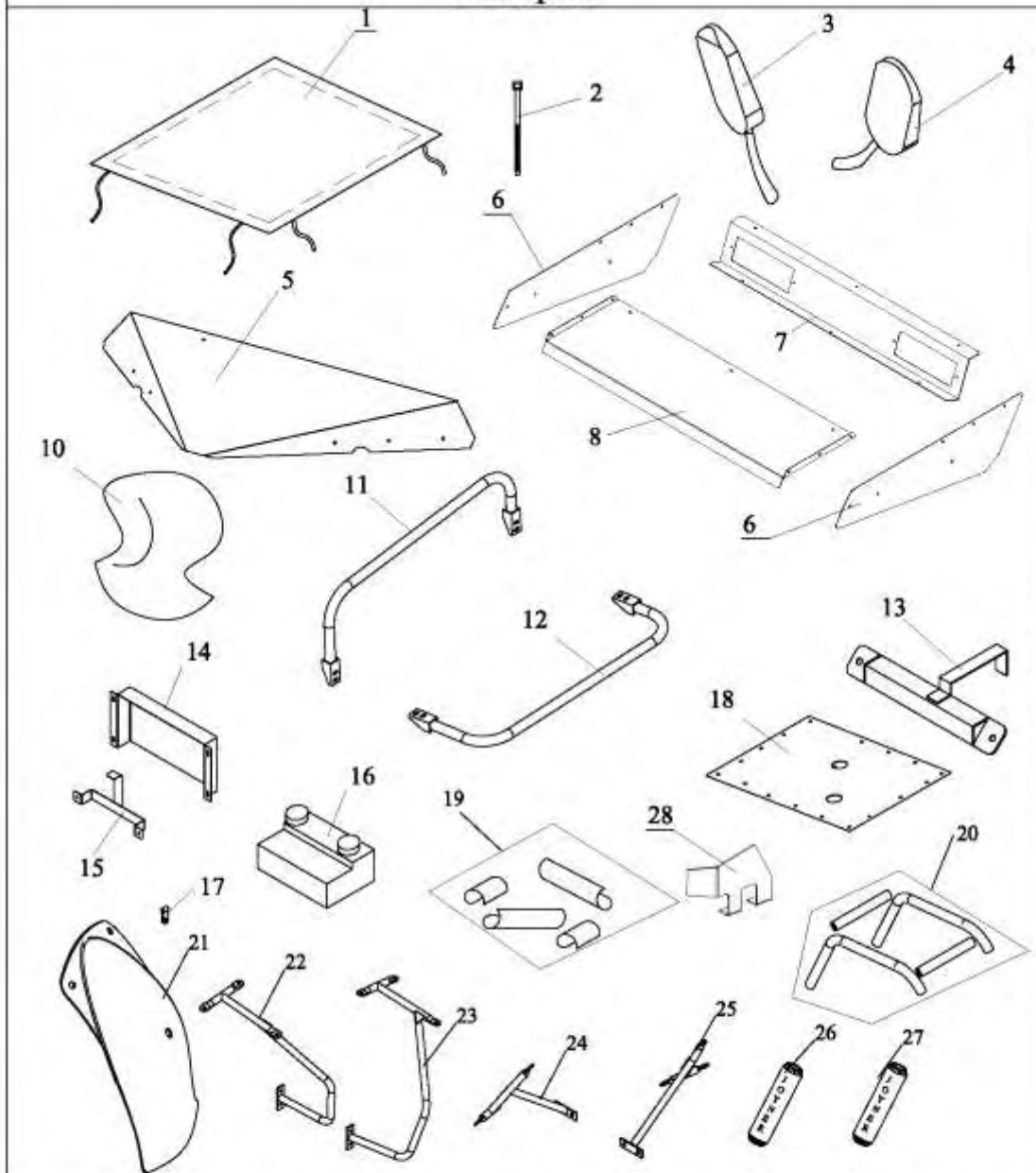
No.	Code name	Description	Q' ty
1	MV800.08.01.00.02	canvas roof	1
2	D650.08.06.00.01	cable tie	20
3	JN0400020EU	back view mirror ,left	1
4	JN0400030EU	back view mirror ,right	1
5	N650.01.02.00.05A	front cover plate	1
6	N650.01.02.00.01	empennage,side	2
7	N650.01.02.00.03	empennage,rear	1
8	N650.01.02.00.02	empennage,upper	1
10	D800.08.01.00.03	cloth cover for entire kart	1

# Other parts



No.	Code name	Description	Q' ty
11	MV800.99.99.02.00A	left guard	1
12	MV800.99.99.03.00A	right guard	1
13	D1600.01.02.08.00	battery bracket	1
14	MV800.05.02.00.01	ECU plastic shield	1
15	SV800.01.02.00.02	ECU press plate	1
16	D1600.08.01.00.04	cover, battery	1
17	SV800.08.01.00.01	tube clip	10
18	MV800.01.02.00.04	engine bottom plate	1
19	MV800.08.01.02.00	envelopment	1

# Other parts



No.	Code name	Description	Q' ty
20	MV800.08.01.07.00	foam cover	1
21	C650.08.01.13.00	fender	4
22	C1100.08.01.03.00	fender bracket.left.front	1
23	C1100.08.01.04.00	fender bracket.right.front	1
24	C1100.08.01.05.00	fender bracket.left.rear	1
25	C1100.08.01.06.00	fender bracket.right.rear	1
26	D800.08.01.00.04-1	shock absorber coat.front	2
27	D800.08.01.00.04-2	shock absorber coat.rear	2
28	N650.01.02.00.01	guide board 2 for cooling	1

## Wearing parts

### 1.Body

Num	English name	件号	数量
1	rubber washer Φ6	JD0900008	20
2	radial bearing	D800.02.01.00.01	4
3	bushing	D800.02.01.00.02	8
4	rod end bearing,control arm	D800.02.01.00.03	8
5	spacer sleeve,control arm	D800.02.01.00.04	16
6	interner circlip φ55 (model B)	893.2-Cφ55	2
7	shocker spacer sleeve	D800.02.03.00.03	16
8	hub screw M10*1.25	D650.03.02.00.03	10
9	wheel nut M10*1.25	D650.03.02.00.02	10
10	ball bearing 25*52*15	D800.03.01.00.04	2
11	ball bearing 30*62*16	D800.03.01.00.05	2
12	oil seal 30*52*8	D800.03.01.00.08	2
13	oil seal 40x62x7	D800.03.01.00.09	2
14	bearing(30*50*32)	D650.03.02.00.07	2
15	rear shaft slotted nut M22*1.5	D650.03.02.00.06	2
16	internal circlip Φ42 (model B)	893.2- Cφ42	2
17	engine rubber bumper	D650.04.01.00.01	8
18	flange gasket	S11-1200011CA	1
19	rod end bearingPOSA12LH	D800.05.01.00.01	2
20	rod end bearingPOSA12	D800.05.01.00.02	2
21	spacer sleeve	D800.05.01.00.03	8
22	electric cable	MV800.06.01.00.00	1
23	spotlight bulb	D1600.06.10.00.01	4
24	headlight bulb	D1600.06.11.00.01	2
25	turning light bulb	D650.06.00.05.01	4
26	compound tail light bulb	D650.06.00.04.02	2
27	stoplight bulb	D650.06.00.04.03	2
28	flasher apparatus	D650.06.00.10.00	1
29	ignition switch assembly	N650.06.00.18.00	1
30	throttle cable	MV800.07.03.01.00	1
31	brake calliper	SV800.07.01.01.01	1
32	clutch cable	MV800.07.04.01.00	1
33	air cleaner	N650.04.05.01.00	1
34	brake pad	SV800.07.01.01.03	8
35	brake Disc	D650.03.02.00.05	2
36	fuel pump assy	D1600.04.03.00.02	1
37	inner boot seal	N650.03.02.01.04	2
38	SMALL band	N650.03.02.01.01	4
39	outer boot seal	N650.03.02.01.03	2
40	big band	N650.03.02.01.02	4
41	drive shaft, right	N650.03.02.02.00	1
42	drive shaft, left	MV800.03.02.01.00	1
43	four switch assy	D1600.06.03.00.00	1
44	FUSE2	E650.06.00.01.06	1
45	FUSE3	E650.06.00.01.07	1

46	FUSE4	E650.06.00.01.08	1
47	FUSE5	E650.06.00.01.09	1
48	FUSE6	E650.06.00.01.10	1
49	FUSE7	E650.06.00.01.11	1
50	FUSE8	E650.06.00.01.12	1
51	FUSE9	E650.06.00.01.13	1
52	FUSE10	E650.06.00.01.14	1

## 2.Engine

1	cylinder head cover gasket	372-1003036	1
2	cylinder head gasket	372-1003040	1
3	cylinder head bolt	372-1003051	8
4	camshaft oil seal	372-1003066	1
5	block cover	372-1003067	1
6	the first Piston ring	372-1004032	3
7	the second Piston ring	372-1004033	3
8	oil control steel-ring	372-1004040	3
9	bearing-connecting rod	372-1004116	6
10	cranksaft upper bearing	372-1005013	4
11	cranksaft lower bearing	372-1005014	4
12	cranksaft front oil seal	372-1005015	1
13	stopper plate	372-1005016	2
14	rear oil seal	372-1005030	1
15	pulley bolt	372-1005031	1
16	intake camshaft assy	372-1006020	1
17	exhaust camshaft assy	372-1006060	1
18	inlet valve	372-1007011	6
19	exhaust valve	372-1007012	6
20	adjustment washer	372-1007017	12
21	lifter valve	372-1007018	12
22	valve seal	372-1007020	12
23	tension pulley assy	372-1007030	1
24	timing gear cover assy	372-1007040	1
25	toothed timing belt	372-1007081	1
26	intake manifold gasket	372-1008021	1
27	hexagon nut	Q33008	13
28	stud	Q1200855F3	1
29	stud	Q1200825F3	5
30	hexagon head bolt	Q1420612	17
31	oil plug washer	372-1010017	1
32	bolt	Q1840612	2
33	hexagon flange bolt	Q1840610	1
34	oil pump gasket	372-1011021	1
35	oil pump	372-1011030	1
36	seal strip	372-1011055	1
37	crankcase ventilation pipe(1)	372-1014110	1
38	crankcase ventilation pipe(3)	372-1014130	1
39	clamp	Q673B155	2

40	seat-thermostat	372-1306001	1
41	thermostat	372-1306020	1
42	water pump set	372-1307010	1
43	seal strip 1	372-1307012	1
44	ring "o"	372-1307015	1
45	water pump washer	372-1307041	1
46	crankshaft position sensor	S11-1003069BA	1
47	intake temperature and pressure sensor	S11-1109411BA	1
48	hexagon head bolt	Q1400416	1
49	ignition coil assy	S11-3705000BA	1
50	hexagon head bolt	Q1460820	2
51	cord NO.1, Hi.tension	S11-3707020	1
52	cord NO.2, Hi.tension	S11-3707030	1
53	cord NO.3, Hi.tension	S11-3707040	1
54	spark plug	S11-3707100	3
55	coolant temperature sensor	S11-3617011EA	1
56	stud	Q1200840F3	1
57	stud	480-1008022	2
58	Starter	S11-3708110B1	1
59	electronic speedometer sensor	S11-3802020	1
60	Alternator	S11-3701110B1	1
61	oil filter	372-1012010	1
62	steel cable baffle ring	2303016	2
63	clutch pressure plate	S11-1601020	1
64	clutch disc	S11-1601030	1

### 3.Transmission

1	DOUBLE-SCREW ROD	5T07-1701058A	1
2	shift turning rod assy	5T07-1702090A	1
3	SHIFT-SELECT SHAFT ASSY	5T07-1702100A	1
4	SHIFT-SELECTING SHAFT	5T07-1702101A	1
5	SNAP RING.STOP PLATE.SHIFT INTERLOCK	QR512-1702214	3
6	RELEASE-SPRING SEAT.1ST GEAR&2ND GEAR	5T07-1702102	1
7	RELEASE-SPRING.1ST GEAR&2ND GEAR	5T07-1702103	1
8	SPRING-STOP PLATE	5T07-1702104	2
9	STOP PLATE.SHIFT INTERLOCK	5T07-1702107A	2
10	SHIFT-SELECT ARM	5T07-1702105A	1
11	PIN.SHIFT-SELECT ARM	5T07-1702106	1
12	SPRING PIN 3.5X28	QR512-1702113	1
13	RELEASE-SPRING.5TH GEAR&REVERSE GEAR	5T07-1702114A	1
14	RELEASE-SPRINGSEAT.5TH GEAR&REVERSE GEAR	5T07-1702112	1
15	SPRING SEAT.REVERSE GEAR	5T07-1702108A	1
16	LIMITING SPRING.REVERSE GEAR	5T07-1702109A	1
17	LIMITING CAM.REVERSE GEAR	QR512-1702111A	1
18	FRONT BEARING.OUTPUT SHAFT	5T07-1701610	1
19	REAR BEARING.OUTPUT SHAFT	5T07-1701250	1

20	FRONT DIFFERENTIAL BEARING	5T07-1701310	1
21	ODOMETER DRIVING GEAR	QR512-1701604	1
22	REAR BEARING.DIFFERENTIAL	5T07-1701320	1
23	LOCATING PIN	5T07-1701001	2
24	INPUT SHAFT SEAL	5T07-1701080	1
25	RIGHT DIFFERENTIAL SEAL	5T07-1701090	1
26	CLUTCH FORK SEAL	5T07-1702030	2
27	LEFT DIFFERENTIAL SEAL	5T07-1701010	1
28	BEARING 6204/YA/P63	4T08-1701130	1
29	DECLUTCH BEARING	5T07-1702010	1
30	BACK-UP LIGHT SWITCH	5T07-3729010	1

#### 4..Standard part

1	self-locking nut M8	6177.1- M8	20
2	self-locking nut M6	6177.1- M6	20
3	nut M10*1.25	6177.1- M10*1.25	20
4	nut M10*1.5	6177.1- M10*1.5	5
5	cotter pin 3.2*30	91-CP3.2*30	3
6	cotter pin 4*40	91- CP 4*40	4
7	Bolt M15*1.5*190	5782- M15*1.5*190	2
8	Bolt M15*1.5*210	5782- M15*1.5*210	2
9	Bolt M15*1.5*80	5782- M15*1.5*80	2
10	Bolt M15*1.5*65	5782- M15*1.5*65	2
11	Nut M15*1.5	6185.1- M15*1.5	8
12	Bolt M16*2*85	5782- M16*2*85	2
13	Bolt M16*2*95	5782- M16*2*95	2
14	Bolt M16*2*65	5782- M16*2*65	2
15	Nut M16*2	6185.1- M16*2	6
18	bolt-washer M10*1.5*30	5787- M10*1.5*30	10
19	spring washer 10	93-SW10	10



## PREPARATION ATTACH INSTRUCTION

### 1.Remove packing

#### Remove Packing

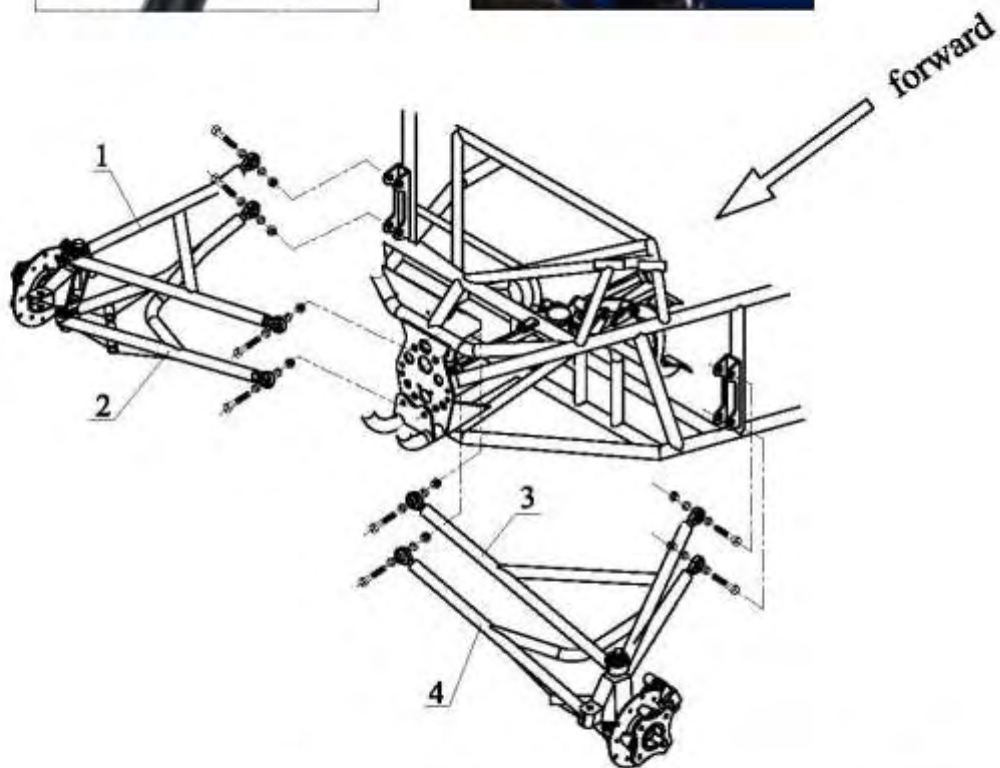


1.Remove Packing.

2.Unbolt both sides and top of crate,carefully remove,cut wire ties holding cart lift cart and slide remaining frame out from under.

2.Install the front suspension arm

Install the front suspension arm

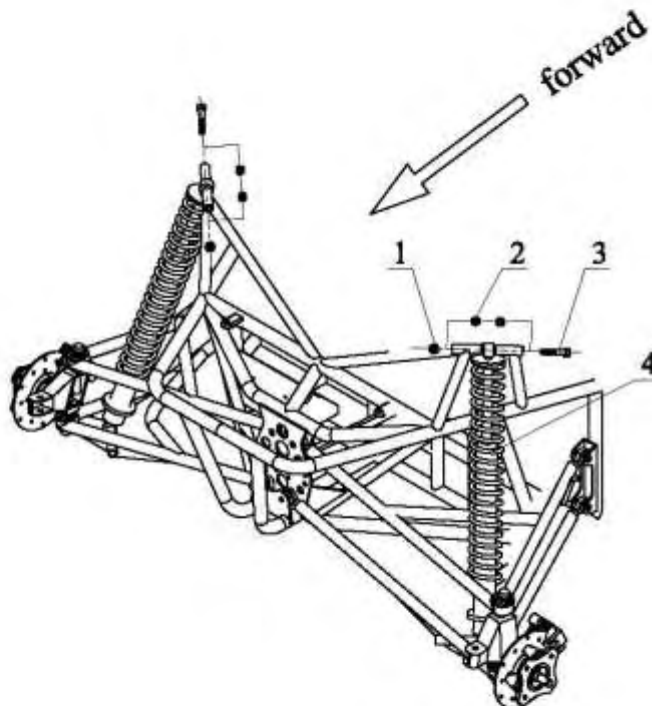


4	N650.02.01.01.00	lower suspension arm,FL	1
3	N650.02.01.02.00	upper suspension arm,FL	1
2	N650.02.01.04.00	lower suspension arm,FR	1
1	N650.02.01.03.00	upper suspension arm,FR	1
No.		Description	Q' ty

1. Install the left upper suspension arm,F-3, and the left lower suspension arm,F-4 on the front of frame as the figure above.
2. Install the right suspension arms as above .  
Note: Before installing, put 3# Lithium-grease into the moving part .
3. Tighten the bolts and nuts with thread glue.

### 3. Attach front shock absorber

Attach front shock absorber

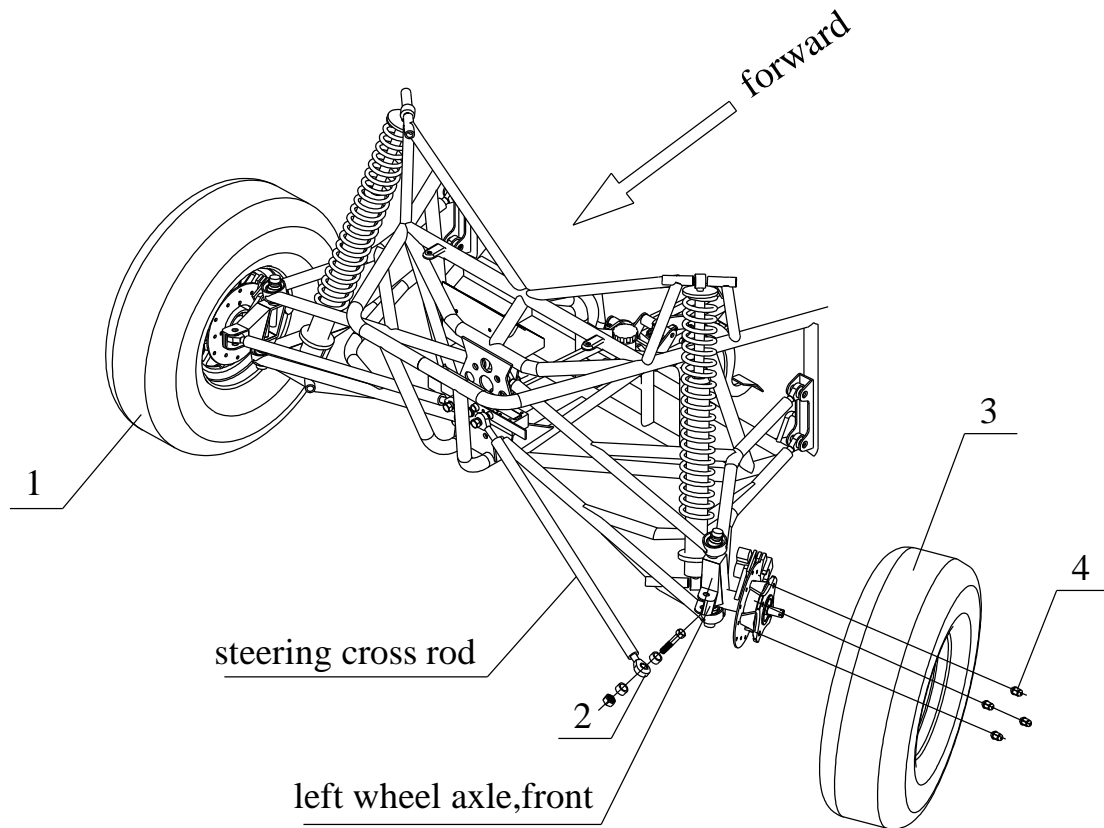


4	N650.02.03.01.00	front shocker absorber	2
3	5782-M15*1.5*190	M15*1.5*190 bolt	2
2	D800.02.03.00.03	shocker spacer sleeve	4
1	6185.1-M15*1.5	M15*1.5 nut	2
	No.	Description	Q' ty

1. Attach front shock absorber-4 on the frame , insert the bolt-3 and spacer sleeve-2, tighten nuts-1 with thread glue.

#### 4. Attach the rod end and front wheel

Attach tie rod end and front wheel



4	S650.03.02.00.02	wheel nut M12*1.5	8
3	D650.03.01.01.00H	wheel(25*8-12),FL	1
2	D800.05.01.00.01	rod end bearing,POSA12LH	1
1	D650.03.01.02.00H	wheel(25*8-12),FR	1
	No.	Description	Q' ty

1. Install the shaft of outer tie rod end-2 to left wheel axle,front.

2. Install bolt,spacer sleeve,then tighen nut.

Note: don't adjust outer tie rod end as wheel alignment is done before packing.

3. Attach the wheel(25\*8-12),FL-3 on the hub, tighten the nuts.

4. Attach the wheel(25\*8-12),FR-1 as described above .

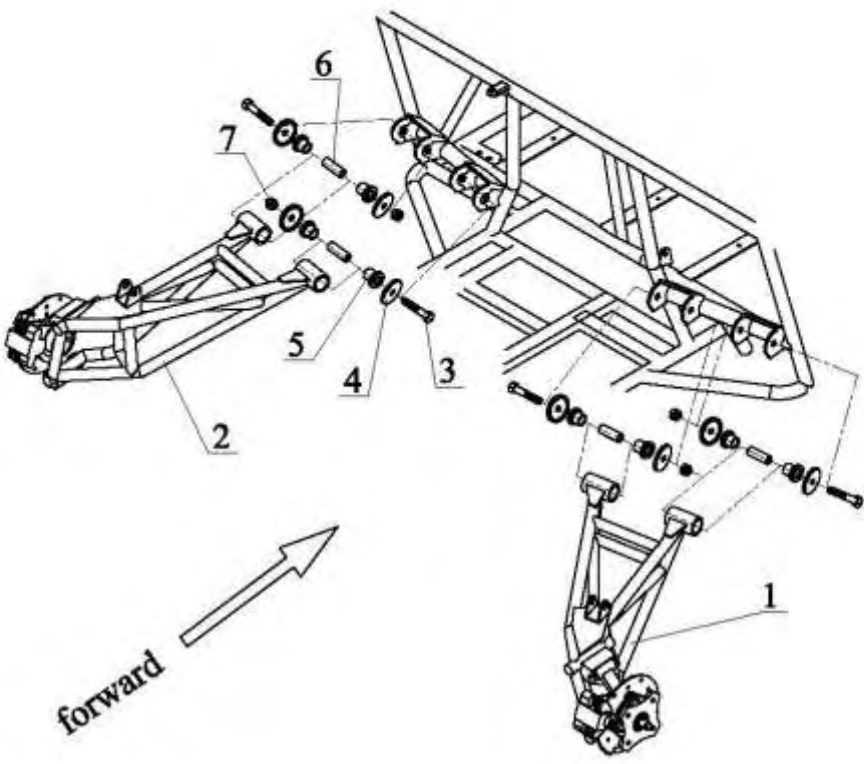

## 5. Attach tie rod and front wheel

Attach tie rod and front wheel



## 6. Attach the rear suspension arm

**Attach the rear suspension arm**

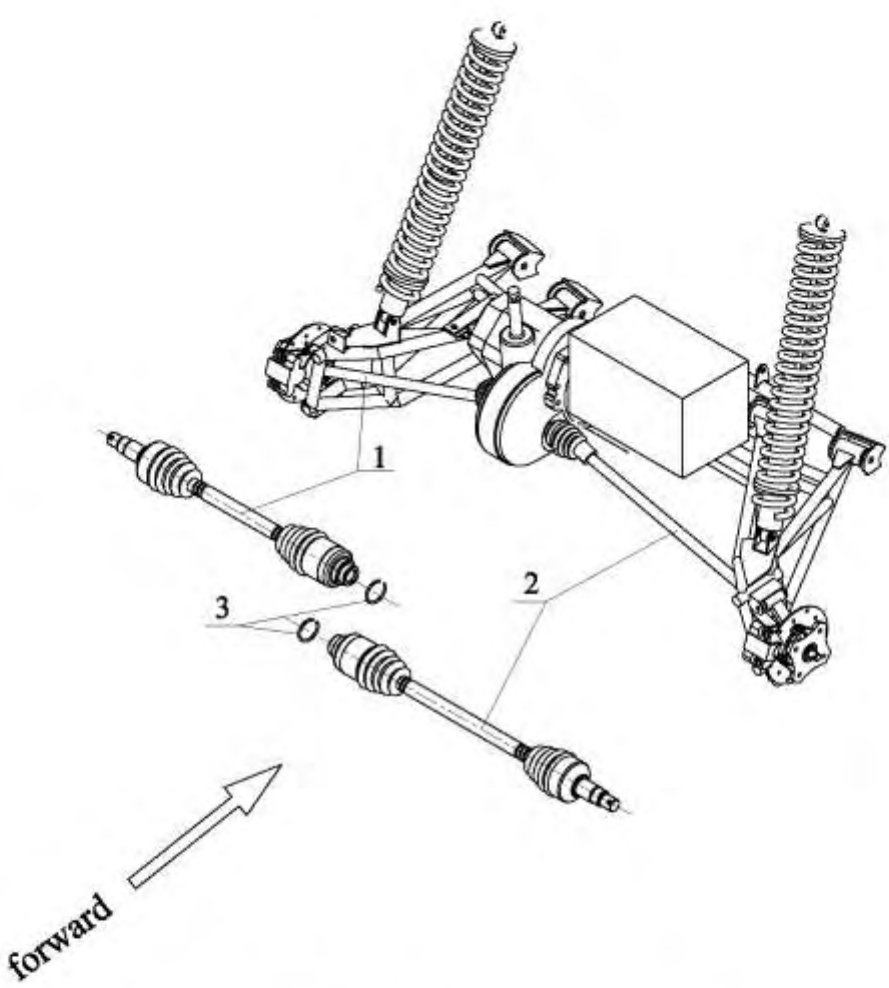



7	6177.1-M16*2	M16*2 nut	4
6	D800.02.02.00.04	spacer sleeve	4
5	D800.02.02.00.02	powdered spacer sleeve	8
4	D800.02.02.00.03	grease seal, ? 46	8
3	5787-M16*2*125	M16*2*125 bolt	4
2	N650.02.02.02.00A	left rear suspension arm	1
1	N650.02.02.01.00A	right rear suspension arm	1
	No.	Description	Q' ty

1. Attach rear suspension arm, right-1 on the rear part of frame. Insert the M16\*2\*125 bolt-3, grease seal, Ø 46-4, powdered spacer sleeve-5 and spacer sleeve-6 in order as above. Tighten the bolts-3 and nuts-7 with threads glue.
2. Attach rear suspension arm, left-2 as described above .

7.Attach driver shaft

Attach drive shaft



3	2303016	steel cable baffle ring	1
2	N650.03.02.02.00	drive shaft, right	1
1	MV800.03.02.01.00	drive shaft, left	1
	No.	Description	Q'ty

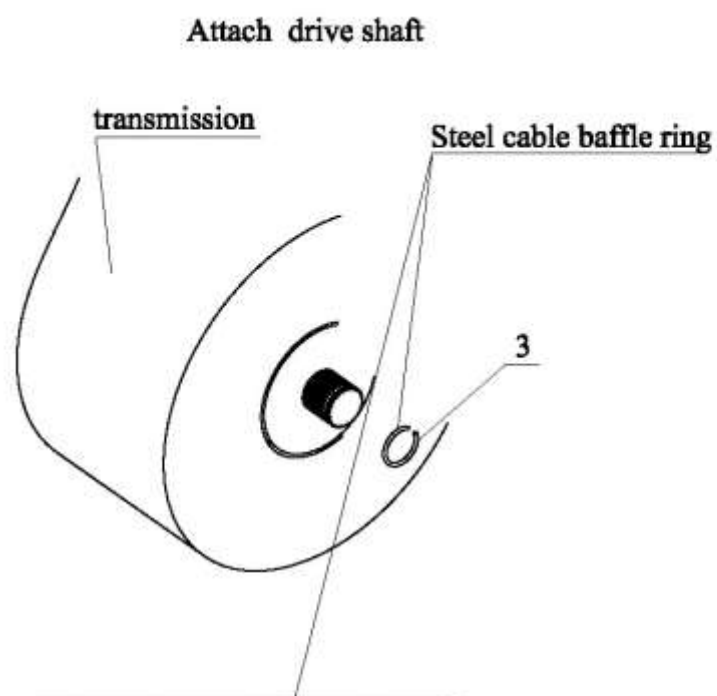
1.Check the steel cable baffle ring-3 in the groove of the output shaft of transmission.

2. Insert right drive shaft-2 onto the output shaft of transmission.

3. Attach the left side as figure .



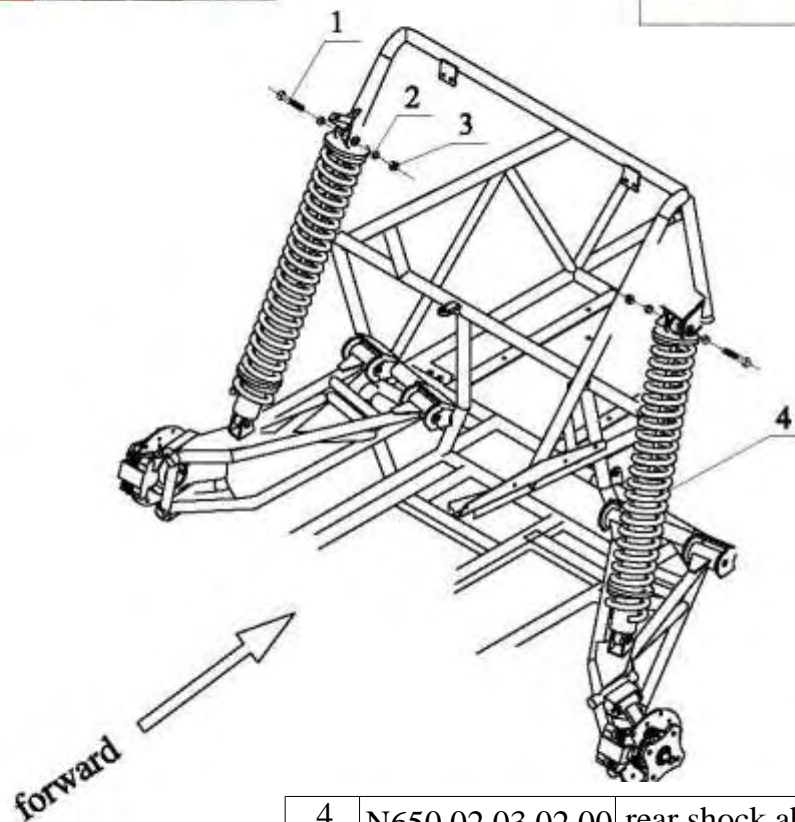
## 7. Attach driver shaft



1. Caution: the Steel cable baffle ring-3 must be confirmed in the groove both sides before attaching drive shaft.

## 8.Attach rear shock absorber

Attach rear shock absorber

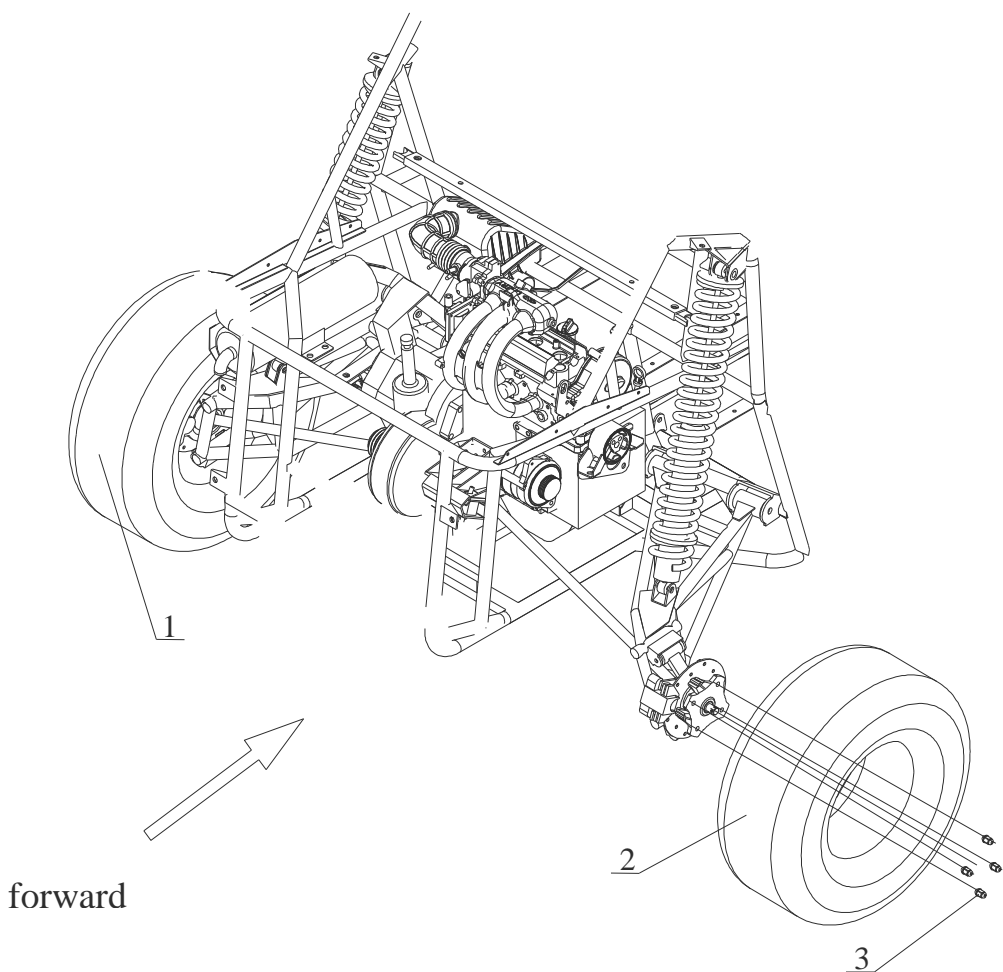


4	N650.02.03.02.00	rear shock absorber	2
3	6185.1-M15*1.5	M15*1.5 nut	2
2	D800.02.03.00.03	shocker spacer sleeve	4
1	5782-M15*1.5*80*30	M15*1.5*80*30bolt	2
	No.	Description	Q' ty

1. Attach rear shock absorber-4 on the frame , tighten the bolt-1 and nuts-3 with thread glue.

9.Attach rear wheel

Attach rear wheel

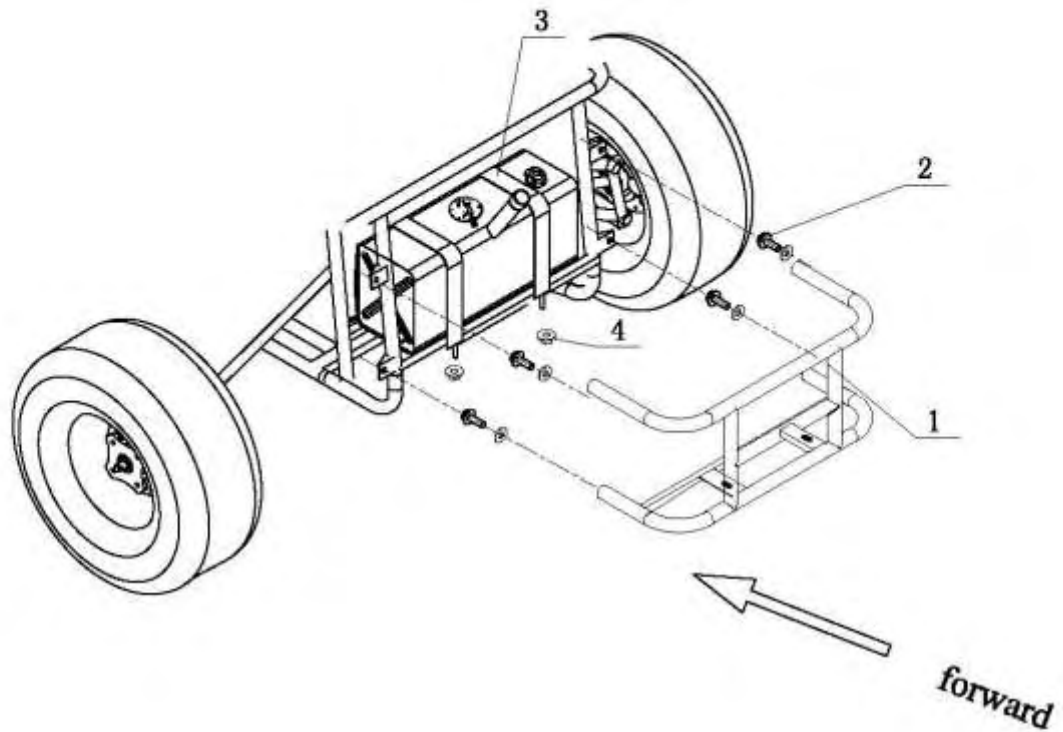


3	S650.03.02.00.02	wheel nut M12*1.5	8
2	D650.03.02.04.00H	wheel(25*11-12),BR	1
1	D650.03.02.01.00H	wheel(25*11-12),BL	1
No.		Description	Q' ty

- 1. Attach wheel (25X11-12),BR-2 on the hub. tighten the nuts-3.
- 2. Attach the left side as above .

## 10. Attach rear bumper bar

Attach rear bumper bar

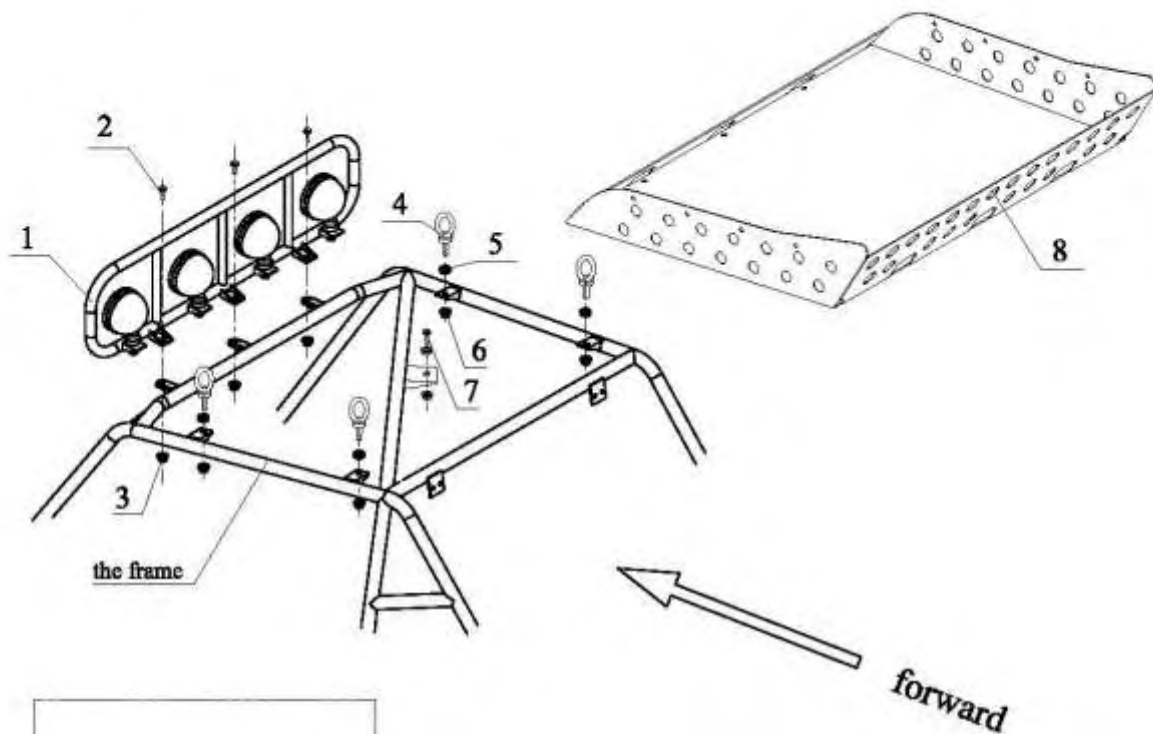


4	6177-M10*1.75	Nut M10*1.75	2
3	D800.04.03.02.00	fuel tank strap	2
2	70.1-M12*30	M12*30 socket head screw	4
1	MV800.01.02.01.00	rear bumper bar	1
	No.	Description	Q'ty

1. Attach the rear bumper bar-1 , fix fuel tank onto the rear bumper bar-1 with fuel tank trap-3 as figure.
2. Tighten bolts-2 and Nut -4.

## 11.Attach of spotlight and aluminum roof rack

Attach mount of spotlight and aluminium roof rack



8	MV800.99.99.01.00	aluminium roof rack	1
7	5787-M10*1.25*30	bolt-washer M10*1.25*30	1
6	6177.1-M10*1.25	self-locking nut M10*1.25	5
5	D1600.01.02.00.07	spacer	5
4	D1600.08.01.00.06	steel ring	4
3	6177.1-M10*1.25	self-locking nut M10*1.25	3
2	5787-M10*1.25*20	bolt-washer M10*1.25*20	3
1	MV800.99.99.04.00	spotlight mount	1
No.		Description	Q'ty

1. Attach mount of spotlight -1 and aluminium roof rack-8 as figure.
2. Tighten bolts with thread glue.



## 12. Check vehicle

### Check vehicle



1. Before starting the engine check engine oil, gearbox oil and all plugs have good connection.  
check the level of coolant at the filler neck of inlet to radiator  
after leaving the cap off at this stage.  
check pressure in the tire; front tire: 0.1MP; rear tire: 0.1MP  
check all bolts and nuts are tight.
2. start engine, make sure oil warning light goes out within 5-10 seconds  
run engine until both radiator hoses are warm (about 5 minutes, < 80 degree).  
keeping watch coolant level at radiator filler neck, top up as it drops.  
install radiator cap and test drive gently for 2-3 minutes  
allow engine to cool, top up coolant in radiator, refit cap.

#### **WARNING:**

when the engine is at high temperature, never open radiator cap.

If you do that, the high temperature coolant will spray out and could cause serious burns.