Daihatsu
HiJet Truck and Vans
English Service Manual

1989~1998 Vehicles

Decode Your Vehicle!

Full Version
Carbureted & EFI

2WD 4WD
HiJet Pickup & Van
660cc

V-S100
V-S110
V-S120
V-S130
V-S140
Truck
Van

Written by,
James Danko

Daihatsu HiJet Factory English Service Manual

English Full Version

2WD &4WD

Truck & Van 660cc

AT-MT Models

Factory Service Manual Edition

1990 to 1998 Models

Written By,
James Danko

Yokohama, Japan
First Edition 2008

Edited By: James L. Danko

Artwork: James L. Danko© 2008

Layout By: James L. Danko & Yoshiro

Computer Assistance: Yoshiro (www.yoshiro.com)

Printed in U.S.A

Publisher: USA-Canada-UK; LuLu.com

Publisher Japan-Asia: Rights Reserved

ISBN:

1rst Edition 2008

All translations and or original text from Japanese 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 Daihatsu Motors Corporation (Japan) for their part in assisting in gathering required information.

Credits: I would like to thank Yoshiro for all his computer technology to make these books happen. His computer graphics and technology is simply the best. www.yoshiro.com

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. This is the first of these books written in English.

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.

Translating from Japanese is by no way an easy task. It is a very time consuming effort. This book due to its high volume of diagrams took one year to complete.

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 written in Factory Service Manual style. 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. Complete diagrams of all major parts, including body. You will have the same information as the Suzuki Factory techs have. This book is written by a mechanic, for mechanics.

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

Parts Information and Part Numbers: Part numbers at time of this first publication are accurate and available from Daihatsu Parts Distribution, Japan. These part numbers may or may not be available outside of Japan. Part numbers can be changed at anytime by Daihatsu and should be verified before ordering.

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

Comments or information on this book please email to info@yokohamamotors.com

Contents

Chapter 1

Chapter 2

Chapter 3

Continued

Chapter 4

Chapter 5

Chapter 6

Chapter 7

Continued

Chapter 11

Chapter 12

My Car Notes

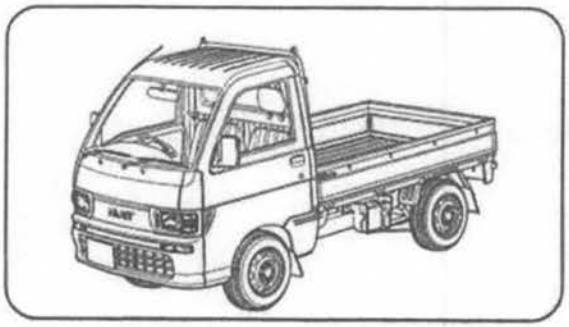
Chapter 1

Vehicle Identification

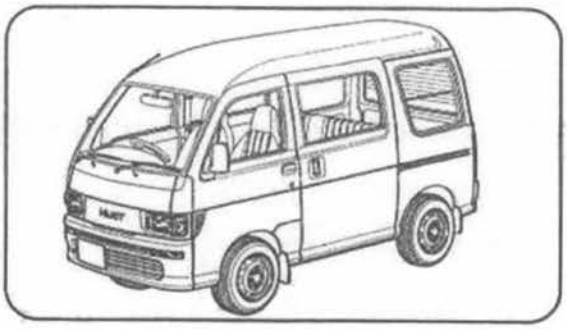
- Vehicle Types
- My Vehicle ID Plate Location & Meaning of ID Plate
- VIN Decoder (Truck)
- VIN Decoder (Van)
- VIN Decoder (Panel Van)
- Rear Differential Decoder
- Manual Transmission Decoder
- Engine Types
- Tire Size and Air Pressure
- Wheel Sizes & Replacements
- 4WD Towing Instructions
- Fuse Box
- Vehicle Lift Positions
- Vehicle Jacking Positions

Vehicle Types

Truck

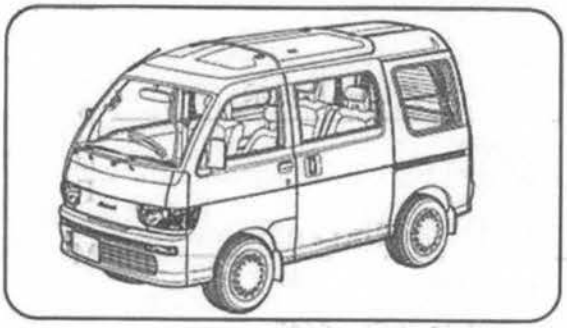


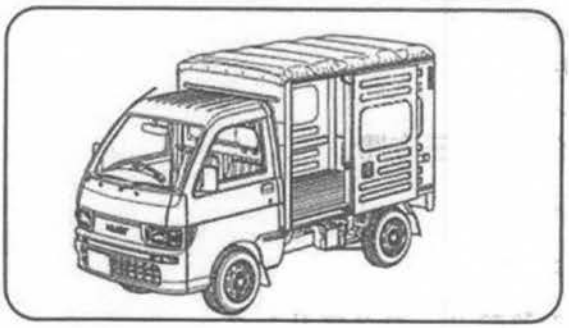
Van



Dump

Van (Cosmic Roof)





Panel Van (Delivery)

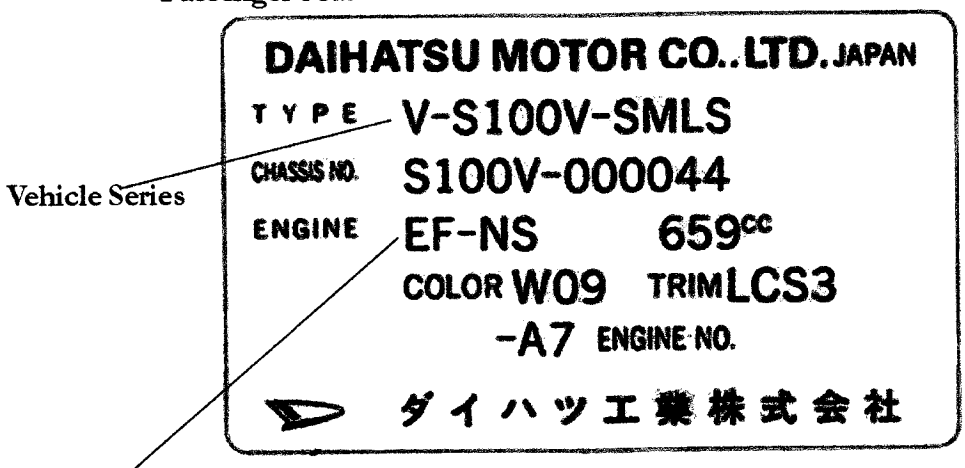
My Vehicle

Vehicle ID Plate

Where is my vehicle Plate?

1990~1991 Generally Located Behind Passenger Seat Left Pillar. If Not Look Below The Drivers Seat (Behind Your Legs).

1991~2000 Behind Drivers Right Side on Pillar (Head Level), or Under or Near Passenger Seat

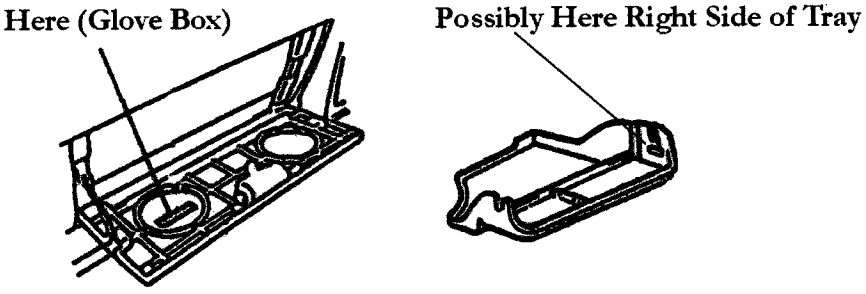


Note: This CODE is Important for This Book! You Need the Chasiss Number Engine Series (Example: EFNS) to Match Specifications and Order Parts.

What year is my Truck/Van?

Japanese Vehicles Do NOT Have a Vehicle Model Year Like Most Countries, They Have a Vehicle TYPE. All Parts & Maintenance is Determined By This Code. If You Want to Know Year of Manufacturer Check The Bottom Seat belt Tag.

1989 and Earlier Daihatsu Plate Location

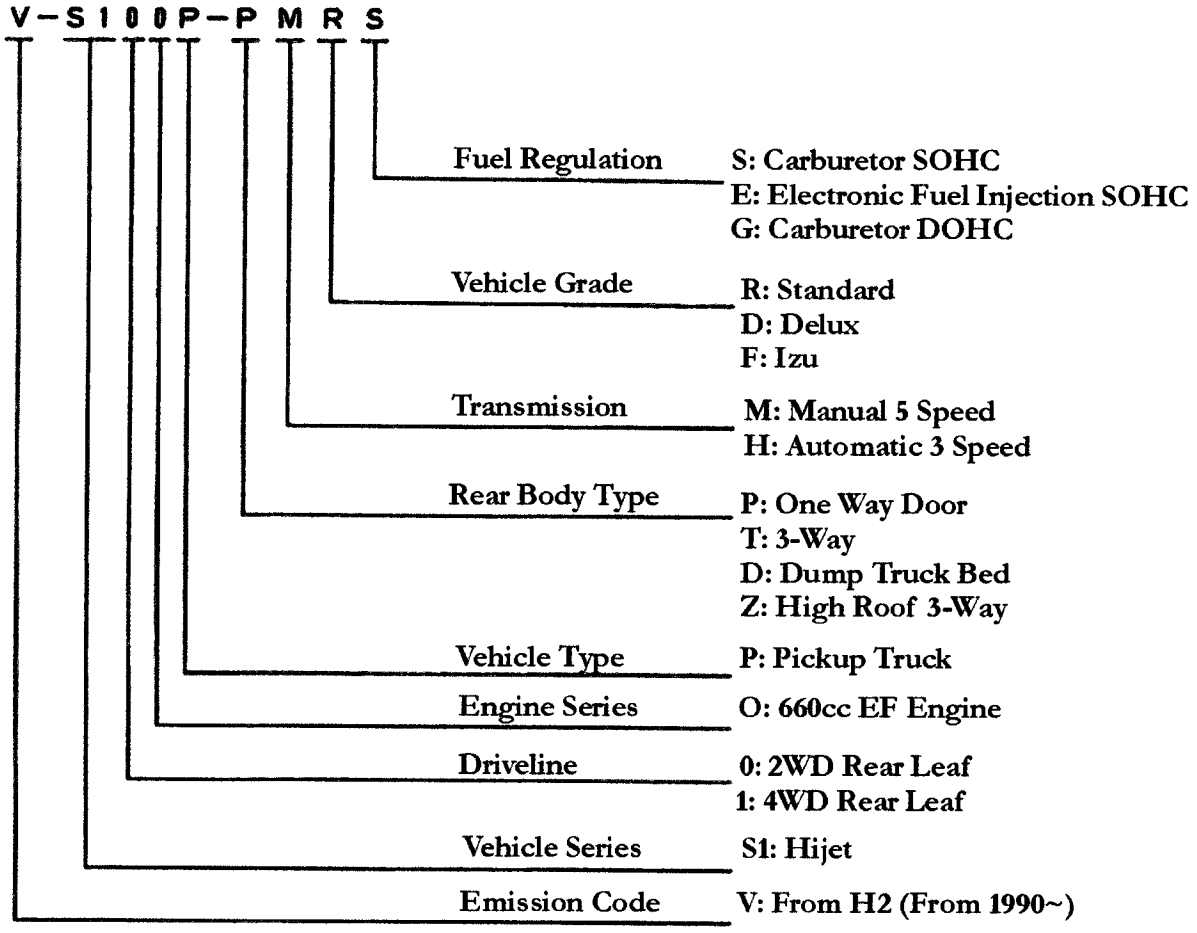


Note: Pre-1989 Was A Sticker and Can be Lost Easy. Important to Keep Paperwork

VIN Decoder

Truck

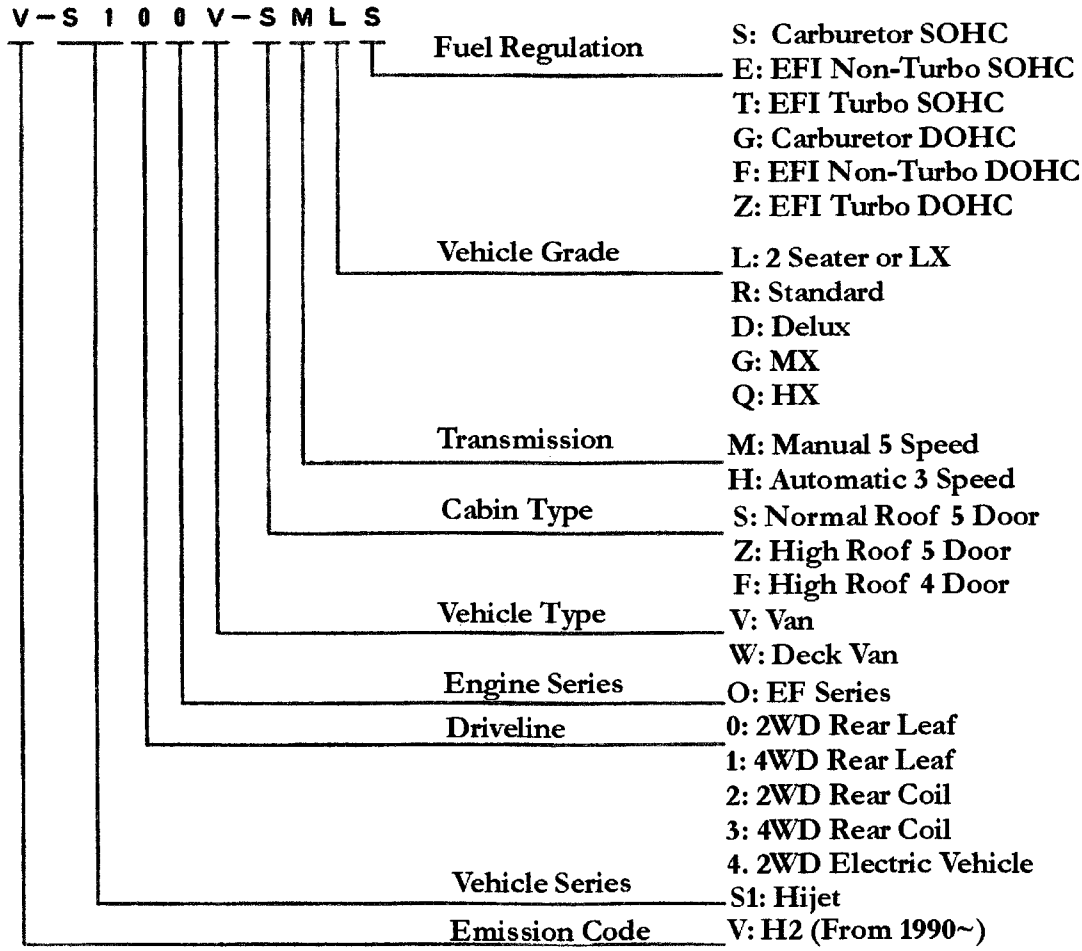
Sample: VIN (Truck)



VIN Decoder

Van

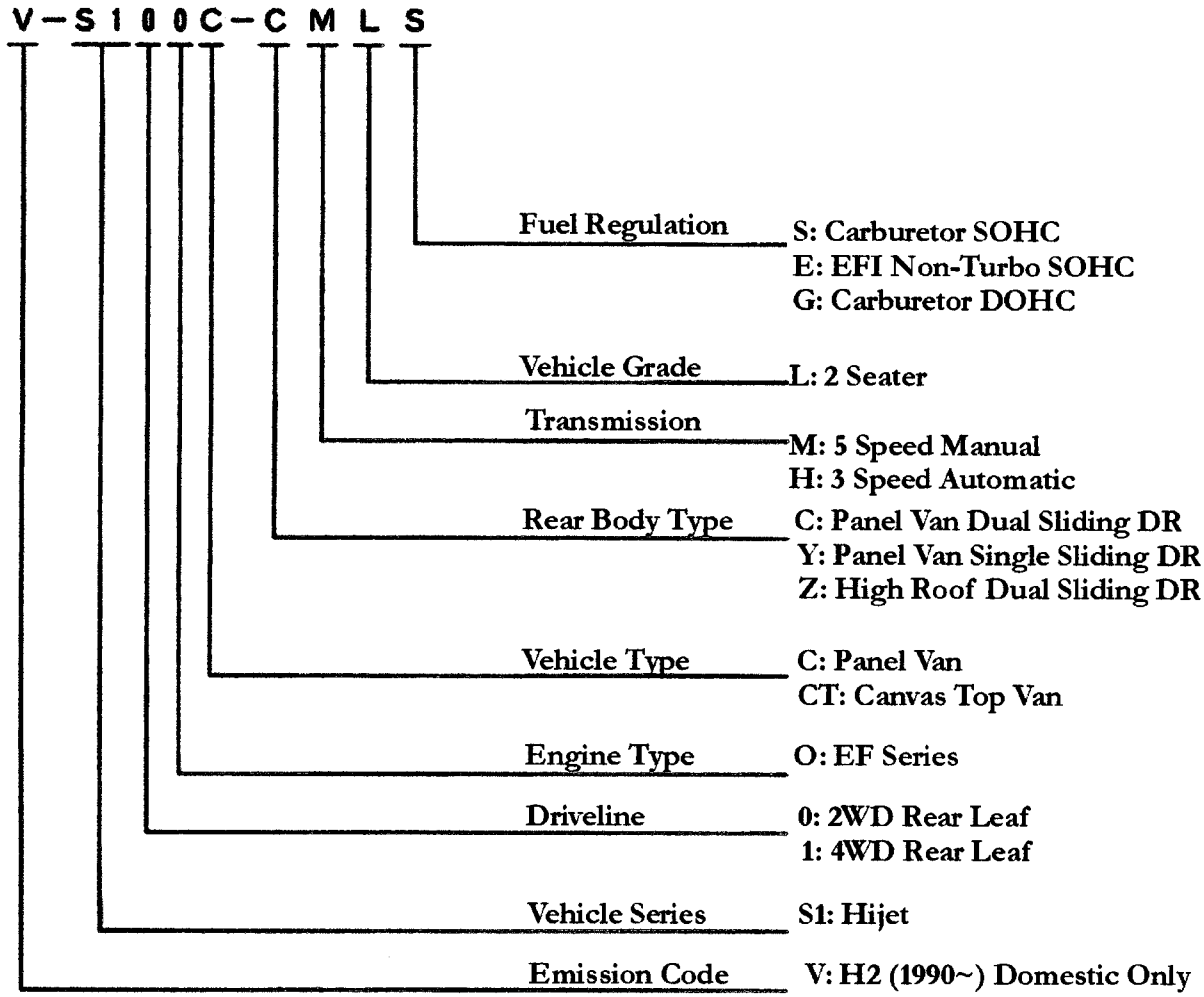
Sample VIN (Van)



VIN Decoder

Panel Van

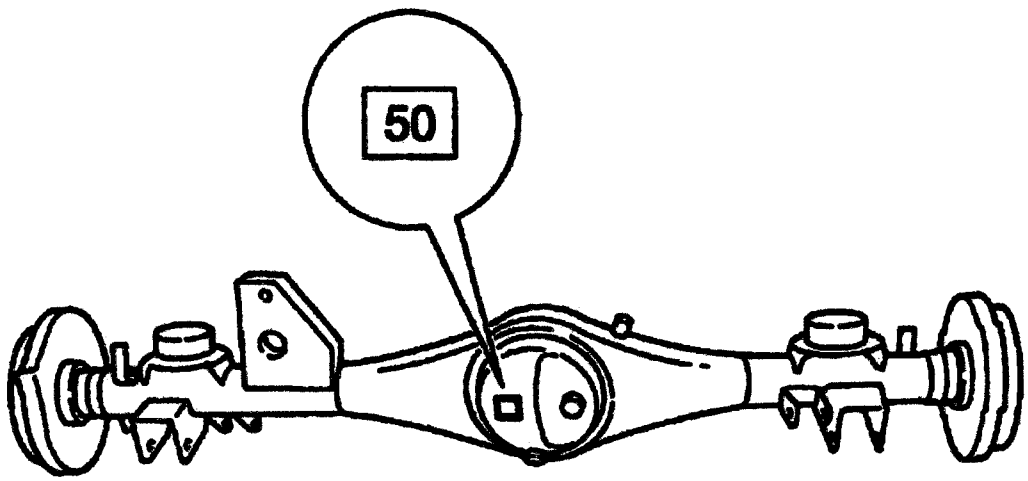
Sample VIN (Panel Van)



Differential

Rear Axel Codes

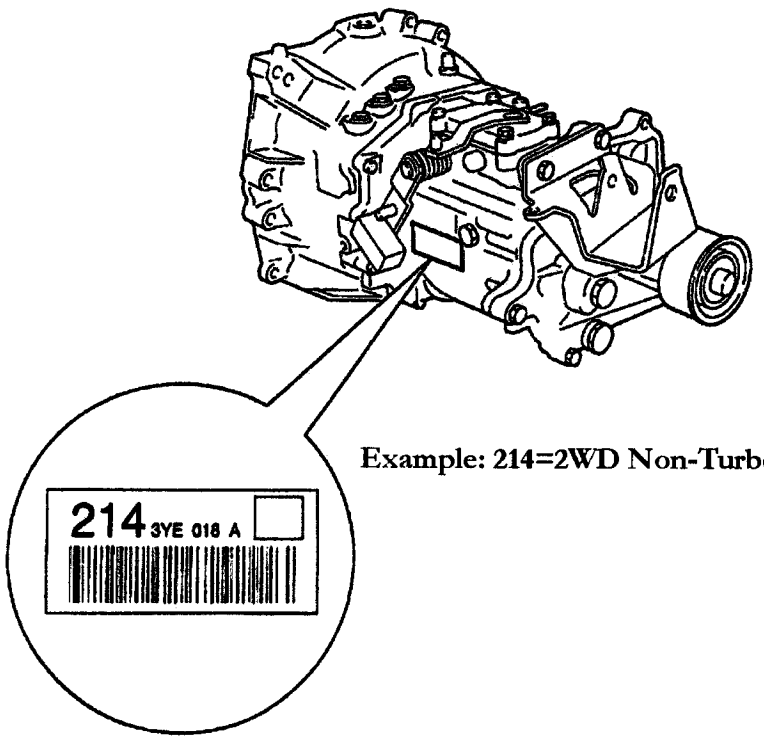
Example: 50=Ratio 5.571 S120V EFTS Series



Gear Ratio	Mark	Series
6.666	01-03	SP100P
6.285	05	SP100P/SP110P
6.666	09-11-13	SP110P
6.285	17	SV100
6.666	61-21-62	SV100V/S100V
6.285	29	EFES S120V
5.571	49-50-51-52	EFTS S120V
6.666	33-37	EFES
5.875	41~48, 53	S130V EFES EFTS

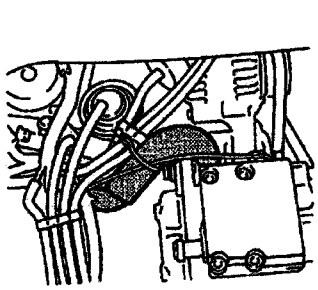
Transmission Identification

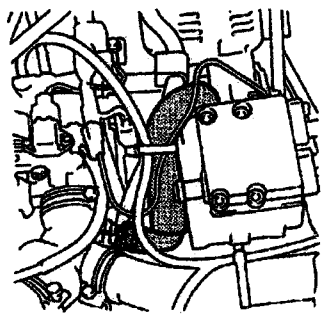
Manual Transmission

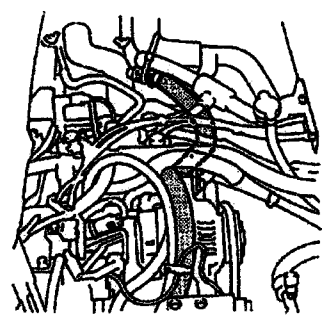


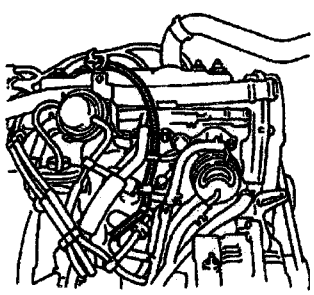
Example: 214=2WD Non-Turbo Van

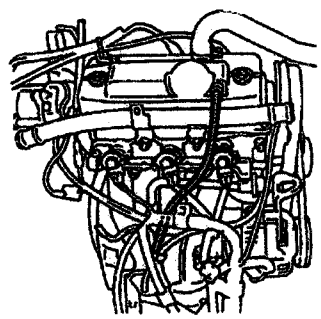
Drivetrain	Type	Mark
2WD	Truck/Van	213
2WD	Atrai	214
2WD Turbo	Atrai	220
4WD PT 4WD	Truck/Van	P19 H-L
4WD Normal	Truck/Van	P10
4WD PT 4WD	Truck	P11 PTO
4WD PT 4WD	Van	P12
4WD PT 4WD	Truck/Van	P20
4WD Turbo	PTO Option	P28
4WD Turbo Muti Select 4WD		A20

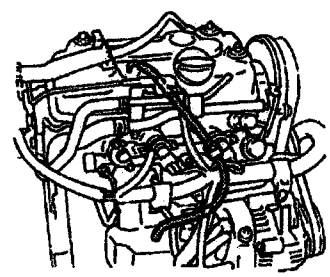








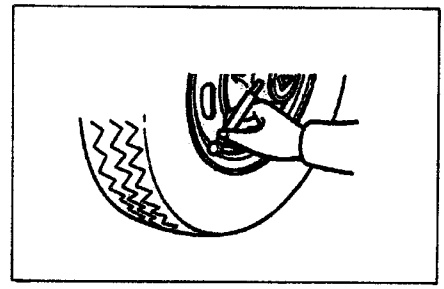




EF-NS **EF-ES** **EF-TS**

Tire Size and Air Pressure (kg.cm)

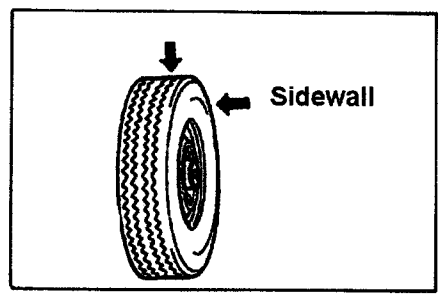
Check tire pressure at regular Intervals



Tire Pressure Guide

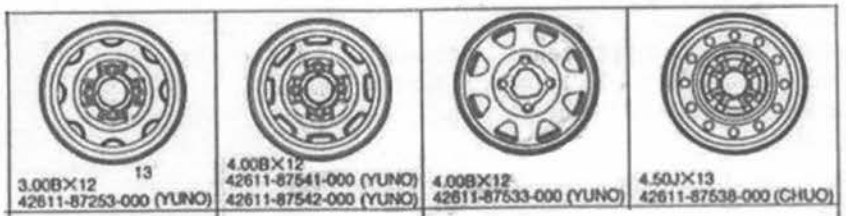
Vehicle Series		Size	Air (kg.cm)	
			F	R
S100P, S110P S100C, S110C S100CT, S110CT		5.00-12-4	2.0	2.4
		5.00-12-6		
		145R12		
S100V	AT	5.00-12-4	2.2	2.4
	MT	5.00-12-6	2.4	2.4
	All	145R12	2.4	2.6
S110V		5.00-12-4	2.4	2.4
		5.00-12-6	2.4	2.4
		145R12	2.4	2.6
S120V		145R12	2.4	2.4
		155R12	2.2	2.2
		165/70R13	2.4	2.4
S130V	ZMGE, ZHGE	145R12	2.4	2.4
	FMQE		2.6	2.6
	ZMGE, ZHGE, ZMGT	155R12	2.2	2.2
	FMQE		2.4	2.4
	All	165/70R13	2.4	2.4
T125/90 D12			4.2	

Tread

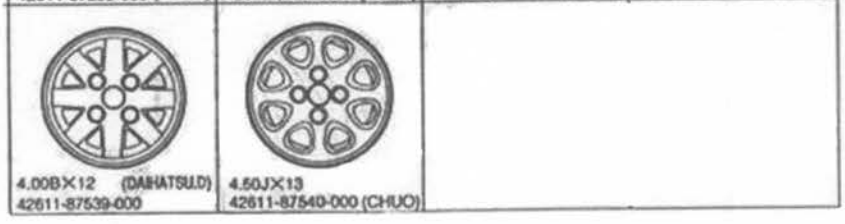


Check uneven tread wear and crakes in the sidewall. Replace if necessary

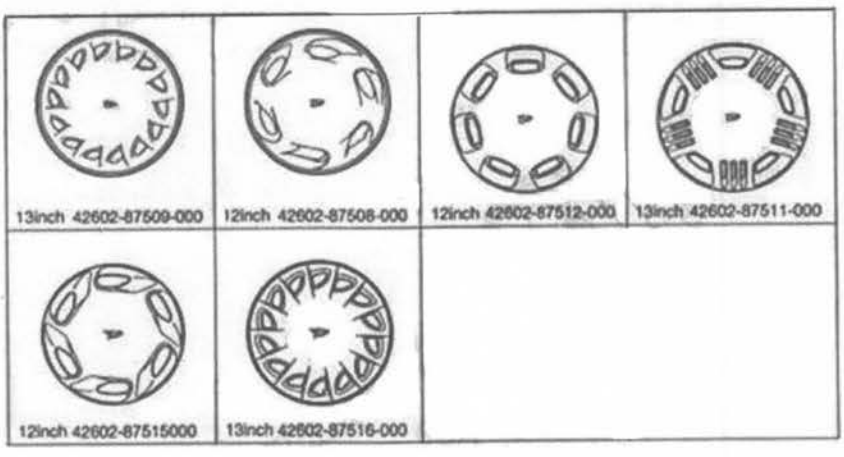
Steel Wheels



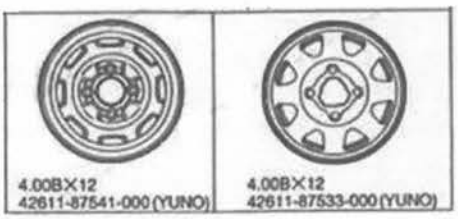
Aluminum Wheels



Wheel Covers (Hub Caps)



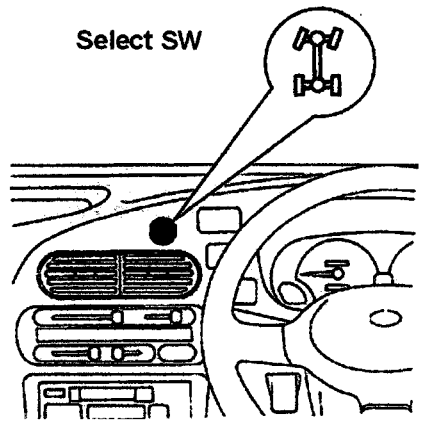
Steel Wheels



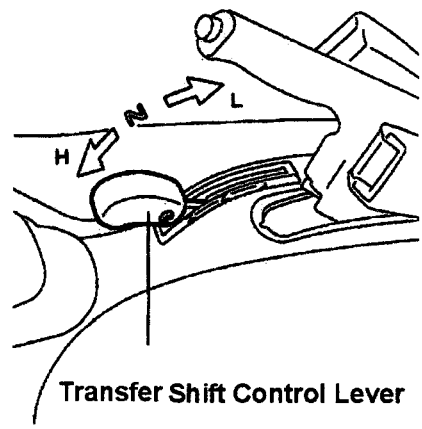
4WD Towing Instructions

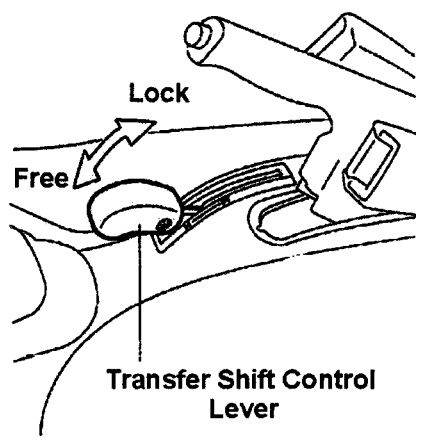
Towing of 4WD vehicles

4WD vehicles must always be towed in 2WD position. Failure to due so can cause damage to both vehicles.



Place Transfer Shift Control Lever in Neutral Posistion

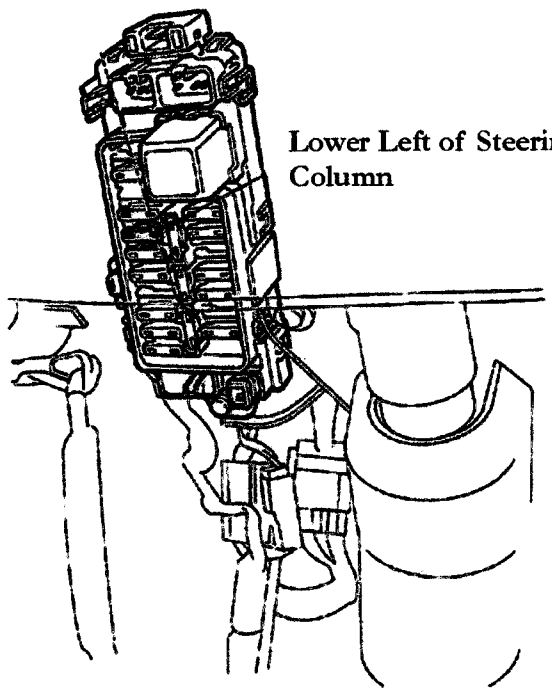




Fuse Box

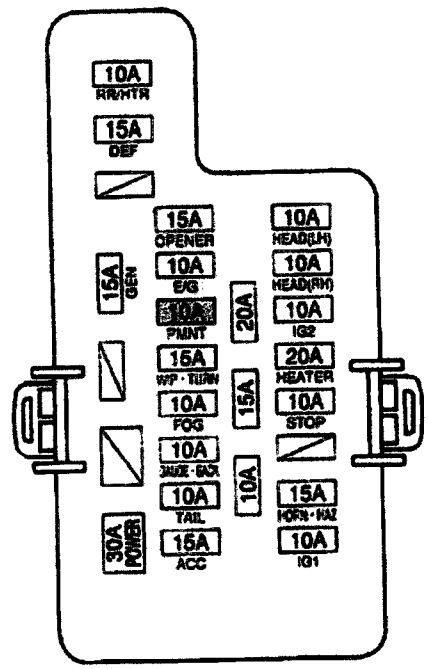
Typical Unit

Truck & Van



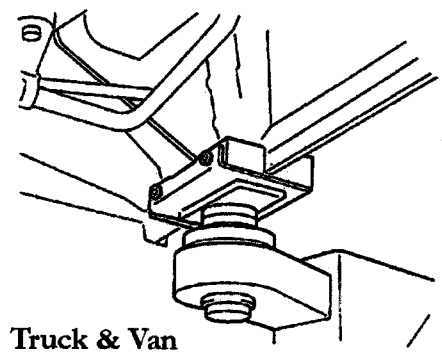
Lower Left of Steering Column

Fuse Box

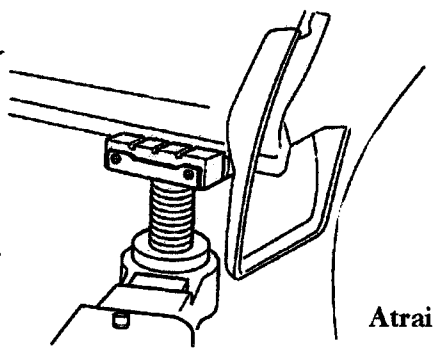


Lift Posistions

Front

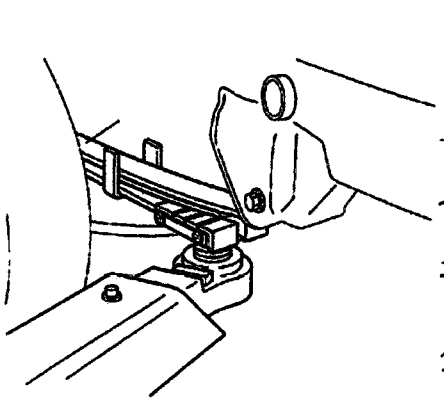


Truck & Van

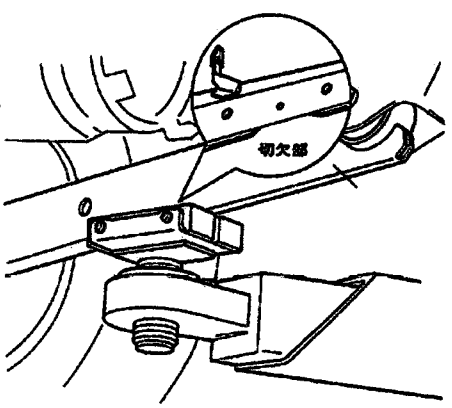


Atrai

Rear



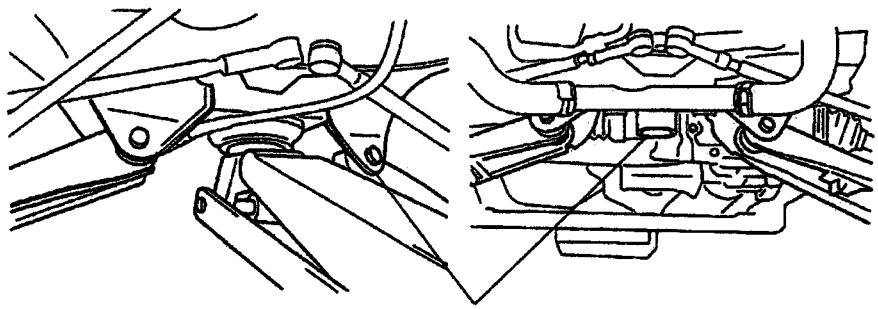
Truck & Van



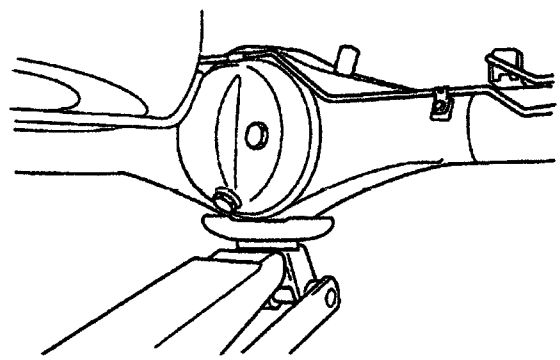
Atrai

Jacking Positions

Front



Front Suspension cross member



Rear

Support both Axels on each side with proper jack stands

Chapter 2

General Maintenance

- Air Filter Replacement & Part Numbers
- Spark Plug Replacement & Part Numbers
- Ignition Timing
- Ignition Circuits & Coil Testing
- Ignition Coil, Spark Plug Wire Part Diagrams
- Distributor Points Setting
- Fuel Filter Replacement & Part Numbers
- Idle Setting & CO-HC Level
- Transmission Oil Replacement & Capacities
- Engine Oil & Capacity Chart
- Oil Filter
- Driveline Inspection & Rear Differential Oil
- Front Wheel Alignment
- Camber & Caster Specifications
- Valve Adjustment

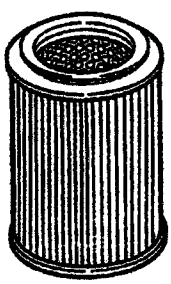
General Maintenance

Air Filter

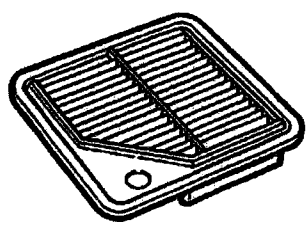
CO Levels must be below 1.5% and HC levels at below 800ppm

A dirty air filter can casue the oxygen sensor to mis-adjust due to air restriction. A clean air filter will alow the system to blance correctly.

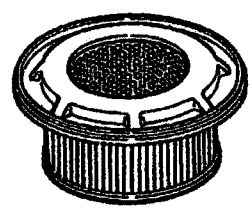
Note: Do not run vehicle without an air filter. Damage to the system will occur



Truck



Van (Turbo)



Van (non-Turbo)

Air Filter Part Numbers

S100-S110 Truck
EF-NS, EF-ES, EF-GS
Part# 17801-87512-000

S120-S130 Truck
EF-TS, EF-RS
Part# 17801-87514-000

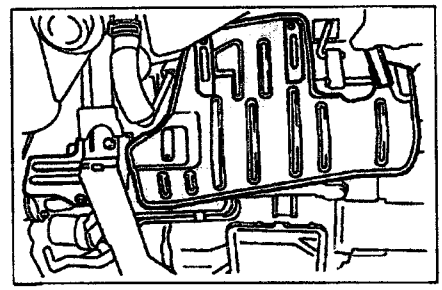
S100-S110-S120-S130 Van
EF-NS, EF-ES
Part# 17801-87515-000

S100-S110-S120-S-130 Van
EF-GS, EF-ZS
Part# 17801-87516-000

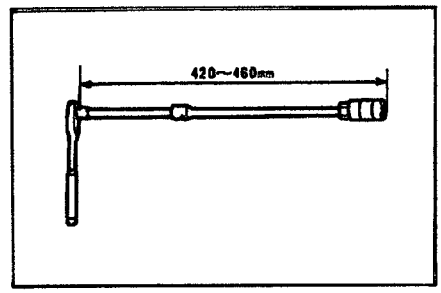
Spark Plug Replacement

EF-TS

Remove side under cover
Remove spark plug wires
Remove Plug 1 & 2

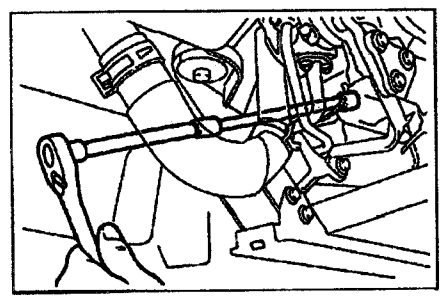


Prepare an extension socket setup as in the diagram on the right



To reach plug No. 2 use the diagram on the right for guidence.

Remove and install new plugs as listed in the box below.



Spark Plug Information

Engine Series	Spark Plug		Plug Gap (mm)
	Denso	NGK	
EFNS	W16DTR-S	BPR5EK-B	0.9~1.0
EFES	QL20TR-S	BCPR6EKD	
EFTS	W20DTR-S	BPR6EK-B	

Note: Instalation of spark plugs will differ slightly between the different vehicle types.

Note: Check vehicle specific tune-up specifications on the sticker placed in the engine compartment.

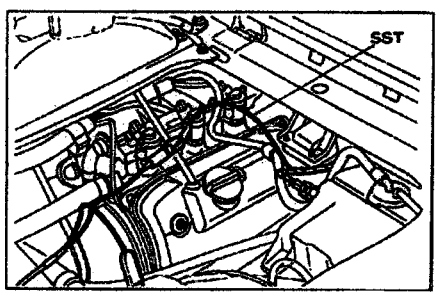
Ignition Timing

Timing	(BTDC/RPM)
EF-NS	7*/950
EF-ES	5*/850
EF-TS	10*/900

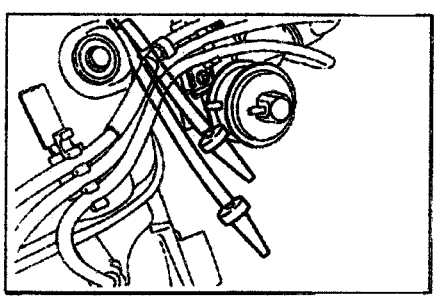
Note: Point Gap Distributors:(All) 0.2~0.4mm

Clear access to check timing. Make sure no wires will touch any moving parts.

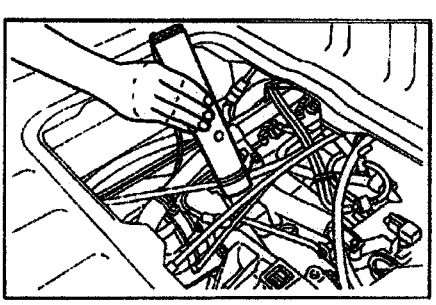
Caution: Be careful of electrical discharge



Remove ditributor vacuum hoses and plug

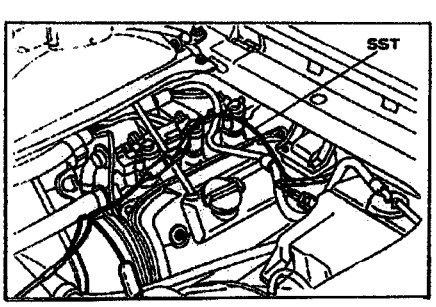


While engine is running verify timing
Example: EF-NS series engine 7*/950 RPM



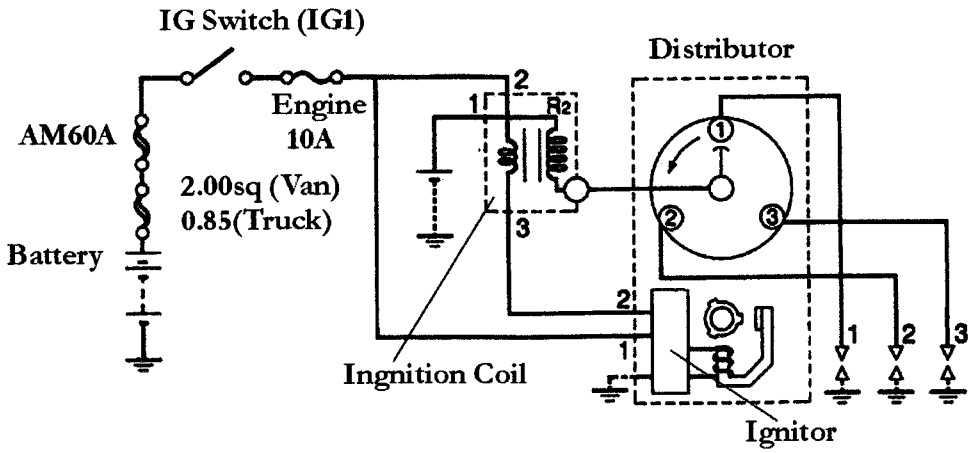
Move ditributor (slowly) to set timing.
Allow engine to adjust itself before moving timing setting too rapidly.

Note: If timing is slightly erratic, remove and inspect distributor cap & rotor. A dirty cpa & rotor can cause erratic timing and poor fuel econony

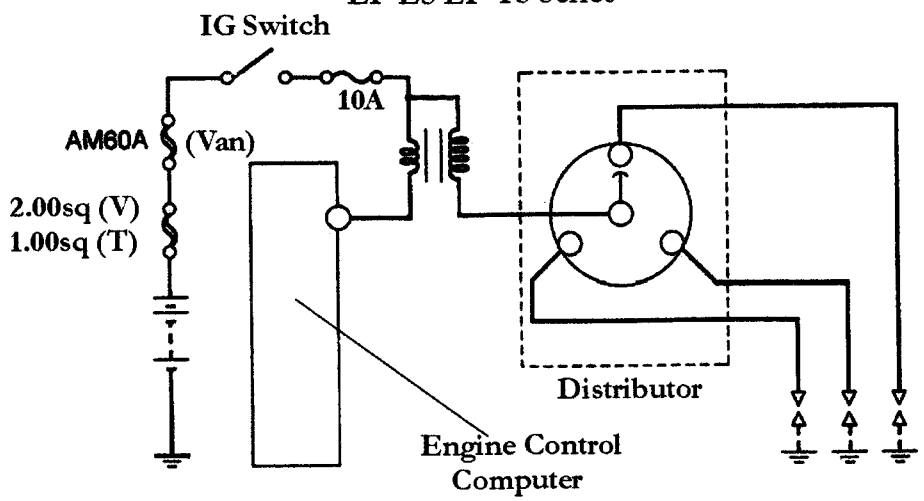


Ignition Circuit & Coil

EF-NS Series

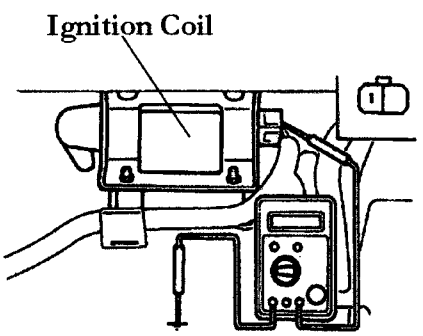


EF-ES EF-TS Series



Ignition Coil Test

1. IG Switch On
2. Use a Voltmeter and Check Power to Connector

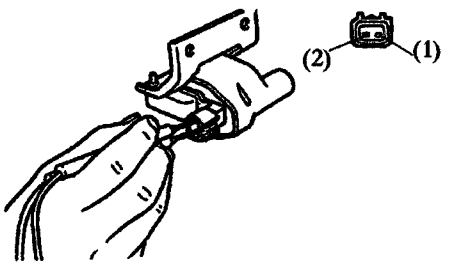


Ignition Coil

Coil Test

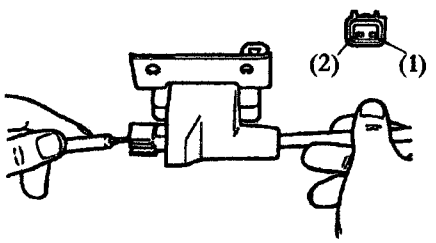
1. Test Ohm Reading Between Pin (1) & (2)

   Limit: 1.0+-0.1Ohm



2. Check Pin (2) to Coil Pole

   Limit: 13.4+-2.0Ohm

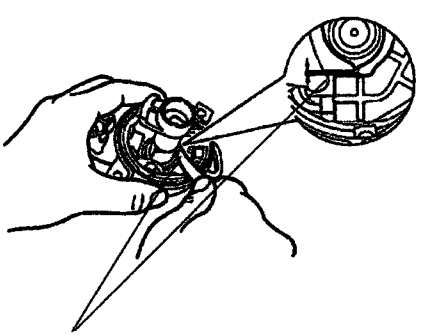


Distributor Points

1. Remove Distibutor Cap
2. Use Feeler Gage and Set Points

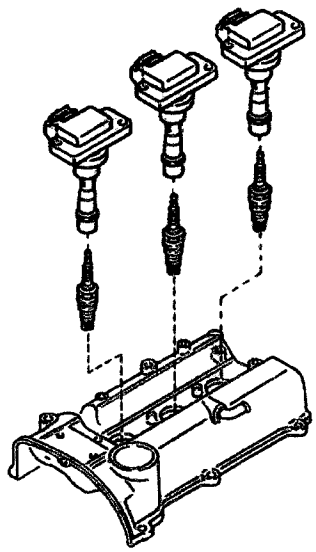
Gap: (All) 0.2~0.4mm

Note: Points Should Be Changed Every
24,000 Kilometers



Feeler gage

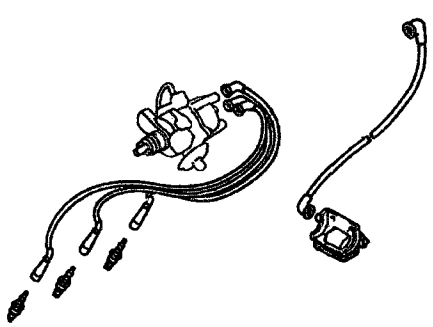
EFGS, EFZS, EFRS



Coil Part Numbers

EFGS-EFZS#90048-52117-000(3)
EFRS #90048-52119-000(3)

EF-NS, EF-ES, EF-TS

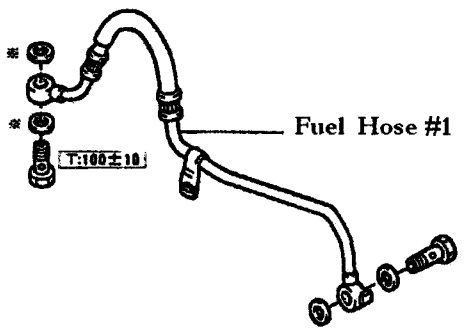


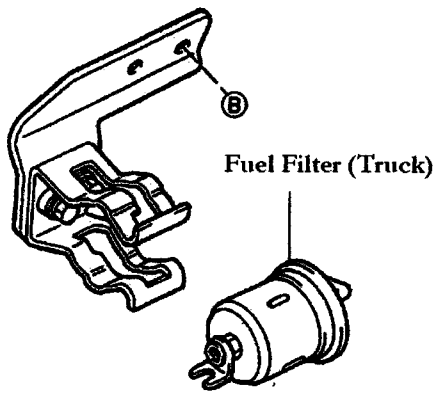
Ignition Coil
EF-TS S-120, S-130
Part# 90048-52108-000
EF-NS, EF-ES S-100, S-110
Part# 90048-52106-000
EF-GS, EF-ZS S-100, S-110, S-120, S-130
Part# 90048-52117-000

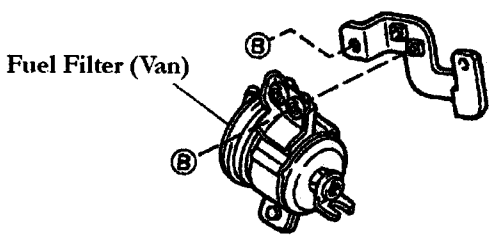
Spark Plug Wire Set
EF-ES VAN S-100,110,120,130
Part# 19901-87D90-000
EF-NS, EF-ES, EF-TS Truck
S-100, S-110, S-120, S-130
Part# 19901-87D91-000

Note: Spark Plugs are Listed in Begining of This Book

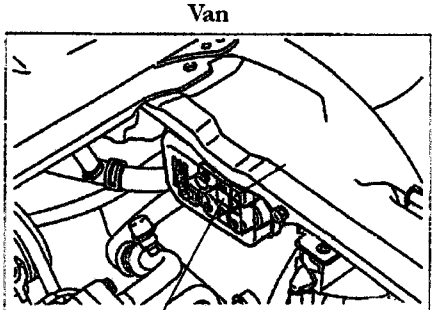
Fuel Filter



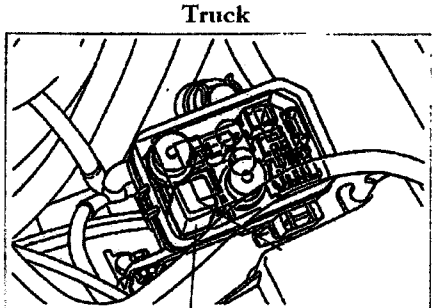




Fuel Pump Relay Location
Van



Fuel Pump Relay Location
Truck

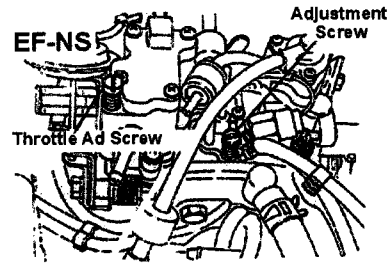


Note: Alway Remove Fuel Relay When Changing Fuel Filter (FI Engines)
Note: Fuel Pumps Ohm Reating 0.2~3.0 Ohm

Fuel Filter Part Numbers

EF-ES, EF-TS, S100-S110-S120-S130 Part# 23300-87508-000
EF-ES, S100-S110-(Truck) Part# 23300-87509-000
EF-NS, EF-GS, S100-S110-S120-S130 (Truck) Part# 23300-87502-000
EF-NS (Van) Part# 23300-87510-000

EF-NS
To Set Idle Adjustment The Idle Adjustment Srew Must Be Turned In Either Direction

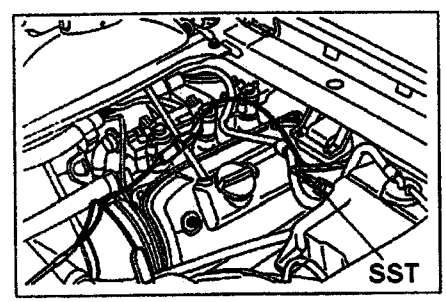


EF-ES

EF-ES Series Engines Idle System is Computer Controled

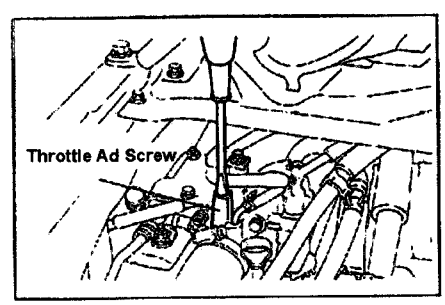
James Note: Idle Curcuit Trouble is 99% of the Time the ISC Valve ISC is Connected to ECU (Rotary ISC) (RSO & RSC Connection)

EF-TS
EF-TS Series
Using a SST connector Pn#09991-87604-000 attach tachometer.
Set Idle to 900+-50 RPM



CO-HC Levels

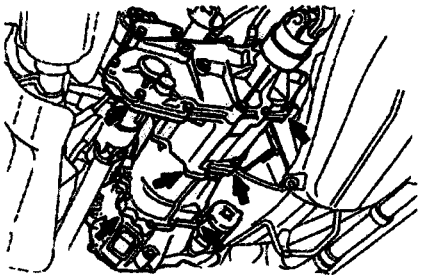
EF-NS (Use Mixture Screw to Adjust)
Idle CO-HC Level
CO 1.5+-1.0% to -0.5%
HC 900 PPM (Parts Per Million) or Less



EF-ES & EF-TS
Idle CO-HC Level
Co 1.5+-1.0% to -0.5%
HC Below 900 PPM

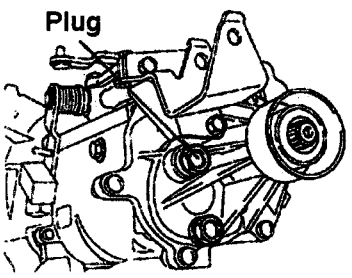
SST=Service Support Tool

Look for leaks around the common case assembly areas. If a constant drip is detecked first torque to spec. If leak or drip continues remove transmission and replace seals.



Manual Transmision
Remove plug:
Level should be within 0~5mm

Capacity:
2WD 1.1 Liters
4WD 2.3 Liters (Including Transfer Case)



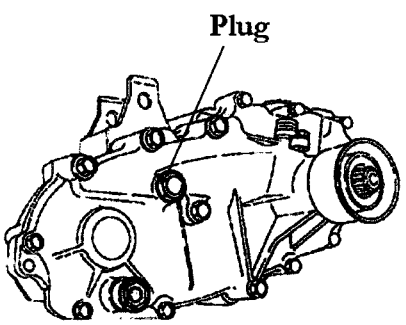
Automatic Transmision
#Check while warm (70~80C)#

Holding down the brake pedal, shift from [P] to [L] 1~2 times to make sure fluid is flowing.

Return to Park [P] Check fluid level
(If dis-colored or smells burnt replace)

Transfer Case (Automatic Trans AT Vehicle)

Remove plug and chck level to: 0~5mm
Capacity: 1.6 Liter



Engine

Engine Oil

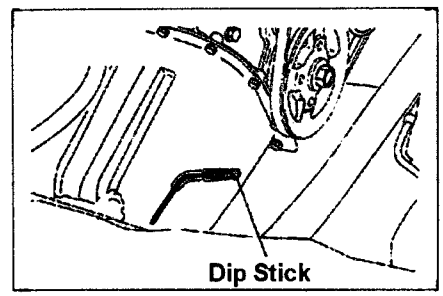
Engine Series	EF-NS, EF-ES	EF-TS
SAE	5W-30	10W-30
API	SE	SF
Capacity	3.1 Liters	3.1 Liters
Oil Change	10,000K or 6mo	10.000K or 6mo

*Note: Do NOT use heavier grade oils. Heavier oils can increase pressure and cause gasket failure

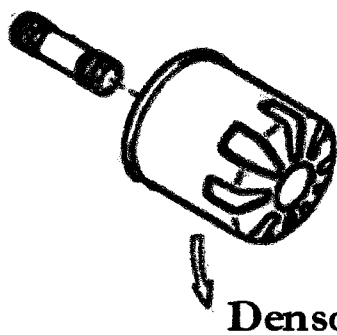
Engine Condition:
Before performing engine work it is important to check oil condition. Oil is the best indicator to the internal condition of the engine.

Dirty oil will impede engine performance and can cause premature engine failure.

Oil Filter maximum use: 10,000 Kilometers



Oil Filter

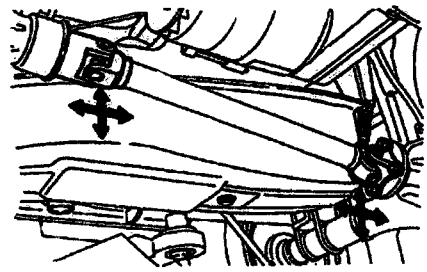


Oil Filter Part#

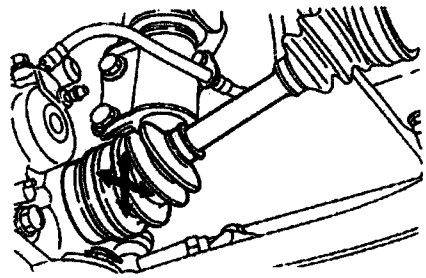
EF Series S100-S110-S120-S130
PN: 15601-87204-000 or PN: 15601-87703-000

Cross Refference to:
Suzuki Part #16510-81403
Mazda Part #AY01-14-300A

Check Driveshaft for excessive play
Inspect U-Joints: Replace if necesary

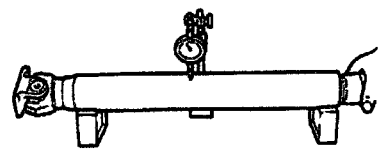


Inspect CV Joints fro broken dust boots
Replace if cracked or torn

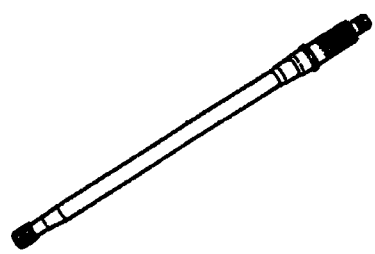


If a vibration is detected in the driveline remove driveshaft and check for round-out

Maximum round-out Below 1.0(mm)

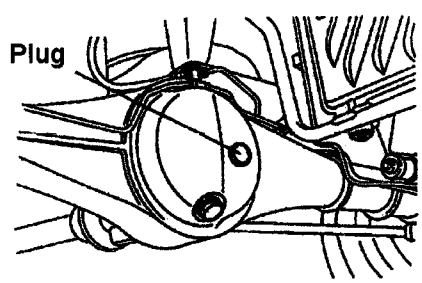


Axel Shafts should be removed and inspected every 75,000 Kilometers
Check for broken teeth. Replace if necessary



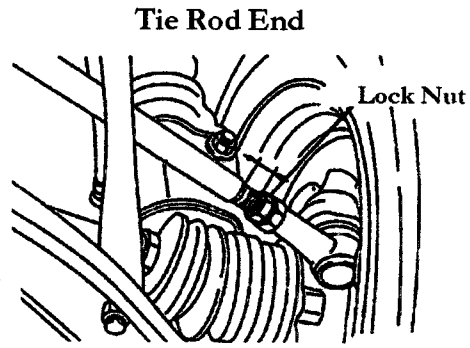
Differential Oil Inspection

Remove plug: Oil Level 0~5(mm) below plug level.
Replace Oil every 25,000 Kilometers
Capacity
Rear: 1.3 Liters
Front: 0.61 Liters

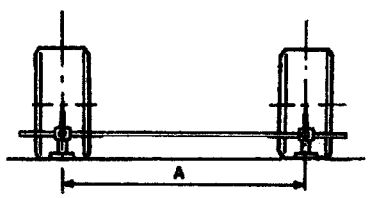


Note: Make Sure Tire Size and Air Pressure
Are Correct Before Alignment

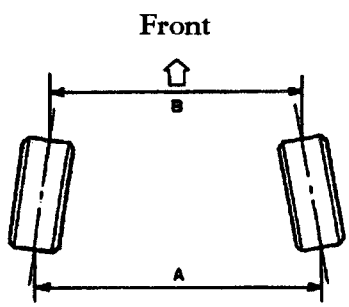
1. Loosen Tie Rod End Lock Nut



2. Measure Toe In



Specifications: (All) 0.0+-1.0mm



3. Set Toe In to Specifications

4. Torque Tie Rod End Lock Nut to T: 450+-100kg.cm

Note: After Setting Torque Once More Verify Toe In

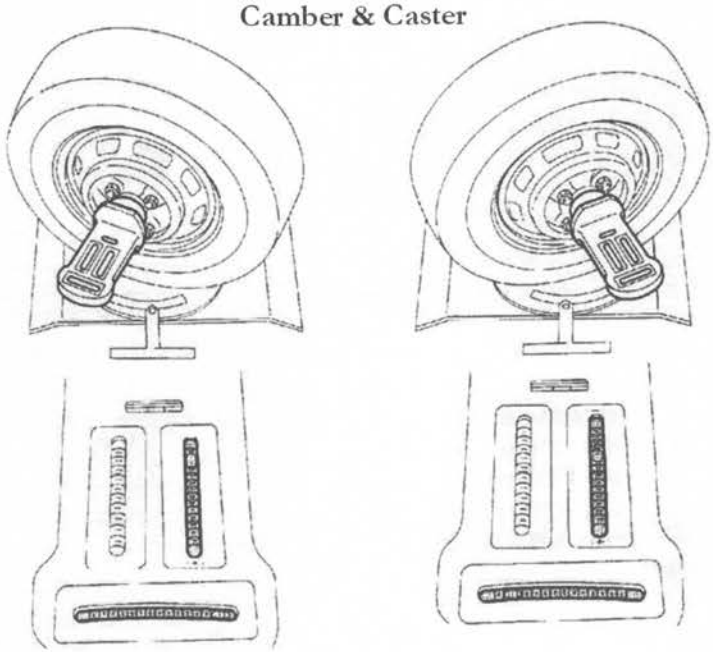
5. Set Camber & Caster

Camber & Caster

Note: Use an Camber & Caster Gage to Set Specifications

Camber Specification: **0*15'+-45'**

Camber & Caster



Specifications

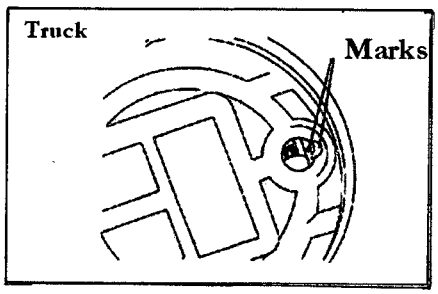
Caster:
3*08+-1 (Truck)
3*04+-1 (Van)
King Pin Degree **13*03+-1**

Front Side Slip= In 5mm~Out 5mm

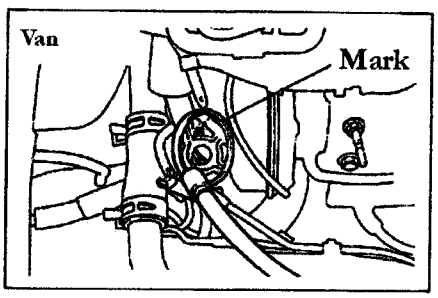
Note: (*)=Degree

1. Remove Air Cleaner (EF-TS)
2. Remove Valve Cover & DIscard Gasket
3. Set Engine to TDC

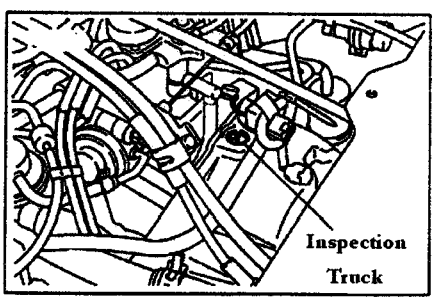
Note: Remove Rubber Cap (Inspection Plug) As in Digram to Right. Verify Marks are Aligned

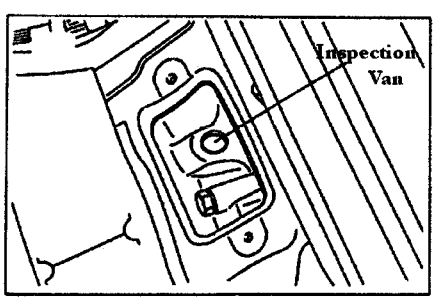


4. Turn Cranckshaft (Right Direction) Until Timing Alighnemt Mark and No.1 Firing Position (Van) Use Mark As In The Picture to the Right.



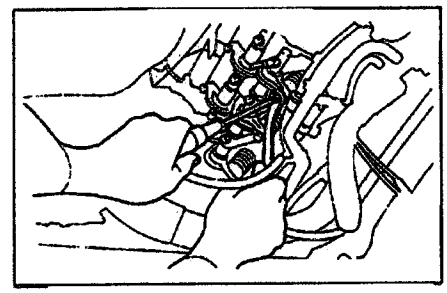
5. Use The Convenient Inpection Holes in THe Diagrams to the Right





Note: Set Valves "Cold"

6. Using a Thickness Gage Set Valves Using The Following Diagrams

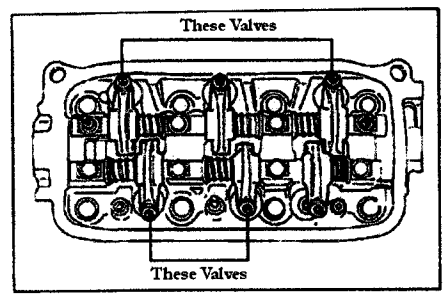


EF-NS - EF-TS (Cold Settings)
(IN)
0.18+-0.05mm
(EX)
0.25+-0.05mm

EF-ES (Cold)
(IN)
0.20+-0.05mm
(EX)
0.30+-0.05mm

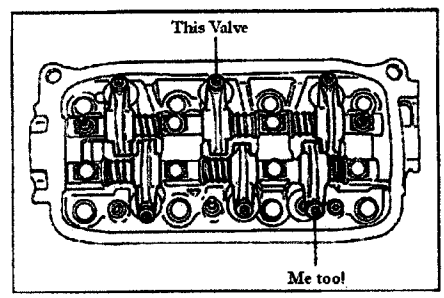
EF-NS-EF-TS Cylinder #1 TDC

Cylinder #1		Cylinder #2		Cylinder #3	
IN	EX	IN	EX	IN	EX
O	O	—	O	O	—



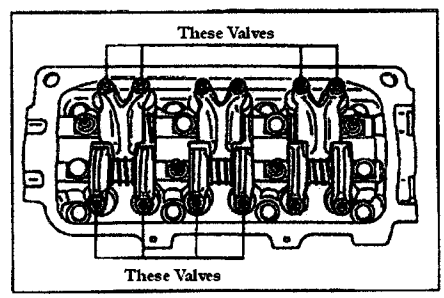
Rotate Engine one Revolution and set Remaining Valves

Cylinder #1		Cylinder #2		Cylinder #3	
IN	EX	IN	EX	IN	EX
—	—	O	—	—	O



EF-ES Series

Cylinder #1		Cylinder #2		Cylinder #3	
IN	EX	IN	EX	IN	EX
O	O	—	O	O	—



Chapter 3

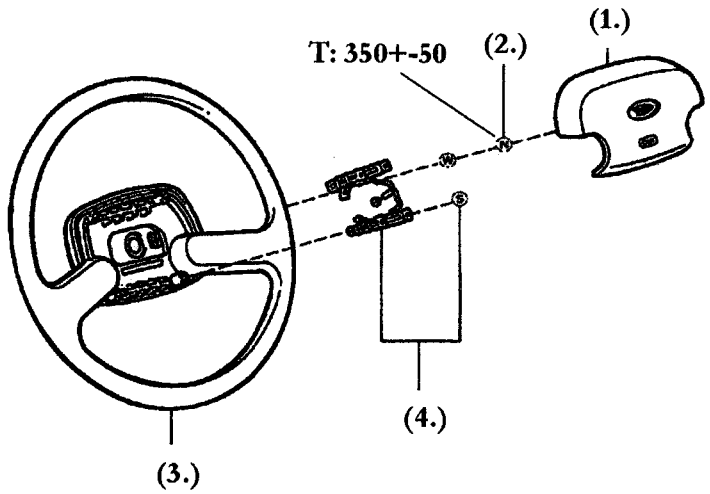
Steering System

- Steering Wheel Type & Components
- Steering Column & Components (MT Manual Vehicle)
- Steering Column Removal
- Tilt Steering Column Components
- Rack & Pinion Gearbox Removal
- Rack & Pinion Gearbox Overhaul
- Tie Rod Ends Removal and Installation
- Rack & Pinion Parts Diagram & Part Numbers
- Tie Rod & Center Arm Parts Diagram & Part Numbers

Note: Front End Alignment Specifications Included
In Suspension Chapter

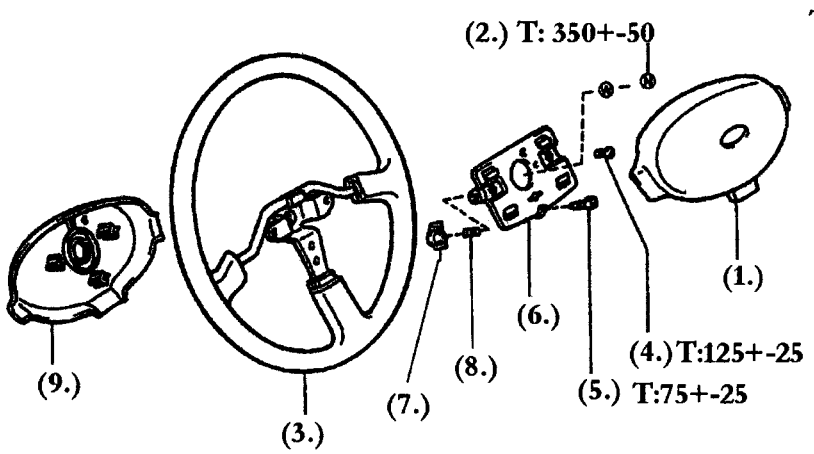
T: =kg.cm

Type 1



1. Steering Wheel Pad
2. Lock Nut
3. Wheel: Steering
4. Horn Contacts

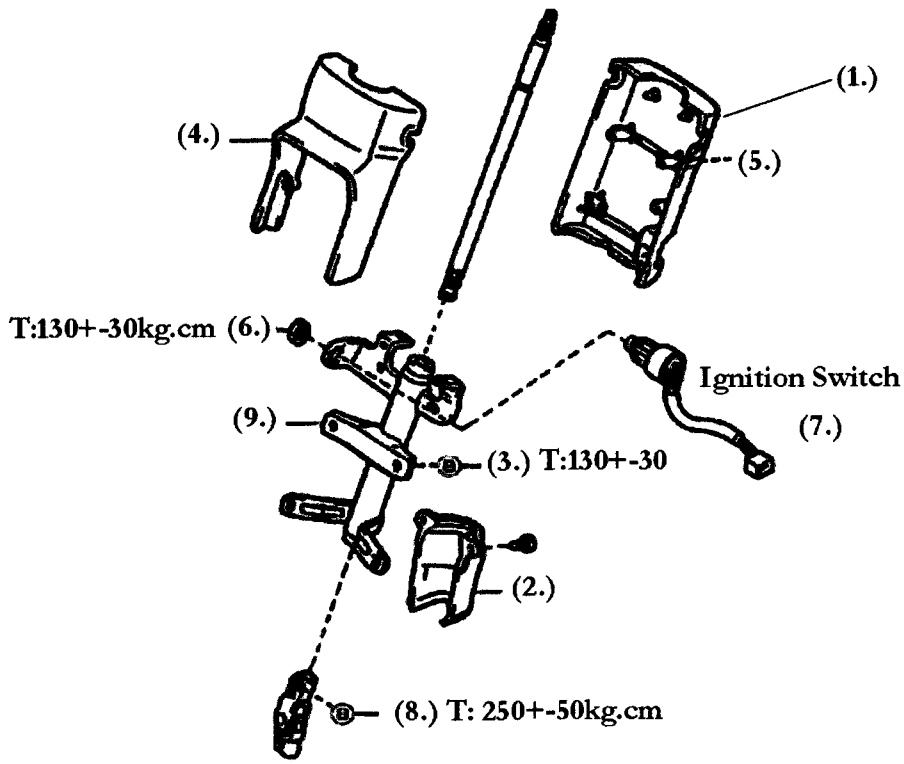
Type 2



1. Steering Wheel Pad
2. Lock Nut
3. Wheel
4. Srcew: Round Taping
5. Screw: Cross Recess Round
6. Plate: Horn Button Contact
7. Cushion: Horn Button
8. Spring: Horn Button
9. Cover

Steering Column Components

Manual Steering MT Vehicle



1. Cover: Steering Column
2. Cover: Main Shaft Joint
3. Bolt: Column Attachment
4. Cover: Steering Column Upper
5. Bolt: Attachemnt
6. Nut: Ingnition Cylinder
7. Ignition Switch
8. Bolt: Steering Shaft U-Joint
9. Column Body

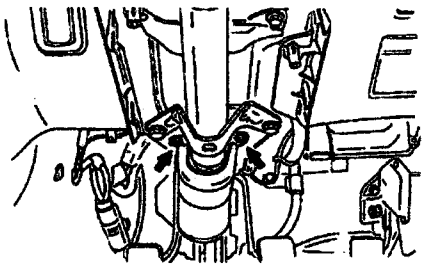
Note: (B)=Bolt (N)=Nut

Steering Column Removal

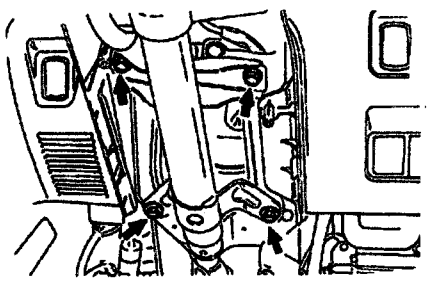
Note: Disconnect (-) negative Battery Terminal

1. Remove Steering Column Lower Cover

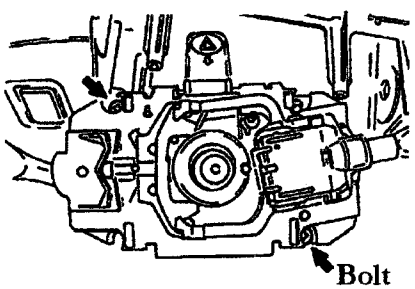
2. Remove Main Shaft Joint Cover



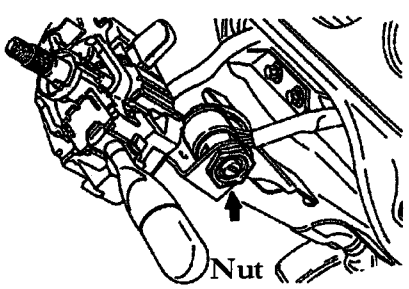
3. Remove Column Assembly (Body) Bolts
4. Remove Steering Column Upper Cover



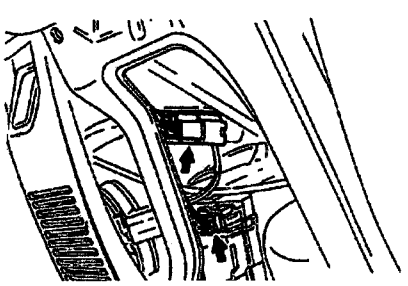
5. Remove Combination Switch Attachment Bolts (See Right Diagram)



6. Remove Ignition Switch Retainer Nut

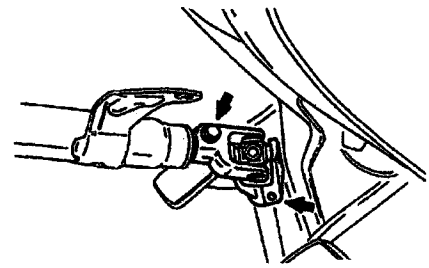


7. Disconnect Combination Switch Harness (Two Connectors) See Diagram on Right

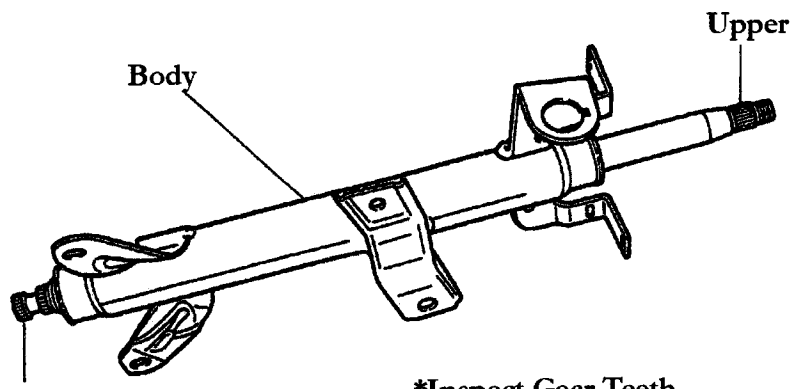


Connectors

8. Remove U-Joint Attachemnt Bolt. Remove Steering Column.

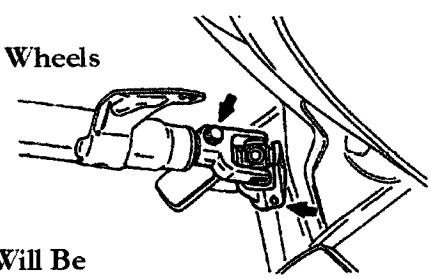


Note: Inspect U-Joint, any Cracks Detected Unit Must be Replaced



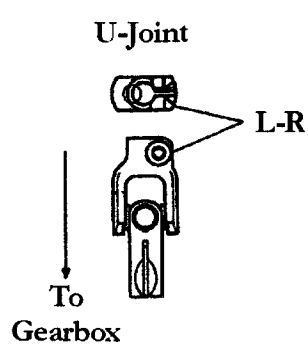
*Inspect Gear Teeth

Note: When Installing U-Joint Make Sure Front Wheels are Facing Forward

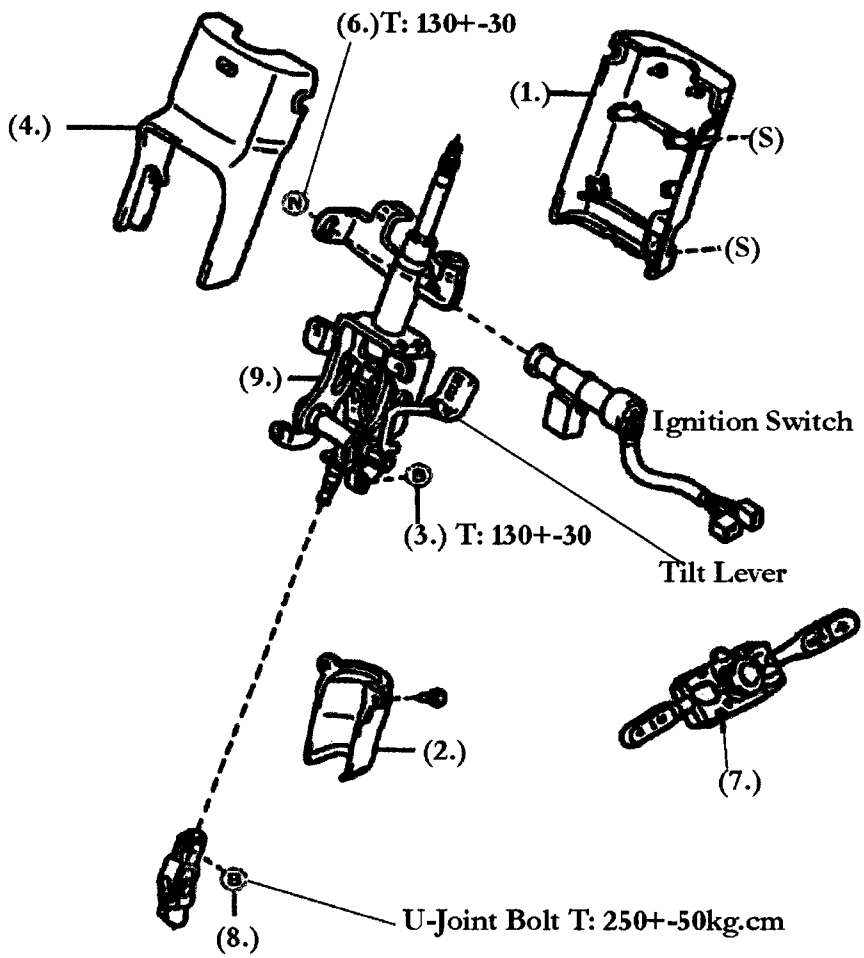


U-Joint Torque: 250+-50kg.cm

Caution: Do Not Over-Torque U-Joint, U-Joint Will Be Damaged and Can Fail



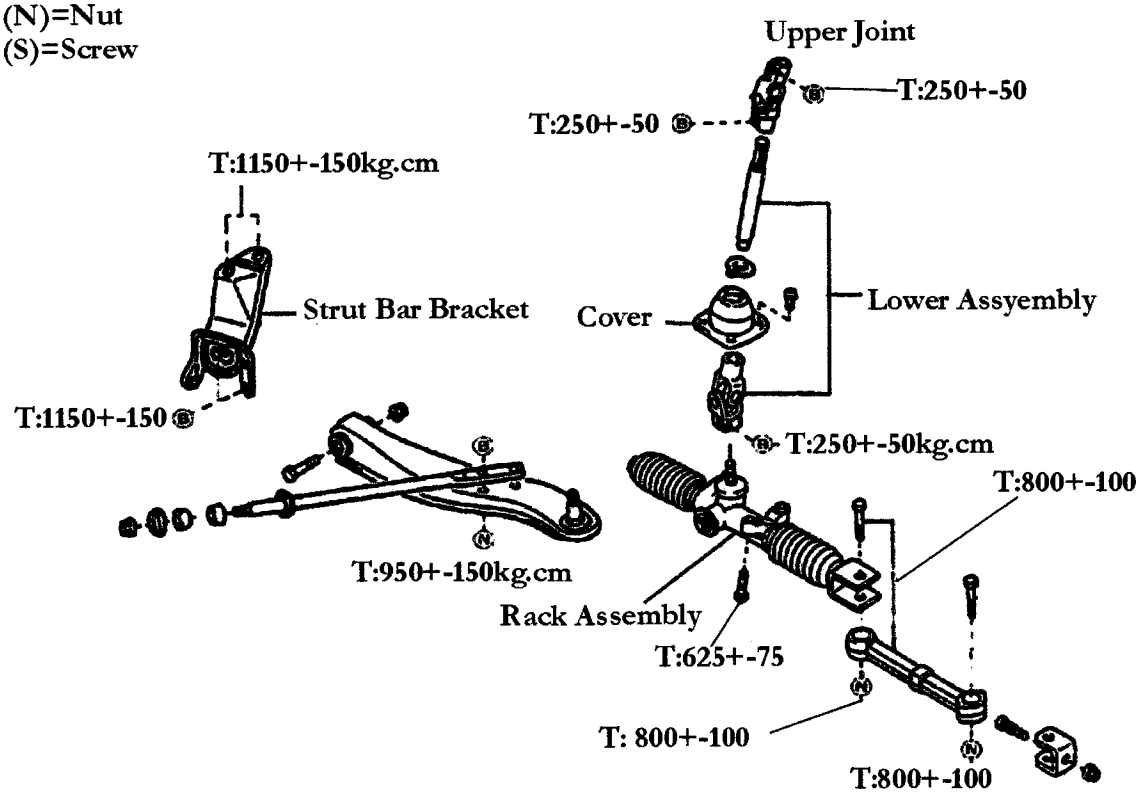
Tilt Steering Column Components



1. Cover: Steering Column Lower
2. Cover: Main Shaft U-Joint
3. Bolt
4. Cover: Steering Column Upper
5. Attachemnt Screws
6. Ignition Switch Retainer Nut
7. Combination Switch
8. Bolt: U-Joint Use
9. Column Assembly

Manual Steering Gearbox (Rack & Pinion) Removal

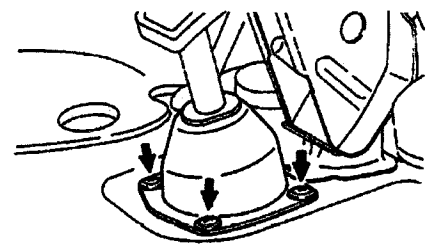
(B)=Bolt
(N)=Nut
(S)=Screw



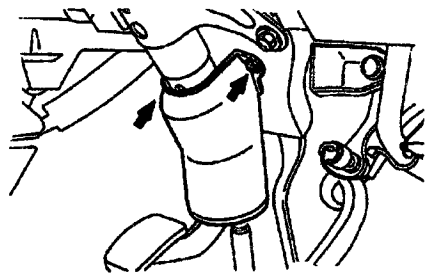
Removal

Preparation Note: Remove (RH) Tire

1. Remove Lower Dust Cover

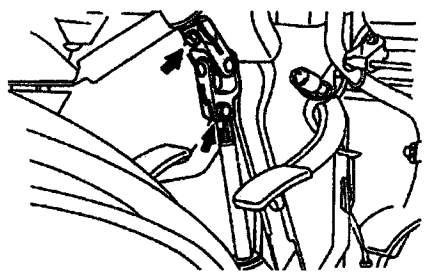


2. Remove Main Shaft U-Joint Cover

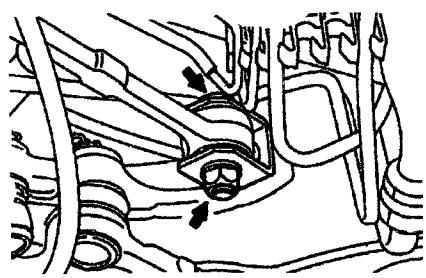


Note: Make Sure Wheels are Pointed Straight

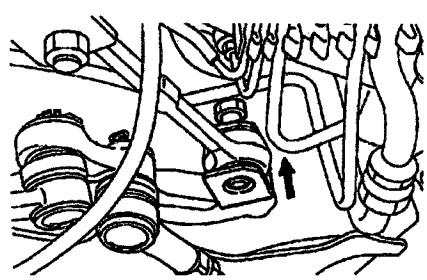
3. Remove Bolts in Diagram to Right



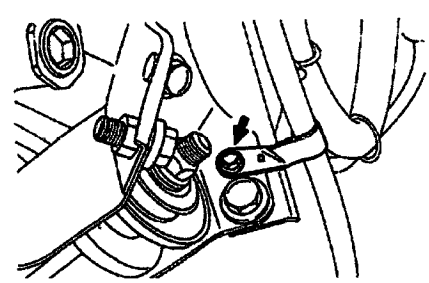
4. Remove Steering Drag Link Attachemnt Bolt



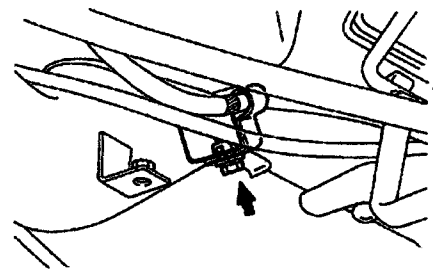
Caution: Bolt is Lifted Upwards, Pay Attention Not to Damage Hoses and Lines



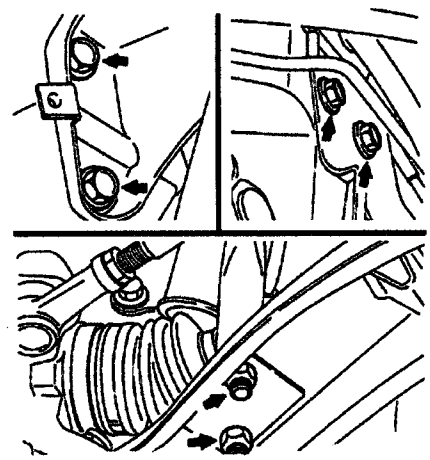
5. (MT Vehicles) Remove Clamp Holding Clutch Cable and Move to Side



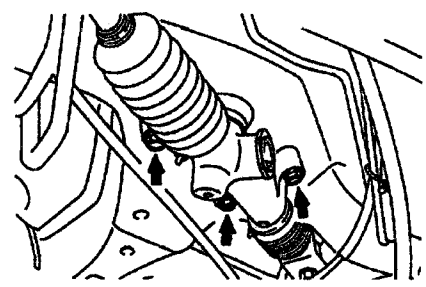
6. Remove Speedometer Cable Retaining Clamp (See Diagram on Right)



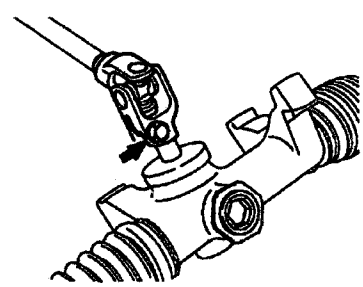
7. Remove the Bolts & Nuts Retaining (RH) Strut Bracket as Indicated in the Diagrams to the Right



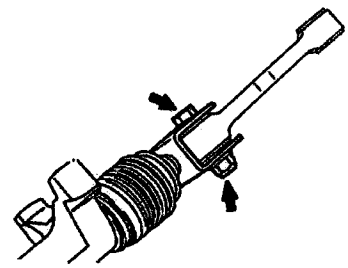
8. Remove Assembly Attachemnt Bolts Slightly Lower Unit



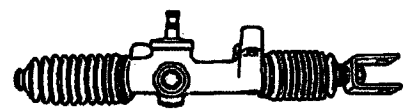
9. Disconnect Universal Joint Attachment Bolt



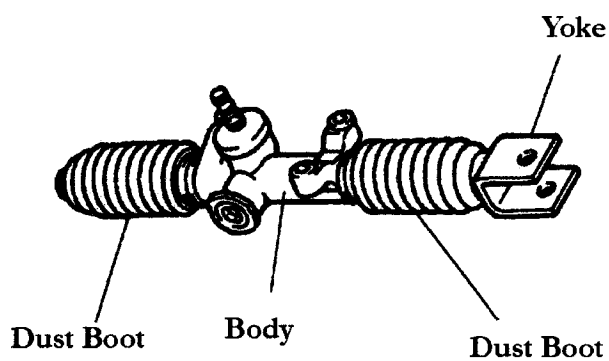
10. Remove Steering Drag Link Retaining Bolt

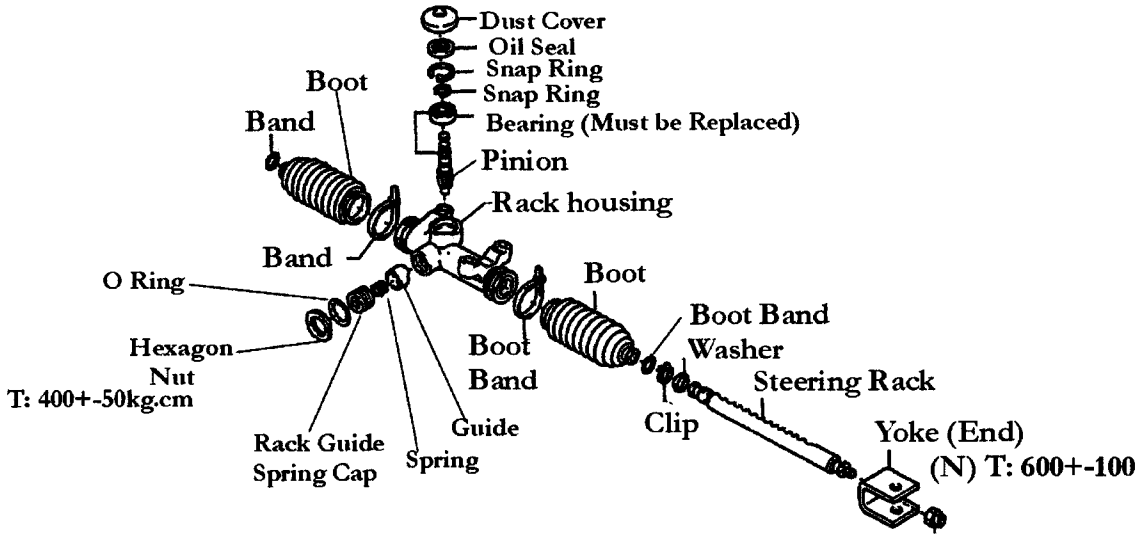


11. Remove Assembly



Note: See Next Section for Overhaul

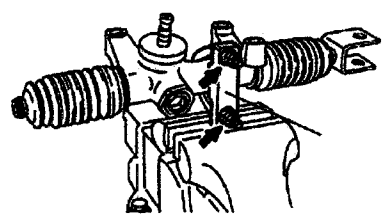




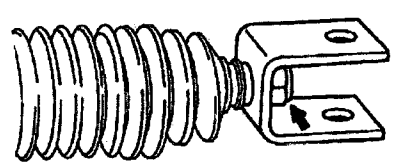
Disassembly

Note: Use Service Tool Vise Holder Adapter 09612-00012-000

Note: Bolt Rack Assembly To Vise Adapter as Shown. Do Not Place Rack Directly in Vise

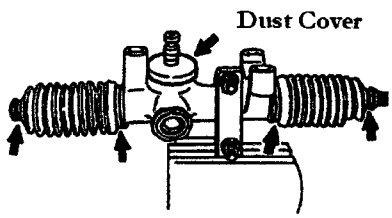


1. Remove Rack Yoke (End) Retaining Bolt Remove Yoke



2. Remove the Following Parts (See Right Diagram)
   (RH-LH) Boot Bands
   (RH-LH) Boots
   Dust Cover

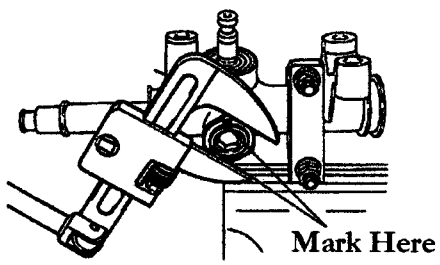
Note: All Parts Must be Discarded & Replaced



Note: Use Service Tool #09922-10010-000
Note: Mark Nut With Present Alignment Position

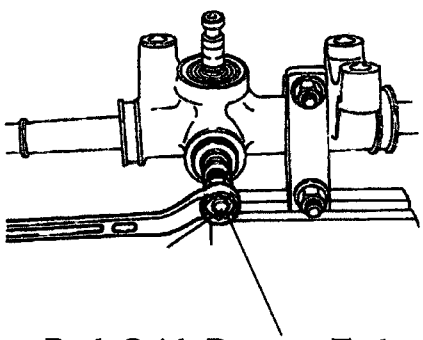
3. After Marking an Alignment Mark Remove Nut With Service Tool or Available Tool

Note: If Nut is Damaged (Rounded) Replace



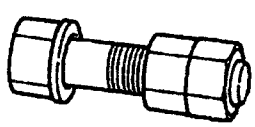
4. Use a Rack Guide Remover Tool (Shown Below) and a Combination Wrench to Remove Guide

Note: Use Proper Tools or Damage Can Occur



How to Make Tool

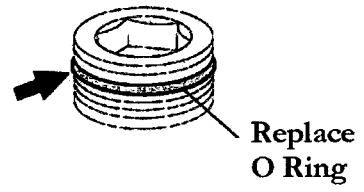
Take a 17mm Bolt & Two(2) 17mm Nuts. Screw Nuts Down Over Shaft and Tighten. Use a Box Wrench and Back Out Guide



Note: Not Necessary to Over Tighten. Snug is Fine (Finger Tight Enough)

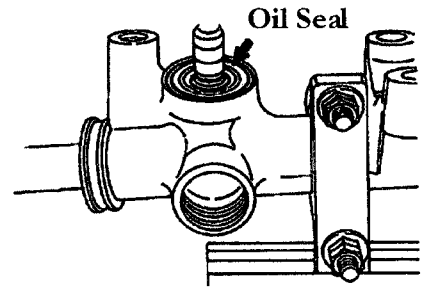
5. Remove Rack Guide Cap O Ring, Clean and Install New O Ring

6. Remove Compression Spring & Rack Guide Inspect for Cracks in Guide, Replace if Found Worn

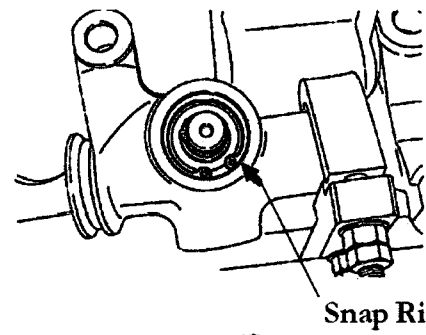


7. Use a Flate Head Driver (-) and Pop Out Oil Seal

Note: Oil Seal is (Type K)



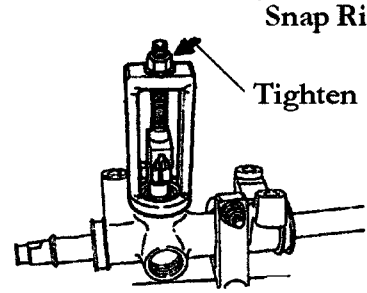
8. Remove Snap Ring (Replace)



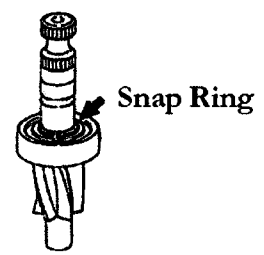
Note: Use Service Tool #09631-87201-000 To Remove Pinion

9. Use Puller to Remove Pinion & Bearing From Housing

Note: Bearing Con Not Be Re-Used

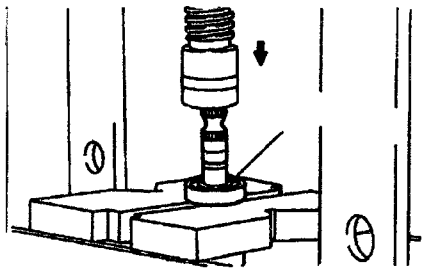


10. Remove Snap Ring From Pinion Shaft



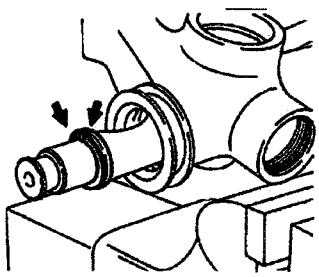
11. Use a Press & Remove Bearing From Pinion Shaft

Note: Discard Bearing



12. Remove Snap Ring From Rack and Slide Rack Out From Housing

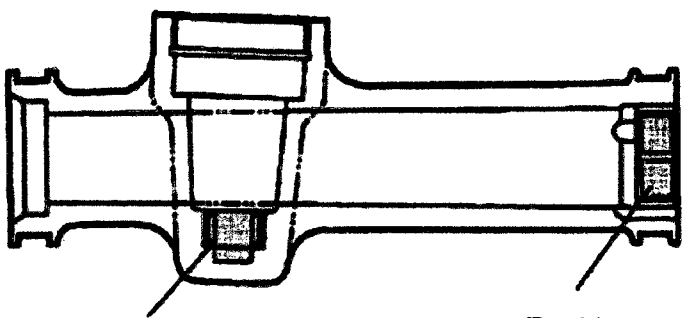
Disaasmbly Complete



Assembly

Note: Clean Housing Body Thoroughly Before Assembly

Housing Preperation



Needle Bearing Grease
1.0+-0.2Gram Grease

Bushing
1.0+-0.2Gram Grease

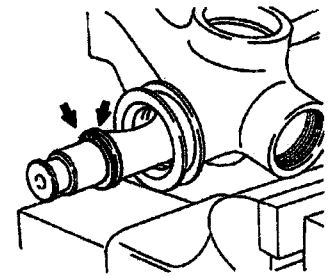
Grease: Long Life Chassis Grease

Note: Before Assembly Rack Must be Greased at Points Marked in the Diagram

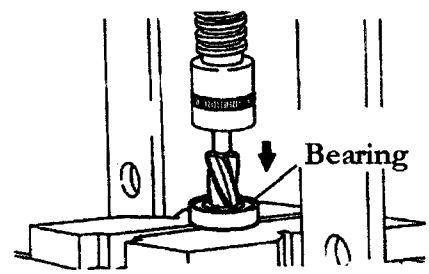
Grease: Long Life Axle/Chassis Grease

Grease Points (Rack)

1. Slide Rack into Housing, Attach Back-Washer and New Snap Ring



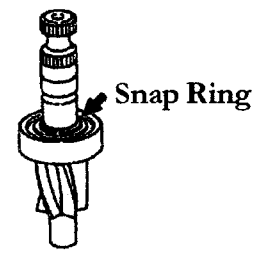
2. Using a Press, Press on New Bearing



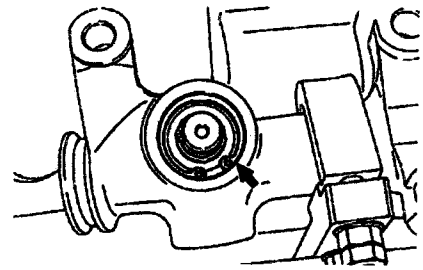
3. Attach New Snap Ring

4. Use a Hard Plastic Hammer to Install Pinion into Housing Assembly.

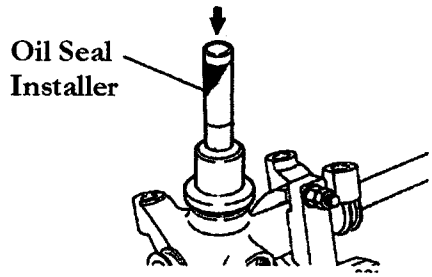
Note: Coat Bearing With Grease Before Installation



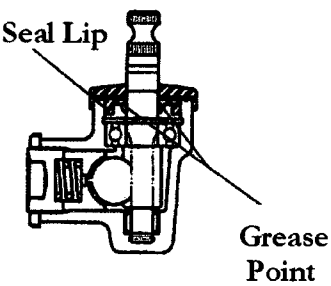
5. Install New Retainer Snap Ring



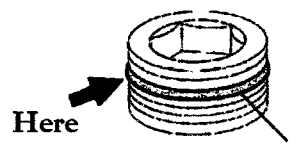
6. Install New Oil Seal



Caution: Oil Seal Lip Must Be Covered With Minimum of 0.3+-0.1g of Long Life Chassis Grease

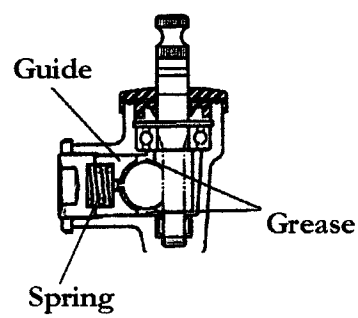


7. Install New O Ring on Guide Spring Cap

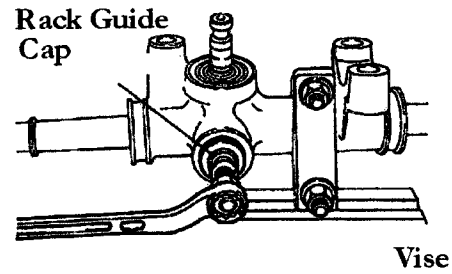


8. Assemble Rack Guide and Compression Sping

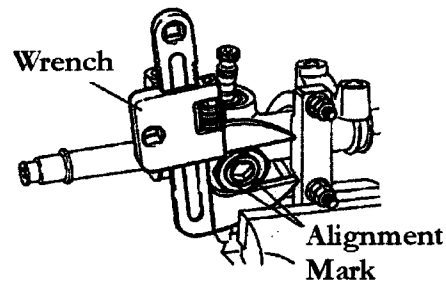
Note: Coat Parts in Long Life Chassis Grease
Minimum: 6~8g



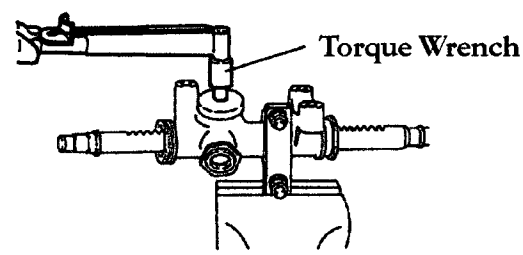
9. Tighten Cap to 70kg.cm



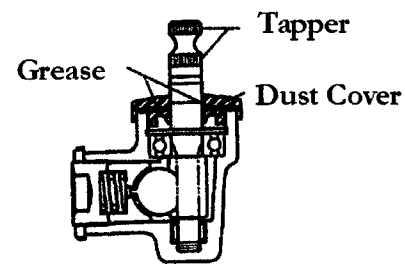
10. Line Up Hexagon Nut With Alignment Mark and Set Torque T:400+-50kg.cm



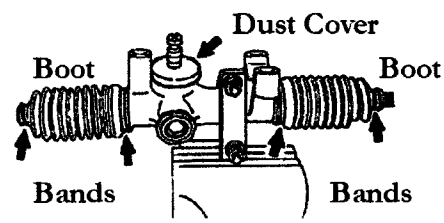
11. Set Torque T: 12~14kg.cm



12.Install New Dust Cover and Coat With Grease

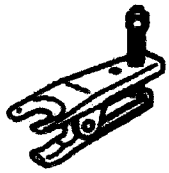


13. Install New Boots and New Attachemnt Bands

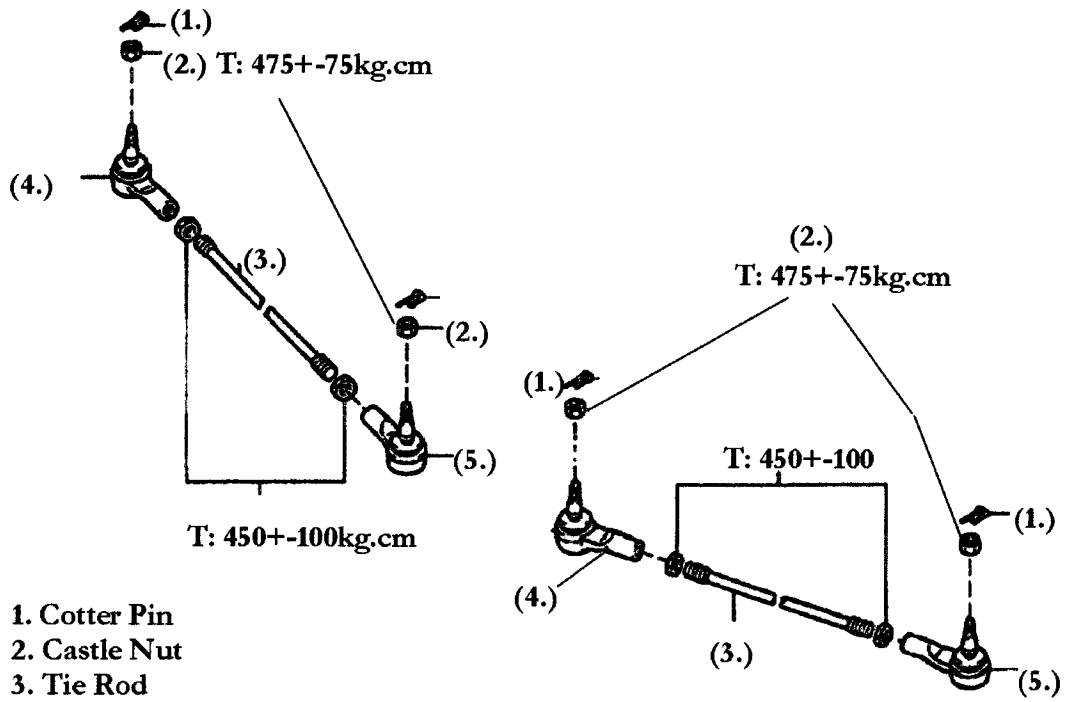


14. Attach End Yoke and Torque T: 600+-100kg.cm
15. Install in Vehicle

Tie Rod Ends



Service Tool #09611-87701-000
Tie Rod End Puller



1. Cotter Pin
2. Castle Nut
3. Tie Rod
4. End: Tie Rod No. 1
5. End: Tie Rod No.2

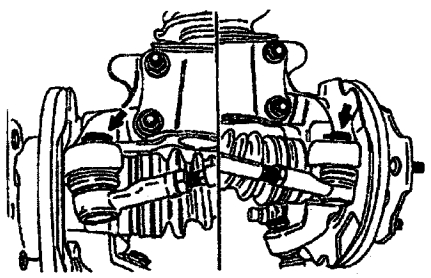
Part Numbers See Parts Page

Tie Rod Removal & Replacement

Note: Replacing Front End Components Requires Front End Alignment

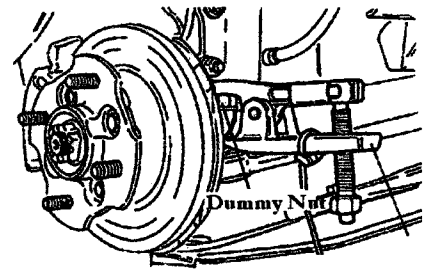
1. Jack Vehicle and Remove Front Tires

2. Remove Cotter Pin (Discard) and Castel Nuts

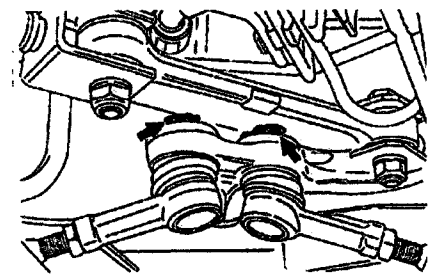


3. If The Tie Rod is Removed For Maintenance and not Replacement Remove Castle Nut & Use Dummy Nut and Puller to Push Out End

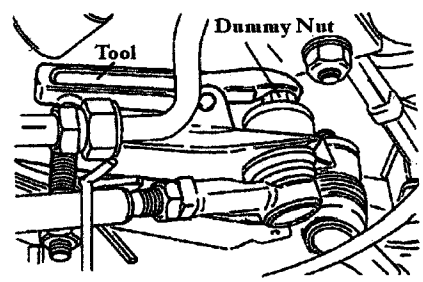
4. Press Out End(s)



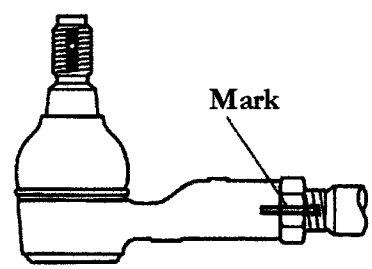
5. Center Arm End Removal: Remove Cotter Pin and Castle Nut



6. Slide in Remover Tool and Press Out. Remove Entire Tie Rod Assembly



7. If End is to be Replaced Make Alignment Mark as in Diagram to the Right. Back Off Lock Nut and Unscrew End. Replace and Do Not Tighten Lock Nut. Lock Nut Shall be Torqued After Alignment Has Been Completed



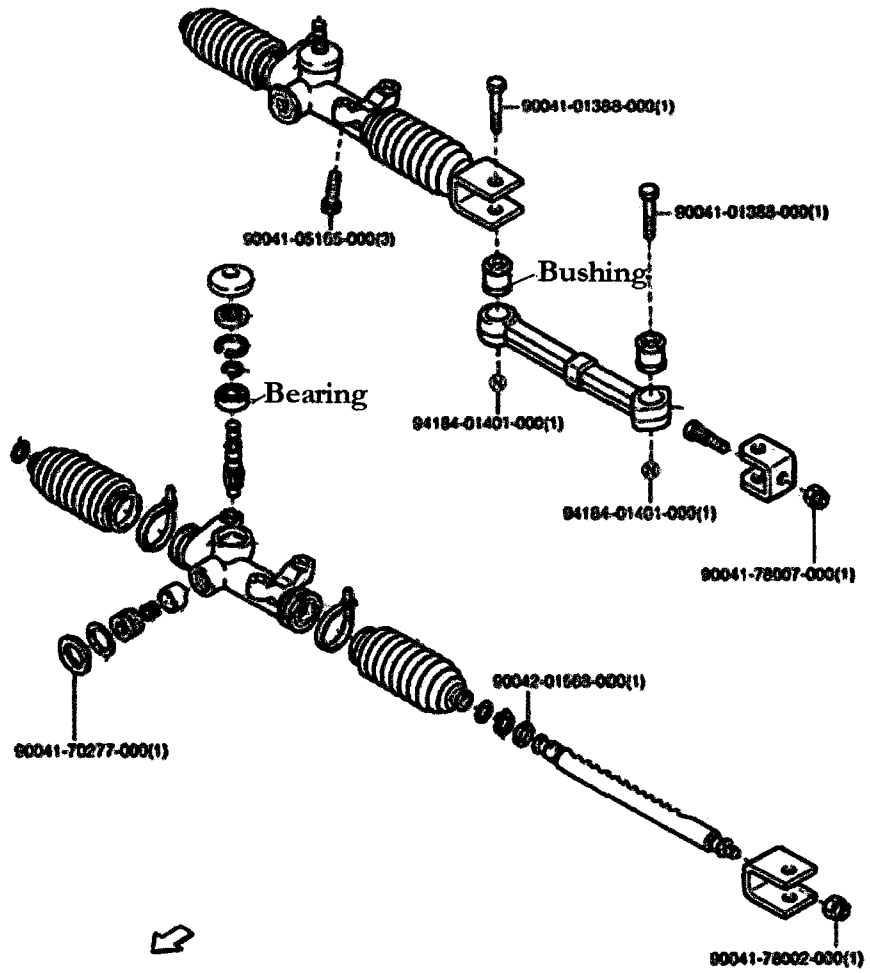
8. Install New Tire Rods and Attach to Vehicle, Adjust Alignment

Note: Make Sure Tire Size and Tire Pressure Are Correct Before Alignment

Rack & Pinion Parts

(N)=Nut
(B)=Bolt

Manual Steering



Note: Rack Unit Has Limited Parts Availablity

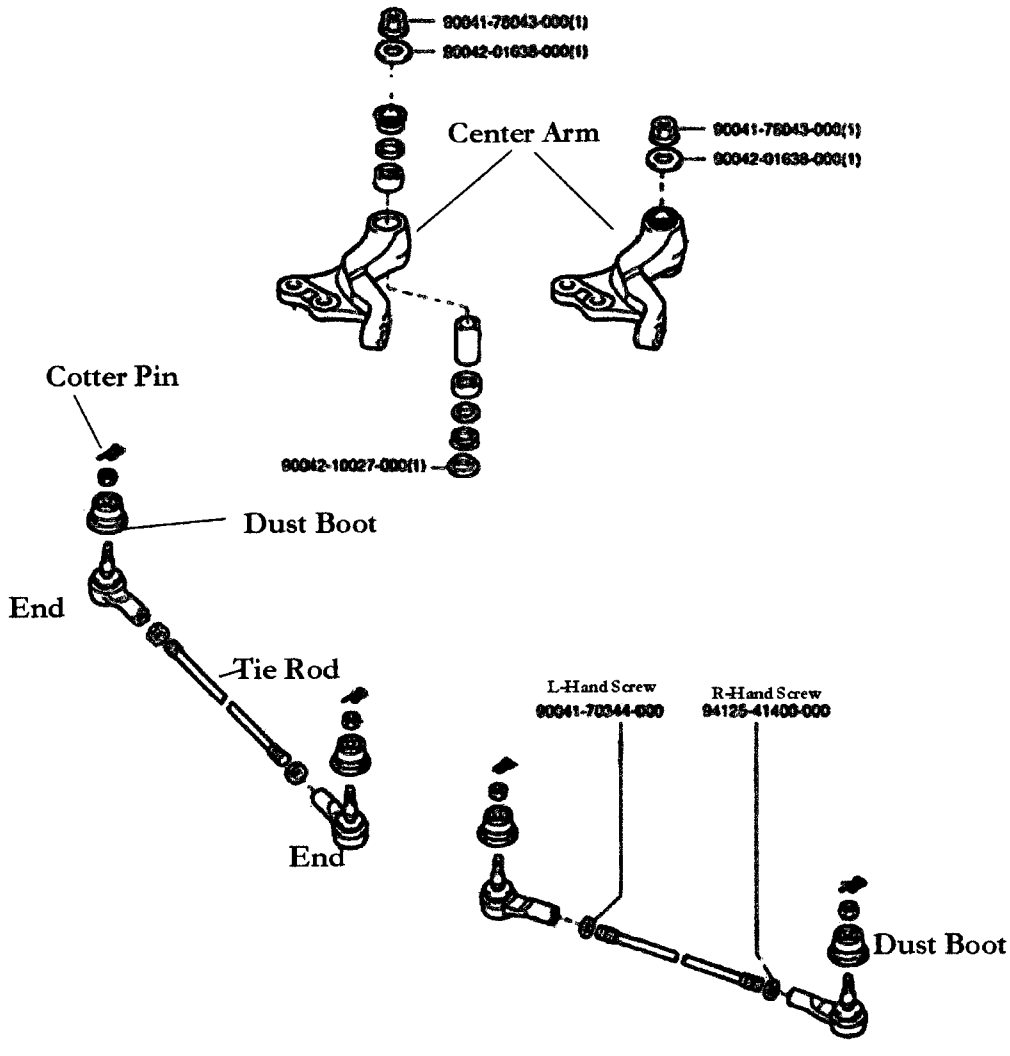
Boots
S100, 110, 120, 130, 140 (MT, DX,LX,NGD,2S+S100VSMRS) #45535-87509-000
S120, 130 DOHC +120 VZMQT, 0VFMQT, S130VZMRS #45535-87507-000
S100, 110 (DECK VAN-OLD) # 45535-87507-000
S120, 130 DOHC # 45535-87508-000

Bearing
(ALL) # 90043-63147-000

Bushing
(All) #90043-85163-000

Note: Above Listed Parts Still Available at Time This Book Is Published

Tie Rod End Parts



Parts & Part Numbers Note: Some Parts May or May Not Be Available On Older Models

Tie Rod End (Right) (All) #45047-87583-000
Tie Rod End (Left) (All) #45046-87583-000

Steering Center Arm
EV, PS1, PS2, PS3 #45402-78536-000
DOHC, CRM, PF2 #45402-87540-000
EFI, TR,MT,DX,MX (HX., NTBO) #45402-87539-000

Tie Rod End Dust Boot
(ALL Ends) #45479-87508-000

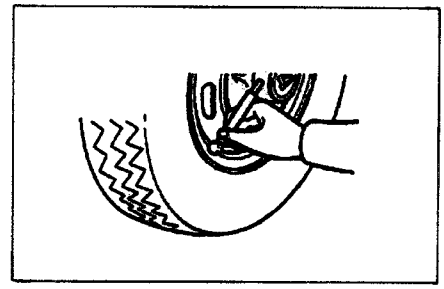
Chapter 4

Suspension

- Tire Size & Air Pressure
- Alignment
- Strut Components
- Front Strut Removal & Replacement
- Rear Shock Absorber Replacement
- Rear Leaf Spring Components
- Rear Coil Spring Suspension (Van)
- Rear Coil Spring & Differential Removal
- Rear Lateral Control Rod Diagram
- Front Strut & Parts
- Rear Leaf Spring Suspension Parts
- Front Suspension Parts

Tire Size & Air Pressure (kg.cm)

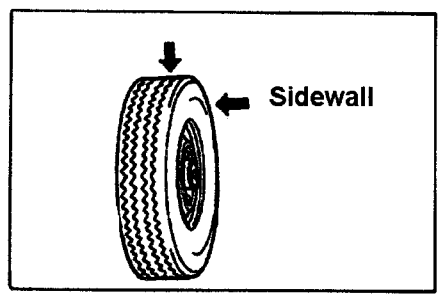
Check tire pressure at regular intervals



Tire Pressure Guide

Vehicle Series		Size	Air (kg.cm) F	Air (kg.cm) R
S100P, S110P S100C, S110C S100CT, S110CT		5.00-12-4	2.0	2.4
		5.00-12-6		
		145R12		
S100V	AT	5.00-12-4	2.2	2.4
	MT	5.00-12-6	2.4	2.4
	All	145R12	2.4	2.6
S110V		5.00-12-4	2.4	2.4
		5.00-12-6	2.4	2.4
		145R12	2.4	2.6
S120V		145R12	2.4	2.4
		155R12	2.2	2.2
		165/70R13	2.4	2.4
S130V	ZMGE, ZHGE	145R12	2.4	2.4
	FMQE		2.6	2.6
	ZMGE, ZHGE, ZMGT	155R12	2.2	2.2
	FMQE		2.4	2.4
	All	165/70R13	2.4	2.4
T125/90 D12			4.2	

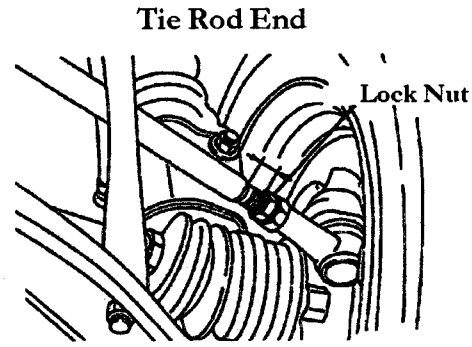
Tread



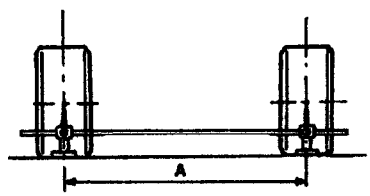
Check uneven tread wear and crakes in the sidewall. Replace if necessary

Note: Make Sure Tire Size and Air Pressure
Are Correct Before Alignment

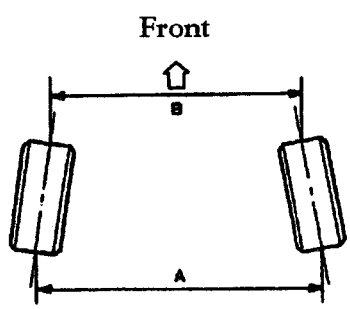
1. Loosen Tie Rod End Lock Nut



2. Measure Toe In



Specifications: (All) 0.0+-1.0mm



3. Set Toe In to Specifications

4. Torque Tie Rod End Lock Nut to T: 450+-100kg.cm

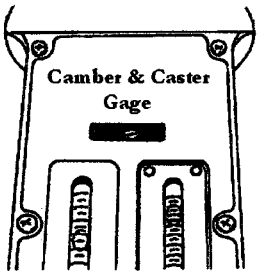
Note: After Setting Torque Once More Verify Toe In

5. Set Camber & Caster

Suspension

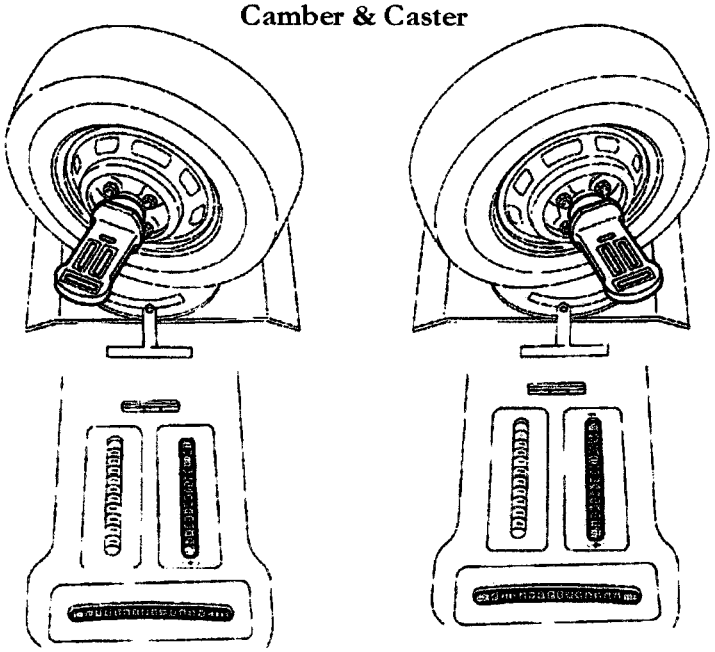
Camber & Caster

Note: Use an Camber & Caster Gage to Set Specifications



Camber Specification: 0*15'+-45'

Camber & Caster



Specifications

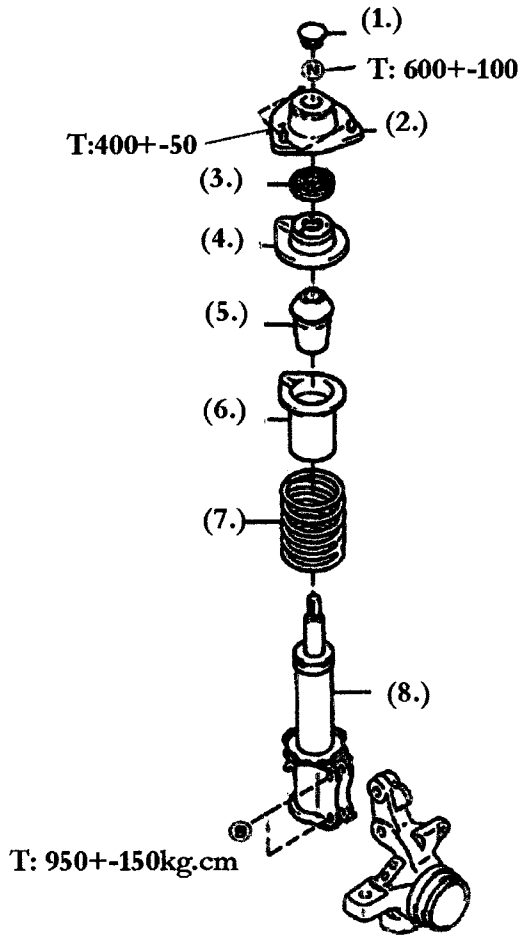
Caster:
3*08+-1 (Truck)
3*04+-1 (Van)
King Pin Degree 13*03+-1

Front Side Slip= In 5mm~Out 5mm

Note: (*)=Degree

Strut Components

Torque: (kg.cm)

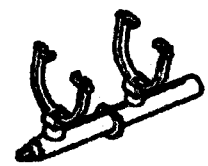


Components

1. Cover: Steering Dust
2. Support S/A: Front Suspension
3. Bushing
4. Seat Ay: Front Spring Upper
5. Bumper: Front Spring
6. Cover: Strut Dust
7. Spring: Coil Front
8. Front Strut Assembly

Tool

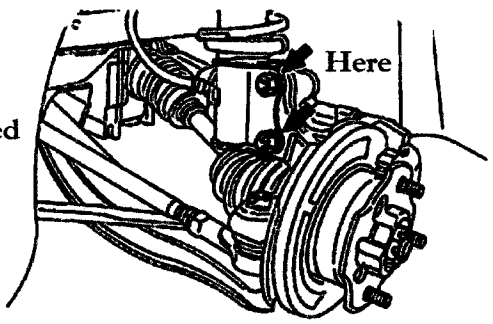
Coil Spring Compressor



P/N#09727-30020-000

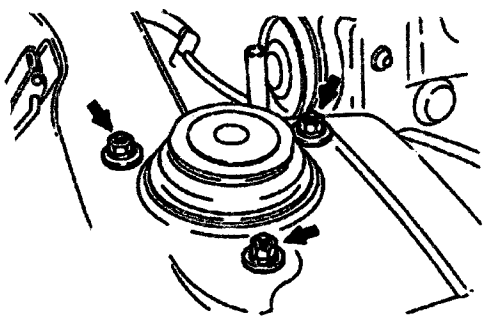
1. Jack Vehicle & Remove Front Tires
2. Remove Brack Hose Clamp
3. Remove Strut Lower (2) Attachment Bots

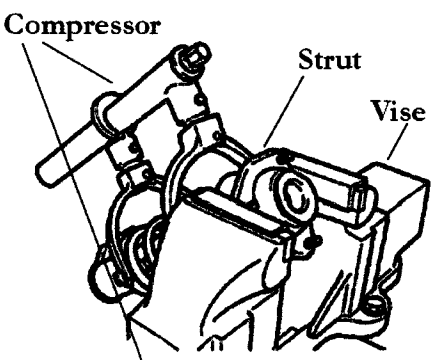
Note: Lower Attachment Bolts Must be Replaced



4. Remove Upper (3) Attachment Nuts as Seen in Right Side Diagram. Remove Strut Assembly With Coil Attached

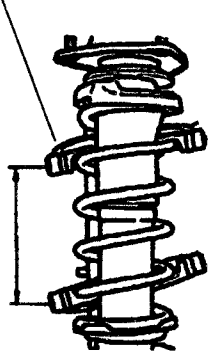
Note: Retainer (3) Nuts Must be Replaced





5. Use Spring Compressor Tool and Compress Spring

6. While Spring is Compressed Remove Support and Slide Off Spring.

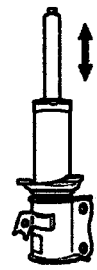


Bottom View of Compressor

Note: Strut Can Not Be Rebuilt, If Defective or Damaged Must be Replace

Note: Inspect Strut for Free Travel and or Oil Leak

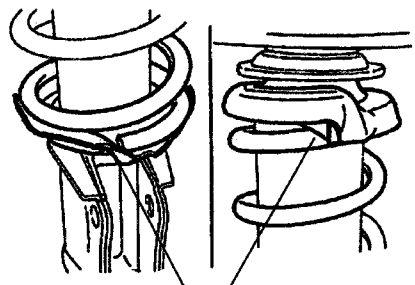
Note: If Strut is Over 60,000 Kilometers Replace



Free Travel Inspection

Installation

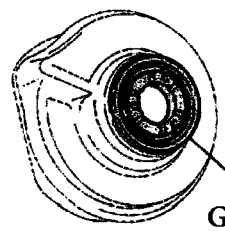
1. Compress Spring with Spring Compressor
2. Place Spring Onto Strut and Position as in Diagram on Right



Spring Position

3. Coat Upper Bushing With Long Life Chassis Grease Minimum Grease: 0.5g

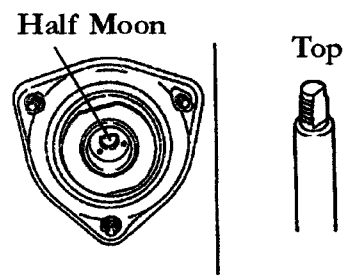
4. Attach Front Suspension Support (Item (2.) Diagram)
5. Remove Spring Compressor
6. Install Strut Assembly Into Vehicle in Reverse Order



Grease Here

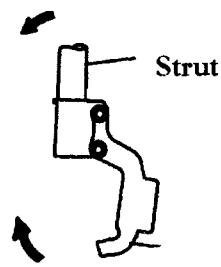
Note: Only New Nuts & Bolts Must be Used For Assembly

Torque
Top Nut T: 600+-100kg.cm
Support (2.) T: 400+-50kg.cm
Lower Strut Mount T: 950+-150kg.cm



Half Moon

Top

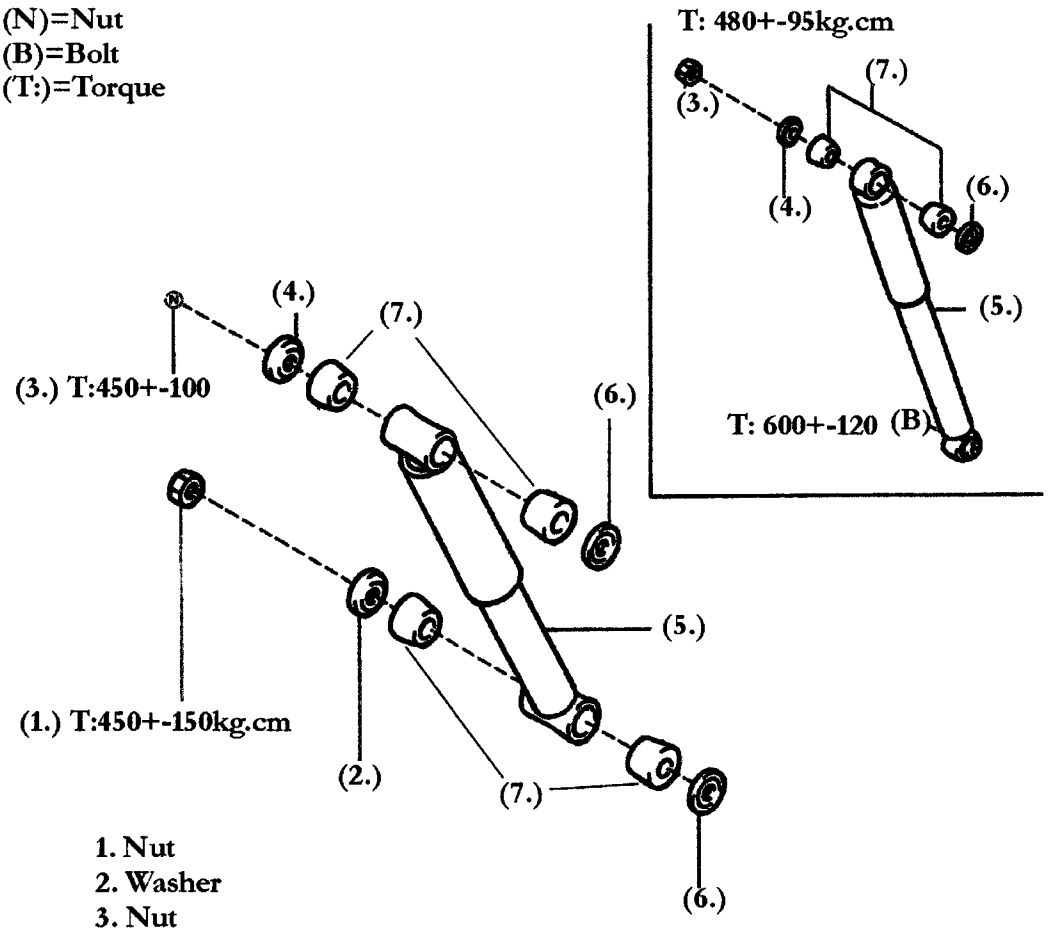


Strut

Strut Travel Range

Rear Shock Absorber

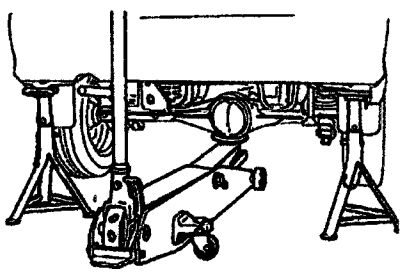
(N)=Nut
(B)=Bolt
(T:)=Torque



1. Nut
2. Washer
3. Nut
4. Washer
5. Rear Shock Absorber
6. Washer
7. Cushion

Replacement

1. Jack up Rear of Vehicle and in Diagram on Right
2. Remove Rear Wheels
3. Remove Spare Tire (AC Equiped)

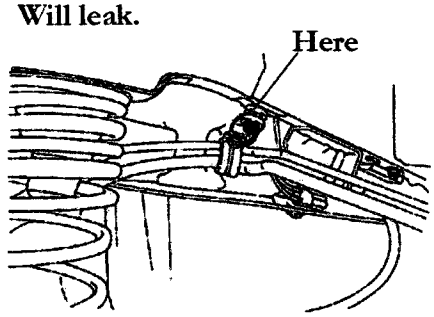


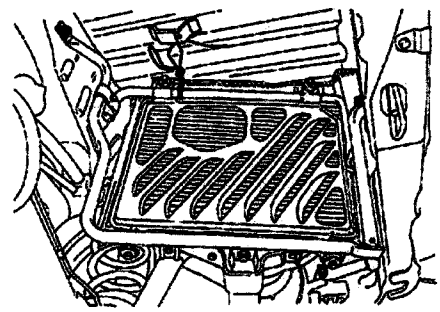
Rear Shock Removal

AC Equiped Only

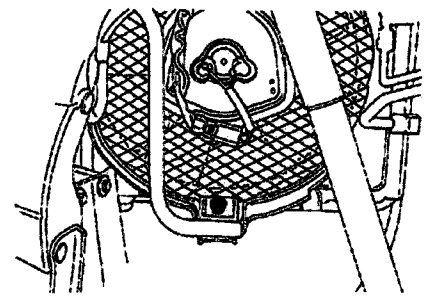
1. Remove AC Hose Bracket

Caution: Do Not Scratch Hose or Oil Will leak.



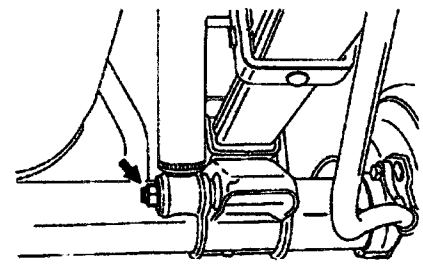


2. Remove (4) Condensor Bolts & Lower Unit



4. Remove Lower Attachment Nut

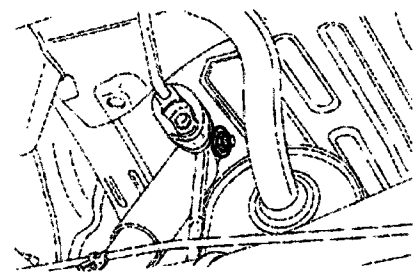
Note: Nuts Must Be Replaced



5. Remove Upper Attachment Nut
6. Remove Shock and Replace New Unit

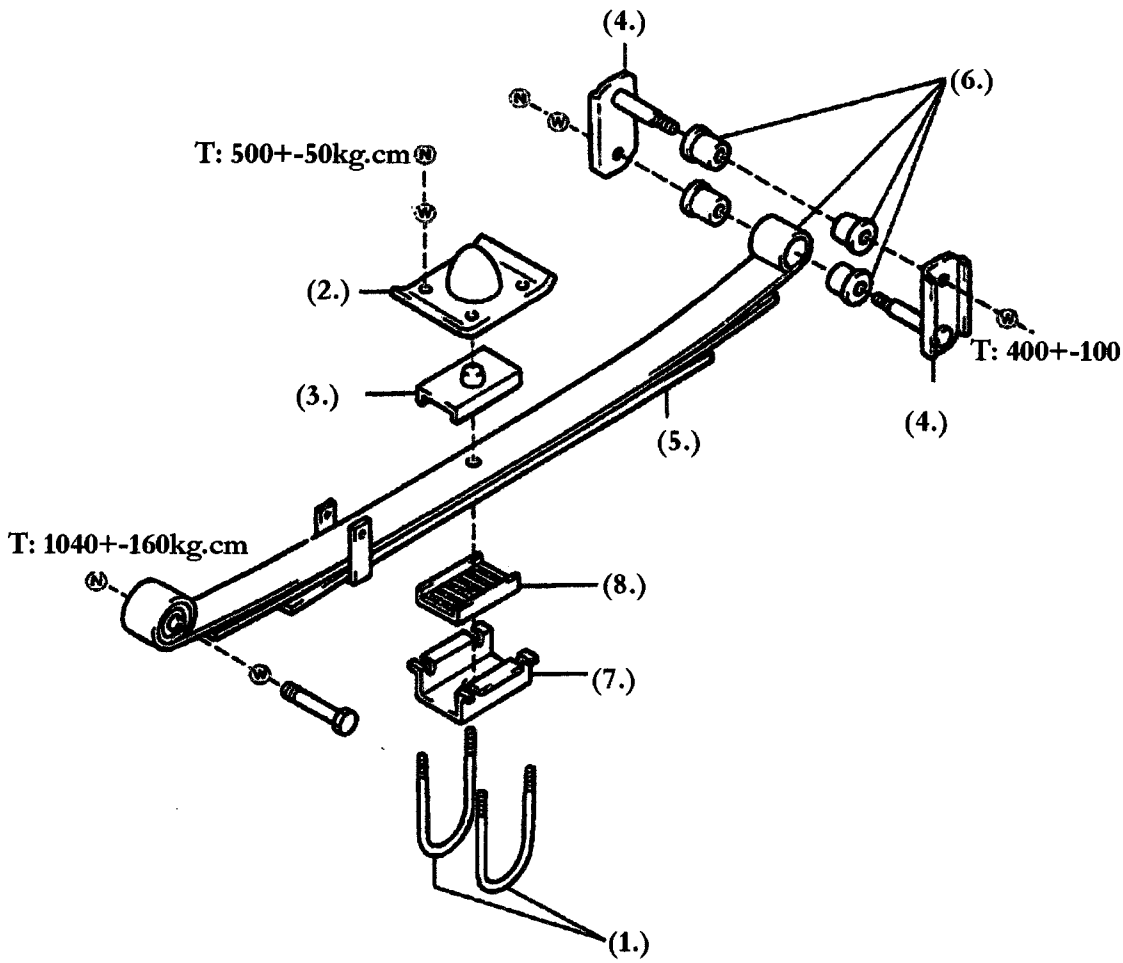
7. Installation is Reverse Order

Note: All Torque Specifications on Previous Page



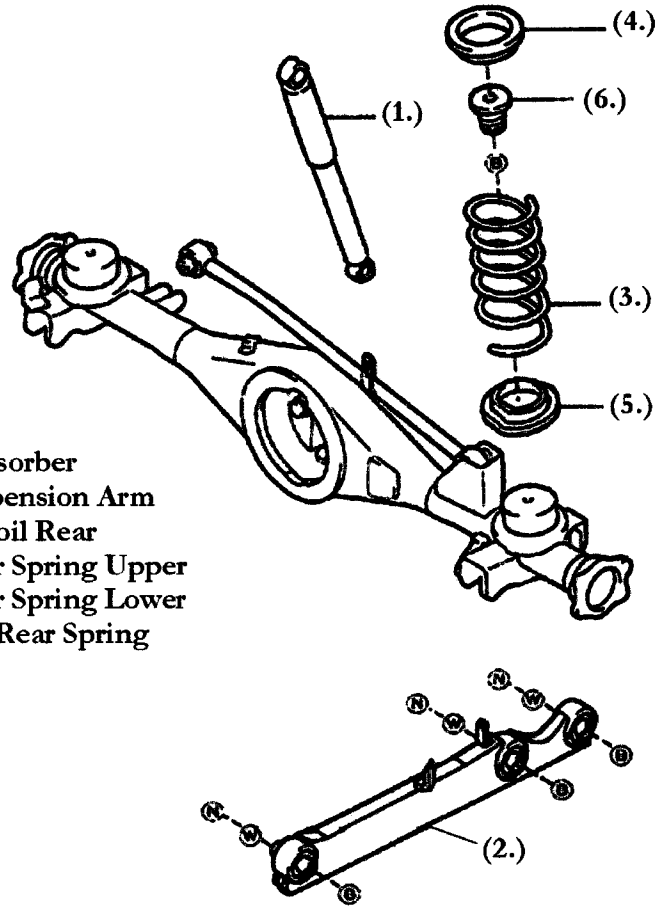
Rear Leaf Spring

(N)=Nut
(W)=Washer
(B)=Bolt



1. U-Bolt
2. Bumper: Rear Spring
3. Pad: Spring Upper
4. Shackle S/A: Rear Spring
5. Leaf Spring
6. Bushings
7. Retainer: Spring Pad
8. Lower Spring Pad

Rear Coil Spring Suspension

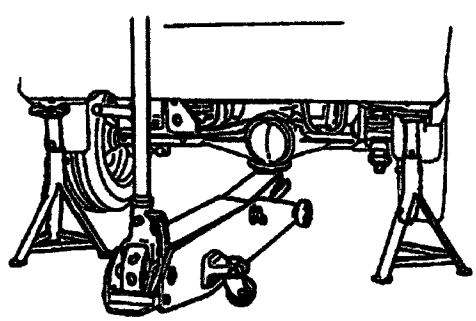


1. Shock Absorber
2. Rear Suspension Arm
3. Spring: Coil Rear
4. Seat: Rear Spring Upper
5. Seat: Rear Spring Lower
6. Bumper: Rear Spring

Removal

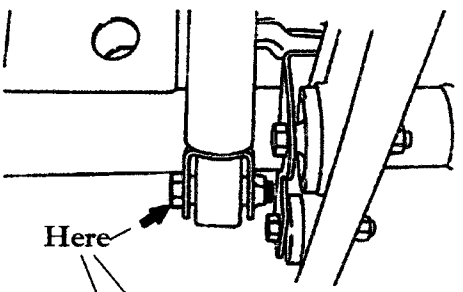
1. Jack Up Vehicle and Place Jack Stands as Shown in Diagram to Right

2. Remove Rear Wheels
3. Remove Parking Brack Cable Bracket
4. (ABS Vehicles) Remove Seansors
5. Disconnect Brake Hose

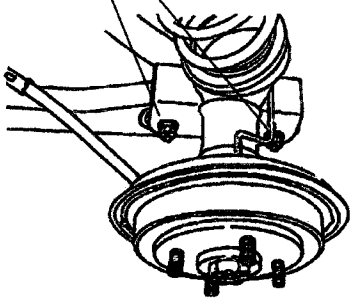


6. Remove Lower Shock From Axel Housing

Note: Bolt Must Be Replaced



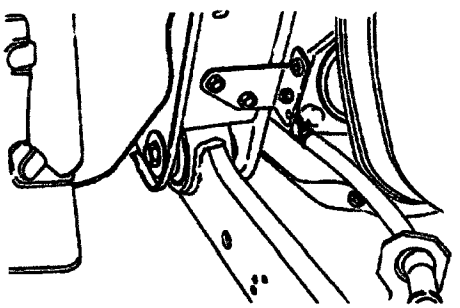
7. Disconnect Rear Suspension Arm from Axel Housing. Use Diagram on Right



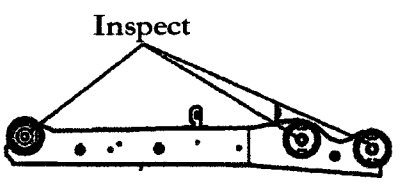
8. Remove Rear Suspension Arm From Mount and Remove Arm

9. Inspect for any Optional Wires Attached to Axel, If Attached, Disconnect or Remove

10. Lower Axel from Vehicle

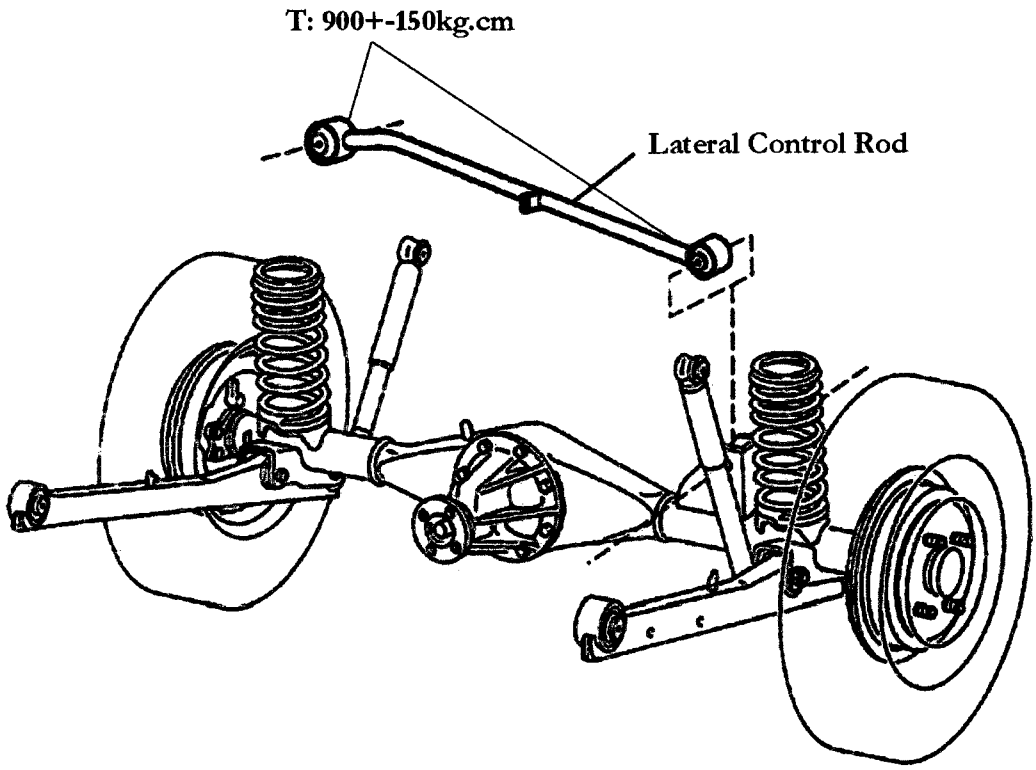


11. Inspect Suspension Arm Bushings and Replace if Necessary Before Re-Installation

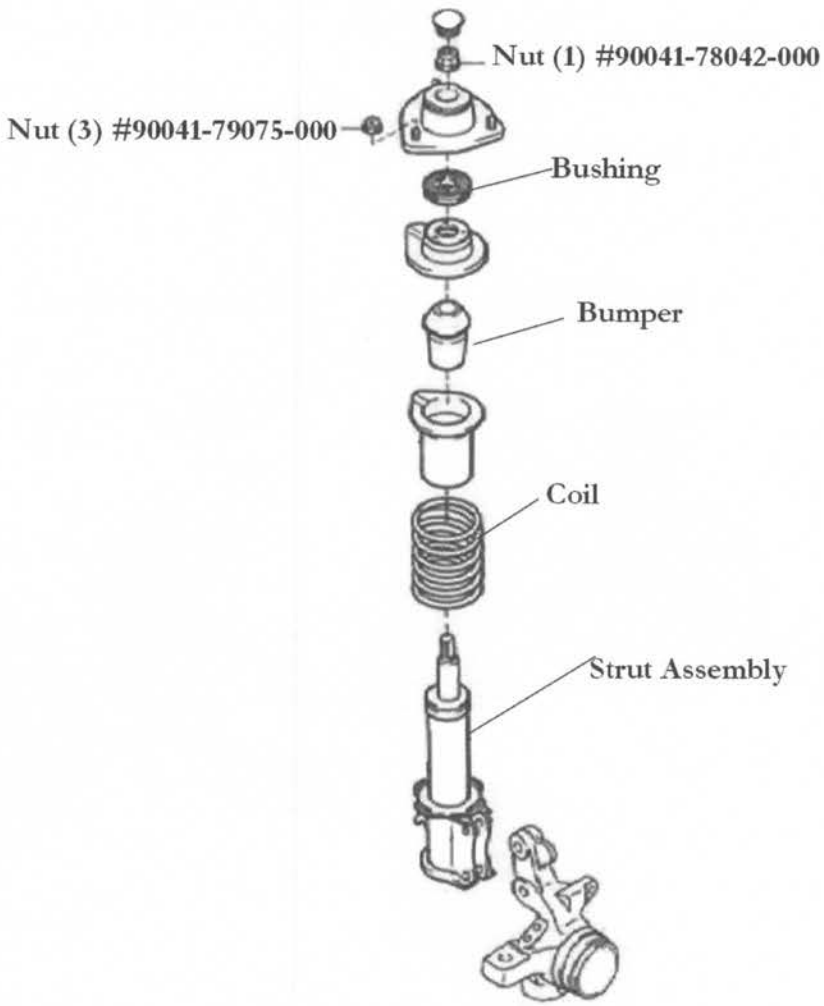


Rear Lateral Control Rod Assembly

Rear Coil Spring Vehicle



Front Strut & Coil Parts



Note: Parts Listed Below Available at Time of Publication

Bumper: (All) #48331-87507-000
Strut Assembly:
EFNS, EFES, EFTS (VAN) DX,HX,MTM,2WD,NTBO
(RH)#48510-87553-000
(LH)#48520-87548-000
S100, S110 (tRUCK) MT,DUMP,NGD,
(RH)#48510-87561-000
(LH)#48520-87556-000

Bushing: (All)#90043-86101-000

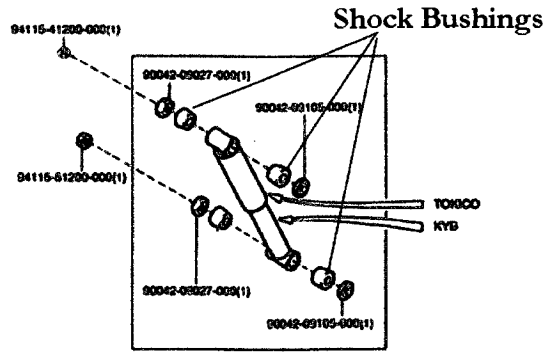
Coil (Truck)#48131-87564-000
(Van) #48131-87566-000

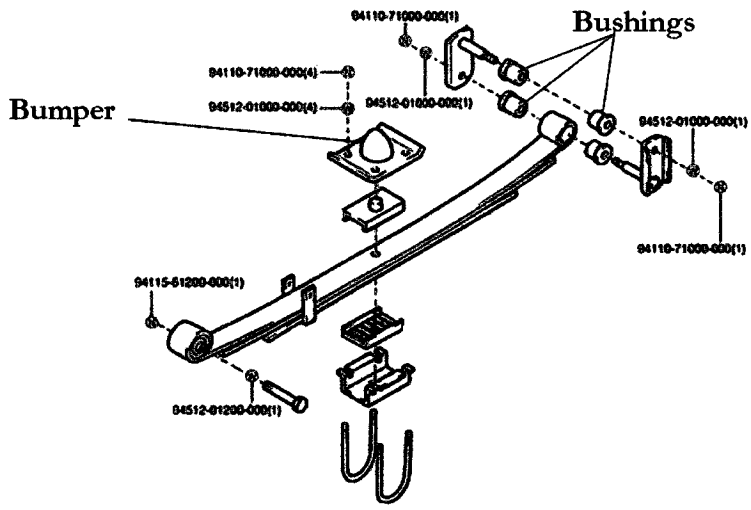
Suspension

Rear Leaf Spring Suspension Parts

(N)=Nut Part#
(B)=Bolt Part#
(W)=Washer Part#

Truck - Van - MT - Deck





Bumper
Truck#48341-87520-000
Van #48341-87521-000

Note: Available Parts Listed to Left

Bushings
(All)#90043-85158-000

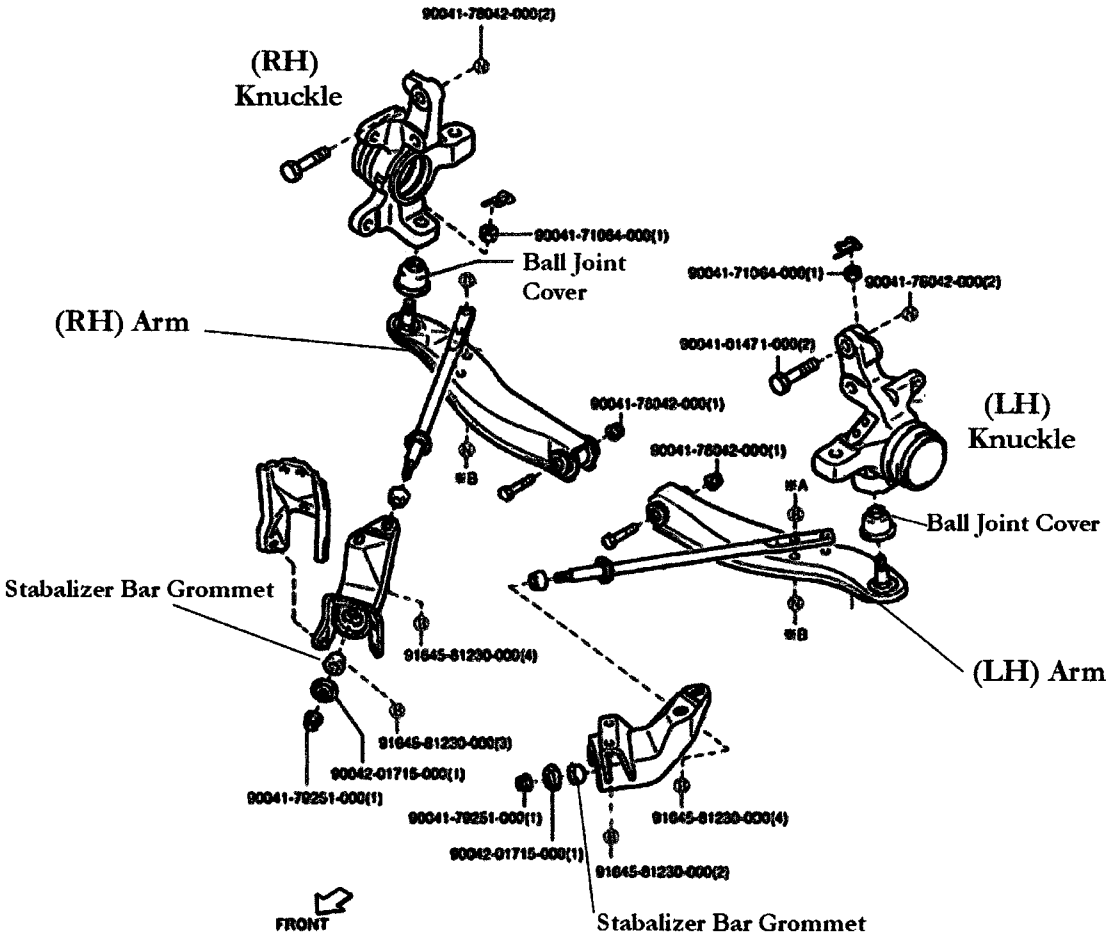
Shock Absorber
Van #48531-87592-000
Truck#48531-87593-000

Shock Absorber Bushings
S110,110,140 #90043-85002-000
S120,130 #90043-85146-000

Suspension

Front Suspension Parts

(B)=Bolt
(W)=Washer
(N)=Nut



Knuckle
(RH) #43211-87517-000
(LH) #43212-87513-000

Ball Joint Cover (ALL) #43345-87508-000

Arm: Lower Suspension
(RH)
EFTS, EFGS, EFGS, EFZS, NTBO #48605-87519-000
Turbo#48605-87520-000
(LH)
EFTS, EFGS, EFGS, EFZS, NTBO #48606-87520-000
Turbo#48606-7521-000

Stabalizer Bar Grommet (All) #48674-87505-000

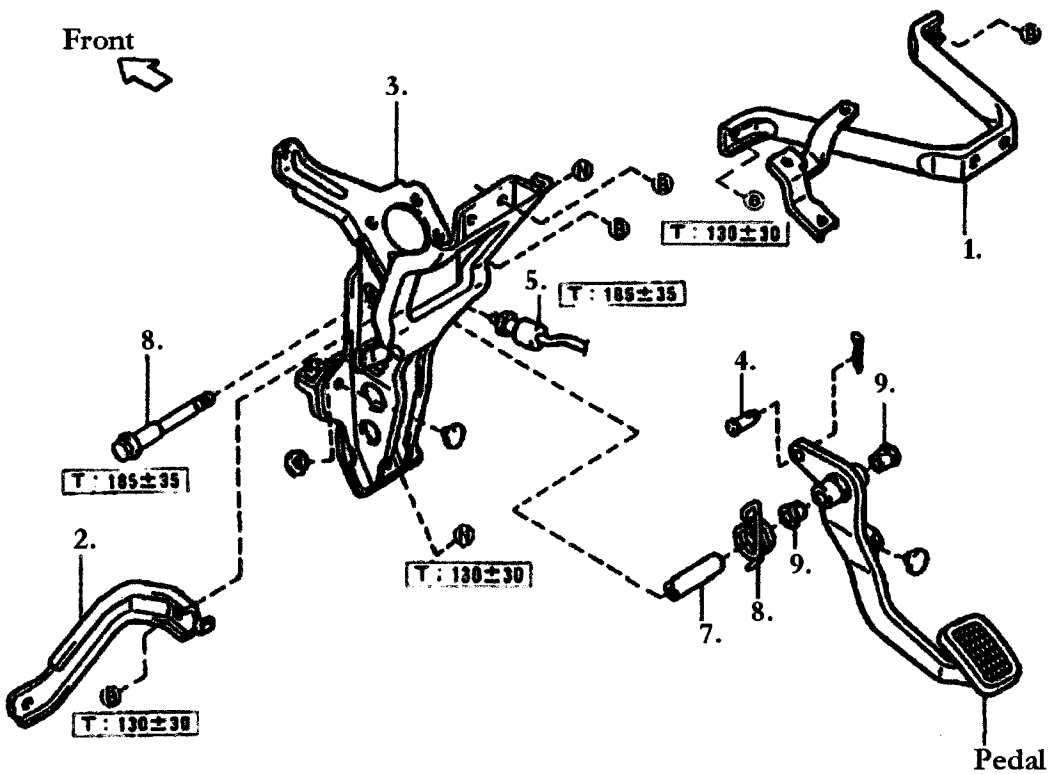
Chapter 5

Brake System

- Brake Pedal & Bracket Diagram
- Mater Cylinder Breakdown Diagram
- Master Cylinder Type (Standard-ABS) & Rebuild
- Parts: Master Cylinder Van-Truck
- Parts: Brake Booster
- Front Disk Brake System 2WD
- Front Disk Brake System 4WD
- Front Caliper Breakdown Diagram & Parts Listing
- Rear Drum Brake System & Parts
- Parking Brake Diagram & Parts
- ABS Control Unit
- ABS Front & Rear Sensor Diagrams
- ABS Computer
- ABS Complete Control Circuit Schematic 2WD
- ABS Complete Control Circuit Schematic 4WD (Including Diff-Lock)

Brake Pedal & Braket Diagram

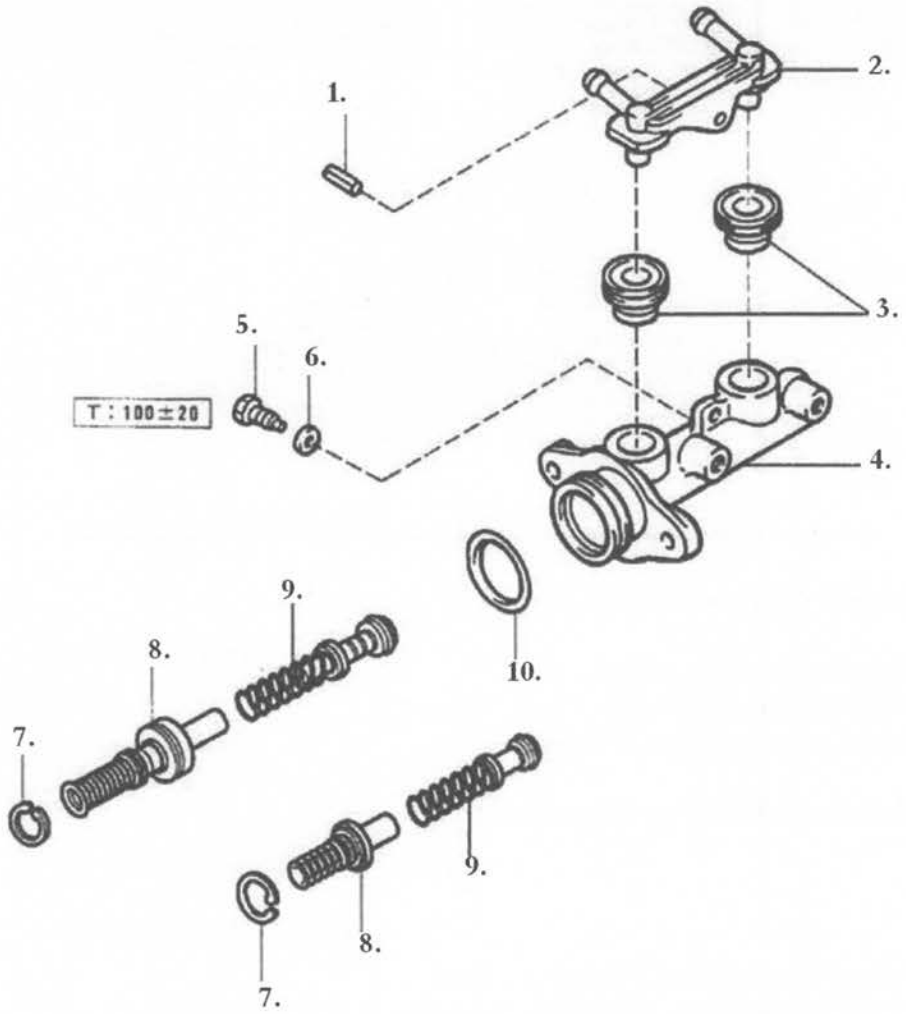
T: =Torque kg.cm



1. Steering Column Bracket
2. Bracket: Fuse Block
3. Support: S/S, Pedal Bracket
4. Link Pin
5. Stop Lamp Switch Assembly
6. Retainer Bolt
7. Spacer
8. Torsion Spring
9. Bushing
10. Brake Pedal

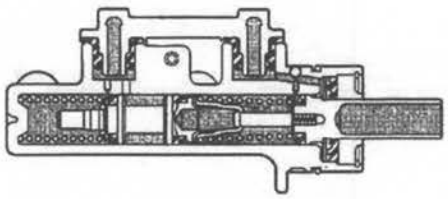
Master Cylinder Breakdown Diagram

Master Cylinder

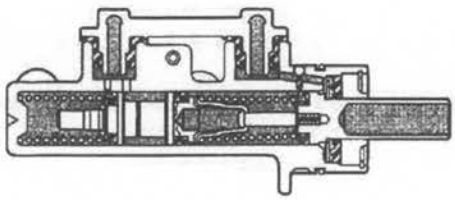


1. Pin
2. Union Inlet
3. Grommet (Must Replace)
4. Master Cylinder Body
5. Bolt Set (Lock)
6. Gasket (Must Replace)
7. C-Ring
8. Piston Assembly No.1
9. Piston Assembly No.2
10. O Ring

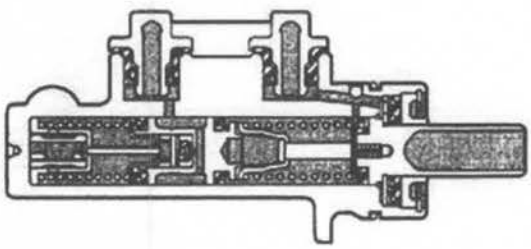
6 Inch Type



7 Inch Type



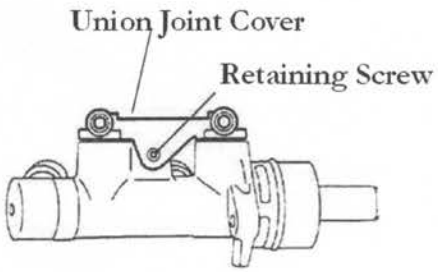
ABS Type 8 Inch



Master Cylinder Disassembly

1. Remove Master Cylinder
2. Remove Retaining Screw From Union Joint Cover. See Right Diagram

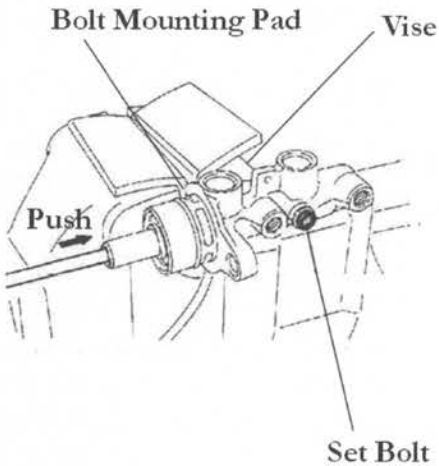
3. Remove Rubber Grommets(Replace)



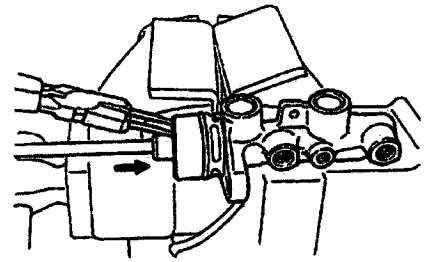
4. Place Master Cylinder Body in a Vise as Shown on Right. Place Bolt Mounting Pad Ear in Vise. Do Not Over Tighten

5. Use a Driver to Push Piston Forward, Remove Set Bolt

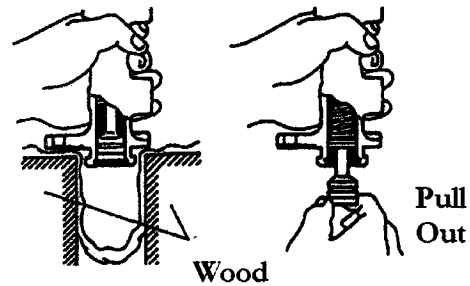
Note: All Gaskets & Grommets Must be Replaced



7. While Holding Pressure Forward Use Snap Ring Pliers and Remove Snap Ring.

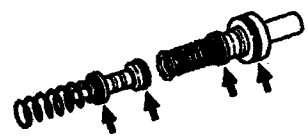


Note: If Piston Unit Does Not Slide Out
Hold Upside Down as in Digram on the Right.
Place Two Wood Blocks in Vise and Tap Unit Unit Piston Unit Slides Out



Two Piston Types

Master Cylinder Assembly

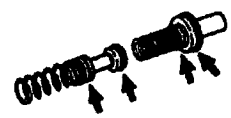


Note: Before Assembly Cafefully Inspect Complete Unit and Thoroughly Clean All Parts

Non-ABS Type

1. Assemble New Piston Unit

Note: ABS & Non-ABS Are Not Interchangable



2. Coat Inside of Master Cylinder With Fresh DOT Type 3 or DOT4 Brake Oil

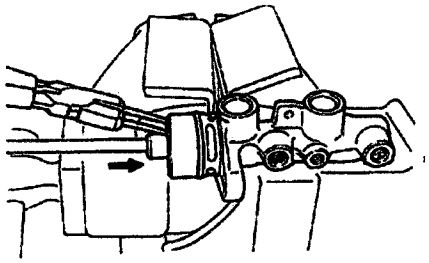
ABS Type

Note: Never Re-Use Gaskets & Grommets

3. Slide Pre-Oiled Piston Unit Into Master Cylinder Assembly

Note: Do Not Force

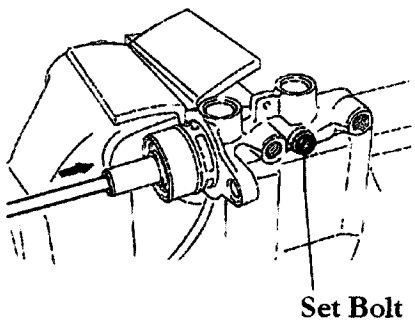
4. Replace Snap Ring



Set Bolt Torque: 100+-20kg.cm

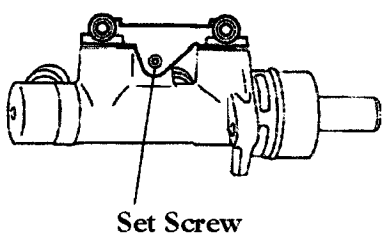
5. Push Piston Unit Forward and Install Set Bolt

6. Remove From Vise and Install New Grommets



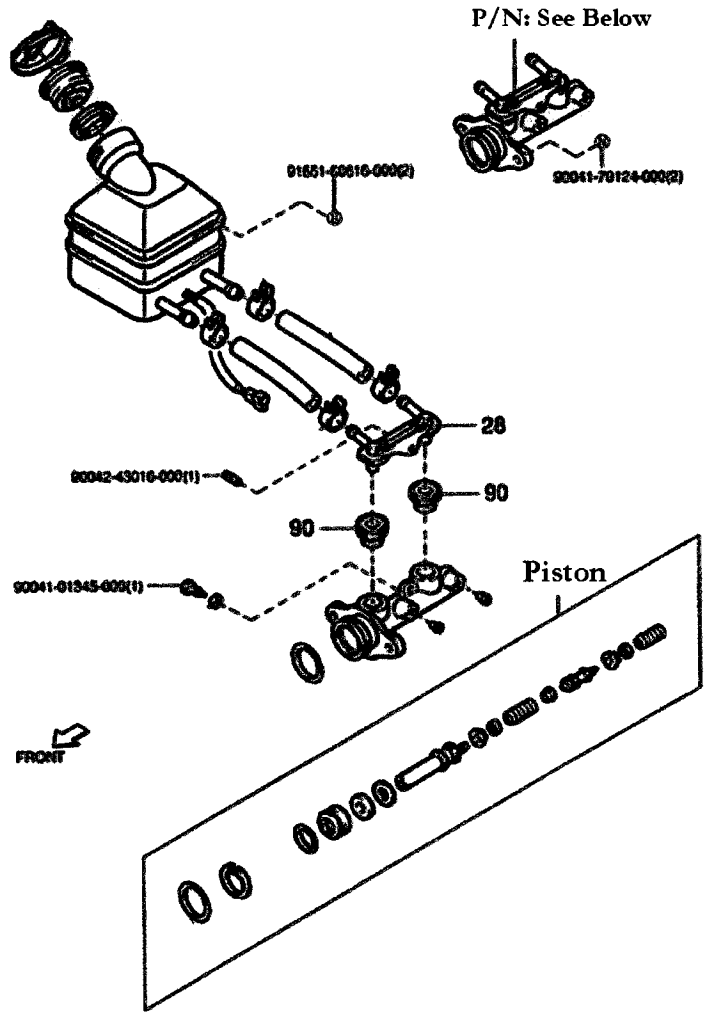
7. Attach Union Cover Plate With Set Screw

8. Install Unit



Brake System

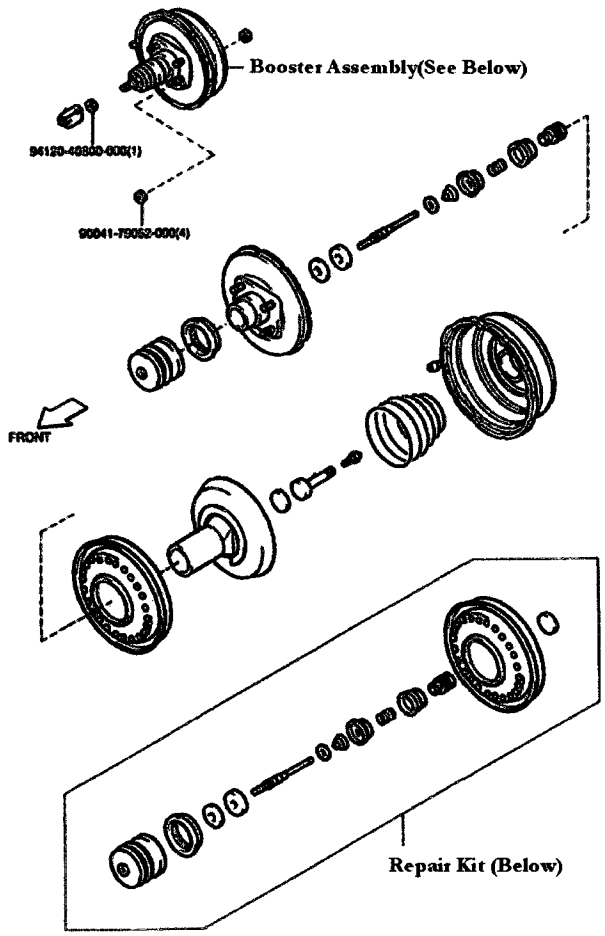
Parts: Master Cylinder



Master Cylinder Assembly

	Assembly P/N	Rebuild Kit P/N
Van/Truck (MT,MTM,NTBO-HX)	#47201-87518-000	#04471-87524-000
Van(EFI-HX,ATM,TBO)	#47201-87519-000	#04471-87525-000
Truck(TR,CAB)	#47201-87518-000	#04471-87524-000
Van/Truck(DOHC,CRM,PF2)	#47201-87518-000	#04471-87524-000

Parts: Brake Booster

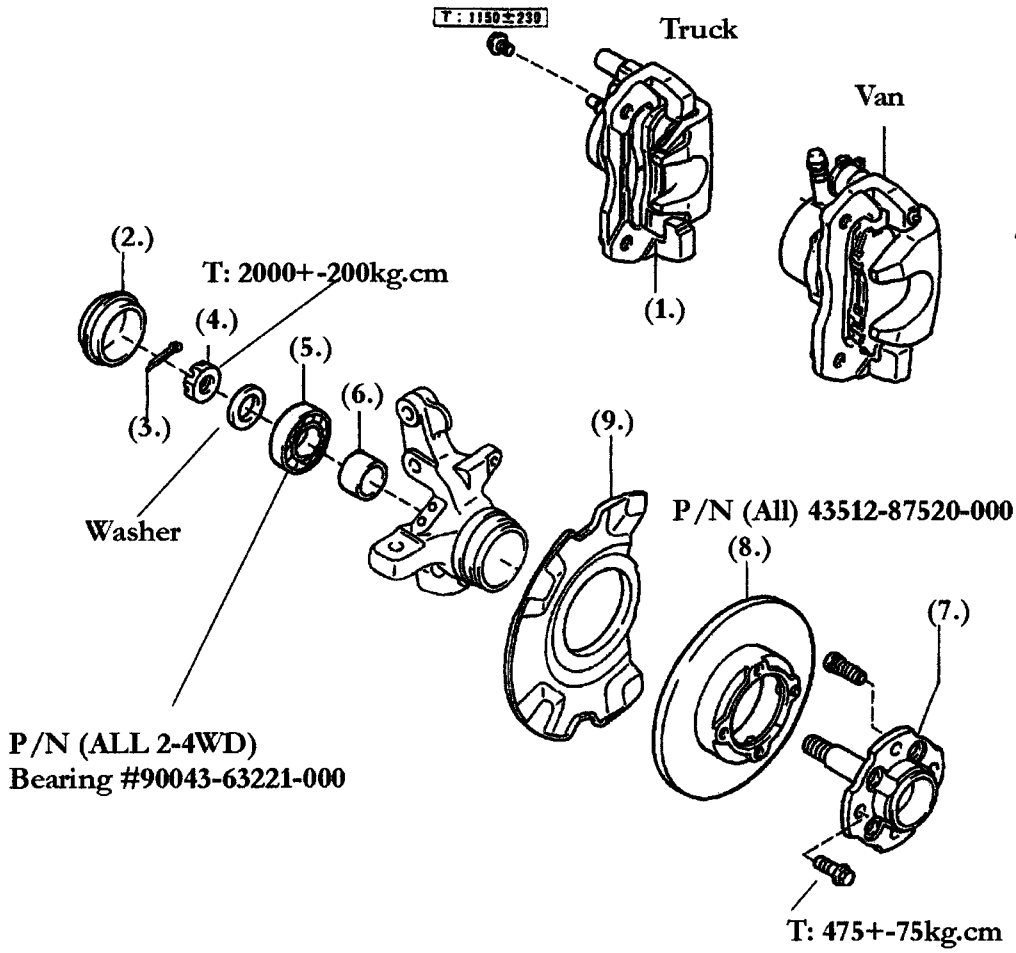


Brake Booster Assembly

	Assembly Unit	Repair Kit
Truck/Van (TR,MT,MTM,NTBO-HX)	#44610-87519-000	#04443-87513-000
Van (EFI, HX, ATM,TBO)	#44610-87520-000	#04443-87514-000
All Others	#44610-87519-000	#04443-87513-000

Front Disk Brake System 2WD

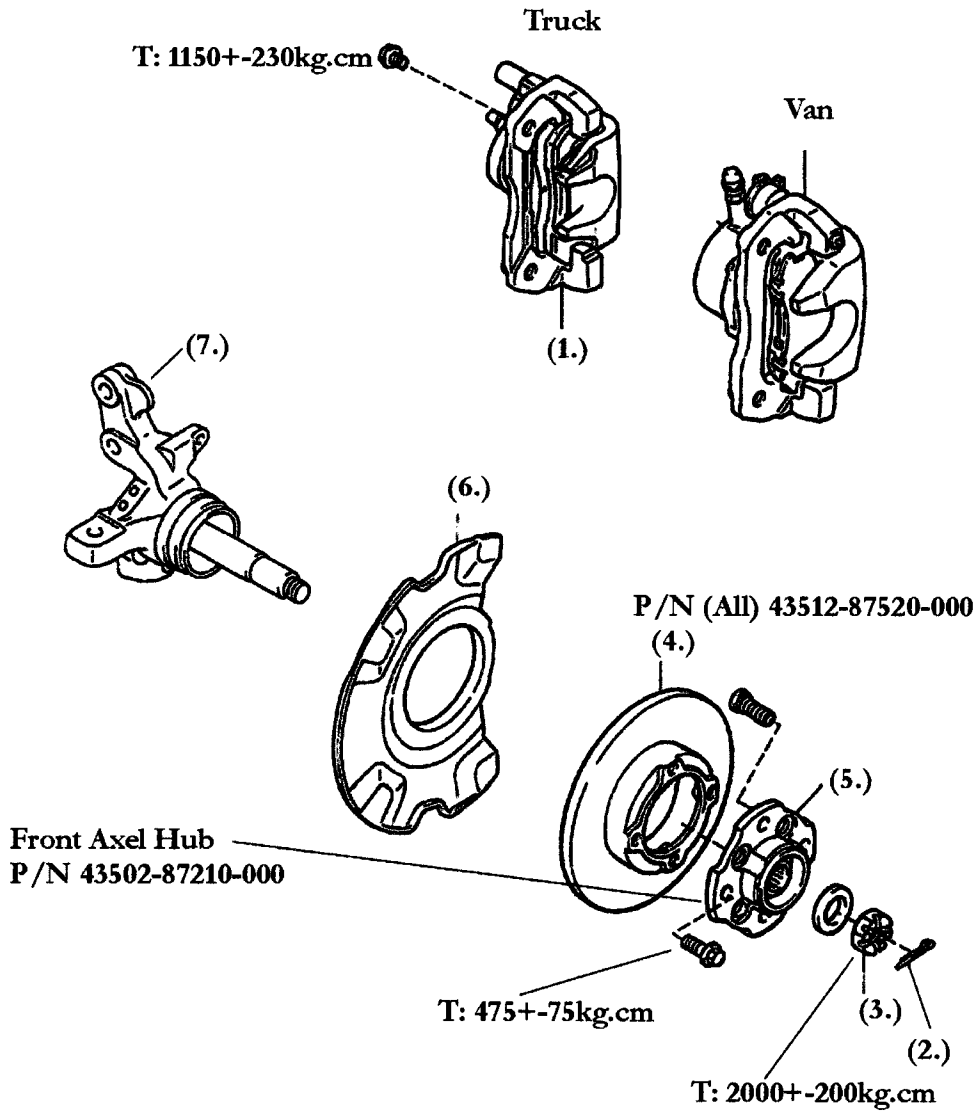
Truck & Van 2WD



1. Front Disk Brake Caliper
2. Front Hub Grease Cup
3. Cotter Pin (Replace)
4. Castle Nut
5. Wheel Bearing
6. Collar
7. Spindle
8. Front Disk Rotor
9. Dust Cover

Front Disk Brake System 4WD

Truck & Van 4WD

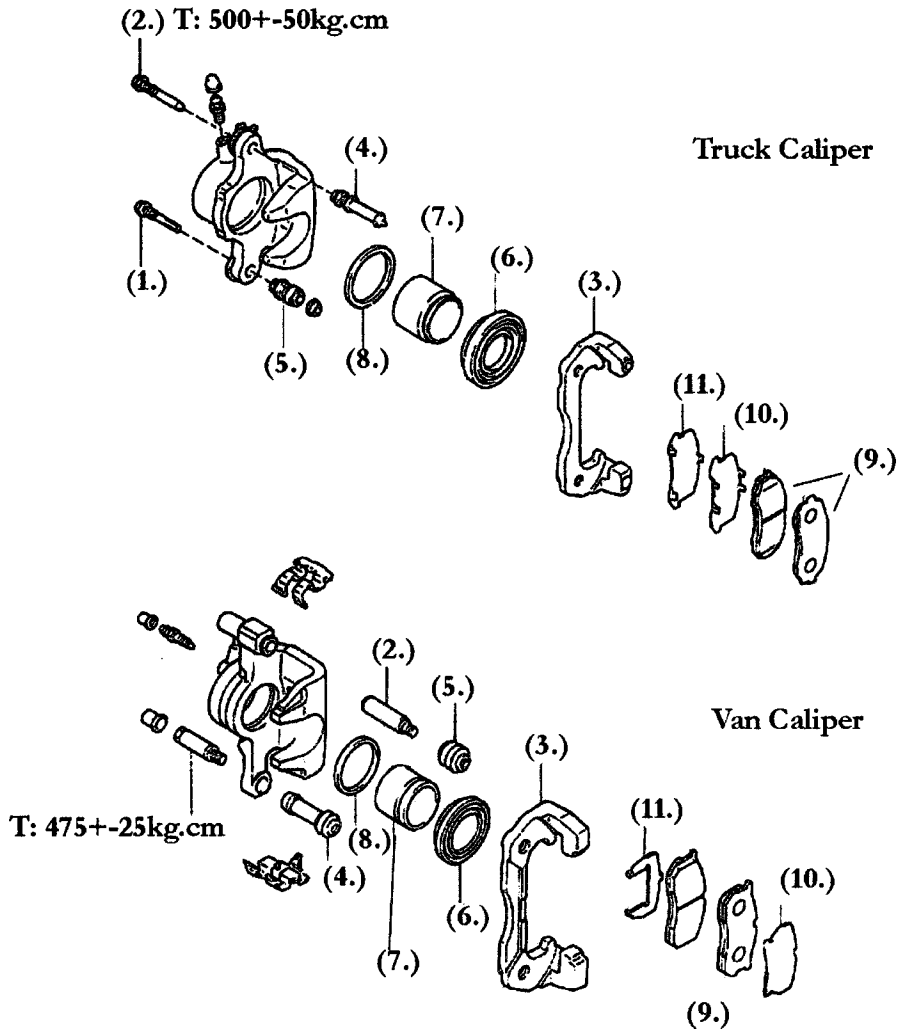


1. Front Disk Brake Caliper
2. Cotter Pin
3. Castle Nut
4. Front Disk
5. Hub: Front Axel
6. Dust Cover
7. Knuckle

Brake System

Front Brake Caliper System

Truck & Van



1. Pin: Main
2. Pin: Sub
3. Braket: Caliper Attachment
4. Bushing: Cylinder Slide
5. Boot: Cover
6. Seal
7. Disk Brake Caliper Piston
8. Seal: Piston
9. Disk Brake Pads
10. Shim (Anti-Squeal)
11. Shim (Anti-Squeal)

Parts List

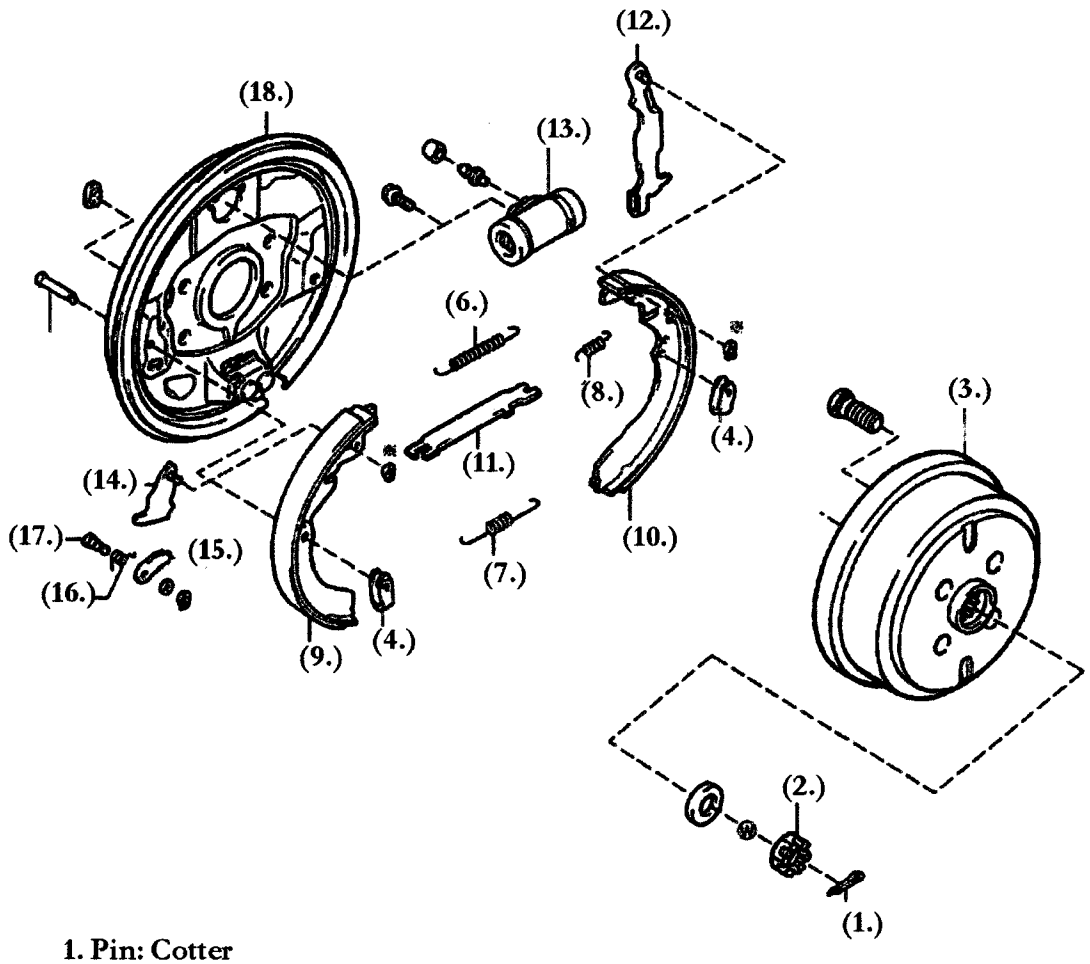
Caliper
Van (All) P/N 47720-87516-000
Truck (All) P/N 47710-87515-000

Pad Kit
Van (All) P/N 04491-87509-000
Truck (All) P/N 04491-87506-000

Caliper Rebuild Kit
Van (All) P/N 04479-87504-000
Truck (All) P/N 04479-87503-000

Brake System

Drum Brake Components & Part Numbers



1. Pin: Cotter
2. Nut: Castle T: 2000+-200kg.cm
3. Drum
4. Spring: Shoe-Hold down
5. Pin: Shoe -Hold Down Spring
6. Spring: Tension
7. Spring: Tension
8. Spring: Tension
9. Brake Shoe No.1
10. Brake Shoe No.2
11. Strut
12. Parking Brake Lever
13. Wheel Brake Cylinder
14. Latch: Automatic Adjuster
15. Lever: Automatic Adjuster
16. Spring: Tension
17. Pin: Adjuster
18. Back Plate

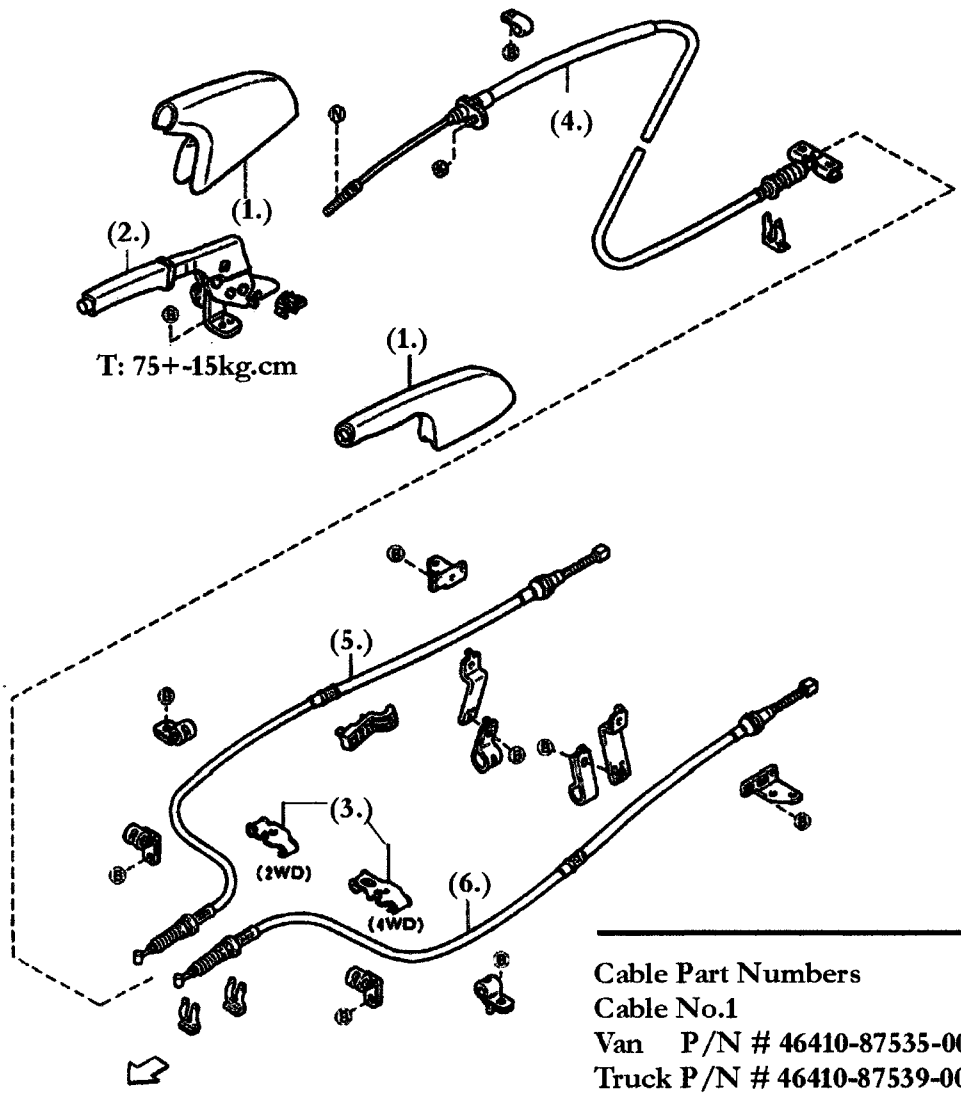
Major Part Numbers

Brake Shoe(s)
Brake Shoe No.1 (All) 47420-87512-000
Brake Shoe No.2 (All) 47430-87514-000
Note: Daihatsu Order Shoes Separately

Wheel Cylinder Assembly
Right Side
Normal: 47550-87509-000
ABS: 47550-87517-000

Left Side
Normal: 47560-87509-000
ABS: 47560-87520-000

Truck & Van



1. Cover: Parking Brake Lever
2. Lever Assembly
3. Clamp
4. Cable No.1
5. Cable No.2
6. Cable No.3

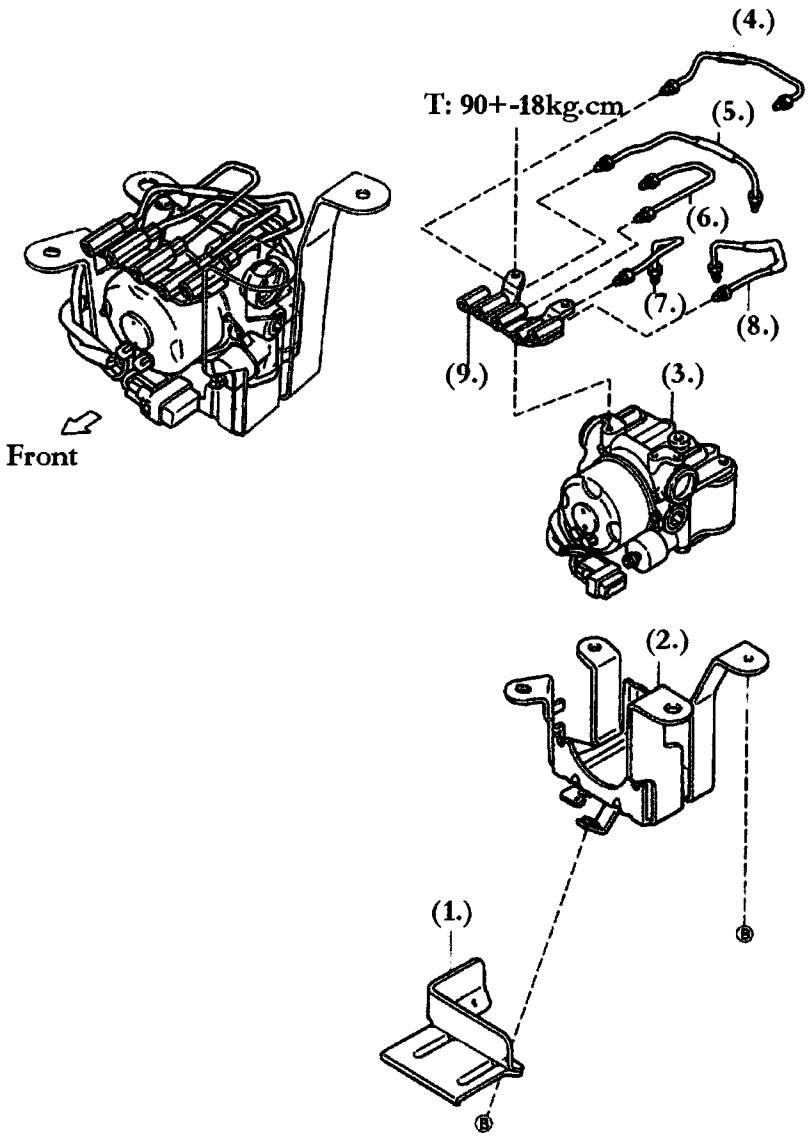
Cable Part Numbers

Cable No.1
Van P/N # 46410-87535-000
Truck P/N # 46410-87539-000

Cable No.2
Van P/N # 46420-87514-000
Truck P/N # 46420-87507-000

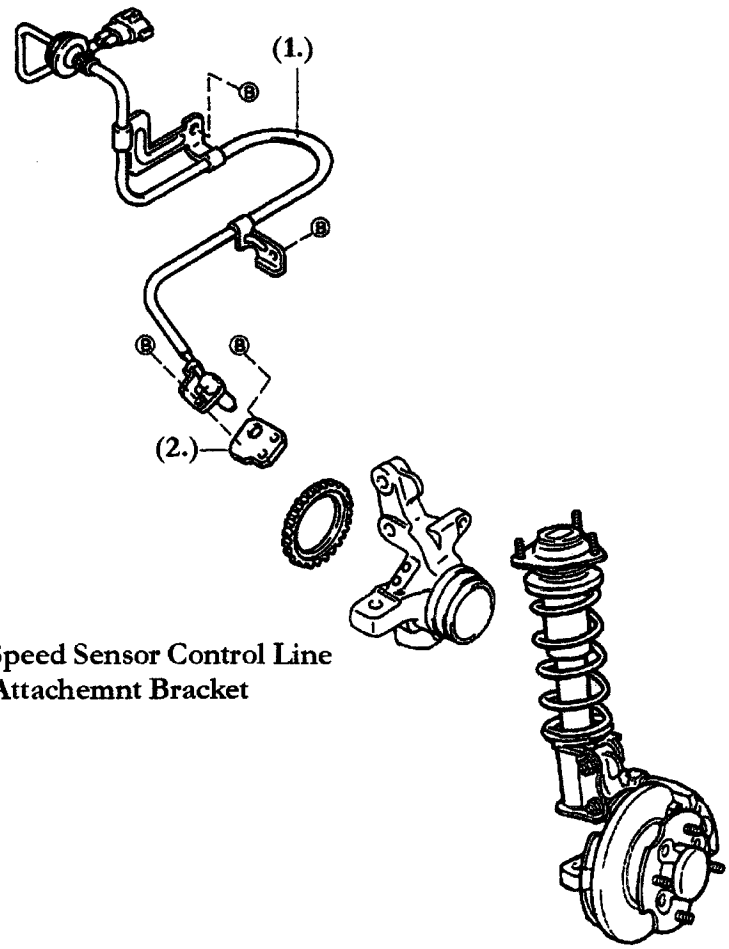
Cable No.3
Van P/N # 46430-87507-000
Truck P/N # 46430-87506-000

ABS Control Unit



1. Bracket: Brake Actuator No.2
2. Bracket: Brake Actuator No.1
3. Actuator Assembly
4. Tube: No.1
5. Tube: No.2
6. Tube: No. 3
7. Tube: No.4
8. Tube: No.5
9. Two-Way Valve

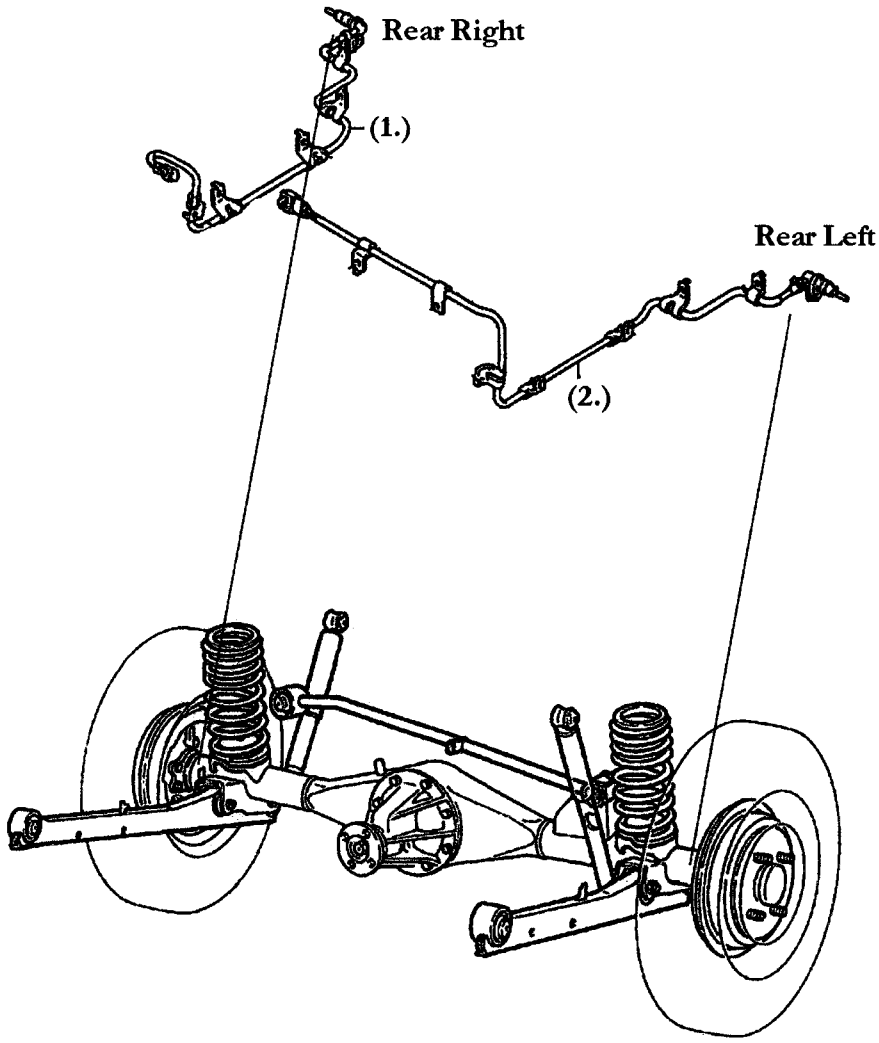
ABS Front Speed Sensor



1. Speed Sensor Control Line
2. Attachemnt Bracket

Note: ABS Part Numbers are Vehicle VIN Specific

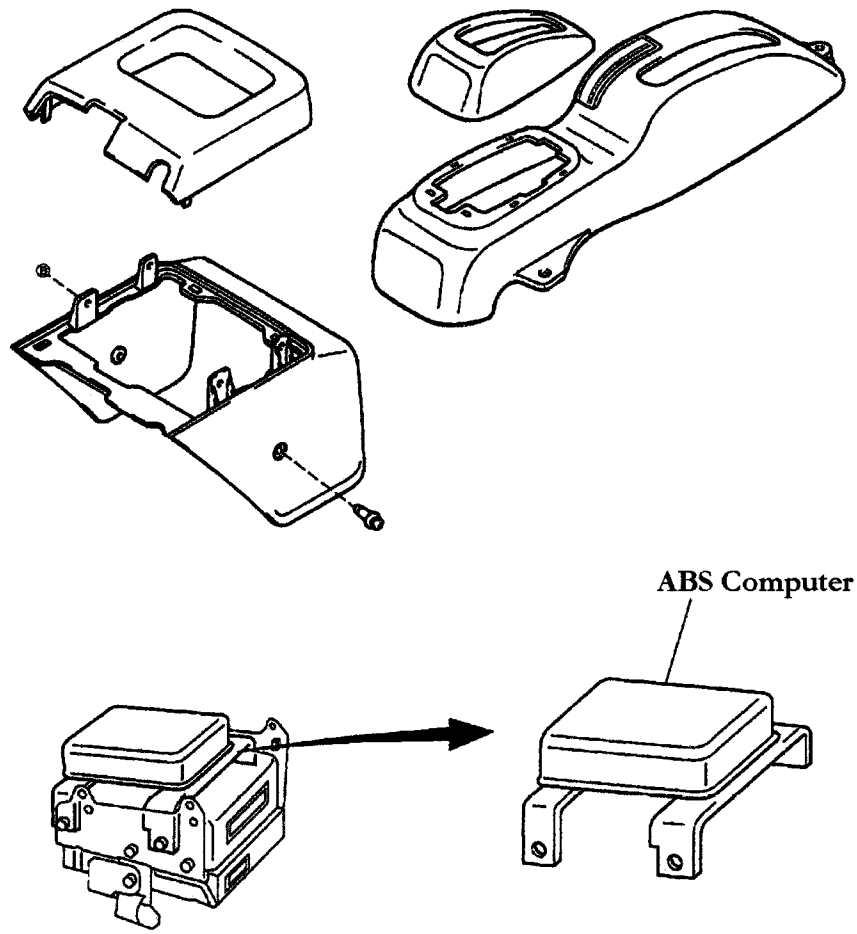
ABS Rear Sensor Location



1. Sensor: Speed Rear Right
2. Sensor: Speed Rear Left

Note: ABS Part Numbers are Vehicle VIN Specific

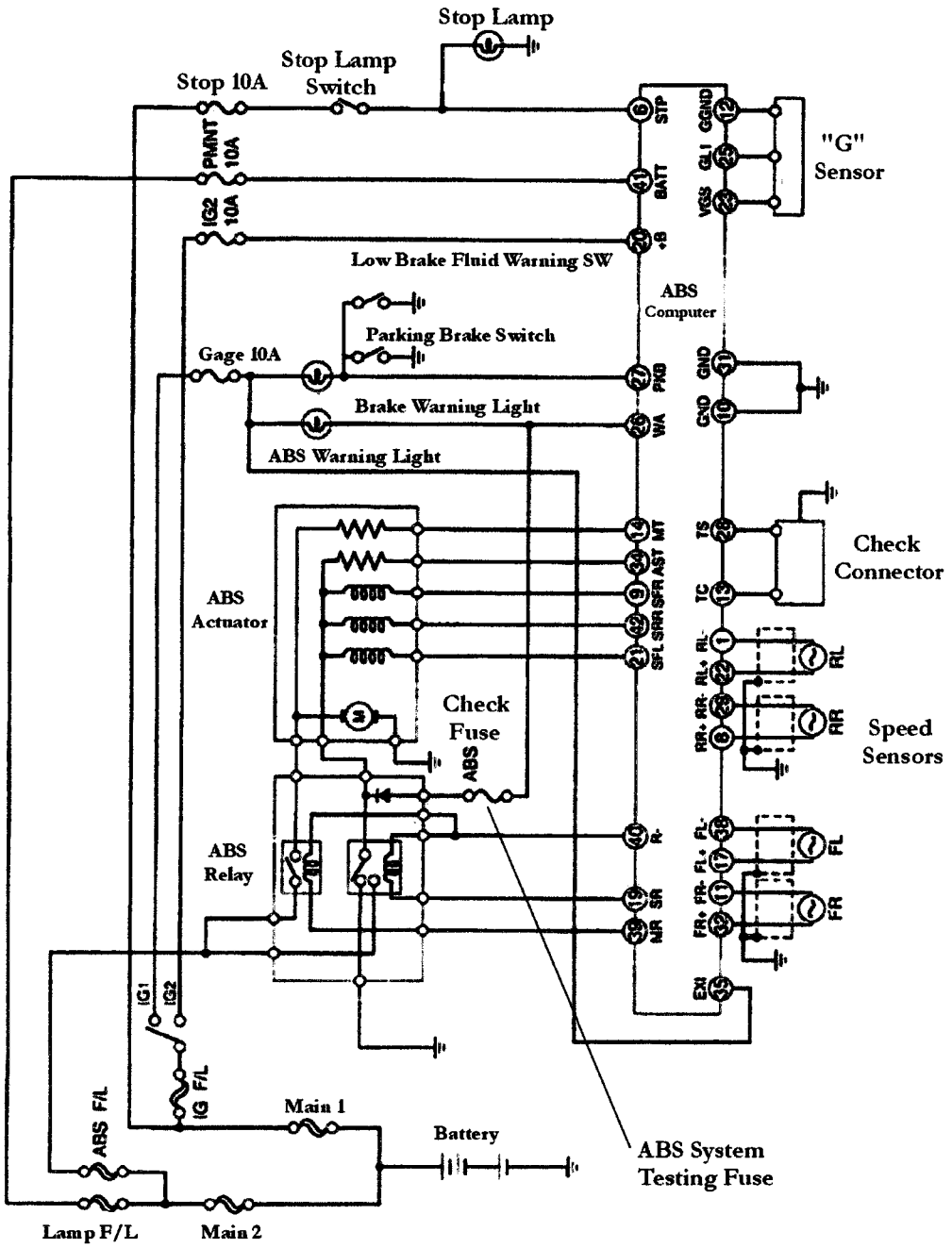
ABS Computer Location



Note: All ABS parts are VIN Specific. Contact Parts Center for More Information

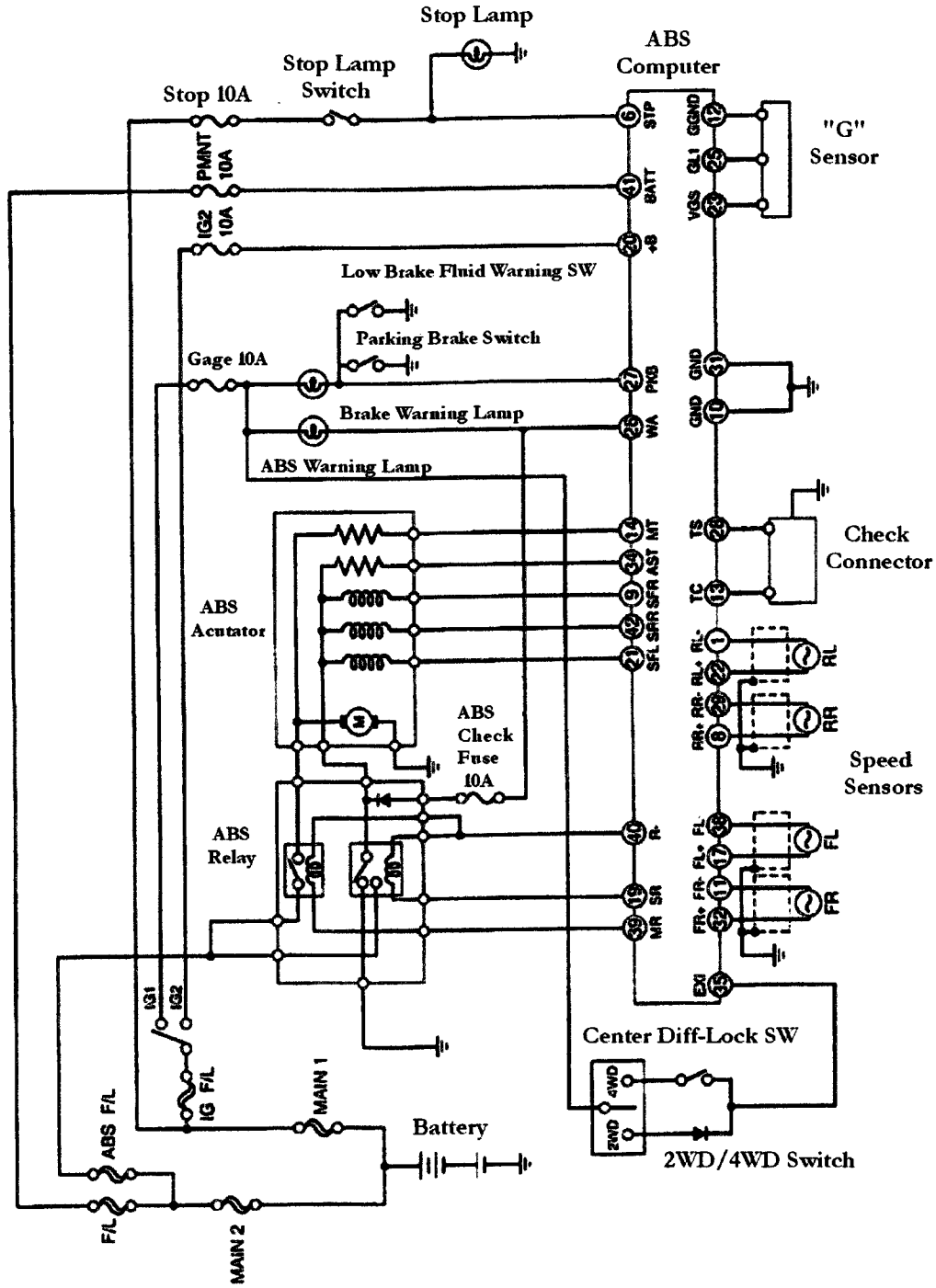
ABS 2WD Control Circuit Diagram

ABS 2WD



ABS 4WD Control Circuit Diagram

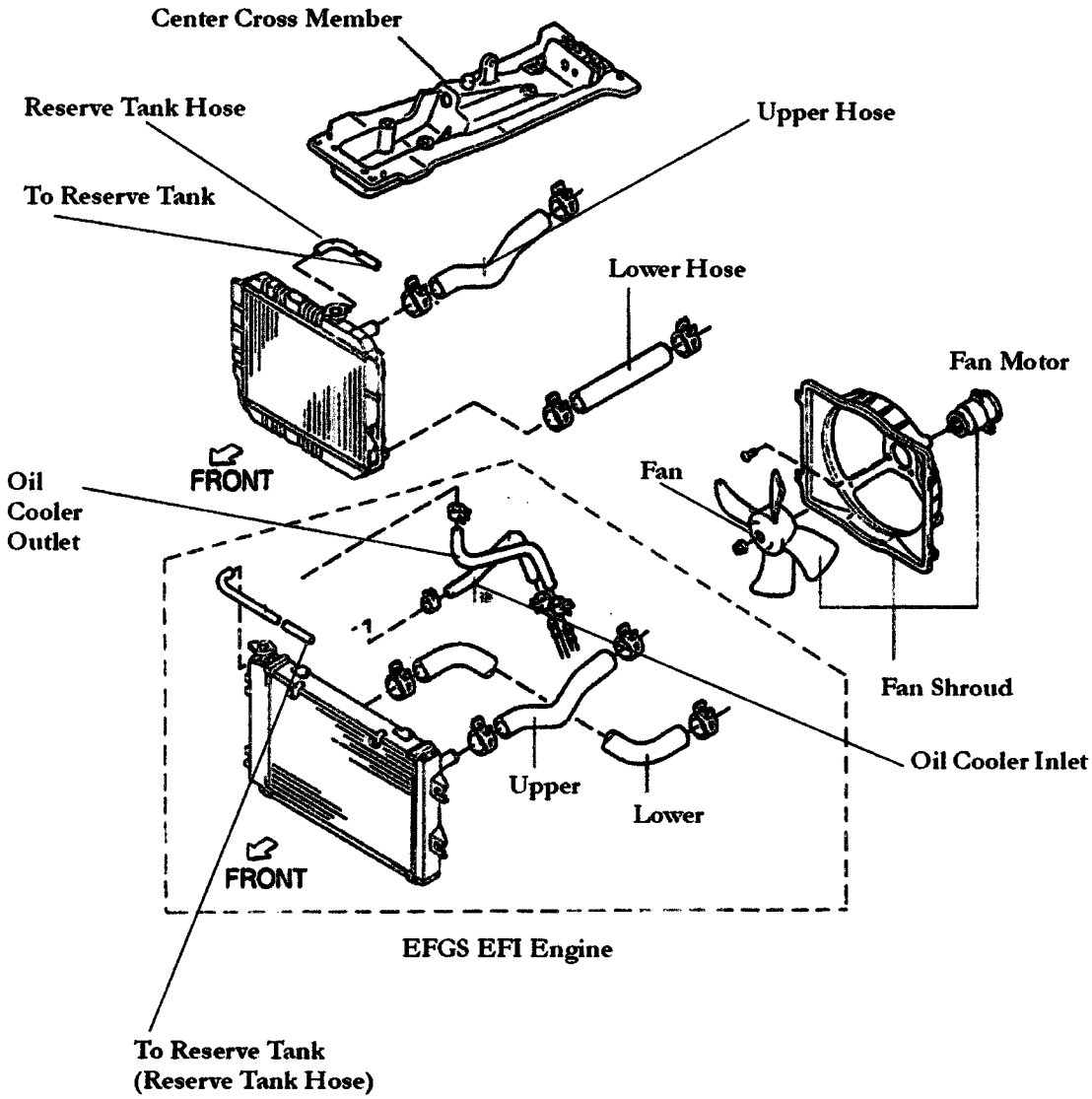
ABS 4WD

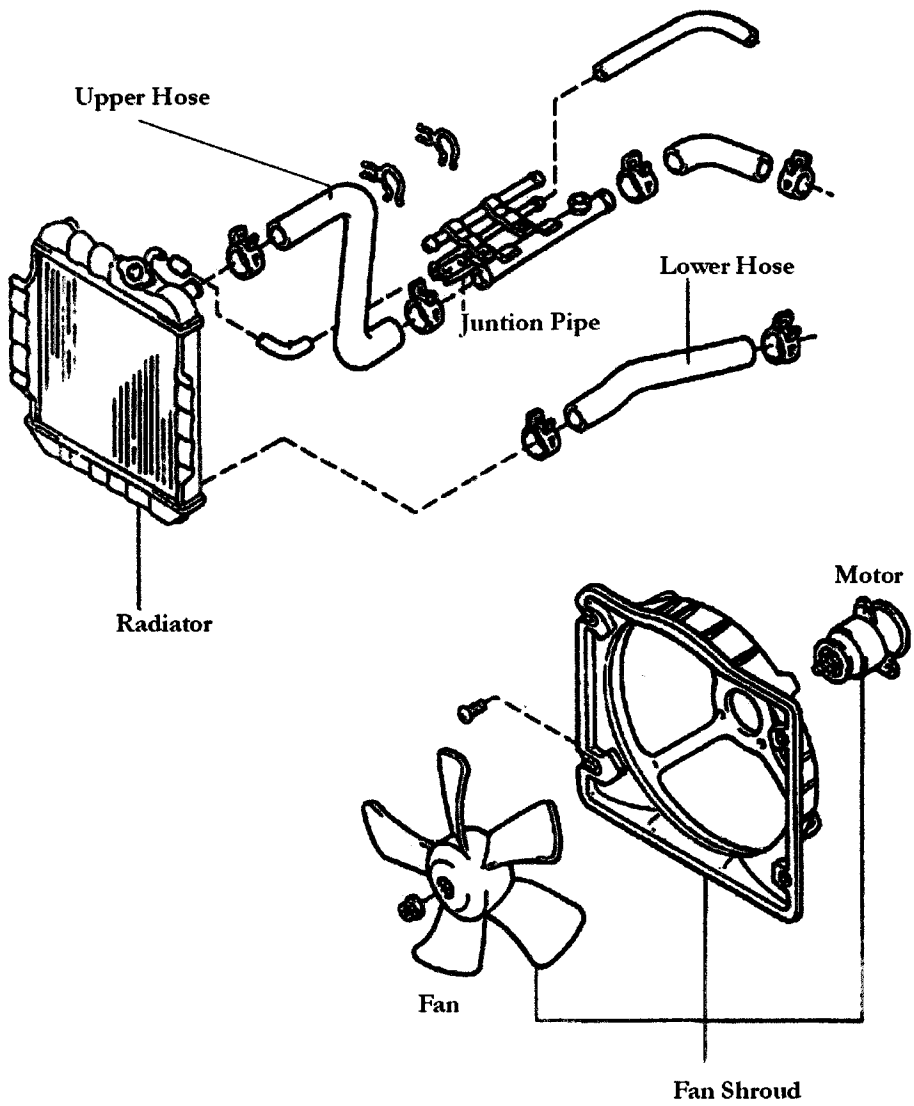


Chapter 6

Cooling System

- Radiator & Components (Truck)
- Radiator & Components (Van)
- Radiator Removal
- Radiator Fan Testing & Relay Circuit
- Radiator Thermo Control Switch Test
- Thermostat Replacement
- Thermostat Testing
- Water Pump Removal
- Water Pump Schematic & Parts EFGS, EFZS, EFRS
- Water Pump Schematic & Parts EFNS, EFES, EFTS
- Radiator & Related Parts Per Series (All Series)
- Additional Major Part Numbers


Center Cross Member
Reserve Tank Hose
Upper Hose
To Reserve Tank
Lower Hose
Fan Motor
FRONT
Oil
Cooler
Outlet
Fan
Fan Shroud
Oil Cooler Inlet
Upper
Lower
FRONT
EFGS EFI Engine
To Reserve Tank
(Reserve Tank Hose)

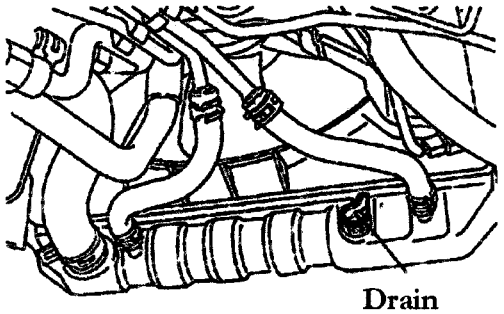

Upper Hose
Lower Hose
Juntion Pipe
Radiator
Motor
Fan
Fan Shroud

Radiator Removal

Caution: Never Drain While Hot

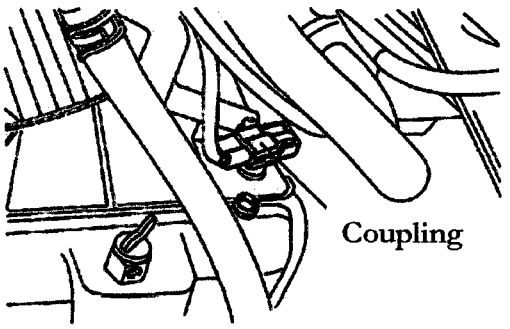
1. Disconnect (-) Battery Cable
2. Remove Front Panel
3. Open Radiator Cap and then Drain Valve. (See Diagram on Right)

Note: Never Re-Use Coolant



Drain Valve

4. Remove Front Bumper
5. Disconnect Radiator Fan Coupling
6. Remove Radiator Inlet Hose



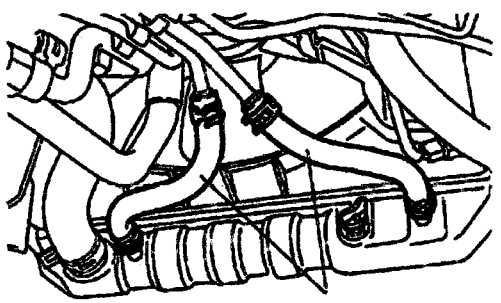
Coupling

AT Vehicle

7. (If Equiped) Remove Oil Cooler Hoses
   Note: Hoses Can Not Be Re-Used

8. Remove Reserve Hose Connections
9. Remove Outlet Hose
10. Remove Fan Shroud Unit
11. Remove Radiator

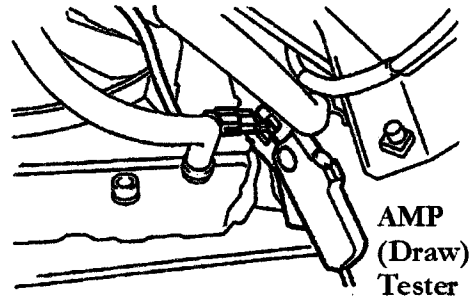
Note: Cover All Open Hoses With Plastic Bags



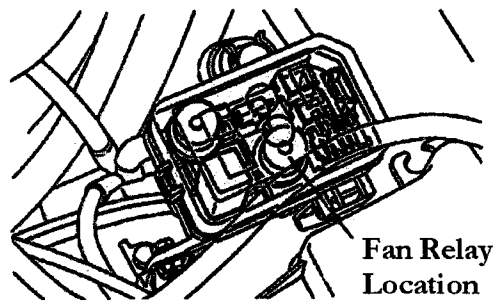
Oil Cooler Hoses

Note: Under Normal Conditions Fan AMP Draw Under 10A

1. Attach Tester Warm Engine Until Cooling Fan Engages. AMP Draw over 10A Indicates Stressed Motor Condition. Check for Restriction or if No Restriction Replace Motor



AMP (Draw) Tester

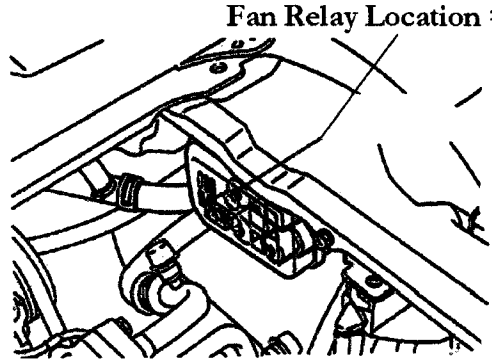


Fan Relay Location

Note: If Fan Does Not Engage Replace Relay If Relay is Replaced And Still No Engagement Replace Fan Motor

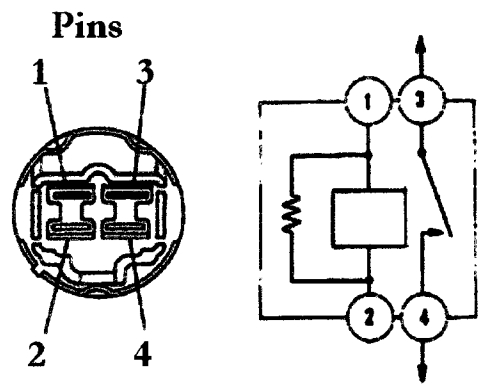
Use Diagrams on the Right For Relay Location Van-Truck

Fan Relay Location #2



Relay Circuit

Note: Use Radiator Cooling Fan Circuit Diagram to Test Relay

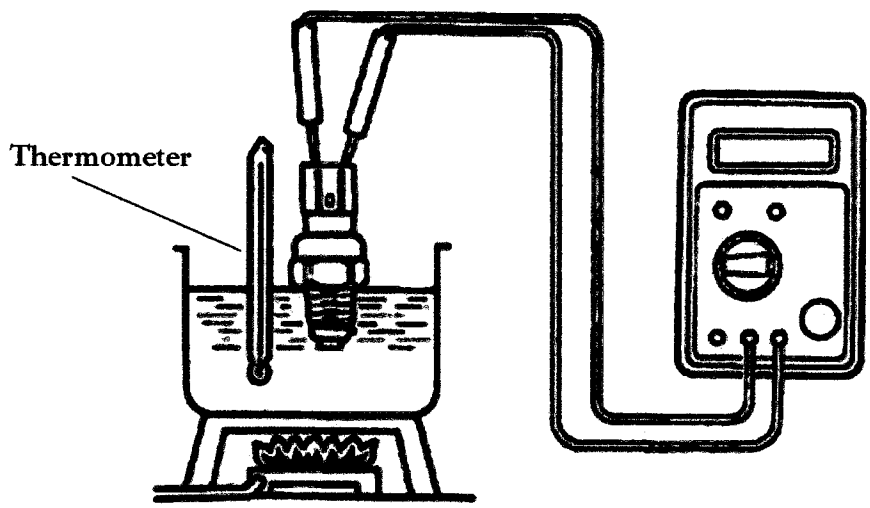


60~80 Ohm (20*C)

Radiator Thermo-Control Switch Test

Note: Be Careful Working Around Hot Water

1. Place Thermo-Switch In Beaker and Warm to Required Temperature
2. Test Connectivity at Selecte Temperature Ranges Listed Below



Truck (Carbureted)

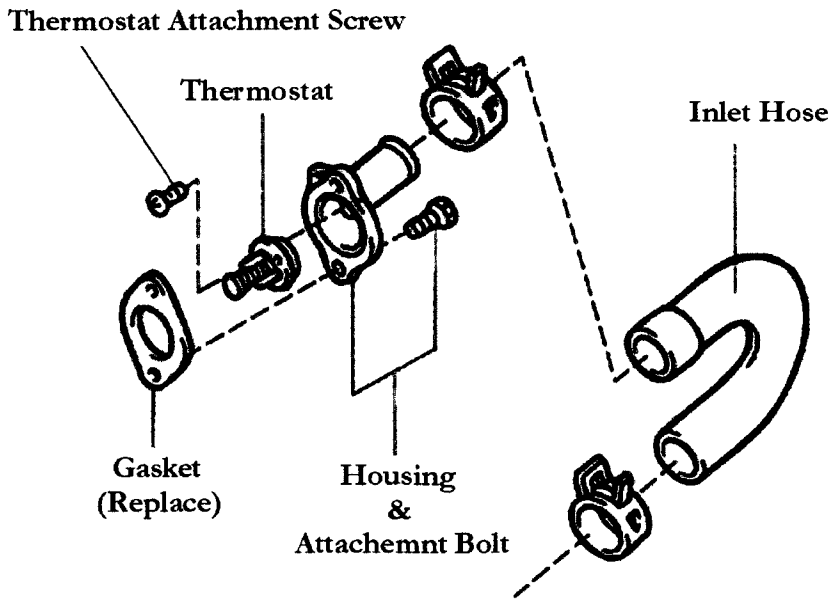
Below 78*C OFF
Above 86*C ON

Truck & Van EFI

Below 90*C OFF
Above 90*C ON

Thermostat Replacement

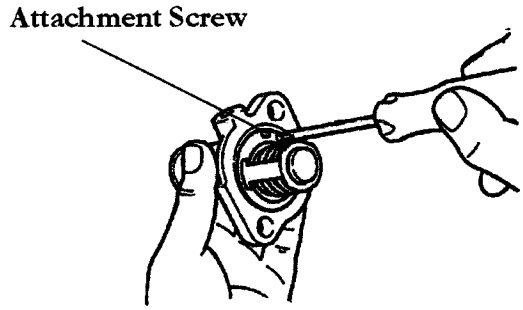
Note: Never Re-Use Thermostat Gasket



Thermostat Part Numbers
EFNS EFES EFTS #16341-87582-000 (82*C)
EFGS EFZS # 90048-33083-000 (84*C)

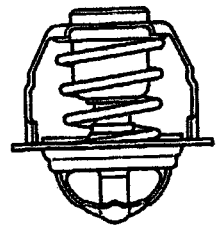
1. Drain Coolant
2. Remove Inlet Hose
3. Unbolt Housing and Remove Unit
4. Un-Screw Thermostat
5. Clean all Surfaces and Reverse Order Installation

Housing Bolt Torque: 75+-15kg.cm
Caution: Do Not Over Torque Bolts, Housing Will Crack



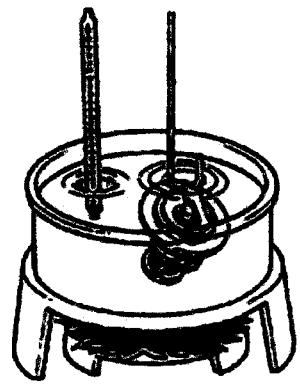
1. Remove Thermostat and Check for Visable Damage or Corrosion.

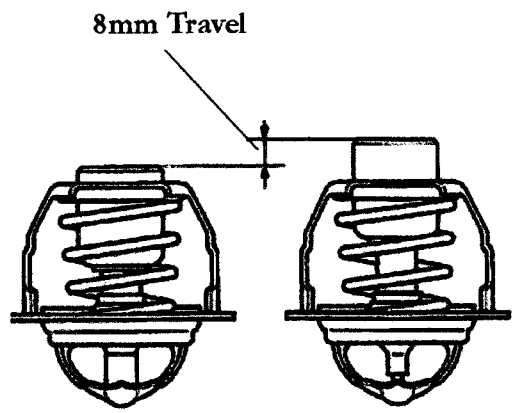
Note: If Corrosion Detected Flush Entire Coolant System Before Replacing Thermostat



Thermostat Hot Testing
Place in Hot Water Heater in Clear Beaker
Slowly Raise Temperature and View Opening Temperature

Minimum Opening: 82~88+-1.5*C





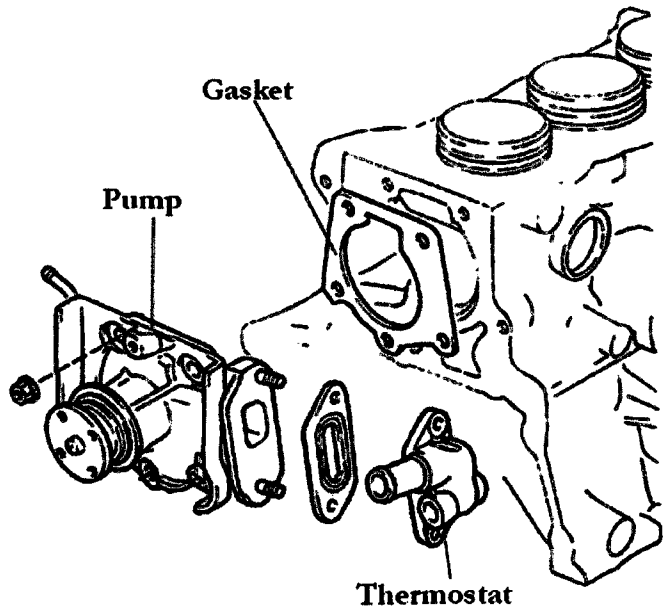
Thermostat Bulb Travel Hight

Truck 95*C 8mm
Van 95~100*C 8mm

Note: Bulb Travel Less Than 8mm Replace

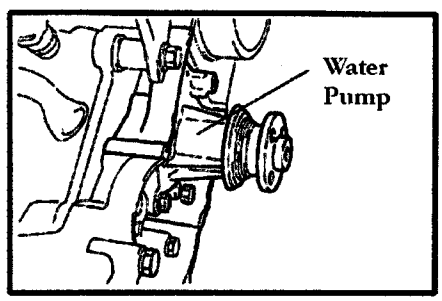
Cooling System

Water Pump Removal

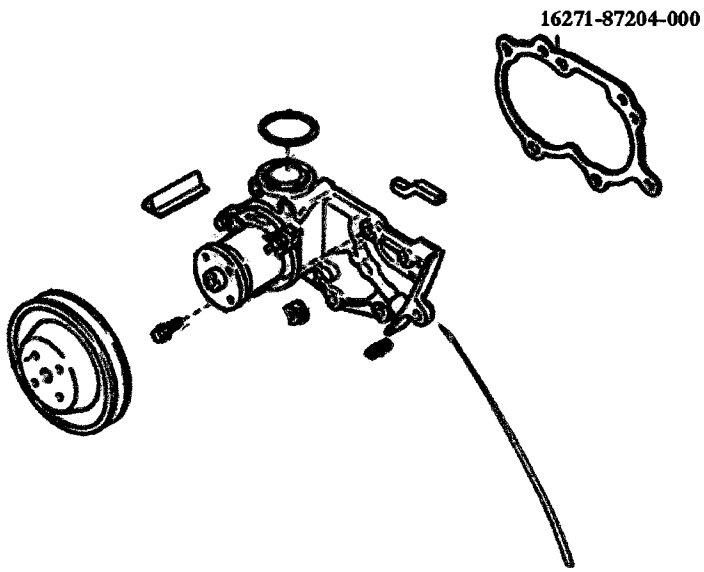


1. Drain Coolant System
2. Remove Timing Belt (See Timing Belt Removal)
3. Remove Thermostat Housing & Thermostat
4. Remove Water Pump Attachment Bolts
5. Remove Water Pump

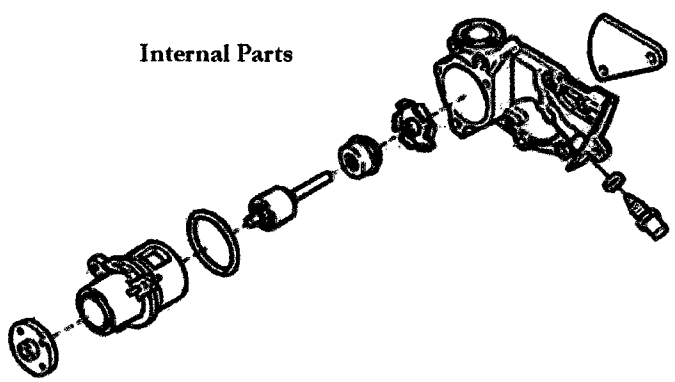
Note: Do Not Re-Use Gaskets



EFGS EFZS EFRS



Internal Parts

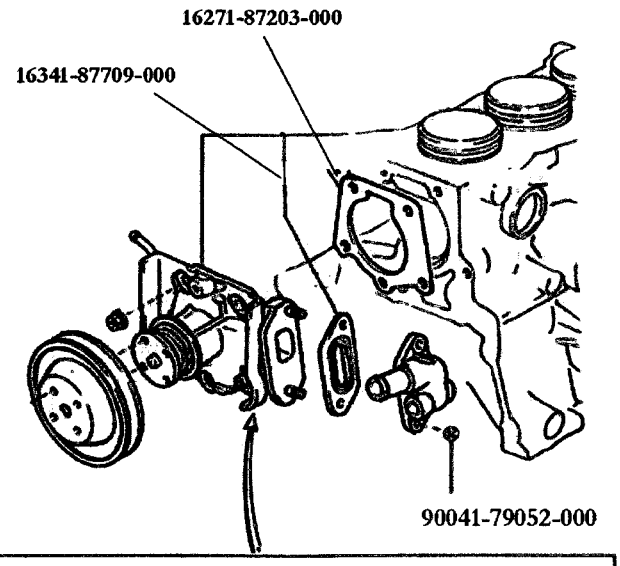


Water Pump Assembly

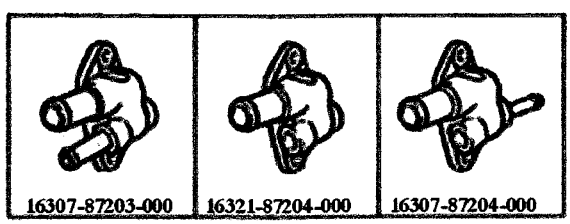
EF-NS,EF-ES, EF-TS S-100,S-110,S-120,S-130 Series Engines
Part# 16100-87592-000
EF-GS, EF-ZS, EF-RS Series Engines TR,DX,MX,HX,MXC
Part# 16100-87231-000

Parts: Water Pump & Thermostat Housing

EFNS EFES EFTS



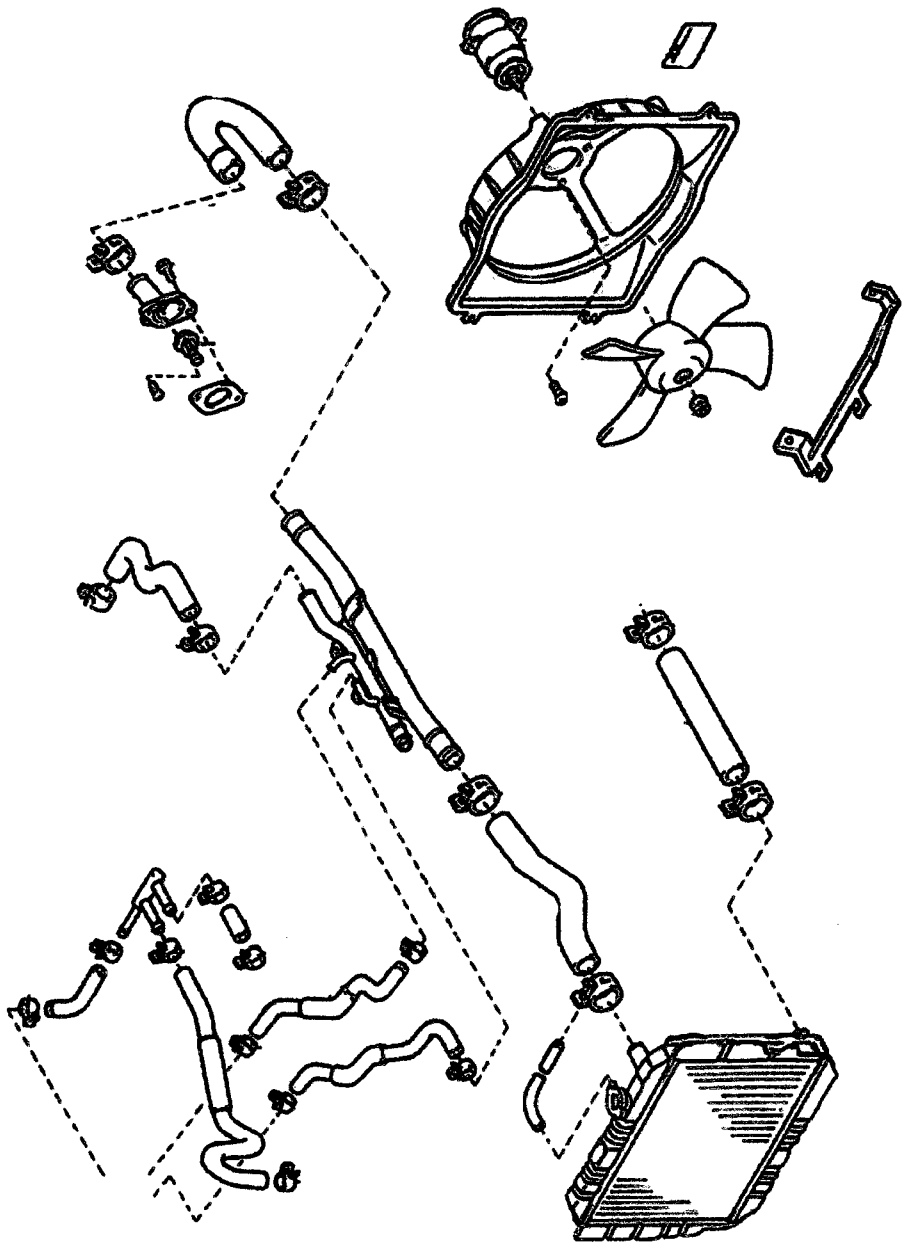
Thermostat Housing Assembly



Water Pump Assembly

EF-NS,EF-ES, EF-TS S-100,S-110,S-120,S-130 Series Engines
Part# 16100-87592-000
EF-GS, EF-ZS, EF-RS Series Engines TR,DX,MX,HX,MXC
Part# 16100-87231-000

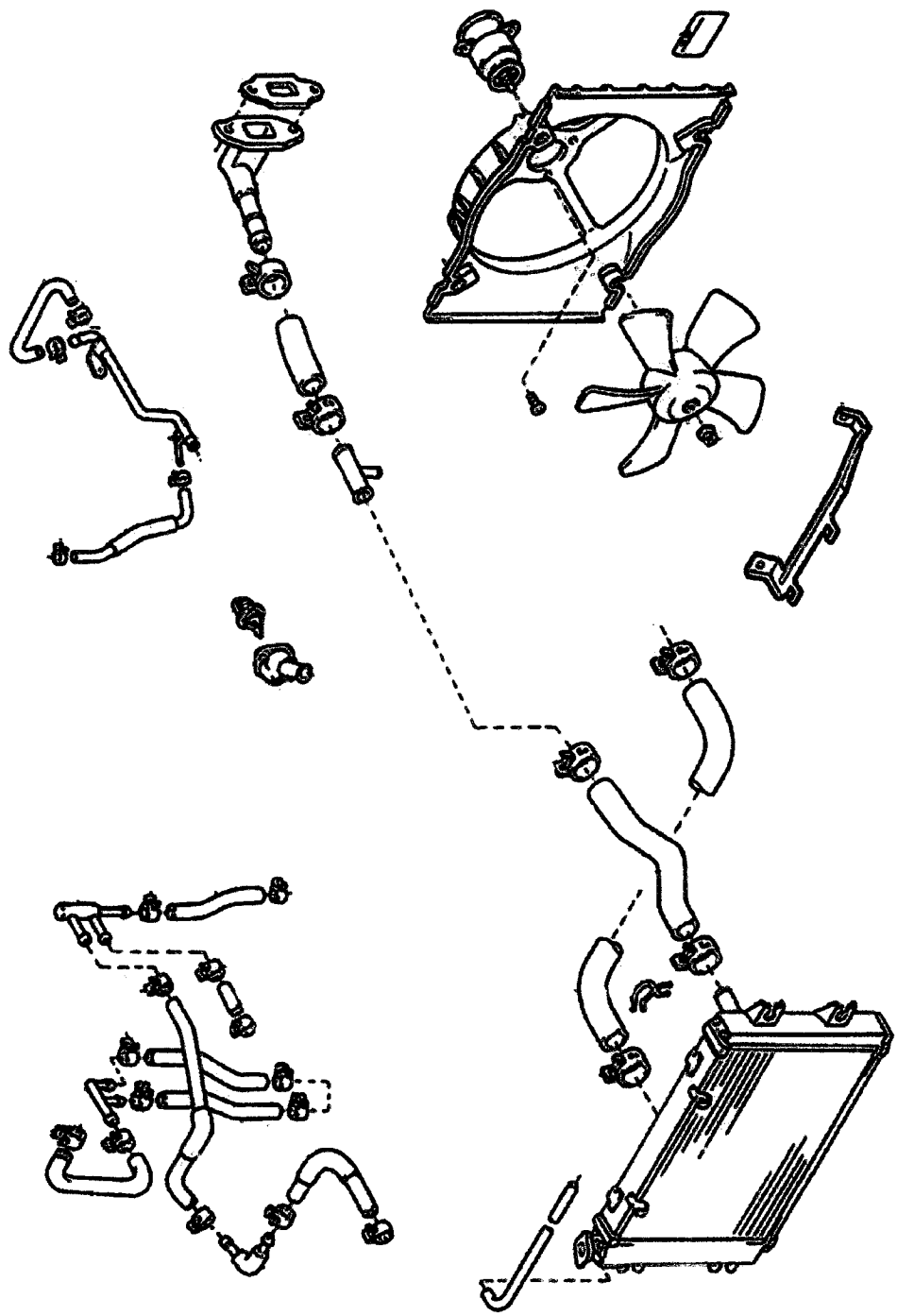
EFNS



Note: See End of This Chapter for Major Parts List Per Series

Parts: Radiator & Related EFGS

EFGS Truck



Note: See End of This Chapter for Major Parts List Per Series

Cooling System

Related Part Numbers (Major)

Radiator Assembly

EFES Van 16400-87D21-000
EFTS (MTM) 16400-87D22-000
EFTS (ATM) 16400-87D23-000
EFES (TR, MT) 16400-87D-000
EFNS, EFES VAN (MTM) 16400-78D27-000

Motor Cooling Fan

EFNS, EFES, EFTS, EFGS (MT) 1680-87518-000
EFTS, EFZS (ATM) 1680-87519-000
EFNS, EFGS (ATM & DUMP) 1680-87520-000

Radiator Inlet Hose

EFNS, EFES, EFTS (VAN) 16571-87D02-000
EFNS (S100-MT) 16571-87574-000
EFNS, EFES (TR,MT,4WD,EFI) 16571-87579-000
EFNS, EFTS, EFGS, EFZS, EFRS (S100,110,120,130 MX,MXC) 16571-87D13-000

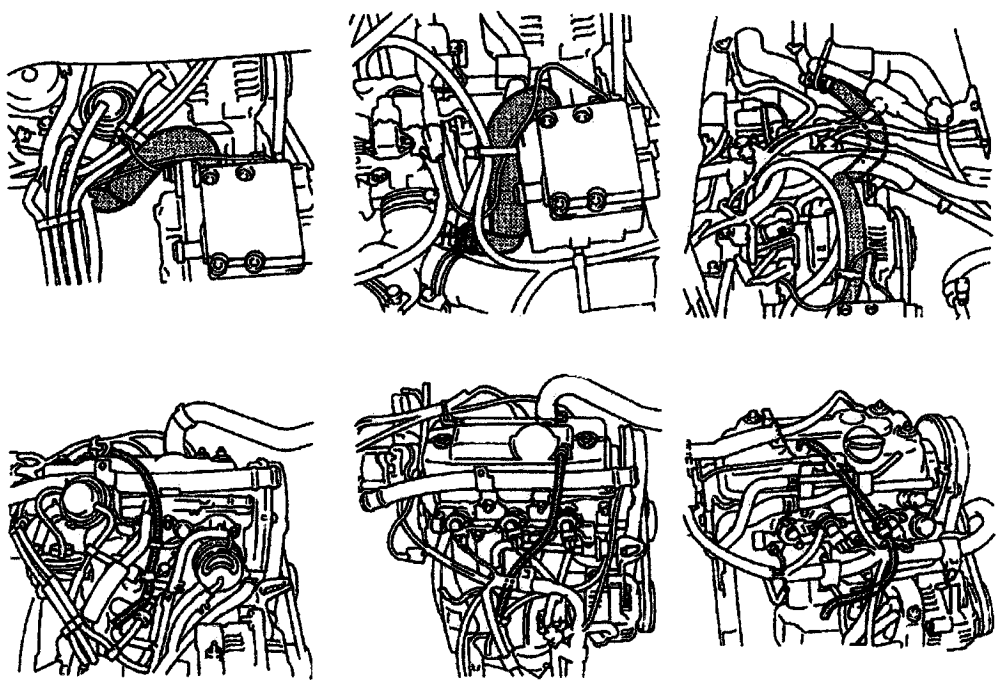
Radiator Outlet Hose

EFNS, EFES, EFTS (VAN S100,110,130) 16572-87D04-000
EFNS, EFES (TR,MT,4WD,EFI) 16572-87D08-000

Chapter 7

Engine

- Engine Series Covered
- Engine Mounts
- Engine Mount Inspection & Limits
- Engine: Exploded Component View
- Diagnostic Connectors & Oil Specification
- Timing settings
- Timing Belt Components & Replacement
- Timing Belt Parts
- Head Gasket Removal & Replacement
- Head Gasket & Valve Cover Gasket Parts
- Valve Train Stem & Oil Seal Parts
- Oil Pump Replacement
- Oil Pump Overhaul
- Oil Pump Parts
- Oil Filter & Parts
- Piston & Block Overhaul
- Engine Parts Replacement Including Oversize Pistons & Rings
- Engine Miscellaneous Guide Pins & Part Numbers

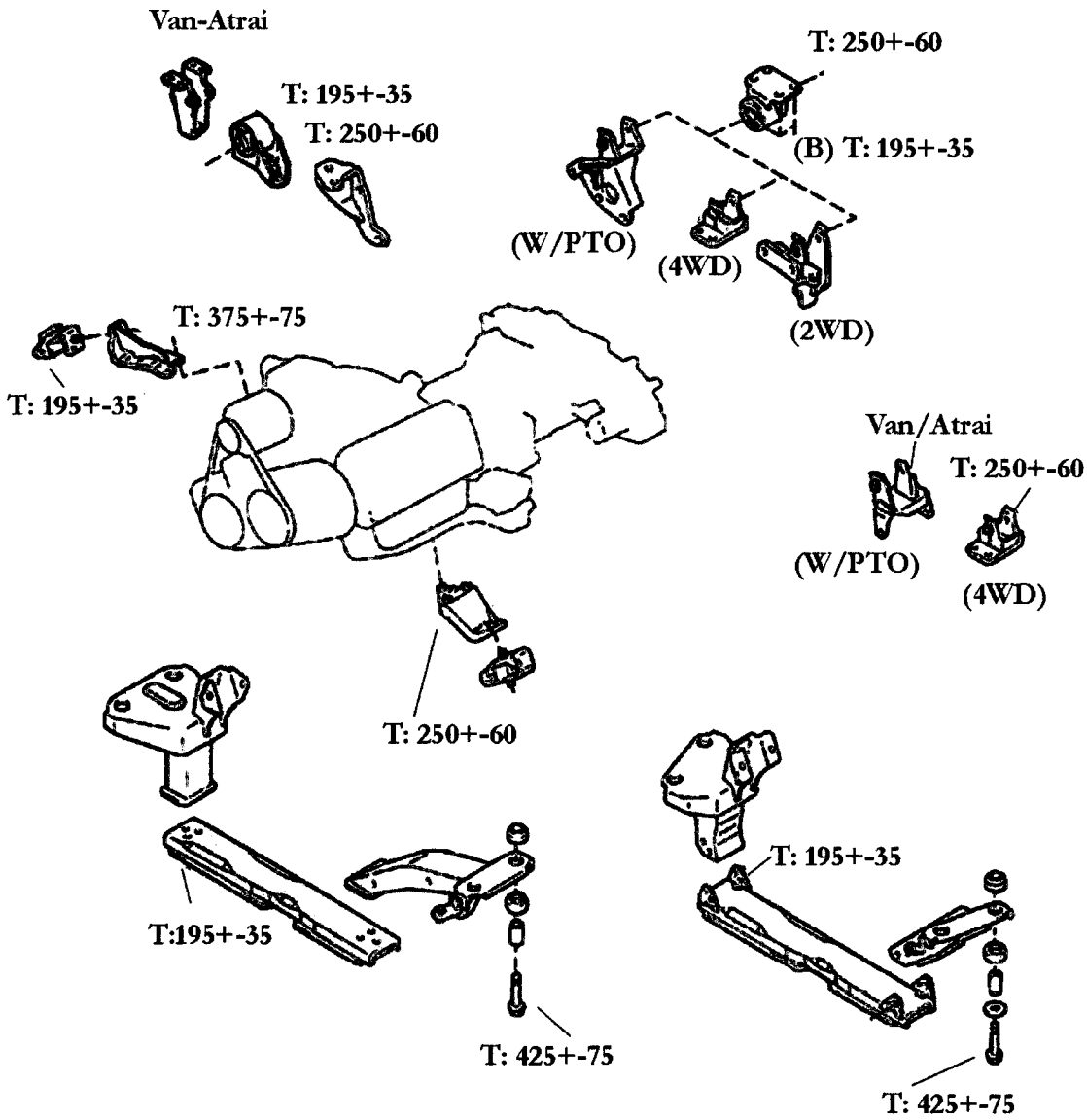


EF-NS EF-ES EF-TS

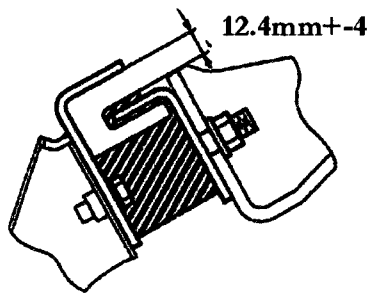
Engine

Engine Mounts

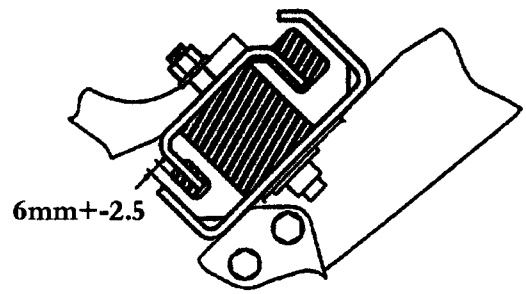
Torque: = kg.cm



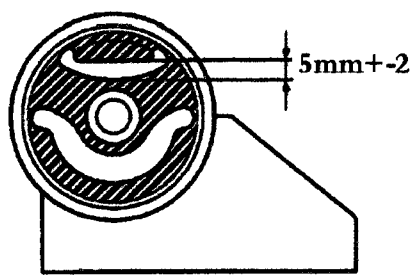
Engine Mount Inspection



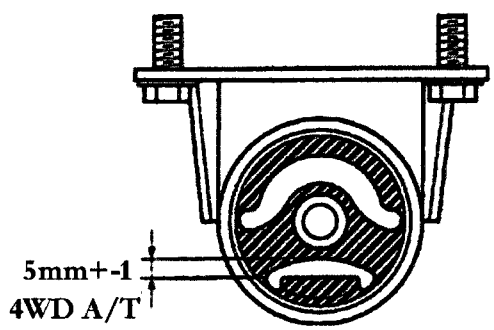
Right



Left



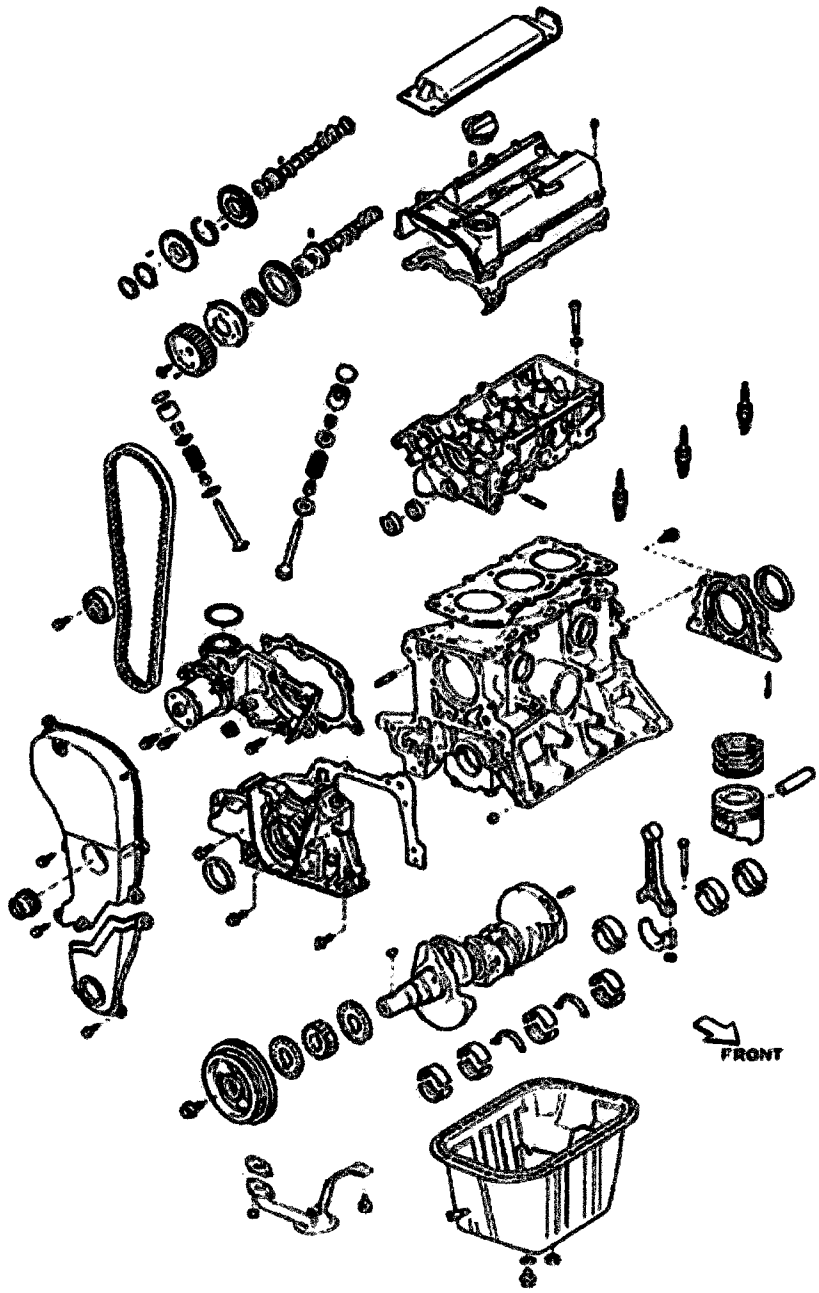
Center Mount



Rear Mount

Engine Expoded View Component Diagram

660cc Engine



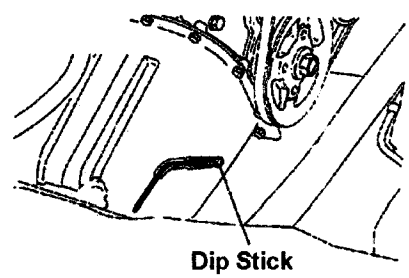
Diagnostic Connectors

Picture	Part Number	Use
	09991-87604-000 Harness Test Connector	Pickup Truck RPM Adapter
	09991-87705-000 Engine Control Harness Test Adapter Connection	Engine Circuit Testing

Engine Condition:
Before performing engine work it is important to check oil condition. Oil is the best indicator to the internal condition of the engine.

Dirty oil will impede engine performance and can cause premature engine failure.

Oil Filter maximum use: 10,000 Kilometers



Engine Series	EF-NS, EF-ES	EF-TS
SAE	5W-30	10W-30
API	SE	SF
Capacity	3.1 Liters	3.1 Liters
Oil Change	10,000K or 6mo	10.000K or 6mo

*Note: Do NOT use heavier grade oils. Heavier oils can increase pressure and cause gasket failure

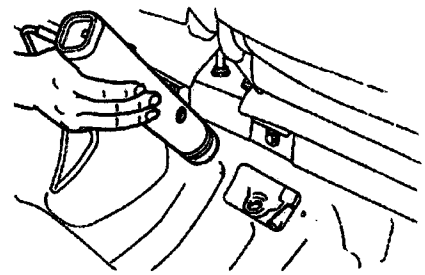
Fuel Hose & Vacuum Hose:

Rubber fuel hoses must be changed maximum every 4 years
Do not re-use fuel hoses if removed once

Use a timing Light to set timing

EF-ES
BTDC 5+-2/850 RPM
EF-TS
BTDC 10+-2/900 RPM

Note: Turn Distributor Slowly to Adjust timing.



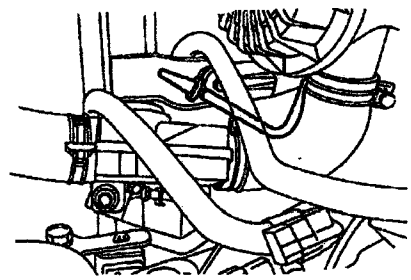
Idle Settings

EF-NS 950+-50 RPM
EF-ES 850+-50 RPM
EF-TS 900+-50 RPM

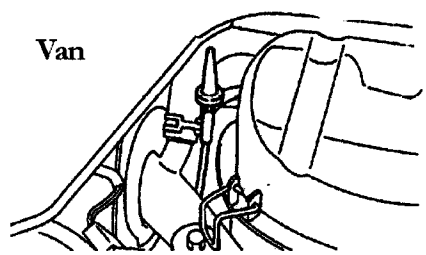
EF-NS Series

Use the diagrams to the right for Truck and Van Location Information on Vacuum Hose Nipple If equiped with vacuum motor remove hose cover

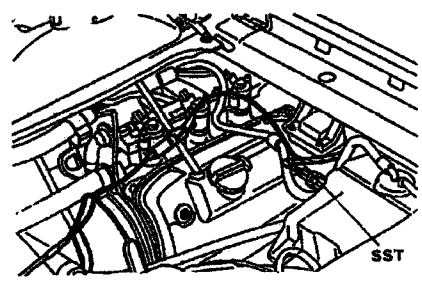
Truck



Van

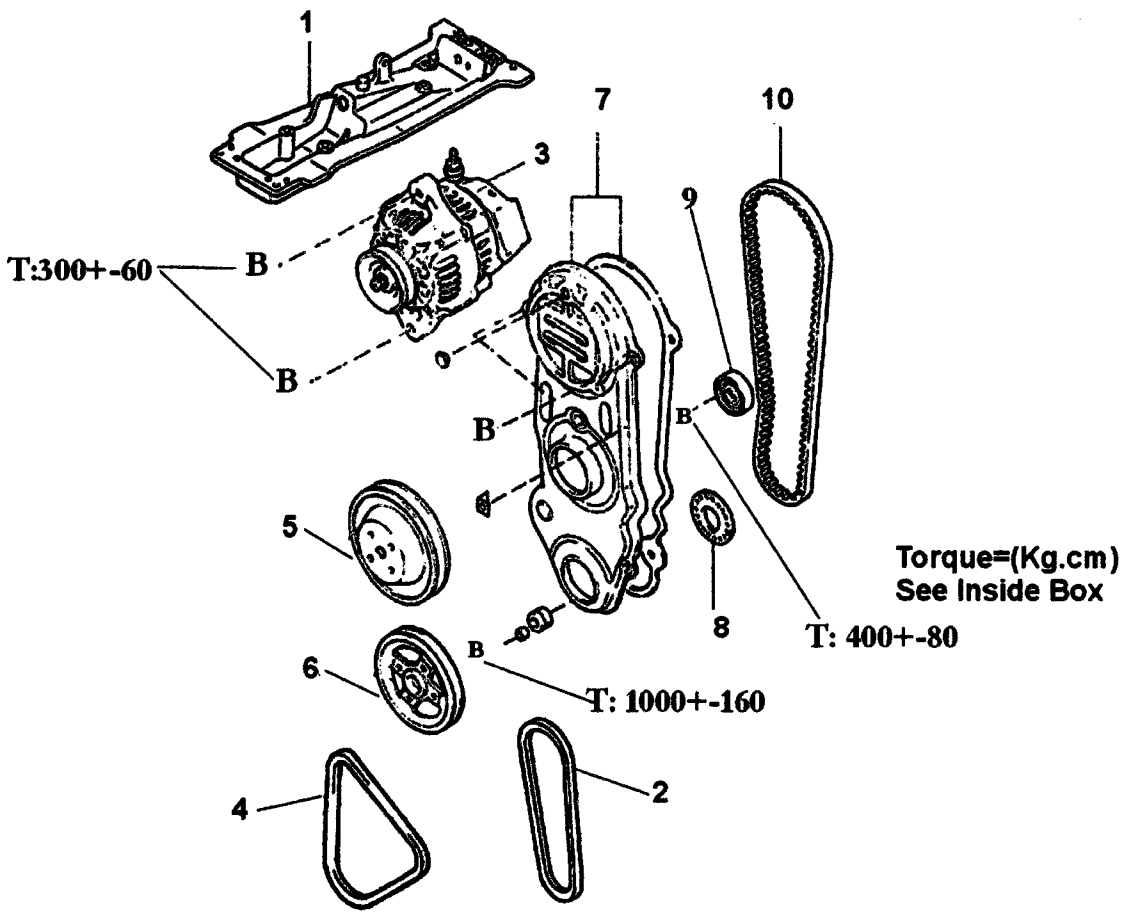


Engines not equiped with an RPM Gage use RPM gage SST Pn# 09991-87604-000



Timing Belt System Components

(B)=Bolt
(N)=Nut
(W)=Washer

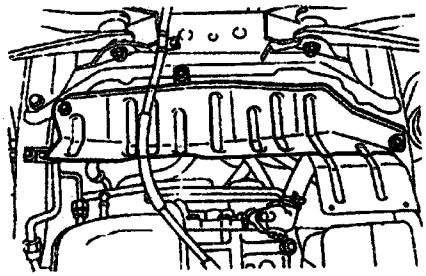


1. Center Member (Side Brake Member)
2. V- Belt AC Option Vehicle
3. Altenator
4. V-Belt (Altenator)
5. Water Pump Pulley
6. Crankshaft Pulley
7. Timing Belt Cover
8. Flange, Crankshaft Timing Pulley
9. Tensioner (Timing Belt)
10. Belt (Timing)

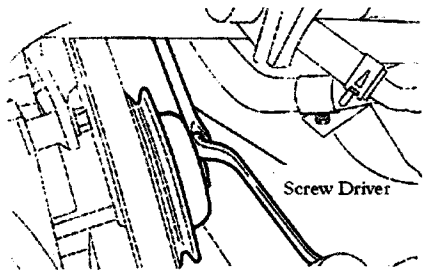
Engine

Timing Belt Replacement

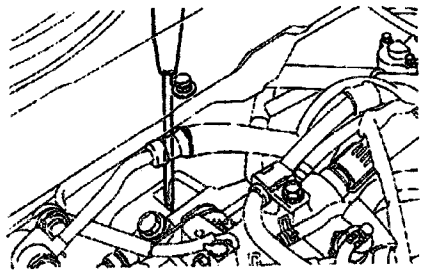
1. Jack up the Front of the Vehicle Using Proper Jack Stands described in the Front of the Book
2. Remove the (-) Battery Connection
3. Remove Inner Seat Belts Retaining Bolts
4. Remove Shift Knob, Consol (If Equiped)
5. Remove Parking Brake Lever Assembly, Transfer Shift Lever (4WD)
6. Remove Center Member (Panel Side Brake Attaches to)
7. Remove Engine Under Cover (Splash Guard) (VAN)
8. EF-NS-EF-TS Series: VSV (AC Fast Idle) Disconect Hose.
9. (AC Vehicle) Loosen AC Compresor Attachment Bolts and Remove V-Belt.
10. Loosen Alternator Attachment Bolts, Remove V-Belt



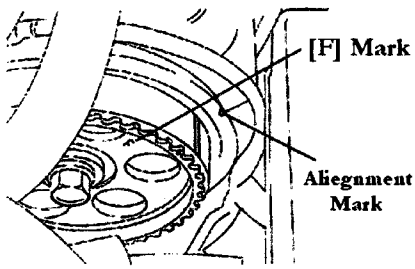
11. Use a Screw Driver as in the Diagram to the Right to Hold the Water Pump Pulley While Loosening the Water Pump Pulley Attachement Bolts



12. Remove Timing Mark Cover and Useing a Long Screw Driver, put it Threw Sevice Hole #2. Wedge it into the Ring Gear to Prevent Movement. Remove Crankshaft Pulley.
13. Remove Timing Belt Cover & Gasket. Do Not Re-Use Gasket.
14. Remove Timing Belt Pulley Flange



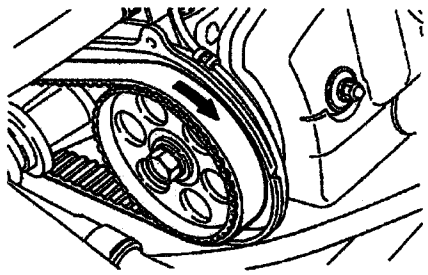
15. Rotate Engine To TDC
    (1) See If "F" Mark is Properly Lined Up with the Aliegnment Mark. If it is "OFF MARK" This Belt Has Slipped. James Note: Tensioner has Failed and must be Replaced. A New Belt Could Cuase an Old Tensioner to Fail Quickly.
    (2) Look For Broken Teeth of Rubber that has Fallen into Cover.



James Note: If the Vehicle has over 100,000 Kilometers and has a slipped Belt Replace All Parts. Its Not Worth doing it All Over Again.

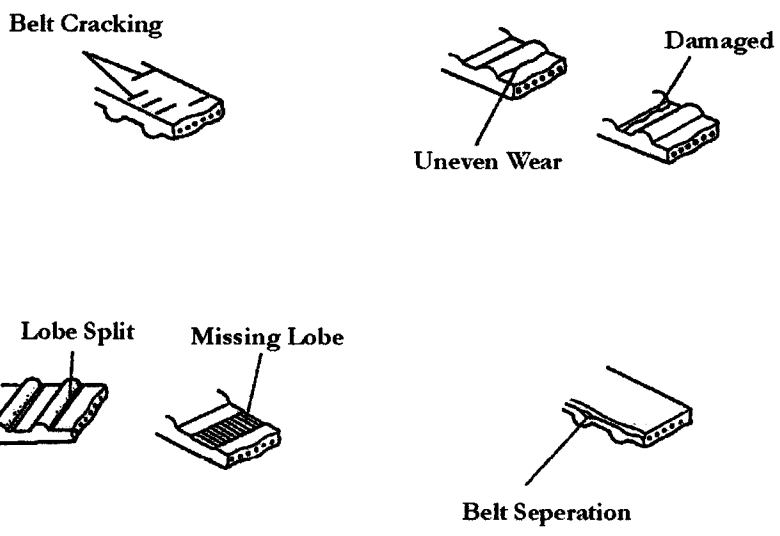
Note #2: Beware of Cheap Replacement Parts that DO NOT Have an (F) Mark! Always Buy Correct OEM Parts

16. Loosen and remove timing belt Tensioner
17. Remove timing belt



Use the chart below to check belt condition
Note: This will help you determine engine running condition.

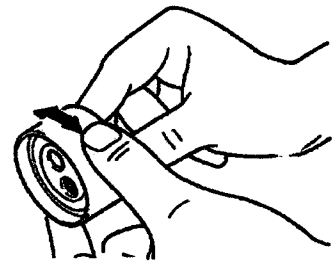
Belt Conditions



Note: Never re-use a timing belt. Used belts will fail if a new tensioner has been installed

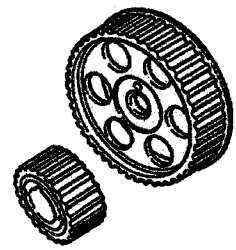
Timing Belt Tensioner Inspection

Rotate timing belt tensioner and check movement. Any resistentence or grity particals can and will cause problems when a new belt is installed.
Note: Replace tensioner if over 100K



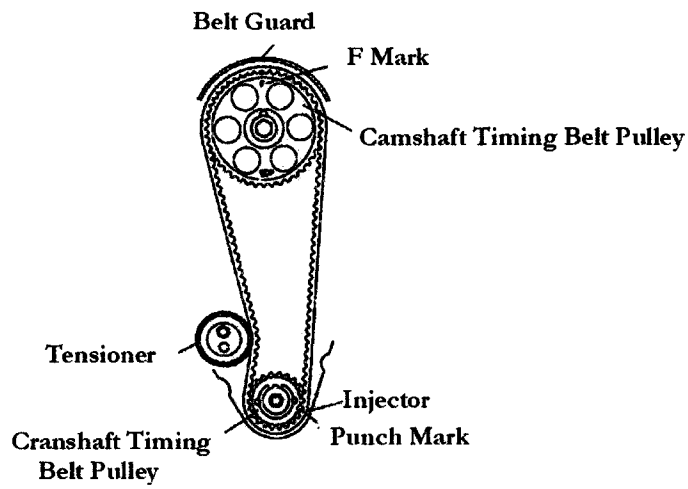
Timing Belt Pulleys

Check pulleys for wear and or missing teeth. If a lobe shows wear replace.



Note: Always replace pulleys in a set

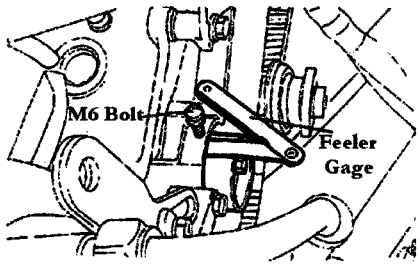
Timing Belt Layout Configuration



Install New Timing Belt

Attach Tensioner

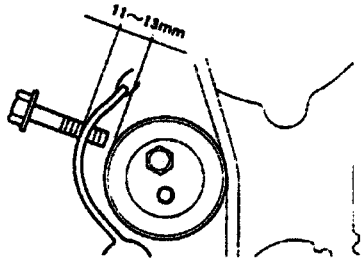
Utilize a M6 Bolt and thread through Access Hole
Bolt Length Should Be 20-30mm



Use the Diagram on the Right as an Example

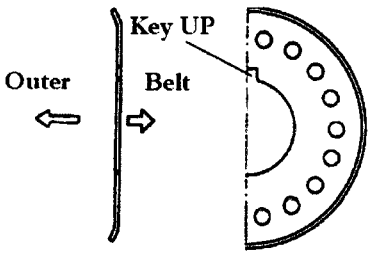
There must be 11~13mm of Clearance Between
The Tensioner and Oil Pump Body

Once the Belt is Tight & Clearance Checked
Torque Tensioner to: 400+-80 KG.CM



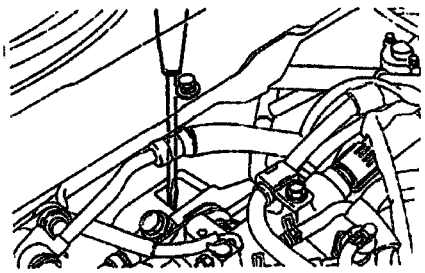
Make Sure Crankshaft Pulley Flange Matches
Diagram on the Right

Key UP as in Previous Diagram



Complete Installation of Dissembled Parts
& Components in Reverse Order

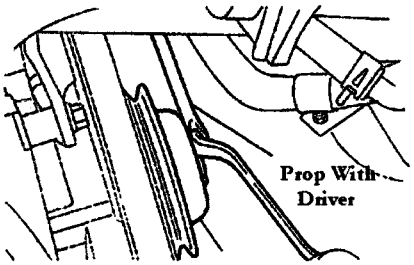
Use a Long Screw Driver to Hold Puley in Place
and Torque Crankshaft Pulley to: 1000+-100KG.CM



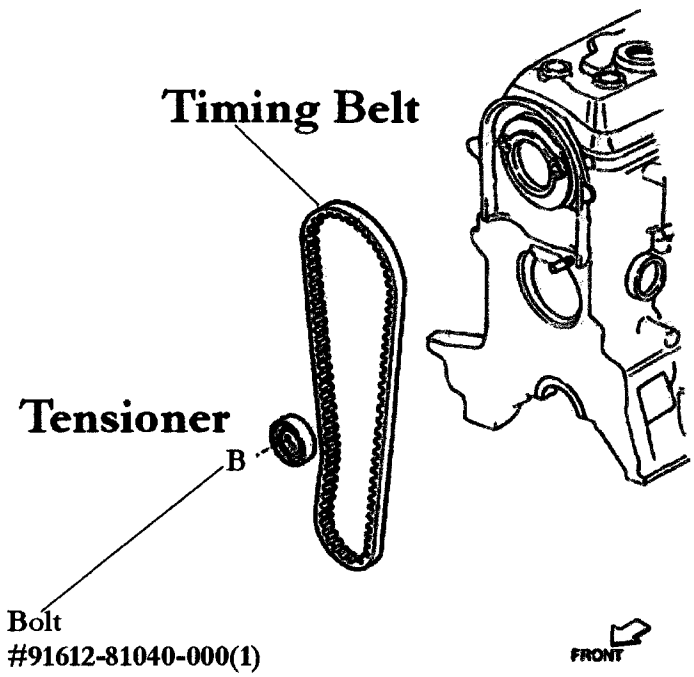
Use Screw Drive To Prop While Tightning Water
Pump Pulley Bolts

*Make Sure All Fluids Have Been Filled to Proper
Level Before Stating Engine*

Start Engine and Check Timing



Timing Belt Parts



Bolt
#91612-81040-000(1)
EFNS, EFES, EFTS
#91642-81045-000(1)
EFGS, EFZS, EFRS

Timing Belt Part Numbers

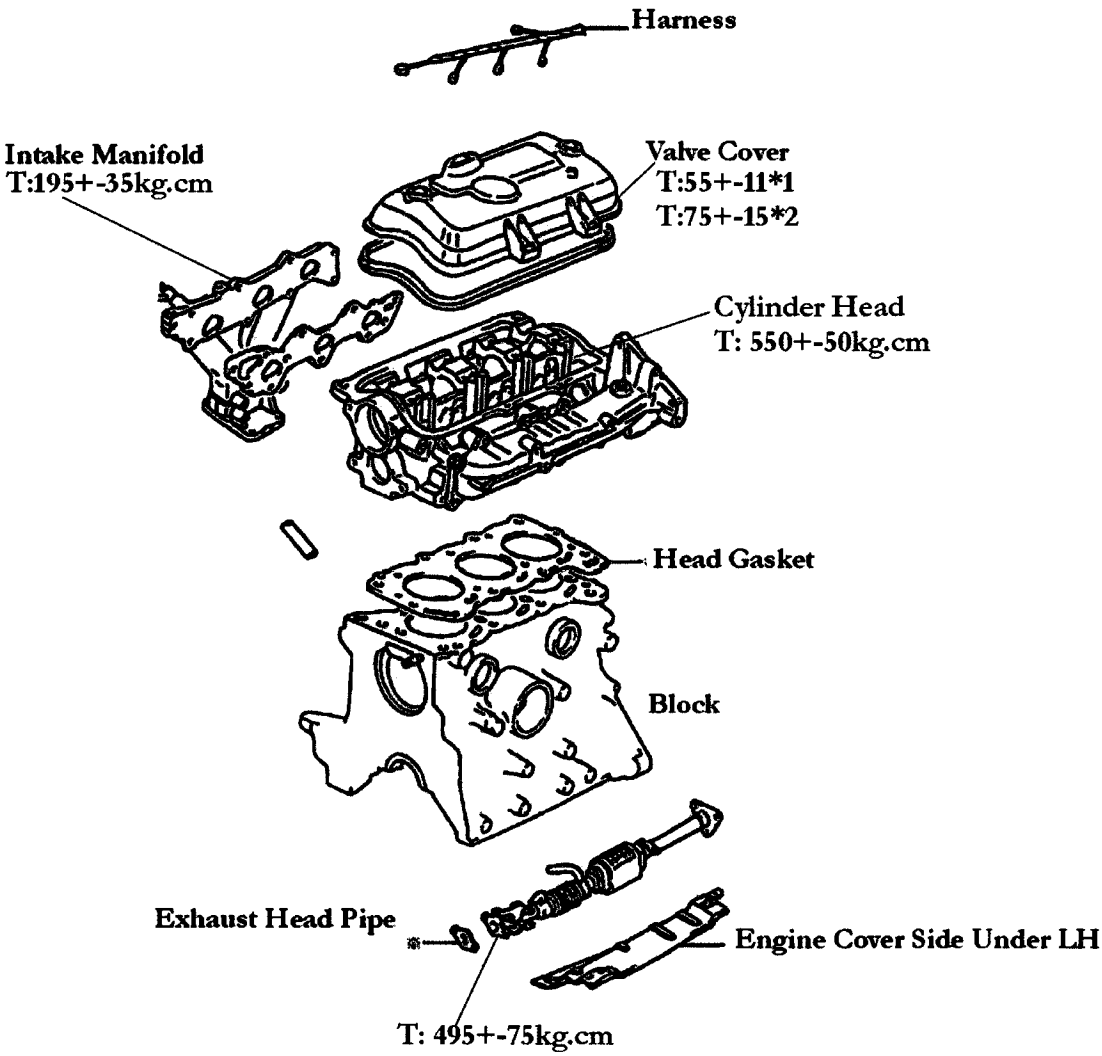
EF-NS, EF-ES, EF-TS	Part # 13514-87282-000
EF-ES	Part #13514-87283-000
EF-GS, EF-ZS,EF-RS	Part#13514-87215-000
EF-NS,EF-ES,EF-TS	Part#13514-87283-000

Tensioner Part Numbers

EF-NS, EF-ES, EF-TS	Part# 13505-87205-000
EF-GS, EF-ZS, EF-RS	Part# 13505-87206-000

Head Gasket

T:=Torque Kg.Cm
*=1: EF-NS, EF-TS
*=2: EF-ES



Note: Gaskets Can not be Re-Used

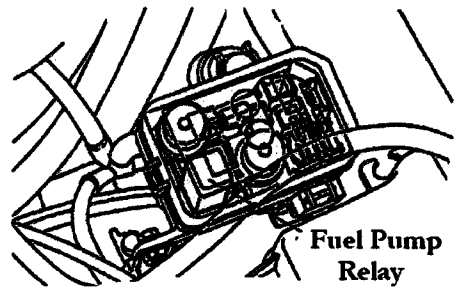
Note: Head Gasket Must Never Contact Oil Before Installed

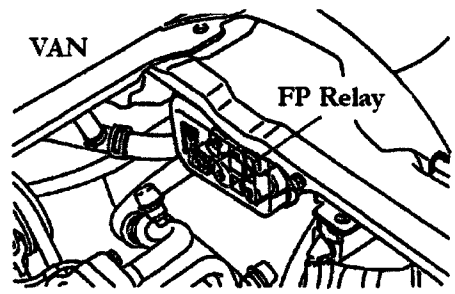
Head Gasket Removal & Replace

1. Jack Up Front of Vehicle
2. Drain Coolant System
3. Release Fuel Pressure
   (1) EF-NS Series
   Open Fuel Tank Cap
   (2) EF-ES & EF-TS
   (1) IG Switch to [OFF]
   (2) Remove Fuel Pump Relay
   (3) Crank Engine Until Fuel Runs Out
   (4) Turn Ignition Switch to [OFF]

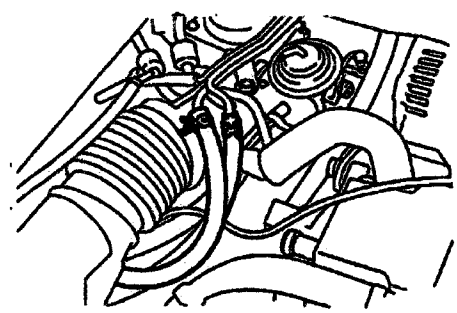
Caution: Fuel Lines are Under High Pressure
Always Use Caution

Fuel Pump Relay (Truck)





Removal
1. Remove Timing Belt (See Previous Section)
2. Remove Air-Cleaner Hose
3. Disconnect Accelerator Cable
4. Disconnect Engine Main Harness
5. Disconnect Fuel Hose Line
6. Disconnect Vacuum Lines
7. Disconnect Water Hose
8. Fuel Pump and EGR Valve (EF-NS)



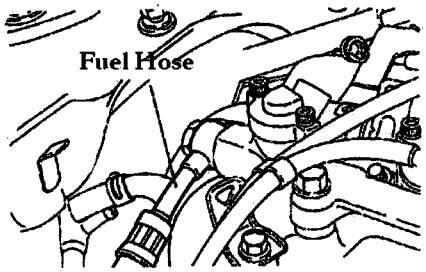
Head Gasket Continued

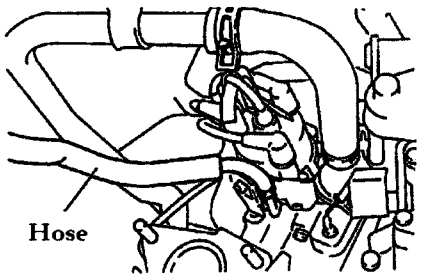
9. Remove Intake Manifold Assembly

Note: Gaskets May NOT be Reused

10. Remove Engine Side Under Cover LH
    Disconnect Front Exuast Head Pipe
    (If Turbo-Charged Remove TB Assembly)

11. Disconnect Vacuum Hose from Distributor

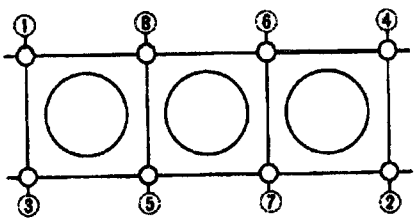




12. Remove Valve Cover Assembly
13. Remove All Remaining Attachment Bolts
14. Carefuly Remove Cylinder Head

Note: Discard All Used Gaskets

15. Place Cylinder Head on a Bench For Cleaning
    and Inspection



Bolt Pattern

Note: Clean All Surfaces Thoroughly
Check for Surface Cracks or Other
visable Damage. If Cracks are Located
replace with New Parts. Cylinder Heads
Can Not Be Repaired.

Head Gasket Part Number

EF-ES #11115-87215-000
E-GS, EF-ZS #11115-87217-000
EF-NS, EF-TS #11115-87210-000
All Others # 11115-87219-000

Valve Cover Gasket
Part Number(s)

EF-ES #11213-87208-000
EF-NS, EF-TS #11213-87206-000
All Others # 11213-87211-000

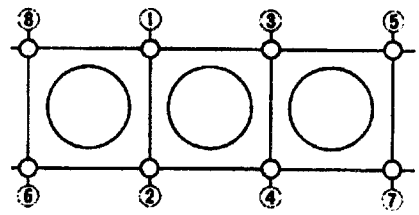
Engine

Cylinder Head Gasket Assembly

1. Place New Gasket On Clean Block Surface
2. Place Head And Start Head Bolts to Snug

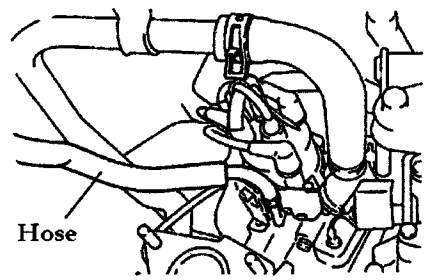
3. Torque Head Bots To: 550+-50(Kg.Cm)
   Use Diagram on Right For Torque Sequence

Torque Sequence



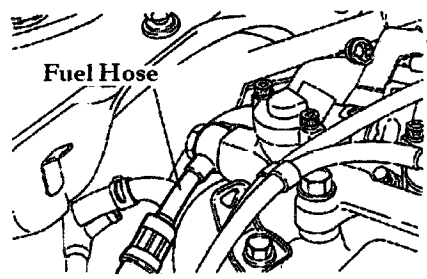
4. Attach Cylinder Head Valve Cover
   Torque to: EF-NS & EF-TS
   55+-11(KG.CM)
   EF-ES
   75+-15(KG.CM)

5. Attach Distributor Hose & Connections
6. Turbo-Charged Engines: Attach Assemby



7. Attach Exhaust
   Torque: 495+-75(KG.CM)

8. Attach Engine Side Under Cover
9. Attach New Gasket for Intake Manifold
   and Torque Intake Manifold to:
   195+-39(KG.CM)
10. EF-ES & EF-TS Attach Fuel Line
11. EF-NS EGR Valve
    Torque 195+-39(KG.CM)
    Fuel Pump Assembly
    Torque: 195+-39(KG.CM)
12. Attach Water Hose
13. Attach Water Outlet Bypass Pipe
14. Re-Attach Vacuum Lines



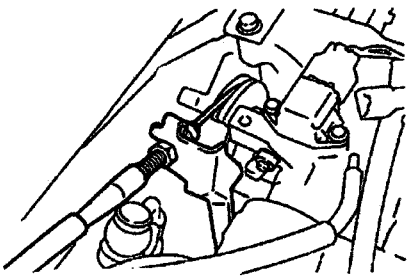
15. Attach Fuel Hose
16. Attach Engine Harness
17. Attach Accelerator Cable
    Engagement Free Play
    1 to 4mm

18. Attach Air Cleaner Hose

19. Assembel Timing Belt
    (See Previous Chapter)

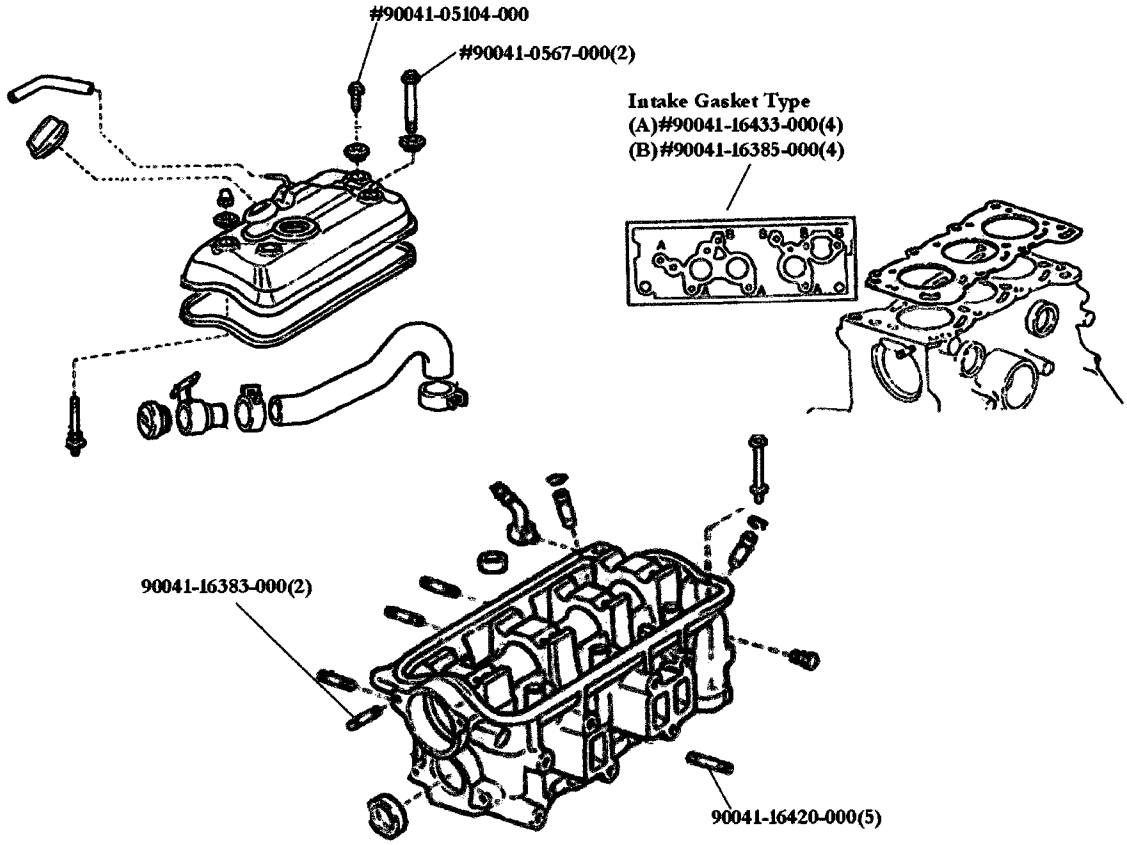
20. Add Coolant
21. Change Engine Oil & Filter

22. Start Engine and Check Timing



Accelerator Cable

Head & Valve Cover Gaskets



Parts (ALL Series)

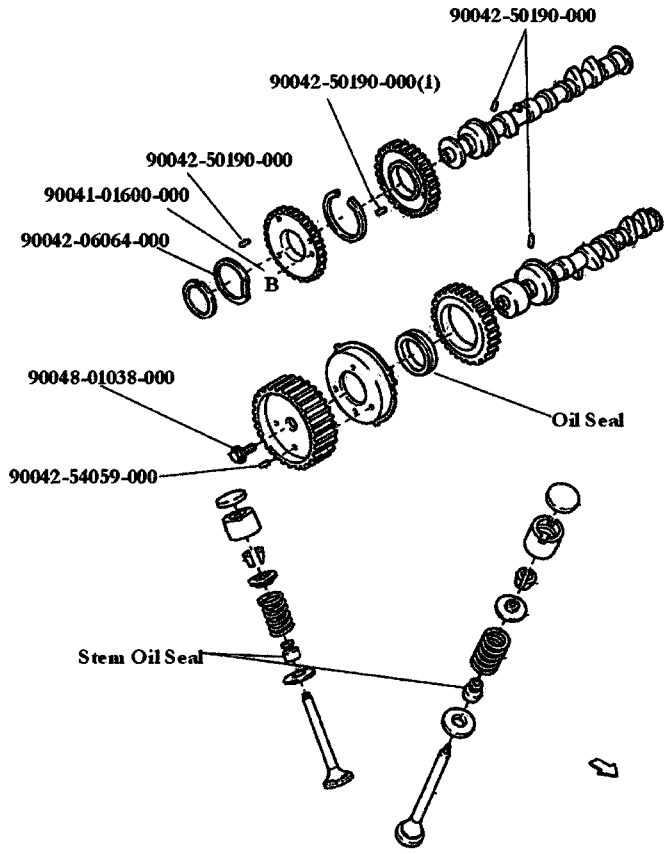
Head Gasket

EFES S100,S110, S120, S130 #11115-87215-000
EFGS-EFZS S100, S110, S120, S130, PS4 #11115-87219-000
EFNS-EFTS S100, S110, S120, S130 #11115-87210-000
All Others #11115-87219-000

Valve Cover Gasket

EFES S100, S110, S120, 130 #11213-87208-000
EFNS-EFTS (All) #11213-87206-000
EFGS-EFZS-EFRS (All) #11213-87211-000

EFGS-EFZS-EFRS Shown



Valve Steam Steam Seal

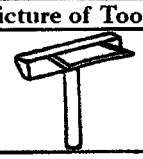
EF-ES	Part# 90048-12015-000
EF-NS, EF-TS	Part#90048-12009-000
EF-GS, EF-ZS, EF-RS	Part#90048-12021-000

Seal Type "T" (All EF Series)

Part # 90043-11277-000

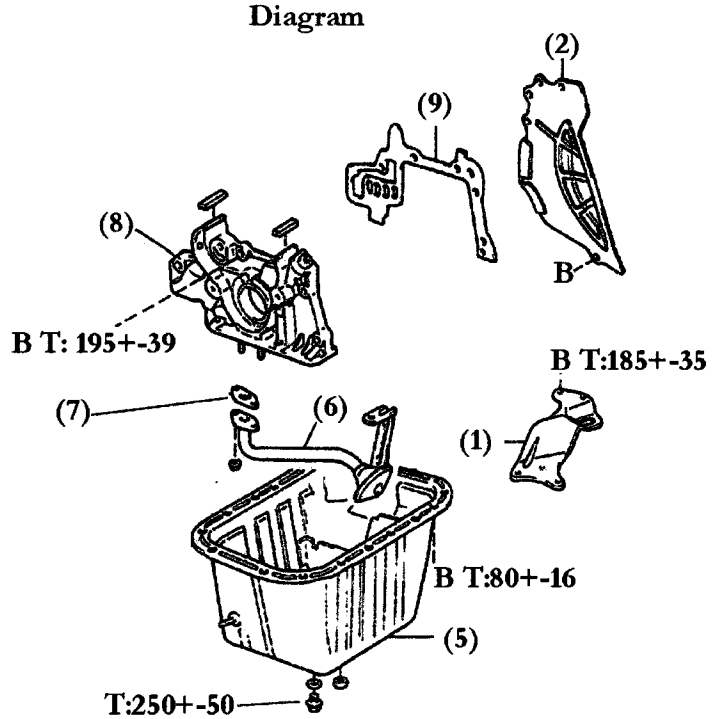
SST=Special Service Tool

Special Service Tools

	Picture of Tool	Part Number Part Name	Use
SST		09032-00100-000 Gasket Scraper	Oil Pan Gasket Removal
		09608-87302-000 Seal Set (Drive)	Oil Seal Replacement

B=Bolt
N=Nut
T: =Torque kg.cm

Diagram



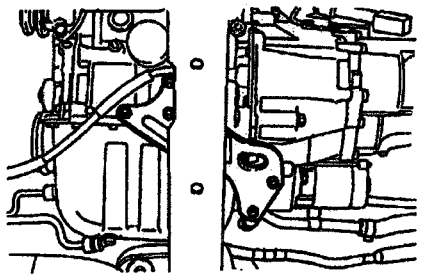
1. Power Train Brakcet
2. Clutch Housing Cover
5. Oil Pan
6. Oil Strainer
7. Oil Strainer Gasket
8. Oil Pump Assembly
9. Oil Pump Gasket

Note: Item 3&4 are note listed in this diagram

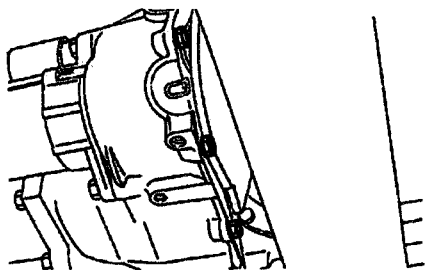
Oil Pump Replacement

Pre-Steps
A. Drain Oil
B. Remove timing Belt (Previous Section)

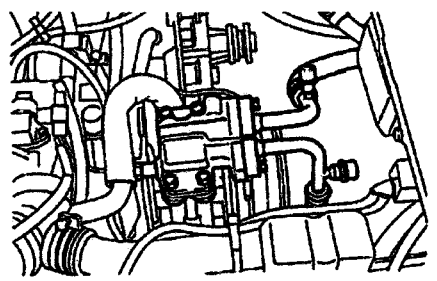
1. Remove Power Train Braket
(See Diagram on the Right)



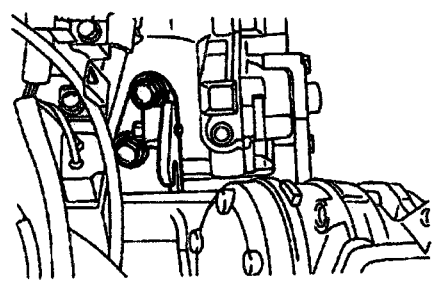
2. Remove Clutch Housing Cover Plate



3. (AC Equiped Vehicles) Disconnect Compressor & Move Harness to the Side for Clearence



4. (AC Equiped) Remove Compressor Braket

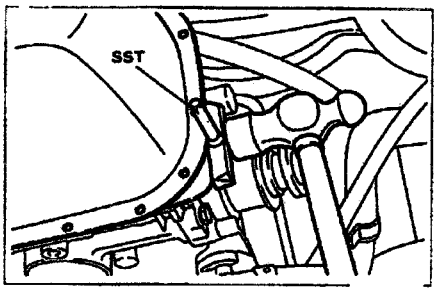


Oil Pump Replacement

5. Remove Oil Pan Bolts

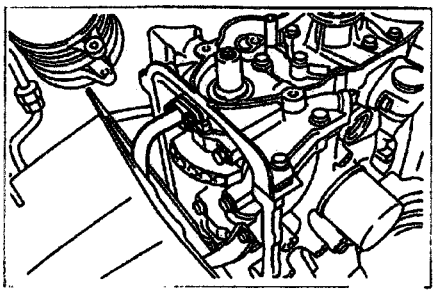
Note: Use Service Tool To Seperate Pan

SST 09032-00100-000



6. Remove Oil Pan

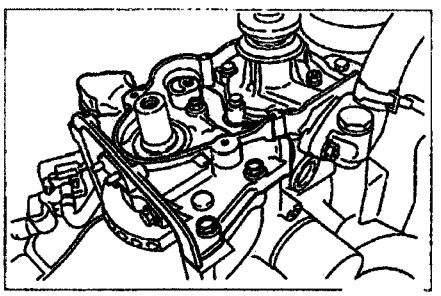
Note: Due to Clearance on Some models it Maybe Nessesary to Unbolt Strainer Attachment Bolts and Strainer to Remove Pan.



7. If Pan was Removed With Strainer Still Attached Remove Now. Scrap Off Old Gasket.

Note: Never Re-use Gaskets

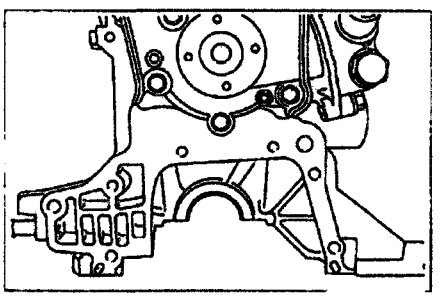
EF Series Gasket PN: 15149-87203-000



8. Remove Pump

Note: Clean All Surfaces & Remove any Foreign Debris

9. Attach New Pump Assembly
Torque to: 200+-40(kg.cm)
10. Attach Strainer

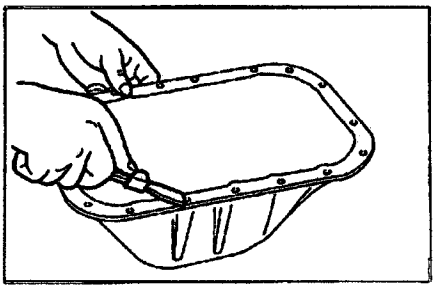


Note: If Planning to Rebuild Pump Please Read Next Chapter

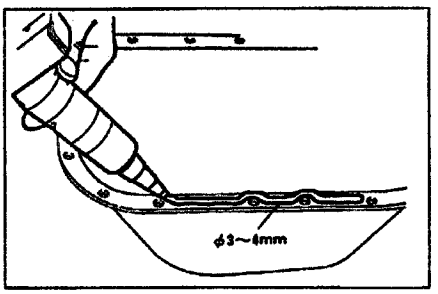
Oil Pump Installation

1. Note: Thoroughly Clean Surfaces

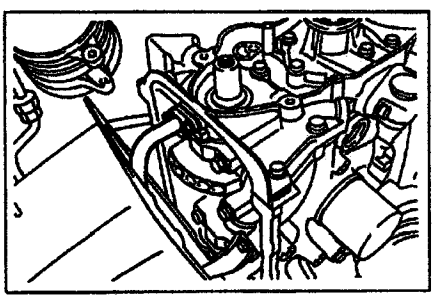
James Note: I Recommend Copper Plus RTV
Blue RTV WILL Leak



2. Put a Bead of Copper Plus High Temp RTV Along The Edges and let Stand 5-10 Minutes

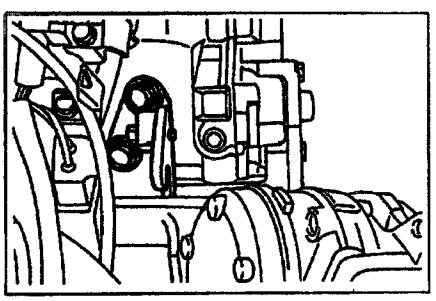


3. Slide Pan on & Take Care Not to Let Gasket Slip
Torque Pan Bolts to: 70+-5(kg.cm)



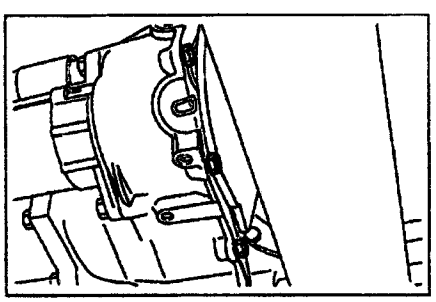
4. Attach Brakets AC Vehicles
Compressor Braket Torque
620+-120(kg.cm)

Attach AC Compressor/Hoses/Harness

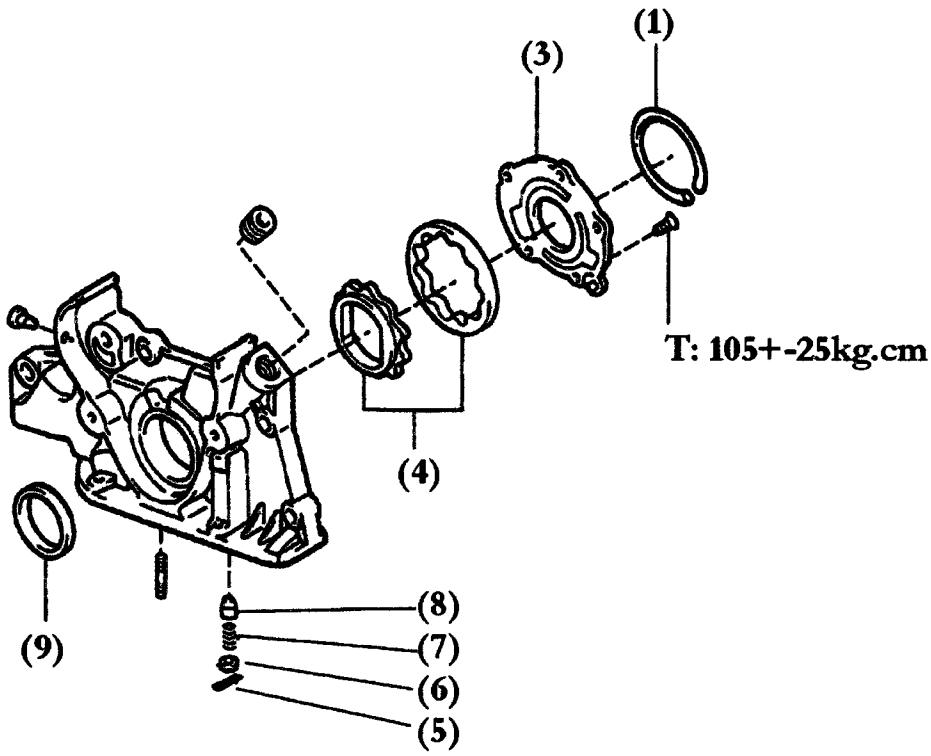


5. Install Clutch Hosing Cover Plate
6. Attach Power Train Braket
Torque to: 185+-35(kg.cm)

7. Attach Timing Belt and Other Belts
8. Change Oil Element & Add New Oil



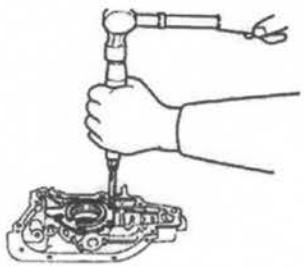
Oil Pump Component Diagram



1. Ring "O"
2. Attachment Screw
3. Cover, Oil Pump
4. Gear, Oil Pump Drive
5. Cotter Pin
6. Oil Pump Relief Retainer
7. Valve Compression Spring
8. Valve Oil Pump Reief
9. Seal, Type "T" Oil

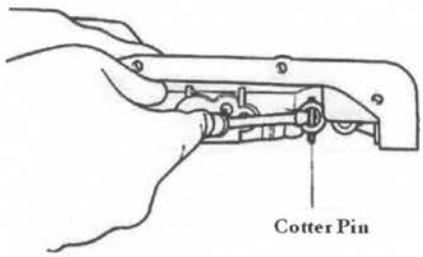
1. Remove "O" Ring
2. Remove Srews
3. Remove Oil Pump Cover
4. Remove Oil Pump Drive Gear

Note: If trouble Removing Screws Tap
Lightly With Hamer & Driver
Do Not Hit Hard



5. Remove Cotter Pin

Note: Do Not Re-Use Cotter Pin

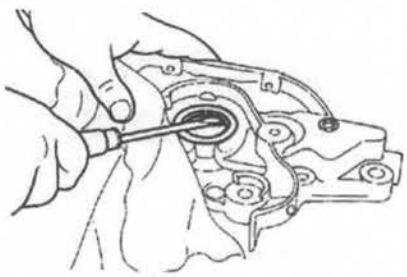


6. Remove Inner Parts. Relief Spring
Relief Valve & Retainer

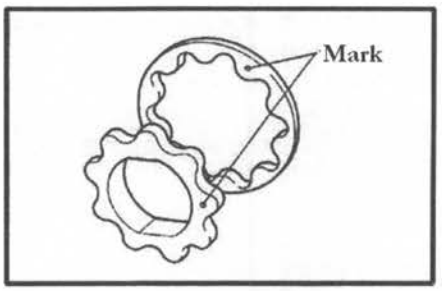
Inspect: Check for Damage or Cracks
Clean Thoroughly

7. Use a Driver & Remove Seal

Caution: Do Not Use Excessive Force



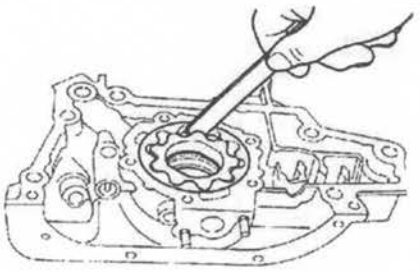
1. Check Oil Pump Drive Gears



2. Clearance Check: Check 9 Lobes

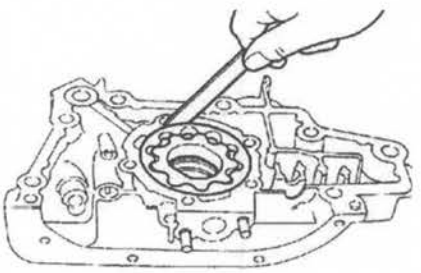
Acceptable: 0.17mm to 0.24mm
Replace: 0.35mm

Note: Make Sure Clearance Checked with Clean Gears. (Grease Free)



3. Body Clearance
(Between Rotor and Body)
See Diagram to the Right

Acceptable: 0.10mm to 0.185mm
Replace: 0.25mm

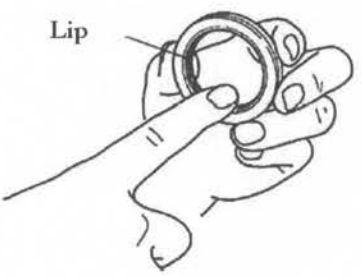


4. Lighlty Lubricate With Grease

Valve Spring Retainer

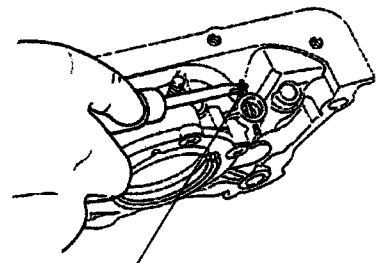
5. Lubricate Seal With Clean Engine Oil

Assemble Oil Pump



6. After Assembling Relief Valve Spring and Retainer Install New Cotter Pin

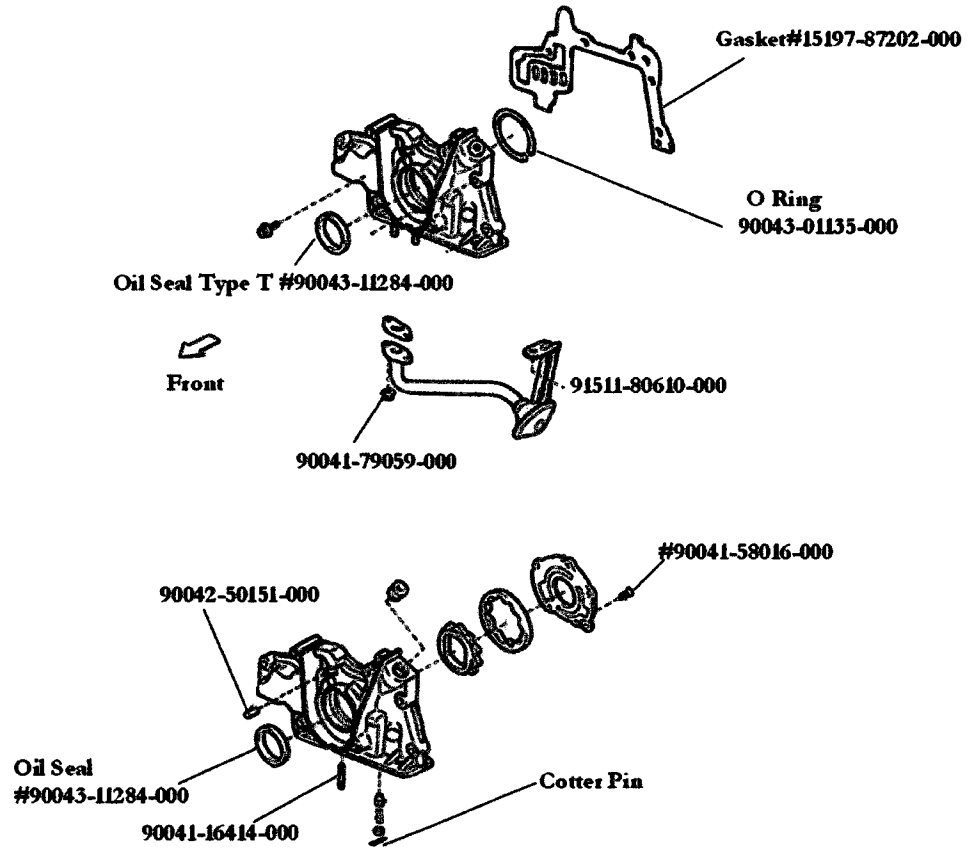
7. Install Pump



Cotter Pin

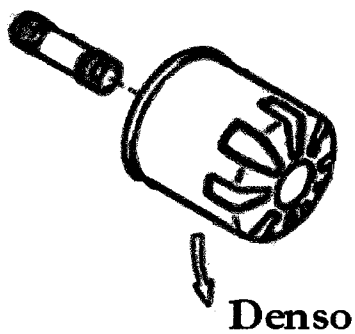
Oil Pump Parts

Oil Pump



Note: At This Time Only Part Listed Above Are Available At Dealer Level

Oil Filter

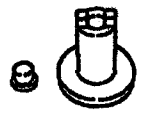
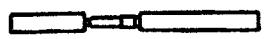


Denso
Tokyo Roki

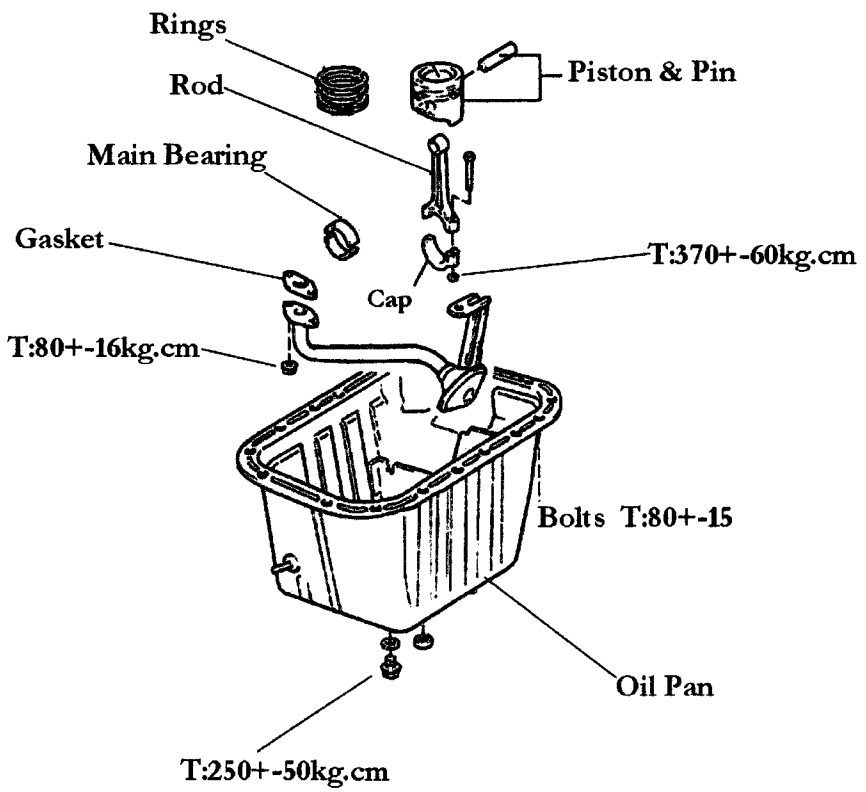
Oil Filter Part#

EF Series S100-S110-S120-S130
PN: 15601-87204-000 or PN: 15601-87703-000

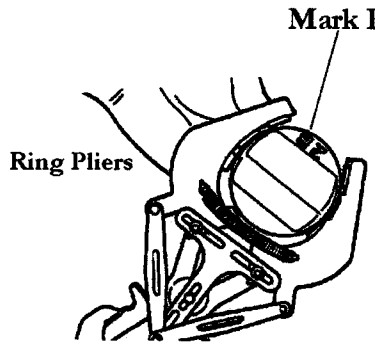
Cross Refference to:
Suzuki Part #16510-81403
Mazda Part #AY01-14-300A

	Picture	Part Number	Use
S		09032-00100-000	Gasket Scraper
S		09221-87206-000	Piston Pin Remover Stand
T		09221-87207-000	Piston Pin Remover Bar

Torque=Kg.cm

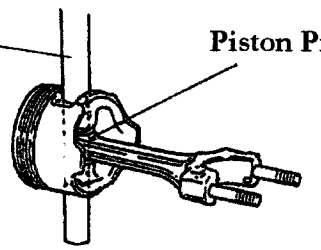


1. Remove Piston Rings with Pliers



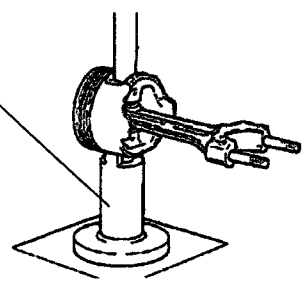
SST09221-87207-000

2. If Piston Pins are to be Removed Use Special Service Tools Listed Above



SST 09221-87206-000

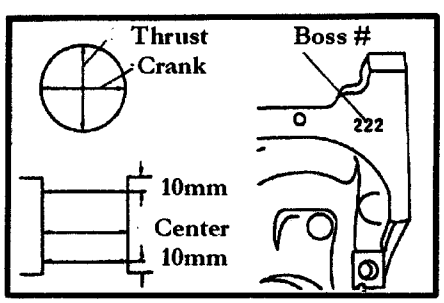
3. Remove Piston Pins and Clean Thorougly



Clylinders

1. Using The Diagram Measure The Cylinder Roundness Minimum 6 Positions

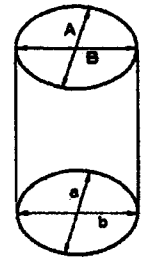
Limits: Between 68.00mm to 68.03mm



2. Use a Cylinder Gage & Check Points

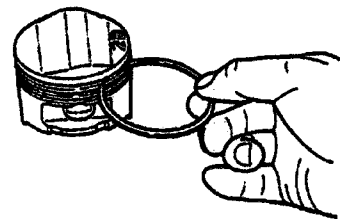
A-B and a-b

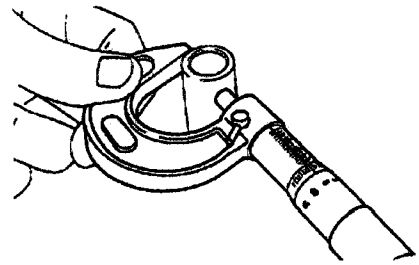
Taper Degree Maximum = 0.03mm



3. Clean out Piston Groves Using an Old Ring or Use Ring Groove Cleaner Tool

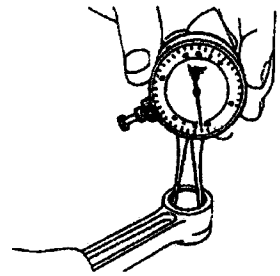
Note: Do Not Re-Use Old Rings
Note: Do Not Use Wire Brush





4. Piston Pin Clerance

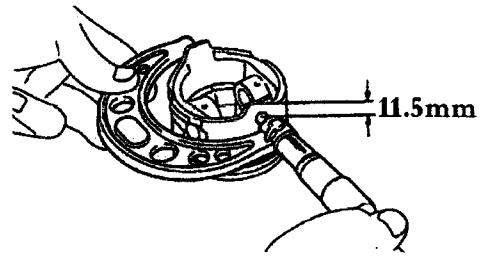
Limit: 0.005mm~0.011



5. Piston Measurment

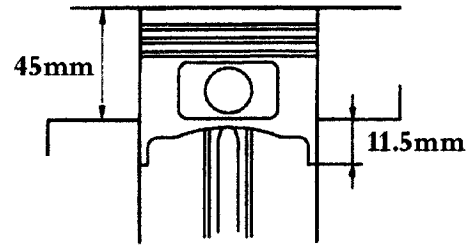
Limit= 67.965~67.995

Note: Measure From 11.5mm Down as in the Diagram on the Right

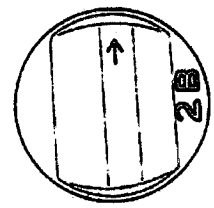


Cylinder & Piston Oil Clearance Check:

Clearance: 0.025mm~0.045mm
Limit: 0.10mm



Front



Piston Mark

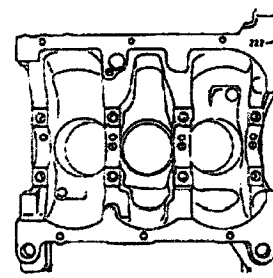
EF-NS & EF-ES

	Cylinder (Inner)	Piston (Outer)
1	68.00mm~68.010mm	67.965mm~67.975mm
2	68.010mm~67.020mm	67.965mm~67.985mm
3	68.020mm~68.030mm	67.995mm~67.995mm

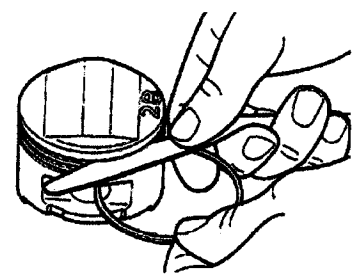
EF-TS

	Cylinder (Inner)	Piston (Outer)
1	68.00mm to 68.010mm	67.955mm to 67.965mm
2	68.010mm ~68.020mm	67.965mm~67.975mm
3	68.020mm~68.030mm	67.975mm~67.985mm

Block ID



Piston Ring Side-Clearence



EF-NS & EF-ES

	Clearence	Limit
No 1	0.03~0.07	0.12
No 2	0.02~0.06	0.11

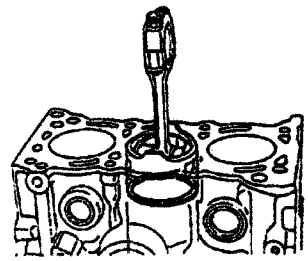
EF-TS

	Clearence	Limit
No 1	0.045~0.095	0.12
No 2	0.015~0.065	0.11

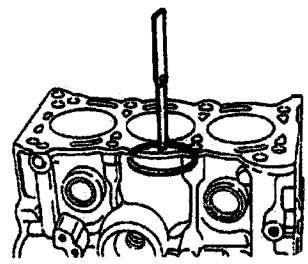
Piston Ring Block Test

Push Piston Ring 45mm Down Into Bore
Take The Following Measurments

	Clearance	Limit	
		EFNS-ES	EFTS
No. 1	0.25~0.40	0.65	0.55
No. 2	0.40~0.55		
Oil	0.2~0.7	1.0	
	0.2~0.5		

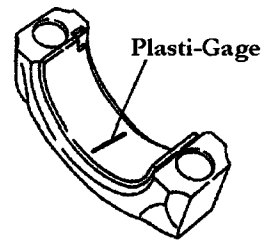


Use a Thickness Gage as Pictured in the Diagram



End Cap [Bearing]

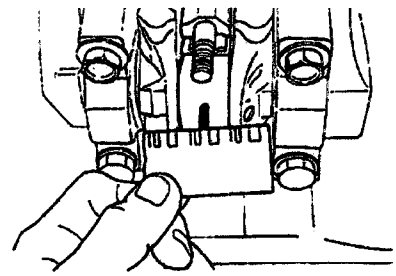
Connecting Rod Bearing Clearance



Use a Plastigage to Check Clearance

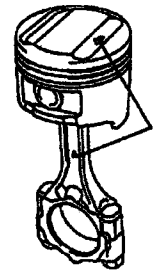
Clearance: 0.020mm~0.044mm
Limit: 0.07mm

Cap Bearing Torque: 370+-60 (kg.cm)



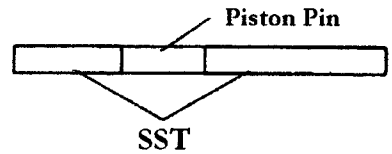
Engine Front Markings

Use the Diagram on the Right for Location Markings



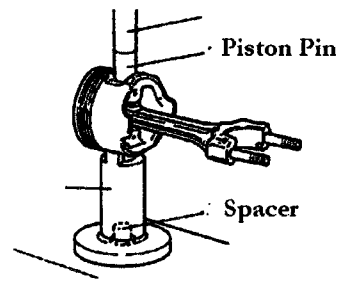
Use The Special Support Tools For The Following

SST 09221-87208-000Ⓐ
09221-87207-000Ⓑ



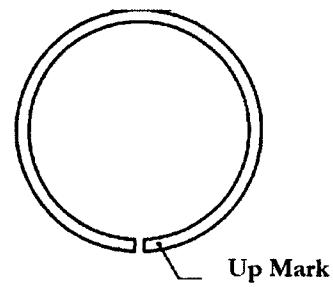
Using the SST Tools Install Piston Pins

Caution: Extream Pressure Required
Wear Saftey Googles and
Protective Wear

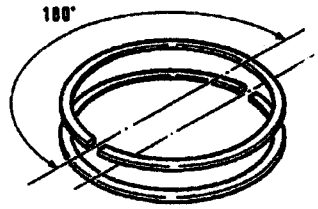


Piston Ring End Gap Face Diagram
Note: Slight Differences Per Maker

	Face
No. 1	
No. 2	

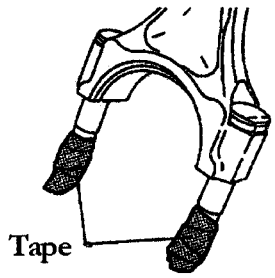


Ring Installation:
No.1 & No.2 Rings Must be 180 Degrees Opposite. Front Rear Direction



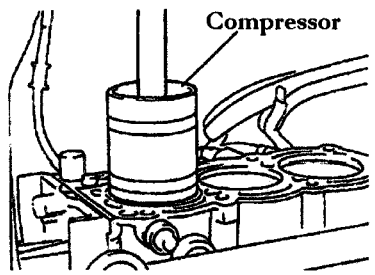
Connecting Rod Installation

Place Either Vinyl Tape over the Ends or Old Vacuum Hose to Prevent Damage To Crankshaft



Piston Intallation

Use a Spring Compressor For Intalation. Make Sure to Use New Engine Oil to Coat the Cylinder Linings and Piston Rings. Straight 30W Oil Recommended



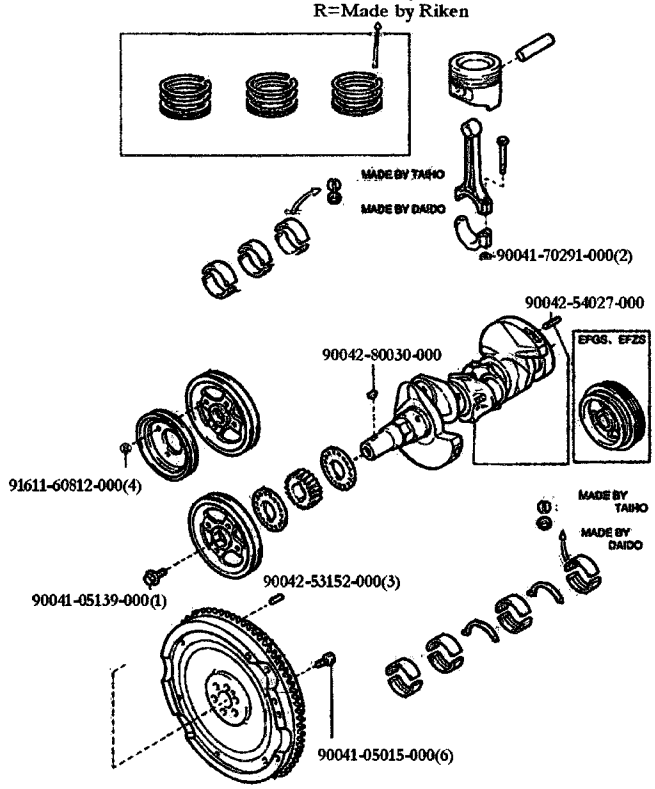
Bearing Cap Torque: 370+-60 (kg.cm)

Engine

Engine Parts

S100-S110-S120-S130

N=Made by NPR
R=Made by Riken



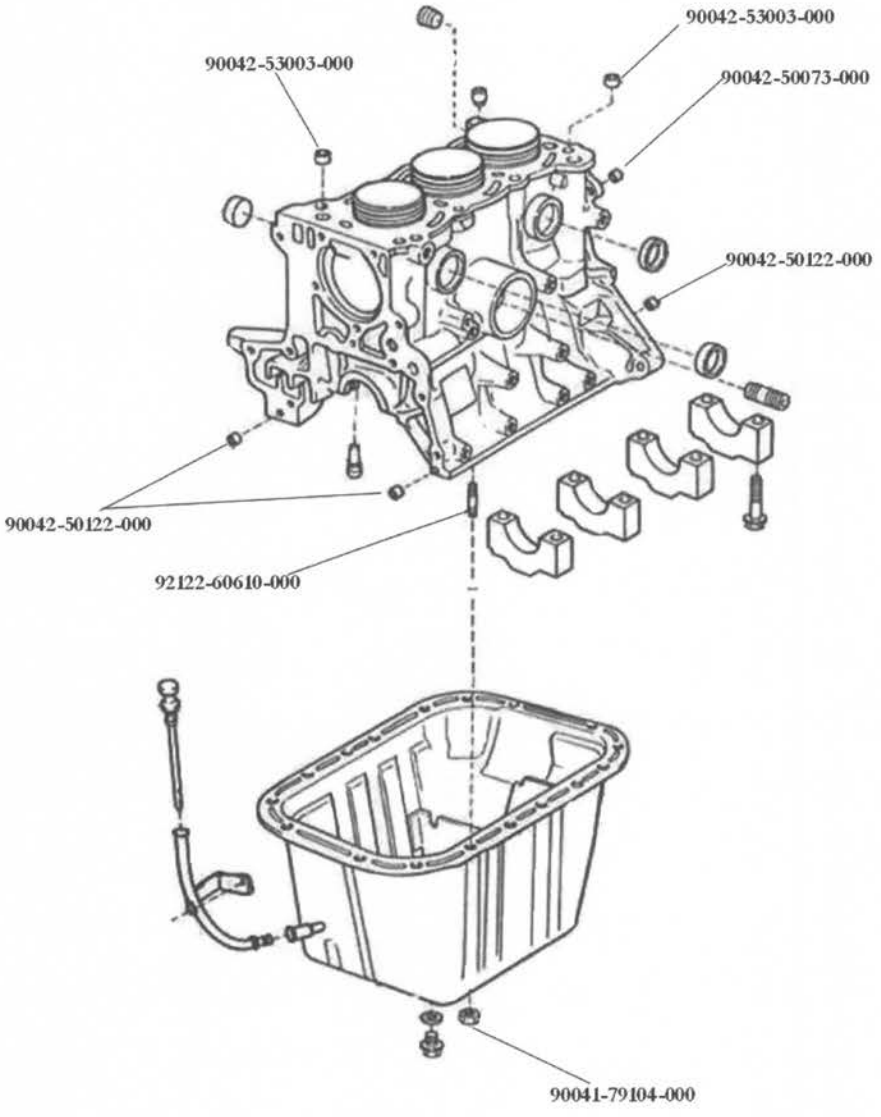
A11 EF Series S100-S110-S120-S130
Washer Set: Crankshaft Thrust
Part# 11011-87201-000 (STD)
Part# 11012-87201-000 (OS) 0.125mm
Part# 11013-87201-000 (OS) 0.25mm

Bearing Set Crankshaft
Part# 11702-87206-000 (STD) Taiho Maker
Part# 11702-87207-000 (STD) Daido Maker
Part# 11703-87206-000 (OS) 0.25mm Taiho
Part # 11703-87207-000 (OS)0.25mm Daido
Part# 11704-87206-000 (OS) 0.50mm Taiho
Part# 11704-87207-000 (OS) 0.50mm Daido

Piston & Pin Set
Part# 13101-87234-000 (STD)
Part# 13102-87234-000 (OS) 0.25mm
Part# 13103-87234-000 (OS) 0.50mm
Part# 13104-87234-000 (OS) 0.75mm
Part# 13105-87234-000 (OS) 1.00mm

Piston Ring Set
Part# 13011-87218-000 (STD) Riken Maker
Part# 13011-87219-000 (STD) NPR Maker
Part# 13012-87218-000 (OS) 0.25mm Riken
Part# 13012-87219-000 (OS) 0.25mm NPR
Part# 13013-87218-000 (OS) 0.50mm Riken
Part# 13013-87219-000 (OS) 0.50mm NPR

Conecting Rod Bearing Set
Part# 13202-87204-000 (STD)
Part# 13203-87204-000 (OS) 0.25mm
Part# 13204-87204-000 (OS) 0.50mm

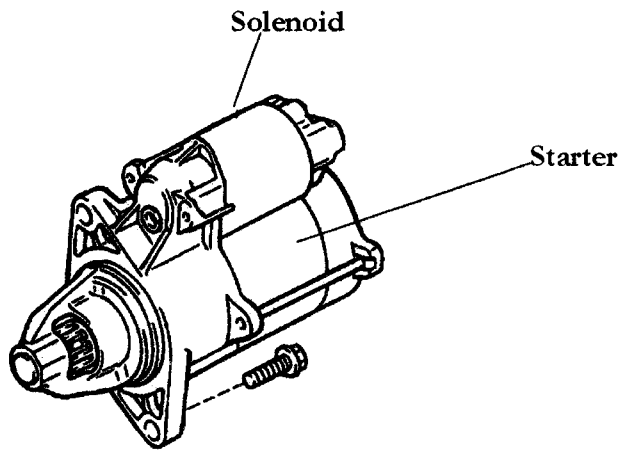

90042-53003-000
90042-53003-000
90042-50073-000
90042-50122-000
90042-50122-000
92122-60610-000
90041-79104-000

Chapter 8

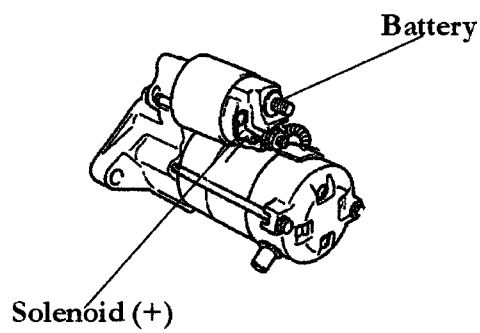
Starter & Alternator

- Starter
- Starter Circuit & Specifications
- Alternator
- Charging Circuit & Specifications

Starter



Removal

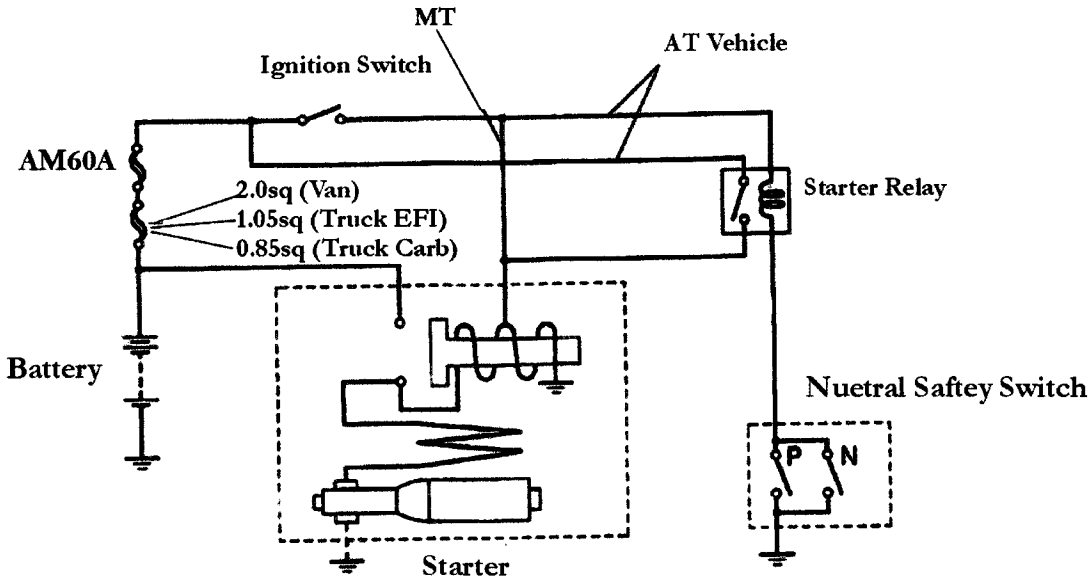


!. Jack Up Vehicle
2. Disconnect Battery (+) and (-) terminals
3. Remove Starter Attachment Bolts (2)
4. Slide Back and Remove Solenoid Terminal Connector and (+) Battery Cable Connection from Solenoid

Starter

Starter Circuit & Specifications

Circuit



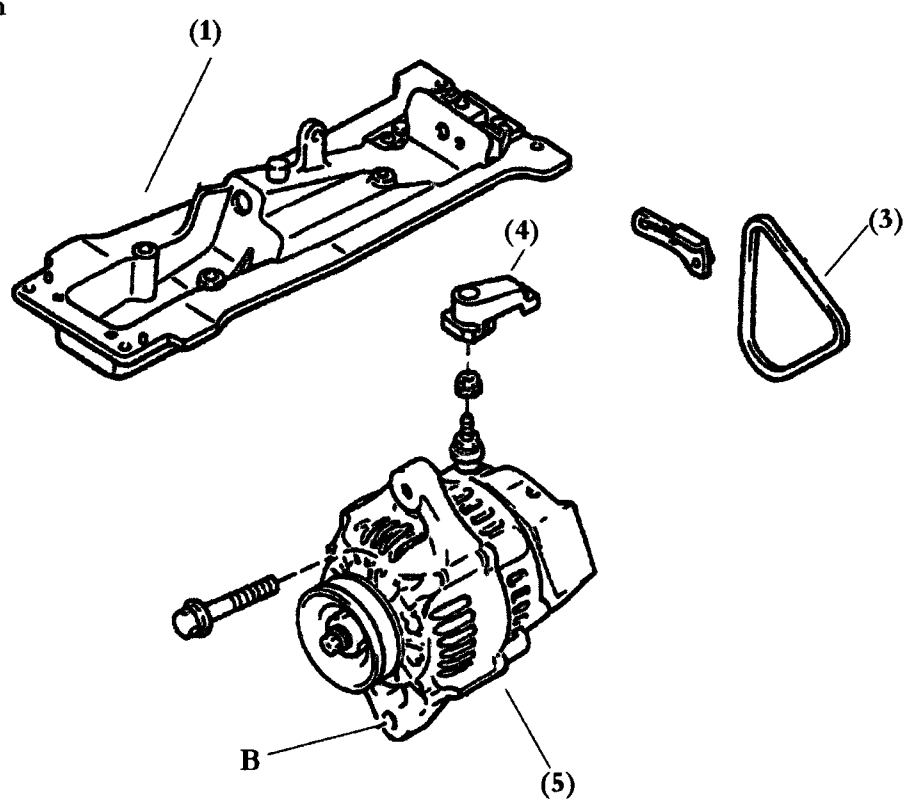
Specifications

Vehicle Type	Normal	Freezer Truck (Special Option)
Output (kw)	M/T 0.6 AT0.7	M/T0.8 AT1.0
Drive Gear Teeth	M/T (9) AT(8)	M/T (9) AT (8)
Weight (kg)	M/T 3.1 AT 3.2	M/T 3.1 AT 3.2

Alternator

Alternator Components & Removal

(B)=Bolt
Torque: kg.cm



1. Seat Riser Center Assembly
2. Belt: V-Belt A/C (Not Shown)
3. Belt: V-Belt Alternator
4. Harness
5. Alternator Assembly

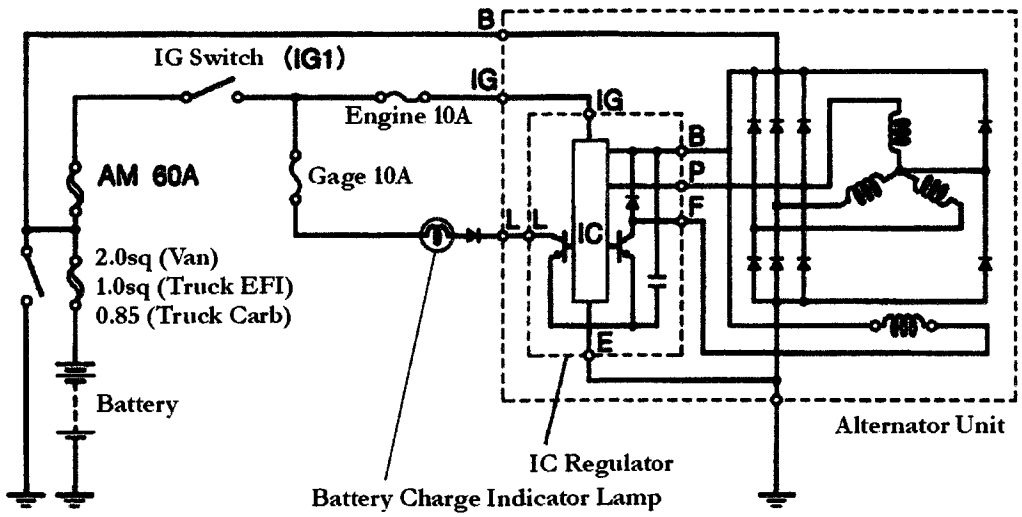
Removal

1. Disconnect Battery (-) and (+) Terminals
2. Remove Seat Riser Center Assembly
3. A/C Vehicles Remove A/C Belt
4. Remove Alternator V-Belt
5. Disconnect Alternator Electrial Harness
6. Remove Attachemnt Bolts and Remove Alternator Assembly

Alternator

Charging Circuit & Specifications

Charging Circuit



Specifications

Vehicle	Volts/Amps	Maximum RPM	Regulator Output
Truck: EFNS	12v 40A	15,000	14.2~14.8
EFES (T) & EFNS(Van)	12v 50A	15,400	13.6~14.4
EFES(T-AT) EFES (V-MT)	12v 55A	18,000	13.6~14.4
EFES (V-AT) EFTS	12v 60A	18,000	13.6~14.4

Chapter 9

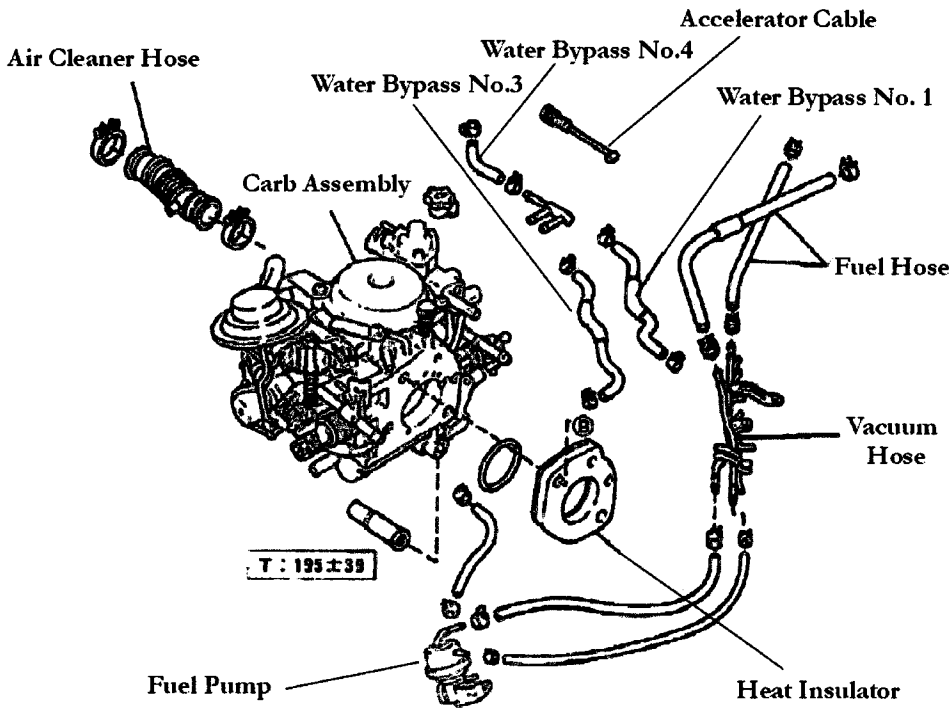
Fuel System

- Carburetor Assembly
- Carburetor Removal & Replacement
- Carburetor Setting and CO HC Levels
- Carburetor Component Diagram
- Fuel Filter & Part Numbers
- Fuel Tank & Components (Truck) Base Carbureted
- Fuel Tank & Components (Van) Base Carbureted
- EFI Fuel Injection
- EFI Fuel Injection Components & Parts Location
- Engine Control Computer Connector Pin Guide
- Fuel Pump: Mechanical (Head Type), & Electric (Body or Tank)
- Fuel Lines EFNS (Truck)
- Fuel Lines: EFES
- Fuel Lines: Turbo-Vehicle
- Fuel Lines: EFNS (Van)
- Fuel Lines: EFES (Van) Fuel Injected

Fuel System

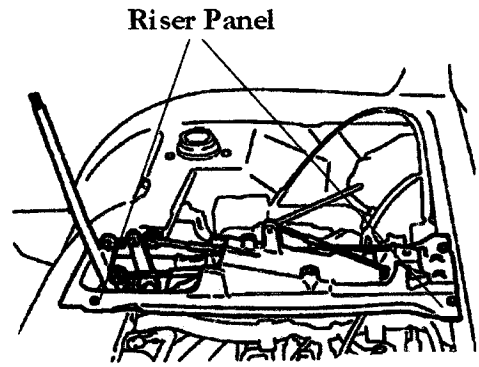
Carburetor Assembly

EF-NS Van & Truck

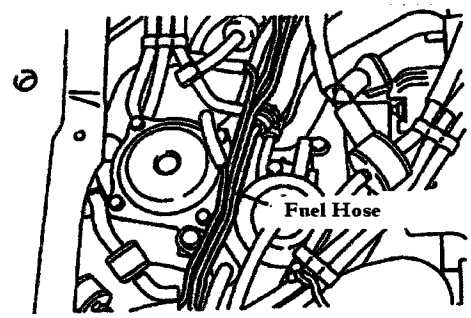


Fuel Pump Part Number
EF-NS, EF-GS S100-S110-S120
Mechanical Part# 90041-79052-000

1. Remove Front Seats and Remove Center Riser Panel (Between Seats)

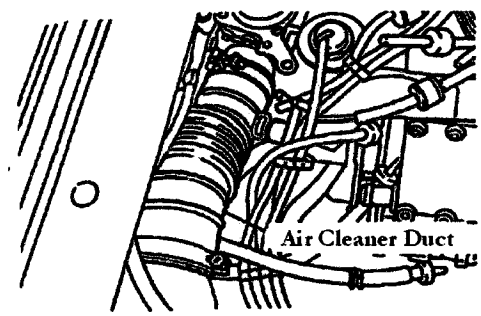


2. Disconnect Fuel Hose Line and Vacuum Conections

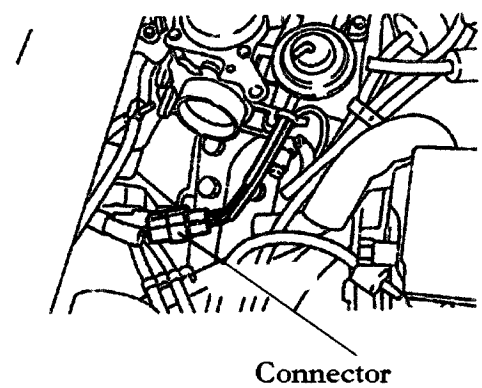


3. Disconnect Air Cleaner Duct Hose

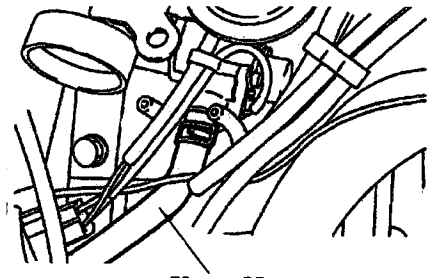
Note: Check Duct Hose For Cracks or Holes Replace if Damaged



4. Carefully Disconnect Electrical Connector

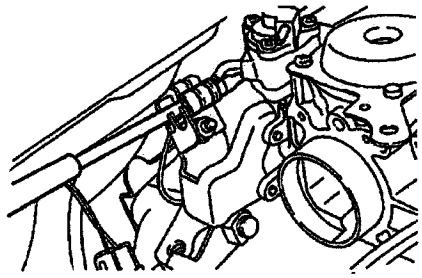


4. Connect Fuel Vapor Hose

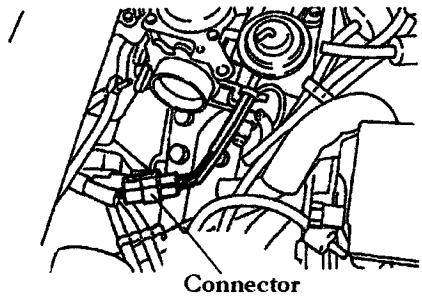


5. Attach Accelerator Cable

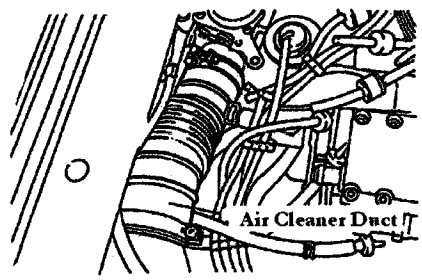
Note: Cable Free Play (Engagement): 1~4mm



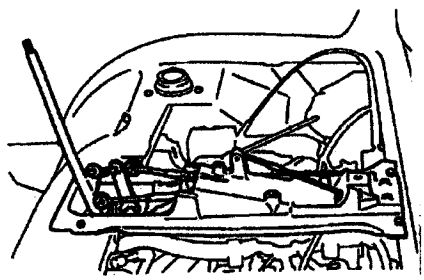
6. Attach Electrical Connector



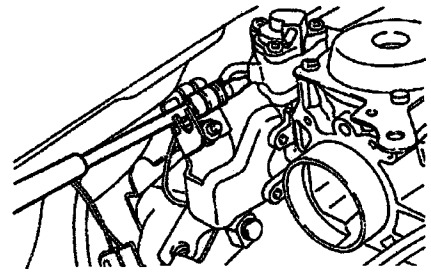
7. Attach Air Cleaner Duct Hose
8. Attach Vacuum Hoses and Fuel Line



9. Assemble Seat Riser Center Member
10. Assemble Remaining Components

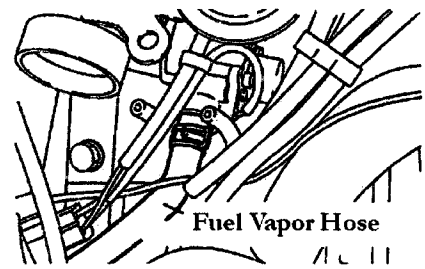


5. Disconnect Accelerator Cable From Carburetor

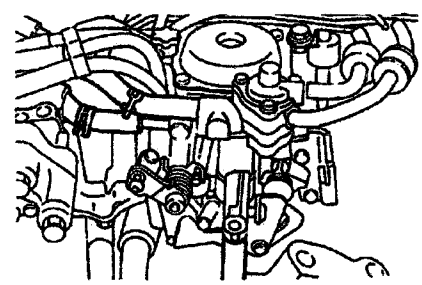


6. Disconnect Fuel Vapor Hose as in Diagram on Right

Note: Replace Hose if Cracked or Brittle



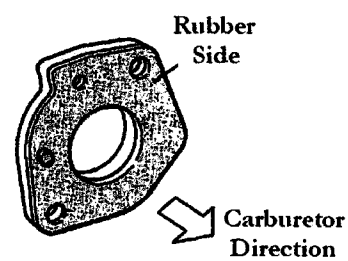
7. Disconnect The Following: Water Bypass Hoses, Mounting Bolts.
8. Remove Carburetor, Place Cover Over Intake Opening.



Installation

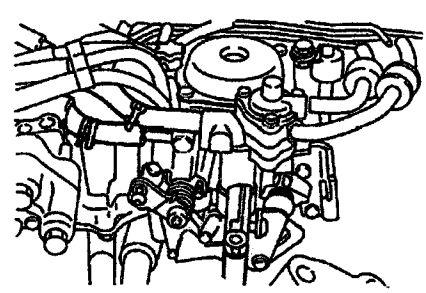
1. Clean All Surfaces

Note: Intake Manifold To Carburetor Gasket Rubber Side to Carb Side

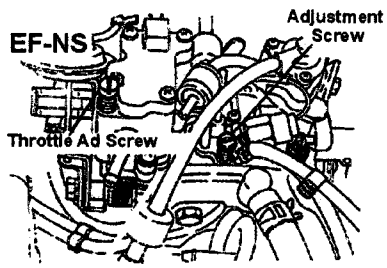


2. Attach Carburetor Assembly Torque Lock Nuts T:195+-39kg.cm

3. Attach Water Bypass Hoses



EF-NS
To Set Idle Adjustment The Idle Adjustment Srew Must Be Turned In Either Direction

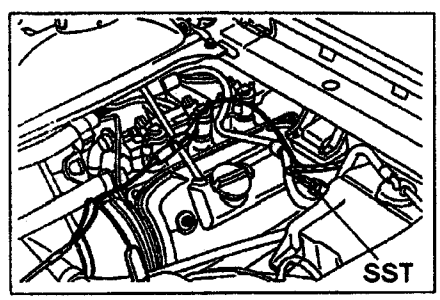


EF-ES

EF-ES Series Engines Idle System is Computer Controled

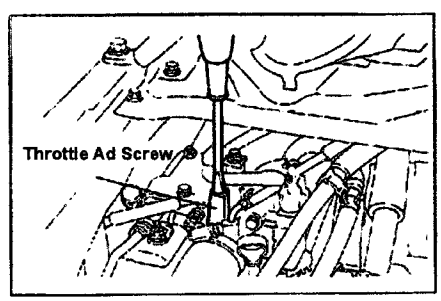
James Note: Idle Curcuit Trouble is 99% of the Time the ISC Valve ISC is Connected to ECU (Rotary ISC) (RSO & RSC Connection)

EF-TS
EF-TS Series
Using a SST connector Pn#09991-87604-000 attach tachometer.
Set Idle to 900+-50 RPM



CO-HC Levels

EF-NS (Use Mixture Screw to Adjust)
Idle CO-HC Level
CO 1.5+-1.0% to -0.5%
HC 900 PPM (Parts Per Million) or Less

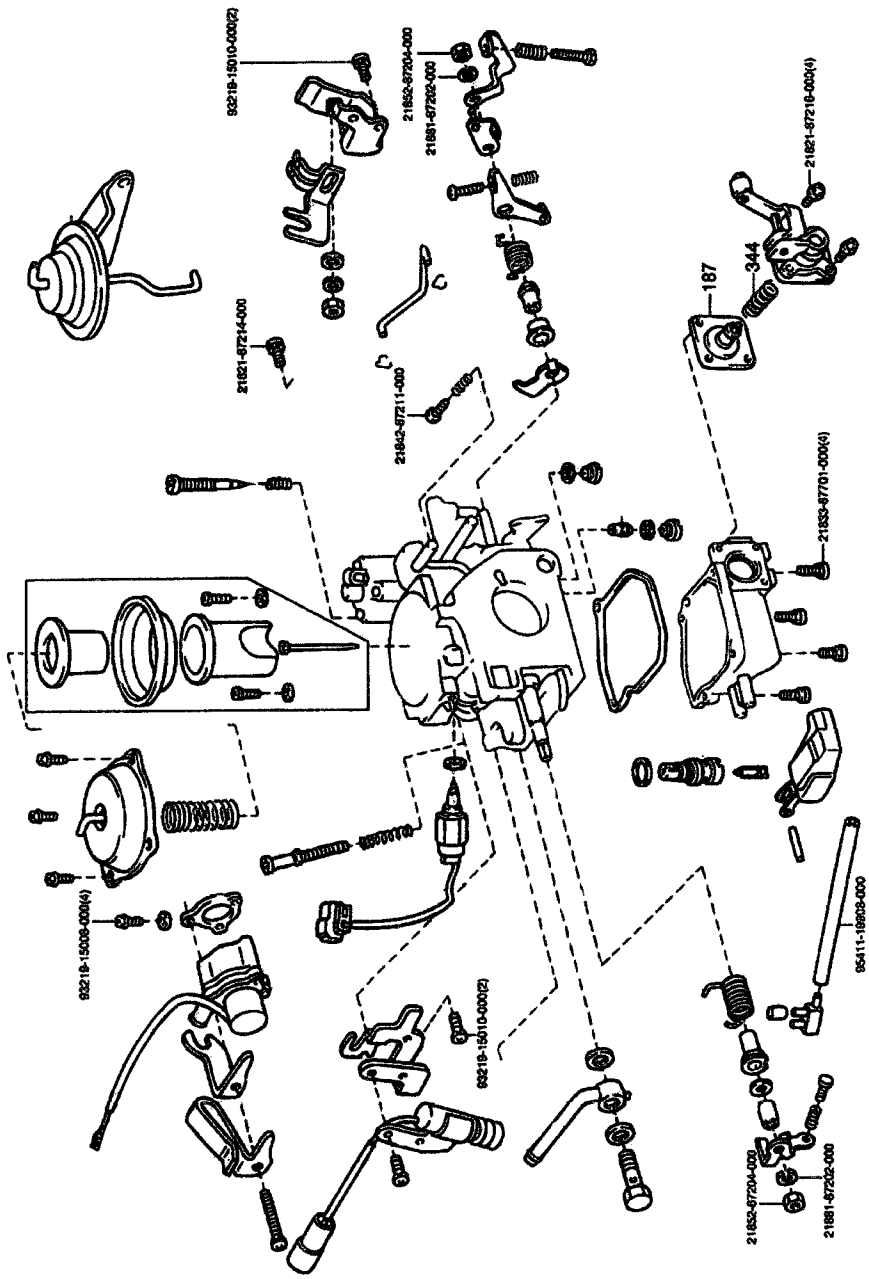


EF-ES & EF-TS
Idle CO-HC Level
Co 1.5+-1.0% to -0.5%
HC Below 900 PPM

SST=Service Support Tool

Fuel System

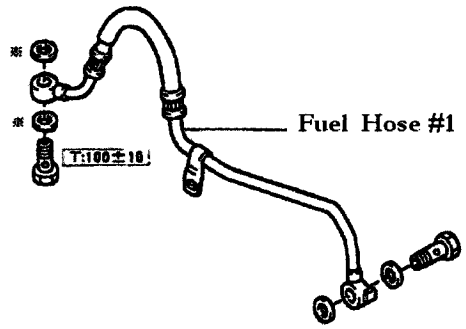
Carburetor Component Diagram

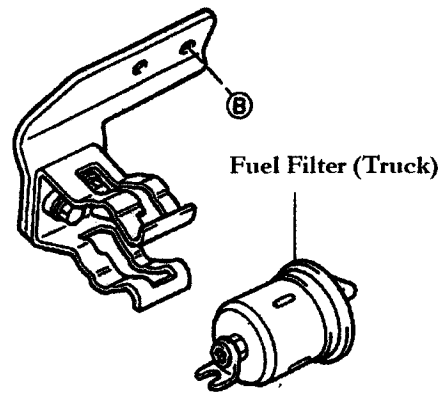


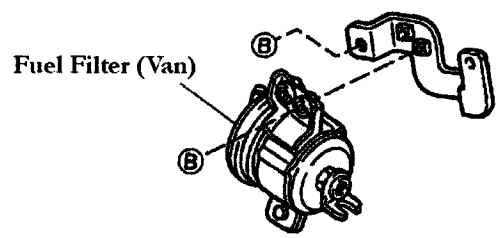
Fuel System

Fuel Filter

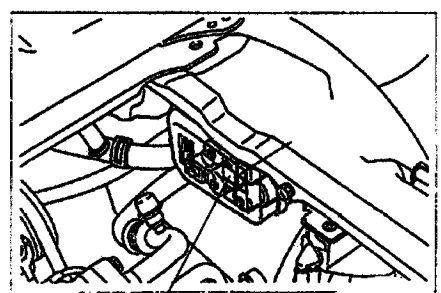
Fuel Pump Part Number
EF-NS, EF-GS S100-S110-S120
Mechanical Part# 90041-79052-000



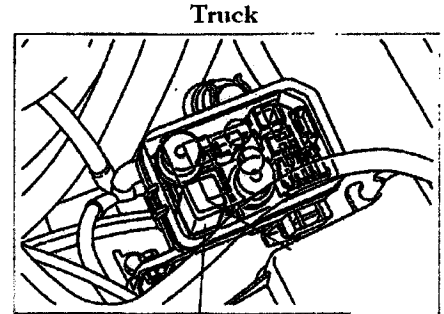




Fuel Pump Relay Location
Van



Fuel Pump Relay Location
Truck

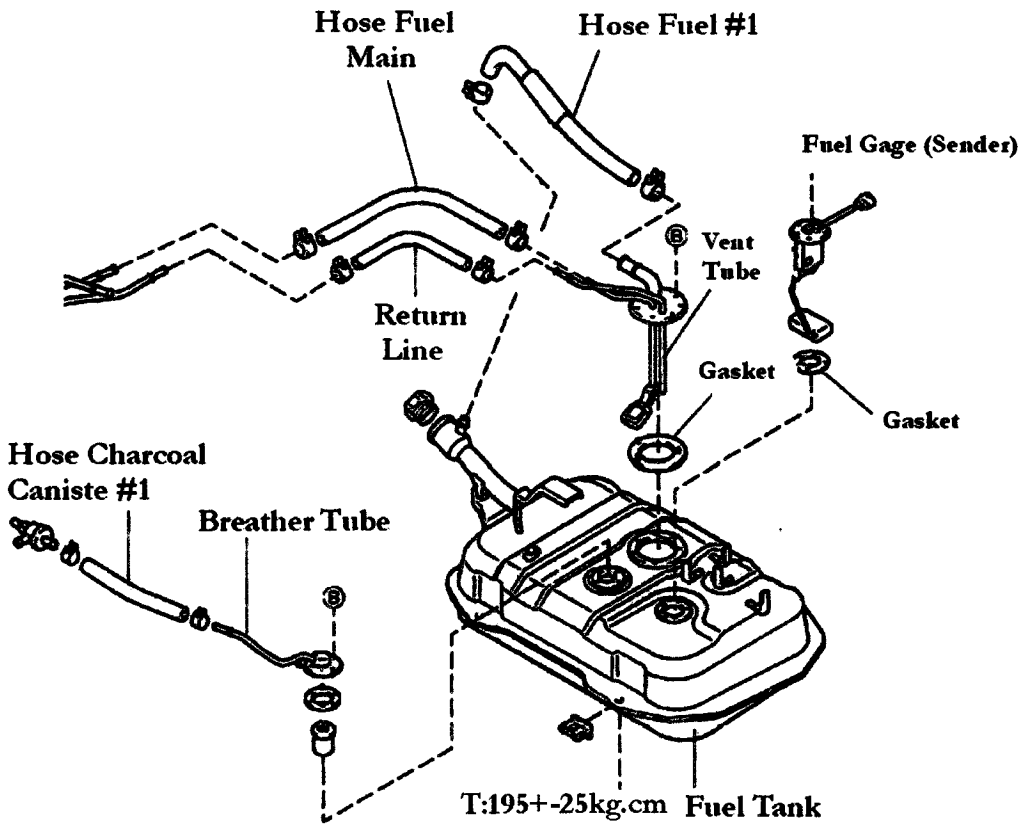


Note: Alway Remove Fuel Relay When Changing Fuel Filter (FI Engines)
Note: Fuel Pumps Ohm Reating 0.2~3.0 Ohm

Fuel Filter Part Numbers

EF-ES, EF-TS, S100-S110-S120-S130 Part# 23300-87508-000
EF-ES, S100-S110-(Truck) Part# 23300-87509-000
EF-NS, EF-GS, S100-S110-S120-S130 (Truck) Part# 23300-87502-000
EF-NS (Van) Part# 23300-87510-000

Fuel Tank EF-NS-EF-ES (Truck)

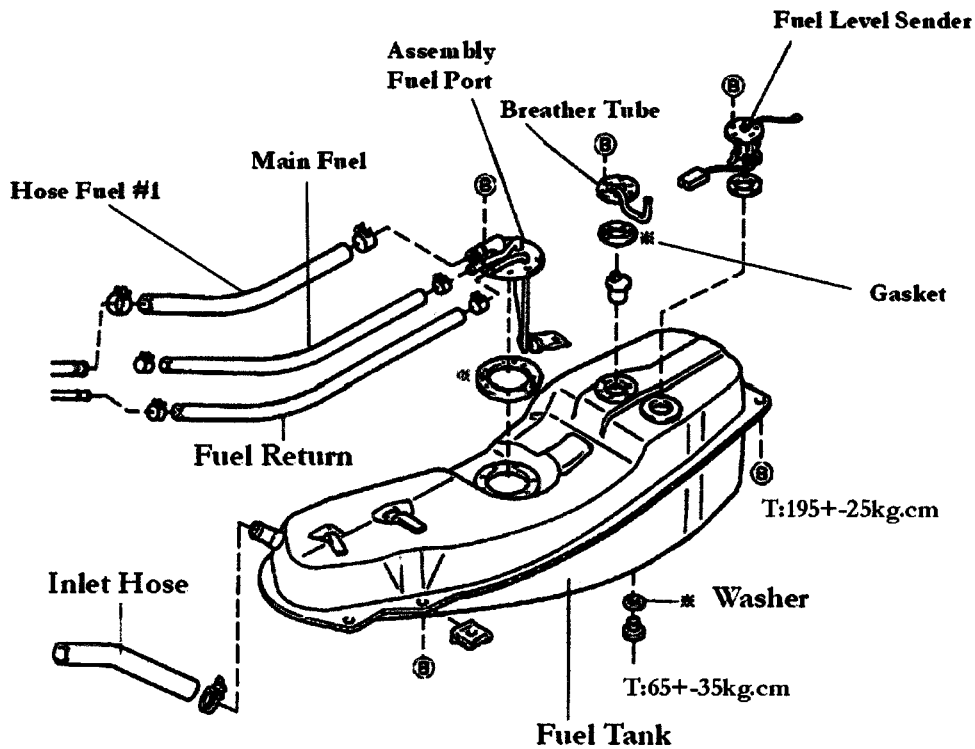


Torque=(kg.cm)

Fuel Tank Components EF-NS - EF-ES - EF-TS (Van)

Torque=(kg.cm)

Note: *=Parts Not Re-usable

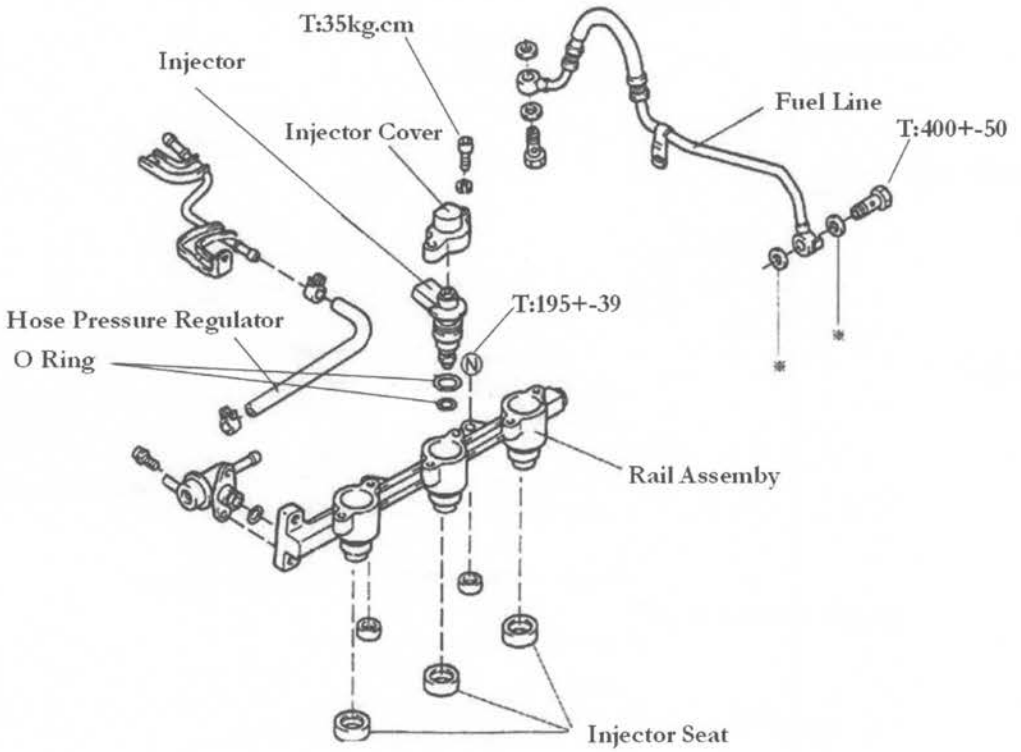


Fuel System

Fuel Injection

Torque: T=kg.cm

Note: *=Must Be Replaced if Dissasembled



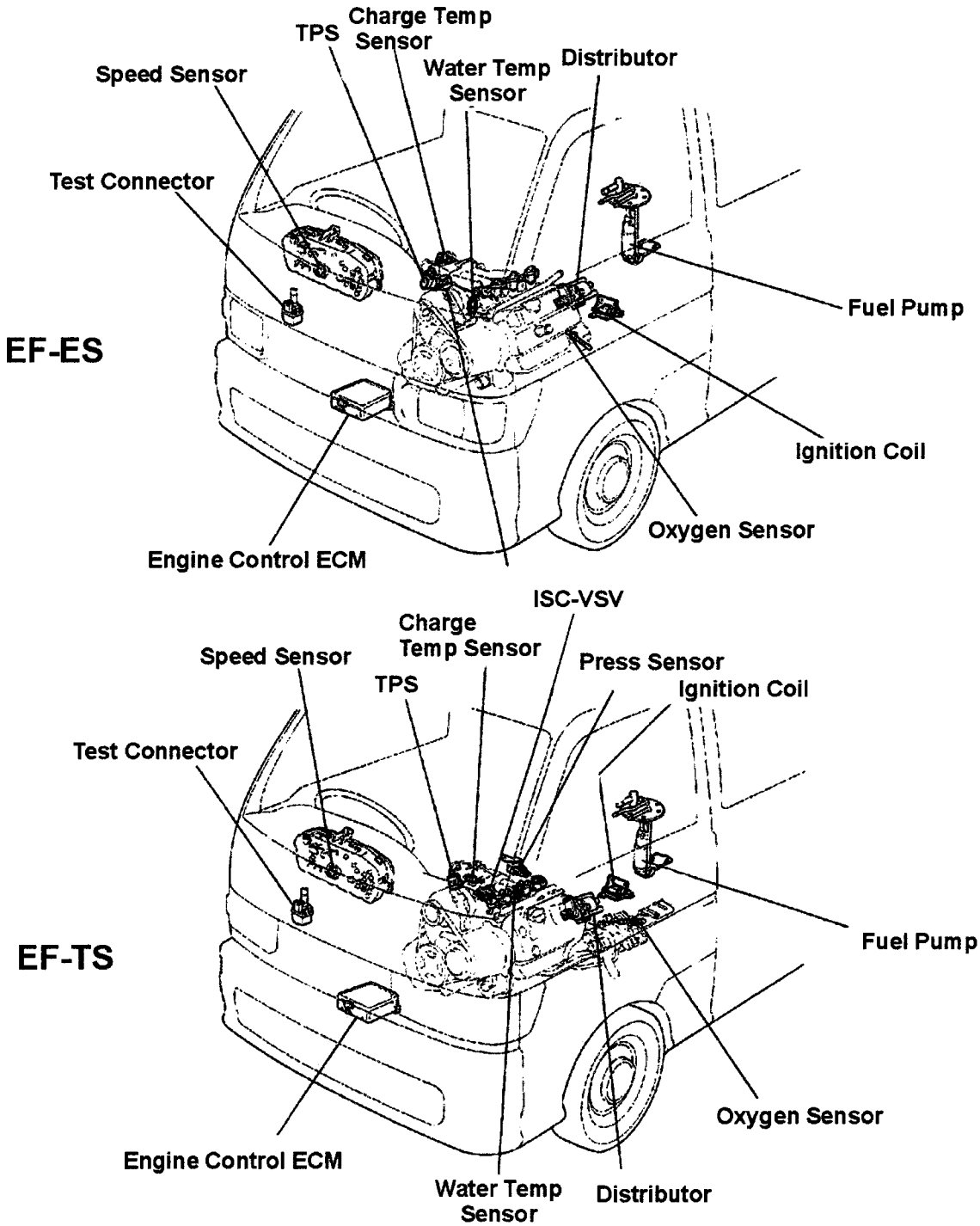
Note: Fuel Injection System Is Controlled by The On-Board Computer. The Special Adapter Cable Listed Below is Required to Check System Funtions.

Engine Control Adapter
Harnes
PN#09991-87705-000

This Adapter Can Also Bypass Fuel Pump Circuit. The Unit Connects Under Drivers Side Steering Wheel Panel

Mechanics Note: 90% of EFI Problems are "Dead Injectors" or Air Leaks. Use a Stethoscope and Listen if Injector is Operating or Not. If Not Check Connetor for Signal or Not. Also Spray a Bit of Carburetor Cleaner Near Injectors and Notice For Idle Speed Change. If Idle Increases or Decreases An Air or Vacuum Leak Has Been Detected. No Injectors Are Operating Change Computer.

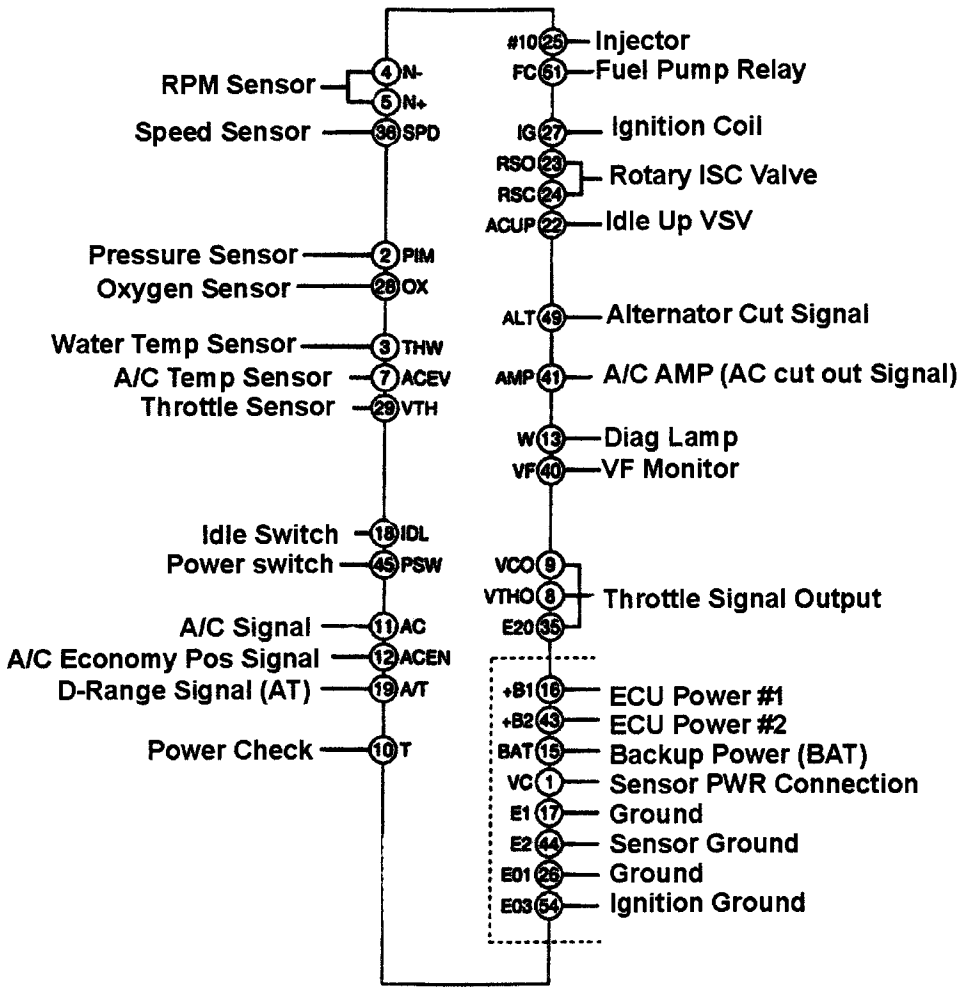
Fuel Injection Component Location

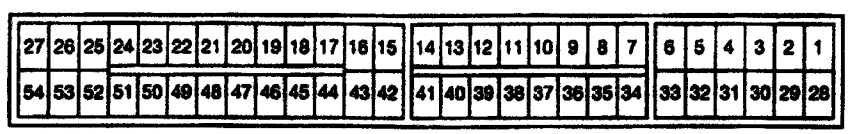


Note: Do Not Confuse Oxegen Sensor With Exhaust Temp Sensor

Engine Control Computer
Fuel Injection

EF-ES



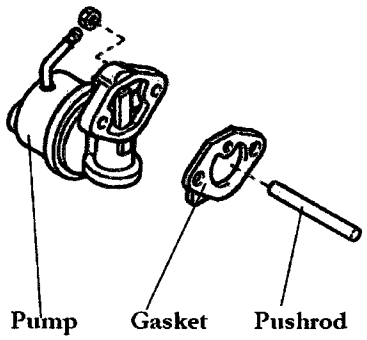


ECU Computer
Connector Pin Guide

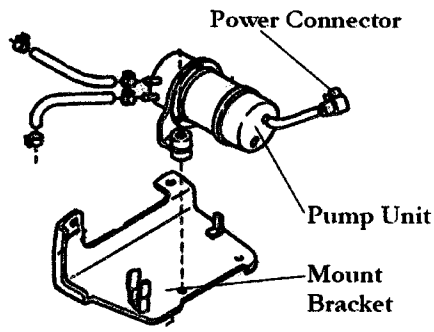
Fuel System

Fuel Pump

EFNS EFGS Mechanical Fuel Pump
(Cylinder Head Mount)

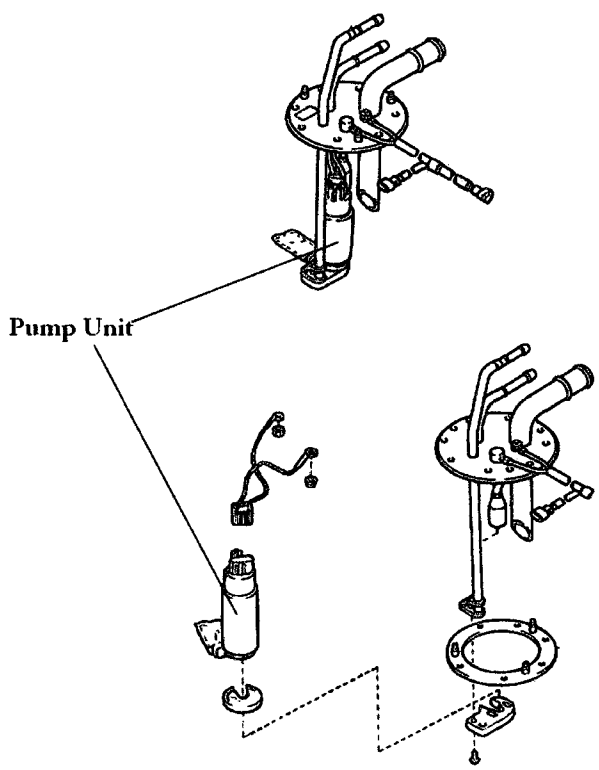


EFGS Electric Fuel Pump
(Body Mount)



Tank Mount Fuel Pump

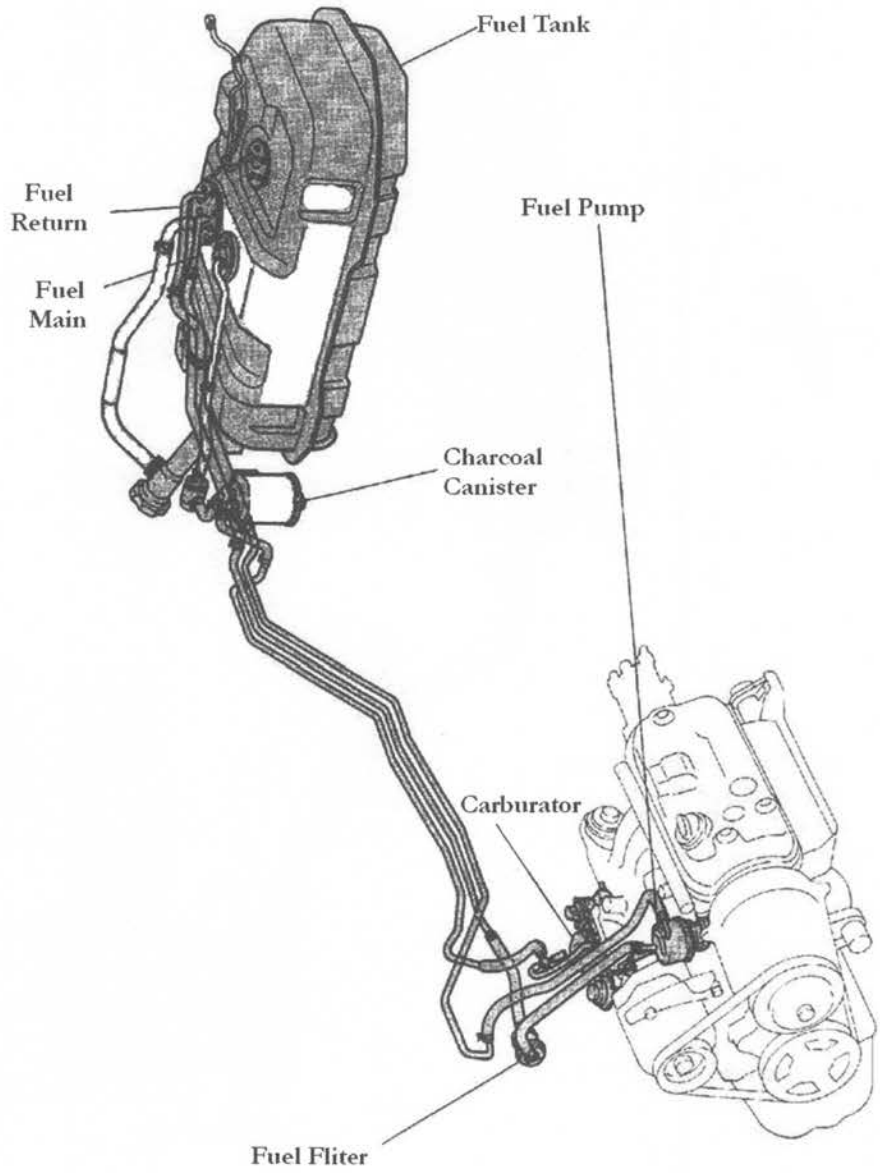
EFES-EFTS-EFZS-EFRS



Note: See Following Pages For Vehicle Specific Tank Mount Location

Fuel Lines Diagram EF-NS

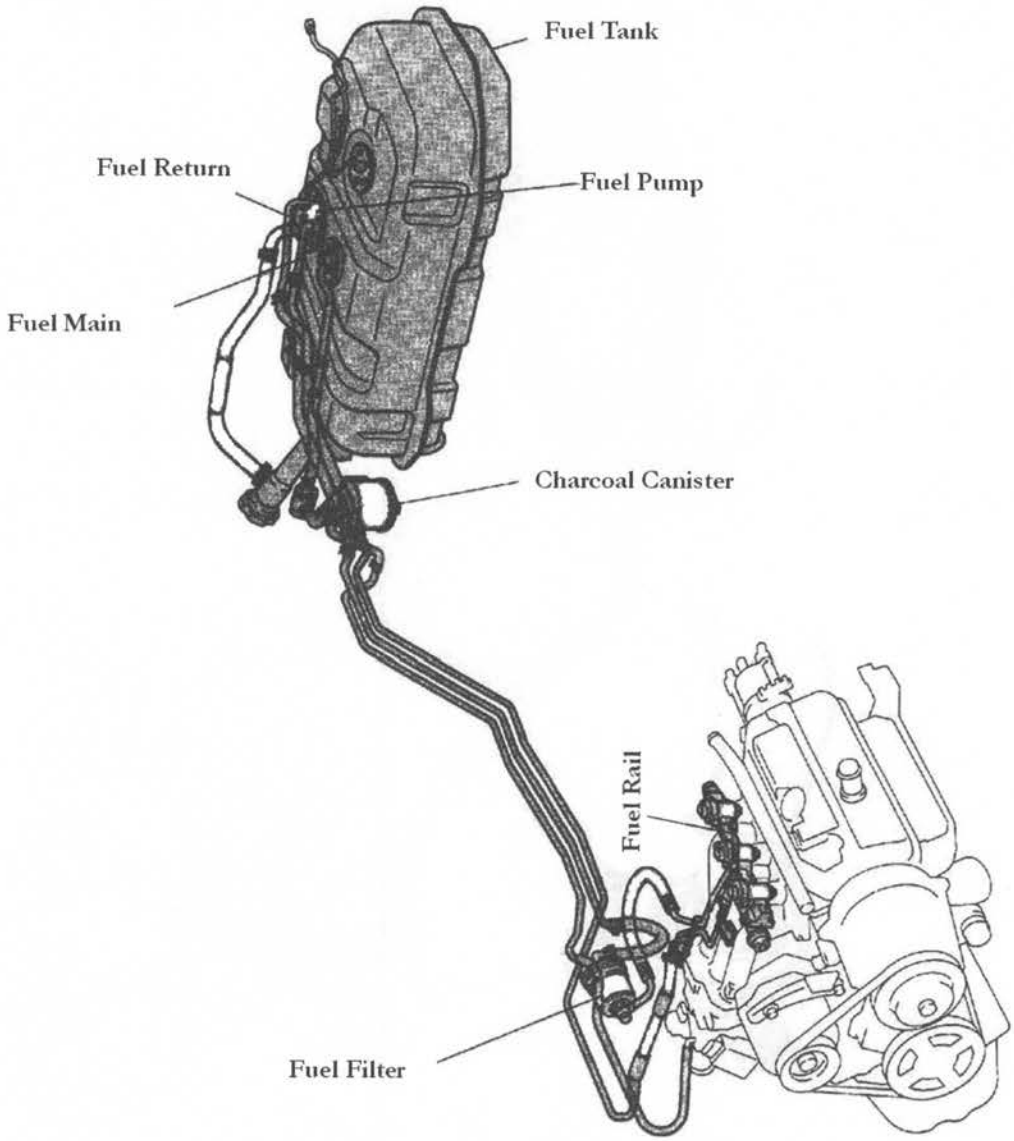
Truck



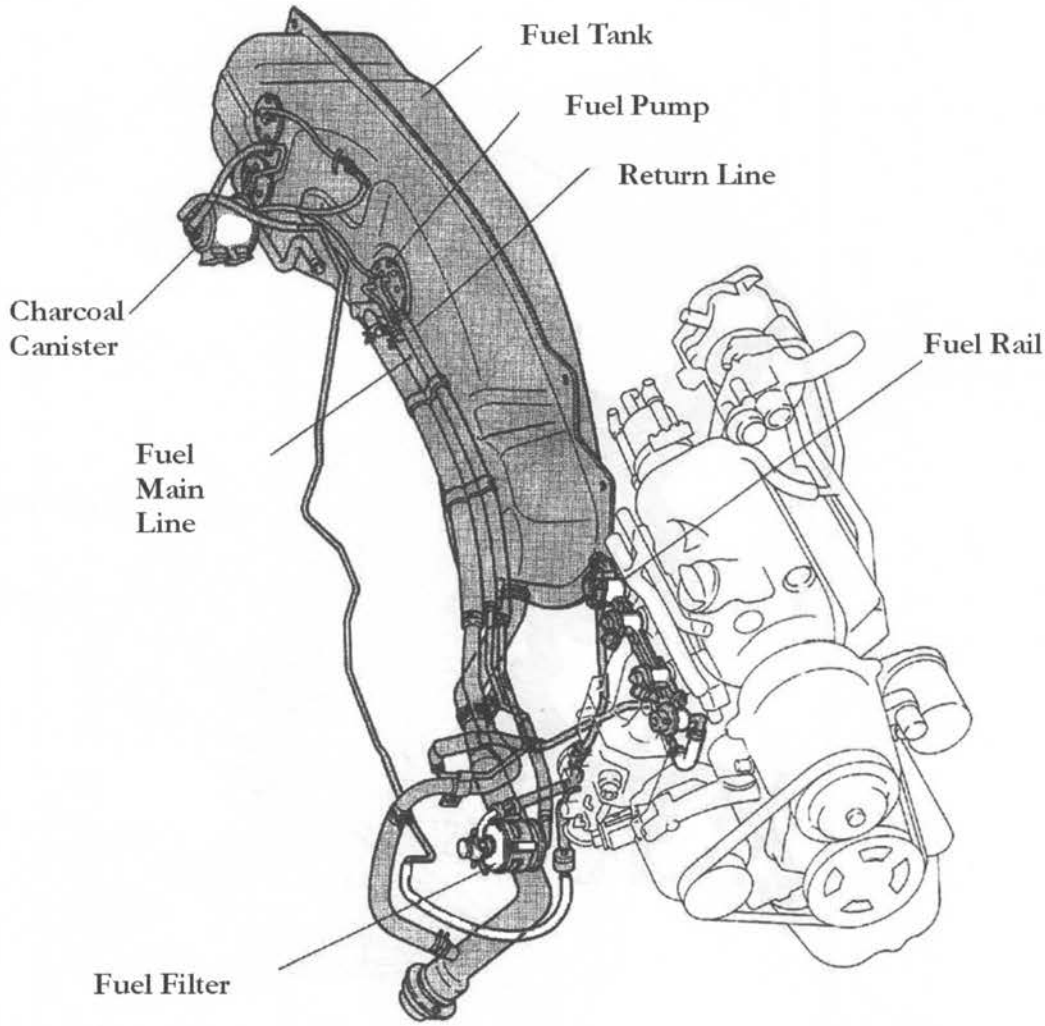
Fuel Line Diagram EF-ES

Fuel Injected Vehicle

Truck

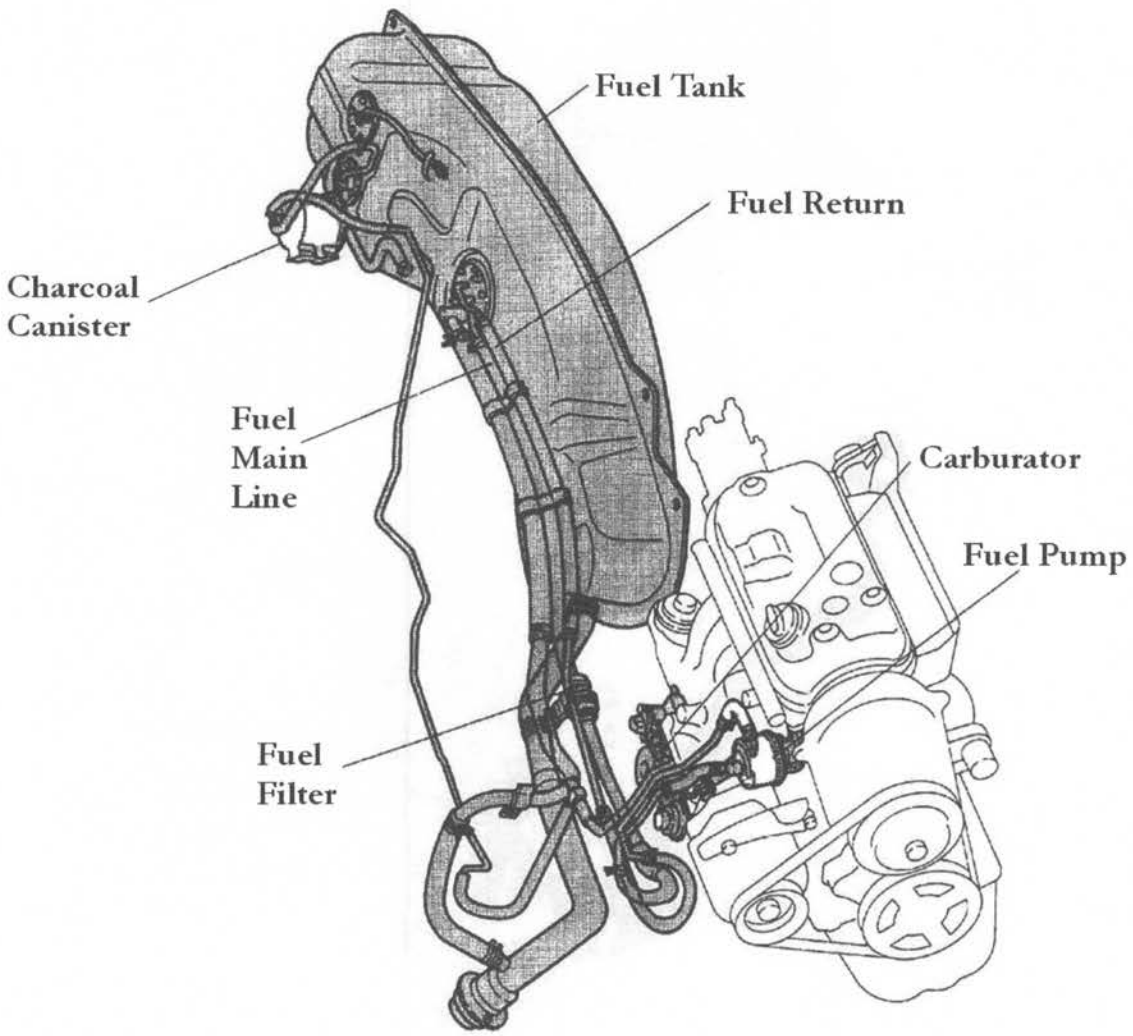


Fuel Injected Vehicle



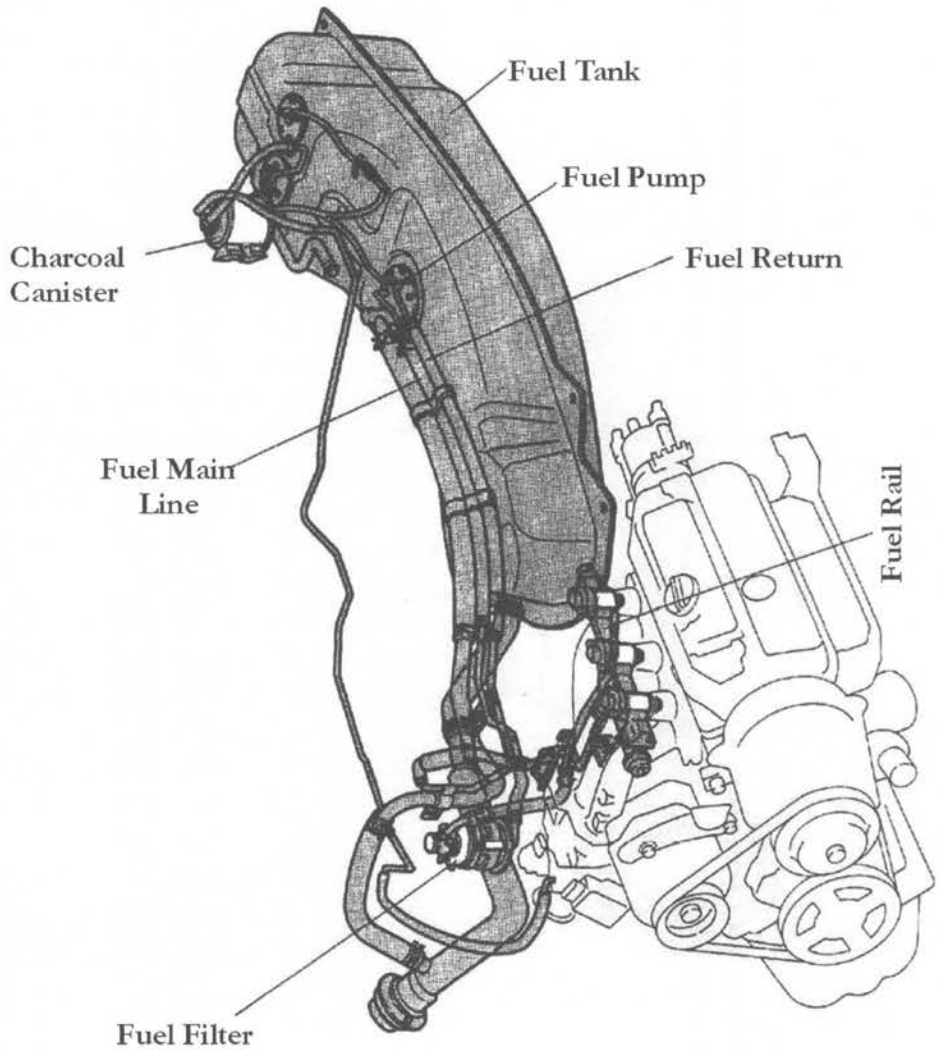
Fuel Lines Diagram EF-NS

Carbureted Van



Fuel Lines Diagram EF-ES

Fuel Injected Van



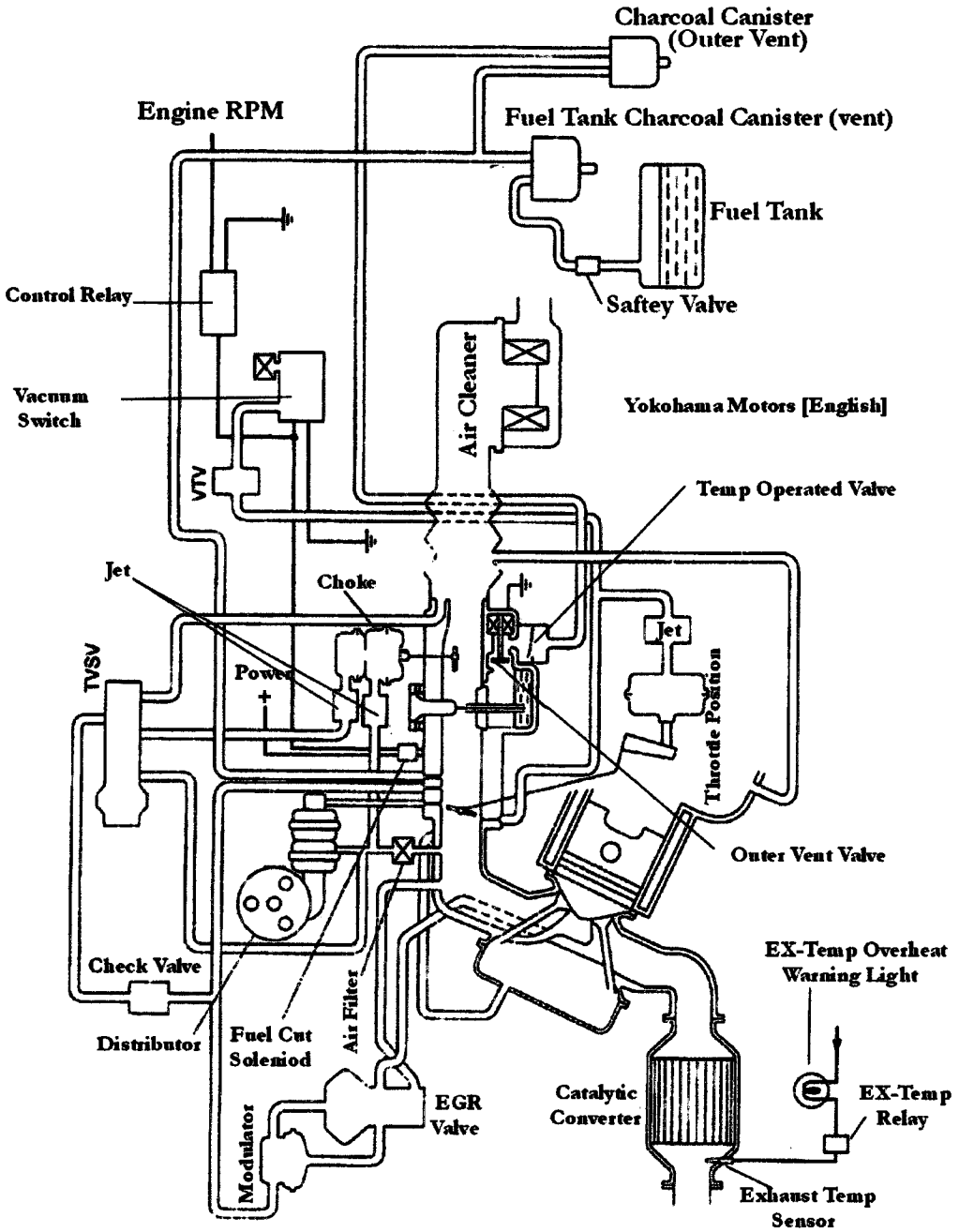
Chapter 10

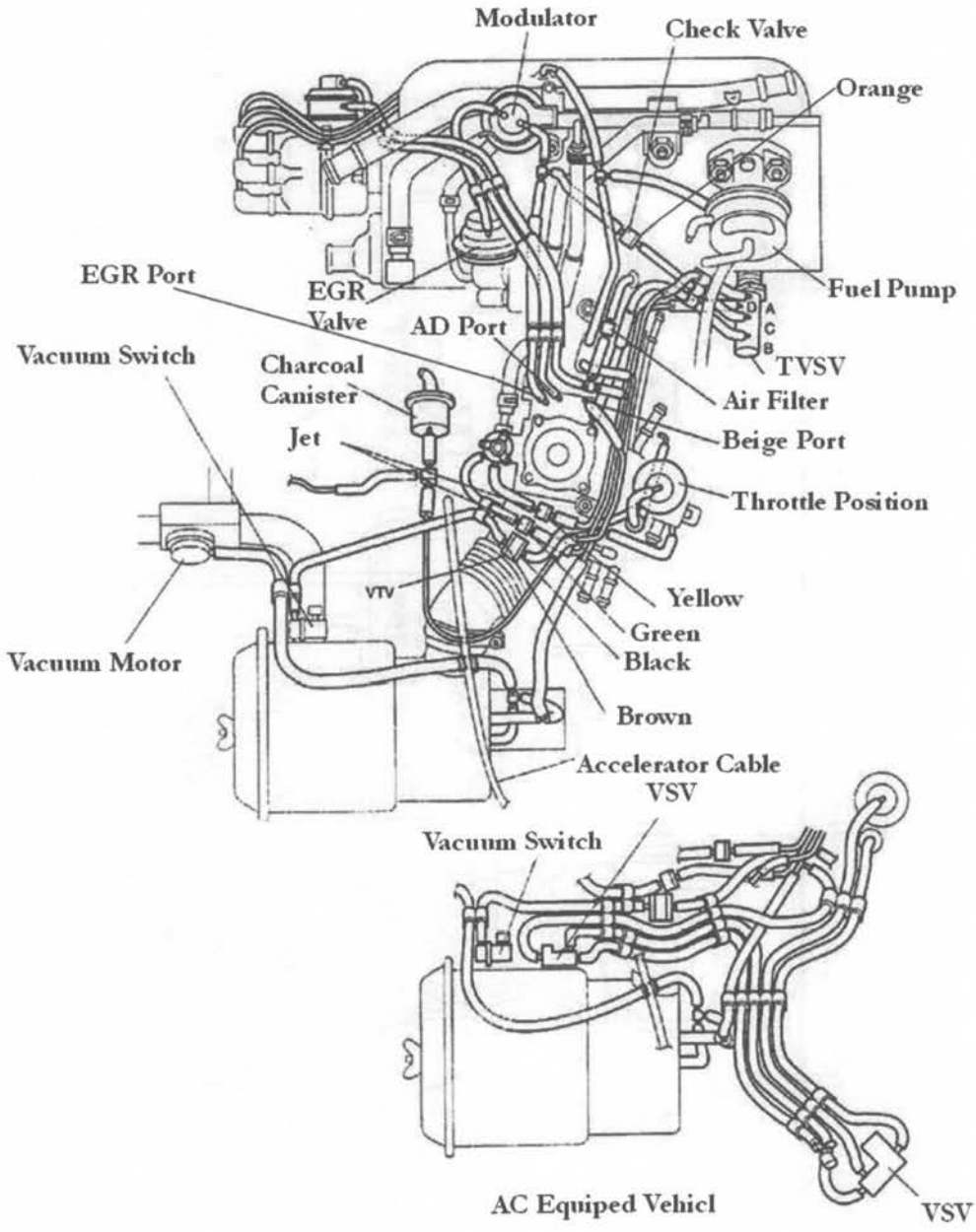
Emission Control & Vacuum System

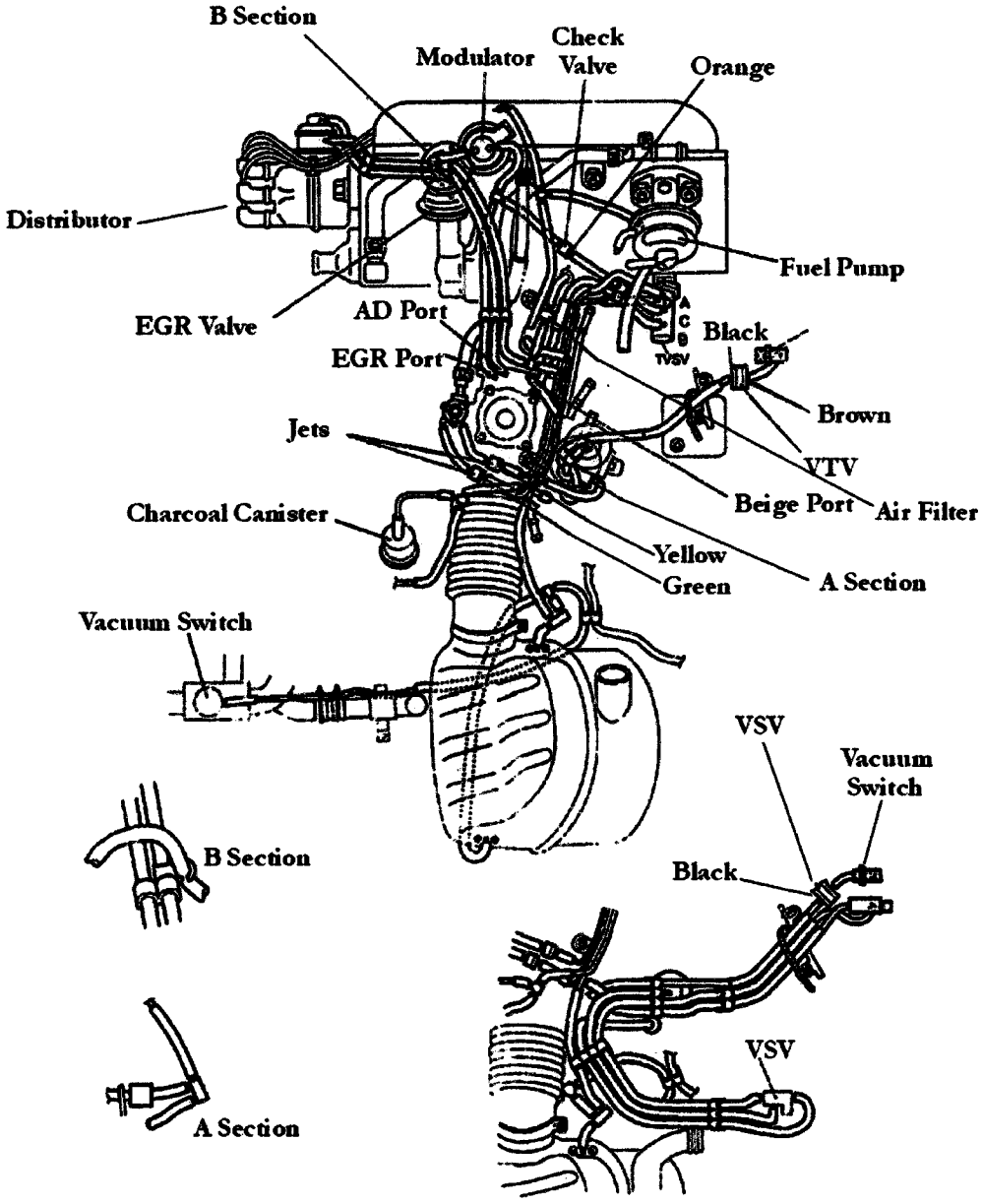
- EFNS Series Vehicles
- EFNS Truck
- EFNS Van
- EFES Series Vehicles
- EFES Truck
- EFES Van
- Others

Emission Control

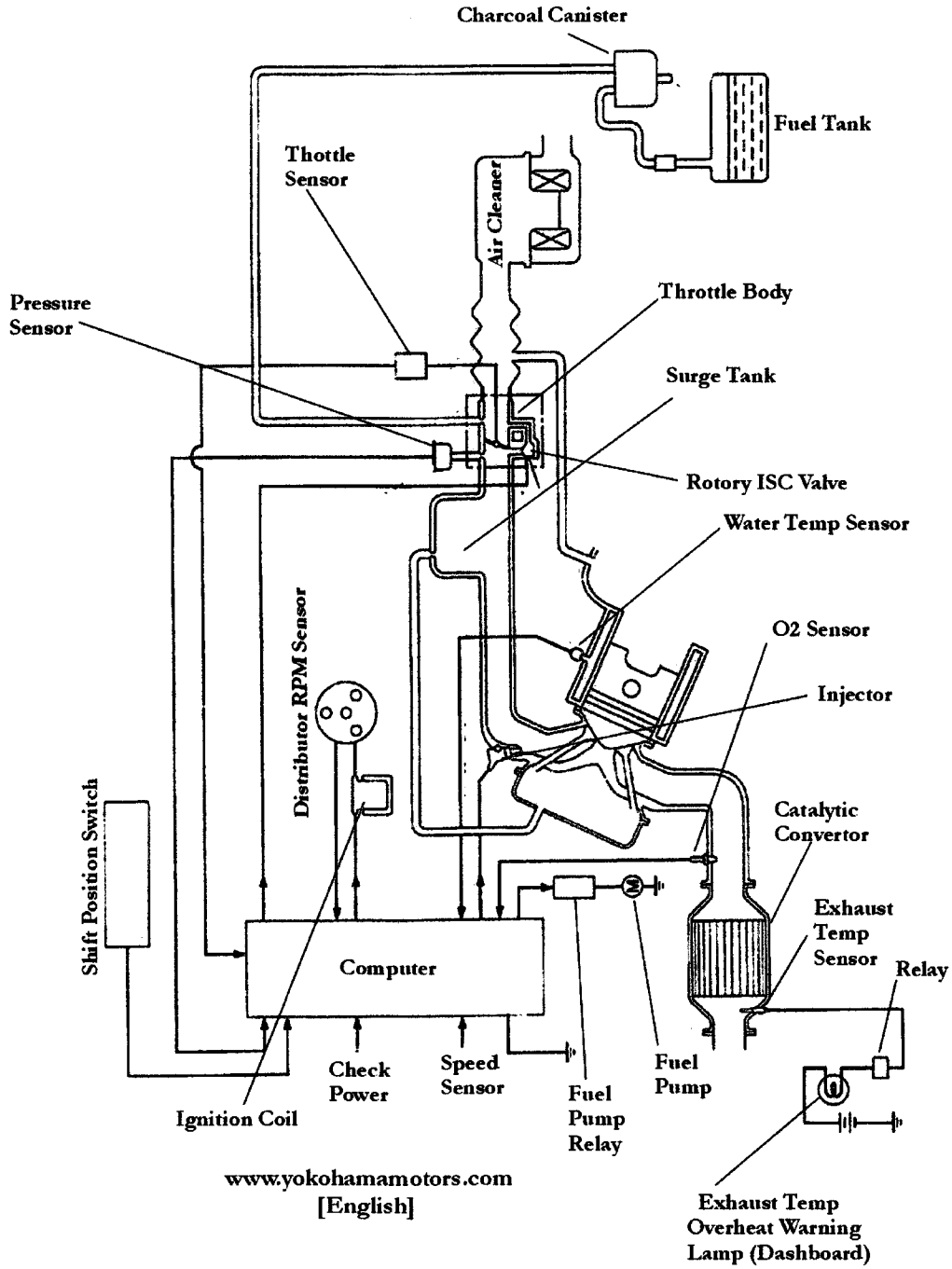
EF-NS Series Diagram

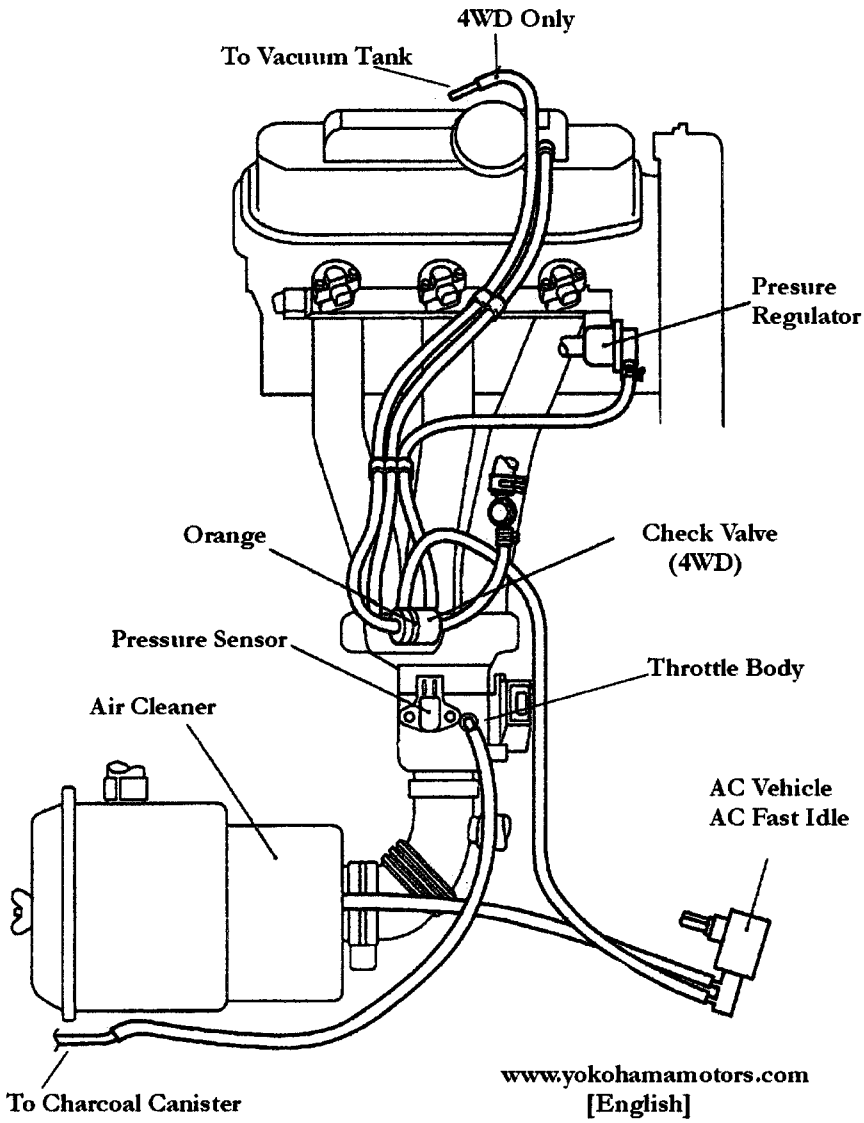


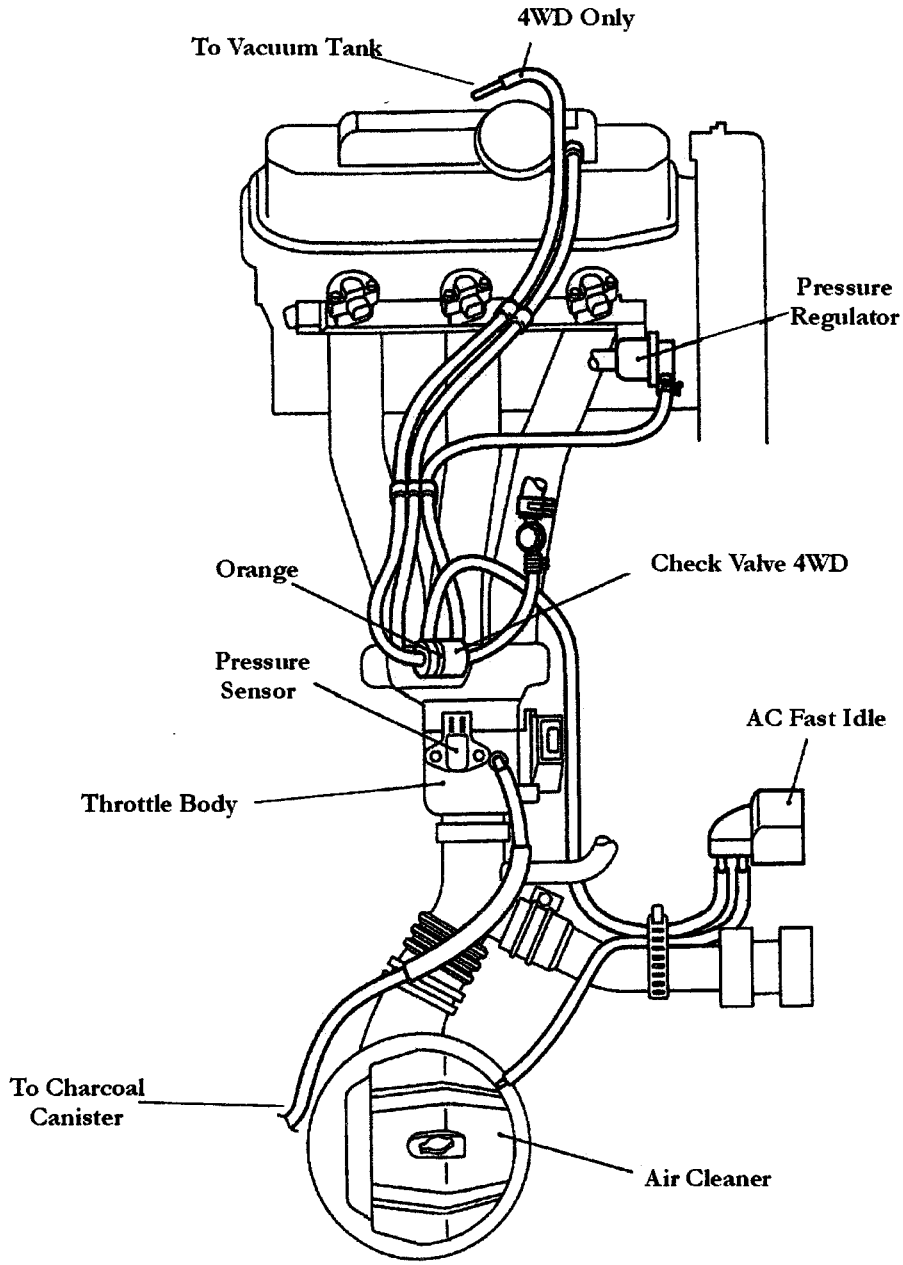

Modulator
Check Valve
Orange
Fuel Pump
EGR Port
EGR Valve
AD Port
TVSV
Vacuum Switch
Charcoal Canister
Air Filter
Jet
Beige Port
Throttle Position
VTV
Yellow
Green
Black
Brown
Vacuum Motor
Accelerator Cable
VSV
Vacuum Switch
AC Equiped Vehicl
VSV

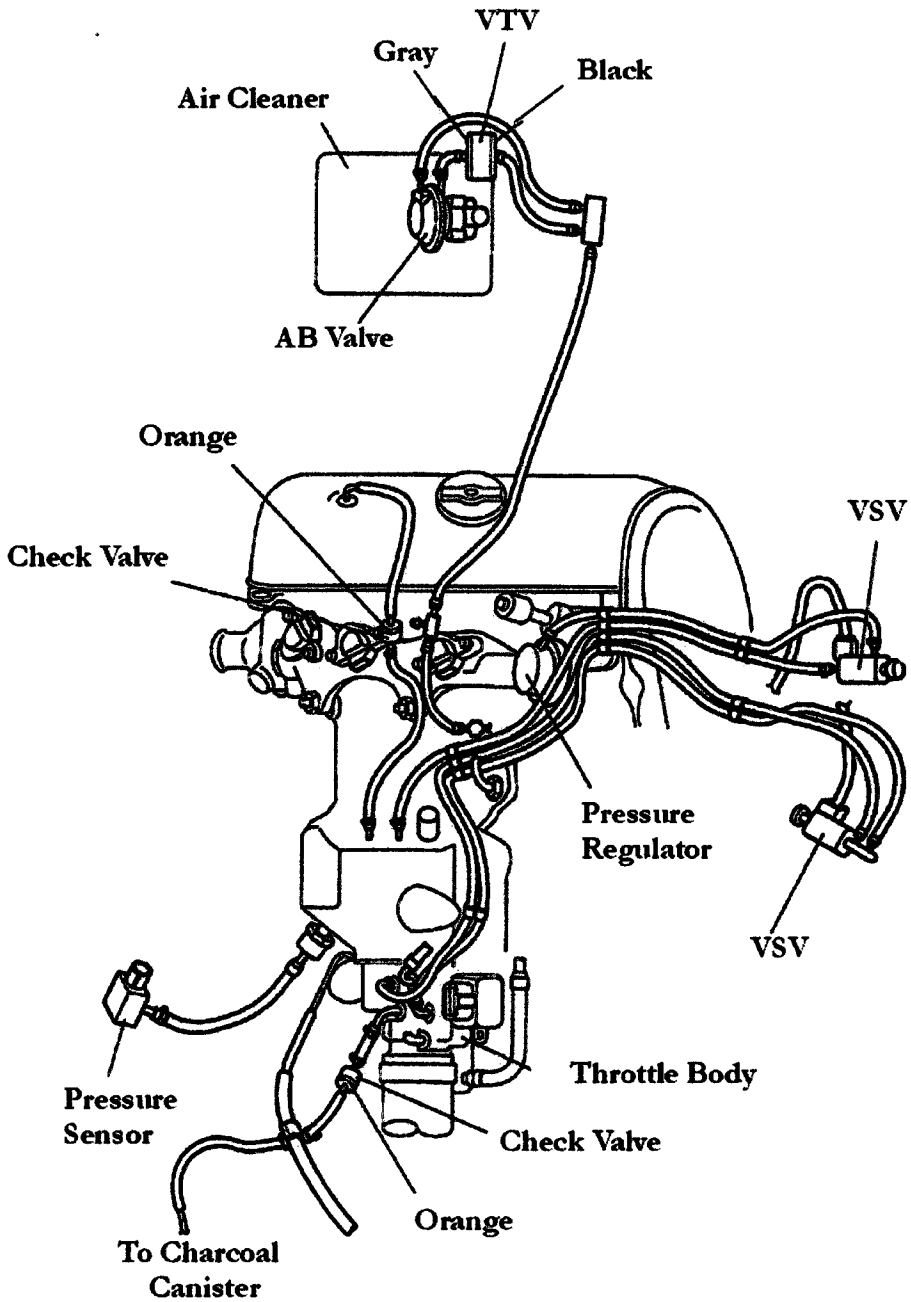


AC Equiped Vehicle


Charcoal Canister
Fuel Tank
Thottle Sensor
Air Cleaner
Pressure Sensor
Throttle Body
Surge Tank
Rotory ISC Valve
Water Temp Sensor
O2 Sensor
Injector
Distributor RPM Sensor
Shift Position Switch
Catalytic Convertor
Exhaust Temp Sensor
Relay
Computer
Check Power
Speed Sensor
Fuel Pump Relay
Fuel Pump
Ignition Coil
www.yokohamamotors.com
[English]
Exhaust Temp Overheat Warning Lamp (Dashboard)


4WD Only
To Vacuum Tank
Presure
Regulator
Orange
Check Valve
(4WD)
Pressure Sensor
Throttle Body
Air Cleaner
AC Vehicle
AC Fast Idle
To Charcoal Canister
www.yokohamamotors.com
[English]


4WD Only
To Vacuum Tank
Pressure
Regulator
Orange
Check Valve 4WD
Pressure
Sensor
AC Fast Idle
Throttle Body
To Charcoal
Canister
Air Cleaner


VTV
Gray
Black
Air Cleaner
AB Valve
Orange
Check Valve
VSV
Pressure
Regulator
VSV
Throttle Body
Pressure
Sensor
Check Valve
Orange
To Charcoal
Canister

Chapter 11

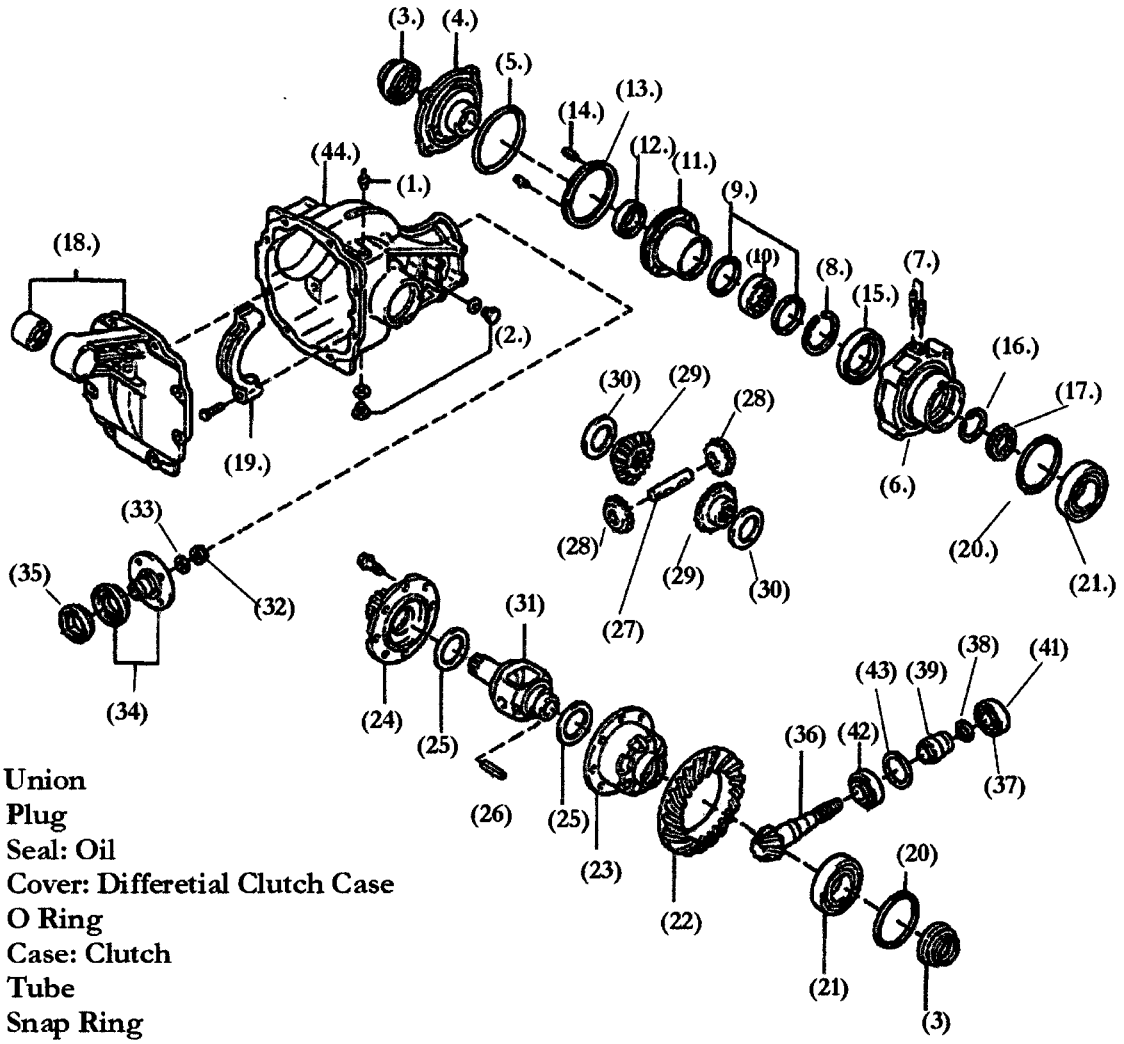
2WD-4WD

Differentials-Driveshaft(s)-Axels

- Front Differential Components 4WD
- Front Differential Oil Seal Replacement
- Front Differential Mounting System
- Rear Differential Identification and Axel Codes
- Standard Rear Differential Components
- Rear Differential With Diff-Lock Option
- Rear Differential Front Oil Seal Replacement
- Rear Diff-Lock Actuator Removal & Replacement
- Rear Diff-Lock Actuator Vacuum System
- Front Driveshaft Removal & Inspection
- Rear Driveshaft Removal & Inspection
- Rear Axel Removal Tools
- Rear Axel Removal
- Rear Axel Bearing & Oil Seal replacement
- Front Axel (CV Joint) Overhaul
- Driveshaft Parts
- Front Axel Hub Parts
- Front Axel Parts
- Rear Axel Parts

Differential

Front Differential Components 4WD

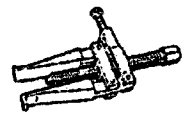


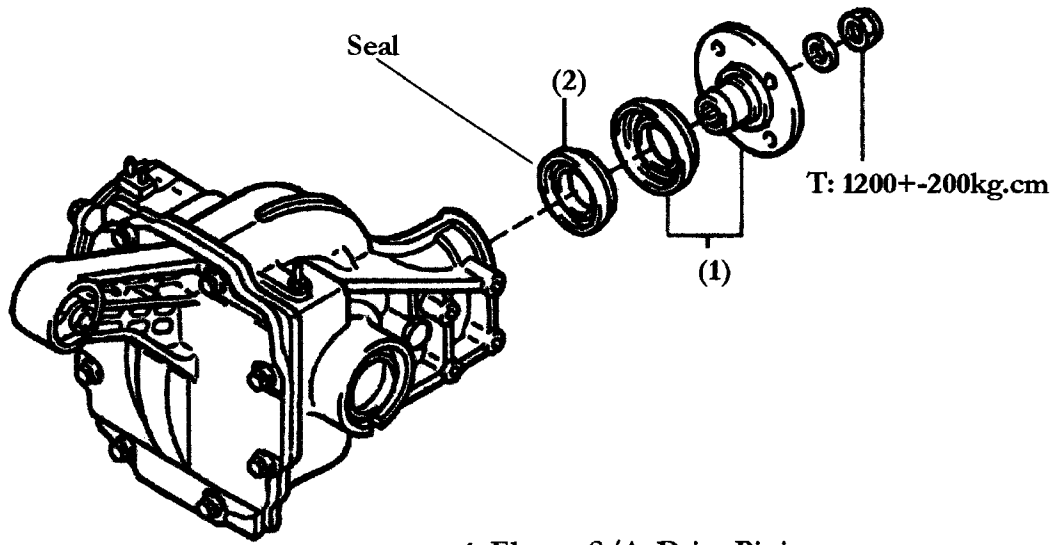
1. Union
2. Plug
3. Seal: Oil
4. Cover: Differetial Clutch Case
5. O Ring
6. Case: Clutch
7. Tube
8. Snap Ring
9. Thrust Washers
10. Sleeve: Clutch
11. Piston: Differential Lock Clutch
12. Seal: Oil Type S
13. O Ring
14. Pin: Sloted
15. Seal: Oil Type S
16. Snap Ring
17. Hub: Clutch
18. Front Diff Cover
19. Diff Bearing Cap
20. Shim
21. Bearing
22. Ring Gear
23. (LH) Case: Ring Gear Housing
24. (RH) Case: Ring Gear Housing
25. Thrust Washer
26. Sloted Pin
27. Shaft: Pinion
28. Shaft Gear
29. Side Gears
30. Thrust Washer
31. Case
32. Nut
33. Washer
34. Flange
35. Seal: Type T Oil
36. Pinion: Drive
37. Bearing
38. Shim
39. Spacer
40. Front Bearing
41. Outer Race
42. Outer Race
43. Shim
44. Differential Carrier

Differential

Front Differential Flange Oil Seal Replacement

Tools

Pinion Flange Holder		#09330-87301-000
Puller: Oil Seal		#09308-10010-000
Oil Seal Installer		#09635-20010-000

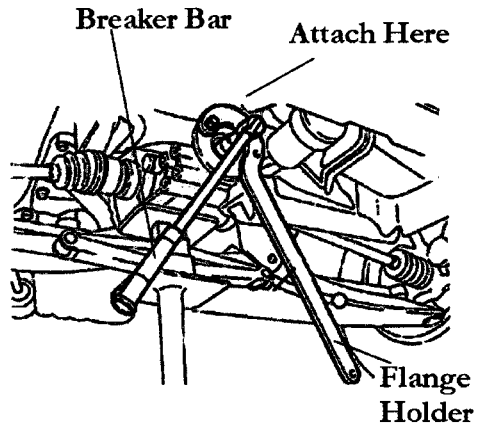


1. Flange S/A: Drive Pinion
2. Oil Seal: Type T

Differential

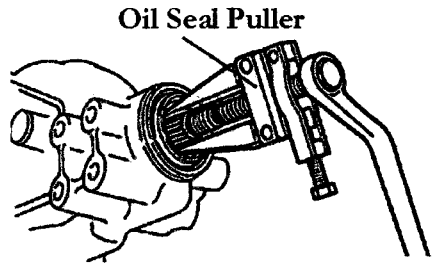
Front Differential Oil Seal Replacement

1. Lift Up Vehicle
2. Remove Drive Shaft



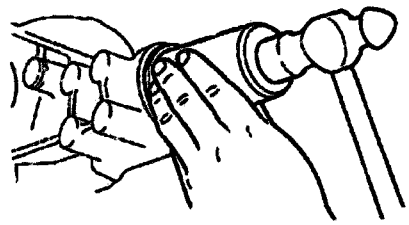
3. Attach Special Tool (Flange Holder) as in Diagram on Right. Hold onto Holder and Use Breaker Bar to Remove Attachment Nut

Note: Nut Must Be Replaced

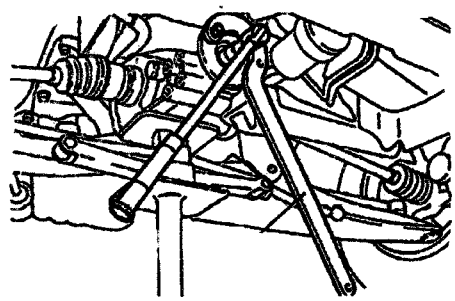


4. Use Oil Seal Puller as in Diagram to Right. Tool: **09308-10010-000**

5. Remove Oil Seal and Discard



6. Clean Surfaces and Coat With Long Life Chasiss Grease. Install New Seal. Use Oil Seal Installer Tool and Tap Into Place



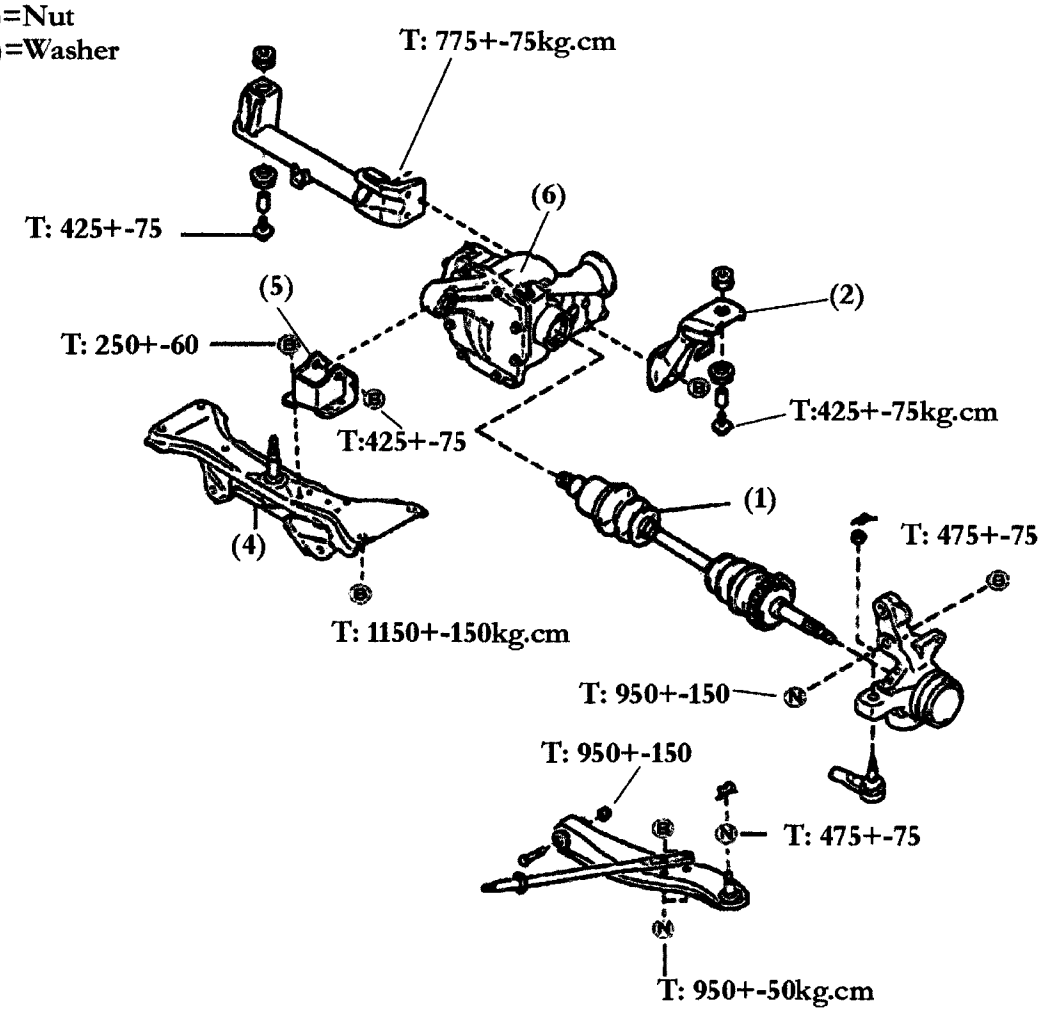
7. Use Holder Tool and Torque Wrench to Attach Nut

   Torque Specification: 1200+-200kg.cm

Differential

Front Differential Mouning Brackets

Torque: =kg.cm
(B)=Bolt
(N)=Nut
(W)=Washer

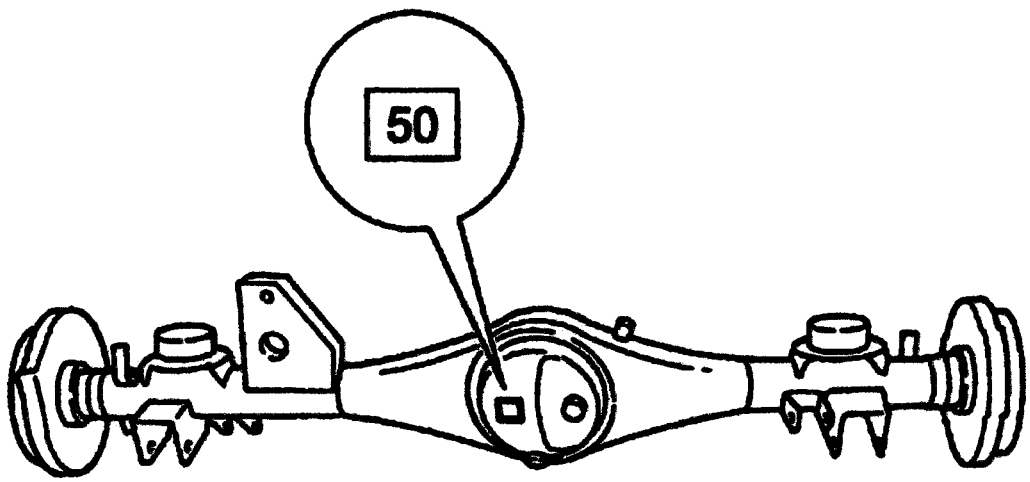


1. Front Drive Axel
2. Bracket: Differential Gear Support Rear Left
3. Bracket: Differential Gear Support Rear Right
4. Cross-member
5. Bracket: Front Differential Support
6. Carrier Assembly

Differential

Rear Axel Codes

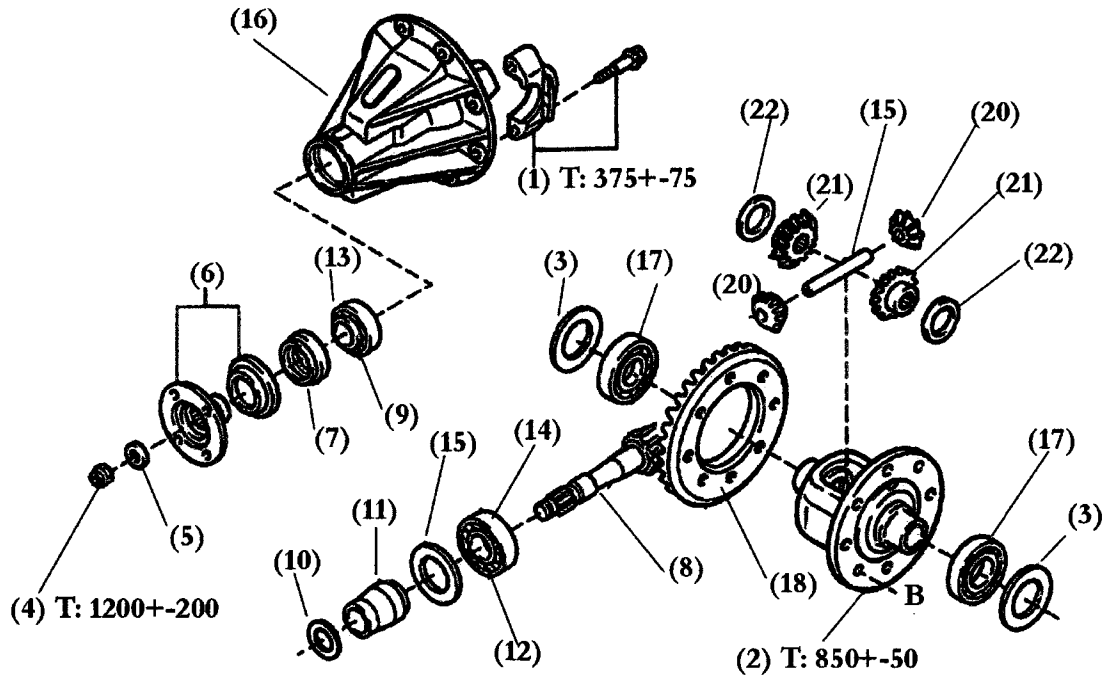
Example: 50=Ratio 5.571 S120V EFTS Series



Gear Ratio	Mark	Series
6.666	01-03	SP100P
6.285	05	SP100P/SP110P
6.666	09-11-13	SP110P
6.285	17	SV100
6.666	61-21-62	SV100V/S100V
6.285	29	EFES S120V
5.571	49-50-51-52	EFTS S120V
6.666	33-37	EFES
5.875	41~48, 53	S130V EFES EFTS

Differential

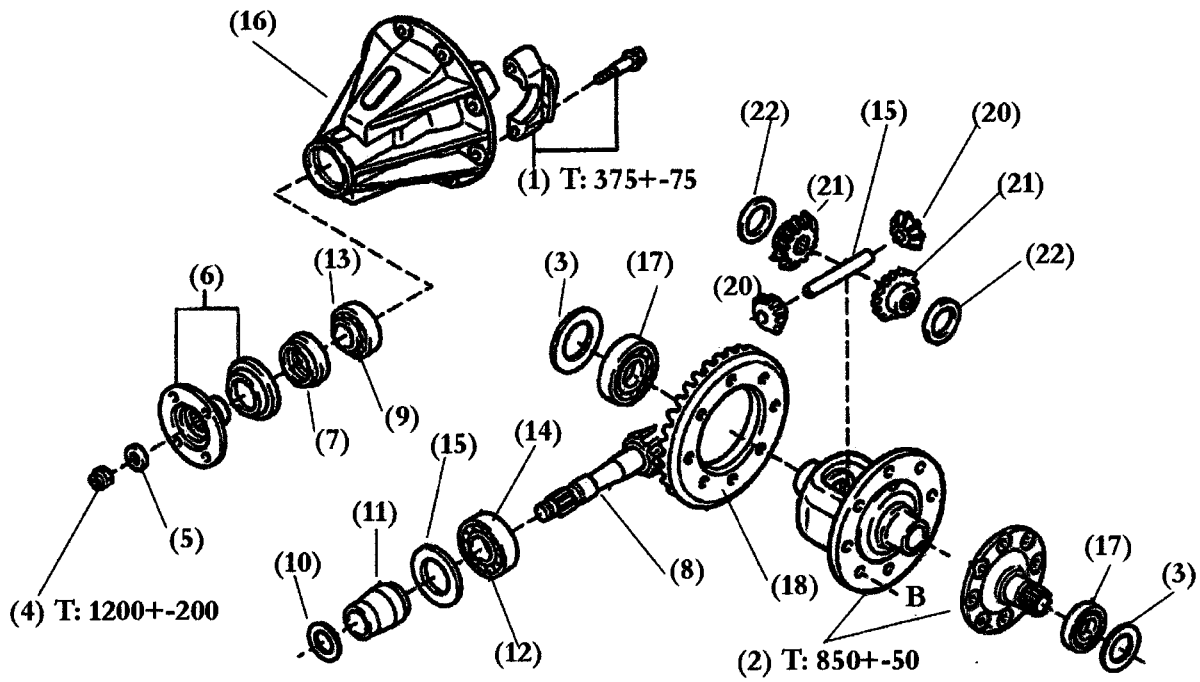
Standard Rear Differential



1. Cap: Bearing
2. Case Assembly
3. Shim
4. Nut
5. Washer
6. Flange Assembly
7. Seal: Oil Type T
8. Pinion: Differential Drive
9. Bearing: Tappered Lower
10. Shim
11. Spacer
12. Bearing: Tappered Lower
13. Outer Race: Front
14. Outer Race: Rear
15. Shim
16. Carrier Case
17. Bearing
18. Ring Gear
19. Shaft: Differential Pinion
20. Pinion Gear
21. Side Gear
22. Washer: Side Gear Thrust

Differential

Rear Differential W/ Diff-Lock Option

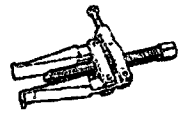


1. Cap: Bearing
2. Case Assembly
3. Shim
4. Nut
5. Washer
6. Flange Assembly
7. Seal: Oil Type T
8. Pinion: Differential Drive
9. Bearing: Tappered Lower
10. Shim
11. Spacer
12. Bearing: Tappered Lower
13. Outer Race: Front
14. Outer Race: Rear
15. Shim
16. Carrier Case
17. Bearing
18. Ring Gear
19. Shaft: Differential Pinion
20. Pinion Gear
21. Side Gear
22. Washer: Side Gear Thrust

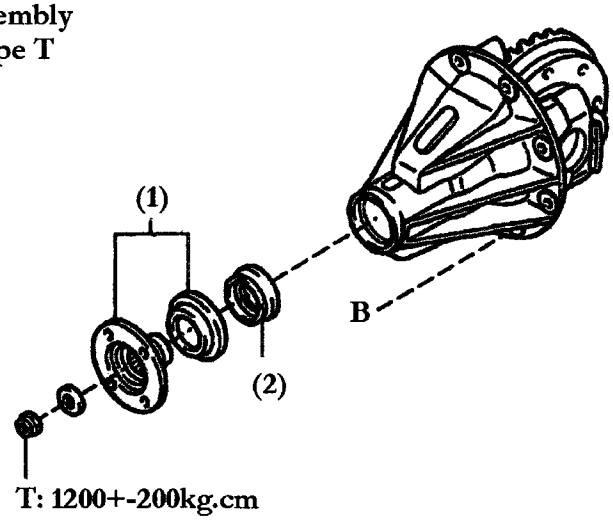
Differential

Rear Differential Front Oil Seal Replacement

Tools

Flange Holder		#09330-87301-000
Oil Seal Puller		#09308-10010-000
Seal Installer		#09635-20010-000

1. Flange Assembly
2. Oil Seal Type T



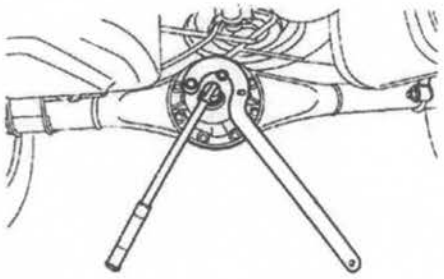
Replacement

1. Jack Up or Lift Up Rear of Vehicle

2. Remove Drive Shaft

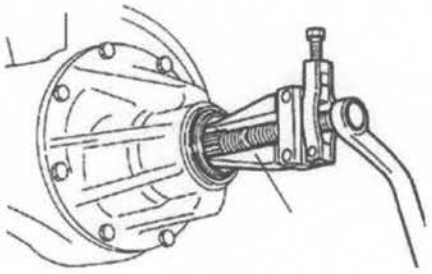
3. Attach Flange Holder Tool and Use Breaker Bar to Remove Retainer Nut

Note: Nut Must Be Replaced



4. Use Oil Seal Puller Tool and Remove Oil Seal

Note: Seal Must Be Replaced



5. Grease New Seal With 90W Differential Oil and Install With Oil Seal Installer

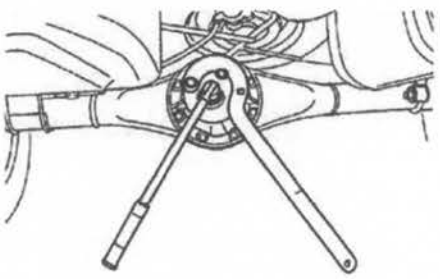
6. Attach Flang Holder Tool and Use a Torque Wrench to Set to Specification

Torque: 1200+-200kg.cm

7. Install Driveshaft

8. Check Differential Oil

Differential Oil: SAE90
Capacity: 1.3 Liters

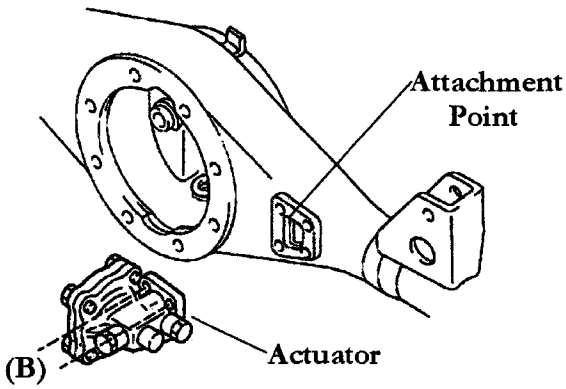


Differential

Diff-Lock Actuator Option Vehicle

Note: Majority of Diff-Lock Problems are Vacuum Related

(B)=Bolt



T: 185+-35kg.cm

Removal

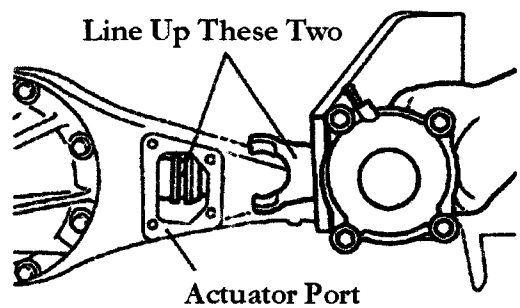
1. Lift Up Vehicle
2. Remove (2) Vacuum Hoses
3. Remove (4) Attachment Bolts

Note: Sensor Equipped Disconnet Connector

Installation

1. Clean Surfaces
2. Attach New Gasket
3. Use Diagram on Right to Line Up Arm and Slot
4. Attach Bolts & Torque: 185+-35kg.cm
5. Check Differential Oil and Add if Low

OIL: SAE90W (API-GL5)
Capacity: 1.3 Liters

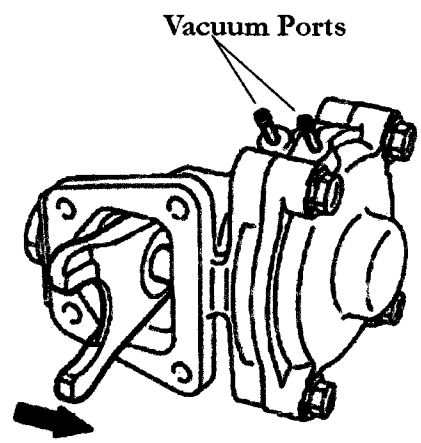


Actuator Testing

1. Remove Actuator

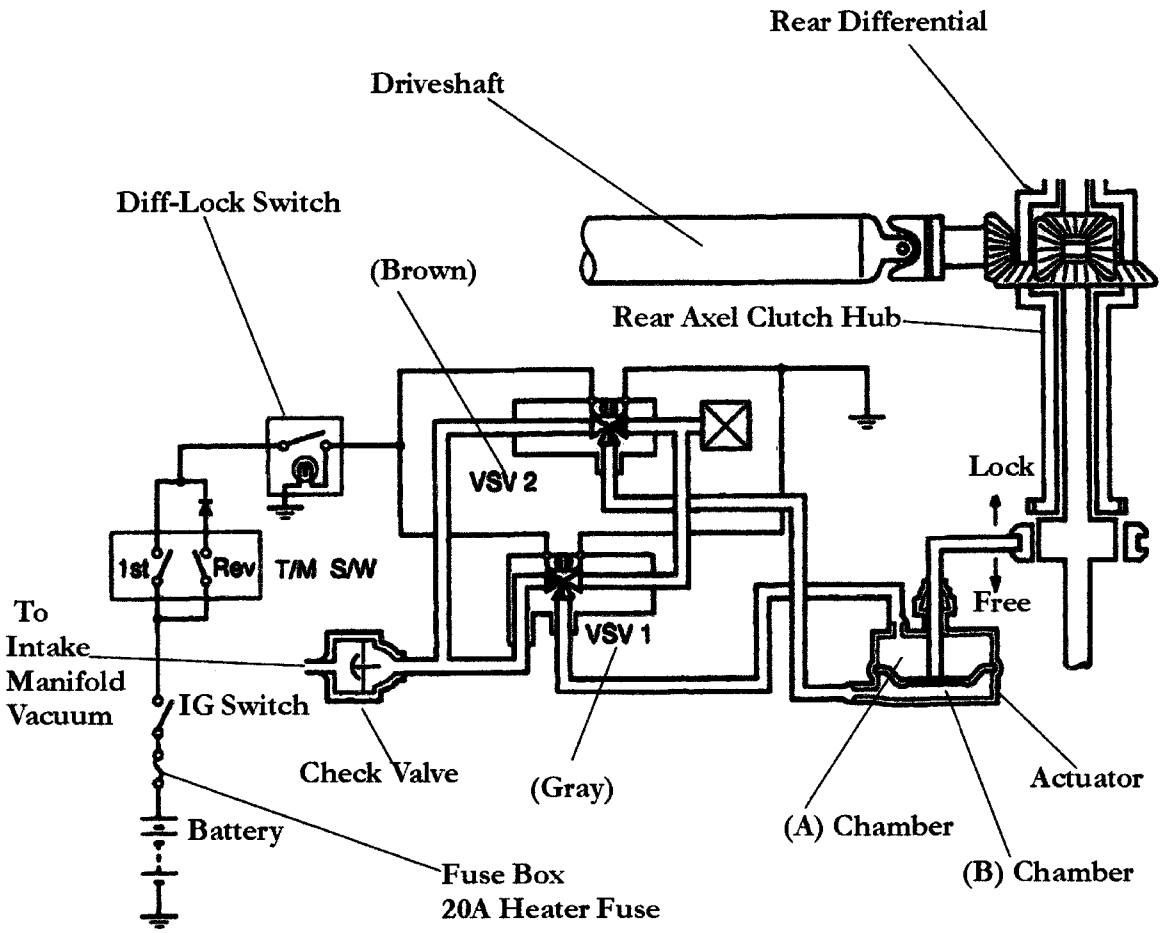
Note: Do NOT Spray Caburetor Cleaner Into Vacuum Port! Unit Will Be Destroyed

2. Attach Hand Held Vacuum Pump and Draw 450mmHG Through Vacuum Port. Actuator Arm Will Move Left (Inwards). Hold Vacuum 20~30 Seconds. No Bleed Down and Unit is Fine. Unit Bleeds Down Less Than 15 Seconds Actuator Should Be Replaced



Differential

Diff-Lock System Diagram



Note: Common Problems 1. Check Valve 2. Leak in Hose 3. Vacuum Port Switched

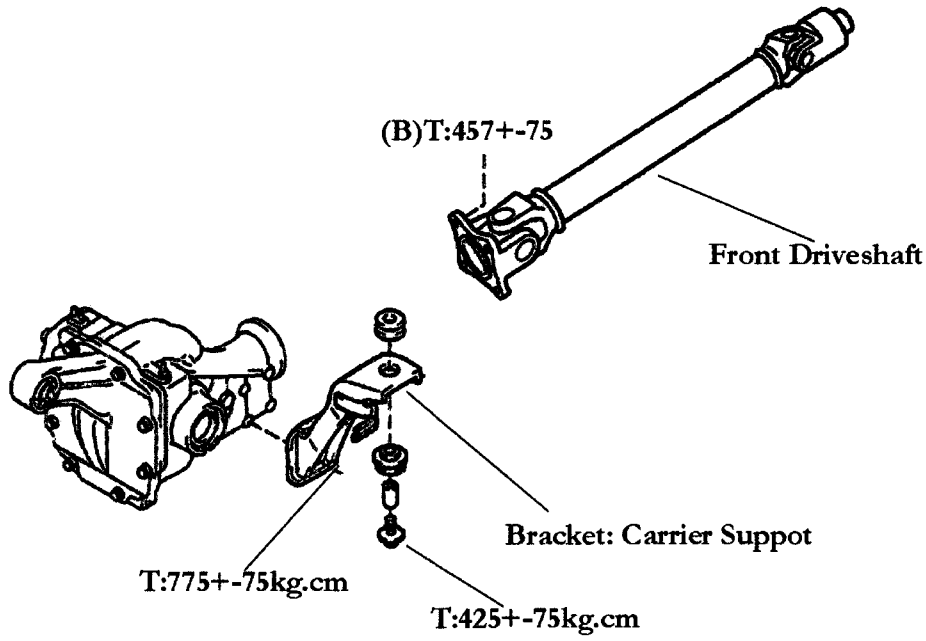
Caution: Never Spray Carburetor Cleaner in Vacuum Lines! Check Valve and Actuator Diaphragm Will Be Destroyed

Caution: Vacuum Leaks Will Cause Idling Problems

Driveshaft

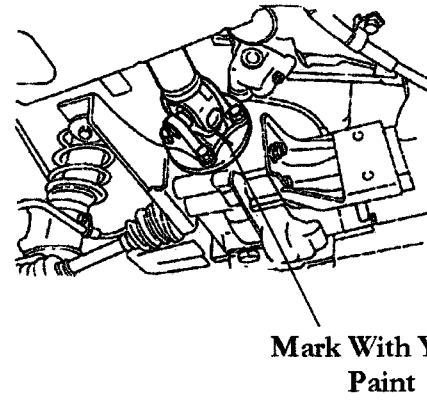
Front Driveshaft & Removal

Torque:=kg.cm
(B)=Bolt



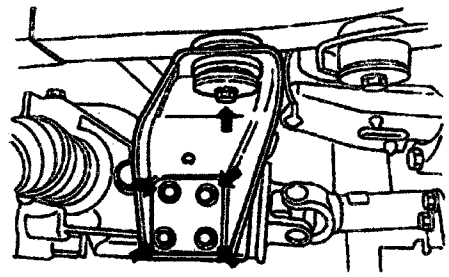
Removal

1. Lift Vehicle
2. Use Yellow Paint and Mark Present Position of Flange and Yoke. This Mark Will Be Used for Installation Guidence.

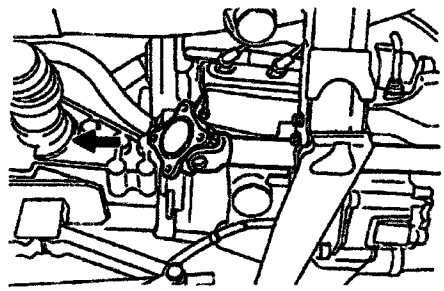


Front Driveshaft Removal

3. Support Differential
4. Remove the (5) Bolts Supporting the Rear Left Carrier Support Bracket as Seen in the Right Side Diagram

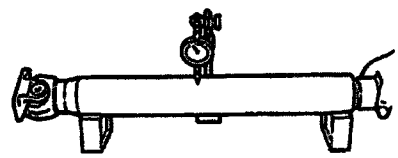


5. Pull Back Driveshaft 5~10cm and Move Front Portion to Left Side of Vehicle. Pull Driveshaft Forward and Remove From Vehicle. Oil From Transfer Case May Leak Out, Place a Bucket Under Transfer Case

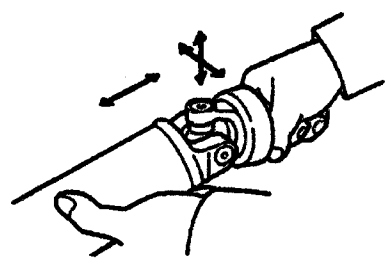


6. Use a Dial Gage and Inspect Driveshaft Round-Out

Limit: Below 1.0mm

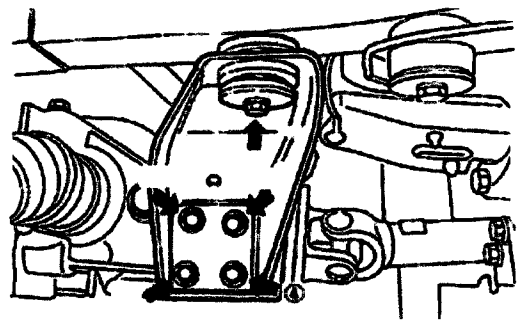


7. Universal Joint Test: Follow the Diagram on Right and Test All Direction Movement. If Failure Replace Universal Joint.

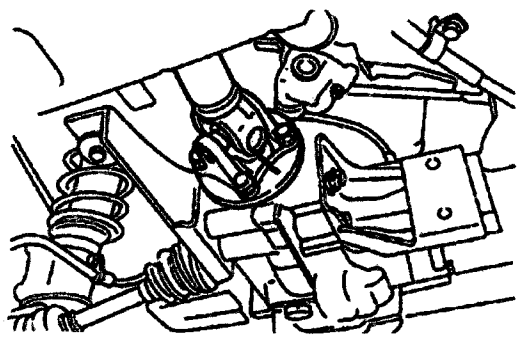


Front Driveshaft Installation

8. Install Driveshaft and Support Bracket
Bracket Torque:
Differential Side: 775+-75kg.cm
Body Mount: 425+-75kg.cm



9. Torque Driveshaft: 475+-75kg.cm

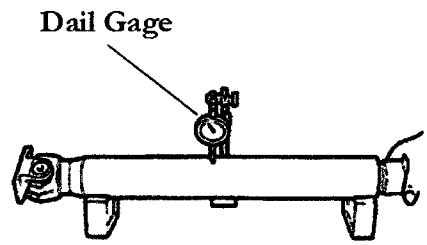


10. Check Transfer Case Oil and Add if Low

Transfer Case Oil Specifications
SAE 75W-85W (API-GL-3)
Capacity: 2.3 Liters (MT) and 1.6 Liters (AT)

Driveshaft

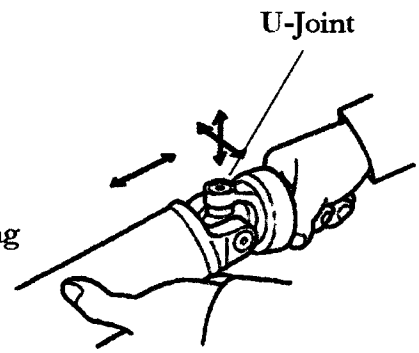
Rear Driveshaft Removal & Replacement



1. Raise Vehicle
2. Use Yellow Paint and Mark Driveshaft Position
3. Remove Attachment Bolts
4. Slie Driveshaft Forward (Front of Vehicle) and Lower Out

5. Use a Dail Gage and Inpect Driveshaft Round-Out

   Limit: 1.0mm

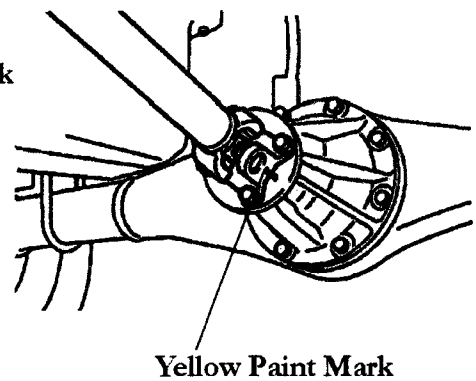


6. Using the Diagram on the Right Perform the Following Travel Movements. If Universal Joint Experiences Binding, Replace U-Joint

7. Install Driveshaft in Reverse Order, Align Paint Mark

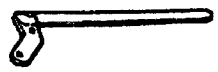
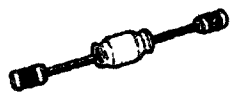
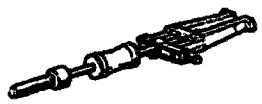
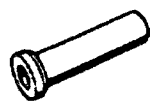
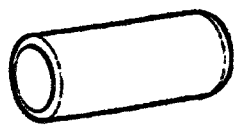
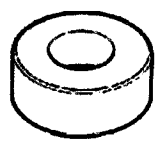
8. Torque Bolts to: 475+-75kg.cm

9. Check Transmission Oil and Differential Oil Levels. Add if Required



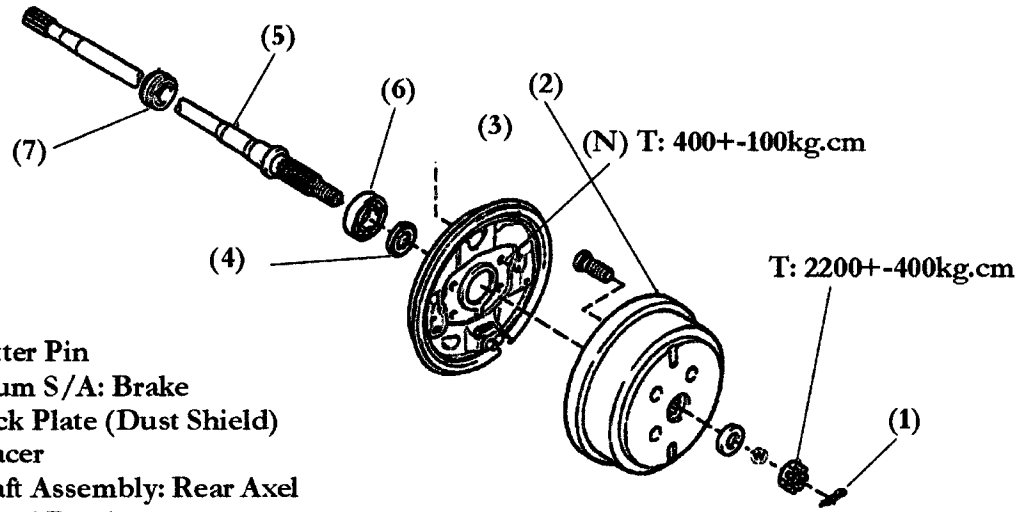
Axel

Rear Axel Removal Tools

Brake Drum Holder		#09511-87202-000
Slide Hammer		#09912-87501-000
Oil Deal Puller		#09308-00010-000
Puller Adapter		#09309-87201-000
Adapter		#09257-87201-000
Adapter		#09515-21010-000

Axel

Rear Axel Removal



1. Cotter Pin
2. Drum S/A: Brake
3. Back Plate (Dust Shield)
4. Spacer
5. Shaft Assembly: Rear Axel
6. Wheel Bearing
7. Oil Seal: Type T

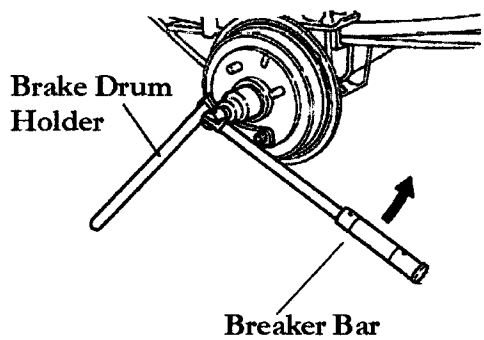
Axel Removal

1. Raise and Support Rear of Vehicle
2. Remove Rear Wheels
3. Drain Rear Axel Oil

Note: Drain Seal Must be Replaced

4. Remove and Discard Cotter Pin

Note: Cotter Pin Must Be Replaced



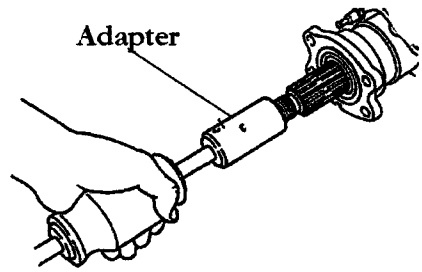
5. Attach Drum Holder Tool and Use Breaker Bar To Remove Castle Nut.

Authors Note: If Brake Drum Holder Tool is Not Available Have a Assistant Hold Brake Pedal. Do Not Use Parking Brake, it Can Slip

Axel

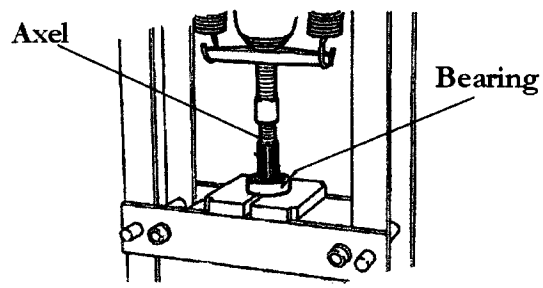
Rear Axel Removal

6. Use Slide Hammer and Screw On Attachment, Pull Axel

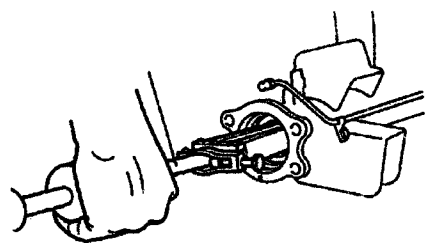


7. Use a Press and Press Off Wheel Bearing

Note: Bearing Can Not be Re-Used

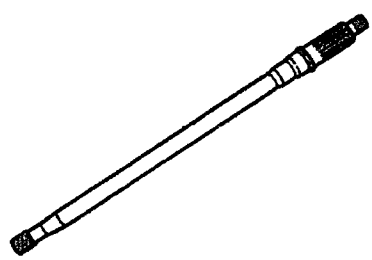


8. Use Oil Seal Puller and Slide Hammer to Pull Out Oil Seal
Note: Oil Seal Can Not be Re-Used



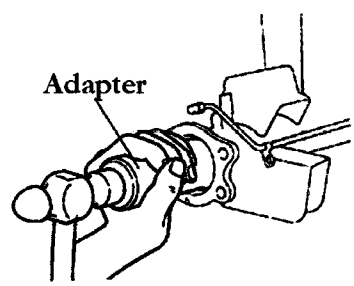
9. Inspect Rear Axel for Chips or Missing Gear Teeth.

Note: Axel Can Not Be Repaired, Any Defects Unit Must be Replaced.



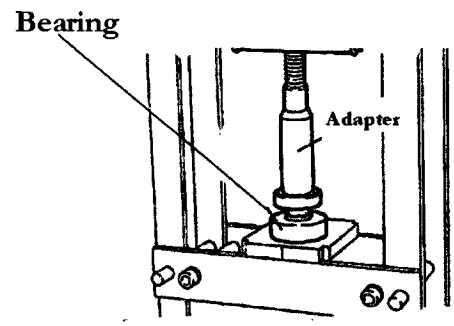
Assembly

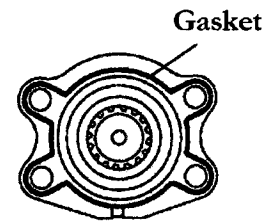
10. Install New Oil Seal in Housing
Use Adapter: #09309-87201-000



Rear Axel Installation

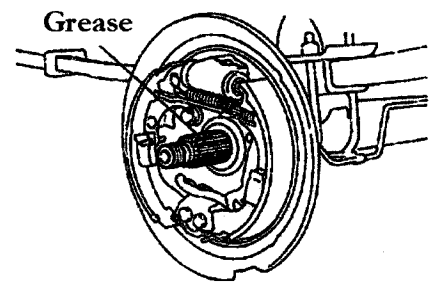
11. Use a Press and Press On New Bearing



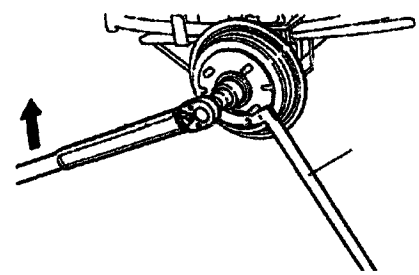


12. Install New Gasket and Axel
13. Torque Back Plate: 400+-100kg.cm

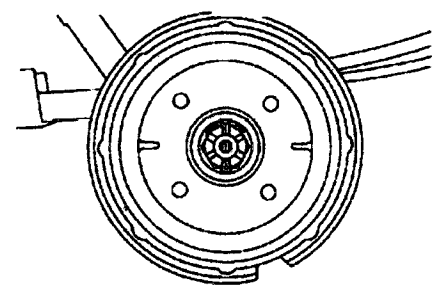
Note: Before Shaft Installation Coat With Axel Grease



14. Make Sure Grease Applied to Area Noted on Right

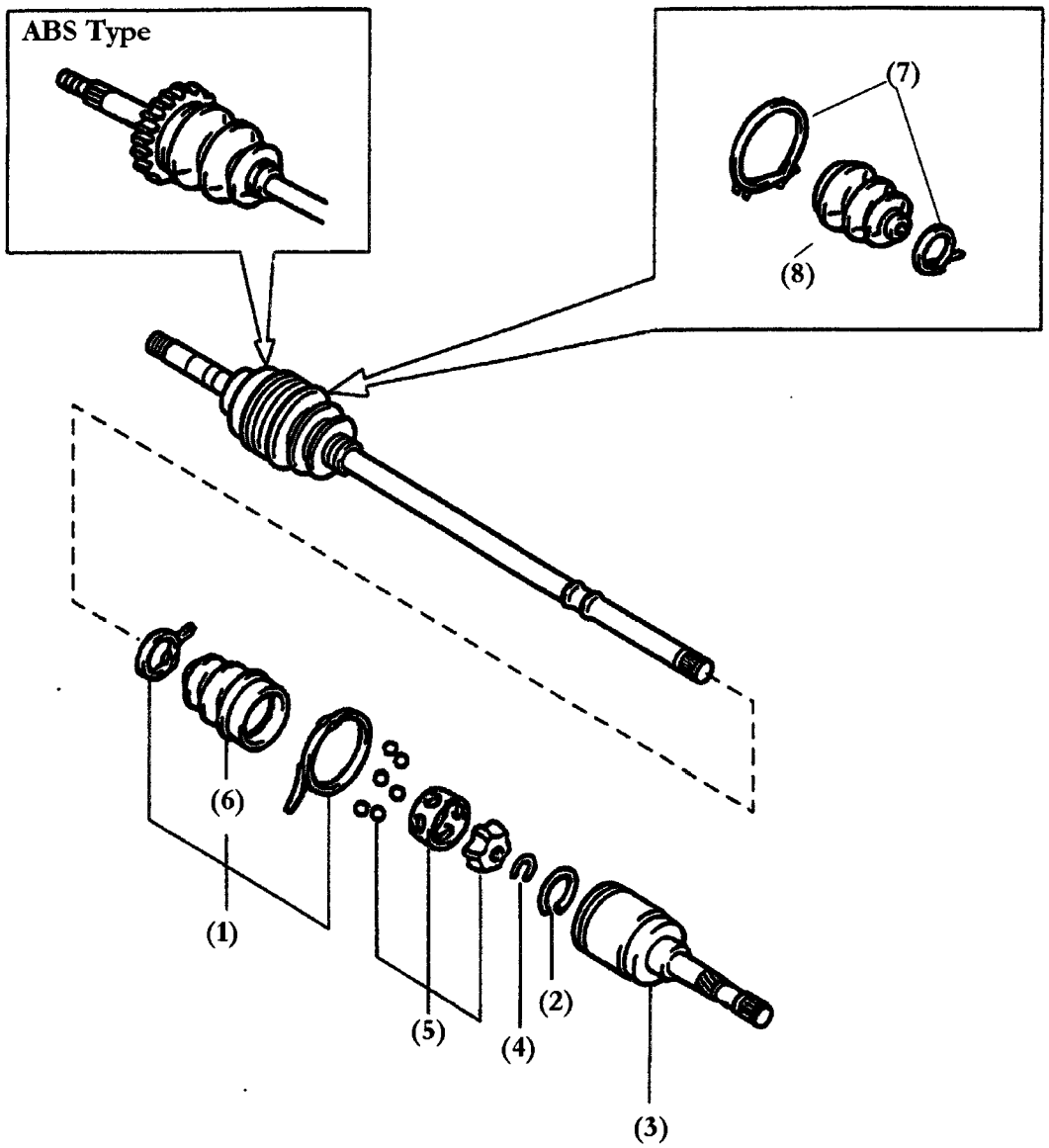


15. Attach Drum, Castle Nut, and Set Torque
    Torque: 2200+-400kg.cm



16. Attach New Cotter Pin
17. Check Oil Level. SAE90W Max: 1.3 Liters
18. Test

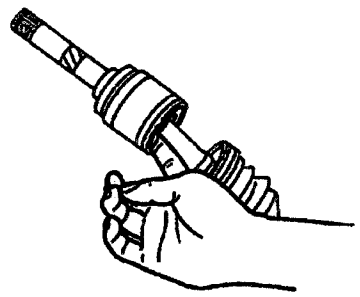
Front Axel Including ABS Vehicle 4WD



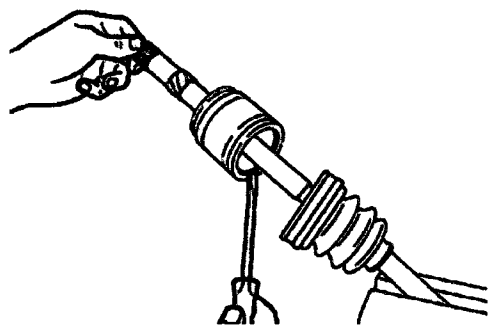
1. Boot Attachment Bands
2. Circle Clip
3. DOJ Assembly
4. Snap Ring
5. Ball Retainer Cage Assembly
6. Boot
7. Boot Bands
8. Boot

Note: Wrap Axel With Shop Towel and Place in Vise. Do Not Over-Tighten

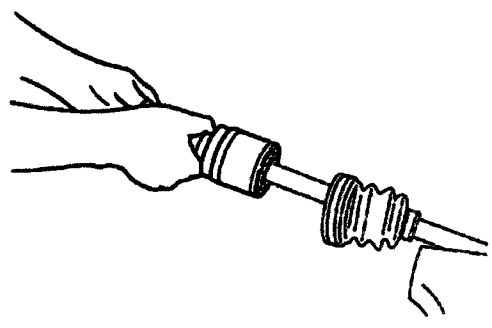
1. Use (-) Screwdriver and Un-Clip Boot Bands.
2. Remove All Old Grease



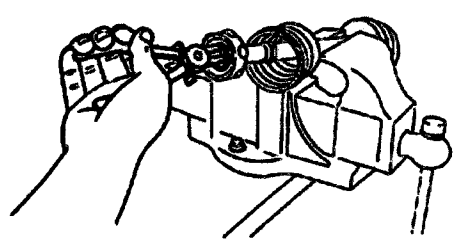
3. Use (-) Screwdriver and Remove Retainer Clip



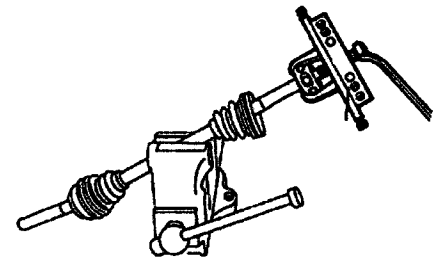
4. Slide Off DOJ



5. Remove Snap Ring

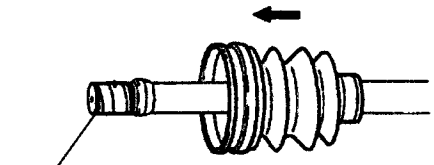


6. Attach Service Tool #09950-20017-000
7. Remove Cage Bearing Assembly



Note: Place Piece of Tape Over Shaft End and Grease
This Protects Shaft End & Makes for Easy Disassembly and Assembly of Boots

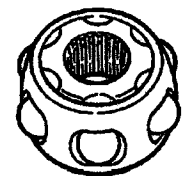
8. Slide Off Boot



Tape & Grease

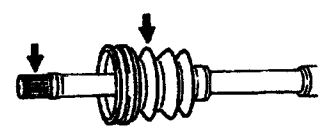
Inspection

1. Inspect Cage & Bearing Balls for Scratches or Other Damage. If Defects Detected Replace Entire Unit



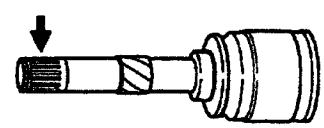
Note: Unit Can Not be Repaired and Must be Replaced as an Assembly

Inspect Here



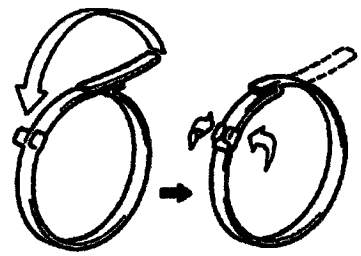
2. Examine Shaft Ends and Boots for Cracks or Excessive Wear. Replace Shaft if Teeth are Worn or Missing. Boots Generally are Replaced if Over 30,000 Kilometers. Boots Must be Changed for Over 80,000 Kilometers

Examine Closley



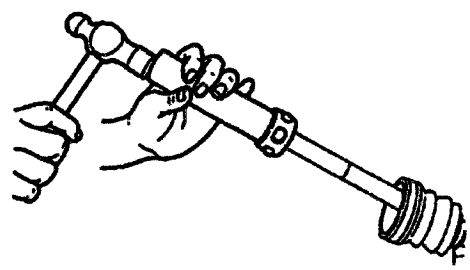
Assembly

1. Test Old Bands for Operation. Use Diagram on Right



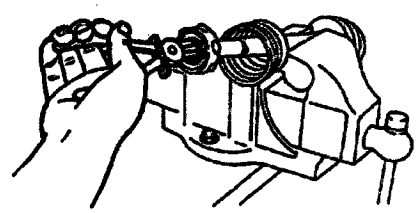
Note: Best Practice to Use New Bands

2. Tape Cage Bearing Onto Shaft

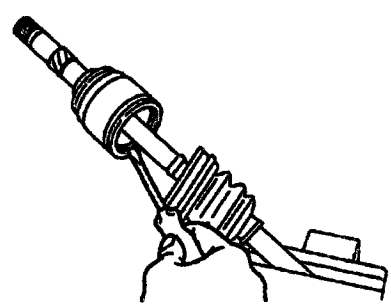


Note: Make Sure Shaft Is Greased Before Taping on Bearing

3. Attach Snap Ring



4. Attach C-Clip
5. Pack Boots with Minimum 65grams Of High Temp Long Life CV Joint Grease

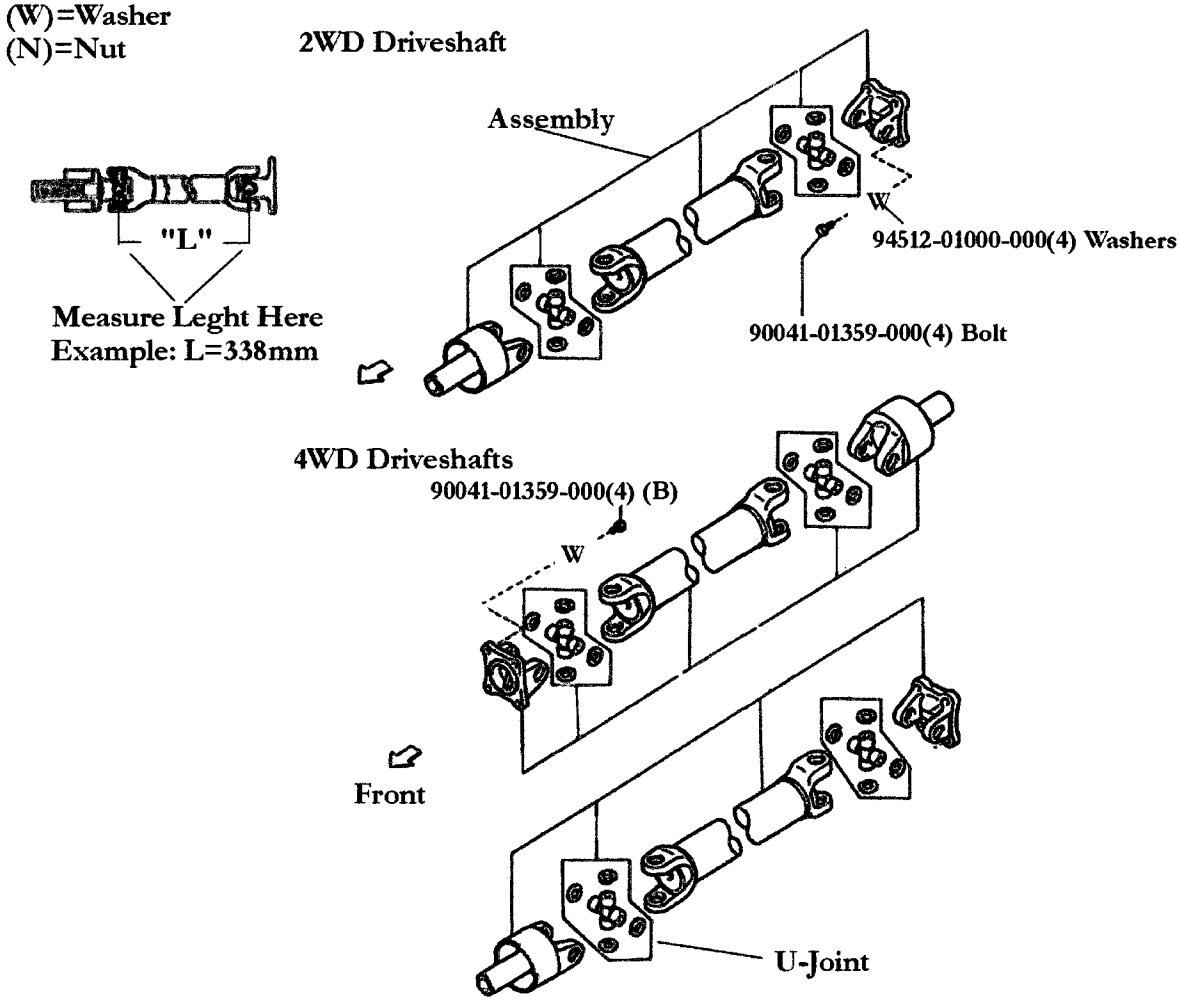


6. Attach Boot Bands
7. Install to Vehicle

Driveshaft

Parts

(B)=Bolt
(W)=Washer
(N)=Nut



Note: Only Complete Assembly Units Avalable L=Length

REAR Driveshaft:

S100 EFNS EFES (MTM, TR, MT)	# 37110-87D07-000	L=338mm
S110 (MT, DUMP, PS2 +S1, THDE	#37110-87D08-000	L=396mm
S100, S120 EFNS EFES (Van) MT	# 37110-87D11-000	L=633mm
S100, S120 EFES (Van) AT	#37110-87D12-000	L=691mm
S110 MTM (MT,DMP, NGD	#37110-87D10-000	L=194mm
S100 MTM (TR, MT)	#37110-87D07-000	L=336mm

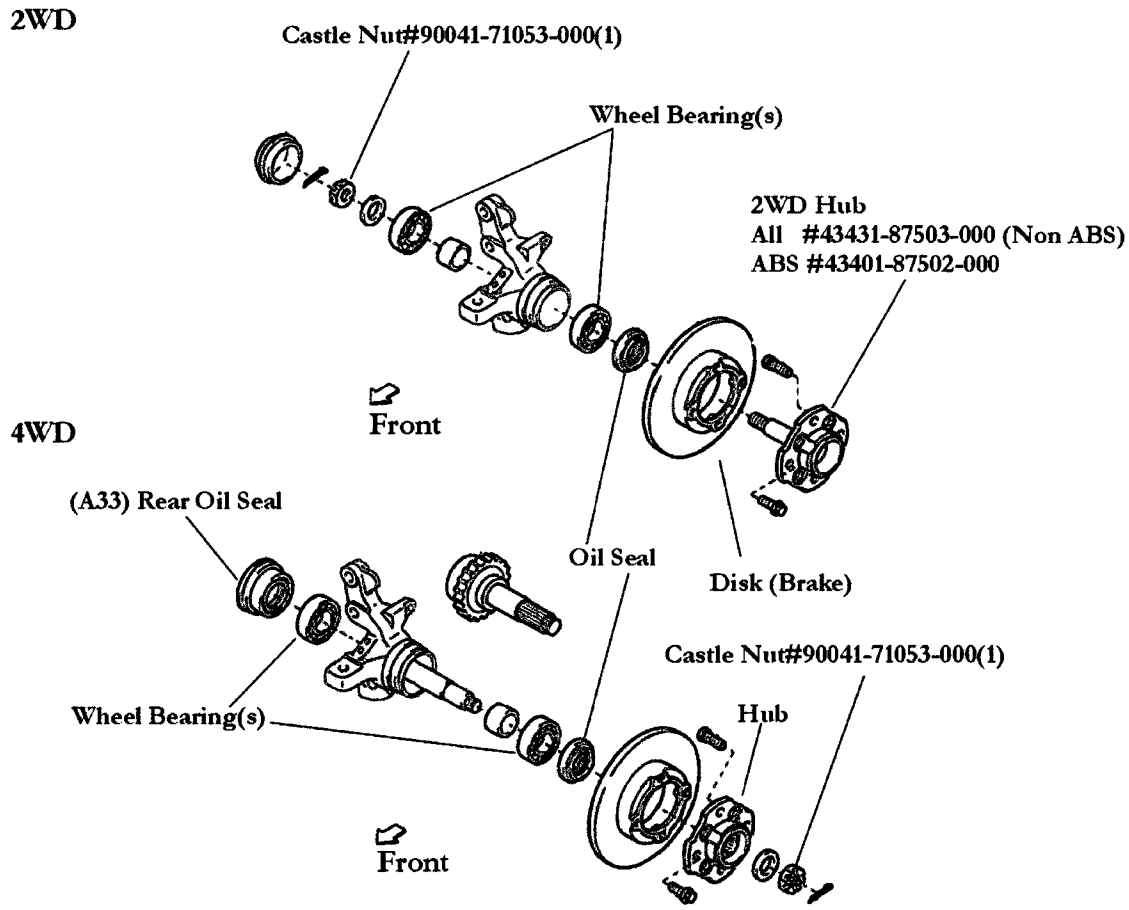
4WD FRONT Driveshafts

S110 DMP +S110P	#37140-87526-000	L=873mm
S110, S120 VAN...PS1	#37140-87527-000	L=580
TRUCKS (Other)	#37140-97501-000	L=873mm

Note: Confirm Driveshaft Length of Your Vehicle Before Ordering

Front Axel

Front Axel Hub Parts



Wheel Bearing
(All) #90043-63221-000

Front Hub Stud
(All) #90049-1230-000 (8) L=35mm, M12 P=1.5

Oil Seal
(All) #90043-11202-000 (2)

4WD (#A33) Oil Seal
(S110,S130) #90043-11201-000
(All Others) #90043-11307-000

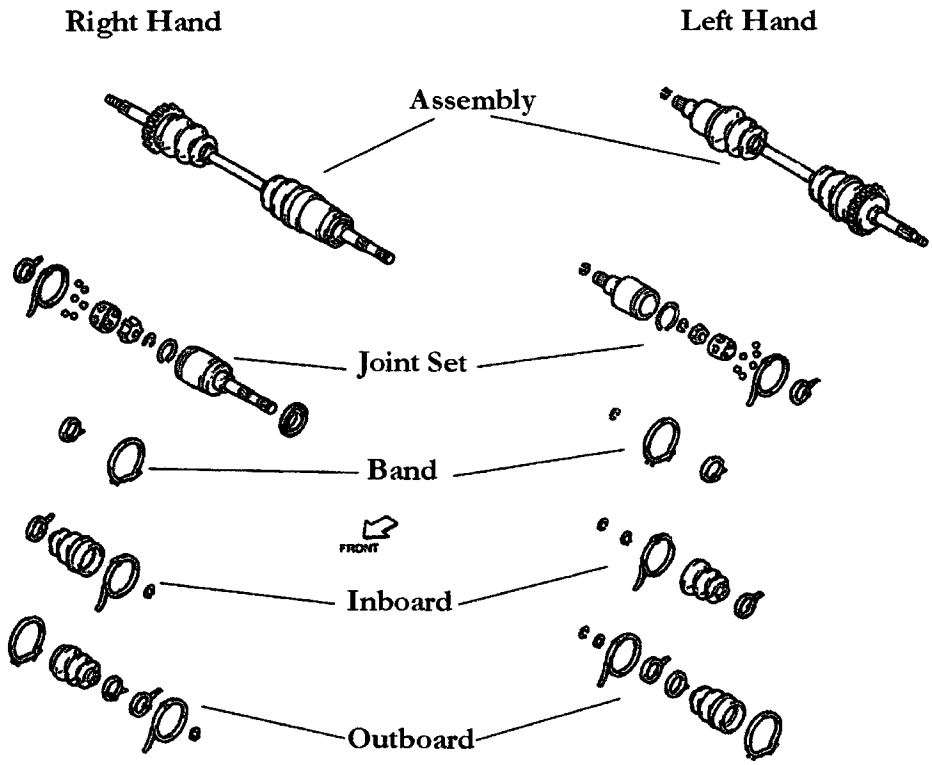
4WD Hub
(ALL) (L&R) #43502-87211-000 (Non-ABS)
(ABS Only) #43502-87210-000

Disk: Front Brake (All) #43512-87521-000

Front Axel

Front Axel Parts

4WD



Joint Set
Left Hand (All) #43404-87591-000
Right Hand (All) #43404-87592-000

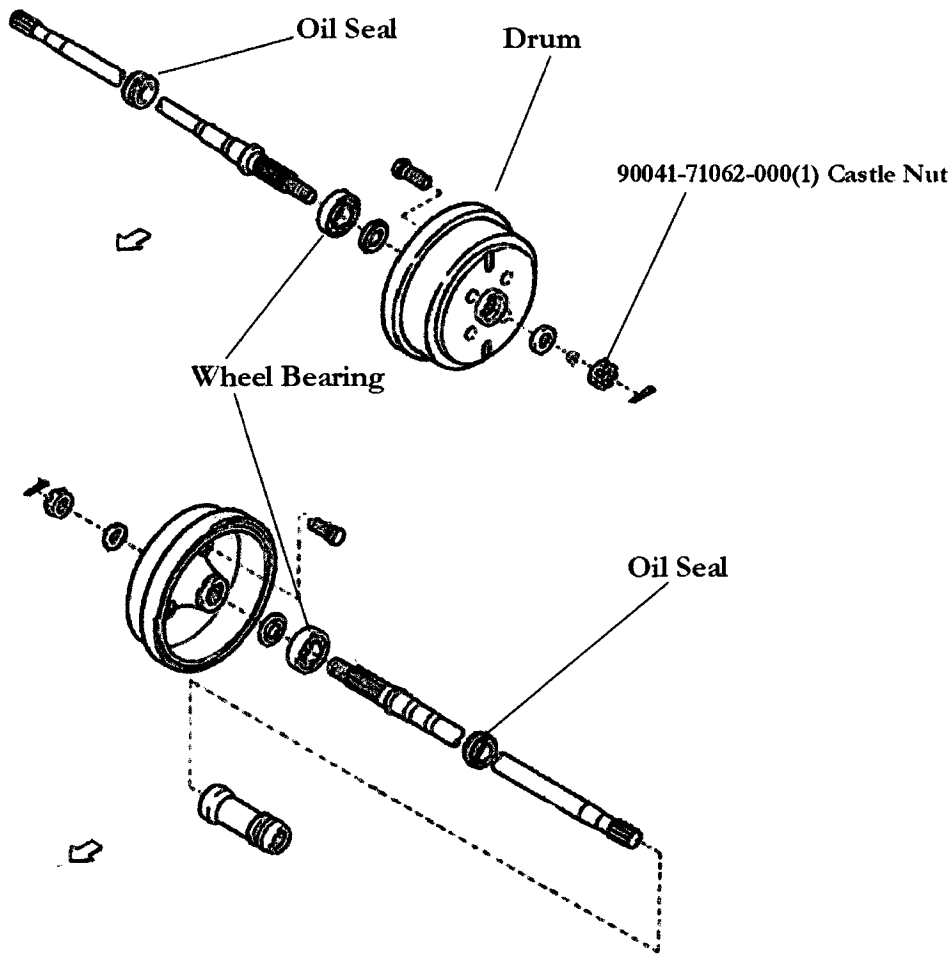
Band Set
(All) #04438-87518-000

Boot Set: Inboard
(All) #04438-87514-000
Boot Set: Outboard
(All) #04438-87521-000

Note: Full Assembly Not Available

Rear Axel

Rear Axel Parts



Note: Only Avbailable Parts Listed Below

Oil Seal
(All) #90043-11312-000

Rear Brake Drum
S100, S110, S120, S130 #42403-87514-000
S140 #42403-87516-000
S120, S130 (TBO) ABS #42403-87515-000

Stud Bolts
(All) #90049-12044-00

Bearing: Wheel
S110, S130 #90043-63230-000
S100, S120, S140 #90043-63236-000

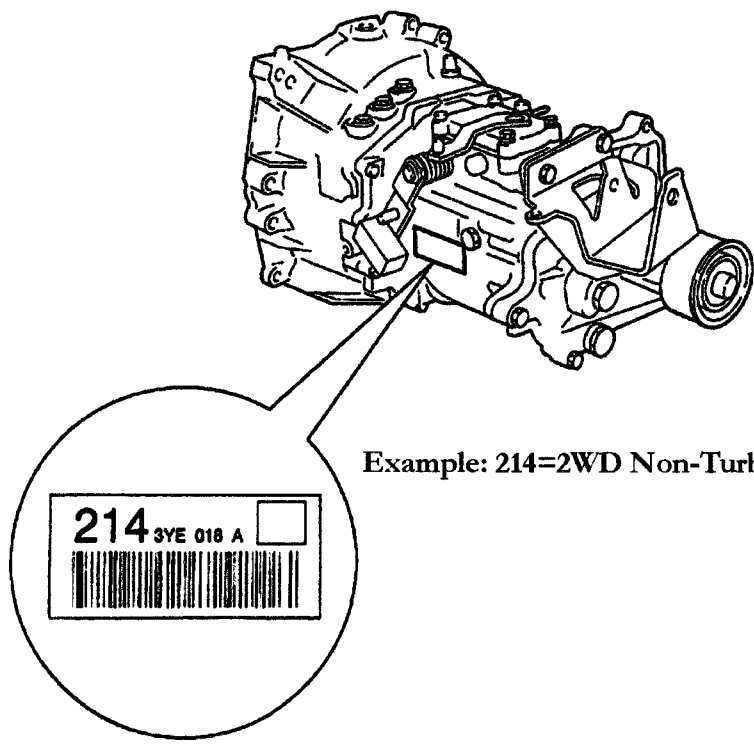
Chapter 12

Clutch System

- Transmission Identification 2WD & 4WD
- Clutch Cable System and Replacement
- Clutch Specialty Tools
- Clutch Pressure Plate & Clutch Disk Replacement
- Parts

Transmission Identification

Manual Transmission



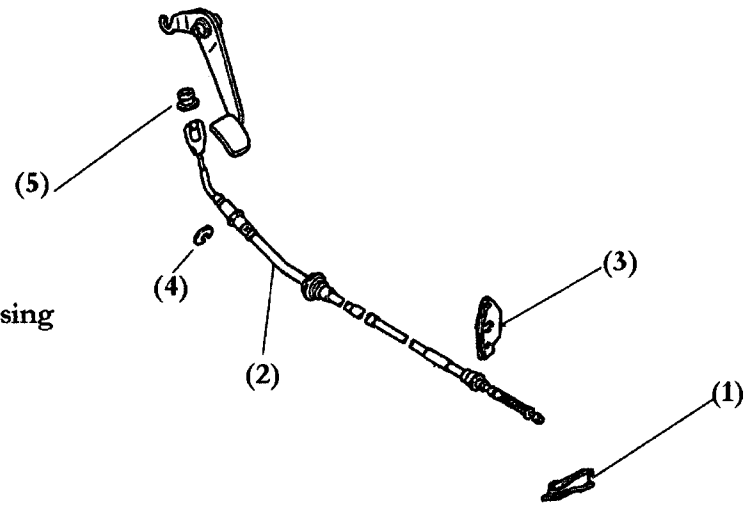
Example: 214=2WD Non-Turbo Van

Drivetrain	Type	Mark
2WD	Truck/Van	213
2WD	Atrai	214
2WD Turbo	Atrai	220
4WD PT 4WD	Truck/Van	P19 H-L
4WD Normal	Truck/Van	P10
4WD PT 4WD	Truck	P11 PTO
4WD PT 4WD	Van	P12
4WD PT 4WD	Truck/Van	P20
4WD Turbo	PTO Option	P28
4WD Turbo Muti Select 4WD		A20

Clutch System

Clutch Cable

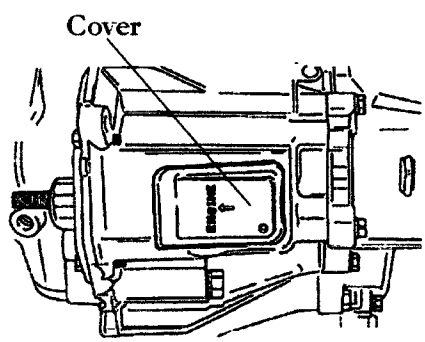
Components



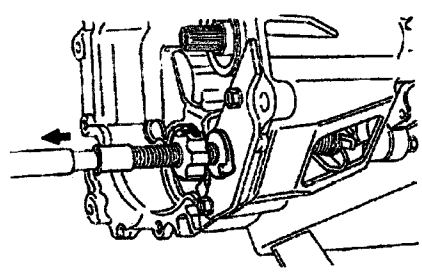
1. Cover: Clutch Housing
2. Cable Assembly
3. Release Fork Plate
4. Plate Washer
5. Bushing

Replacement & Adjutment

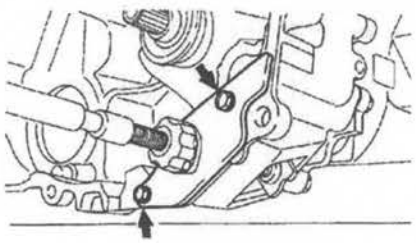
1. Remove Clutch Housing Cover (Dust)
2. Remove Cable Clamp



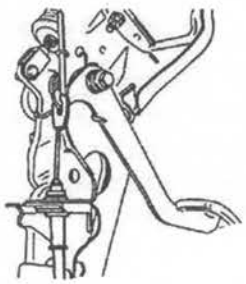
3. Back Off Adjustment Nut (Left) and Pull Forward
4. Disconnect Cable From Fork



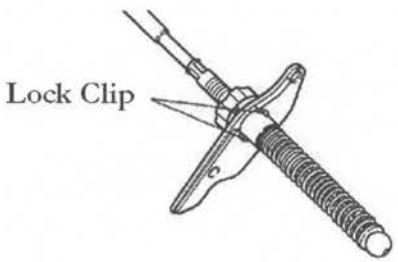
5. Remove The Two Retainer Bolts Shown on Right Diagram



6. Lift Up on Clutch Pedal and Remove Cable

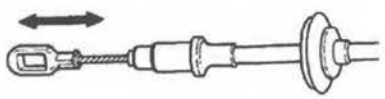


7. Un-Lock Clip as in Diagram on Right
Note: Some Models Do Not Have This Feature

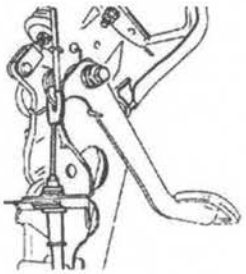


Installation

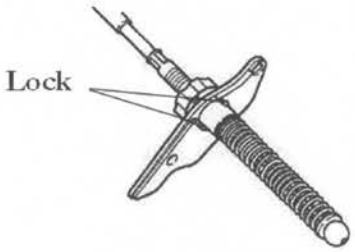
1. Check New Cable For Free Travel



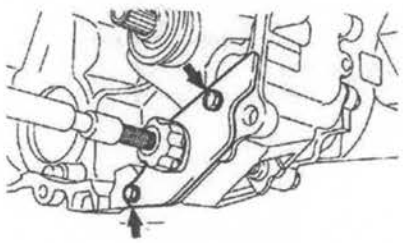
2. Attach Cable to Pedal Assembly
3. Run Cable to Transmission



4. Set Lock Clip And Slide Cable Unit Into Housing

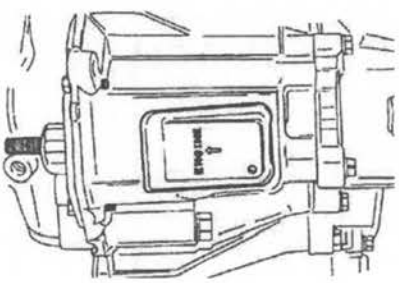


5. Attach Cable to Fork
6. Attach Retaining Bolts as in Diagram on Right
7. Attach Cable Retaining Clamp

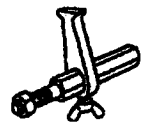
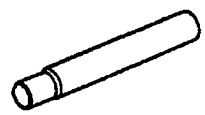
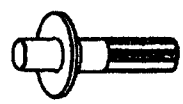


8. Attach Cluth Housing Dust Cover

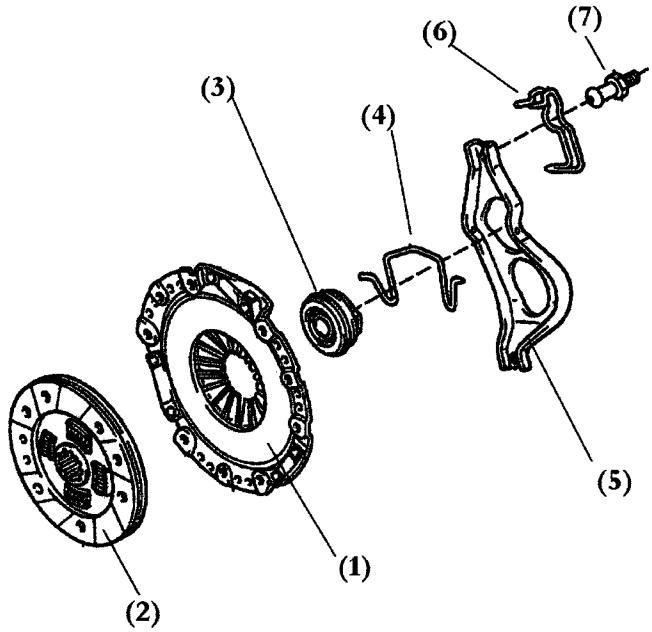
9. Set Cable Free Play
   Limit: 15~25mm
   Clutch Pedal Deck Height
   Limit: 139~149mm



Clutch Specialty Tools

Flywheel Holder		#09210-87701-000
Clutch Guide		#09301-87501-000
Height Gage		#09302-87701-000
Alignment Tool		#09333-00013-000
Clutch Cetering Tool		#999-08440-W9-023

Clutch Replacement

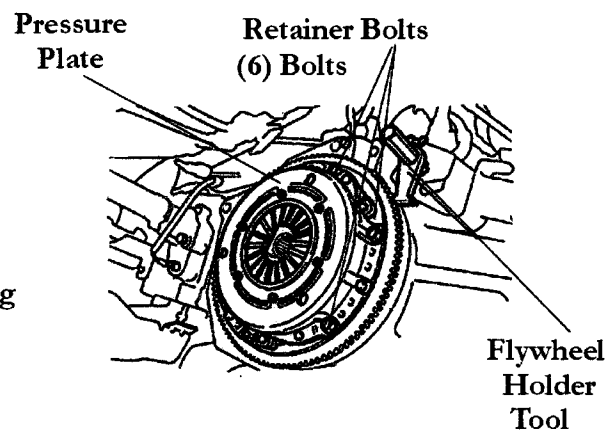


1. Pressure Plate
2. Clutch Disk
3. Bearing
4. Bearing Retainer
5. Clutch Fork
6. Spring: Release Fork
7. Pivot Support

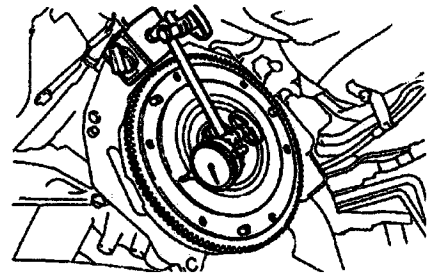
Replacement

1. Remove Transmission

2. Attach Flywheel Holder Tool and Remove (6) Pressure Plate Retaining Bolts
3. Remove Pressure Plate and Clutch Disk

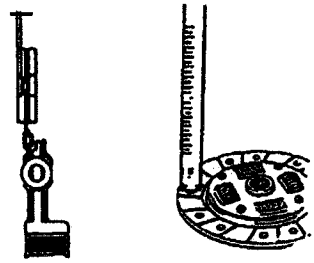


4. Attach Dial Gage as in Diagram on Right and Check Flywheel Round-Out



Limit: 0.10mm
Note: Inspect Flywheel Ring Gear Teeth. If Teeth Are Missing or Worn Replace

Clutch Disk Inspection

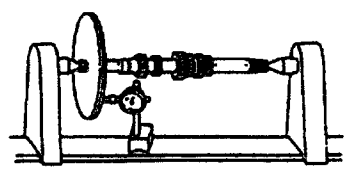


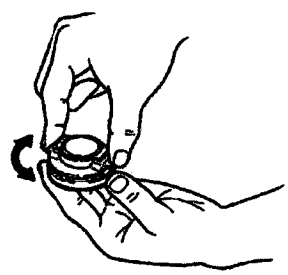
Note: Skip Step If New Disk to be Installed

5. Measure Rivet Depth

Limit: 0.3mm

Clutch Disk Round-Out Limit: 1.0mm

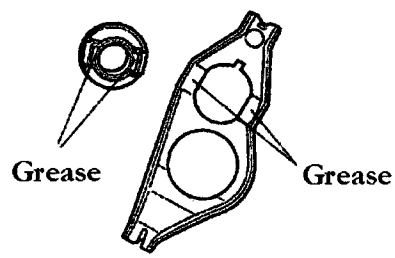




6. Release Bearing: Check for Free Spin. Any Binding Replace Unit. Unit Must be Replace Every 80,000 Kilometers

Note: Never Clean Bearing With Solvant

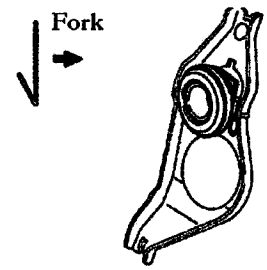
Installation



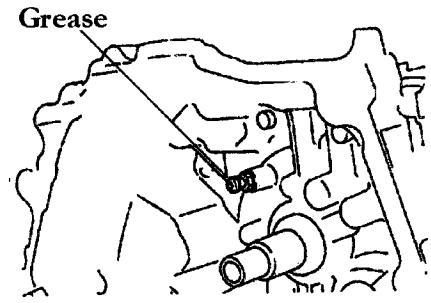
1. Replace or Install Release Bearing and Grease as Noted on Right

Use High Temp-Long Life Chassis Grease

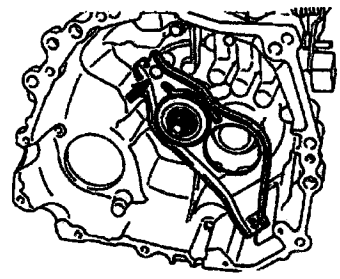
2. Attach Release Bearing Hub Clip to Release Fork as in Diagram to Right



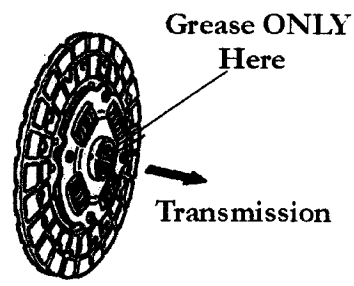
3. Inspect Pivot Point (Replace if Worn) and Apply Grease



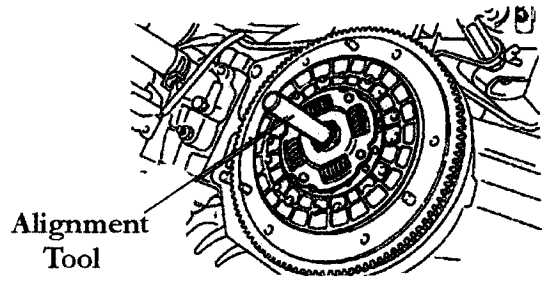
4. Attach ReleaseFork Assembly as in Diagram to Right



5. Apply 0.2grams of Grease to Center Spline as in Diagram. Do Not Get Grease On Disk Friction Plates.

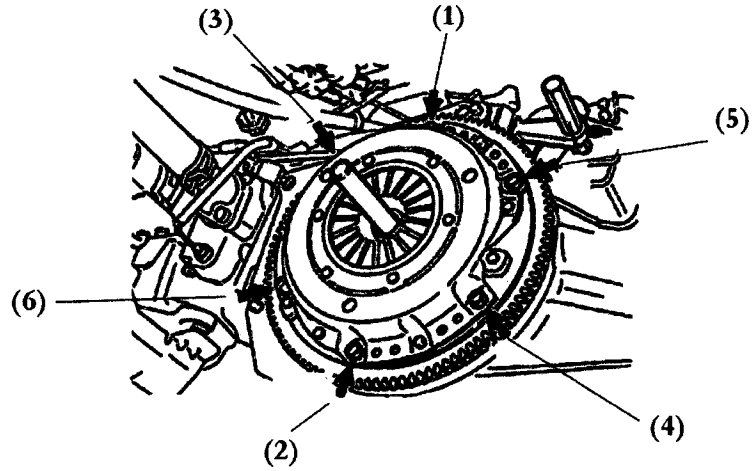


6. Use Alignmet Tool And Line Up Disk



7. Attach Pressure Plate Over Clutch Disk and Place Alignment Tool Between

8. Install (6) Pressure Plate Attachement Bolts and Torque in Order Lited Below



Torque Order

9. Torque Pressure Plate Bolts to T: 185+-35kg.cm
10. Remove Alignment Tool
11. Install Transmissiom

Parts

Release Bearing Retainer Clip (All) #31232-87505-000

Release Bearing (All) #31230-87507-000 or #31230-97501-000

Pressure Plate
S120, S130 OVZM #31210-87237-000
S100, S110, S120, S130, S140 #31210-87526-000

Clutch Disk
(Universal) #31250-87560-000

Daihatsu HiJet Truck and Vans

Full Mechanical Version

The Full Mechanical Version Loaded With Over 230 Pages and Hundreds of Easy to Understand Diagrams. All in Plain and Simple English.

Vehicle-Engine-Transmission-Differential Decoding & More!
General Maintenance
Steering & Suspension
Brakes
Cooling System
Engine Overhaul
Starter & Alternator
Complete Fuel System for EFI & Carbureted Engines
Emission Control & Vacuum Line Circuits
Differentials
Axels
Clutch System
Much, Much More! Check Book Contents List for Complete Details!

1989~1998 Models

2WD 4WD HiJet Pickup & Van 660cc

V-S100
V-S110
V-S120
V-S130
V-S140
Truck
Van

James Danko