Suzuki Carry & Every
English Version
Factory Service Manual Translation

F6A Series 660cc Engine & Parts Manual
Second Edition

DE51V
DF51V
DC51T
DD51T
DC51B
DA52T
DB52T
DA52V

James L. Danko

Suzuki Carry & Every

English Version

Factory Service Manual Translation

F6A Engine Manual

Carry Truck 660cc
2WD &4WD
Every Van 660cc
AT-MT Models

Suzuki Kei Vehicles Series

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James Danko

Second Edition 2008

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All translations from original Japanese test to English completed by James Danko.

Disclaimer: All translations from one language to another can involve technical errors. The author has found mistakes in the original Japanese text. The best suitable English vocabulary has been chosen by the author.

Credits: I would like to thank the Suzuki Motors Corporation (Japan) for their part in supplying required information.

Introduction

Due to the high request for English version manuals on Japanese mini trucks & Vans, we are publishing wide variety information to provide the mini truck community with the ability to maintain their vehicles.

Japanese mini tucks & vans are produced only for the Japanese market. Therefore, all original manuals are only available in Japanese.

Service manuals are not sold to the public in Japan, as in many countries. You must be a new car dealer to receive them. We have a few hundred in stock. We do not sell manuals from our own library. We will start publishing them in English (Translated) and our own original versions.

This book or manual is for the professional mechanic. Simple items as how to change a spark plug, or an air-filter are not in this book. It is full of diagrams and schematics that are easily understood by a professional mechanic. How to do an engine overhaul using the correct parts sizes, measurements, torque, etc. You will have the same information as the Suzuki Factory techs have.

We have manuals for all Japanese manufactures. It's a time consuming process, please check back frequently as we post more information.

For more information please visit our home page at www.yokohamamotors.com

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2WD & 4WD

DC51T

DD51T

Suzuki Every Van

DE51V

DE51V

DF51V

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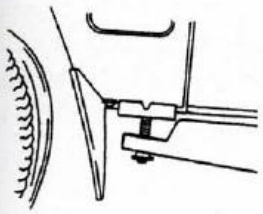
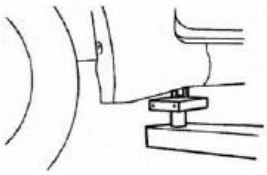
Jacking Locations

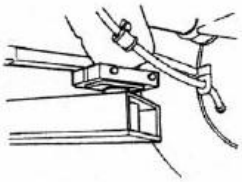
Van

Front



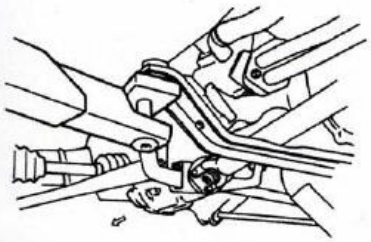
Rear



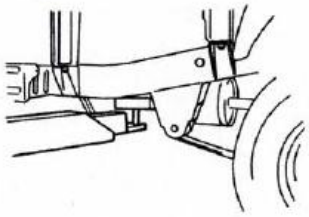


Truck

Front

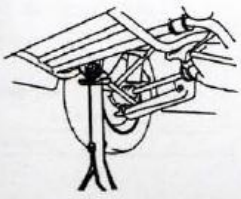


Rear

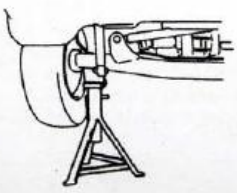


Rear

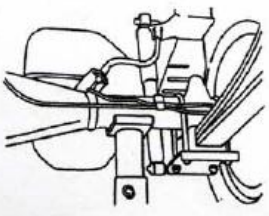
Front



Rear



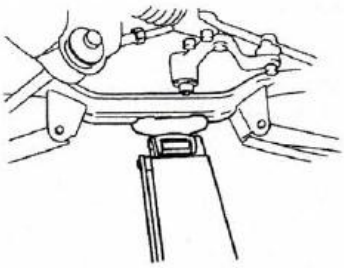
Axle



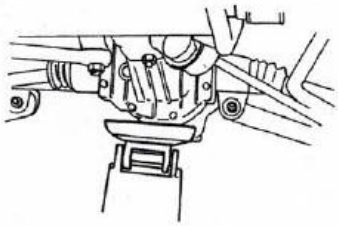
Floor Jack Locations

Front

2WD

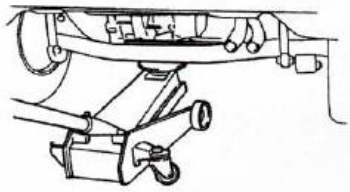


4WD

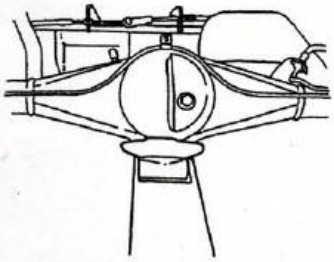


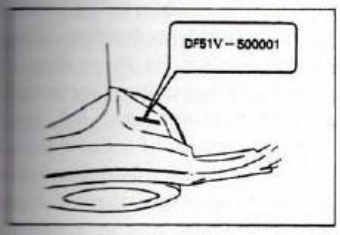
Rear

Van



Truck



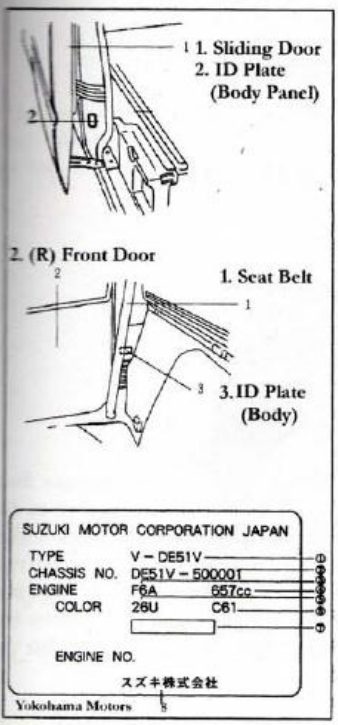


Drivers Side Inner Fender
Under Seat

Example: DE51V=Vehicle Series
500001=Production number
In Sequence

Every Van
DE51V-500001
DF51V-500001
Carry Truck
DC51T-100001~
DD51T-100001~
DC51B-100001~

Other Locations of ID Plates



Note: Model Years do not exist in Japan, only Series.

Example: Car Manufactured in 2000 but not sold until 2008=2008. Therefore, vehicles go by codes and manufactures date means nothing in Japan.

*Note: For manufactured year check the seat belt tag or any paperwork you have from your dealer.

ID Plate Decoder

1. Vehicle Series
2. Vehicle VIN Number
3. Engine Series
4. Engine True Size(cc)
5. Body Color Code
6. Interior Color Code or Package Code
7. Makers Code (For Sales Dept. Information)
8. Suzuki Corporation(Japanese)

The Suzuki Carry has been a work horse in Japan for decades. Officially it is classified as a □□□□ (Kei-vehicle or Light Vehicle) which is symbolized by the unique yellow license plates they use for registration. All Kei-vehicles must be manufactured under law with a maximum 660cc engine displacement. Due to the obvious safety issues for their size and weight they are designed for a maximum highway speed of 80 kilometers per hour, or roughly 50MPH. Although recently with the addition of five peed transmissions and 3-4 speed automatics it is possible to travel at greater speeds. Since the average length of a Kei-Truck is roughly 10.2 feet it is not a good idea to push them to the limit as safety of drivability issues will arise. Average use in Japan for agricultural purposes and off road durability, these vehicles generally travel at 25MPH (40KPH) on local roads. As Japan is an island nation, roads are small and narrow. Kei-trucks are rarely seen going down the highway for long distance travel. The other issues of engines overheating at prolonged highway speeds. Their high winding motors do not have adequate cooling systems for long distance travel.

The Suzuki Carry is built tough and properly maintained will last for many years. The platform is durable, and easy to repair. There are still thousands of them driving around Japan that are 20-30 years old. This in itself amazing as the average life cycle of a normal car in Japan is 5-10 years.

Common uses in Japan of Carry Truck and Every Van

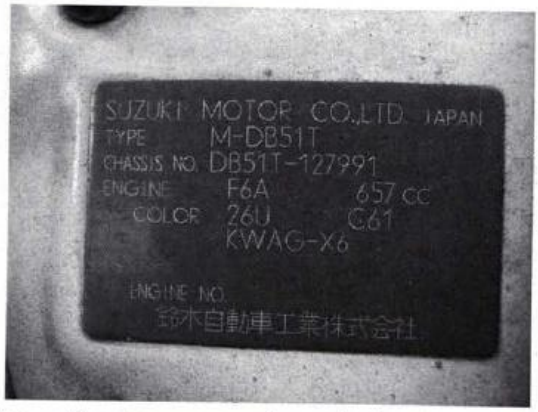
- Agriculture
- Construction companies
- Dump trucks
- Delivery Vans (Every Van)
- Postal
- Rescue and fire trucks
- Police Patrol
- Moving companies
- Many, many more

The basic body style has not changed much from the 1980s to 1998. The engines from the late 1970s to the beginning of 1980s saw the change from the 550cc engine to the 660cc version. Some makers in the 1980s started producing engines with either superchargers or turbochargers. Turbochargers and superchargers were not used that much on trucks but heavily on vans. Since vans we designed for on-road conditions and mostly delivery, they got the boost. Off road trucks could use the boost in power but due to dirty conditions and the chance of dirt in a turbo would provide disaster for the engine.

Vehicle Identification

One of the most highly requested questions we get at Yokohama Motors from overseas customers (remember, I'm in Japan) is what is my vehicle? What year is it? Is it a Suzuki or a Honda? Are parts interchangeable? Can I get parts from a Suzuki dealer in Kansas? After 30 years of questions I'm writing this book hoping to eliminate or at least lessen the amount of email requests.

VIN Plate



All Japanese vehicles have at least two ways to determine its identity. One is the standard VIN plate. Sometimes the VIN plate is attached by glue, screws, or rivets. If your plate is missing you will also find a permanent stamped VIN code on the body (Near or Under Drivers Seat).

VIN Stamp

This body stamp just happens to be next to the ID plate. This is not always the case. It can be located almost anywhere as there is no set rule for this marking. Most common is under the driver's seat in the engine compartment or around the kick-panel on the passenger side. You will also notice that neither picture indicates the production year. That's because in Japan we don't specifically have a year! Totally confused now? A model year is not used, per say in

Japan. If I buy the same vehicle in December, 2007 it is a 2007. If I bought a car that was manufactured in 2006 and didn't register it until 2008 it is a 2008 car. To make it even more confusing, if I import a 1969 Camaro to Japan today and register it, it is a 2008 Camaro.

Instead of model years as the western world is used to, Japanese makers identify vehicles by code. The code will tell the parts supplier of mechanic everything about the vehicle. There is no room for error; for example between a 1996 or a 1997. We don't have a California or a New York version. A code tells all about the vehicle, period.

If you really want to know the vehicles manufactured year and you do not have a copy of the Japanese registration, look at the seatbelt tag. But remember, when ordering parts the year will have nothing to do with it.

Mistaken Identity

Note:* We have had people call for help and to their surprise found out their Suzuki was really a Mitsubishi! Not all vehicle name plates have English names on them! Use the chart below to correctly identify your truck!

Note* Japanese can spell names up to four different ways. Listed bellow is the most common.

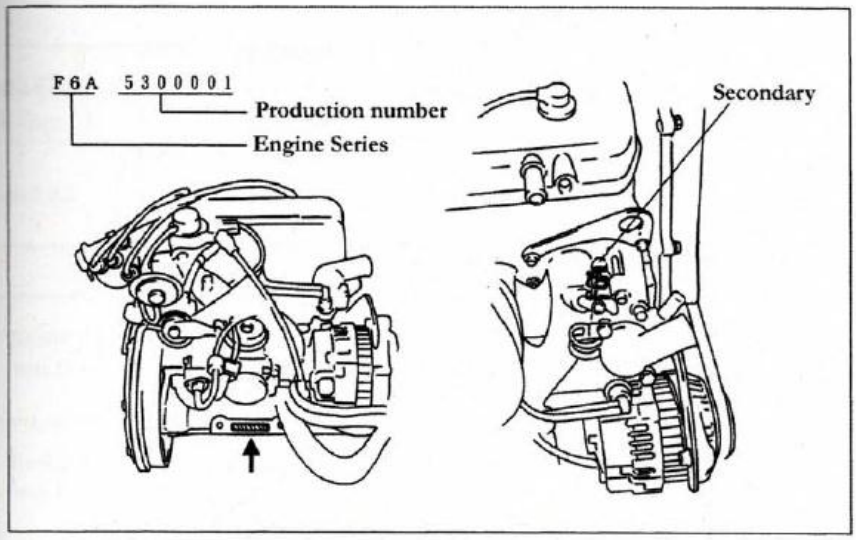
Manufactures Names

□□ or □□□	Suzuki	□□ or □□□	Isuzu
□□□	Toyota	□□□ or □□	Honda
□□□□	Daihatsu	□□	Mitsubishi
□□ or □□□□	Nissan	□□□	Subaru
□□□	Mazda	□□□	Yamaha

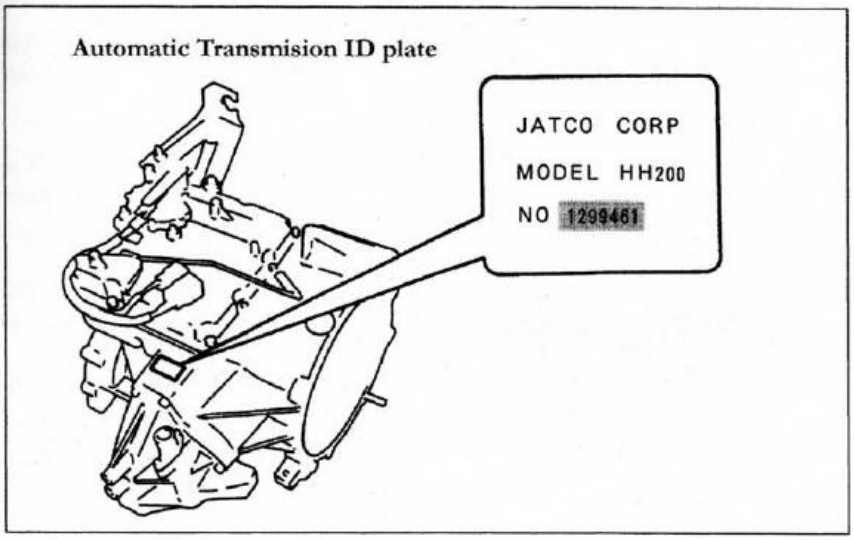
Common Japanese terms on paperwork

□□□ (Shakenshou)	Title or registration
□□□□ (kabushikikaisha)	Corporation
□□□□ (shadaibangou)	VIN
□□ (nenshiki)	Year of manufacture- (Not model year)
□□ (katashiki)	Vehicle designation code(model)
□ (iro)	Color

Engine & Transmision Identification Location



Automatic Transmision ID plate



Service Data- Carry Truck and Every Van

<table>
<tr><td>Fuel Capacity (Liters)</td><td colspan="2">Carry Truck 36L
Every Van 37L</td><td colspan="3">Conversion 1.0 Liter= 0.264 Gallon</td></tr>
<tr><td>Engine Oil Requirements</td><td colspan="2">Maximum 5000Km
3125 Miles</td><td>All Models 10W-30</td><td colspan="2">Capacity
2.9 Liters</td></tr>
<tr><td colspan="6">Oil Filter Change 10,000 Km (Harsh conditions 2500Km)</td></tr>
<tr><td rowspan="5">Transmission Oil</td><td rowspan="3">MT</td><td rowspan="3">2 Years or
20,000Km</td><td rowspan="3">Gear Oil #90
Suzuki (GL-4)</td><td rowspan="2">2WD</td><td>4 Speed
1.1Liter</td></tr>
<tr><td>5 Speed
1.2Liter</td></tr>
<tr><td>4WD</td><td>Part Time
2.6 Liter</td></tr>
<tr><td rowspan="2">AT</td><td rowspan="2">2 Years or
40,000Km</td><td rowspan="2">Suzuki
AT oil 5D06</td><td>Normal</td><td>Cp 2.6L</td></tr>
<tr><td>Turbo</td><td>Cp 2.8L</td></tr>
<tr><td rowspan="5">Differential</td><td rowspan="5">2 Years or
20,000Km</td><td rowspan="5">75W-80
(GL-5)</td><td>2WD</td><td>Normal</td><td>1.0L</td></tr>
<tr><td></td><td>Turbo</td><td>1.3L</td></tr>
<tr><td rowspan="2">4WD
Part Time</td><td>Front</td><td>0.7L</td></tr>
<tr><td>Rear</td><td>1.0L</td></tr>
<tr><td rowspan="2">4WD
Full Time</td><td>Front</td><td>0.7L</td></tr>
<tr><td>Rear</td><td>1.3L</td></tr>
</table>

Spark Plug & Gap	Turbo	ND	W16EXR-U	GAP (Millimeters) 0.7 to 0.8mm
		NGK	BPR5E	
	Normal	ND	XU22EPR-U	0.8 to 0.9mm
		NGK	DCPR7E	

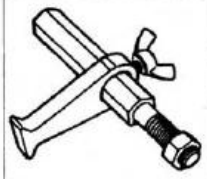
Battery	Normal	Part # 28B19R (Right positive connection)
	AC Equipped Also Refrigerated Trucks	Part # 38B20B

Ignition Timing

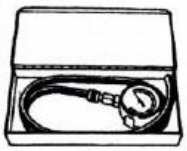
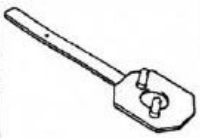
Carburetor Vehicles	Injection and Turbo Charged
Idle 950+-50 7 Degrees BTDC	Non-Turbo Idle 900+-50 Turbo Charged 950+-50 5 Degrees BTDC

Note: See Vehicle Tag Mounted in Engine Room for Specific Details

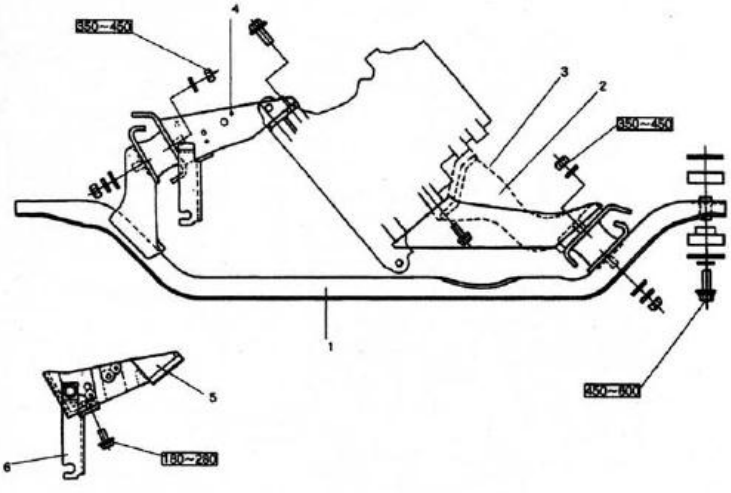
Suzuki Factory Tool Part Numbers

 09915－47340 Oil Filter Wrench Socket	 1. 09916－14510 Compressor 2 Valve : 09916－48210 4 Valve : 09916－14910	 4 Valve : 09916－44310 2 Valve : 09916－44910 Valve Guide Remover	 4 Valve : 09916－57340 2 Valve : 09917－88230 Valve Guide Installer Socket
 4 Valve 09916－57330 Others 09916－58210 Valve Guide Installer	 Reamer 2 Valve 09916－38220(5.5mm) 4 Valve 09916－34570(5mm)	 Reamer 2 Valve 09916－38210(11mm) 4 Valve 09916－37320(10.5mm)	 09916－34541 Reamer Handle
 09916－77310 Spring Compressor	 09918－08210 Vacume Hose Joint	 09900－00410 Hexagon Wrench	 09924－17810 Flywheel Holder

Suzuki Factory Tool Part Numbers

 09926－18210 **Oil Seal Guide**	 09915－77310 **Oil Pressure gage Set** **1. Gage** 09915－64510－001	 09915－77310 **Oil Pressure Gage**	 09915－67310 **Vacume Gage**
 09927－56020 **Crankshaft Pulley Holder**	 09917－68220 **Camshaft Holder**	 09915－64550 **Compression gage 4Valve Attachment**	 09915－64540 **Compression gage 2Valve Attachment**
 **T-Box 10mm Wrench** 09914－25550	 **Compression Gage Hose** 09915－64530	 **Oil Pressure Gage Attachment** 09915－78211	

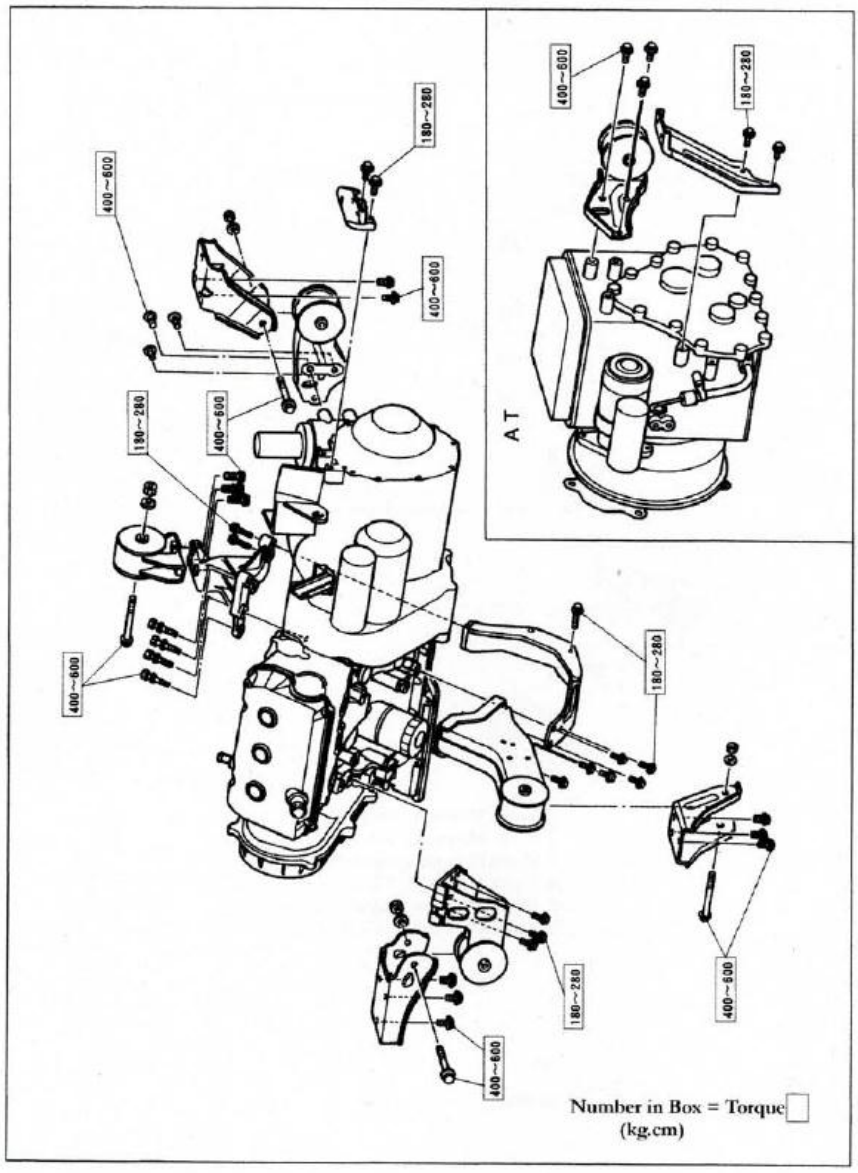
Frame Mount Diagram & Torque



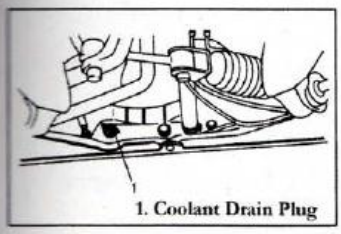
1. Front Mounting Member
2. Front Mounting Bracket Left (4WD)
3. Front Mounting Bracket Left (2WD)
4. Front Mounting Right Bracket (Truck)
5. Front Mounting Right Bracket (Van)
6. Clutch Cable Bracket (MT)

Box=Torque Spec (kg.cm)

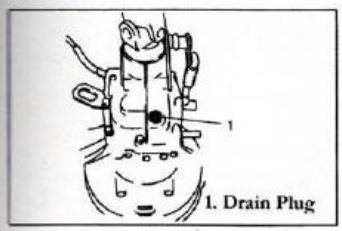
Engine & Transmission Mounts



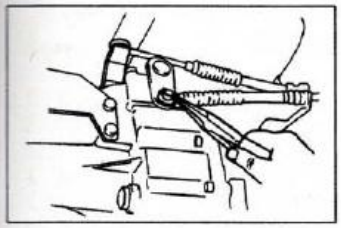
Engine Removal
Truck
2WD & 4WD

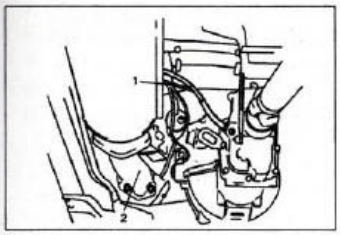


1. Coolant Drain Plug



1. Drain Plug

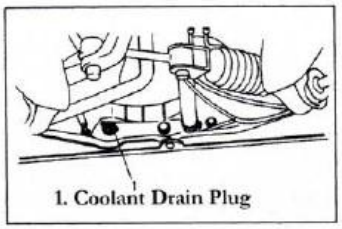


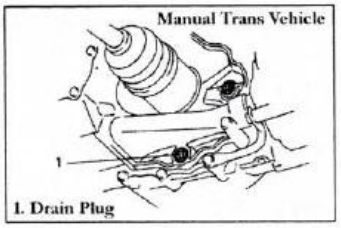


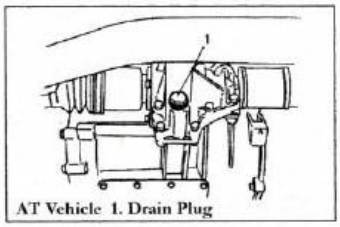
1. Speedometer Cable
2. Exhaust Pipe

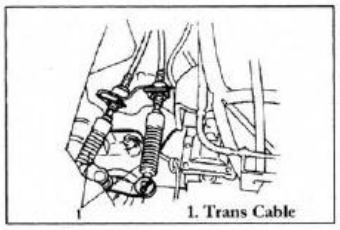
1. Remove Front Seat
2. Remove Front Door (Easy Access)
3. Remove Battery
4. Drain Coolant
5. Drain Transmission Oil
6. Disconnect Exhaust Pipe
7. Remove Rear Driveshaft
8. Remove Front Driveshaft (4WD)
9. Disconnect Clutch Cable (MT)
10. Disconnect shifter Connections
11. Disconnect Speedometer Cable
12. Disconnect Electrical Connections
13. Remove Heater Hoses
14. Remove Air Cleaner
15. Remove Air Duct
16. Disconnect Accelerator Cable
17. Disconnect Fuel Hose & Plug Line
18. Un-Bolt Mounts
20. Remove Engine

Engine Removal
VAN 2 &4WD
AT-MT Versions


1. Coolant Drain Plug

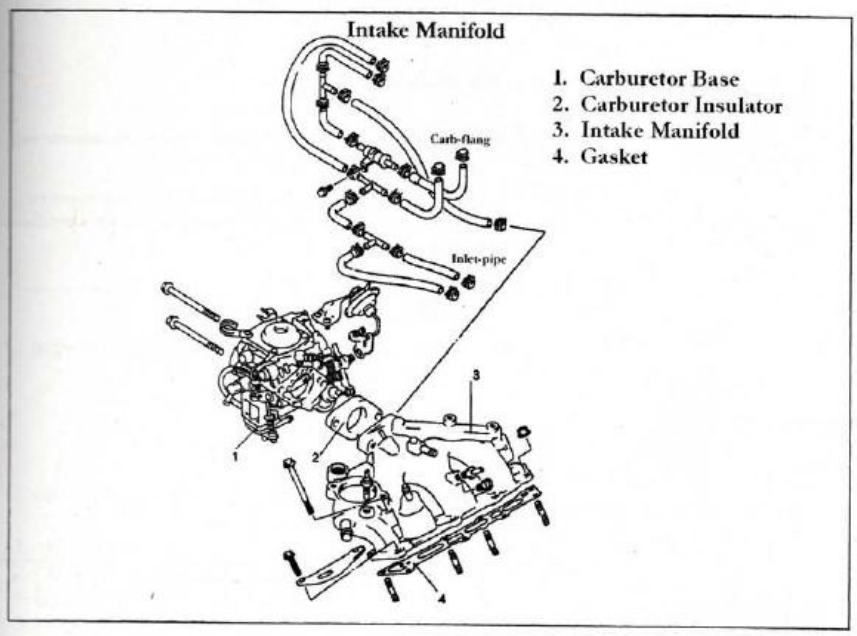

Manual Trans Vehicle
1. Drain Plug


AT Vehicle 1. Drain Plug


1. Trans Cable

1. Remove Battery Connctions
2. Remove Engine Service Cover
3. Remove Rear Bumper
4. Drain Coolant System
5. Remove right-left wheel
6. Drain Transmision Oil
7. Disconnect Electrical Harness from Engine
8. Disconect Speedometer Cable
9. Disonnect Accelerator Cable
10. Disconnect Transmision Cable
11. Disconnect Clutch Cable (MT Vehicle)
12. Remove Water Hose
13. Disconnect Vacume Hoses
14. Disconnect Fuel Hose
15. Remove (L-R) Brake Drum
16. Remove (L-R) Driveshaft hub
17. Disconnect Diveshaft connections
18. Disconnect Exhaust Center Pipe Bracket
19. Remove Front Drive Shaft (4WD Version)
20. Engine & Tranny Stiffiner
21. Remove Muffler
22. Remove Exhuast Center Pipe
23. Turbo-Charger Air Cleaner (If Equiped)
24. Remove Oil Filler Pipe (If Equiped)
25. Disconnect Tranny Mount
26. Remove Rear Engine Mounting Bracket
27. Unbolt Engine Front Mount
28. Unbolt Right Engine Mount
29. Remove Engine

Truck
Carry



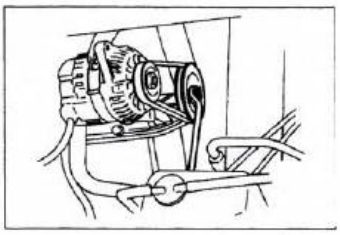
Remove or Disconnect the Following

1. Remove Front Seats
2. Remove Center Member and Side-Brake
3. Remove Air Cleaner
4. Drain Engine Coolant
5. Disconnect Carburetor Water Hose
6. Disconnect Carburetor Fuel Line
7. Disconnect Accelerator Cable
8. Disconnect Vacuum Hoses
9. Disconnect Electrical Connections
10. Disconnect and Remove Carburetor Assembly
11. Remove Manifold Attachment Bolts
12. Remove Intake Manifold

*Note: Use Only New Replacement Gaskets

Torque: Intake Manifold Bolts to (kg.cm) 180~280

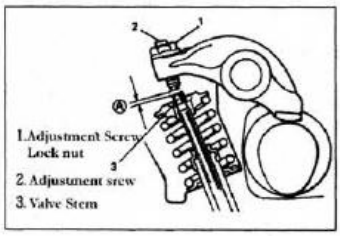
Valve Lash (2 Valve)



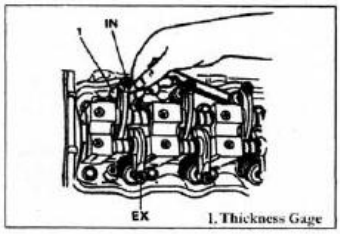
Valve Lash adjustment

2 Valve Engine

1. Remove Cylinder head valve cover
2. Rotate crankshaft to TDC position. Remove distributor cap and verify rotor buttom is facing #1 cylinder.
3. Using the chart below, use a feeler gage to slip between the adjustment screw and valve stem. Set to the specifications listed below.



Note: Adjustment Screw Torque: (kg.cm) 150~200



Cylinder Number		1	2	3
Cylinder 1 TDC	IN	○	○	
	EX	○		○
Cylinder 1 Rotate the crank 1 turn	IN			○
	EX		○	

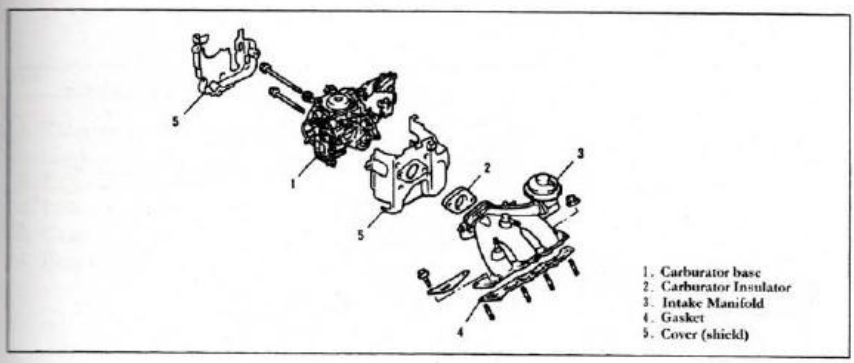
○ Circle mark =Time to adjust

Valve clearence measurments

Cold (mm)	IN	0.15
	EX	0.17
Hot (mm)	IN	0.25
	EX	0.27

4. Install a new valve cover gasket and install valve cover. *do not over tighten valve cover bolts*
5. Set timing to specifications (see timing settings at the begining of this book).
6. Test drive vehicle

Carburetor Intake Manifold
VAN



Caution: Never Drain Fluids While Hot. Always Drain Coolant at Outside Temperature

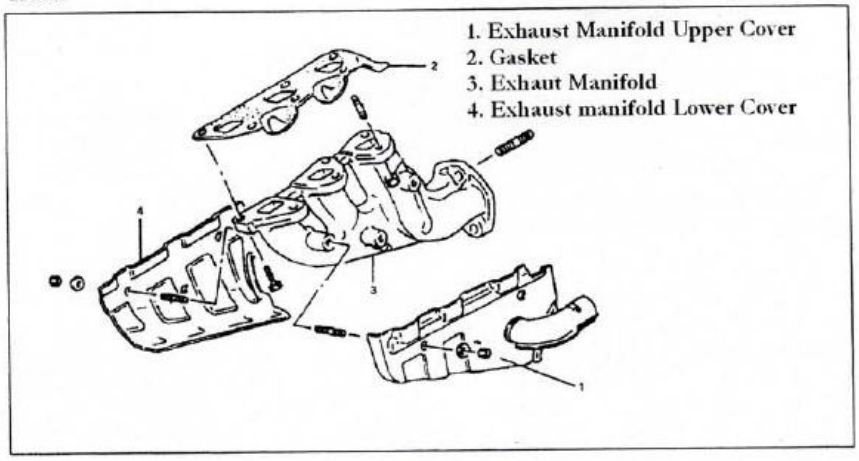
1. Drain Radiator
2. Remove Engine Service Cover
3. Remove Air Cleaner Assembly
4. Disconnect Electrical Connections
5. Remove Vacuum Hoses
6. Disconnect Accelerator Cable
7. Disconnect Fuel Lines and Plug
8. Remove Carburetor Cover
9. Disconnect Water Hose
10. Remove Carberator Attachment Bolts and Remove Carburetor
11. Remove Intake Manifold Attachment Bots and Remove Mainifold

Intake Manifold Torque: (kg.cm) 180~280

Note: Never Reuse Coolant

Exhaust Manifold

Truck



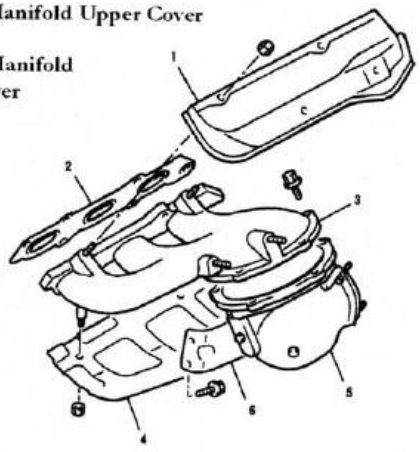
1. Remove Seat
2. Remove Air Cleaner Assembly
3. Remove Muffler
4. Remove Exhaust manifold Upper Cover
5. Remove Exhasut Manifold Lower Cover
6. Remove Exhasut Manifold Attachment Bolts
7. Remove Exhaust Manifold

Torque: Manifold Bolts (kg.cm) 180~200

Exhaust Manifold

Van

1. Exhaust Manifold Upper Cover
2. Gasket
3. Exhaust Manifold
4. Lower Cover
5. Case
6. Bracket

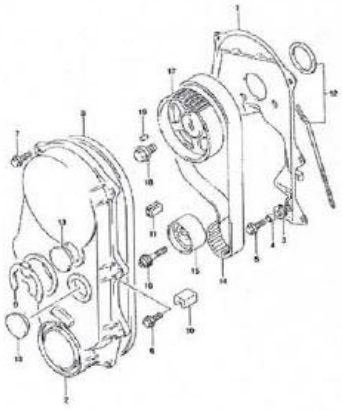


1. Jack Up Front of Vehicle
2. Remove Engine Service Cover
3. Remove Exhaust Manifold Upper Cover
4. Remove Exhaust Manifold Lower Cover
5. Remove Center Exhaust Pipe
6. Disconnect Sensor Coupler
7. Disconnect Bracket Attachment
8. Remove Manifold Attachment Bolts
9. Remove Manifold

Torque: Manifold Bolts (kg.cm) 100~200
Bracket Bolts (kg.cm) 180~280

Timing Belt & Tensioner Part Numbers

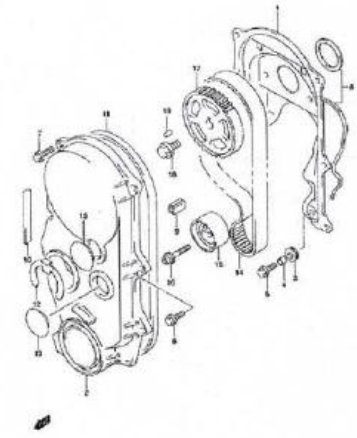
Timing Belt (4V)
FIG.14



1.	11360-79A00	Cover: Timing Belt Inside
2.	11390-77G01	Cover: Outside
3.	09308-10004	Grommet
4.	09180-06106	Spacer 6.8x10x7
5.	09116-06167	Bolt 6x20
6.	01550-06163	Bolt
7.	01550-06203	Bolt
8.	11396-77G00	Seal: Timing Belt Cover-Outside
9.	11397-76G00	E-Ring: Timing Belt Cover
10.	11394-77G00	Seal
11.	11394-70B00	Seal
12.	11480-77G00	Seal Set: Timing Cover-Inside
13.	09250-30017	Cap: OD:36
14.	12761-79A00	Belt: Timing
15.	12810-76G00	Tensioner
16.	12815-76G00	Bolt: Tensioner
17.	12741-61D01	Pulley: Camshaft Timing
18.	01550-12253	Bolt
19.	09206-05001	Pin

Timing Belt (4V)

Timing Belt (Turbo)
FIG.15

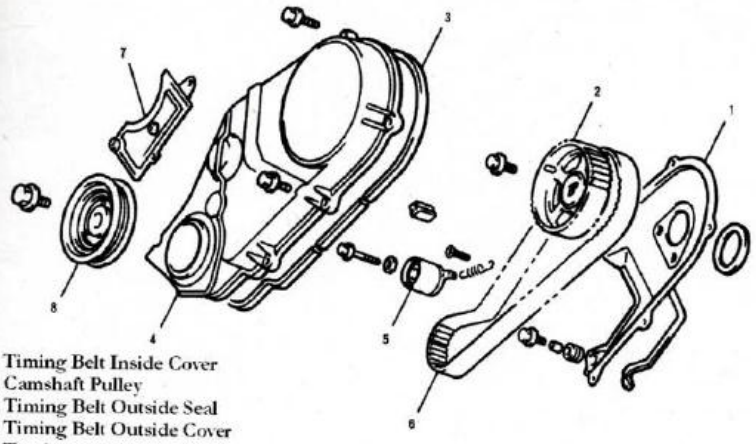


1.	11360-78A00	Cover: Timing Belt-Inside
2.	11390-76G01	Cover: Outside
3.	09308-10004	Grommet
4.	09180-06106	Spacer: 6.8x8x10x7
5.	09116-06167	Bolt 6x20
6.	01550-06163	Bolt
7.	01550-06203	Bolt
8.	11480-76G00	Seal Set:Timing Cover-Inside
9.	11394-70B00	Seal
10.	11395-76G00	Seal
11.	11396-76G00	Seal
12.	11397-76G00	E Ring: Timing Cover
13.	09250-30017	Cap: OD:36
14.	12761-78A00	Belt: Timing
15.	12810-76G00	Tensioner
16.	12815-76G00	Tensioner Bolt
17.	12741-70D00	Pulley: Camshaft Timing
18.	01550-12253	Bolt
19.	09206-05001	Pin

Timing Belt (Turbo)

Timing Belt Tensioner

Van & Truck



1. Timing Belt Inside Cover
2. Camshaft Pulley
3. Timing Belt Outside Seal
4. Timing Belt Outside Cover
5. Tensioner
6. Timing Belt
7. Inside Cover: Oil Splash
8. Crankshaft Pulley

Note: Timing Belt Must be Changed Every 100,000 Kilometers (64,000 Miles)

Tensioner Replacement

1. Raise the Front of Vehicle. Place Jack Stands as recommended in this book
2. Remove Engine Service Cover
3. Remove Altinator Belt Outside Cover
4. Turn Crankshaft Pulley Over to TDC Posistion (Top Dead Center)

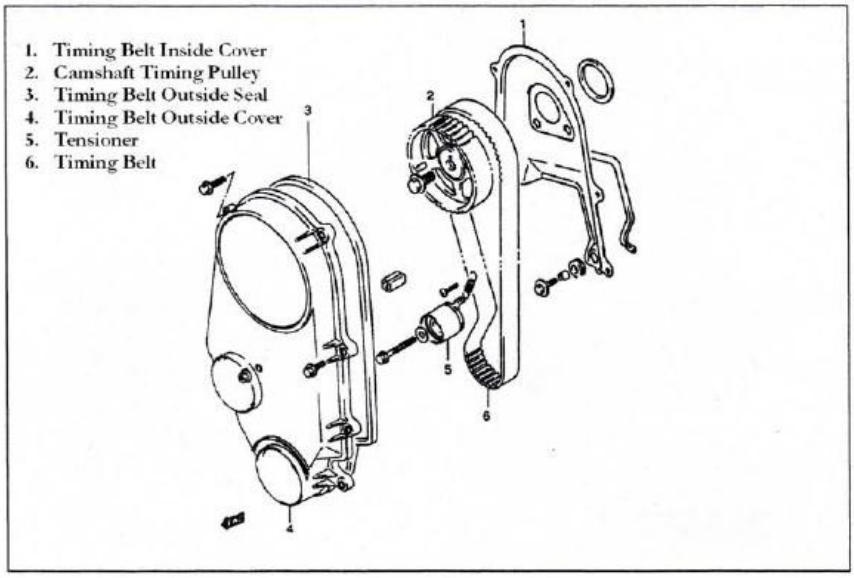
Note: Verify Distributor Rotor is Pointed to #1 Cylinder & Transmission Service Mark is Lined Up Through the Veiw Hole.

5. Remove Atlinator Belt
6. Remove Crankshaft Pulley
7. Remove Altinator Belt Inside Cover
8. Remove Timing Belt Outside Cover
9. Remover Tensioner and Inspect. If Over 50,000 Kilometers Replace. It is Not Recommended to Reuse Tensioner. If Tensioner Shows Damage Replace Timing Belt.

Note: It is Always Best Policy to Replace Tensioner & Timing Belt as a Set

Note: After Tensioner or Belt Replacement Always Adjust Valve Lash

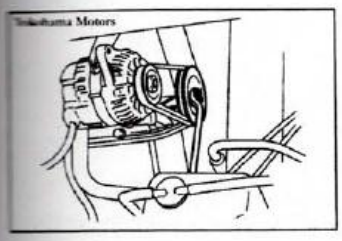
Timing Belt Replacement



*Belt change every 100,000 Kilometers

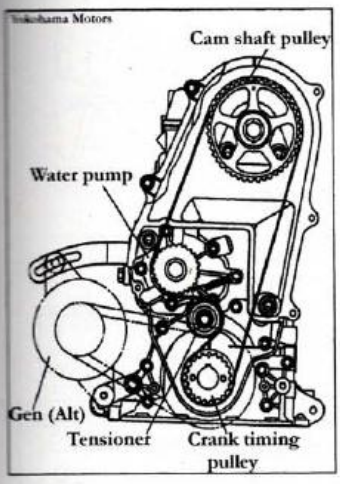
*If tensioner fails, always replace belt

Timing Belt Replacement



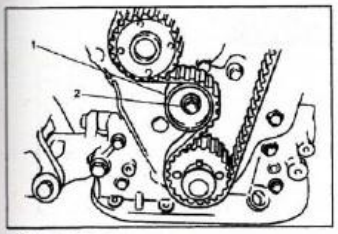
Procedure

1. Turn crank pulley until pointed to TDC
2. Remove crank pulley
3. Remove outside cover
4. Loosen tensioner
5. Remove old belt
6. Clean area
7. Inspect parts for damage or cracks (replace if damaged)



Service Point

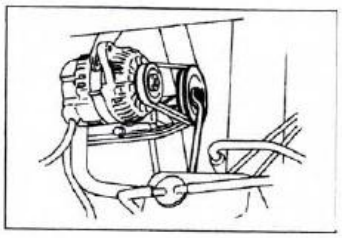
* Check tensioner for free spin. Any resistance replace*

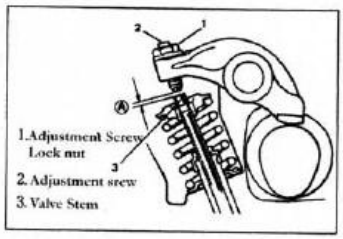


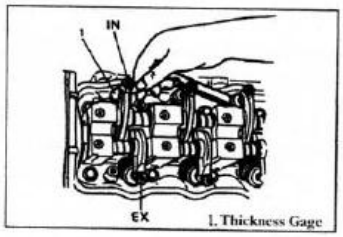
1. Tensioner
2. Tensioner bolt

8. Install Reverse Procedure
9. Run Engine 5~10 at Variable Speeds
10. Check Timing Settings
11. Check Valve Lash

Valve Lash (2 Valve)







Valve Lash adjustment

2 Valve Engine

1. Remove Cylinder head valve cover

2. Rotate crankshaft to TDC position. Remove distributor cap and verify rotor buttom is facing #1 cylinder.

3. Using the chart below, use a feeler gage to slip between the adjustment screw and valve stem. Set to the specifications listed below.

Note: Adjustment Screw Torque: (kg.cm) 150~200

Cylinder Number		1	2	3
Cylinder 1 TDC	IN	○	○	
	EX	○		○
Cylinder 1 Rotate the crank 1 turn	IN			○
	EX		○	

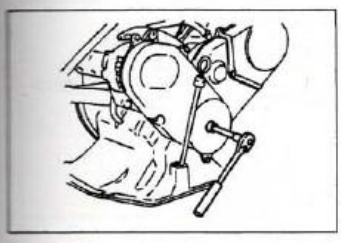
○ Circle mark =Time to adjust

Valve clearence measurments

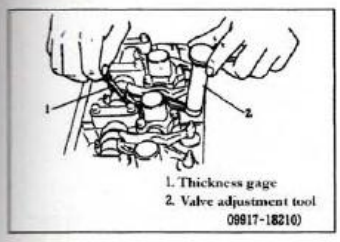
Cold (mm)	IN	0.15
	EX	0.17
Hot (mm)	IN	0.25
	EX	0.27

4. Install a new valve cover gasket and install valve cover. *do not over tighten valve cover bolts*
5. Set timing to specifications (see timing settings at the begining of this book).
6. Test drive vehicle

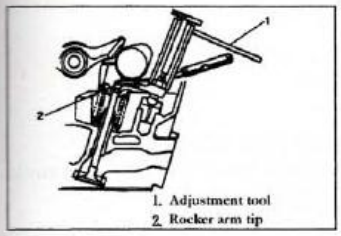
Valve Lash (4 Valve)



Valve lash adjustment
4 Valve
1. Remove Cylinder head valve cover
2. Rotate cranshaft to TDC posistion. Remove distributor car and verify rotor buton is facing #1 cylinder
3. Using the chart below, use a feeler gage to slip between the adjustment screw and valve stem. Set to the specifications listed below.



1. Thickness gage
2. Valve adjustment tool 09917-18210)



1. Adjustment tool
2. Rocker arm tip

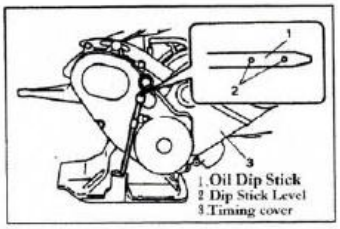
Cylinder Number		1	2	3
Cylinder #1 TDC	I N	○	○	
	E X	○		○
Cylinder #1 Rotate the crank 1 turn	I N			○
	E X		○	

○ Circle mark=Time to adjust

Cold (㎜)	I N	0.08
	E X	0.10
Hot (㎜)	I N	0.12
	E X	0.12

Adjustment screw lock nut torque (kg.cm) 100 to 130

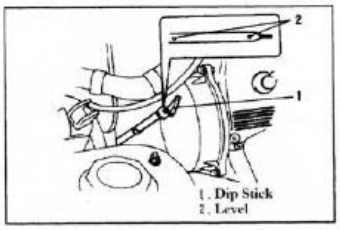
Engine Oil



Engine Oil Level

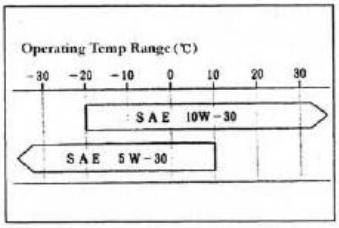
1. Remove dip stick and check level.
   Level should be between the dots

2. If clean, add oil to proper level.

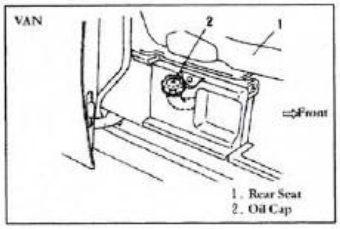


Oil Change

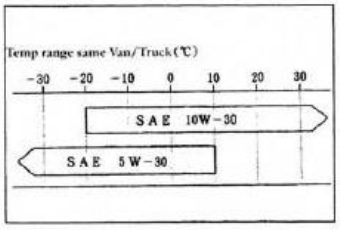
1. Remove drain plug from oil pan.
2. Inspect oil for contaminents, if clean replace plug.



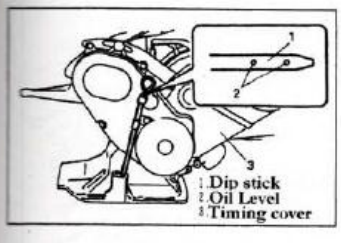
3. Fill oil to proper capacity with recomended oil
   from the temperature chart. Verify level with dip stick.

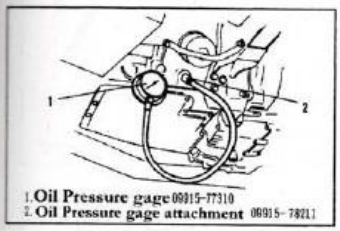


Oil Cpacity 2.3 Liter
Check vehicle specifications chart



Engine Oil Pressure Test





Part # for gage & Adapter is Suzuki Equipement

Oil Presure

VAN

Caution: Make sure to check oil level is correct!

- Check oil level
  add if necessary
- Make sure oil is clean
  Change before test if dirty.

If contaminents such as metal shavings are found, damage will occure to test equipment. At this point recomended to disassemble engine for inspection.

1. Remove plug from cylinder block as shown.

2. Attach gage and adapter as shown

3. Start engine and run to operating temperature.

4. Operating temp 90℃~100℃

Run engine to 4000RPM. Presure range below.

Oil Pressure

(kg/cm) : Turbo 3.3~4.3

Non-Turbo 2.7~3.7

5. Remove gage and adapter. Use new silicon tape on plug and torque to specification bellow.

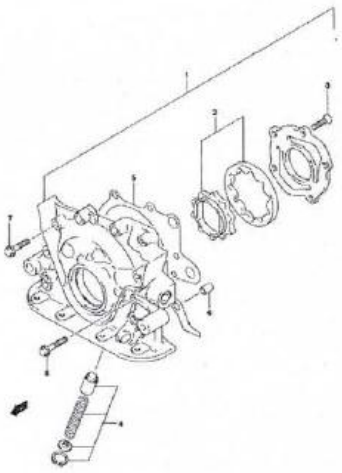
6. Start engine and inspect for leaks.

Plug torque (kg · cm) : 120~150

Pressure out of range: Replace pump and repeat procedure.

Oil Pump Parts

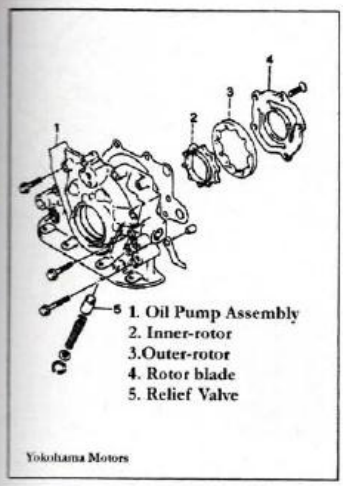
Oil Pump (All)
FIG.31



1.	16100-76820	Oil Pump Set
2.	16130-70B01	Rotor Set
3.	02122-06163	Screw
4.	16150-60A00	Relief Vavle Set
5.	16119-76G00	Gasket: Oil Pump Case
6.	04211-09109	Pin
7.	01550-06305	Bolt
8.	01550-06355	Bolt

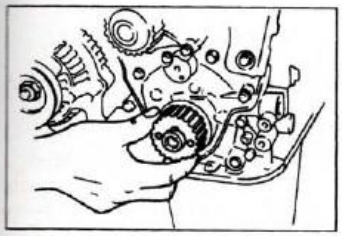
Oil Pump (All)

Oil Pump



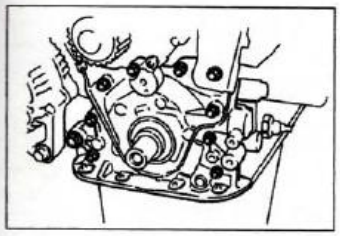
Procedure

1. Remove the following
   Cranck pulley, outside cover, timing belt tensioner, timing belt. *more information see "Timing belt removal".

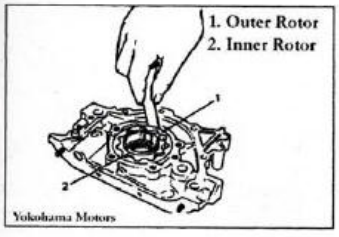


Remove

2. Timing belt pulley
3. Engine front mounts
4. Oil pan
5. Oil strainer



6. Remove the oil pump bolts (10).
7. Carefully remove assembly

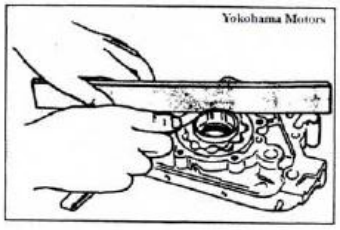


Pump Clearence Check

Outer rotor to case clearance must be below 0.13 (mm).

Replace if clearence is out of range

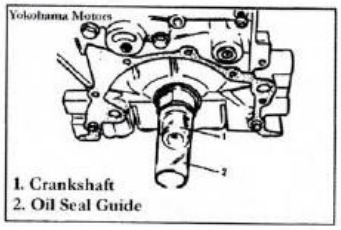
Oil Pump

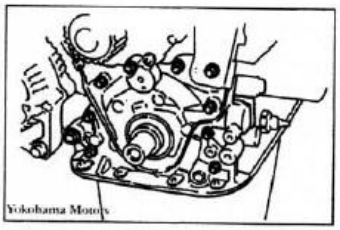


Side Clearence

Measure side clearence.
Side clearence must be below 0.15(mm)

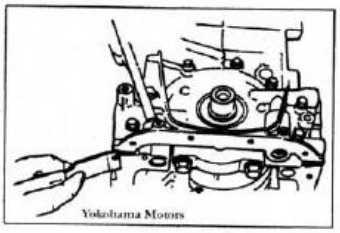
Out of range replace





Attach oil pump *Do not over torque*

Torque bolts to (kg.cm) 90-120

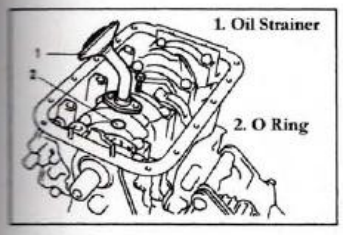


Oil Pump Gasket

Make sure all of the old gasket has been removed ans surface is clean before installing new gasket

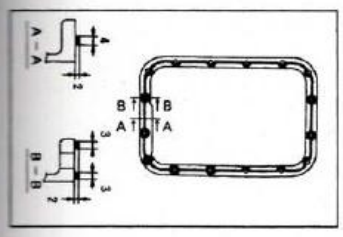
Re-assemble timing cover assembley
Always fill engine with new oil
Run engine a check oil pressure (begining of chapter)

Oil Pan & Strainer



When ever removing or replacing the oil strainer always replace the O Ring. Before installing the O Ring, coat with clean engine oil.

Oil Strainer torque (kg.cm) 90-120



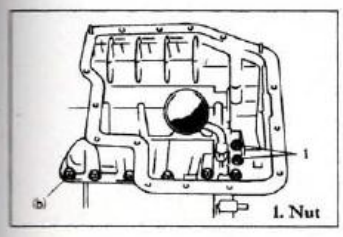
Type 1

Oil Pan Gasket. Apply High Temp Gasket Sealer

Note: Make sure all surfaces are oil free before applying sealant

Suzuki Sealant Part#1207C 99000-31150

Oil Pan Torque (kg.cm) 90-120



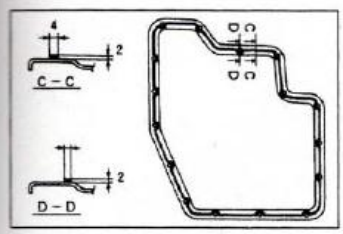
Type 2

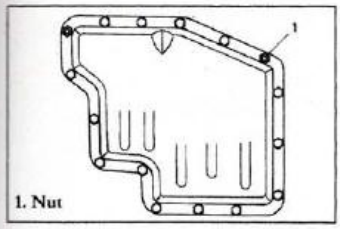
Oil Pan Gasket. Apply High Temp Gasket Sealer

Note: Make sure all surfaces are oil free before applying sealant

Suzuki Sealant Part#1207C 99000-31150

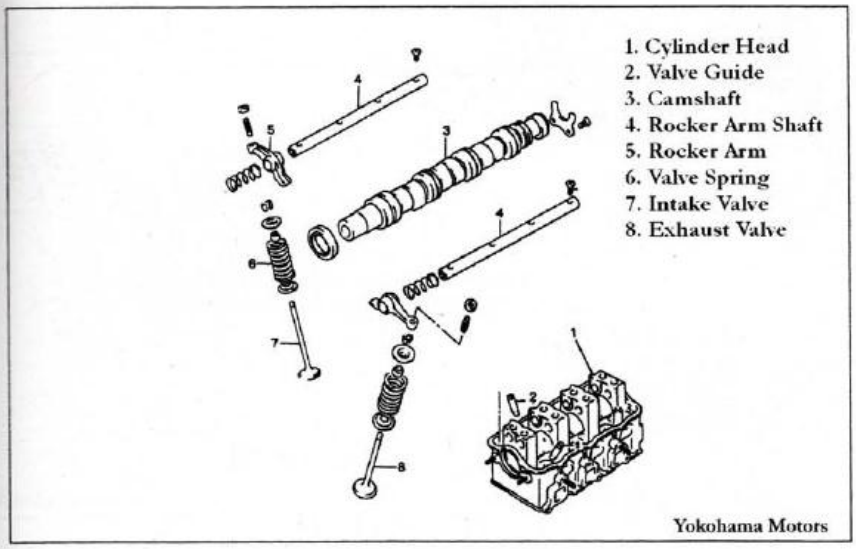
Oil Pan Torque (kg.cm) 90-120





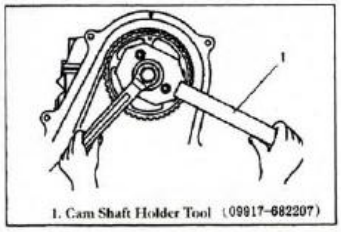
Cylinder Head, Camshaft, Valve, Rocker Arm

2 Valve Head

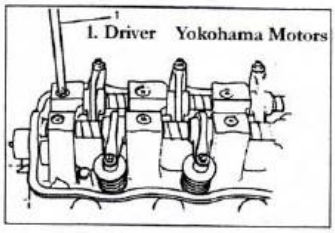


Disassemble-Disconnect-Remove The Following

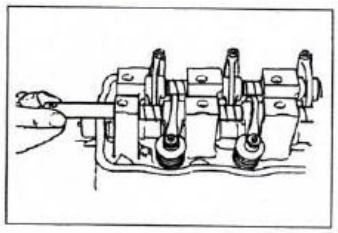
1. Remove front seat
2. Disconnect negative (-) battery cable
3. Remove Engine service cover
4. Drain coolant system
5. Remove air cleaner case
6. Remove water pump
7. Disconnect fuel hose
8. Disconect vacume hoses
9. Disconnect accelerator cable
10. Disconnect wiring
11. Remove timming belt (see previous)
12. Remove cam shaft pulley
13. Disconnect exhaust pipe and Manifold
14. *If equipped Turbo attachments*
15. Remove distributor
16. Remove valve cover
17. Remove cylinder head bolts (8)
18. Remove cylinder head



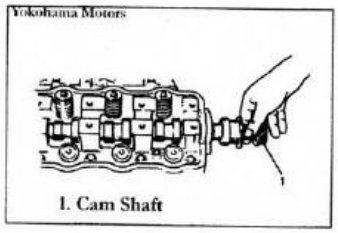
Cylinder Head (2-Valve)



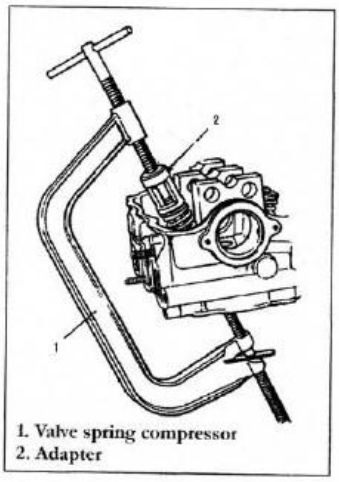
1. Remove Rocket Arm Shafts Screws



2. Remove intake and exhaust rocker arm shaft, then remove rocker arm shaft springs



3. Carefully slide out cam shaft

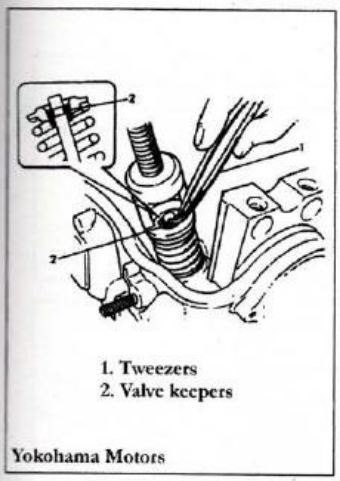


4. Using a valve spring compressor remove springs

note-lable springs from original location

Caution-never hit sticky springs with a steel hammer use only soft brass head hammer

Cylinder Head (2-Valve)

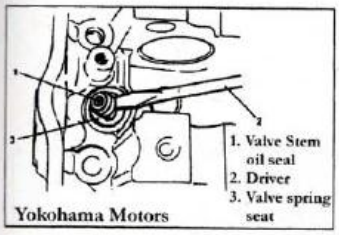


1. Tweezers
2. Valve keepers

Yokohama Motors

Caution- Springs under extream pressure, use saftey glasses when removing springs

7. Remove valve lifter, spring retainer, valve spring
8. Remove valve
9. Remove valve strem oil seal, next remove valve spring seat

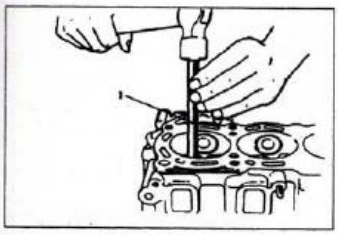


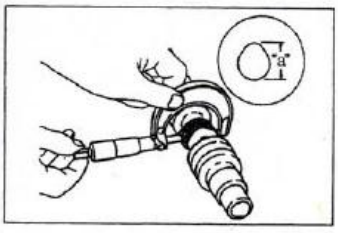
1. Valve Stem oil seal
2. Driver
3. Valve spring seat

Yokohama Motors

Caution-Never re-use oil seals!

Note-if valve guides must be removed use Suzuki tool number (09916-44910)

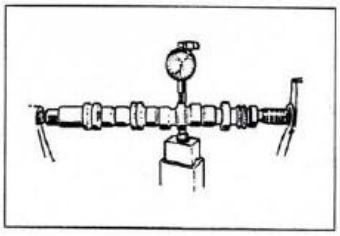




Inspection
Using a micrometer check the cam hight. If it is out of spec replace camshaft

Cam Hight "a"	Acceptable	Limit
Intake cam (mm)	30.74	30.6
Exhaust cam (mm)	29.75	29.6

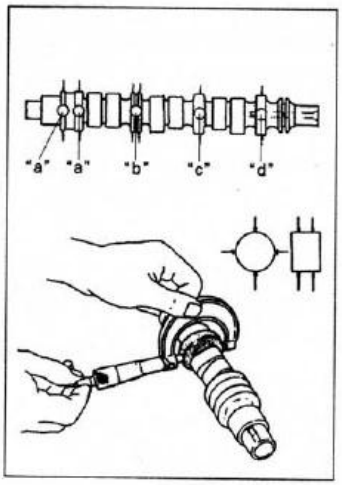
Cylinder Head (2-Valve)



Camshaft Straightness Measurment

Use a dail indicator to measure for straightness rotate the camshaft and observe the reading

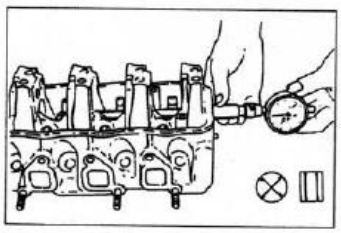
Reading must not exceed 0.10(mm)
If over the limits replace camshaft



Camshaft Journal
*To determine the amount of out-of-round, measure each journal in two different directions and compare to specifications

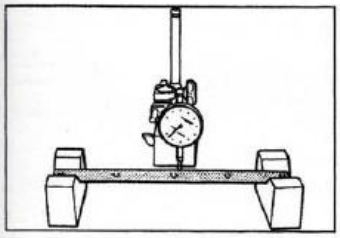
*Also check for joural taper by measuring at each end of the journal

Journal limits: Within limits 0.050-0.091
Replace 0.15



		Camshaft Outside (㎜) Diameter	Cylinder Head Diameter (㎜)
"a"	Normal	43.425~43.450	43.500~43.516
	Limit	43.375	43.525
"b"	Normal	43.625~43.650	43.700~43.716
	Limit	43.575	43.725
"c"	Normal	43.825~43.850	43.900~43.916
	Limit	43.755	43.915
"d"	Normal	44.205~44.050	44.100~44.116
	Limit	43.975	44.125

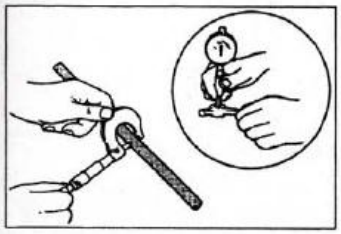
Cylinder Head (2-Valve)



Rocker Arm Shaft Inspection

Use a dial gage to check diameter for warp age

*Maximum allowance 0.12 (mm)

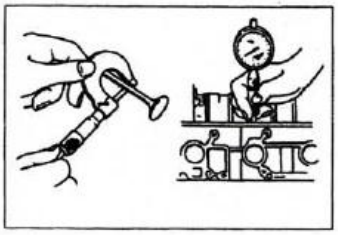


Roker Arm and Roker Arm Shaft Clearance

Rocker Arm and Shaft clearence

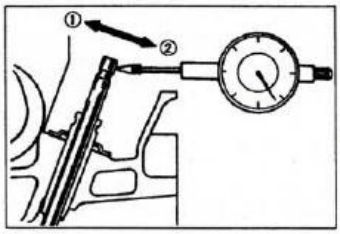
Allowance 0.005-0.040
Replace 0.06

Valve Stem & Guide Measurments



		Allowance	Limit
Valve Stem (mm) outer Diameter	IN	5.465~5.480	–
	EX	5.450~5.465	–
Valve Guide Inside (mm) Diameter	IN	5.500~5.512	5.54
	EX	5.500~5.512	5.54
Stem & Guide Clearence (mm)	IN	0.020~0.050	0.07
	EX	0.035~0.065	0.09

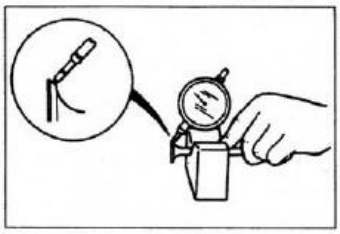
Cylinder Head (2-Valve)



If a bore gage is not available, it is posible to use a dail gage. Use the diagram to the right as an example.

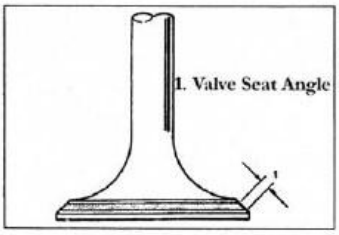
If the play between the stem and the guide are outside the range below. Replace valve guide.

IN 0.14
EX 0.18



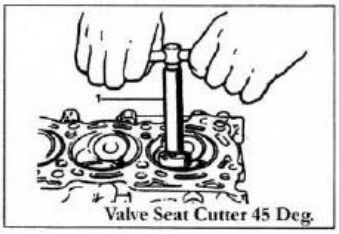
Place a Valve in a V block, and using a dial gage rotate valve.

Maximum allowance: 0.08 (mm)



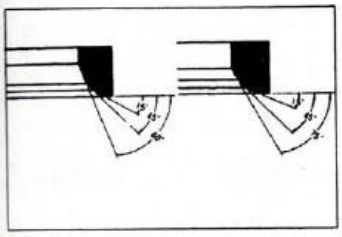
Valve to Valve Seat face

IN 1.3-1.5(mm)
EX 1.3-1.5(mm)

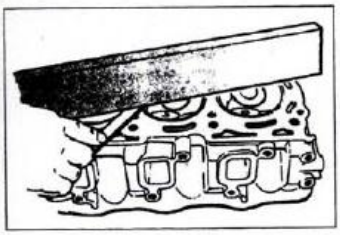

Valve Seat Cutter 45 Deg.

*Use extream caution when cutting valve seats. It is recommended to start with a small cutter and work up to a larger cutter. Finally with 45 degree cutter. It is recommended to take the head to a machine shop for this operation. Over-cutting can cause serious damage to the head.

Cylinder Head (2-Valve)



Valve Lap Degree Diagram

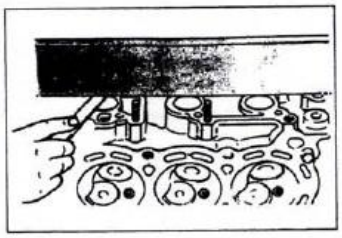


Cylinder Head Plane

Use a straight edge bar and a feeler gage

Allowange 0.05(mm)

Over range, have head machined to spec



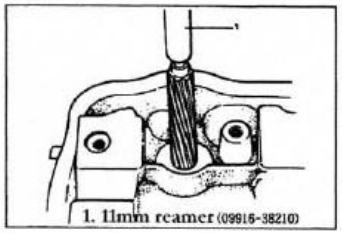
Manifold Face (Cylinder Head)

Use a straight edge bar and a feeler gage.

Allowance 0.10(mm)

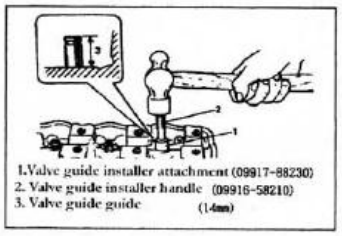
Out of range, have face milled at a machine shop

Cylinder Head (2-Valve)



Assembly

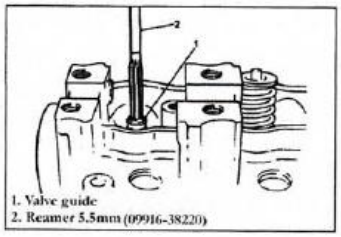
1. Before installation of new valve guides use a 11mm reamer.



2. Pre-heat cylinder head to 80-100 Degrees Celcius Use the proper tools as displayed in the box to the left. Install guides.

Note-if a guide has been removed for any reason it must be replaced with a new guide.

Oversize Guides (mm) 0.03

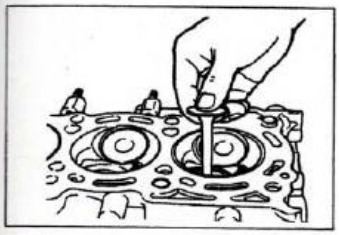


3. After installation, use a 5.5(mm) reamer to verify size.
4. Next place valve spring in place
5. Install new valvle stem oil seal

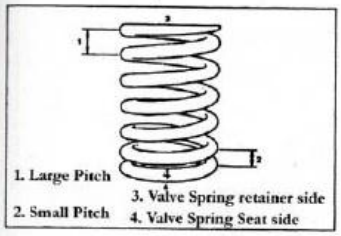
*Note-lubricate new seals with clean engine oil

Cylinder Head (2-Valve)

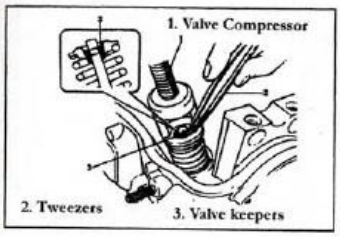
Assembly



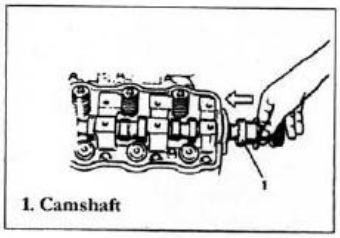
6. Lubricate valve with engine oil and slide into guide. Make sure guide slides without restriction.



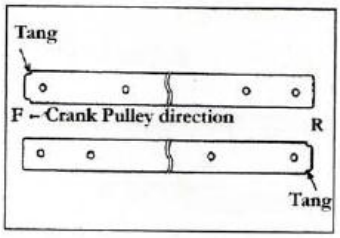
7. See chart on left for proper spring seating



8. Using a valve compressor, install valve keepers

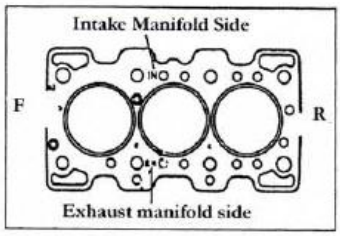


9. Heavily lubricate camshaft with engine oil and install



10. Install rocker arm shaft. Make sure tang is in the correct direction as noted in the diagram on the left.

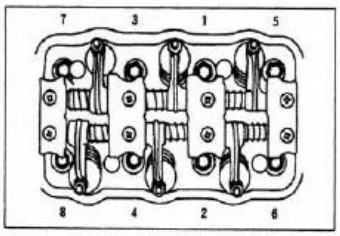
Cylinder Head (2-Valve)



Assembly

Install new head gasket. Follow the diagram on the left for guidence.

Do not use sealant
Make sure all surfaces are clean

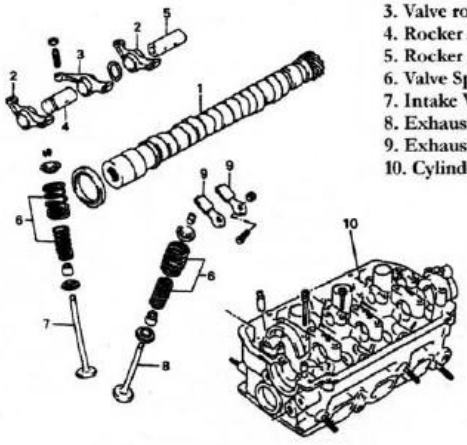


Install head assembly
Torque to (kg.cm) 550-600
Follow torque sequence on the chart to the left

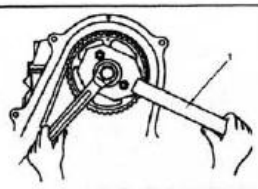
Assemble remaining parts as in previous section of this chapter.

Cylinder Head (4-Valve)

Yokohama Motors



1. Camshaft
2. Valve rocker intake No. 1 Arm
3. Valve rocker intake No.2 Arm
4. Rocker Arm No.1 Shaft
5. Rocker Arm No.2 Shaft
6. Valve Spring Set
7. Intake Valve
8. Exhaust Valve
9. Exhaust Valve Roker Arm
10. Cylinder Head



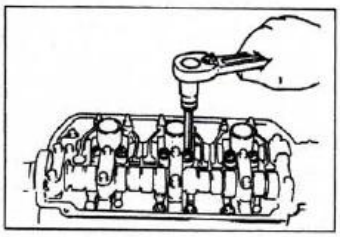
1. Camshaft holder (09917-68220)

Revomal

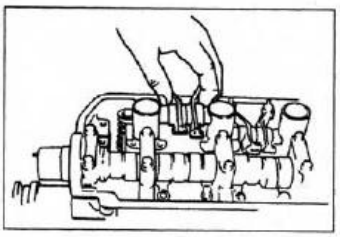
1. Drain coolant system
2. Remove service cover
3. Reome air cleaner case
4. Remove water hose
5. Disconnect vacum hoses
6. Disconnect fuel hose
7. Disconnect accelerator cable
8. Remove timing belt (see previous steps)
9. Disconnect Electrical connectors
10. Remove camshaft timing pulley
11. Remove timing belt inside cover
12. Remove exhaust center pipe
13. Remove exhaust manifold
14. Remove cylinder head

Cylinder Head (4-Valve)

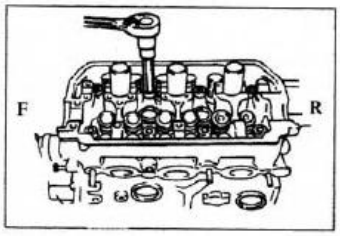
Disassembly



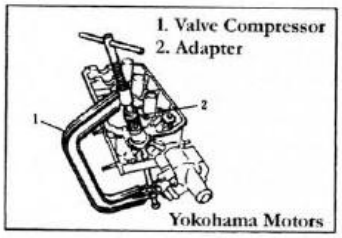
Remove Rocker Arm Shaft



Remove
Intake Rocker Arm
Camshaft Caps
Camshaft



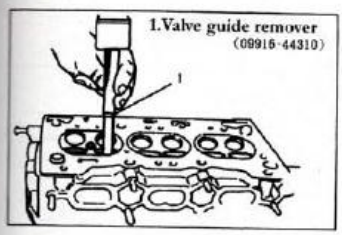
Remove Cylinder head Bolts (8)
Remove Cylinder Head



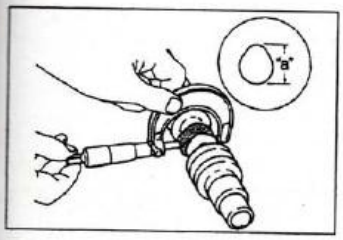
Using a spring compressor remove valves
Spring under extreme pressure, always use proper saftey glasses

Cylinder Head (4-Valve)

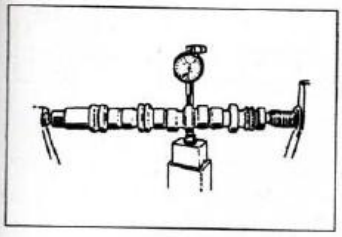
Inspection



Using an appropriate tool, remove valve guides
Note-Never re-use valve guides



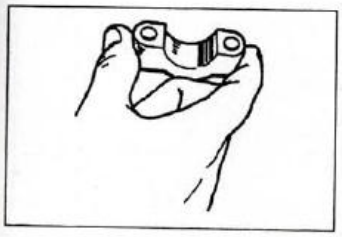
Cam Hight "a"	Allowance	Limit
Intake Cam (mm)	30.74	30.6
Exhaust Cam (mm)	30.20	30.1



Camshaft Warp Age

Using a dail gage, check the camshaft

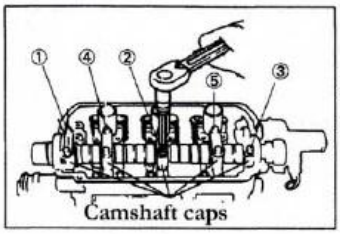
Allowance: Below 0.10 (mm)



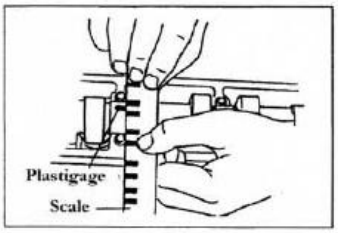
Check the camshaft housing caps for scratches,etc.
If visable damage exists-replace

Cylinder Head (4-Valve)

Inspection

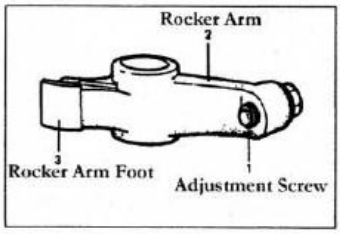


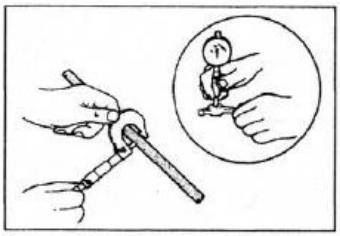
Re-insert camshaft into head and torque caps
Torque (kg.cm) 90-100
Make sure camshaft is well oiled



Using Plastigage, check clearance

Allowance 0.045-0.087(mm)
Limit 0.12(mm)



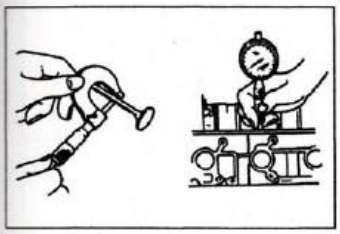


Rocker Arm Shaft Clearance

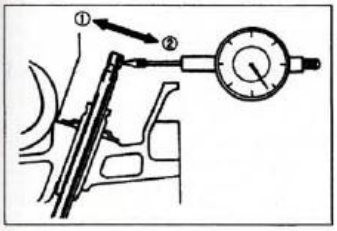
Allowance 0.005-0.040(mm)
Limit 0.006(mm)

Cylinder Head (4-Valve)

Valve Inspection

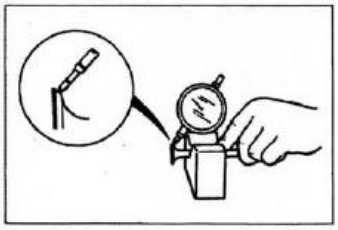


		(mm) Allowance	(mm) Limit
Valve Stem Diameter	I N	4. 965~4. 980	–
	E X	4. 950~4. 965	–
Valve Guide Inner-Dia	I N	5. 000~5. 012	5. 04
	E X	5. 000~5. 012	5. 04
Stem Guide	I N	0. 020~0. 047	0. 07
	E X	0. 035~0. 062	0. 09



If a bore gage is not available, use a dailgage as in the example to the left

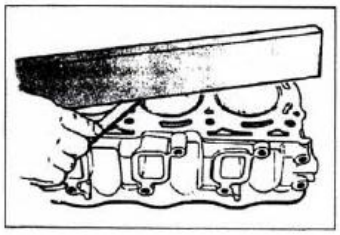
Limit= IN 0.14(mm)
EX 0.18(mm)



Using a V-Block and a dail gage check valve face

Limit= 0.08(mm)

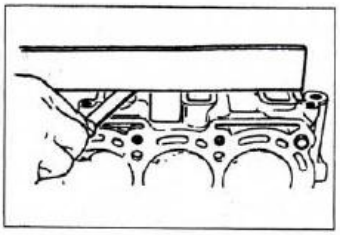
Cylinder Head (4-Valve)



Surfaces

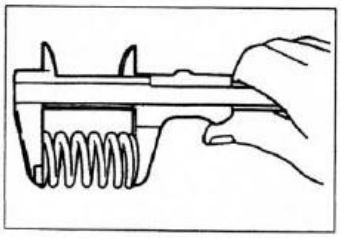
Using a straight edge and a feeler gage, check surface clearance

Allowance 0.05(mm)

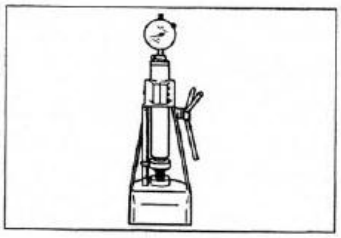


Using a straight edge check clearance

Manifold Face: Allowance 0.10(mm)



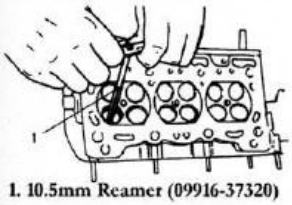
Valve Sping Chart



		Allowance	Limit
Valve Spring(mm)	Inner	32.9	31.8
	Outer	36.6	35.5
Valve Spring Pressure (kg/41.5mm)		24.8~29.2	22.8

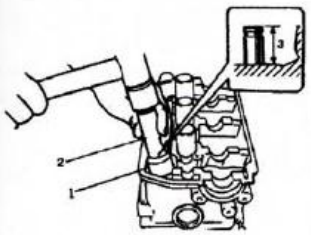
Cylinder Head (4-Valve)

Assembly



1. 10.5mm Reamer (09916-37320)

Using a 10.5(mm) reamer, ream out guide holes



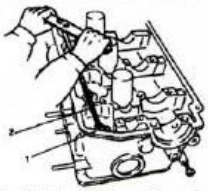
1. Valve guide installer attachment
2. Valve guide installer handle
3. Valve guide guide

Warm cylinder head to between 80-100 degrees Celsius.

Use proper valve guide installation tools

Note-Never re-use valve guides

Maximum oversize guide use: 0.03(mm)



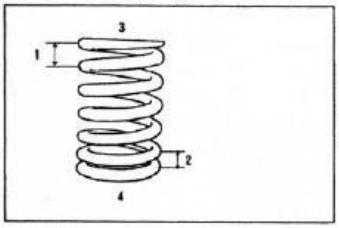
1. Valve Guide 2. 5mm Reamer

After guide installation, use a 5mm reamer to clean guide holes

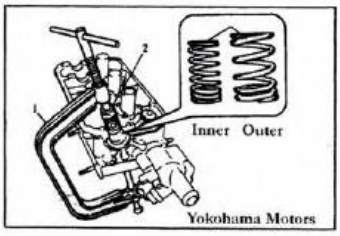
Make sure no shavings are left in the holes

Cylinder Head (4-Valve)

Valve Spring Assembly



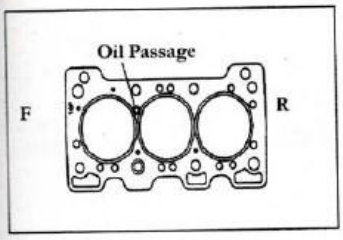
1. Large Pitch Side
2. Small Pitch Side
3. Valve Spring Retainer Side
4. Valve Spring Seat Side



Assemble Springs and valves using a spring compressor as shown

Cylinder Head (4-Valve)

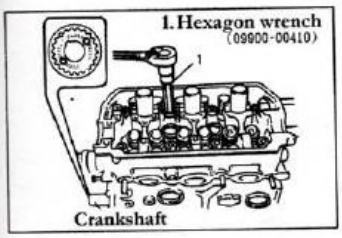
Assembly



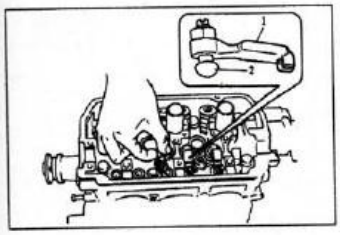
Install head gasket using the diagram on the left.

Make sure the gasket is oil free and clean

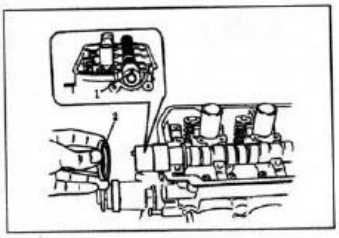
Do not use sealant on the head gasket



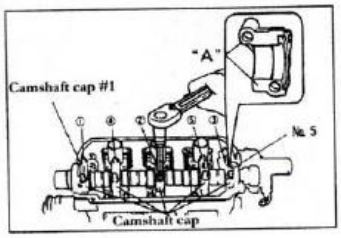
Cylinder Head Torque 600-650(kg.cm)



1. Arm
2. Pivot



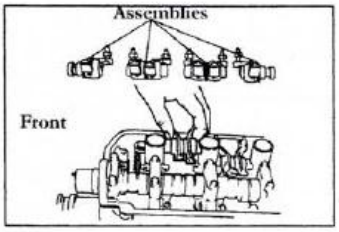
1. Timing Pulley Key
2. Oil Seal



Camshaft Torque Spec

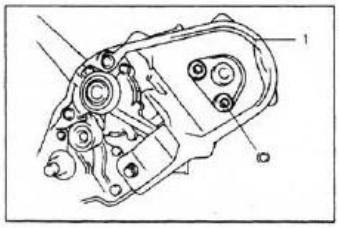
(kg.cm) 90-120

Cylinder Head (4-Valve)



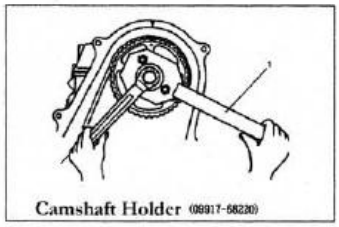
Assembly

Assemble Rocker Arms



1. Timing Belt Inside Cover

Timing Belt Inside Cover (kg.cm) 90-120
Do not over torque

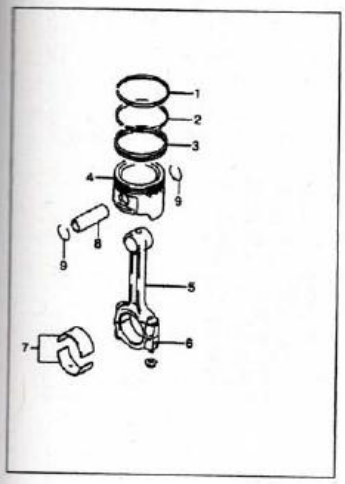


Set Camshaft pulley torque (kg.cm) 500-600

Assemble accessories and attachments

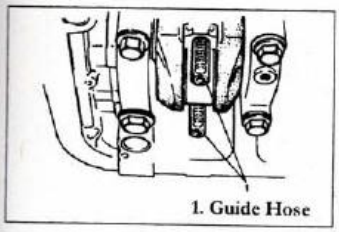
Set Valve Lash To Spec (see previous)

Piston & Rings-Connecting Rod-Cylinder



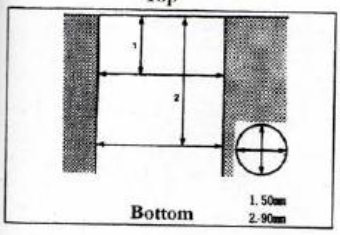
Piston Diagram 660cc 2 Valve and 4 Valve

1. Top Ring
2. 2nd Ring
3. Oil Ring
4. Piston Ring
5. Connecting Rod
6. Bearing Cap
7. Bearings
8. Piston Pin
9. C-Clip



Note-When removing pistons place vacume hose or fuel hose over the bolt ends to prevent cylinder wall scratches during removal

Cylinder Diagram
Top

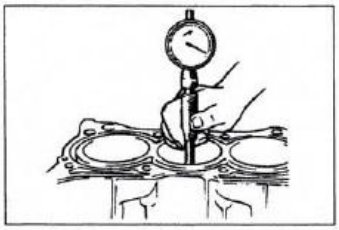


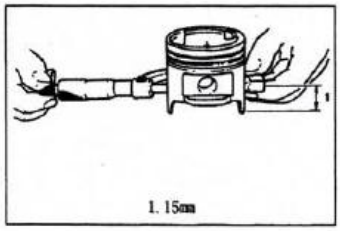
After piston removal check for a lip to determine excessive wearing. Excessive wearing will require cylinder boring. Oversize pistons and rings are available in 0.25(mm) or maximum 0.50(mm) sizes.

Use the chart on the left to determine diameter limits. The following charts and diagrams provide the correct sizes per boring requirments

Piston & Rings-Connecting Rod-Cylinder

Cylinder Bore Measurements





Cylinder Bore

Inside Diameter: 65.070(mm)
Taper Limit: 0.10(mm)

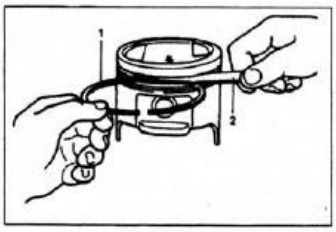
Note: If one or more cylinders are out of round or limits, all cylinders must be bored to the same size.

Piston Size

Piston Diameter (mm)	Allowance	64.965~64.985
	Oversize 0.25	65.215~65.235
	Oversize 0.50	65.465~65.485

Piston Rings

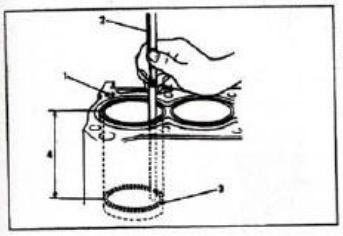
1. Piston Ring
2. Thickness Gage



Ring Clearance Chart

Ring Side Clearance	Piston Ring	Allowance	Limit
	Top	0.03~0.07	0.12
	Second	0.02~0.06	0.10

Piston & Rings-Connecting Rod-Cylinder



Measure Ring End Gap

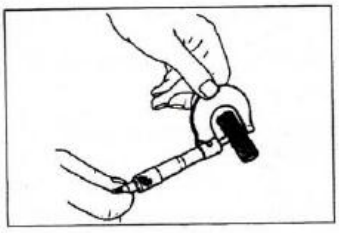
Before installing new piston rings, the ring end gap must be checked.

1. Cylinder Block
2. Feeler Gage
3. Piston Ring

Note: Check from top to bottom of cylinder

		Allowance	Limit
	Top Ring	0.12~0.27	0.7
	2nd Ring	0.15~0.30	0.7
	Oil Ring	0.20~0.70	1.8

Piston Pin

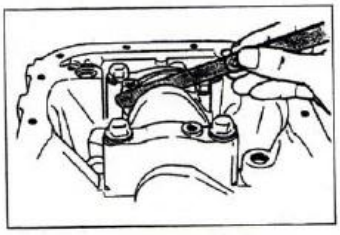


Piston Pin and Piston Boss Clearance

Piston Pin Hole		
	Allowance	
Outer	17.995~18.000 (15.995~16.000)	–
Piston Boss Inner Dia	18.006~18.014 (16.006~16.014)	–

( ) =4Valve

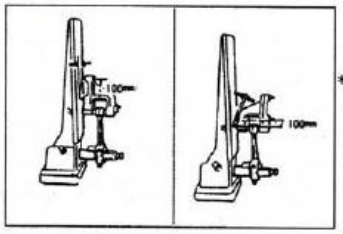
Connecting Rod Side Clearence



Connecting Rod Clearance

Allowance: 0.1-0.2(mm)

Piston & Rings-Connecting Rod-Cylinder



Alignment Machine

Connecting Rod Alighment

If a rod knocking noise was detected before disassembly, this test should be preformed

Bend Rate Failure @ 0.05(mm)
Twist Rate Failure @0.10(mm)

Connecting Rod Bearings

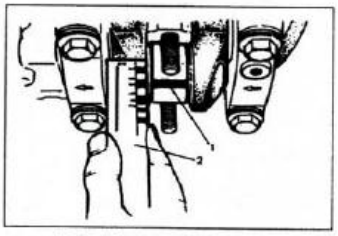
Note: Do Not Remove Old Bearings With Sharp Tools Damage Will Occure

Note: Always replace both upper and lower bearing as a set

Note: If an irregularty is indicated, measure the crank journal with a micrometer

Note: Only standard (STD) replacement bearings available

Warning: Do not rotate the crankshaft while gaging material is between the bearing and journal



1. Plastigage 2. Scale

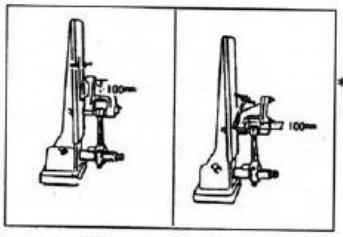
Bearing Clearance Measurement

Clearance
Allowance 0.020-0.040(mm)

Bearing Size
Normal: STD
Crankshaft (mm) 35.982-36.00

Bearing Cap Torque (kg.cm) 310-350

Piston & Rings-Connecting Rod-Cylinder



Alignment Machine

Connecting Rod Alighment

If a rod knocking noise was detected before disassembly, this test should be preformed

Bend Rate Failure @ 0.05(mm)
Twist Rate Failure @0.10(mm)

Connecting Rod Bearings

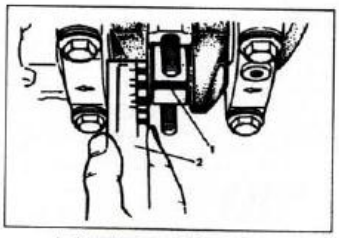
Note: Do Not Remove Old Bearings With Sharp Tools Damage Will Occure

Note: Always replace both upper and lower bearing as a set

Note: If an irregularty is indicated, measure the crank journal with a micrometer

Note: Only standard (STD) replacement bearings available

Warning: Do not rotate the crankshaft while gaging material is between the bearing and journal



1. Plastigage 2. Scale

Bearing Clearance Measurement

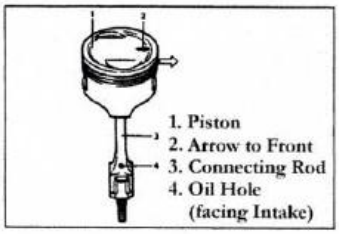
Clearance
Allowance 0.020-0.040(mm)

Bearing Size
Normal: STD
Crankshaft (mm) 35.982-36.00

Bearing Cap Torque (kg.cm) 310-350

Piston & Rings-Connecting Rod-Cylinder

Piston Assembly

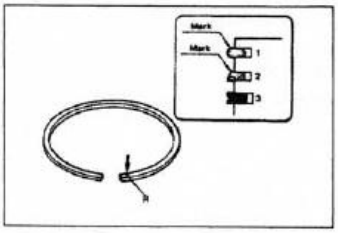


1. Piston
2. Arrow to Front
3. Connecting Rod
4. Oil Hole (facing Intake)

Note: Always use new piston rings

Install the connecting rod to the piston, making sure the piston direction arrow on the piston facing the front of the engine.

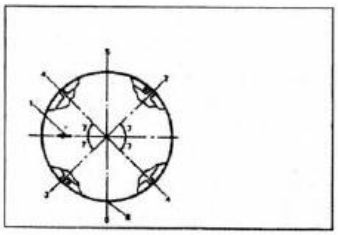
Make sure the piston pin is well lubricated, install retaining clips and verify they are well seated.



Piston Ring Chart

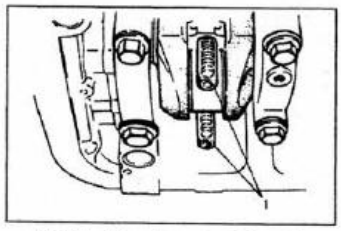
1. Top Compression Ring
2. Secondary Compression Ring
3. Oil Ring

Ring Gap Location



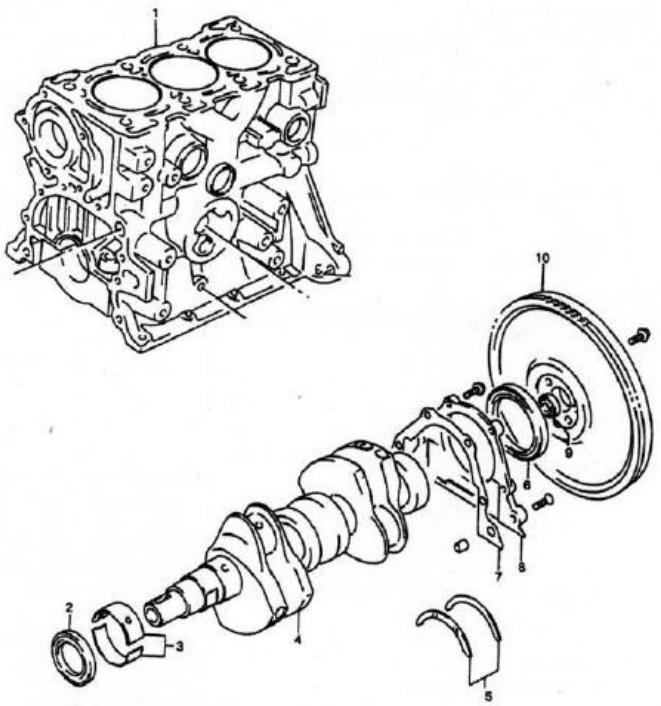
Use the chart to the left for Ring Gap Direction

1. Arrow (Pointing to front of engine)
2. Top Compression Ring
3. Second Compression Ring
4. Oil Ring
5. Intake direction
6. Exhaust direction
7. 45 degrees
8. Oil Ring



1. Guide Hose to protect journal

Main Bearing-Crankshaft, Cylinder Block

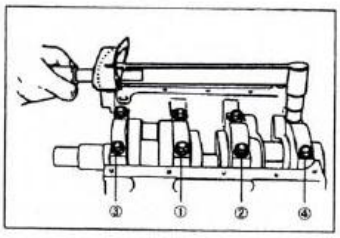


1. Cylinder Block
2. Front Main Seal
3. Main Bearing
4. Crankshaft
5. Thrust Bearing
6. rear Oil Seal
7. Oil Seal Housing Gasket
8. Oil Seal Housing
9. Input Shaft Bearing
10. Flywheel

Yokohama Motors

Main Bearing-Crankshaft, Clyinder Block

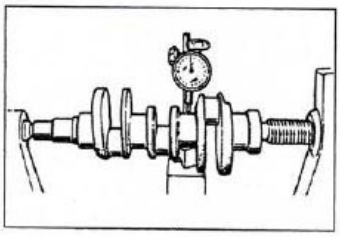
Crankshaft Inspection



*Note: Before removing crankshaft verify previous torque setting were correct

Follow the torque sequence guild to the left.
Torque should be (kg.cm) 550-600

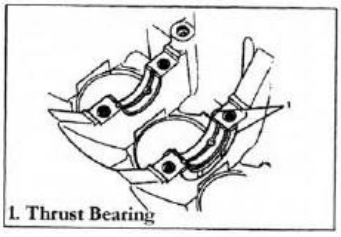
Remove Crankshaft



Crankshaft Journal Taper/Out of round Limit
Using a dial gage check the crankshaft. The test should involve minimum 3 turns per Journal

Out of round Limit: 0.03(mm)

Thrust Bearing



1. Thrust Bearing

Inspect thrust bearings for unusual ware.

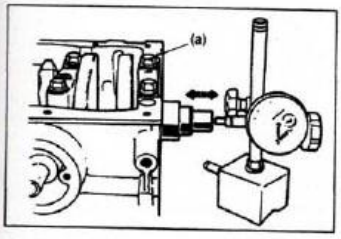
Remove thrust bearings and discard

*Not: Do not re-use thrust bearings

Replace with new bearings

Main Bearing-Crankshaft, Cylinder Block

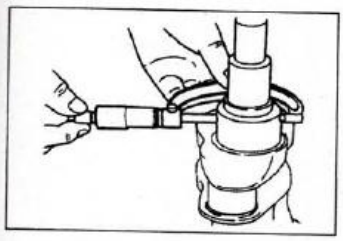
Crankshaft Inspection



Main Bearing torque (kg.cm) 550-600

Cranckshaft End-Play

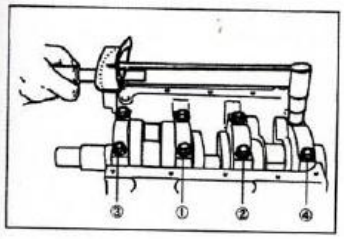
Allowance: 0.13-0.28(mm)



Using a micrometer, check journal taper

Crankshaft Journal STD
43.982-44.000(mm)

Journal Taper Allowance: 0.01(mm)

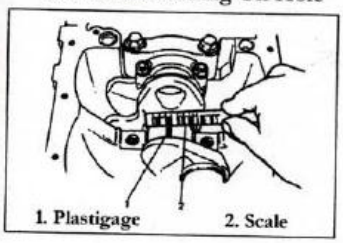


Re-Install Crankshaft and torque to Spec

Torque (kg.cm) 550-600

Use the diagram on the left for sequence

Crankshaft Bearing Oil Hole

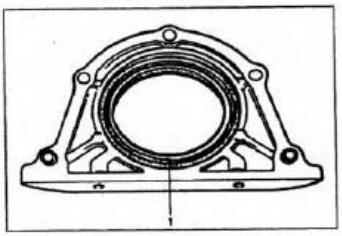


Crankshaft Bearing Orifice
(Oil Hole)

Allowance: 0.020-0.040(mm)

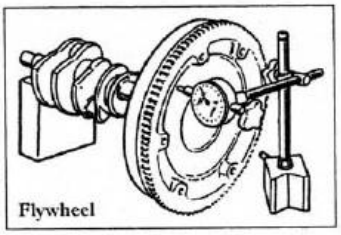
Main Bearing-Crankshaft, Cylinder Block

1. Rear Oil Seal



Install new rear oil seal

*Note: Take cuation not to damage seal Lip

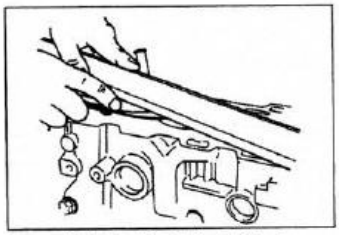


Flywheel

Flywheel Roundness Check

Limit (mm) 0.2

Flywheel Torque: (kg.cm) 400-450



Cylinder Block Deck Check

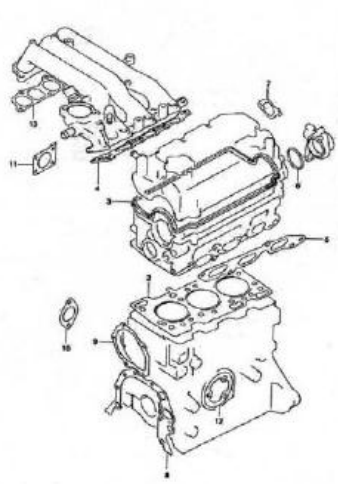
Using a straight edge bar and a feeler gage check head deck for levelness

Allowance: 0.05(mm)

Out of spec, have deck re-surfaced

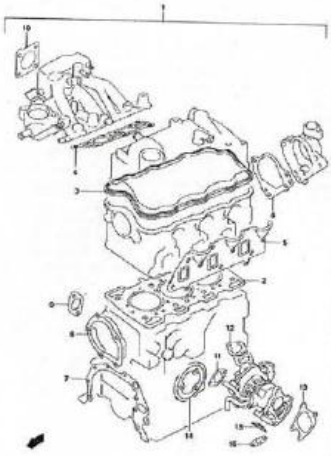
Engine Related Diagrams & Part Numbers

Engine Gasket Set (4V)



1. #11402-78881 Gasket Set: Engine
2. #11141-81401 Gasket: Cylinder Head
3. #11189-81402 Gasket Cylinder Head Cover
4. #13119-71G00 Gasket Intake Manifold
5. #14114-63F00 Gasket: Exhaust Manifold
6. #11162-81400 O Ring
7. #17699-53F01 Gasket
8. #16119-76G00 Gasket: Oil Pump
9. #17431-73001 Gasket: Water Pump
10. #17559-73000-H17 Gasket: Water Inlet
11. #13421-77G00 Gasket: Throttle Body
12. #16539-76001 Gasket: Oil Filter Adapter Case (4WD)
13. 13139-60H30 Gasket

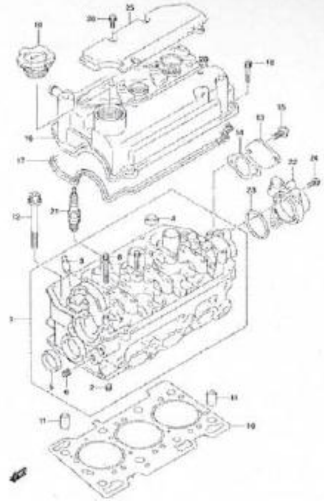
Engine Gasket Set (4V)



Turbo-4V

1-1	11401-78894	Gasket Set, Engine	
1-2	11401-60810	Gasket Set, Engine: DA52V-DB52V-DA52W	
2	11141-81401	Gasket: Cylinder Head	
3	11189-70D50	Gasket: Valve Cover	
4	13119-84360	Gasket: Intake Manifold	
5	14141-67F02	Gasket: exhaust Manifold	
6-1	11169-70D00	Gasket: Case	
6-2	11169-76G00	Gasket: Case	DA52T-DB52T-DA52V-DB52V-DA52W
7	16119-76G00	Gasket: Oil Pump Case	
8	17431-73001	Gasket: Water Pump	
9	17559-73000-H17	Gasket: Water Inlet	
10	13421-77G00	Gasket: Throttle Body	
11	13955-56F00	Gasket: Intake Air Pipe	
12	13965-56F00	Gasket: Outlet Air Pipe	
13-1	14182-72B51	Gasket: Turbo Outlet Pipe	
13-2	14182-60H50	Gasket: Turbo Outlet Pipe	DA52V-DB52V-DA52W
14	16539-76001	Gasket: Oil Filter Adapter Case	
15	14181-81051	Gasket: Exhaust No.1	
16	13945-70G50	Gasket: Oil Drain	

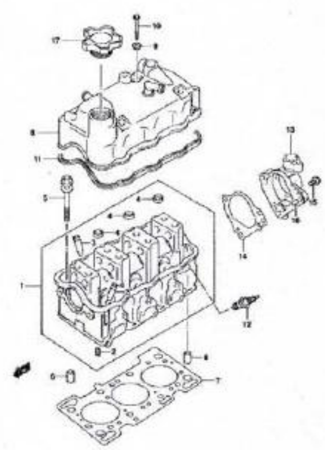
Cylinder Head (4V)



DA52T-2 003
CYLINDER HEAD (4V)

1. 11100-77G00 Cylinder Head Assembly
2. 11112-53A00 Plug: Oil Venturi
3. 11115-77G00-001 Valve Guide
4. 09241-20006 Plug, Outside Diameter:20
5. 09241-30009 Pug, OD:30
6. 09246-05006 Plug, 1/8PT, H:5.5
7. 09206-08001 Pin, 6.2x8x11
8. 07130-06403 Bolt
9. 09103-06185 Bolt, 6x20
10. 11141-81401 Gasket: Cylinder Head
11. 04211-13189 Pin
12. 1117-52E10 Bolt: Cylinder Head
13. 11116-79A00 Plate: Cylinder Head
14. 17699-53F01 Gasket
15. 01550-08203 Bolt
16. 11170-79A01 Cover: Cylinder Head
17. 11189-81402 Gasket: Cylinder Head Cover
18. 01550-06253 Bolt
19. 16920-86502 Cap: Oil Filler
20. 11179-81402 O Ring
21-1. #09482-00448 Spark Plug: DCPR7E (NGK)
21-2. #09482-00449 Spark Plug: XU22EPR-U (Denso)
22. 33221-76G00 Case: Cam Posistion Sensor
23. 11162-81400 O Ring
24. 01550-06203 Bolt
25. 11180-77G00 Cover: Cylinder Head Upper
26. 01547-06163 Bolt

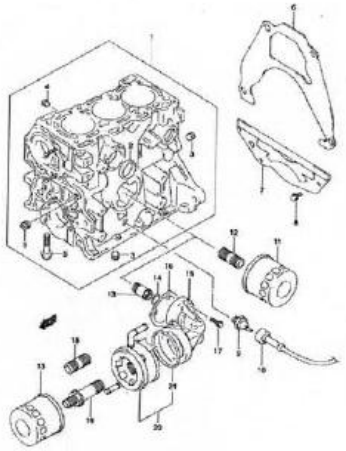
Cylinder Head (Turbo)



CYLINDER HEAD (TURBO)

1. 11110-7002 Cylinder Head
2. 11112-73002 Plug: Oil Venturi
3. 11115-62D00-001 Valve Guide
4. 09241-20006 Plug: OD:20
5. 09116-101116 Bolt 10x87
6. 04211-13189 Pin
7. 11141-81401 Gasket: Cylinder Head
8. 11170-60H50 Cover: Cylinder Head
9. 11180-60B00 Seal/Washer Cylinder Head Cover
10. 09113-06002 Bolt 6x65
11. 11189-70D50 Cover Gasket
12-1. BPR5E (NGK) Spark Plug
12-2. W16EPR-U (Denso) Spark Plug
13. 11161-78A50 Case: Cam Position Sensor
14. 11169-76G00 Gasket
15. 09103-08152 Bolt 8x25
16. 04221-06129 Pin
17. 16920-86502 Cap: Oil Filter

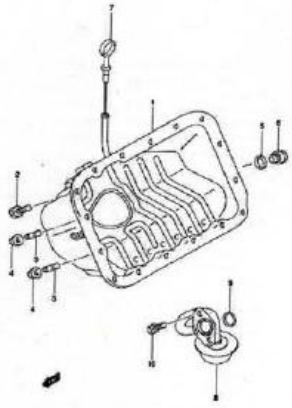
Cylinder Block



1-1.	11200-53F10	Block Assembly (4V)
1-2.	11200-55F00	Block Assembly (Turbo)
2.	09241-300009	Plug, OD:30
3.	09246-60002	Plug, 1/4PT, H:7.5
4.	09246-05006	Plug, 1/8PT, H:5.5
5.	09103-10022	Bolt 10x54
6-1.	11310-78A00	Plate Clutch Housing Upper (MT)
6-2.	11311-78A20	Plate Clutch Housing Upper (AT)
7-1.	11320-78A02	Plate Clutch Housing Lower (MT)
7-2.	11320-78A21	Plate Clutch Housing Lower (AT)
8-1.	01550-06103	Bolt (MT)
8-2.	01550-06103	Bolt (AT)
9.	37820-82001	Oil Pressure Switch
10.	36895-78A01	Oil Pressure Wire
11-1.	16510-82703	Oil Filter (Tokyo ROKI)
11-2.	16510-81403	Oil Filter (Denso)
12.	11241-7300	Adapter Pipe
13.	11241-85400	Oil Filter (4V-4WD-Turbo)
14.	09280-16005	O Ring
15.	16530-78A00	Cover Oil Cooler Adapeter
16.	16539-76001	Gasket
17.	01550-06253	Bolt
18.	11241-73003	Adapter Adachemnt Pipe
19.	11241-82C00	Oil Cooler Adapter Pipe
20.	16600-78A00	Oil Cooler Asembly
21.	16221-78A00	Gasket

Cylinder Block

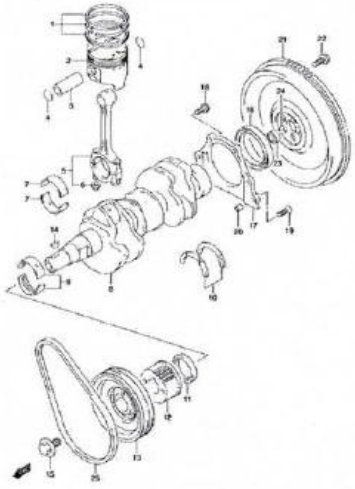
Oil Pan



1.	11510-78A10	Oil Pan
2.	09117-06033	Bolt 6x12
3.	01411-06123	Stud
4.	08316-10063	Nut
5.	09247-14027	Plug
6.	09168-14015	Gasket
7.	16910-78A01	Oil Level Stick (Dip Stick)
8.	16520-78A00	Strainer
9.	09280-16005	O Ring
10.	01570-06163	Bolt

Oil Pan

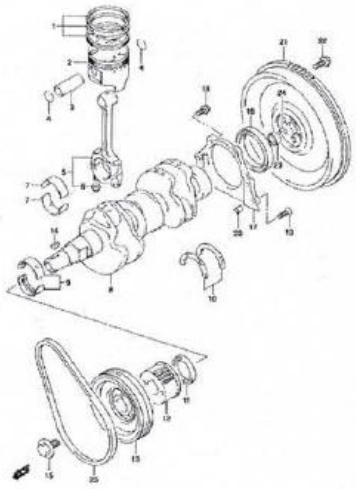
Crankshaft (4V)



1-1.	12140-51F10	Ring Set: Piston STD
1-2.	12140-51F10-025	Ring Set: Piston OS: 0.25
1-3.	12140-51F10-050	Ring Set: Piston OS: 0.50
2-1.	12111-71G00-0B0	Piston: STD
2-2.	12111-71G00-025	Piston: OS: 0.25
2-3.	12111-71G00-050	Piston: OS: 0.50
3.	12151-78110	Piston Pin
4.	09381-16001	Snap Ring
5.	12160-60D02	Connecting Rod Assembly
6.	09159-08033	Nut
7-1.	12181-81401-0A0	Con Rod Bearing STD
7-2.	12181-81401-025	Con Rod Bearing US: 0.25
8.	12221-50E00	Crankshaft
9-1.	12300-61810-0A0	Crankshaft Bearing Set STD
9-2.	12300-61810-025	Crankshaft Bearing Set US:0.25
10-1.	12300-82820	Thrust Bearing: T:2.5
10-2.	12300-82820-012	Thrust Bearing: T:2.563
11.	09283-32042	Oil Seal 32x47x6
12.	12631-61D01	Timing Belt Pulley
13.	12610-61H00	Crankshaft Pulley
14.	08341-31059	Key
15.	12619-60B00	Crankshaft Pulley Bolt

Cranshaft (4V)

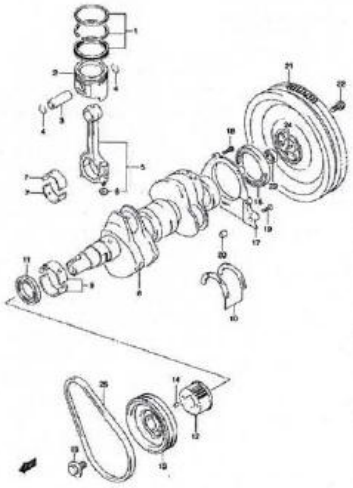
Crankshaft (4V) Part 2



16.	09283-60005	Oil Seal, 60x80x8
17.	11341-70B01	Housing Oil Seal
18.	01550-06203	Bolt
19.	02122-06253	Screw
20.	04211-09109	Pin
21.	12620-78A00	Flywheel
22.	09103-10097	Bolt 10x17
23.	12623-70B00	Bearing: Input Shaft
24-1.	04221-06129	Pin (MT)
24-2.	09205-06009	Spring Pin 6x14 (AT)
25.	17521-78A01	Belt: Alternator L:758mm (LFM-30)

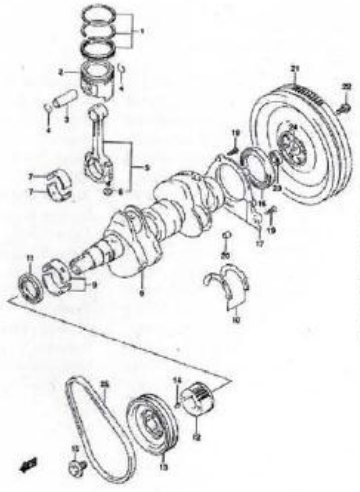
Crankshaft (4V)

Crankshaft (Turbo)



1-1.	12140-50E50	Ring Set: Piston STD
1-2.	12140-50E50-025	Ring Set: Piston OS 0.25
1-3.	12140-50E50-050	Ring Set: Piston OS 0.50
2-1.	12111-78A50-0B0	Piston: STD (Truck)
2-2.	12111-60D51-0B0	Piston: STD (Van)
2-3.	12111-78A50-025	Piston: OS 0.25 (T)
2-4.	12111-60D51-025	Piston: OS 0.25 (Van)
2-5.	12111-78A50-050	Piston: OS 0.50 (Truck)
2-6.	12111-60D51-050	Piston: OS 0.50 (Van)
3.	12151-54A50	Piston Pin (T&V)
4.	09381-18005	Snap Ring
5-1.	12160-76G50	Connecting Rod Assembly (T)
5-2.	12160-60d51	Connecting Rod Assembly (V)
6.	09159-08033	Nut
7-1.	12181-81401-0A0	Con Rod Bearing (T)
7-2.	12181-81051-0A0	Con Rod Bearing (V)
7-3.	12181-81401-025	Bearing: UnderSize: 0.25 (T)
7-4.	12181-81051-025	Bearing: US 0.25 (Van)
8-1.	12221-50E00	Crankshaft (T)
8-2.	12221-60H50	Crankshaft (V)
9-1.	12300-61810-0A0	Bearing Set Crankshaft STD (T &V)
9-2.	12300-61810-025	Bearing US: 0.25 (T&V)
10-1.	12300-82820	Thrust Bearing T:2.5
10-2.	12300-82820-012	Thrust Bearing T:2.563
11.	09283-32042	Oil Seal 32x47x6

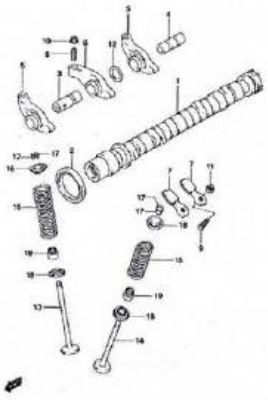
Crankshaft (Turbo)



12.	12631-61D01	Timing Belt Pulley
13.	12610-61H00	Crankshaft Pulley
14.	08341-31059	Key
15.	12619-60B00	Crankshaft Pulley Bolt
16.	09283-60005	Oil Seal 60x80x8
17.	11341-70B01	Oil Seal
18.	01550-06203	Bolt
19.	02122-06253	Screw
20.	04211-09109	Pin
21.	12620-78A00	Flywheel
22.	09103-10097	Bolt 10x17
23.	12623-70B00	Bearing: Input Shaft
24-1.	04221-06129	Pin (MT)
24-2.	09205-06009	Spring Pin 6x14 (AT)
25.	17521-78A01	Alternator Belt: L:758mm (LFM-30)

Crankshaft (Turbo)

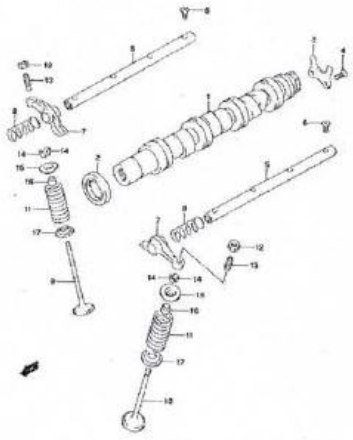
Camshaft-Valves (4V)



1.	12710-7900	Camshaft
2.	09283-35047	Oil Seal 35x47x6
3.	12861-71G00	Shaft: Rocket Arm No. 1
4.	12862-71G00	Shaft: Rocker Arm No.2
5.	12841-77G11	Rocker Arm: Intake No.1
6.	12844-77G11	Rocker Arm: Intake No.2
7.	12845-77G00	Rocker Arm: Exhaust
8.	12842-77G00	Adjustment Screw: Intake
9.	12846-61D00	Adjustment Screw
10.	12843-32400	Nut
11.	12843-66D00	Nut
12.	12891-814H0	Washer
13.	12911-77G00	Valve: Intake
14.	12915-77G00	Valve: Exhasut
15.	12921-51E00	Spring: Valve
16.	12931-77G00	Retainer
17.	12932-24400	Keeper (Valve)
18.	12933-51E00	Seat: Valve Spring
19.	09289-05012	Seal: Valve Stem

Camshaft-Valves (4V)

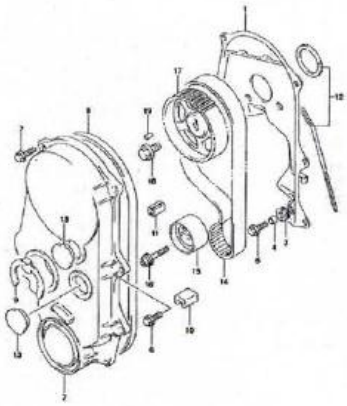
Camshaft-Valves (Turbo)



1.	12710-60H50	Camshaft
2.	09283-32042	Oil Seal 32x47x6
3.	12749-73002	Plate: Camshaft Thrust
4.	02122-06123	Screw
5.	12860-78102	Shaft: Valve Rocker
6.	02122-06163	Screw
7.	12841-77300	Arm: Valve Rocker
8.	12891-51G00	Spring: Rocker Arm
9.	12911-70B30	Valve: Intake
10.	12915-70B00	Valve: Exhaust
11.	12921-60H00	Spring: Valve
12.	09159-07002	Nut
13.	12848-73010	Screw
14.	12932-24400	Keeper (Valve)
15.	12931-60B01	Retainer
16.	09289-05012	Valve Stem Seal
17.	12933-86510	Seat: Valve Spring

Camshaft-Valves (Turbo)

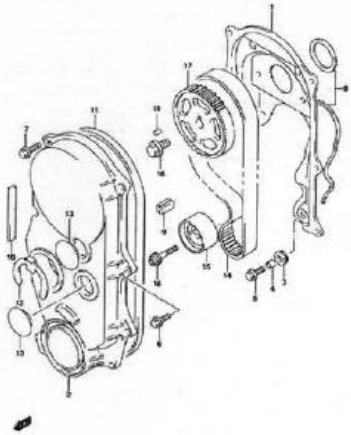
Timing Belt (4V)



1.	11360-79A00	Cover: Timing Belt Inside
2.	11390-77G01	Cover: Outside
3.	09308-10004	Grommet
4.	09180-06106	Spacer 6.8x10x7
5.	09116-06167	Bolt 6x20
6.	01550-06163	Bolt
7.	01550-06203	Bolt
8.	11396-77G00	Seal: Timing Belt Cover-Outside
9.	11397-76G00	E-Ring: Timing Belt Cover
10.	11394-77G00	Seal
11.	11394-70B00	Seal
12.	11480-77G00	Seal Set: Timing Cover-Inside
13.	09250-30017	Cap: OD:36
14.	12761-79A00	Belt: Timing
15.	12810-76G00	Tensioner
16.	12815-76G00	Bolt: Tensioner
17.	12741-61D01	Pulley: Camshaft Timing
18.	01550-12253	Bolt
19.	09206-05001	Pin

Timing Belt (4V)

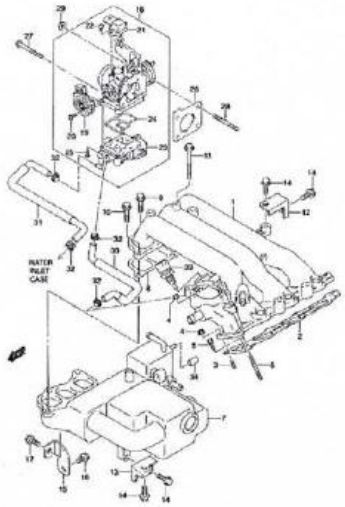
Timing Belt (Turbo)



1.	11360-78A00	Cover: Timing Belt-Inside
2.	11390-76G01	Cover: Outside
3.	09308-10004	Grommet
4.	09180-06106	Spacer: 6.8x8x10x7
5.	09116-06167	Bolt 6x20
6.	01550-06163	Bolt
7.	01550-06203	Bolt
8.	11480-76G00	Seal Set:Timing Cover-Inside
9.	11394-70B00	Seal
10.	11395-76G00	Seal
11.	11396-76G00	Seal
12.	11397-76G00	E Ring: Timing Cover
13.	09250-30017	Cap: OD:36
14.	12761-78A00	Belt: Timing
15.	12810-76G00	Tensioner
16.	12815-76G00	Tensioner Bolt
17.	12741-70D00	Pulley: Camshaft Timing
18.	01550-12253	Bolt
19.	09206-05001	Pin

Timing Belt (Turbo)

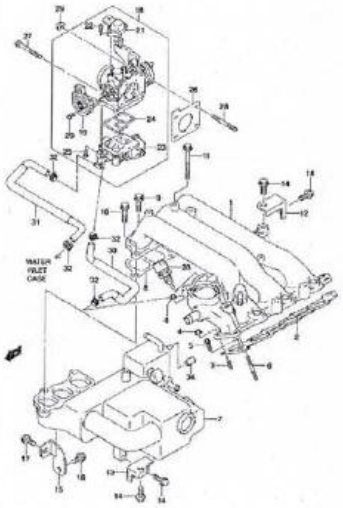
Intake Manifold/Throttle Body (4V)



Intake Manifold/Throttle Body (4V)

1.	13110-60H30	Intake Manifold
2.	13119-71G00	Gasket: Intake Manifold
3.	01411-06203	Stud Bolt
4.	08316-10063	Nut
5.	01550-06203	Bolt
6.	01411-06603	Stud Bolt
7.	13130-60H30	Surge Tank
8.	13139-60H30	Gasket: Surge Tank
9.	01550-08253	Bolt
10.	01550-08303	Bolt
11.	01550-08803	Bolt
12.	13161-60H30	Bracket: Intake Manifold No.1
13.	13162-60H30	Bracket: Intake Manifold No.2
14.	01550-08203	Bolt
15.	13163-60H30	Bracket: Surge Tank
16.	01550-08163	Bolt
17.	01550-08203	Bolt
18.	13400-60H30	Throttle Body Assembly
19.	13420-77G00	Throttle Body Position Sensor
20.	13428-77G10	Screw
21.	18590-72F21	Pressure Sensor
22.	13601-05148	Screw 5x14
23.	18117-60H30	Valve: Idle Throttle Control
24.	14139-77G10	Gasket: Valve
25.	13601-05148	Screw 5x14

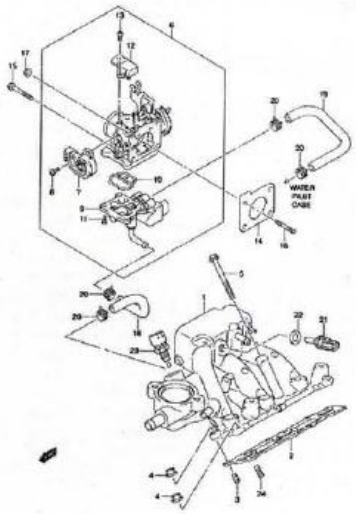
Intake Maniford/Throttle Body (4V) Part 2



Intake Maniford/Throttle Body (4V) Part 2

26.	13421-77G00	Gasket: Throttle Body
27.	01550-06503	Bolt
28.	01421-06453	Stud Bolt
29.	08316-10063	Nut
30.	13491-60H30	Hose: Water-TB Inlet
31.	13492-60H30	Hose: Water-TB Outlet
32.	09401-12410	Clip
33.	13650-50F10	Water Pressure Sensor
34.	09250-04003	Plug: OD:8

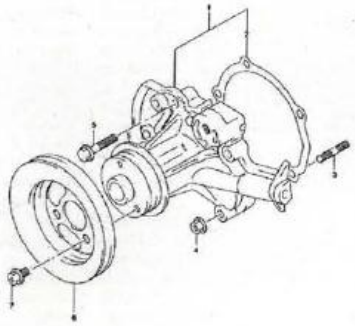
Intake Manifold/Throttle Body (Turbo)



1.	13110-60H50	Intake Manifold
2.	13119-84360	Gasket: Intake Manifold
3.	01411-08203	Stud Bolt
4.	08316-10083	Nut
5.	01550-08953	Bolt
6.	13400-78A50	Throttle Body Assembly
7.	13420-77G00	Throttle Position Sensor
8.	13428-77G10	Screw
9.	18117-78A50	Valve: Idle Control
10.	14139-70G30	Gasket
11.	13601-05148	Screw 5x14
12.	18590-76G50	Pressure Sensor
13.	13428-77G10	Screw
14.	13421-77G00	Throttle Body Gasket
15.	01550-06503	Bolt
16.	01421-06453	Stud Bolt
17.	08316-10063	Nut
18.	13491-78A50	Hose: Water Inlet
19.	13492-78A50	Hose: Water Outlet
20.	09401-12410	Clip
21.	13650-61B00	Temp Sensor
22.	09168-12016	Gasket: 12.2x21x0.8
23.	13650-50F10	Water Temp Sensor
24.	01411-08253	Stud Bolt

Intake Manifold/Throttle Body (Turbo)

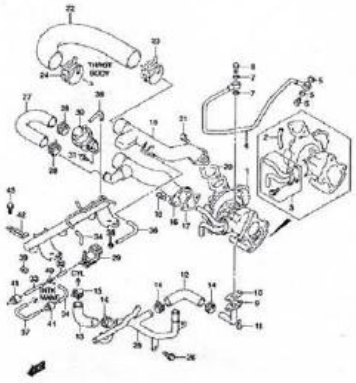
Water Pump (All)



1.	17400-78880	Water Pump Set (Assembly)
2.	17431-73001	Gasket: Water Pump
3.	01411-06253	Stud Bolt
4.	08316-10063	Nut
5.	01550-06303	Bolt
6.	17511-76G10	Water Pump Pulley
7.	02162-06103	Bolt

Water Pump (All)

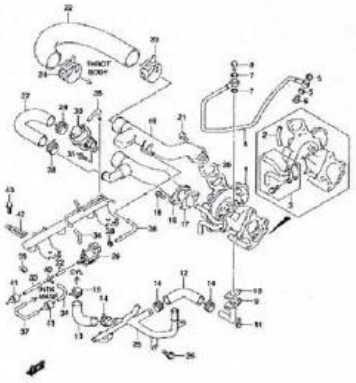
Turbocharger (Turbo)



22.	13962-78A70	Hose: Turbocharger Outlet
23.	09402-50511	Clamp
24.	09402-57511	Clamp
25.	13980-60H50	Pipe: Drain
26.	01550-06123	Bolt
27.	13924-78A50	Hose: Air Bypass Outlet
28.	09401-23405	Clip
29.	18117-60H80	Valve: 3-Way Solenoid
30.	18119-78A50	Valve: Air Bypass
31.	01550-06253	Bolt
32.	09355-35754-601	Hose: 3.5x7.5x601
33-1.	09355-35754-601	Hose: 3.5x7.5x601
34.-37.	09355-35754-601	
38.	09401-06405	Clip
39.	09408-00035	Clip
40.	09367-04002	3-Way Joint
41.	95569-78040	Check Valve
42.	09404-08207	Clamp L:97
43.	01550-06123	Bolt

Turbocharger (Turbo)

Turbocharger (Turbo)



1-1.	13900-78A53	Turbocharger (Truck)
1-2.	13900-60H62	Turbocharger (Van)
2-1.	13913-78A50	Hose: Wastegate (T)
2-2.	13913-60H60	Hose: Wastegate (V)
3-1.	13919-78A50	Pipe Set: Water (T)
3-2.	13919-60H60	Pipe Set: Water (V)
4-1.	13930-78A51	Pipe: Turbo Oil Intake (T)
4-2.	13930-60H60	Pipe: Turbo Oil Intake (V)
5.	09161-10009	Washer 10x15x1.5
6-1.	09360-10049	Union Bolt (T)
6-2.	09360-10031	Union Bolt (V)
7.	09168-08016	Gasket: 8.2x14x1
8.	13948-76G50	Union Bolt
9.	13940-60H50	Oil Drain Joint
10.	13945-70G50	Gasket: Drain
11.	07120-06163	Bolt
12.	13946-60H50	Hose: Oil Drain No.1
13.	13947-78A50	Hose: Oil Drain No.2
14.	09401-18404	Clip
15.	09401-20404	Clip
16.	13950-78A50	Pipe: Turbo Inlet
17.	13955-56F00	Gasket
18.	01550-06253	Bolt
19.	13960-60H51	Pipe: Outlet
20.	13695-56F00	Gasket: Outlet
21.	01550-06853	Bolt

Turbocharger (Turbo)

Conversion Charts

CONVERSION OF TORQUE					
Convert			Convert		
From	To	Multiply	From	To	Multiply
lb.in.	oz.in.	16	oz.in.	lb.in.	.0625
lb.in.	lb.ft.	.08333	lb.ft.	lb.in.	12
lb.in.	kg.cm.	1.1519	kg.cm.	lb.in.	.8681
lb.in.	kg.m.	.011519	kg.m.	lb.in.	86.81
lb.in.	Nm	.133	Nm	lb.in.	8.85
lb.in.	dNm	1.13	dNm	lb.in.	.885
lb.ft.	kg.m.	.1382	kg.m.	lb.ft.	7.236
lb.ft.	Nm	1.356	Nm	lb.ft.	.7376
Nm	dNm	10	dNm	Nm	.10
Nm	kg.cm.	10.2	kg.cm.	Nm	.09807
Nm	kg.m.	.102	kg.m.	Nm	9.807

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