

HONDA English Factory Service Manual

ACTY TRUCK

ACTY VAN



HONDA SERIES

Carbureted Vehicles

660cc Engine

E07A

2WD & 4WD

1989~1997 Models

Series Models

V-HA3

V-HA4

V-HH3

V-HH4

Honda Acty English Factory Service Manual

Carbureted Vehicles

Acty Truck - Acty Van - Street Van

660cc

2WD & 4WD

AT-MT Models

Model Series

V-HA3, V-HA4, V-HH3 & V-HH4

1989~1998

James Danko

Yokohama, Japan

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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.

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

Service manuals are not sold to the public in Japan, as in many countries. You must be a new car dealer to receive them. We have a few hundred in stock. We do not sell manuals from our own library

Translating from Japanese is by no way an easy task. It is a very time consuming effort. English Terms and phrases are made as clear as possible for peoples of all countries to read easily. Hundreds of diagrams make repairs simpler to get the job done.

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 Honda 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.

For more information please visit our home page at www.yokohamamotors.com
Comments or information on this book please email to info@yokohamamotors.com

Note: Large Print Used for The Vision Impaired.

Contents

Chapter 1

Specifications & Body Schematics.....Page 13~28

- Acty Truck Specifications Chart
- Acty Van & Acty Street Versions
- Vehicle Identification & Code Locations
- Lift Points
- Jack Points
- Jack Stands
- Towing
- Body Schematics Truck M-HA3 M-HA4
- Body Schematics Van M-HA3 M-HA4
- E07A Engine (HP) & Torque Curves
- Truck Frame Specifications (Diagram)
- Van Frame Specifications (Diagram)

Chapter 2

Service Data Specifications.....Page 29~44

- Engine Specifications
- Fuel & Emission Control
- Clutch System
- Manual Transmission Clearances (2WD)
- Manual Transmission Clearances (4WD)
- Manual Transmission Clearances (4WD UL/UR)
- Front Differential Specifications (4WD)
- Steering
- Suspension & Alignment Specifications
- Brakes
- Air Conditioner (AC)
- Starter Motor
- Ignition Timing & Spark Plugs

Chapter 3

General Maintenance and Tune-Up.....Page 45~62

- Required Tools This Chapter
- Radiator Cap Test
- Coolant Requirements
- Oil Change and Capacities
- Oil Filter & Part Numbers
- Oil Pressure Testing
- Air filters & Part Numbers
- Spark Plugs & Part Numbers
- Engine Compression Testing
- Alternator & AC Belts
- Valve Clearance Setting
- Carbureted Vehicle Idle Settings
- AC Equipped Idle Up Settings
- CO – HO Level Settings (Carbureted)
- Timing Adjustment & Settings

Chapter 4

Engine Cooling System.....Page 63~76

- Coolant System Diagrams & Capacities
- Coolant System Pipe & Hose Routing Components
- Radiator Removal
- Cooling System Air Bleeding
- Thermostat Replacement
- Thermostat Specifications & Testing Procedure
- Water Pump Testing & Removal Procedure
- Cooling Fan Relay & Sensor Location
- Sub-Cooling Control Sensors (Van)
- Sub-Cooling Control Sensors (Truck)
- Thermo-Switch & Sub-Cooling Sensor Testing
- Radiator Fan/Condenser Fan/sub-Cooling Relay

Chapter 5

Engine.....Page 77~108

- Tools
- Engine Removal Steps
- Engine Removal MT & AT Vehicles
- Engine Mount Torque Specifications
- Timing Belt Component Breakdown
- Timing Belt Removal
- Timing Belt Positioning and Setting
- Cylinder Head & Valve Train Components
- Intake Manifold (Carbureted)
- Exhaust Manifold System
- Rocker Arm Assemblies
- Camshaft Inspection
- Specialty Tools
- Piston-Crankshaft-Cylinder Block Components
- Connecting Rod Bearings
- Piston Pin
- Oiling System
- Oil Pump
- Oil Pump Clearances & Inspection

Chapter 6

Fuel System & Emission Control.....Page 109~128

- Components
- Van & Truck Full System Diagram
- Vacuum Routing Schematic (MT Vehicle)
- Vacuum Routing Schematic (AT Vehicle)
- Emission Control Main Control Box (MT & AT)
- Emission Control Full Schematic (MT)
- Emission Control Full Schematic (AT)
- Emission Control Electrical Schematic (MT)
- Emission Control Electrical Schematic (AT)
- Air Intake & Carburetor

- Carburetor Complete Exploded Parts View Diagram
- Float Bowl Setting (Sea Level~3000Feet Altitude Setting)
- Fuel Filter & Fuel Pump
- Fuel Pump Replacement
- Gasoline Tank & Removal
- Overheat Indicator (Dash Light)
- Exhaust Overheat Sensor
- Idle Control Unit & Testing

Chapter 7

Clutch.....Page 129~140

- Specialty Tools
- Clutch System Diagram
- Clutch Pedal & Cable Adjustment
- Release Bearing Inspection & Replacement
- Pressure Plate
- Clutch Disk & Inspection
- Flywheel
- Clutch Assembly

Chapter 8

Driveshaft & Axel.....Page 141~156

- Specialty Tools
- Rear Driveshaft (Axel) Removal
- Rear Driveshaft (Axel) Rebuild (CV Joints)
- Components & Inspection
- Rear Driveshaft (Axel) Assembly
- Front Driveshaft (Axel) 4WD Vehicle
- Front Driveshaft (Axel) Removal
- Front Driveshaft Rebuild
- Propeller Shaft (Driveshaft)

Chapter 9

Steering & Suspension.....Page 157~186

- Steering Components Diagram
- Steering Box Removal (Rack & Pinion)
- Gearbox Parts Exploded View
- Gearbox Overhaul
- Gearbox Assembly
- Steering Wheel Components
- Steering Column (With & Without Tilt Option)
- Steering Column Removal
- Tie Rod & Center Arm
- Tie Rod & Center Arm Removal
- Front & Rear Suspension Overview Diagram
- Wheel Alignment (Camber & Caster) Van & Truck
- Toe In & Toe Adjustment Van & Truck
- Wheel (Rim) Inspection
- Front Strut System 2WD
- Front Strut System 4WD
- Front Knuckle & Hub System 2WD
- Front Knuckle & Hub System 4WD
- Lower Arm, Stabilizer Bar, and Torsion Bar
- Front Strut Assembly
- Front Strut Removal & Replace-Inspection
- Rear Suspension & Components

Chapter 10

Brake System.....Page 187~200

- **Brake System Schematic Top & Side View**
- **Front Disk Brake Caliper System Components**
- **Front Disk Brake Pad Replacement**
- **Disk Brake Rotor Measurements & Inspection**
- **Master Cylinder System & 5 Way Directional Fluid Joint**
- **Master Cylinder Breakdown Components**
- **Brake Booster Components**
- **Rear Drum Brake System**
- **Pad & Drum Specifications**
- **Drum Brake Wheel Cylinder**
- **Parking Brake Handle and Cable System**

Chapter 11

Starter and Alternator Charging System.....Page 201~212

- **Starter Circuit Diagram**
- **Starter Terminal Identification (ND Nippon Denso & Hitachi)**
- **Starter Removal**
- **Starter Complete Schematic (ND Denso 0.6kw)**
- **Starter Complete Schematic (ND Denso 0.8 & 0.9kw Versions)**
- **Starter Complete Schematic (Hitachi 0.8kw Version)**
- **Vehicle Diagram**
- **Charging Circuit Diagram**
- **Alternator Circuit Test & Unit Removal**
- **Alternator Parts Schematic**
- **Rectifier Inspection & Circuit**
- **Brush Specifications**

Chapter 12

Heater & Air-conditioning.....Page 213~230

- Front and Rear Heater Unit Components
- Heater Control Circuit Diagram
- Heater and Damper Valve Position
- Front Blower Fan Removal
- Front Blower Assembly Breakdown
- Heater Unit Schematic and Heater Core
- Rear Heater Components (Optional Rear Heater)
- Heater Fan Switch(s) Pin Contacts & Positions
- A/C System Schematic (Truck)
- A/C System Schematic (Van Type 1)
- A/C System Schematic (Van Type 2)
- A/C Electrical Circuit Diagram
- Condenser Schematic Van
- Condenser Schematic Truck
- Compressor Breakdown

Chapter 13

Fuse and Relay Information.....Page 231~238

- Main Fuse Block 45A
- Fuse Box Universal Truck-Van Including A/C Vehicle
- Relay Locator
 1. Idle Control Unit (AT)
 2. Wiper Control
 3. Turn Signal
 4. Sub-Cooling Relays
 5. Chime
 6. AT Interlock
 7. A/C Compressor
 8. Radiator Fan
 9. Condenser Fan
 10. A/C Power Control Unit

Chapter 1

Specifications & Body Schematics

- **Acty Truck Specifications Chart**
- **Acty Van & Acty Street Versions**
- **Vehicle Identification & Code Locations**
- **Lift Points**
- **Jack Points**
- **Jack Stands**
- **Towing**
- **Body Schematics Truck M-HA3 M-HA4**
- **Body Schematics Van M-HA3 M-HA4**
- **E07A Engine (HP) & Torque Curves**
- **Truck Frame Specifications (Diagram)**
- **Van Frame Specifications (Diagram)**

Acty Vehicle Series



Acty Truck



Acty Van



Street

Acty Truck

Series		Acty						
Models		M-HA3				M-HA4		
Engine		E07A				E07A		
Size (cm³)		656(cc)				656		
Drive		2 WD				4 WD		
Type		STD	STD	SDX	SDX-II	SDX	ATTACK	
Transmission	4 MT	○	○	○				
	5 MT				○			
	MT 4 DUL/UR							○
	MT 5 4WD					○		
	AT 3 Speed				○			
Dealer Option AC		◎	◎	◎	◎	◎	◎	◎
Factory Installed AC				◎	◎	◎		

○ Standard Availability

◎ Option

Vehicle Specifications

Options

Acty Van

Model		Acty Van							
Use		Route Van							
Series		M-HH3				M-HH4			
Engine		E07A				E07A			
Size (cc)		656				656			
Drive		2WD				4WD			
Type		STD	PRO-B	PRO-T	SDX	SDX-2	PRO-B	PRO-T	SDX
Trans	MT 4 Speed	☐	☐	☐	☐				
	MT 5 Speed					☐			
	MT 5 4WD						☐	☐	☐
	AT 3 Speed				☐				
Dealer Cooler Option		☐	☐	☐	☐	☐	☐	☐	☐
Factory AC					☐	☐			☐
Rear Wiper		☐		☐	☐	☐		☐	☐ ¹
Delay Wiper Option		☐		☐	☐	☐		☐	☐ ¹

☐ Standard ☐ Option

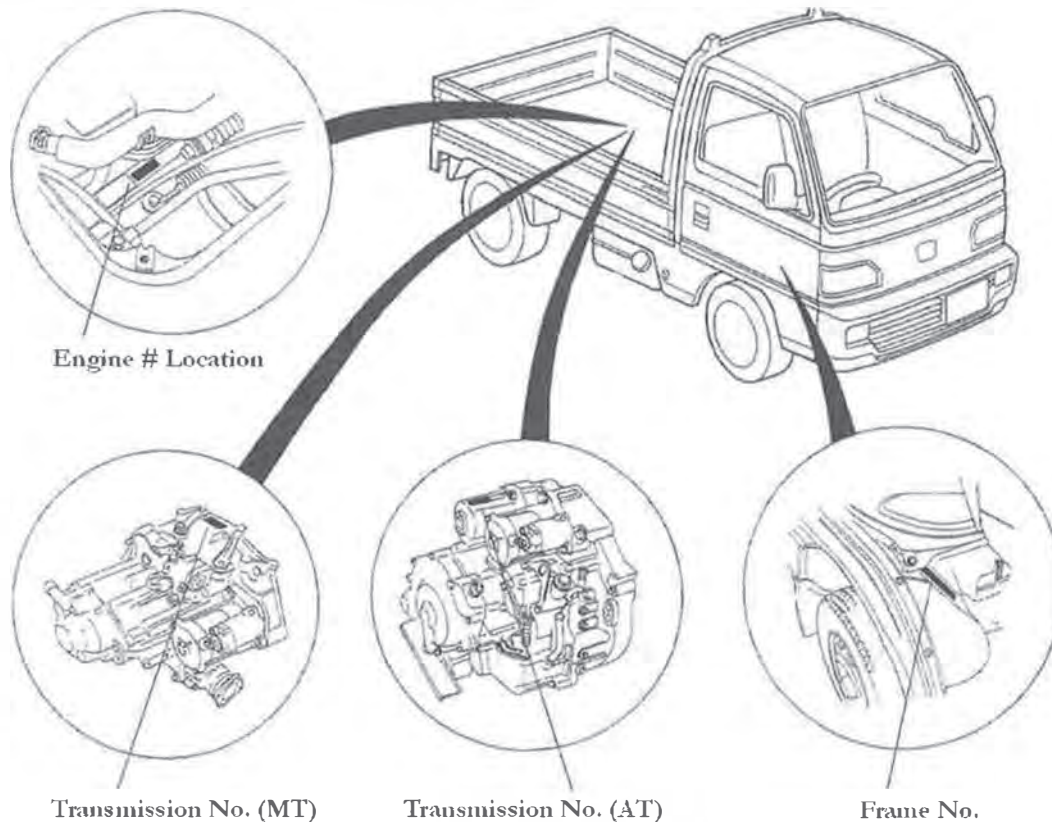
Acty "Street" Van

Model		Acty Street											
Use		Route Van											
Series		M-HH3						M-HH4					
Engine		E07A						E07A					
Size (cc)		656						656					
Drive		2WD						4WD					
Type		L		G		EX		L		G		EX	
Trans	MT 5 Speed	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>
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	AT 3 Speed	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Factory A/C		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stereo		<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sun Roof		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>
Rear Wiper		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delay Rear Wiper		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aluminum Wheels		<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dealer Option		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vehicle Identification

Note: SR=Series

Doors		Series	Frame #	Type		Engine		Manual (MT)		(AT)			
						Series	No. #	SR	No.	SR	No.		
TRUCK ACTY	3WAY 2D	M-HA3	HA3-1000001~	STD	2WD	E07A	E07A-1000001~	Z8	Z8-1000001~				
				STD				Z5	Z5-1000001~				
		SDX	Z8	Z8-5000001~									
		SDX-II	Z9	Z9-1000001~									
	M-HA4	HA4-1000001~	ATTACK	4WD	Z8			Z8-1000001~					
			SDX		Z9			Z9-1000001~					
VAN	3D	M-HH3	HH3-1000001~	STD PRO-B PRO-T	2WD			C A R B U R E T E	E07A-1000001~	Z8	Z8-1000001~		
				SDX						Z5	Z5-1000001~		
				SDX-II						Z8	Z8-5000001~		
		M-HH4	HH4-1000001~	PRO-B PRO-T SDX	4WD					Z9	Z9-1000001~		
				L G EX						Z8	Z8-5000001~	Z5	Z5-1000001~
				M-HH4						HH4-1000001~	L G EX	4WD	Z9



Lift Points

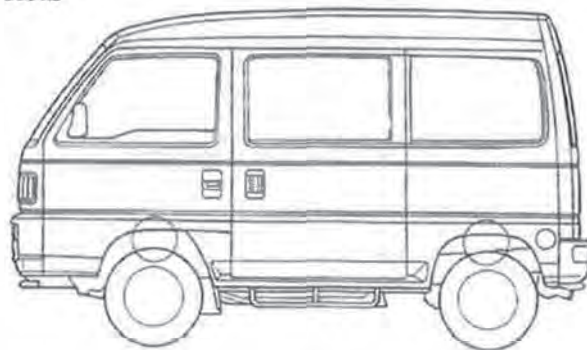
Truck



Front

Rear

Van

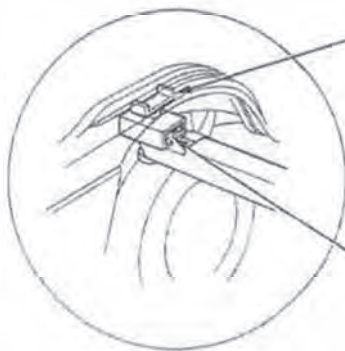


Front

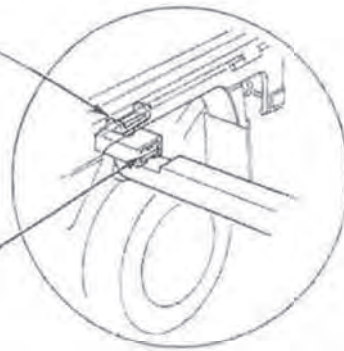
Rear

Front Wheelhouse

Rear Wheelhouse



Attachment



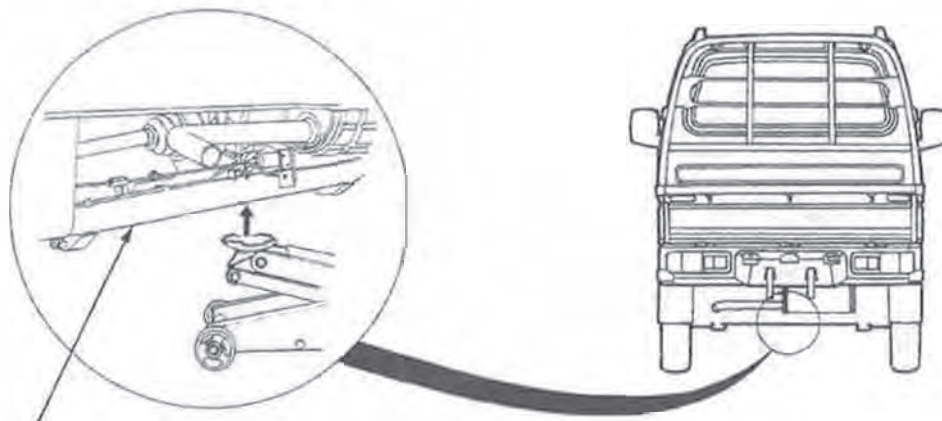
Lift Block

Jack Up Points

Front

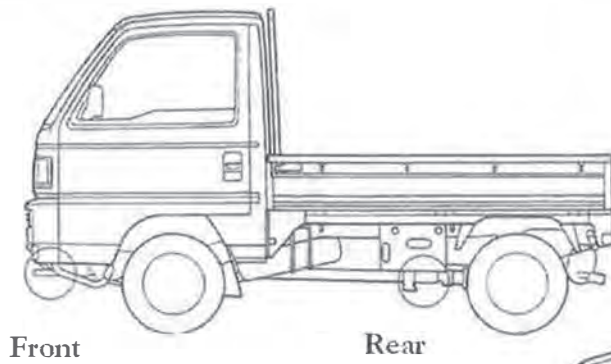


Rear



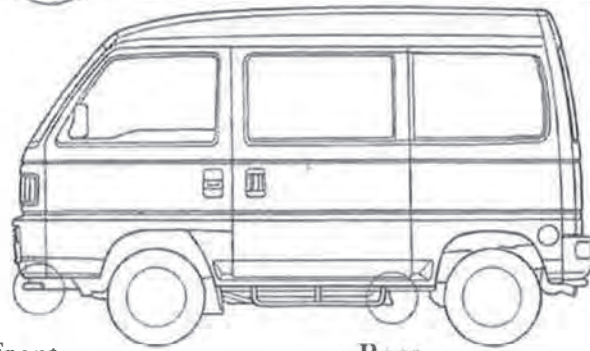
Rear Axel Beam

Jack Stand Locations



Front

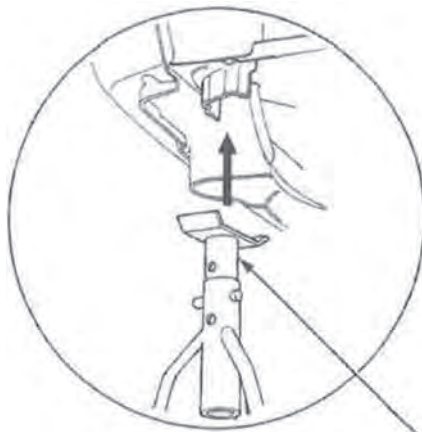
Rear



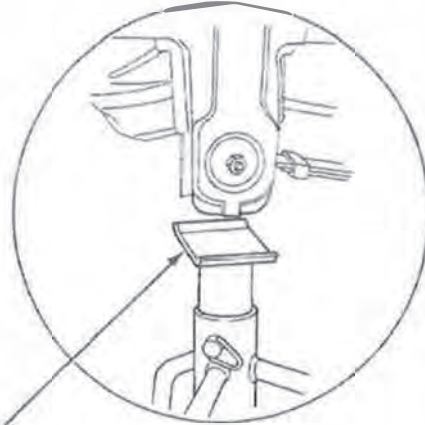
Front

Rear

Front Stand Corner



Rear Stand Bracket



Use This Type Jack Stand Head

Towing Attachment Point

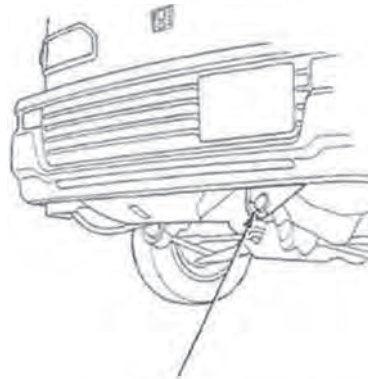
Note: Make Sure Parking Brake is Released During Towing.

Note: Make Sure Vehicle is in Neutral Position

Caution: Full Time 4WD Should Not be Towed Over 25MPH (40KPH)

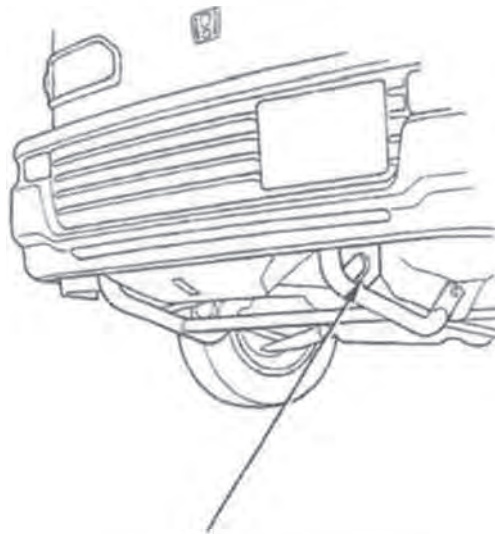
Caution: Full Time 4WD Should be Trailered For Long Distance

2WD



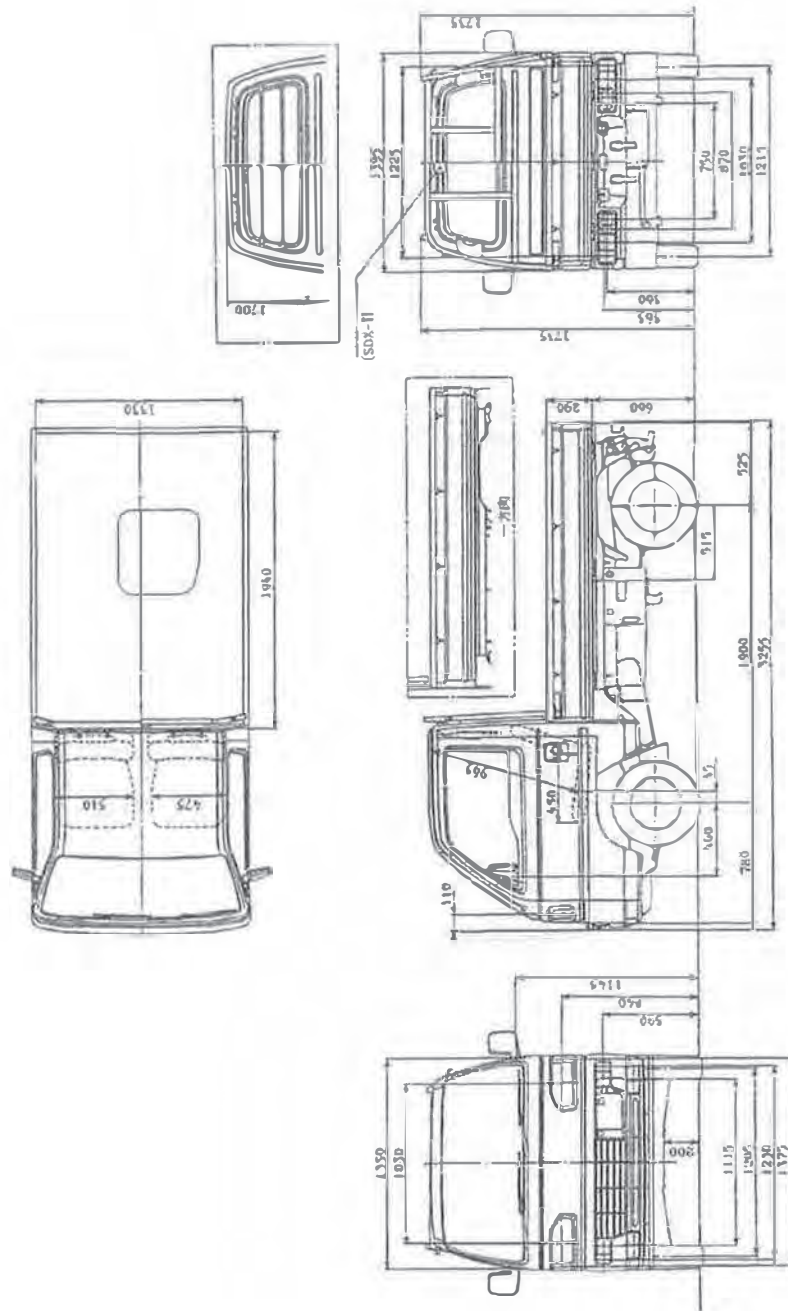
Attachment Point (Hook)

4WD



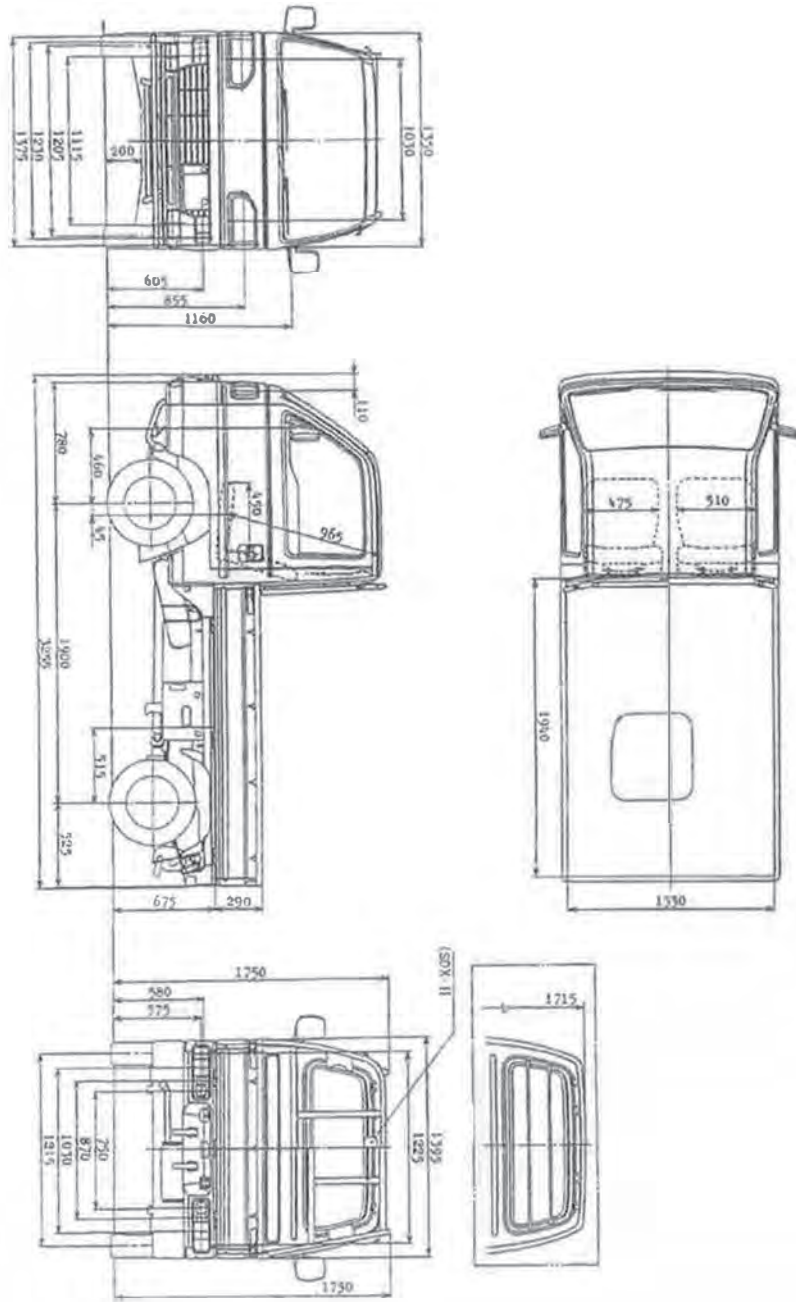
Attachment Point (Hook)

Truck
Series: M-HA3
L=mm



Body Schematic

Truck
Series: M-HA4
L=(mm)



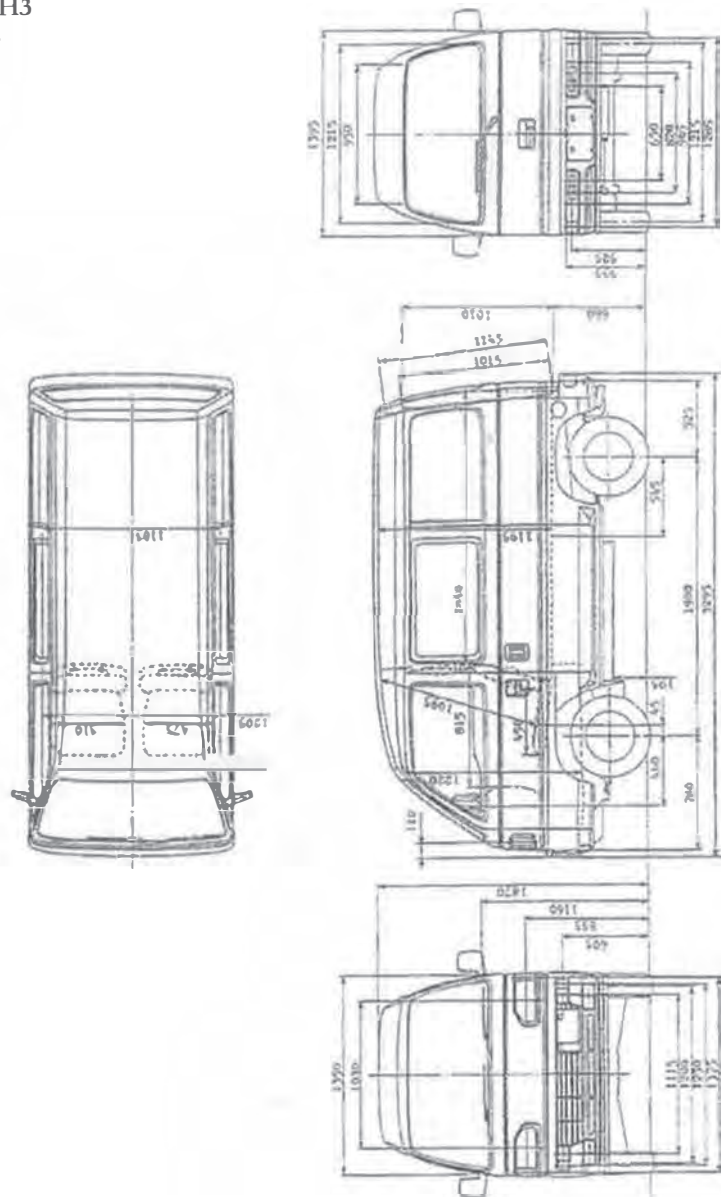
Acty STD, SDX, SDX-2



Note: *1=5MT
*2=3AT



Van
Series: M-HH3
Acty PRO-B

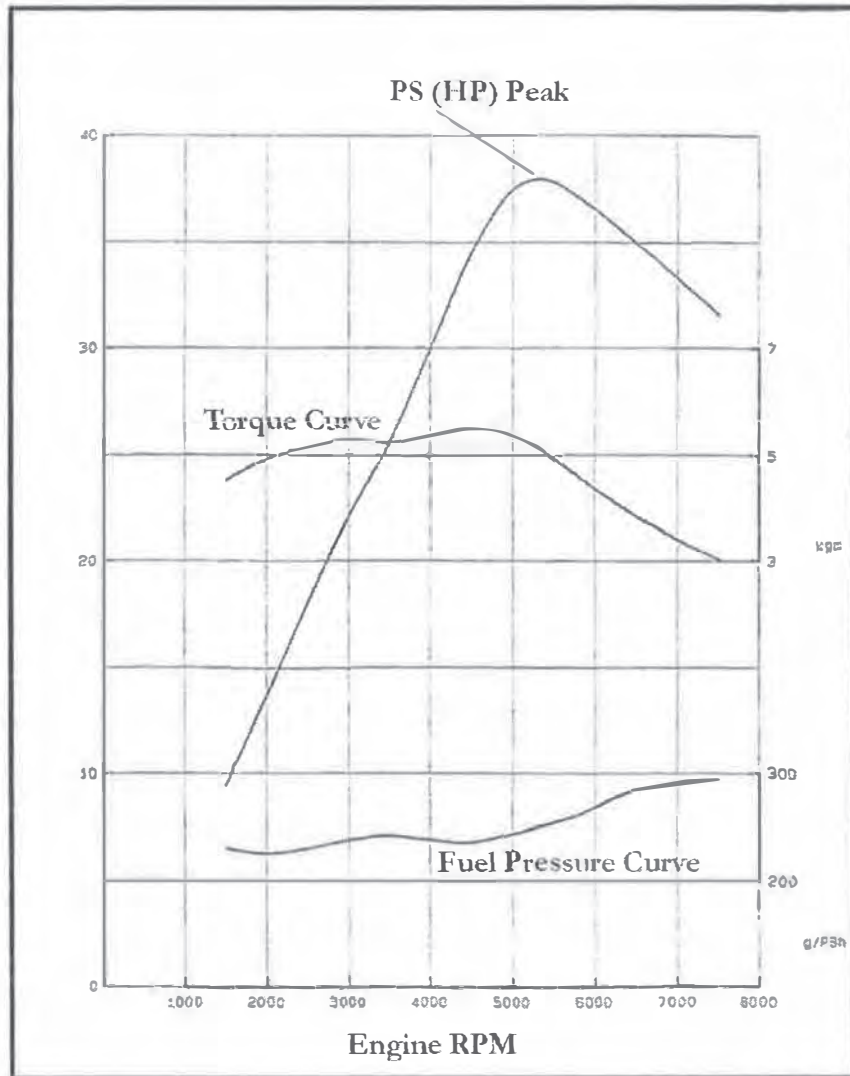


*1 = 5MT
*2 = 3AT



E07A Engine Torque & HP Curve

Honda Acty Truck



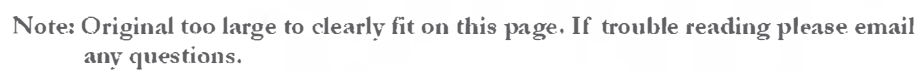
Torque Rating: kgm

PS (HP) (HP=Max 38.8HP)

Fuel Curve = g/PSH

Yokohamamotors.com Dynamometer Test 2008/5

Series: M-HA3 & HA 4



28

Chapter 2

Service Data Specifications

- Engine Specifications
- Fuel & Emission Control
- Clutch System
- Manual Transmission Clearances (2WD)
- Manual Transmission Clearances (4WD)
- Manual Transmission Clearances (4WD UL/UR)
- Front Differential Specifications (4WD)
- Steering
- Suspension & Alignment Specifications
- Brakes
- Air Conditioner (AC)
- Starter Motor
- Ignition Timing & Spark Plugs

Service Data

Engine

Part Name	Item		Benchmark	Limit Value
Engine	Compress Pressure(kg/cm ² -rpm)		14.0-250	9.5-250
Cylinder Head	Buckle surface between head and block		-	0.05
	Height		94.25-94.35	-
Camshaft	Directional Shaft		0.05-0.15	0.50
	Oil Clearance		0.050-0.089	0.150
	Distortion		0.015	0.030
	Height of Cam	IN	34.799	-
		EX	33.944	-
Valve	Valve Clearance (Cold)	IN	0.18-0.22	-
		EX	0.25-0.29	-
	Stem External Diameter	IN	5.48-5.49	5.45
		EX	5.45-5.46	5.42
	Stem and Guide Clearance	IN	0.02-0.05	0.08
		EX	0.05-0.08	0.11
Valve Seat	Finishing Seat Width	IN	0.95-1.25	1.60
		EX	1.15-1.45	1.80
	Valve Seat Sunken(Installation Height)	IN	45.76-46.24	46.49
		EX	46.26-43.74	43.99
Valve Spring	Free	IN	46.66	45.89
		EX	47.15	46.36
Valve Guide	Valve Guide Internal Diameter	IN,EX	5.51-5.53	5.55
Rocker Arm	Rocker Arm and Rocker Arm shaft Clearance	IN	0.017-0.050	0.080
		EX	0.018-0.054	0.080
Cylinder	Buckle surface between head and block		not over0.07	0.10
	Internal Diameter		66.00-66.02	66.07
	Error Internal Diameter		-	0.05
	Cylinder expansion limit		-	0.50
Piston	Skirt External Diameter at 20mm from Bottom		65.98-65.99	65.98
	Gap between Cylinder		0.010-0.040	0.040
	Ring width	Top	1.225-1.235	1.25
		Second	1.225-1.235	1.25
		Oil	2.805-2.825	2.850
Piston Ring	Gap between Piston	Top	0.040-0.065	0.130
		Second	0.035-0.060	0.130
	Joint Gap	Top	0.15-0.30	0.60
		Second	0.30-0.45	0.60
		Oil	0.2-0.5	0.60

Piston Pin	External Diameter	15.994-16.000	-
	Piston Pin and Piston Pin Clearance	0.010-0.022	-
Con Rod	Piston Pin Injection	0.013-0.036	-
	Piston Pin hole	15.964-15.981	-
	Large End directional Shaft	0.15-0.30	0.40
	Parallelism Large End and Small End	over 0.12/100	0.15/100

Part Name	Item		Benchmark	Limit Value	
Crankshaft	Journal Radius		39.976-40.000	-	
	Round-Out Limit		Not over 0.0025	0.010	
	Pin Radius		35.976-36.000	-	
	Circularity		Not over 0.0025	0.010	
	Shaft Directional Backlash		0.10-0.35	0.45	
	Distortion		Not over 0.015	0.030	
Bearing	Journal Oil Clearance		0.020-0.038	0.050	
	Pin Oil Clearance		0.020-0.038	0.050	
Recommended Engine Oil	APISF,10W-30 APISE	Oil (ℓ)	Disassemble	3.0	
		Exchange	2.7(With Oil Filter)		
			2.5		
Oil Pump	Structure		Trochoid Pump		
	Rating oil feed(ℓ/min-rpm)		25-6.000	-	
	Inner & Outer Chip Clearance		0.14	0.20	
	Outer & Body Radius Clearance		0.100-0.175	0.200	
	Rotor & Body Side Clearance		0.03-0.08	0.15	
Relief Bulb	Structure		Plunger		
	Hydraulic Adjustment[kg/cm ²]	Idling 80°C	Not under 0.7	-	
		80°C 3000 r p m	Not under 3.5	-	
Radiator			MT	AT	
	Cooling Water(ℓ)	Tank (Include Reserve Tank)	6.5	7.1	
		Include Reserve Tank 0.9ℓ	No Rear Heater	6.5	7.2
			With Rear Heater	6.7	7.4
	Radiator Limit (ℓ)(Include Reserve Tank)		4.0	4.7	
	Cap Valve Pressure(kg/Cm ²)		0.75-1.05		
Thermostat			Benchmark		
	Starting Temperature (°C) (0.35mmLifting)		76-80		
	Temperature		90		
	Full Bore lift		Not under 8		
Water Pump	Crankshaft rotation ratio		0.952		
	Water Conveyance(ℓ/min-rpm)		69-5.300		
Fan	Temperature Thermo switch (ON)		87-93		
	Temperature Thermo switch (OFF)		82-88		

Fuel & Emission Control

Part Name	Item		Benchmark
Fuel Pump	Discharge[cc/min]	Truck	400
		Van, MT	350
		Street AT	400
	Discharge Pressure[kg/cm ²]	Truck	0.06-0.10
		Van, MT	0.08-0.12
		Street AT	0.06-0.10
Fuel Tank	Content(ℓ)		37
Fast Idle RPM	(RPM)		AC 1200RPM
Idling(Non Load)	(RPM)		MT:1.000±50 1.150±50 (UL/UR) AT:950±50 (D Range)
Idling Emission(Non Load)	CO Concentration (%)		Below 3.0
	HC Concentration[ppm]		Below 900ppm

Clutch

Part Name	Item	Benchmark	Limit Value
Clutch Pedal	All Stroke	130-135	-
	Backlash	15-25	-
	Gap (Gap between Floor)	Not Under 79	-
Clutch Flywheel	Disk Surface Fluctuation	Under 0.05	0.15
Clutch Friction Disk	Surface Fluctuation	Under 0.6	1.00
	Galling (depth to rivet head)	Not Under 1.3	0.20
	Disk thickness	8.35-9.15	5.75
Clutch Cover Assembly	Pressure Disk Face Flatness	Under 0.03	0.15
	Diaphragm Spring	Under 0.8	1.00
Release Bearing	Internal Diameter	29.030-29.150	29.250
	Gap Between Guide Shaft	0.080-0.233	0.300

Manual Transmission 2WD

Part Name	Item		Benchmark	Limit
Recommended Transmission Oil	APISE,10W-30W or MTF		Dry	1.3
			change	1.2
Main Shaft	Directional Shaft		0.10-0.15	Shim adjust
	Ball Bearing External Diameter	A(Clutch Case Side)	21.940-21.960	21.903
		C(Transmission Case Side)	19.987-20.000	19.940
	B(Needle Bearing)External Diameter		24.987-25.000	24.930
	Distortion		Under 0.02	0.05
Counter Shaft	Directional Shaft		0.05-0.21	0.30
	C(Ball Bearing) External Diameter		19.987-20.000	19.930
	A(Clutch Case Needle Bearing)Diameter		24.9935-25.0065	24.940
	B(Needle Bearing)External Diameter		24.987-25.000	24.930
	Distortion		Under 0.02	0.05
Main 3rd Gear	Directional Shaft Gap		0.05-0.22	0.31
	Gear Height		28.45-28.50	-
	Internal Diameter		30.007-30.020	30.070
Main 4th Gear	Directional Shaft Gap		0.05-0.20	0.29
	Gear Height		27.45-27.50	-
	Internal Diameter		35.009-35.025	35.080
Main 5th Gear	Directional Shaft Gap		0.05-0.20	0.29
	Gear Height		25.45-25.50	-
	Internal Diameter		34.009-34.025	34.080
Counter 1st Gear	Directional Shaft Gap		0.04-0.12	0.18
	Gear Height		31.45-31.50	-
	Internal Diameter		31.009-31.025	31.080
Counter 2nd Gear	Directional Shaft Gap		0.05-0.10	0.18
	Gear Height		32.45-32.50	-
	Internal Diameter		38.009-38.025	38.080
Main Shaft Distance	External Diameter		29.987-30.000	29.930
	Internal Diameter		23.202-23.212	23.260
	Width	5speed	48.95-49.05	-
		4speed	63.95-64.05	-
Counter Shaft Distance	External Diameter		32.989-33.000	-
	Internal Diameter		26.980-26.991	-
	Width		30.5	-
Reverse Idle Gear	Internal Diameter		15.016-15.043	-
	Gap of Shaft		0.036-0.084	-

2WD (continued)

Part Name	Item		Benchmark	Limit
Blocking Ring	Gap between Gear		0.85-1.10	0.4
Shift Folk	Nail Thickness	1st-2nd	9.4-9.5	9.0
		3rd-4th	7.9-8.0	7.5
		5th	6.4-6.5	6.0
	Gap between Synchronizer Sleeve		0.45-0.65	1.00
	Internal Diameter	1st-2nd	12.000-12.043	-
		3rd-4th	12.000-12.068	-
		5th	12.000-12.043	-
	Gap between Shift Folk Shaft	1st-2nd	0.04-0.113	-
		3rd-4th	0.040-0.138	-
		5th	0.040-0.113	-
	Shift Arm B Sliding Groove Width		13.2-13.4	-
Reverse Shift Folk	Nail Groove Width		11.5-11.8	-
	Gap between Reverse Idle Gear		0.224-0.819	1.5
	L Groove Width		7.05-7.25	-
	Gap between Reverse Shift Piece		0.05-0.35	0.50
Shift Arm B	Sliding Diameter		13.973-13.986	-
	Shift Folk, Reverse Shift Piece		0.003-0.034	0.06
	Gap between Sliding and Select Arm		0.01-0.08	0.10
Reverse Shift Piece	Shift Arm B Sliding Groove Width		13.2-13.4	-
	Reverse Shift Folk Sliding External Diameter		6.9-7.0	-
Select Arm	Nail Width		11.00-11.03	-
	Gap Between Shift Arm B Sliding		0.01-0.08	0.10
Final Driven Gear	Backlash		0.087-0.146	0.200
Diff Case	Pinion Shaft Internal Diameter		15.000-15.018	-
	Gap between Pinion Shaft Internal Diameter		0.016-0.052	0.100
	Drive Shaft Internal Diameter		26.005-26.025	-
	Gap between Drive Shaft Internal Diameter		0.025-0.066	0.120
Diff Pinion Gear	Backlash		0.05-0.15	Use Washer 7 to Adjust
	Internal Diameter		15.042-15.066	-
	Gap between Pinion Shaft		0.058-0.100	0.15
Gap between Snap Ring and Bearing Outer Race			0-0.15	Use Snap Ling to Adjust

Manual Transmission 4WD

Part Name	Item		Benchmark		Limit
Recommended Transmission Oil	APISE,10W-30 or MTF		5 MT	Assemble	1.3
				Exchange	1.2
			4MT UL/UR	Assemble	1.5
				Exchange	1.4
Main Shaft	Directional Shaft		0.10-0.15		Shim to Adjust
	Ball Bearing External Diameter	A(Clutch Case Side)	21.940-21.960		21.903
		C(Transmission Case Side)	19.987-20.000		19.940
	B(Needle Bearing)External Diameter		24.987-25.000		24.930
	Bend Limit		Under 0.02		0.05
Counter Shaft	Directional Shaft		0.05-0.21		0.30
	C(Ball Bearing)External Diameter		20.987-21.000		20.930
	A(Clutch Case Needle Bearing)External Diameter		24.9935-25.0065		24.940
	B(Needle Bearing)External Diameter		24.987-25.000		24.930
	Bend Limit		Under 0.02		0.05
Main 3rd Gear	Gap Directional Shaft		0.05-0.22		0.31
	Gear Height		28.45-28.50		-
	Internal Diameter		30.007-30.020		30.070
Main 4th Gear	Gap Directional Shaft		0.05-0.20		0.29
	Gear Height		27.45-27.50		-
	Internal Diameter		35.009-35.025		35.080
Main 5th Gear	Gap Directional Shaft		0.05-0.20		0.29
	Gear Height		25.45-25.50		-
	Internal Diameter		34.009-34.025		34.080
Counter 1st Gear	Gap Directional Shaft		0.04-0.12		0.18
	Gear Height		31.45-31.50		-
	Internal Diameter		31.009-31.025		31.080
Counter 2nd Gear	Gap Directional Shaft		0.05-0.10		0.18
	Gear Height		32.45-32.50		-
	Internal Diameter		38.009-38.025		38.080
Main Shaft Distance Color	External Diameter		29.987-30.000		29.930
	Internal Diameter		23.202-23.212		23.260

	Width	5speed	48.95-49.05	-
		4speed	63.95-64.05	-
Counter Shaft Distance Color	External Diameter		32.989-33.000	-
	Internal Diameter		26.980-26.991	-
	Width		30.5	-
Reverse Idle Gear	Internal Diameter		15.016-15.043	-
	Gap of Shaft		0.036-0.084	-
Part Name	Item		Benchmark	Limit
Blocking Ring	Gap between Gear(Thrust Ring onto Gear)		0.85-1.10	0.4
Shift Folk	Nail Thickness	1st-2nd	9.4-9.5	9.0
		3rd-4th	7.9-8.0	7.5
		5th	6.4-6.5	6.0
	Gap between Synchronizer Sleeve		0.45-0.65	1.00
	Internal Diameter	1st-2nd	12.000-12.043	-
		3rd-4th	12.000-12.068	-
		5th	12.000-12.043	-
	Gap between Shift Folk Shaft	1st-2nd	0.04-0.113	-
		3rd-4th	0.040-0.138	-
		5th	0.040-0.113	-
	Shift Arm B Sliding Groove Width		13.2-13.4	-
Reverse Shift Folk	Nail Groove Width		11.5-11.8	-
	Gap between Reverse Idle Gear		0.224-0.819	1.5
	L Groove Width		7.05-7.25	-
	Gap between Reverse Shift Piece		0.05-0.35	0.50
Shift Arm B	Sliding Diameter		13.973-13.986	-
	Shift Folk, Reverse Shift Piece		0.003-0.034	0.06
	Gap between Sliding and Select Arm		0.01-0.08	0.10
Reverse Shift Piece	Shift Arm B Sliding Groove Width		13.2-13.4	-
	Reverse Shift Folk Sliding External Diameter		6.9-7.0	-
Select Arm	Nail Width		11.00-11.03	-
	Gap Between Shift Arm B Sliding		0.01-0.08	0.10
Final Driven Gear	Backlash		0.087-0.146	0.200
Diff Case	Pinion Shaft Internal Diameter		15.000-15.018	-
	Gap between Pinion Shaft Internal Diameter		0.016-0.052	0.100
	Drive Shaft Internal Diameter		26.005-26.025	-

4WD (continued)

Diff Pinion Gear	Backlash	0.05-0.15	Use Washer7 to Adjust
	Internal Diameter	15.042-15.066	-
	Gap between Pinion Shaft	0.058-0.100	0.15
Gap between Snap Ring and Bearing Outer Race		0-0.15	Use Snap Ring to Adjust

Part Name	Item	Benchmark	Limit
Companion Flange Shaft	A(Ball Bearing)External Diameter	27.980-27.993	27.925
Driven Gear Shaft	A(Tapered Roller Bearing)External Gear Side	30.002-30.018	29.950
	B(Tapered Roller Bearing)External Lock Nut Side	29.987-30.000	29.932
	Back Lash	0.10-0.15	-
Intermediate Shaft	A(Ball Bearing)External Diameter	23.980-23.993	23.925
	B(Needle Bearing)External Diameter	25.00-25.01	24.984
Half Shaft	Bearing External Diameter	34.975-34.991	34.923

Manual Transmission 4WD (UL/UR Version)

Part Name	Item		Benchmark	Limit
	Directional Shaft		0.10-0.15	Shim to Adjust
UL/UR Main Shaft	Ball Bearing Ext Diameter	A(Clutch Case Side)	21.940-21.960	21.903
		C(Transmission Case Side)	23.190-23.200	23.150
	Needle Bearing Ext Diameter	B(3Speed Gear)	24.987-25.000	24.930
		D(Main Idle Gear Side)	22.990-23.000	22.937
		E(UL/UR Case Side)	19.973-19.987	19.884
	Bend Limit		Under 0.02	0.05
UL/UR Counter Shaft	Directional Shaft		0.10-0.67	Shim to Adjust
	Needle Bearing Ext Diameter	A(Transmission Case Side)	34.992-35.008	34.938
		B(UL Gear External Diameter)	25.987-26.000	25.937
	C(Ball Bearing)External Diameter		19.977-19.990	19.943
UL/UR Idle Shaft	Needle Bearing Ext Diameter	A(Transmission Case Side)	12.708-12.719	12.756
		B(UL/UR Case Side)	16.989-17.000	16.937
UL Counter Gear	Internal Diameter		31.009-31.025	31.075
	Gear Height		27.95-28.00	-
UR Counter Gear	Internal Diameter		31.009-31.025	31.075
	Gear Height		26.5	-
UL/UR Idle Gear	Needle Bearing Ext Diameter	A(Transmission Case Side)	17.726-17.737	17.774
		B(UL/UR Case Side)	22.007-22.020	21.957
	Width		65.95-66.00	65.83
Shift Folk	Nail Thickness		UL-UR 6.4-6.5	-
	Internal Diameter		UL-UR 12.000-12.068	-
	Gap Between Shift Folk Shaft		UL-UR 0.040-0.768	-
UL/UR Piece Plate	Shift Arm B Sliding Groove Width		0.2-0.5	-
Distance Color	Needle Bearing External Diameter		25.987-26.000	25.937
	Internal Diameter		20.003-20.070	20.100
	Width A	A	22.000-22.050	-

	Width B	B	24.35-24.65	24.30
Blocking Ring	Gap Between Gear(Thrust Ring onto Gear)		0.85-1.10	0.40
Defrock L Side Half Shaft	Ball Bearing Ext Diameter		61.987-62.000	61.970
Diff-Lock Sleeve	Sleeve Groove Width		8.4-8.6	-
Diff-Lock Lever	Width		7.9-8.0	-
	Gap Between Nail and Sleeve Groove Width		0.4-0.7	0.9

Front Differential 4WD

Part Name	Item		Benchmark	Limit
Recommended Differential Oil	API GL-4 or	Oil(ℓ)	Dry	0.50
			Oil Change	0.46
Differential Carrier	Tapered Bearing Internal Diameter	Viscous	54.987-55.000	-
		Def Case Side	61.949-61.979	-
Differential Case	Pinion Shaft Internal Diameter		15.000-15.018	-
	Gap Between Pinion Shaft Internal Diameter		0.016-0.052	0.10
	Drive Shaft Internal Diameter		24.005-24.025	-
	Gap Between Drive Shaft Internal Diameter		0.025-0.055	0.120
Differential Pinion Gear	Backlash		0.10-0.15	Use Washer to Adjust
	Internal Diameter		15.042-15.066	-
	Internal Diameter		0.058-0.100	0.15
Drive Pinion	Backlash		0.10-0.15	Shim to Adjust
	Tapered Bearing External Diameter	Viscous	28.557-28.570	-
		Def Case Side	30.002-30.015	

Steering

Part Name	Item	Benchmark	Limit
Steering Wheel	Backlash (By Circumference)	0-10	-
Rack Guide	Angle after Return Adjustment Lock [Angle]	20°-25°	30°
Rack End	Sliding Torque(Lack End	5-30	~
Gear Box	Pinion Start-up Torque [kg-cm]	5-13	-

Suspension (Wheel Alignment)

Part Name	Item			Benchmark	Limit
Wheel Alignment	Total toe		Front Tire	IN 1±3	-
			Rear Tire	0±3	-
	Camber[Angle]	M-HA3	Front Tire	1.00'±1'	-
			Rear Tire	0.00	-
		M-HH3	Front Tire	1.20'±1'	-
			Rear Tire	0.00	-
		M-HA4 M-HH4	Front Tire	1.30'±1'	-
			Rear Tire	0.00	-
	Caster[Angle]	M-HA3,M-HA4,M-HH4		2.30'±1'	-
		M-HH3		2.50'±1'	-
	R/L Rotation Angle	Inside	M-HA3,M-HH3	40.00'±2'	-
			M-HA4,M-HH4	39.30'±2'	-
		Outside	All Type	35.00'	-
	Side Slip		Front	0±3	-
			Rear	-	-
Wheel	Steel Wheel Fluctuation		Horizontal Fluctuation	0-1.0	-
			Vertical Fluctuation	0-0.8	-
	Steel Wheel Fluctuation		Horizontal Fluctuation	0-0.3	-
			Vertical Fluctuation	0-0.3	-
	Model		Matching Tire		Matching Wheel
	Truck		5.00-12-4PR ULT <STD,ATTAC> 145R12-6PR LT <SDX,SDX- II >		12.x3.50B(Copper) 12x3 1/2J (Aluminum Alloy)
	Van, Street		5.00-12-4PR ULT <STD> 145R12-6PR LT <Van,Street4WD Except STD> 1.45SR12<Street 2WD>		12x3.50B(Copper) 12x3 1/2J (Aluminum Alloy)

Standard Equipment	Item		Benchmark	
	Pitch Circle Diameter(P.C.D)		100(All Wheel Disk)	
	Off Set		40(All Wheel Disk)	
Wheel Bearing			Benchmark	Limit
	Front Wheel Bearing		0(Shaft Direction)	0.05
	Rear Wheel Bearing		0(Shaft Direction)	0.3

Brake

Part Name		Item	Benchmark	Limit
Parking Brake Lever	Pull Test (Operation Ability20kg)		8-12notch	-
Brake Pedal	Pedal Height(from Floor Surface)		145	-
	Backlash		1—10	-
Master Cylinder	Gap between Master Schilling and Booster Push rod		0.2±0.2	-
Front Disk Brake	Disk Thickness		12.0	10.0
	Disk Fluctuation		-	0.10
	Disk Parallelism		-	0.015
	Pad Thickness		8.5	3.0
Rear Drum Brake	Gap between Brake Drum and Lining		Auto Adjustment	
	Lining Thickness		4.5	2.0
	Internal Diameter of Brake Drum		200.0	201.0
Master Power	Discharge Side Hydraulic	Negative Pressure[mmHg]	Pedal Force[kg]	Hydraulic Output[kg/cm ²]
		0	20	Not Under17.4
		300	20	Not Under37.6
		500	20	Not Under51.0

Air Conditioning

Part Name		Item	Benchmark
Air Conditioner System	Lubricating Oil[cc]	Capacitor	
		Cooling Unit	
		Receiver	
		Piping	
Compressor	Lubricating Oil[cc]		60-80
	Clutch Resistance[Ω] (at20°C)		2.7-3.3
	Gap between Pulley and Flange		0.3-0.6(Case Internal Pressure4kg/cm ²)
Air Conditioner Belt	Deflection(Pressure onto Center Belt 10kg)	Inspection	9.0-12.0
		Brand new	7.0-10.0
	Tensile[kg]	Inspection	22-40
		Brand new	35-60

Electrical (Starter Motor)

Part Name		Item	Benchmark	Limit
Starter Motor	Maker/Output[kW]		NIHON DENSO/0.6	
	Mica Depth		0.4-0.5	0.2
	Fluctuation		0-0.05	0.4
	External Diameter		28.0	27.0
	Brush Length		10.0	6.0
	Brush Spring Pressure(Brand New)[kg]		0.9-1.5	-
Starter Motor	Maker/Output[kW]		NIHON DENSO/0.8,0.9	
	Mica Depth		0.4-0.8	0.2
	Fluctuation		0-0.05	0.4
	External Diameter		28.0	27.0
	Brush Length		16.0	10.0
	Brush Spring Pressure(Brand New)[kg]		1.2-2.0	-
Starter Motor	Maker/Output[kW]		HITACHI/0.8	
	Mica Depth		0.5-0.8	0.2
	Fluctuation		0-0.1	0.4
	External Diameter		40	39.0
	Brush Length		15	11.0
	Brush Spring Pressure(Brand New)[kg]		2	-

Ignition Timing & Spark Plugs

Part Name	Item		Benchmark
Ignition Timing	MT	4MT,5MT	4±2°/1,000
			4±2°/1,150
	AT		4±2°/950
Spark Plug	Model * Standard	NGK	BKR5E-11 *BKR6E-11 BKR7E-11
		ND	K16PR-U11 *K20PR-U11 K22PR-U11
	Electrode Gap		1.0-1.1

Chapter 3

General Maintenance and Tune-Up

- Required Tools This Chapter
- Radiator Cap Test
- Coolant Requirements
- Oil Change and Capacities
- Oil Filter & Part Numbers
- Oil Pressure Testing
- Air filters & Part Numbers
- Spark Plugs & Part Numbers
- Engine Compression Testing
- Alternator & AC Belts
- Valve Clearance Setting
- Carbureted Vehicle Idle Settings
- AC Equipped Idle Up Settings
- CO – HO Level Settings (Carbureted)
- Timing Adjustment & Settings

Tools

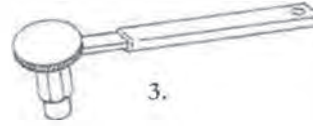
No.	Tool Number	Tool Name
①	07HAA-PJ70100	Oil Filter Socket
②	07406-0030000	Oil Pressure Gage Attachment
③	07JAA-PN40100	Socket Wrench
④	07GAZ-SE00300	RPM Adapter (Pick up)



1.



2.



3.

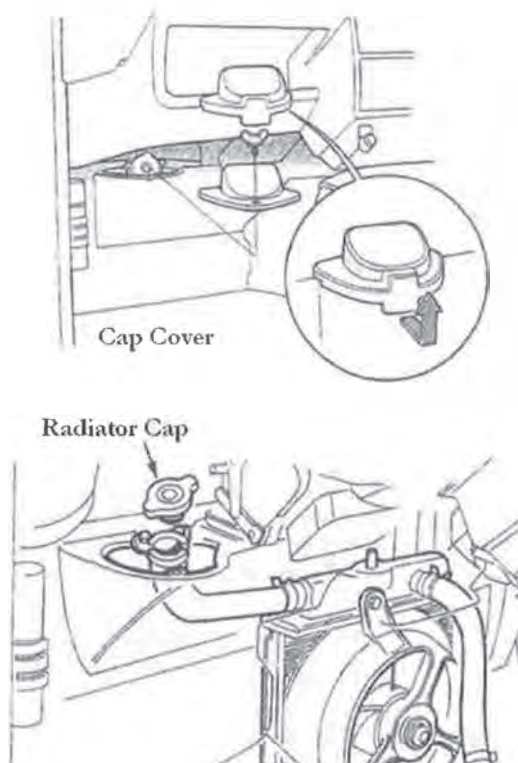


4.

Engine Maintenance & Tune-Up

Radiator Cap Test

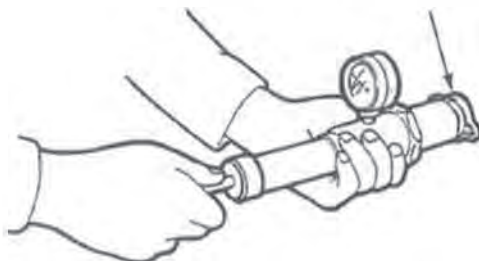
Caution: Remove Cap Only When Engine Cool



1. Remove Cap
2. Attach to Pressure Tester, Pump Up and Hold 6 Seconds.

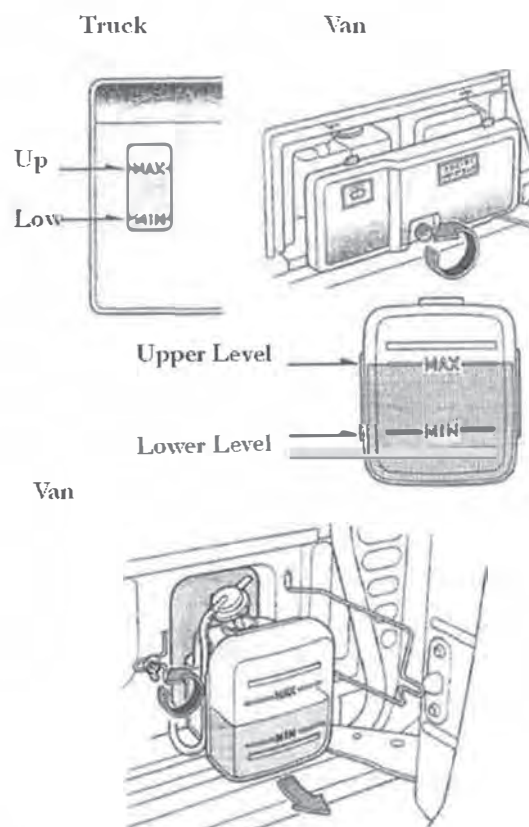
Correct Range: 0.75-1.05kg-cm²

Radiator Cap Pressure Test



Reserve Coolant Inspection

- 1 Visually Inspect Reserve Tank Side Markings for Proper Level.



Note: Do Not Add Water, Only Coolant to Reserve Tank

Note: More Details Located in Radiator Section of this Book

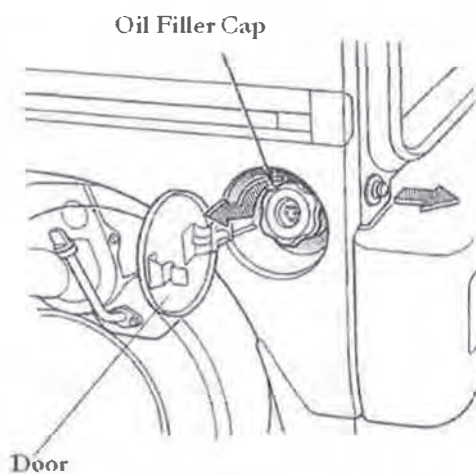
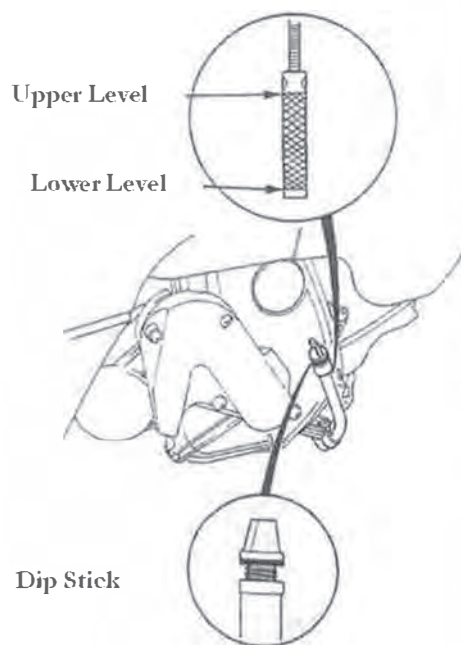
Total Coolant Capacity

Truck	MT : 8.5 l	AT : 7.1 l
	MT : 8.5 l	AT : 7.2 l
Van	Rear Heater (Y) MT : 8.7 l	AT : 7.4 l

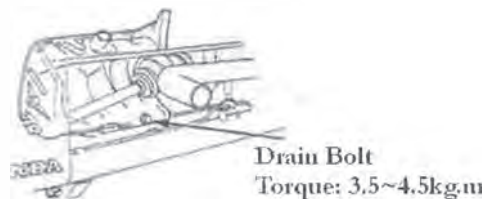
Oil Change

Remove Dip Stick and Check Oil Level

Note: If Oil is Dirty Drain Oil, Replace Filter, Add New Oil Re-Check Level



Use Diagram Below and Drain Oil (Filter Removal Next Page)



Oil Temperature Range

Normal 0°C~40°C 10W 30
Cold -30°C~0°C 5W 30

Capacity:

Engine Oil + Filter = 3.0 Liter
Engine Oil = 2.7 Liter

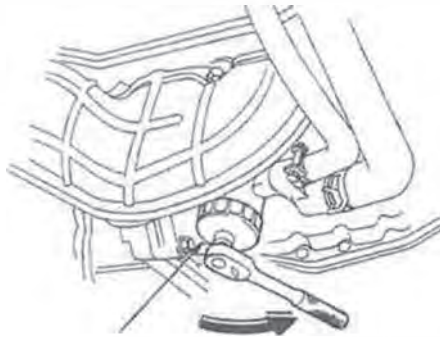
Change Interval: Every 6 Months or
10,000 Kilometers
(6250 Miles)

Extreme Cold: Change Every 3 Months

Oil Filter

Replacement

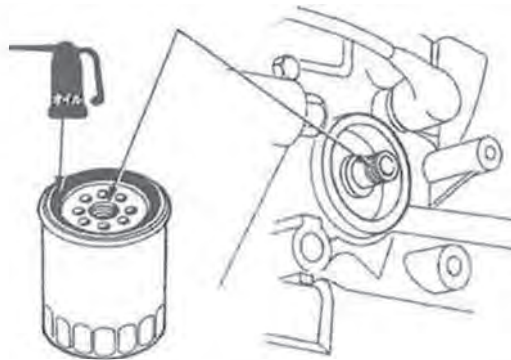
Left is Loose, Right is Tight



Socket

Tool 07HAA-PJ70100

Coat These Areas With Fresh Oil



Note: Do NOT Over Tighten Filter



General Maintenance

Oil Pressure Check

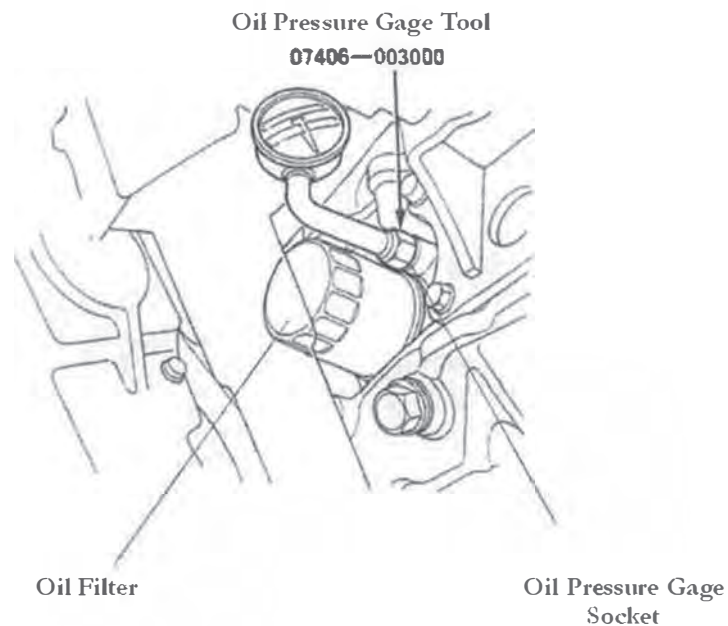
Note: Before Checking Oil Pressure Make Sure Oil Level is Correct

Note: Change Oil and Filter if Oil is Dirty Before Test

Use Tool 07406-003000 Oil Pressure Gage Attachment

1. Attach RPM Meter
2. Remove Oil Pressure Switch
3. Attach Pressure Gage (1/8 Inch)

Note: Due to Tight Clearance Issues it Maybe Necessary to Remove Oil Filter to Attach Pressure Gage. After Attaching Gage Attach Oil Filter



4. Start Engine and Warm to Operating Temperature
5. At Idle Oil Pressure Reading 0.7 kg/cm²
6. Increase RPM to 3000 RPM. Reading 3.5 kg/cm²
7. Reading are Correct Remove Gage and Replace Pressure Switch

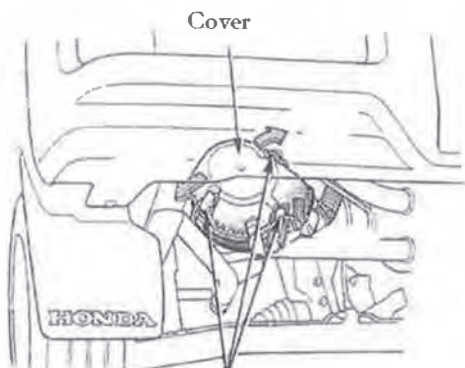
Note: Failed Readings Continue to Oil Pump Replacement Section of This Book

General Maintenance

Air Filter Element

Replace Air Element 12,000 Kilometers

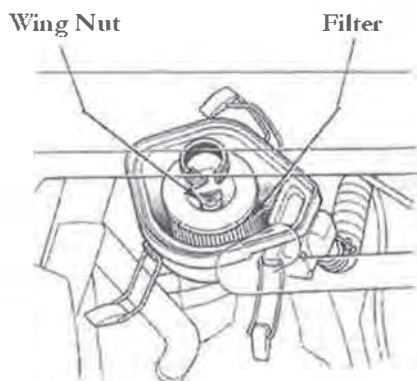
Remove Cover by Un-Snapping Clips



Retainer Clips (Un-Snap)

Remove Wing Nut and Slide Out Filter

Note: Before Replacing Air Filter Clean Container Area



Engine: E07A

Series: M-HA3 - HA4

M-HH3 - HH4

Part Numbers

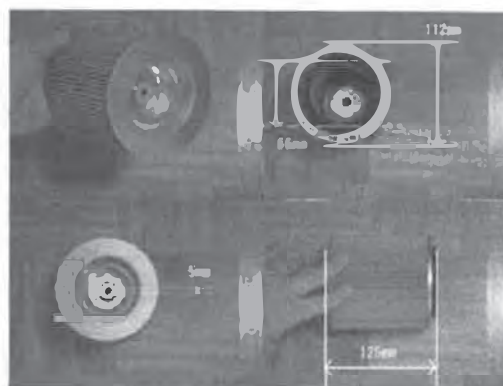
TOYO: TO-3670

MICRO: A-60

NKK: 4HM-1046

PMC PA-5623

Size Dimensions

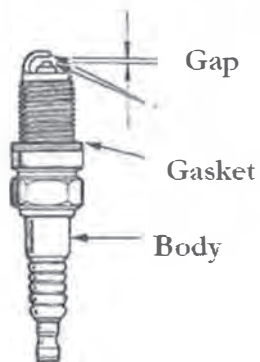


General Maintenance

Spark Plugs

Replace Spark Plugs **48,000 Kilometers**

Note: Champion **IRIDIUM** Replace at **160,000 Kilometers**



Spark Plug Gap

A = 1.0~1.1mm



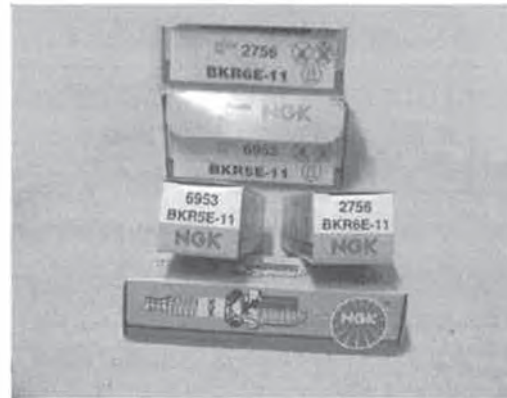
Note: Spark Plug Torque: 1.5kg-m

Spark Plug Part Numbers

USA Champion **IRIDIUM** #9001

DENSO: K16R-U11, K16PR-U11, Q16PR-U11

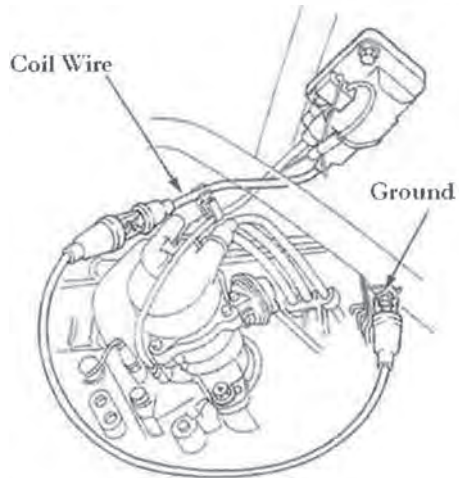
NGK Series



Note: DENSO & NGK Series Replace at 48,000K

General Maintenance

Engine Compression Check



1. Remove Turn Signal 15A Fuse from Fuse Box

Note: Removing Turn Signal Fuse Will Disable Fuel Pump

2. Disconnect Coil Wire from Distributor and Connect to Ground as in the Diagram on the Left

3. Remove All 3 Spark Plugs From Engine

Attach Compression Gage to Cylinder 1

Caution: Be Careful When Turning Over Engine

Note: Starter Motor = 250RPM Speed

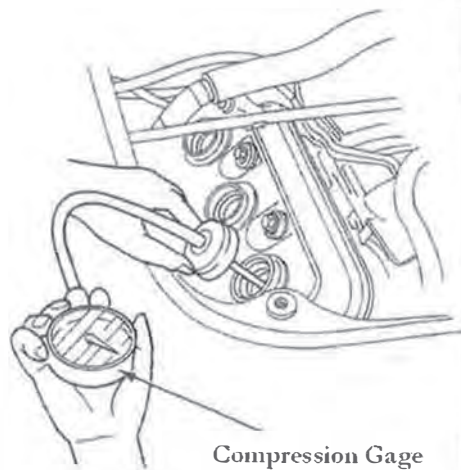
In Range: 14.0kg/cm² @ 250RPM

Out of Range: 9.5kg/cm² @ 250RPM

Check all Cylinders

Note: Cylinder Balance Must Not Have a Difference Within 2.0kg/cm²

Note: If Compression FAILS Check Valve Settings. Re-Set Valves and Re-Test



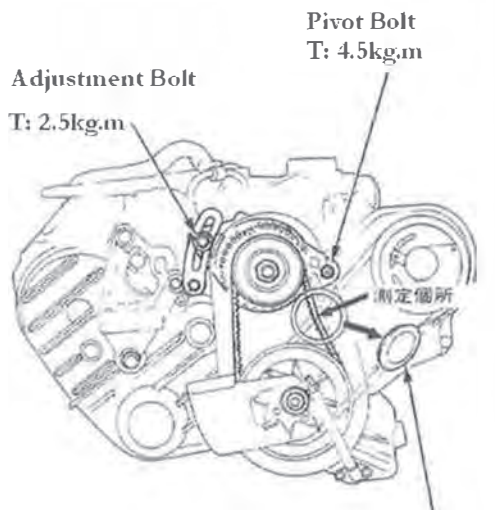
General Maintenance

Accessory Belts (Alternator)

Belt Inspection

Note: Alt Belt/AC Belt Change 68,000K

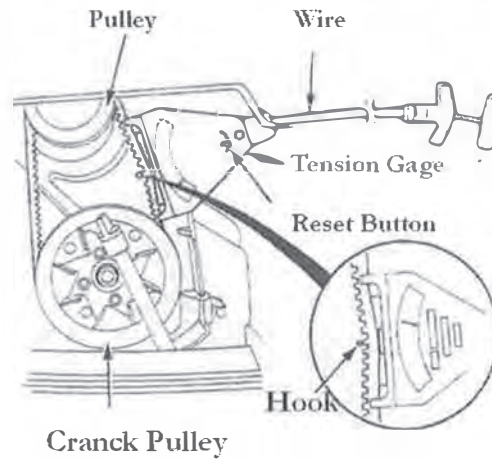
1. Visually Inspect Belts for Wear
2. Remove Inspection Grommet



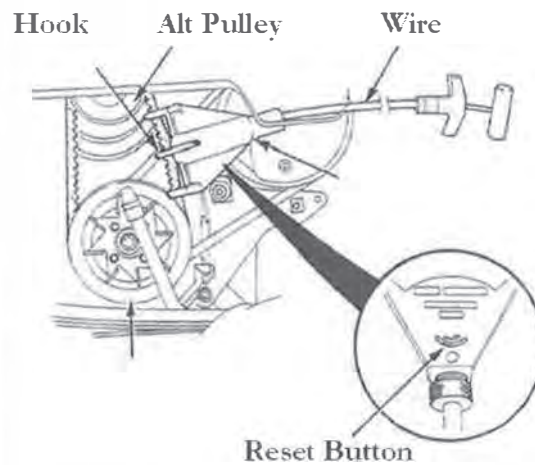
Inspection Grommet
(Remove)

3. Test Tensioner Gage on a Known Weight. Reset to Zero

4. Attach Hook to Belt



5. Belt Tension 20~30kg
Travel 9~12mm

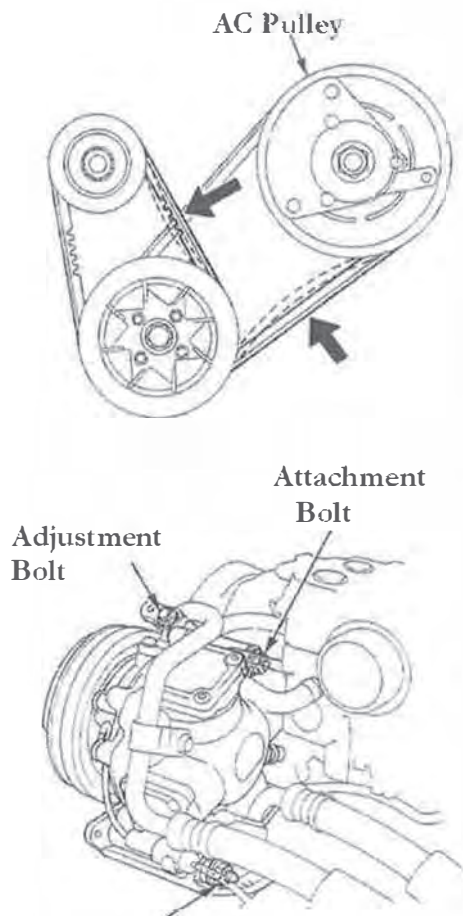


6. After Adjustment Repeat Test
(Reset After Each Test)

General Maintenance

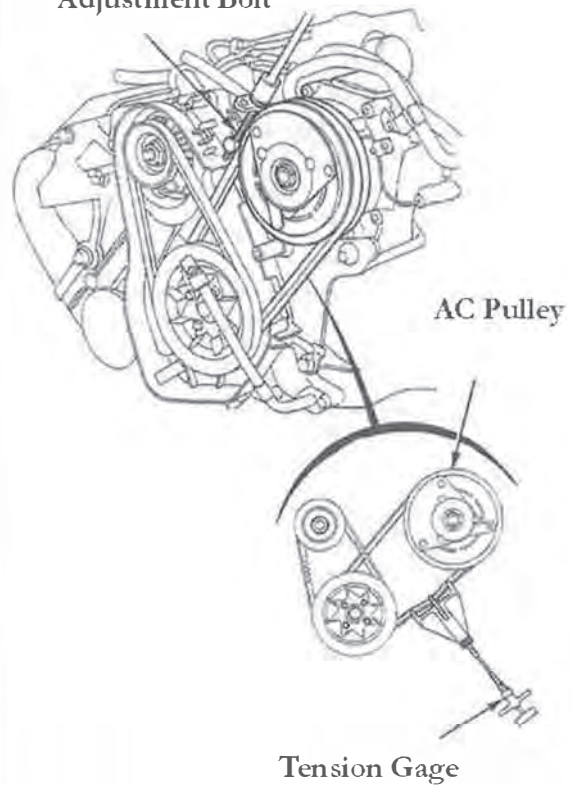
(AC Compressor Belt)

Belt Diagram



Attachment Bolt

Adjustment Bolt



Tension Gage

New Belt Reading: 35~60kgf
In Place Belt Reading: 22~40kgf

Replace AC Belt: 68,000K

Note: Check AC Fluid When Replacing
Belt

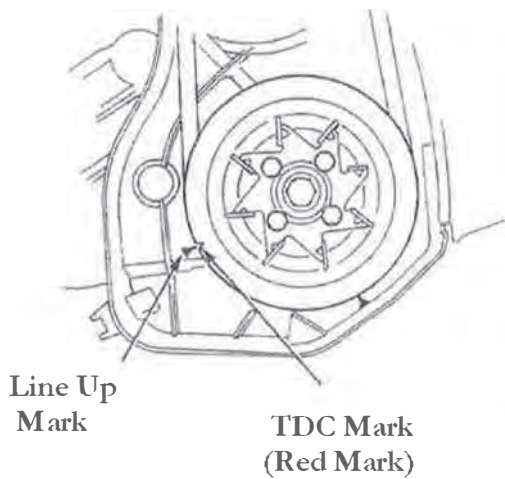
General Maintenance

Valve Clearance

Note: For Detailed Instructions on Timing Belt System See Timing Belt Section of this Book

1. Remove Appropriate Covers and Set Engine to Cylinder #1 at TDC
2. Verify Cranshaft Positioning Marks as Shown in the Diagram Below

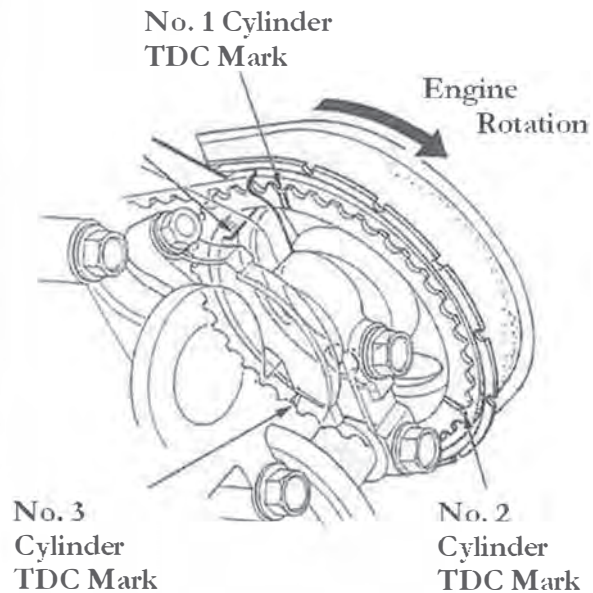
Crankshaft Mark (Red)



3. Remove Valve Cover

Note: Do Not Re-Use Valve Cover Gasket

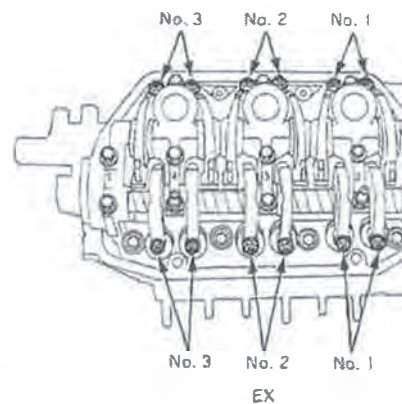
4. Verify Cam Pulley is Pointing to No. 1 Cylinder TDC Position



Valve Positions

IN= Intake

EX= Exhaust



General Maintenance

Valve Clearance

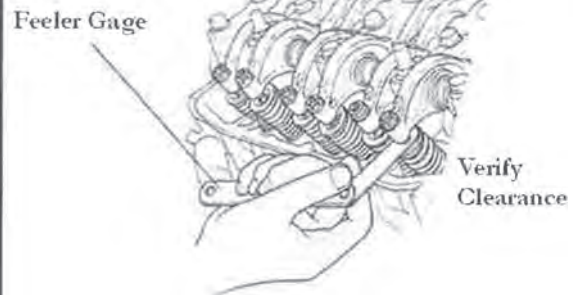
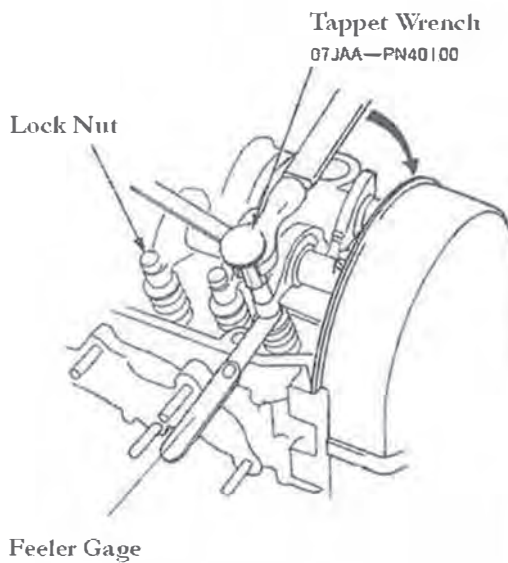
Note: Set Valve Clearance "Cold".

IN= Intake EX= Exhaust

IN: 0.18~0.22mm

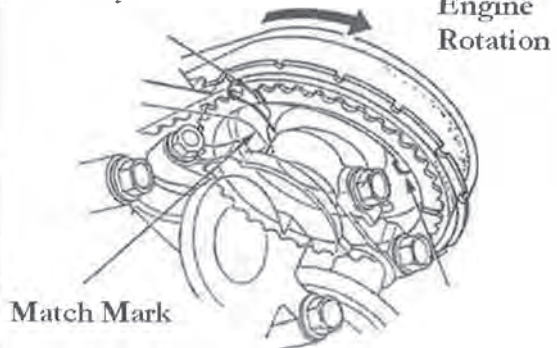
EX: 0.25~0.29mm

Adjustment Procedure

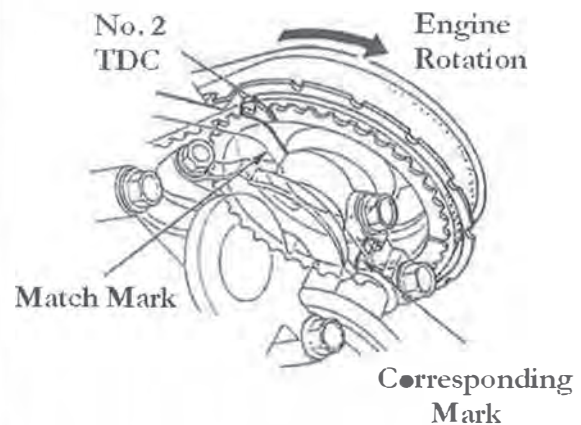


1. Set Cylinder No.1 and Then Rotate Cam Pulley 120 Degrees to Set Cylinder No. 3

No. 3 Cylinder TDC



2. Next Rotate Cam Pulley 120 Degrees to Set Cylinder No. 2

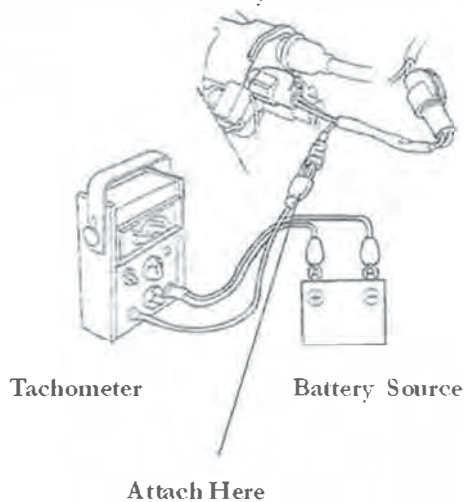


Note: Do Not Re-Use Valve Cover Gasket

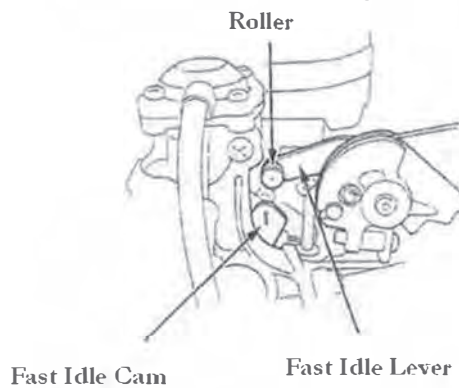
General Maintenance

Carbureted Idle Setting

Note: If 3 Cylinder Tachometer is Not Available Use 6 Cylinder and Calculate



1. Run Engine Up to 3000 RPM for 2 Minutes and Let Idle
 2. Remove Carburetor Cover and Disconnect Fast Idle Roller
- Note: Re-Connect After Idle Setting



Set Idle

Idle RPM Specifications:

MT Vehicle 1000+/-50RPM

1150+/-50RPM (4WD Truck UL/UR)

AT Vehicle 950+/-50RPM

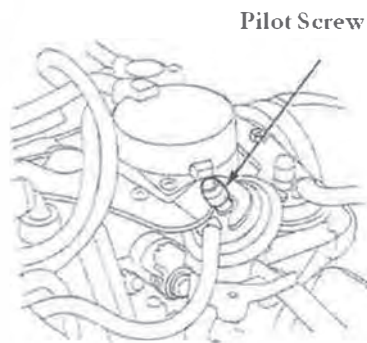
Note: AT Set in "D"

Adjustment Screw



Note: If Idle Does Not Set Properly Check Ignition Timing

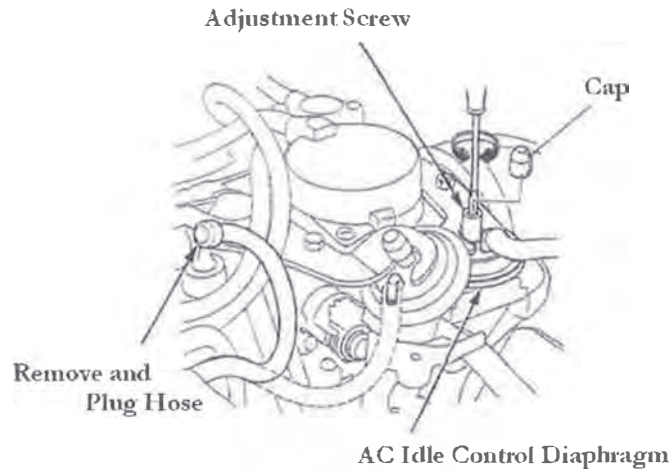
Note: If Ignition Timing is Set Correctly Check Pilot Screw In diagram Below



General Maintenance

AC Idle Up Adjustment

Note: Only AC Equipped Vehicles



Idle Speed AC Engaged

MT Vehicles: 1350+/-50 RPM (Truck)

1100+/-50 (Street, Van)

AT Vehicles: 950+/-50RPM ("D" Drive Position)

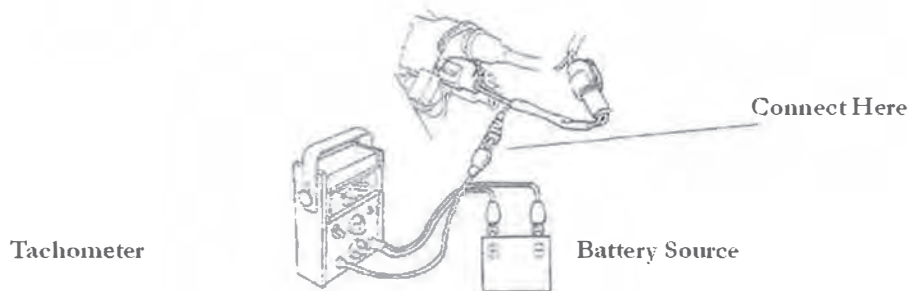
1. Unplug Vacuum Hose as Shown in the Above Diagram and Plug
2. Remove Adjustment Screw Cap Cover
3. Attach Tach and Set Idle Speed to Specifications.

Note: Erratic Idle Can Be Caused By Incorrect Timing Settings.
Vacuum Leaks Can Fail to Open Diaphragm

General Maintenance

CO & HO Levels

Note: If 3 Cylinder Tachometer is Not Available Use a 6 Cylinder Tachometer and Calculate



1. Connect Tachometer and Set Idle Speed To Specifications

Idle Speed

MT Vehicle: 1000+/-50 RPM

1150+/-50RPM (4WD Truck UL/UR)

AT Vehicle 950+/-50RPM (Set in "D" Drive)

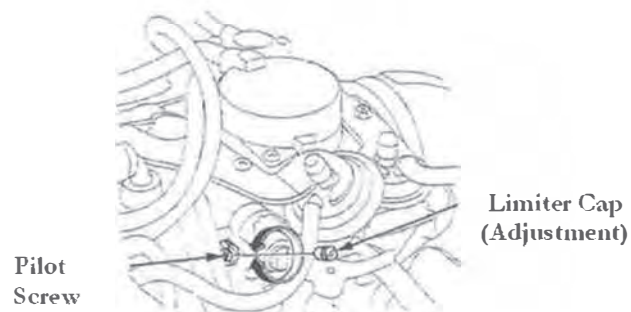
CO Level at Idle: =Below 3.0%

HO Level at Idle: =Below 900ppm

Note: Warm Engine and Place Sniffer into Tail Pipe

2. Remove Caps from Pilot Screw and Limiter Screw

3. Use Screws to Slowly Adjust CO & HO Levels



Note: After Turning Screws Wait Minimum 3~5 Minutes for Results

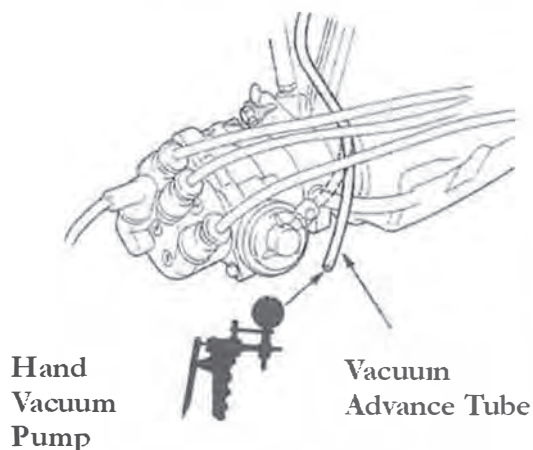
Note: If Levels Can Not Be Adjusted Within Limits Check The Following

1. Ignition Timing
2. Spark Plugs
3. Distributor Cap and Rotor
4. Valve Clearance
5. Carburetor

General Maintenance

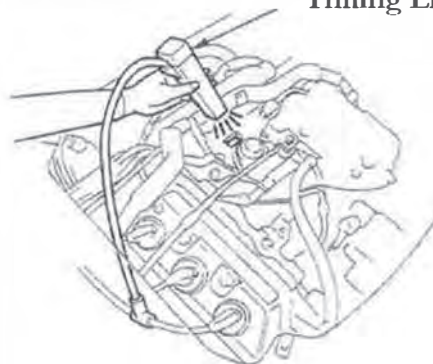
Timing Settings

Distributor Vacuum Test



1. Warm Engine to Operating Temperature
2. Disconnect Vacuum Advance Hose and Attach to Vacuum Pump/Gage
3. No Vacuum Should Be Present at Idle, Vacuum Detected Replace Thermo-Valve and Re-Test
4. Run Engine To 1200~5000 RPM. Vacuum Should be Present Entire Range. No Vacuum Replace Thermo-Valve

Timing Light



Note: Not Necessary to Disconnect Vacuum Hose For Idle Timing

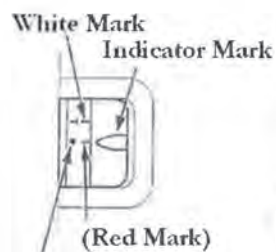
1. Attach Timing Light To Cylinder #1 Spark Plug Wire. Set to Specifications

MT	4° BTDC / 1000 (1150) rpm
AT	4° BTDC / 950 rpm

MT = Manual Transmission

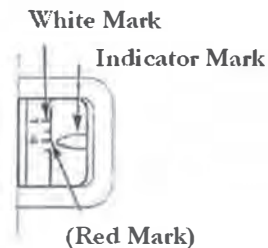
AT = Automatic Transmission

MT Vehicle



Initial Timing
(Point Mark)

AT Vehicle



MT = Red to Indicator Mark = 4° BTDC

AT = Red or (4) Mark = 4° BTDC

Chapter 4

Engine Cooling System

- Coolant System Diagrams & Capacities
- Coolant System Pipe & Hose Routing Components
- Radiator Removal
- Cooling System Air Bleeding
- Thermostat Replacement
- Thermostat Specifications & Testing Procedure
- Water Pump Testing & Removal Procedure
- Cooling Fan Relay & Sensor Location
- Sub-Cooling Control Sensors (Van)
- Sub-Cooling Control Sensors (Truck)
- Thermo-Switch & Sub-Cooling Sensor Testing
- Radiator Fan/Condenser Fan/sub-Cooling Relay

Engine Cooling System

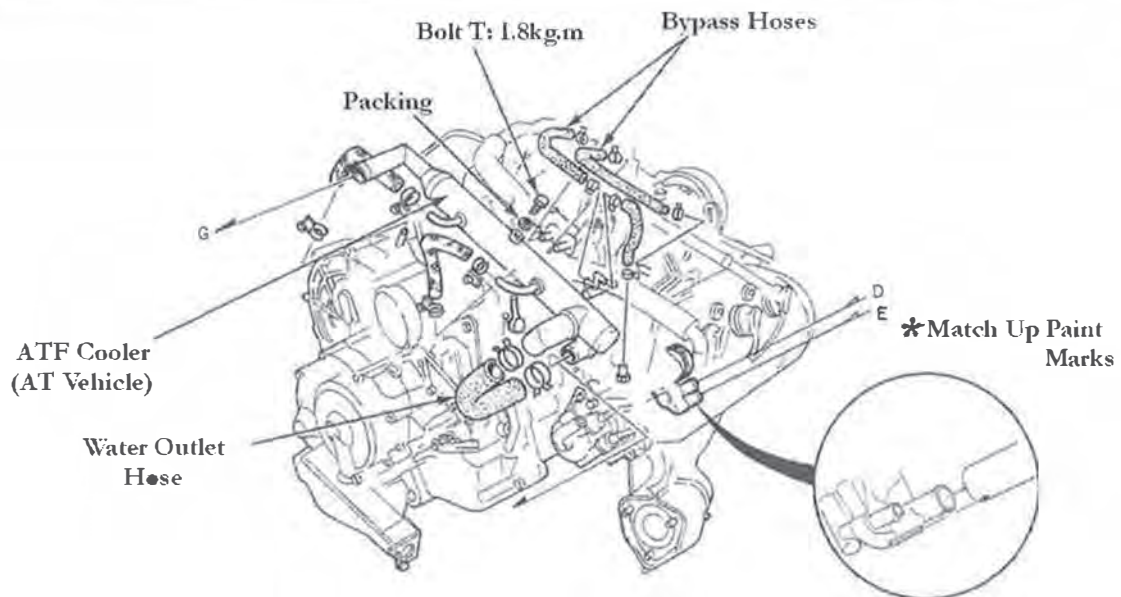
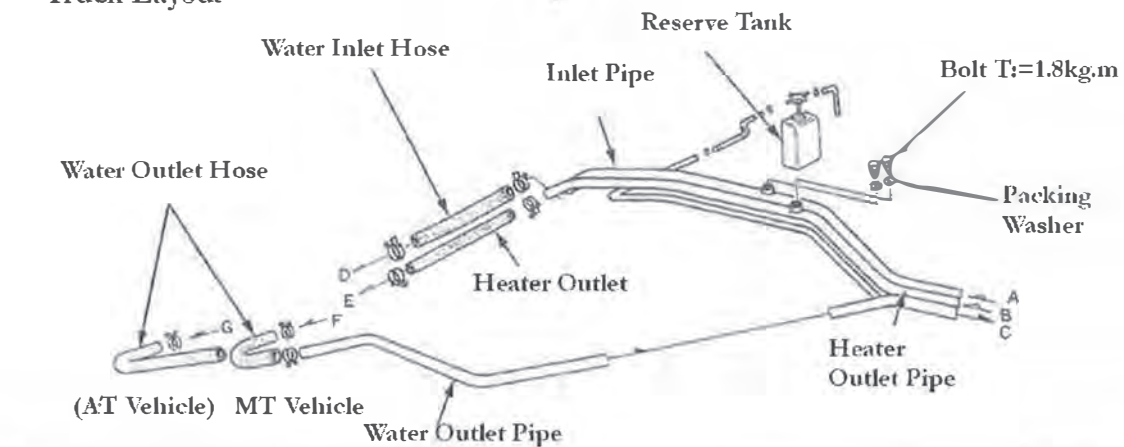
Coolant Diagrams

(Truck)

Capacities

Truck:	MT	6.5 Liters
	AT	7.1 Liters
Van	MT	6.5 Liter
	MT+ Rear Heater	6.7 Liters
	AT + Rear Heater	7.4 Liters

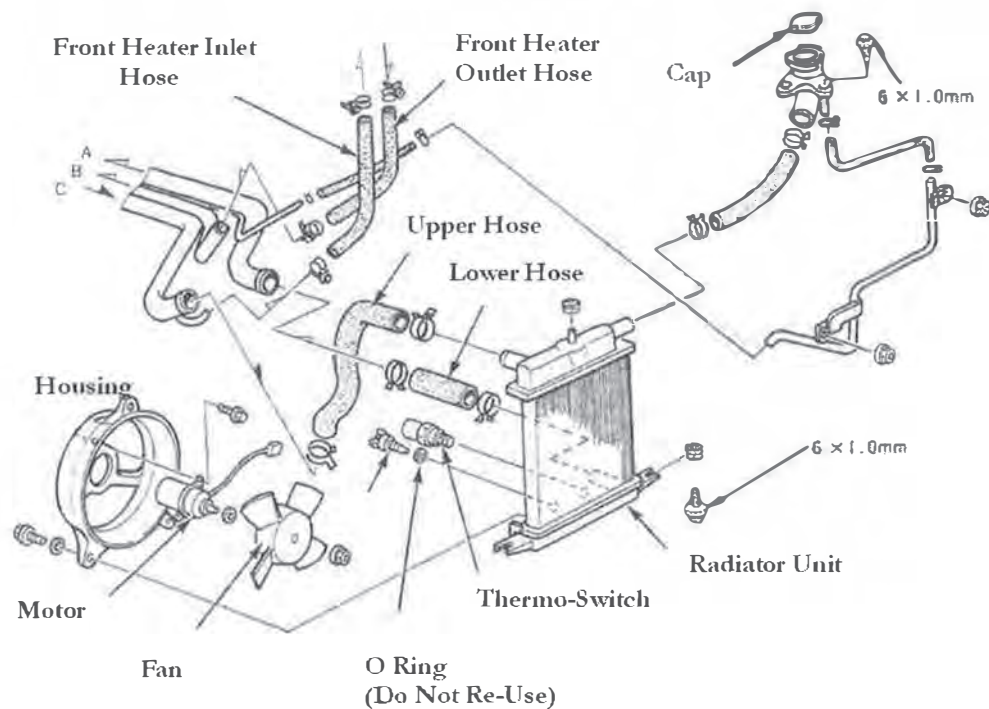
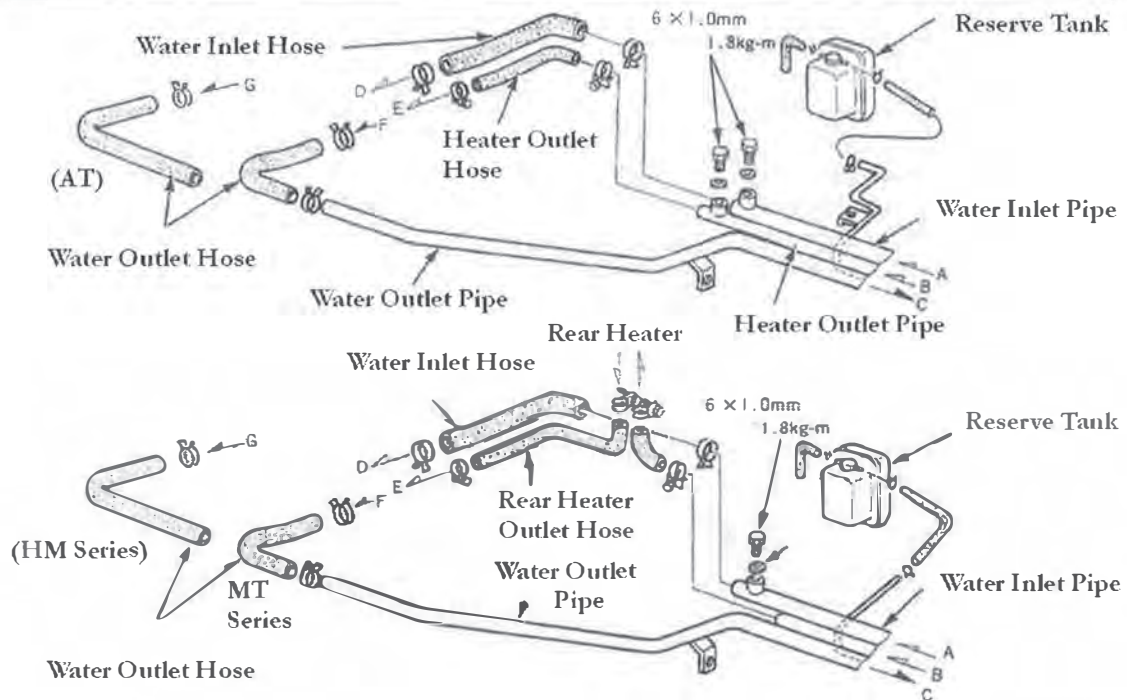
Truck Layout



Engine Cooling System

Van Cooling System Layout

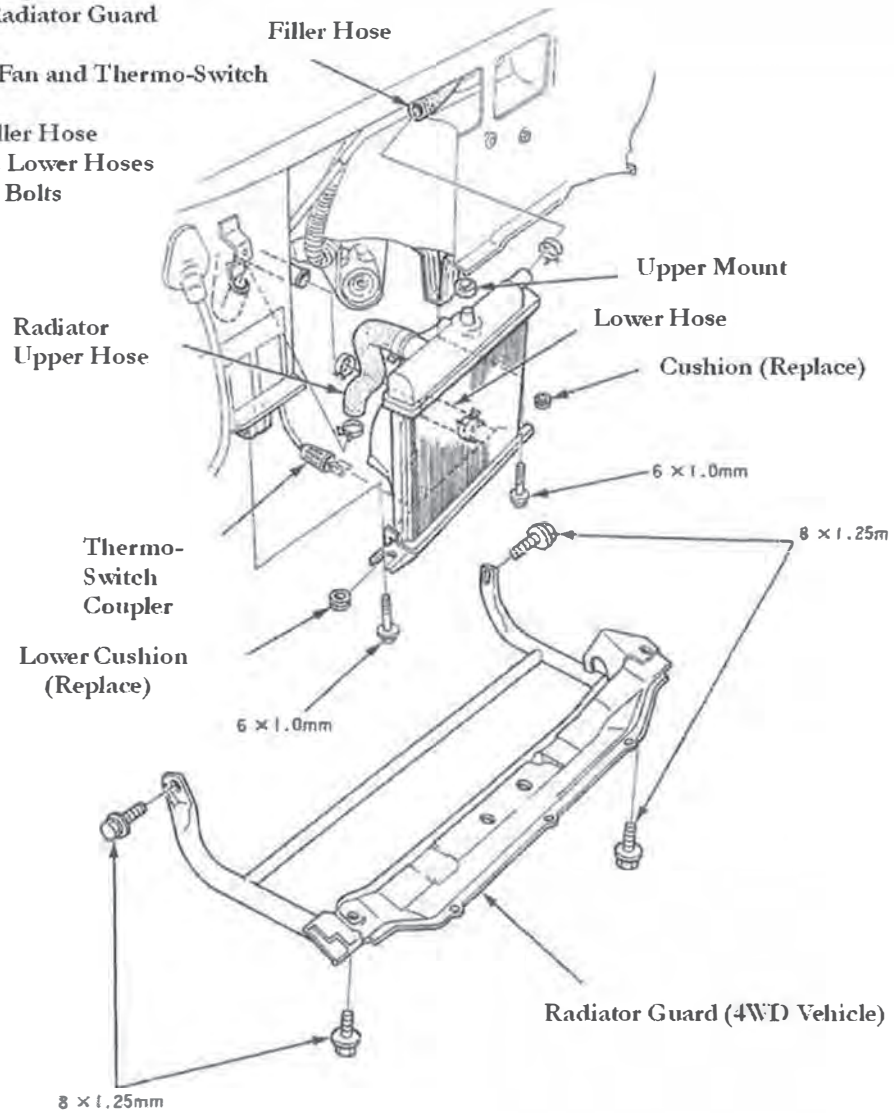
Van Rear Heater Option



Engine Cooling System

Radiator Removal

1. Remove Front Bumper
2. (4WD) Remove Radiator Guard
3. Drain Radiator
4. Remove Cooling Fan and Thermo-Switch Coupler
5. Remove Water Filler Hose
6. Remove Upper & Lower Hoses
7. Remove Support Bolts
8. Remove Radiator



Engine Cooling System

System Air Bleeding

Note: Air in Cooling System Can Cause Overheating and Water Pump Failure. Air Should Be Bleed Every Two Years

	Type	Capacity
T	MT	6.5 ℓ
	AT	7.1 ℓ
V	MT	6.5 ℓ
A	AT	7.2 ℓ
N	MT Rear Heater	6.7 ℓ
	AT Reare Heater	7.4 ℓ

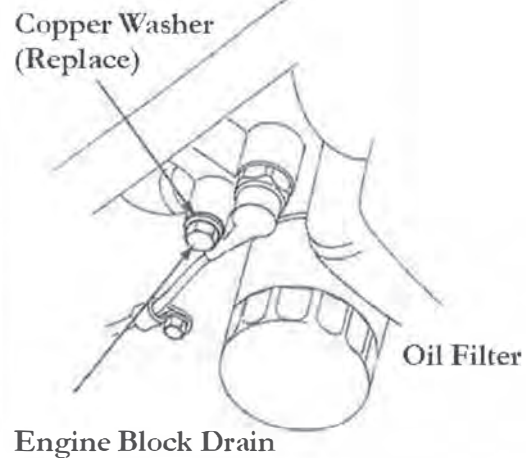
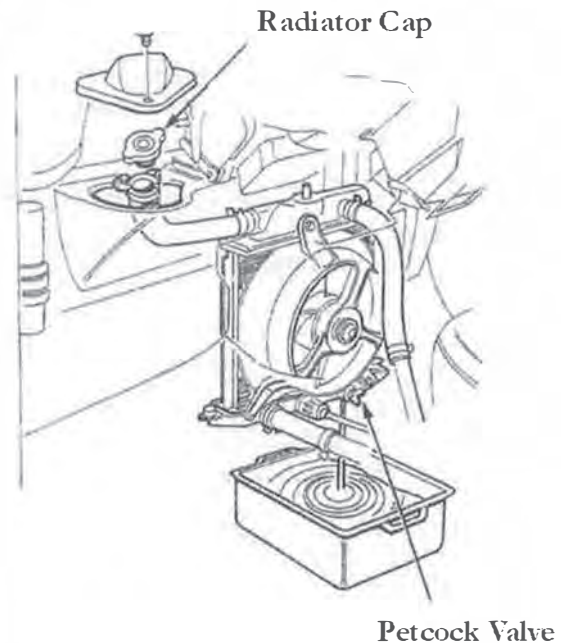
Note: Use Diagrams to The Right For Draining System

Caution: Engine and Cooling System Must be Cool Before Draining

1. Remove Radiator Cap
2. Open Petcock Valve on Bottom of Radiator
3. Remove Block Drain Bolt (Must Replace Copper Washer)
4. Drain All Water
5. Attach Engine Block Bolt and Torque to 4.0-5.0kg-m
6. Close Petcock Valve
7. Fill Radiator With 70% Water~30% Coolant
8. Start Engine and Add Water/Coolant as Needed.

Caution: Be Careful of Hot Water

9. Shut Off Engine and Shake Vehicle to Release Air Bubbles.
10. Start Engine Again and Repeat Process Until All Bubbles Have Gone.
11. Cap System and Test Drive



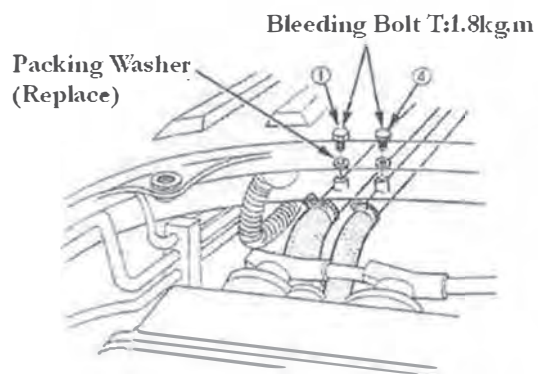
Engine Cooling System

System Air Bleeding

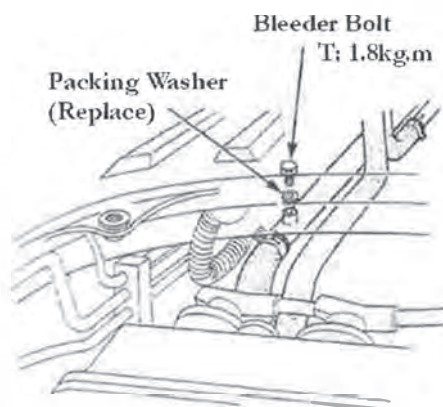
Note: If Complete System Air Bleeding is Required Use The Following Diagrams to Locate Bleeder Ports

Note: Packing Washers Must Be Replaced

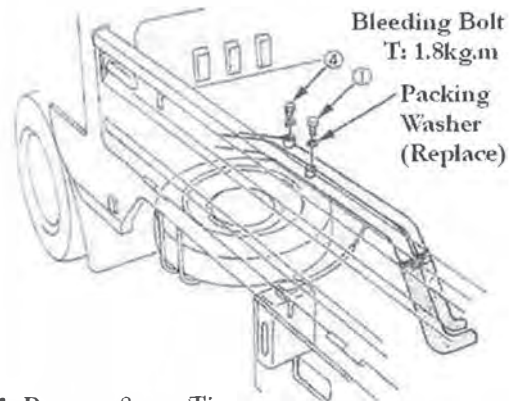
(Van Rear Heater Option)



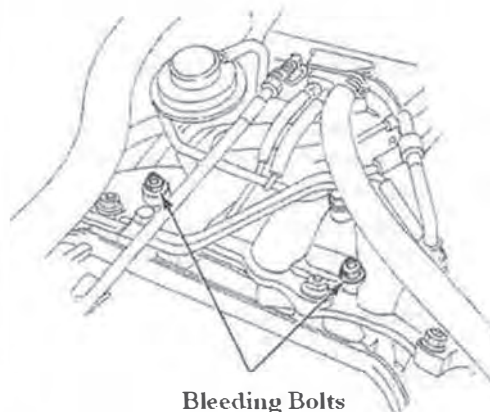
(Van Non-Rear Heater)



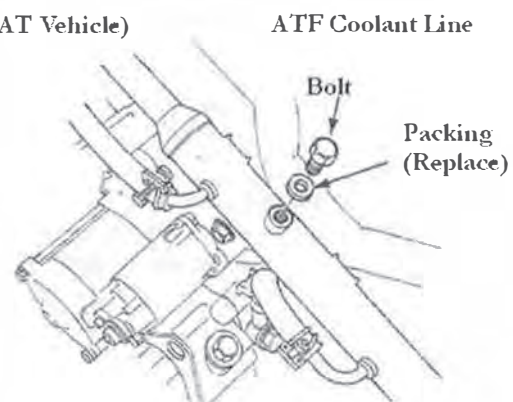
(Truck)



* Remove Spare Tire



(AT Vehicle)

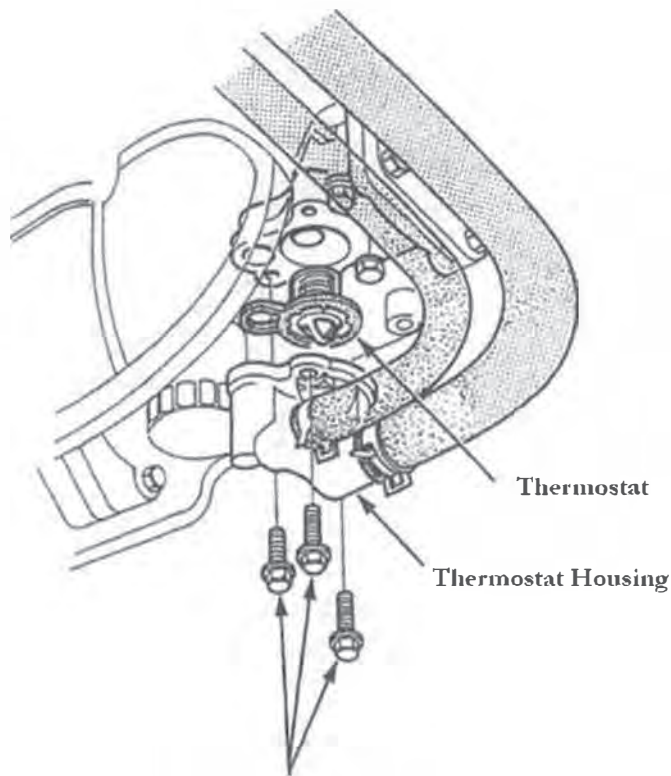


Engine Cooling System

Thermostat Replacement

Note: Do Not Re-Use O-Ring. O-Ring Must Be Replaced

1. Drain Coolant
2. Remove (3) Retainer Bolts
3. Remove Thermostat



6 x 1.0mm
T: =1.0kg.m

4. Clean All Parts Before Assembly
5. Install New O-Ring and Thermostat
6. Assemble and Add Coolant 70% Water 30% Coolant
7. Start Engine, warm and Check for Leaks

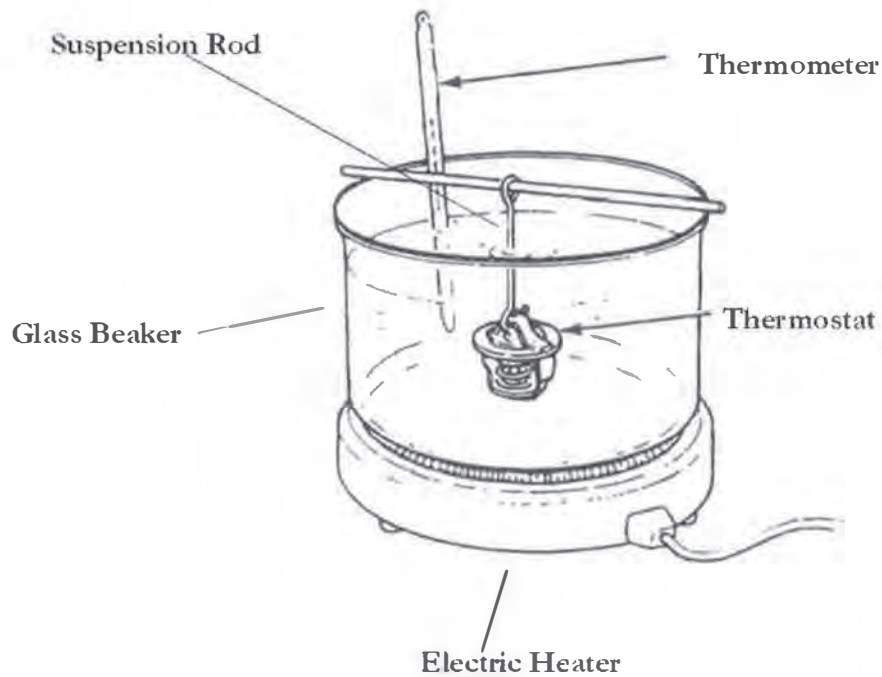
Engine Cooling System

Thermostat Specifications

Caution: Wear Protective Gear When Working With Hot Water

1. Suspend Thermostat as in Diagram Below
2. Slowly Raise Temperature
3. Observe Opening Temperature.

Note: If Unit Fails to Open at Below Listed Ranges Replace Unit Can Not Be Repaired

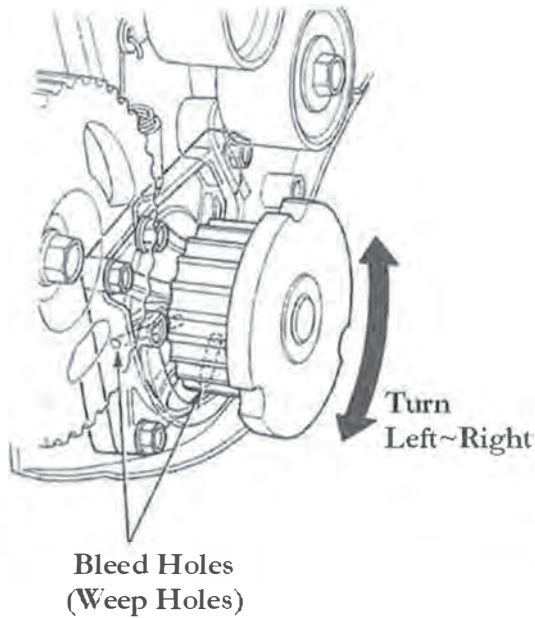


Opening Temperature	76~80°C
Initial Lift	0.35mm
Full Opening Temperature	90°C
Total Lift	8mm

Engine Cooling System

Water Pump

Water Pump Bleed Hole Test



Note: If Water Is Detected From Bleed Holes Pump Must Be Replaced

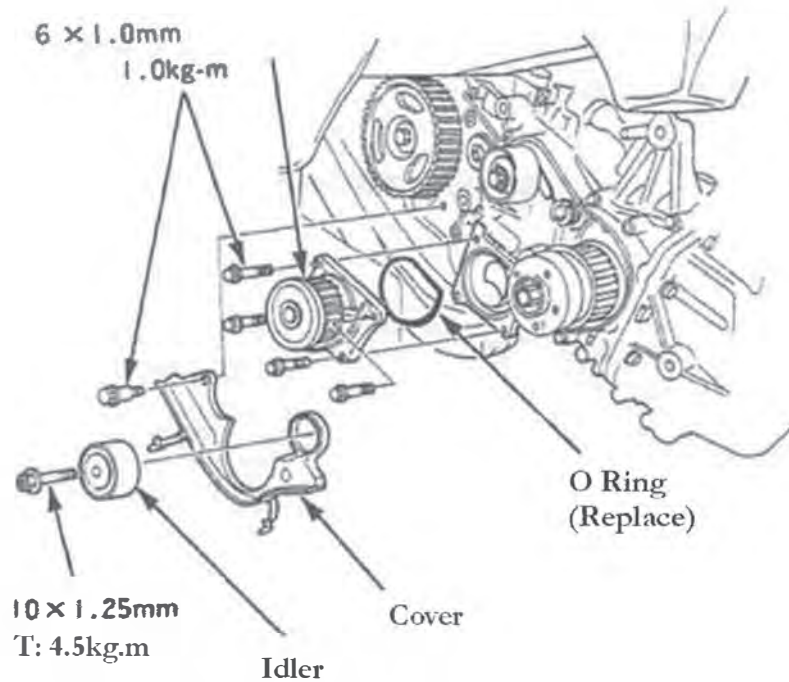
1. Remove Belt
2. Rotate Left~Right Direction. Water is Detected Drain Coolant System and Replace Water Pump

Water Pump Removal

1. Remove Timing Belt
2. Remove Timing Belt Idler
3. Remove Timing Belt Back Cover
4. Remove (4) Attachment Bolts
5. Remove Pump

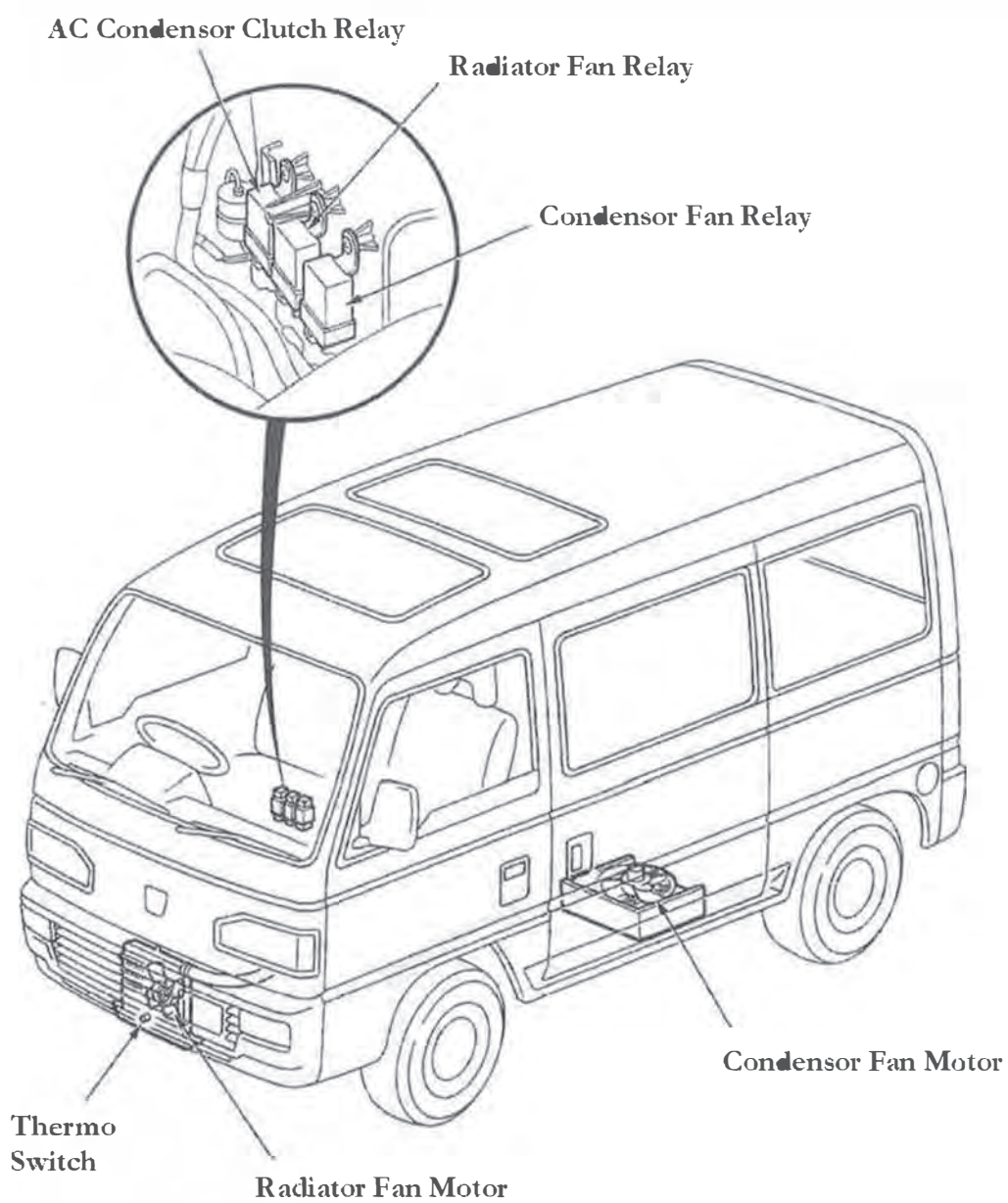
Note: Do Not Re-Use O Ring

Water Pump



Engine Cooling System

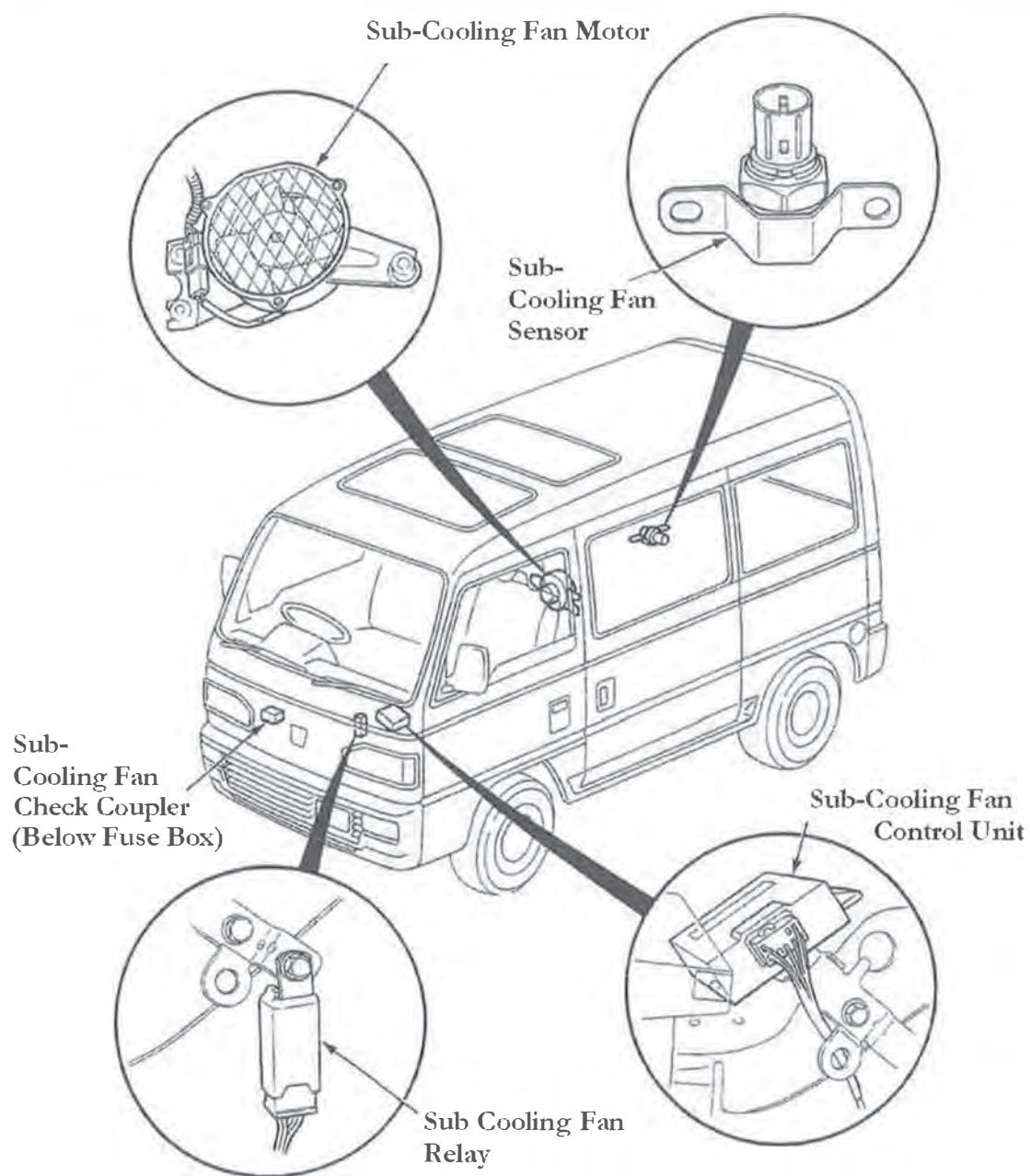
Cooling Fan Relay Location



Engine Cooling System

Control Units and Sensors VAN

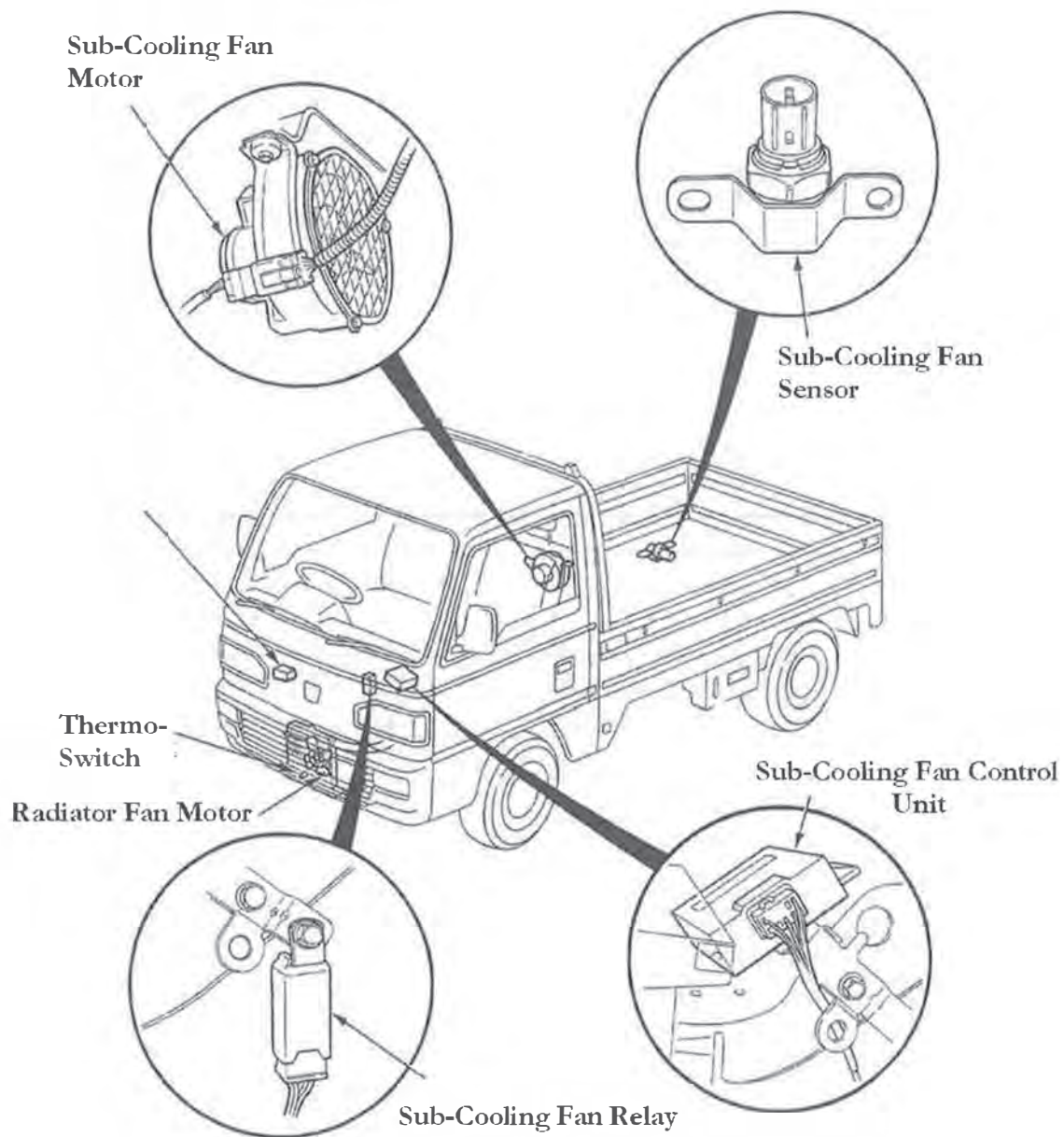
Van



Engine Cooling System

Sub-Cooling Fan System Truck

Truck



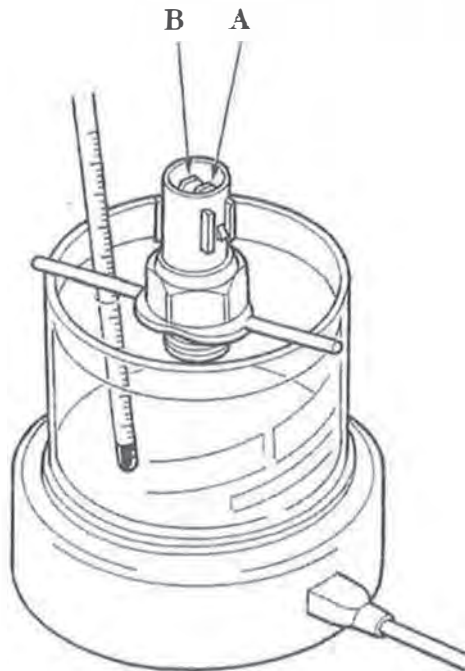
Engine Cooling System

Thermo-Switch Testing

Thermo- Switch

Note: Do Not Get Electrical Connections
Wet

Switch In OPEN Position: $93 \pm 3^{\circ}\text{C}$
OFF Position $85 \pm 3^{\circ}\text{C}$



Sub-Cooling Fan Sensor

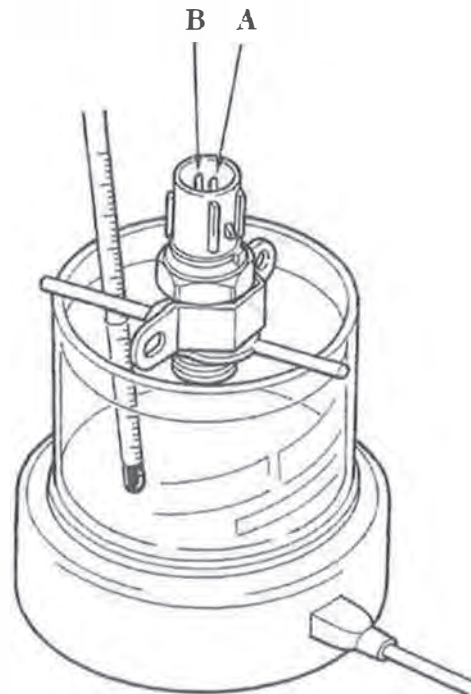
Note: Do Not Get Electrical Connections
Wet

VAN

Switch in OPEN Position: $65 \pm 2^{\circ}\text{C}$
OFF Position: $57 \pm 2^{\circ}\text{C}$

TRUCK

OPEN: $60 \pm 2^{\circ}\text{C}$
OFF: $52 \pm 2^{\circ}\text{C}$

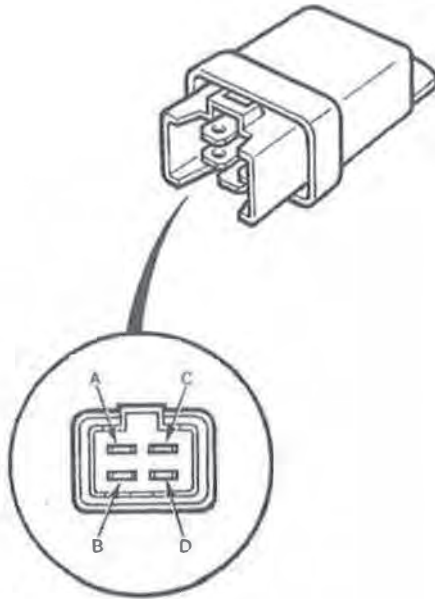


Note: Be Careful Not to Mix Switches as They Are Not Interchangeable

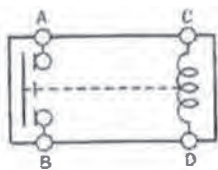
Engine Cooling System

Cooling Fan Relay Circuit & Pins

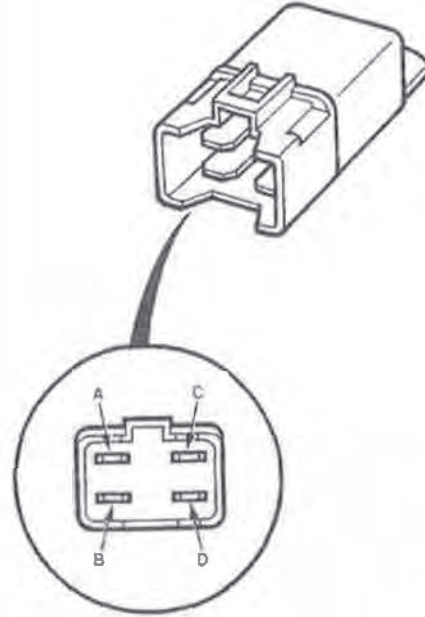
Radiator Fan Relay
Condensor Fan Relay
A/C Compressor Clutch Relay



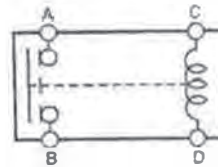
Relay Circuit



Sub-Cooling Fan Relay



Relay Circuit



Chapter 5

Engine

- Tools
- Engine Removal Steps
- Engine Removal MT & AT Vehicles
- Engine Mount Torque Specifications
- Timing Belt Component Breakdown
- Timing Belt Removal
- Timing Belt Positioning and Setting
- Cylinder Head & Valve Train Components
- Intake Manifold (Carbureted)
- Exhaust Manifold System
- Rocker Arm Assemblies
- Camshaft Inspection
- Specialty Tools
- Piston-Crankshaft-Cylinder Block Components
- Connecting Rod Bearings
- Piston Pin
- Oiling System
- Oil Pump
- Oil Pump Clearances & Inspection

Engine Engine Removal Equipment

Specialty Tools

No.	Part #	Tool Name
(1)	07KAK-SJ40100	Engine Hoist
(2)	07966-6800000	Cradle



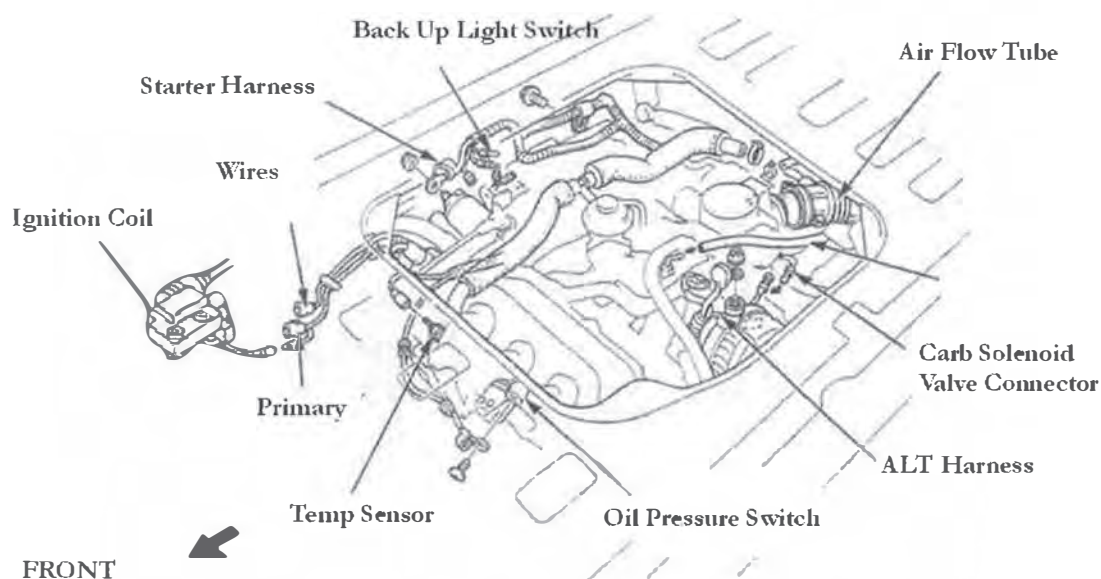
(1.)



(2.)

Engine

Removal



1. Remove Engine Inspection Cover
2. Disconnect Battery and Remove
3. Drain Engine Oil (Do Not Re-Use)
4. Drain Transmission Oil Using 9.5mm (3/8") Socket
5. Drain Radiator
6. Disconnect Ignition Coil and Wires
7. Disconnect Oil Pressure Switch and Temp Sensor
8. Disconnect Starter Harness and Alternator Connections
9. Disconnect Back- Up Light Switch Connector (MT Vehicle)
10. Remove Engine and Transmission Connections
11. Remove Air Flow Tube and Vacuum Hoses (Mark For Identification)
12. Disconnect Carb Solenoid Connector

Engine

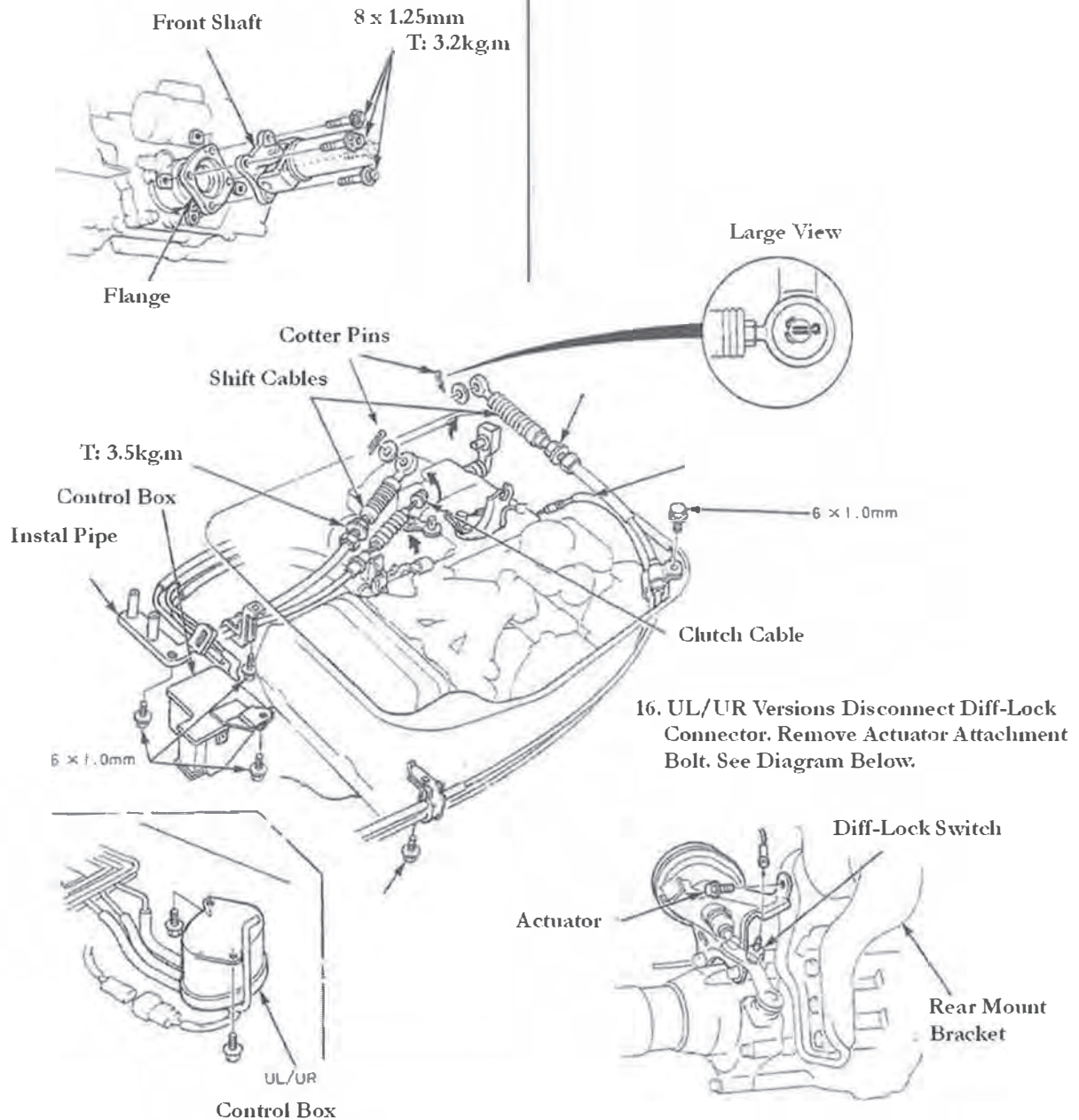
Removal

MT/4WD Vehicle

13. (4WD) Remove Shaft (See Below)

14. Remove Clutch Cable and Associated Parts in Diagram

15. Disconnect Emission Control Box (See Bottom Left Diagram) For AC & UL/UR Series Vehicles

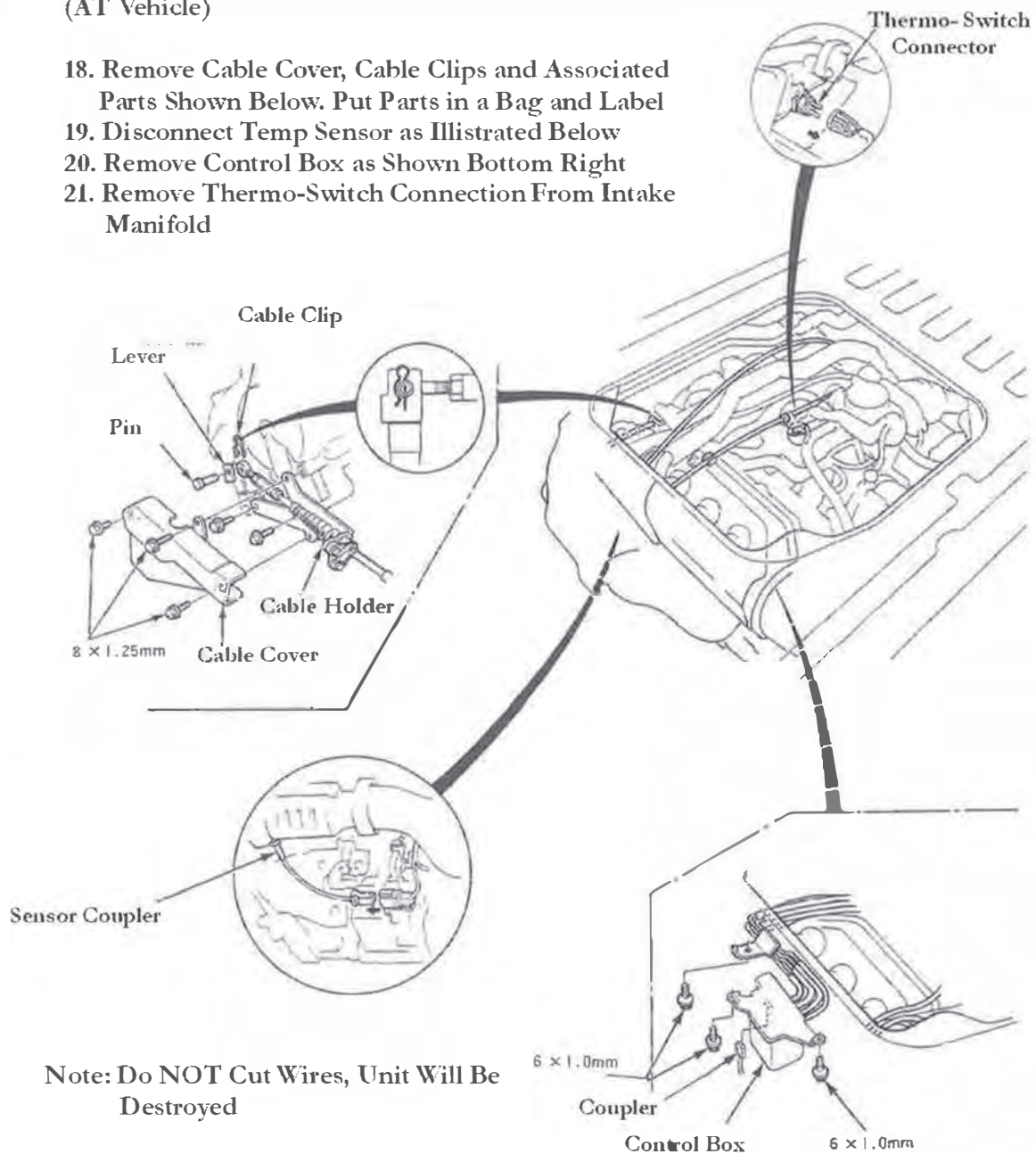


Engine

Removal

(AT Vehicle)

18. Remove Cable Cover, Cable Clips and Associated Parts Shown Below. Put Parts in a Bag and Label
19. Disconnect Temp Sensor as Illustrated Below
20. Remove Control Box as Shown Bottom Right
21. Remove Thermo-Switch Connection From Intake Manifold



Note: Do NOT Cut Wires, Unit Will Be Destroyed

Note: Place All Small Parts in a Bag and Label

Engine

Removal

22. Disconnect Throttle Cable
(See Diagram to Right)

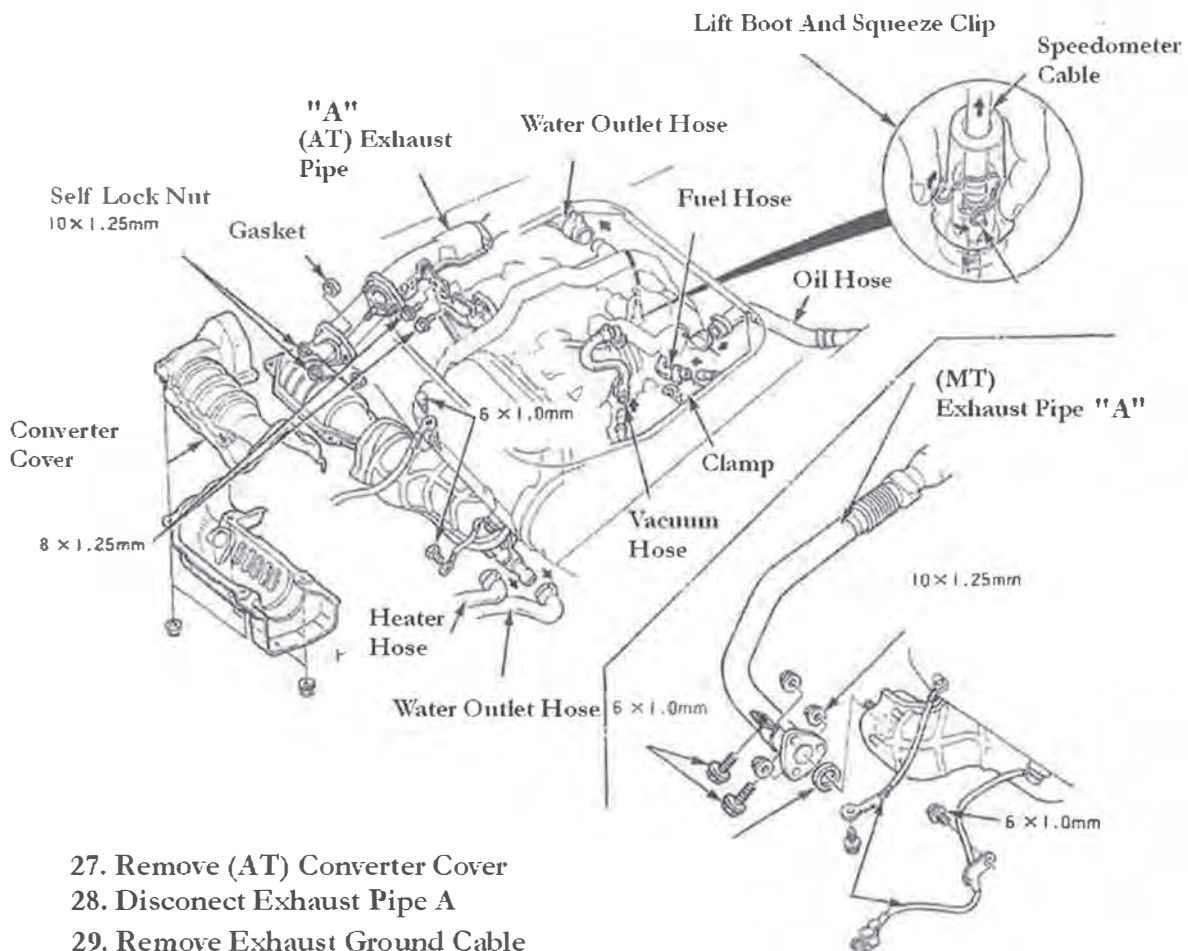
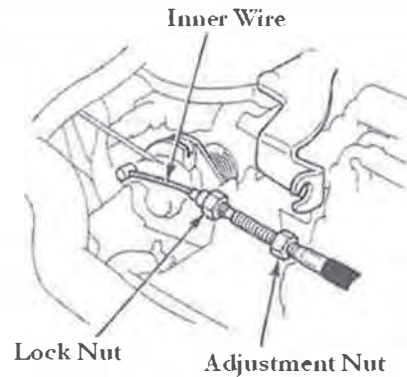
23. Disconnect Fuel Hose

Caution: Be Careful When Working Around Fuel

24. Disconnect Brake Booster Vacuum Hose

25. Disconnect Oil Hose

26. Disconnect Speedometer Cable
(See Diagram on Right)



27. Remove (AT) Converter Cover

28. Disconnect Exhaust Pipe A

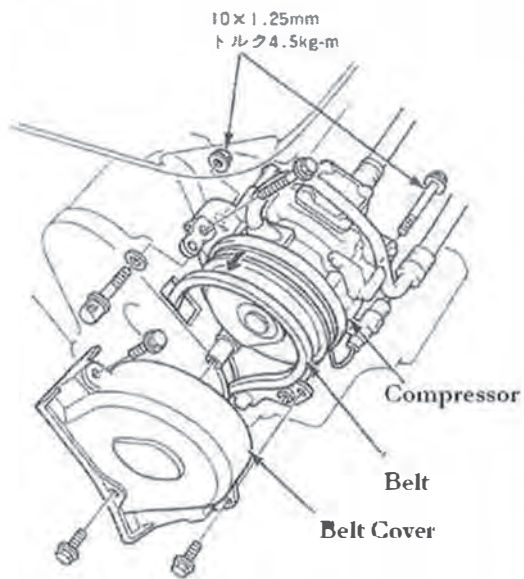
29. Remove Exhaust Ground Cable

30. Water Inlet & Outlet Hose (Including Heater Hose)

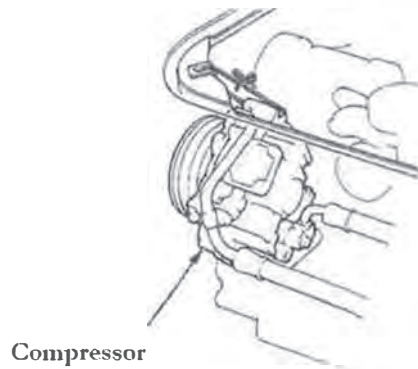
Engine Removal

AC Equipped Vehicle

31. Remove Compressor Cover
32. Loosen Belt
33. Unbolt Compressor
(Do NOT Disconnect Pressure Lines)

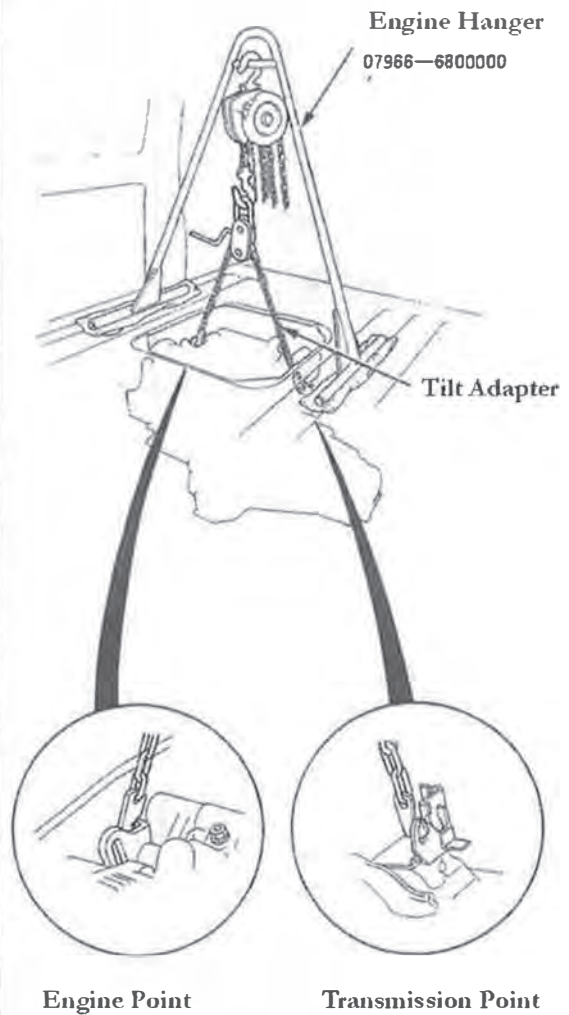


Note: Be Careful Of AC Pressure Lines



34. Remove Compressor and Hang to Side With Tie Straps

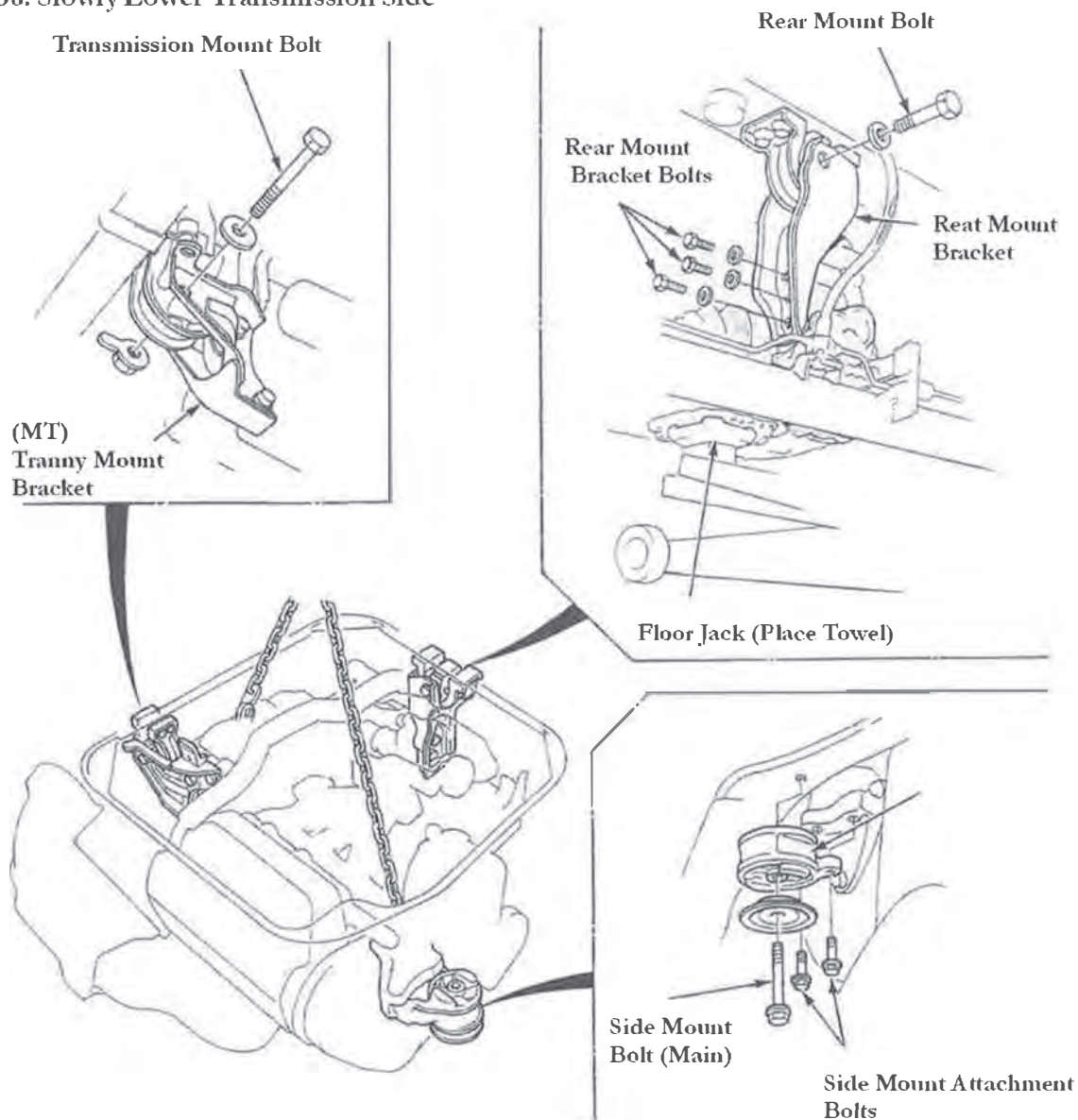
35. Attach Engine Hoist and Chain to Lift Points in Diagram Below



Engine

Removal

36. Remove (3) Rear Side Mount Bracket Bolts
37. Remove Transmission Mount Bolt
38. Slowly Lower Transmission Side



39. Be Careful of Brake Hoses Push Aside
40. Remove Rear Mount Bolt
41. Remove Remaining Attachment Bolts

Engine

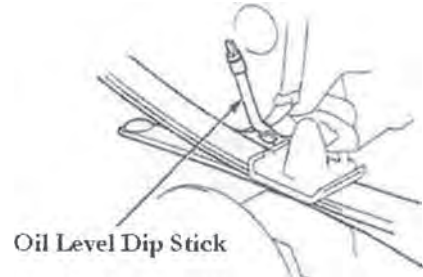
Removal

42. Remove Drive Shafts and Cover

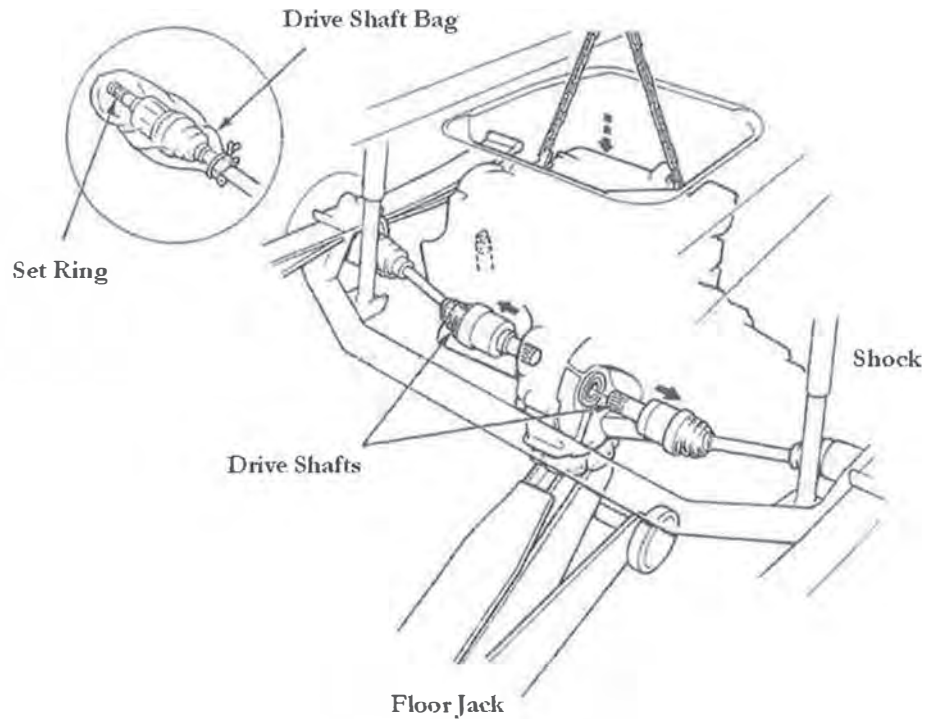
43. Lower Engine

44. Remove Engine

Note: Be Careful When Lowering
Engine of Dip Stick



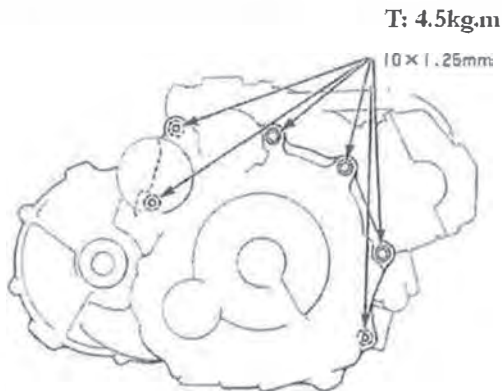
Note: Place Rags and Plastic Bag Over Shafts to Protect Units



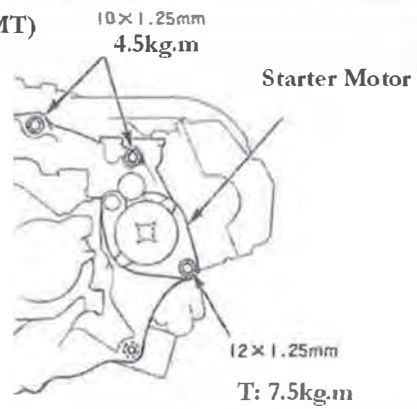
Engine

Mount Torque Specifications

(AT)



(MT)



(AT)

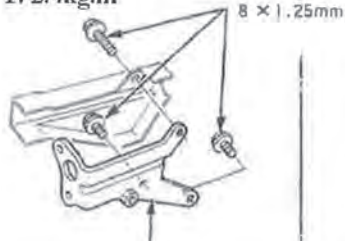
Transmission Mount



(MT)



T: 2.4kg.m

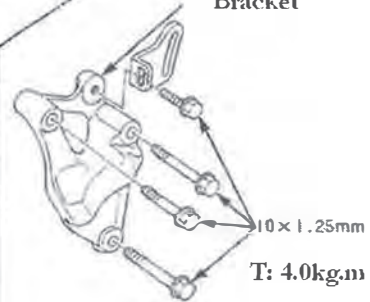


Shift Control Cable Holder Plate (AT)

Oil Filter Guard (4WD)



Engine Mount Bracket



$10 \times 1.25\text{mm}$
 4.5kg.m

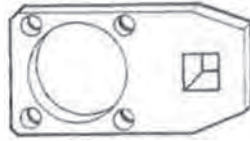
AC Compressor Bracket



Engine

Timing Belt Setting Special Tools

No.	Part Number	Part Name	Use
(1)	07IAB-PN40100	Pulley Holder	Hold Crank Set Torque



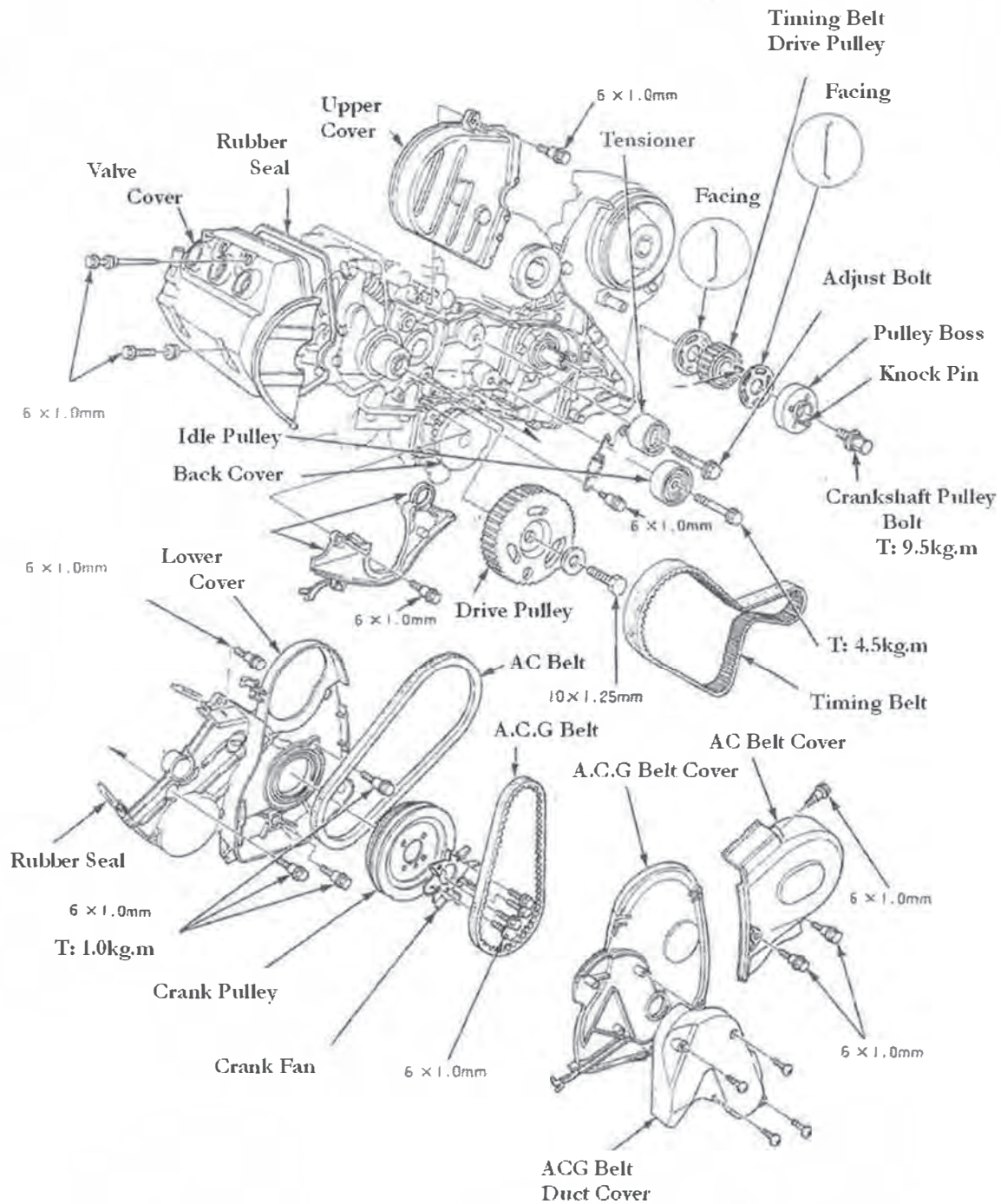
(1.)

Crankshaft Holder Tool

Engine

Timing Belt

Complete A/C & Non-A/C



Exploded View

Engine

Timing Belt Removal

Note: Before Disassembly Set Cylinder #1 to TDC

1. Remove A.C.G Belt Cover

2. Remove Dip Stick Tube Attachment Bolt

Caution: Turn Dip Stick Tube to Left as in Diagram Below
Do NOT Remove Pipe (Tube)

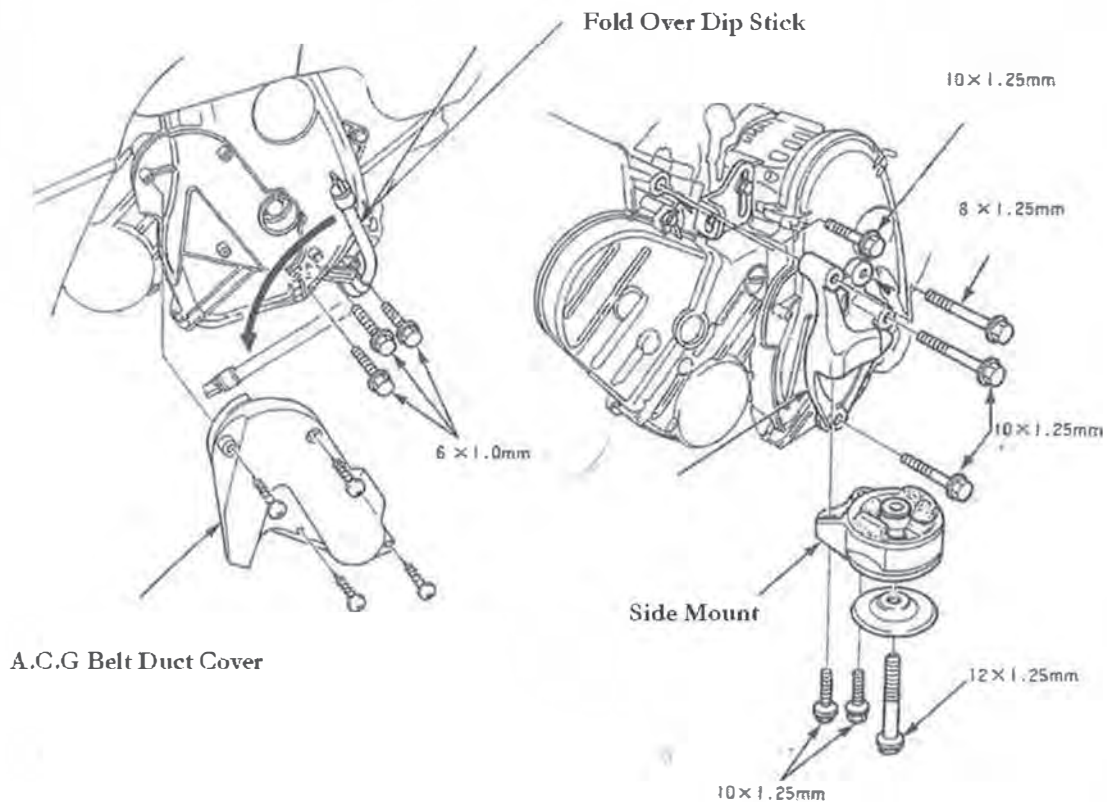
3. Place a Jack Under Engine and Lift Up Slightly

Note: Use Rag On Jack Pad Not to Damage Oil Pan

4. Remove Side Mount Bolt

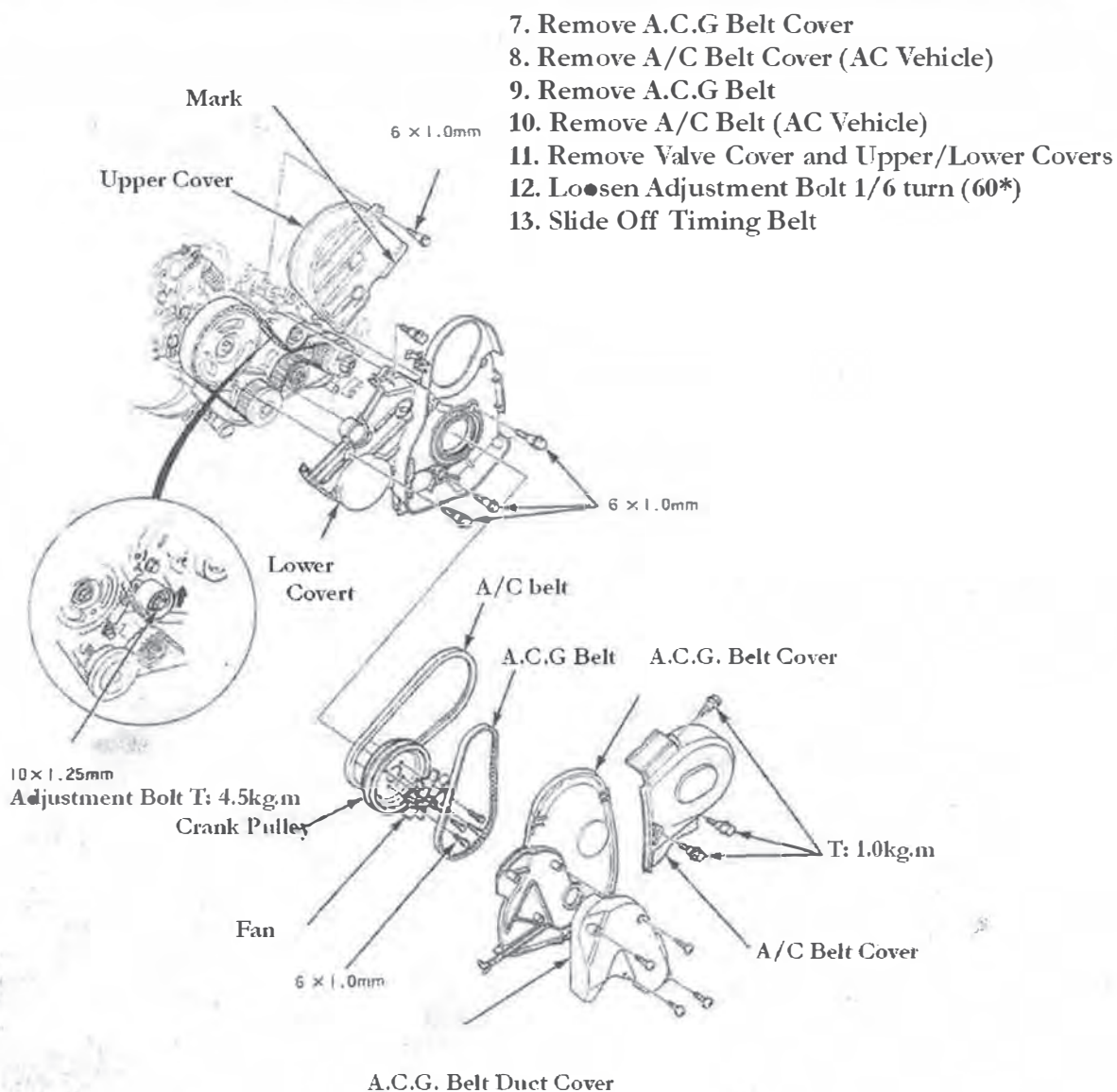
5. Remove Side Mount

6. Remove Side Mount Braket (See Diagram Below)



Engine

Timing Belt Removal



Note: Do Not Re-Use Timing Belt if Over 68,000 Kilometers

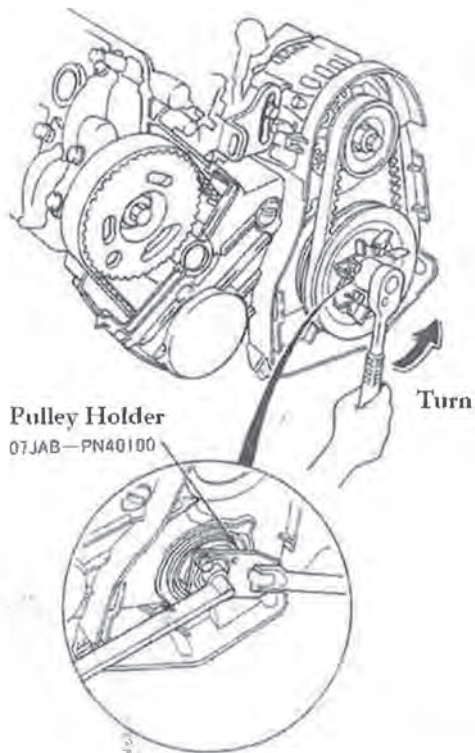
Note: Timing Belt Must Be Changed at 100,000 Kilometers

**Note: Before Replacing A/C & A.C.G Belts Check for Wear
A/C & A.C.G Belts Should Replaced 68,000 Kilometers**

Engine

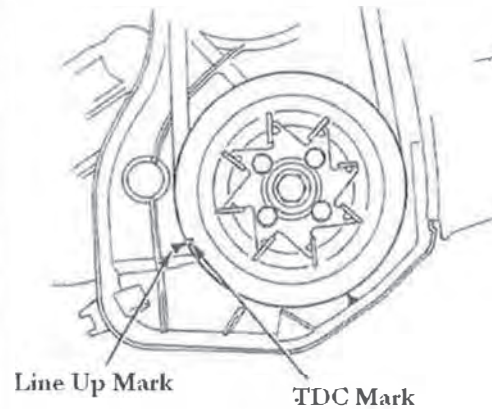
Timing Belt Positioning

Use Pulley Holder and Torque Wrench to Set Torque.
T:=9.5kg.m

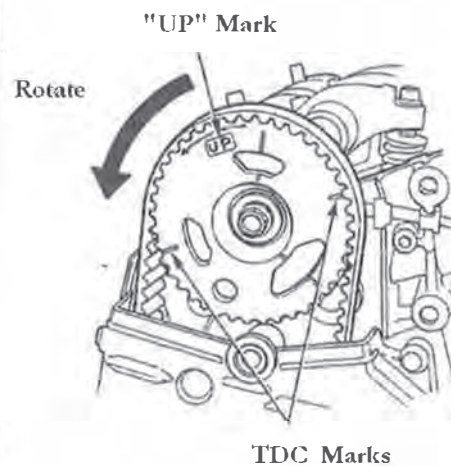


Note: Rotate Only In Direction Shown

Line Up Crankshaft Pulley and Mark



Line Up Top Pulley and Marks



Note: UP Mark is #1 Cylinder, All Marks Should Line Up like Diagram

Assemble and Check Valve Clearance

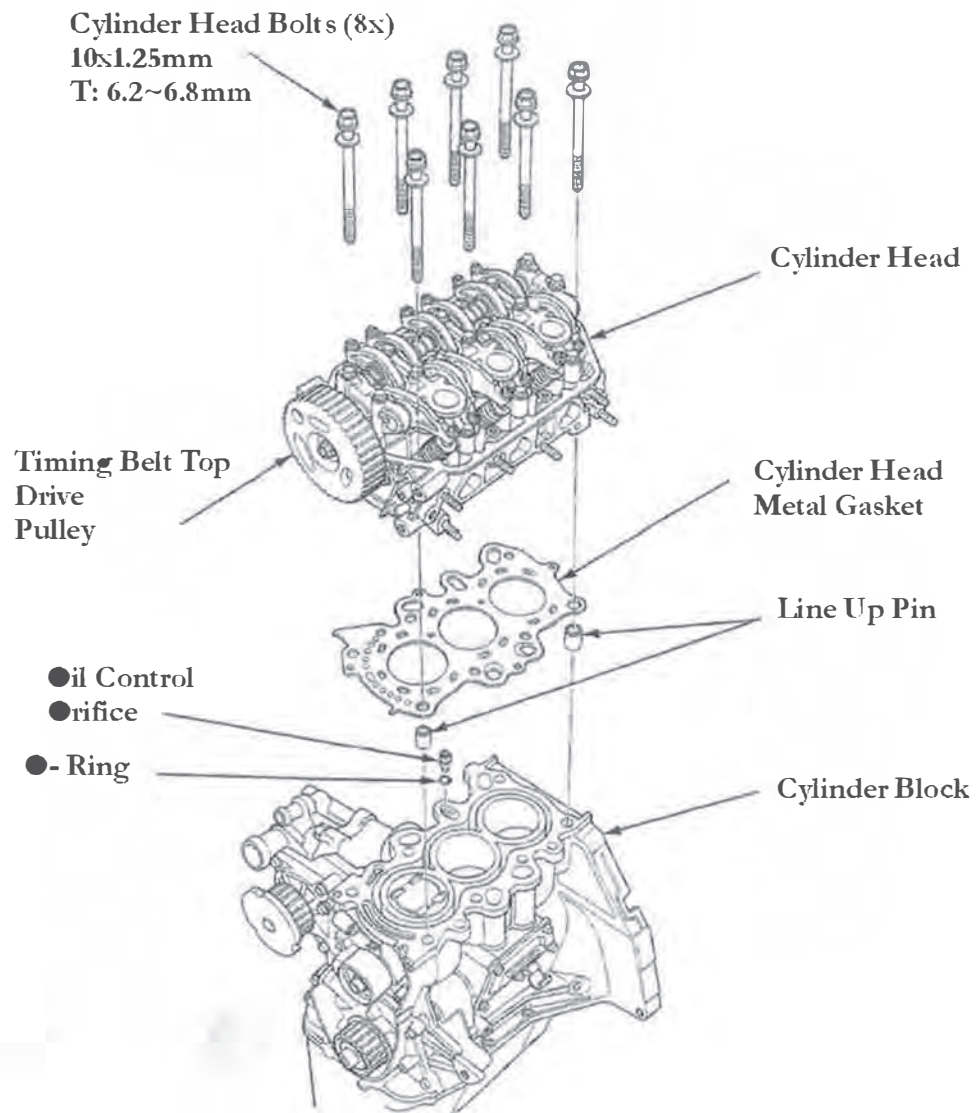
Engine

Cylinder Head & Valve Train

Note: Always Use Metal Head Gasket

Note: Never Re-Use ●-Rings

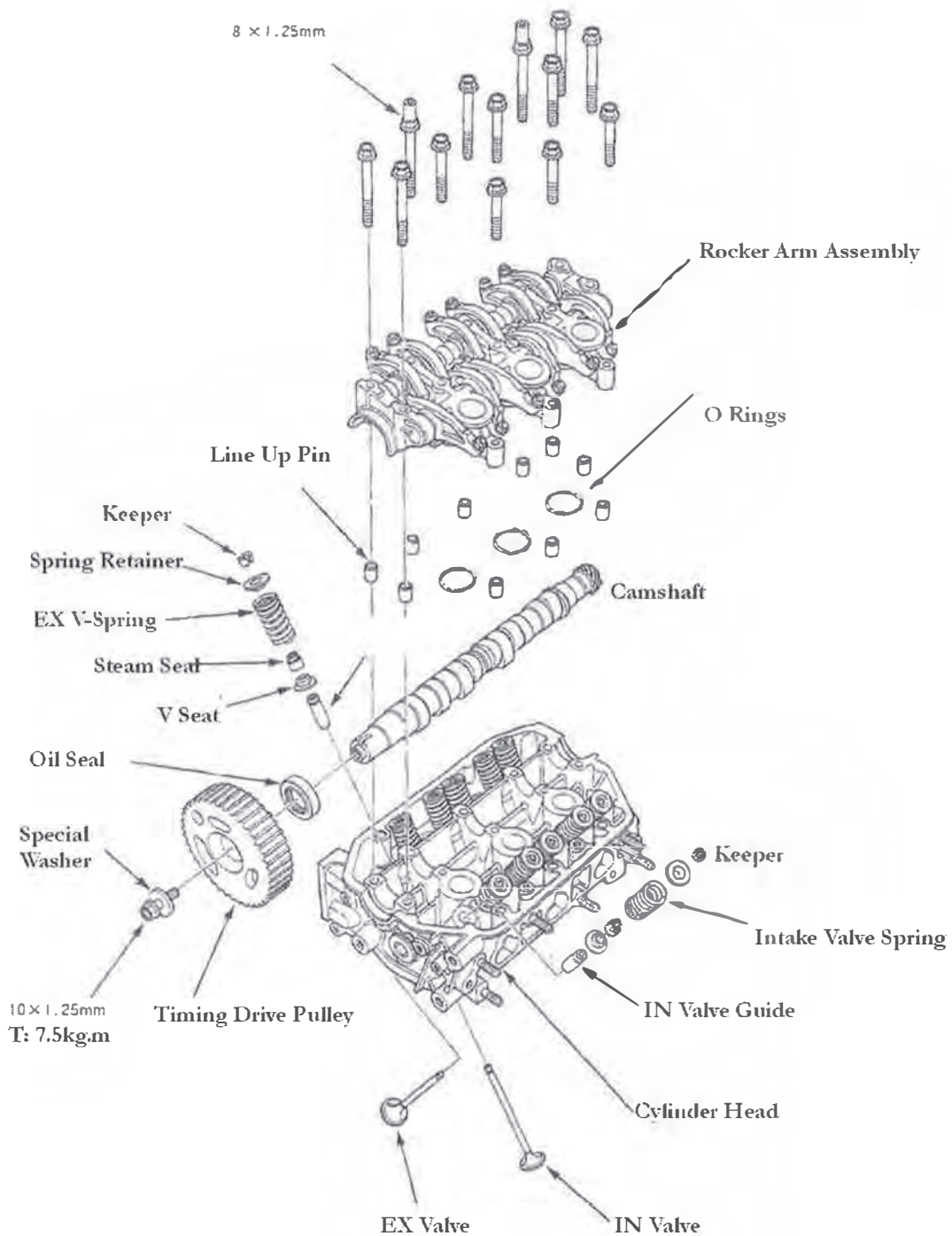
Exploded View



Engine

Cylinder Head & Valve Train

Exploded View

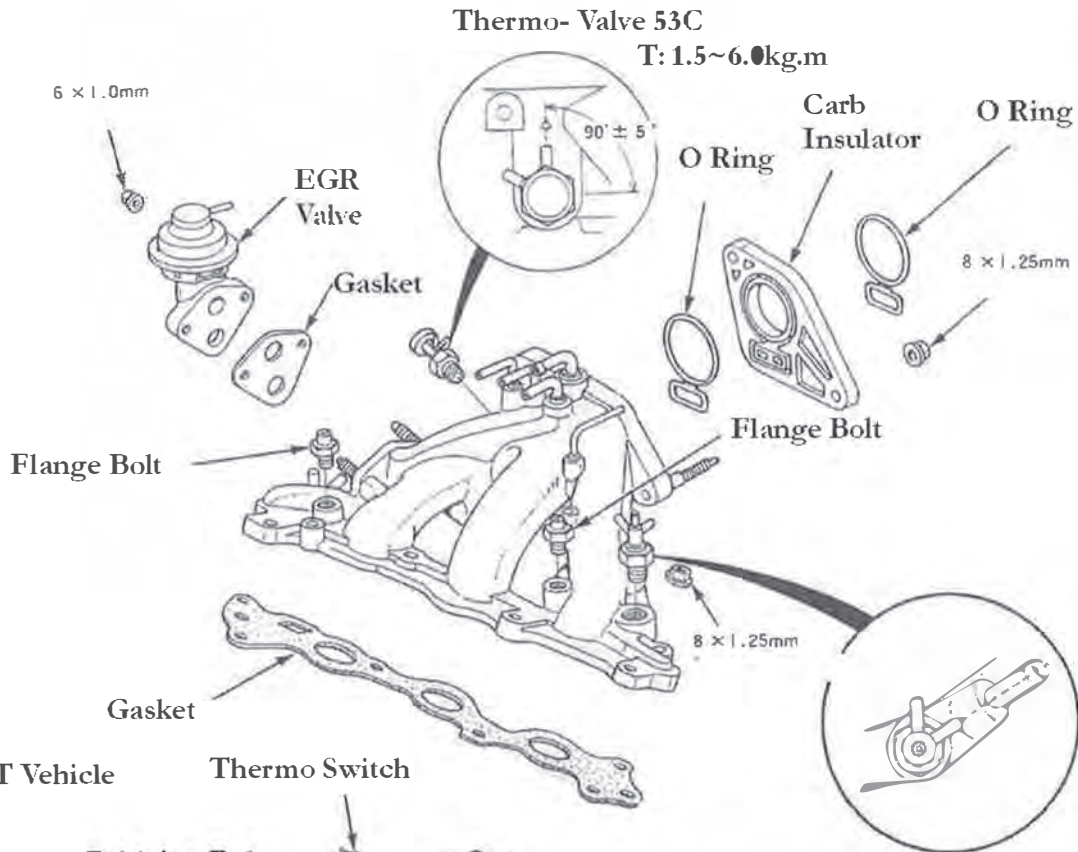


Engine

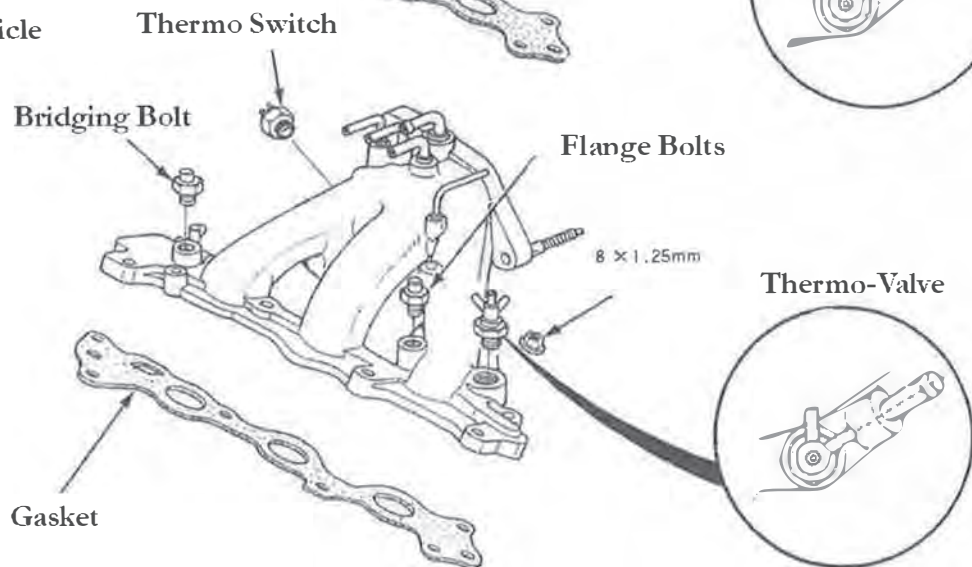
Cylinder Head & Valve Train

Intake Manifold (Carbureted)

MT Vehicle



AT Vehicle



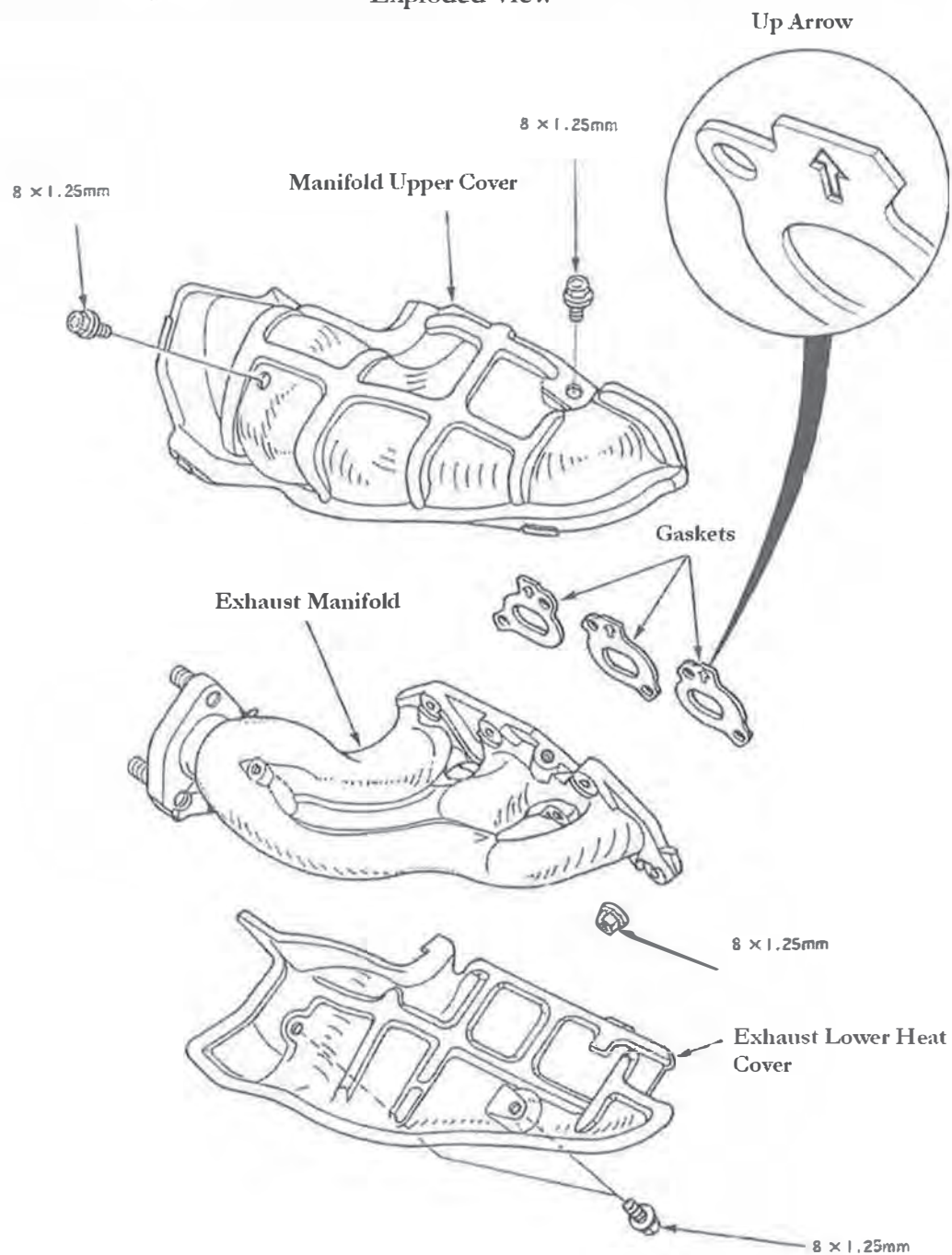
Note: Fuel Injected Manifold See Fuel Section

Engine

Cylinder Head & Drive Train

Exhaust Manifold

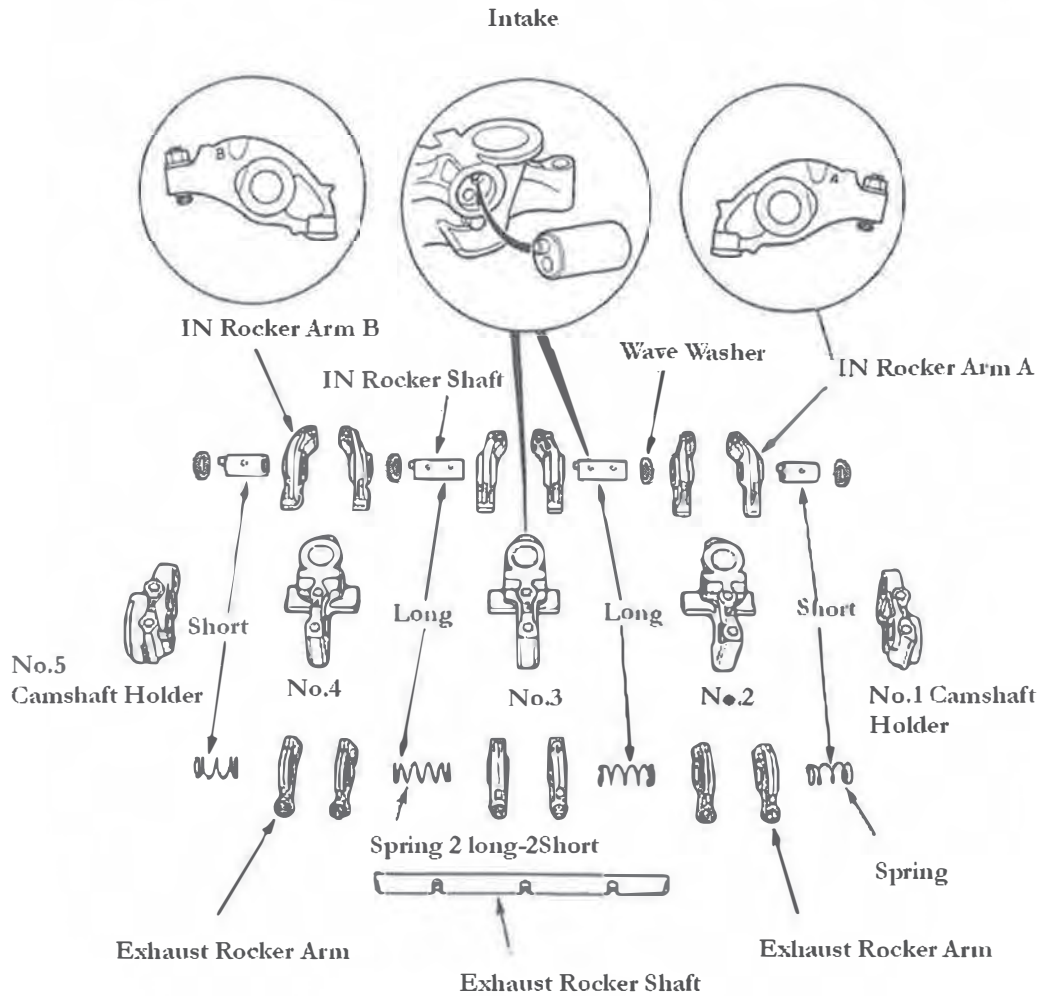
Exploded View



Engine

Cylinder Head and Drive Train

Rocker Arm Assemblies



Note: For Detailed Specifications See Service Data Section

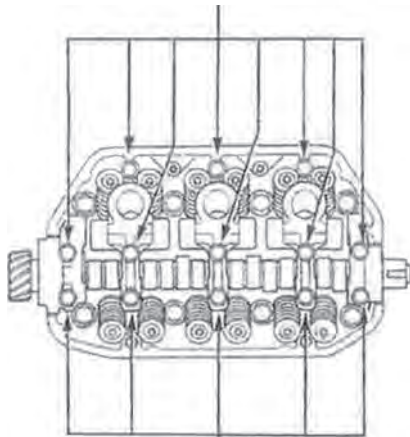
Engine

Cylinder Head and Drive Train

Camshaft

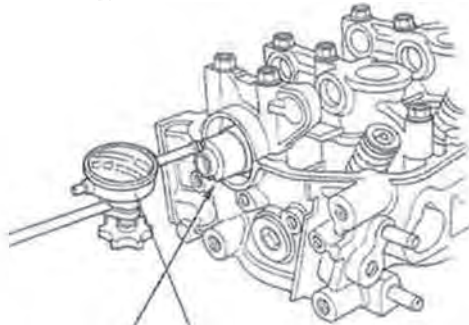
To Remove Camshaft Remove Bolts Shown Below

8mm Bolts T: 2.2kg.m



8mm Bolts

Camshaft End-Play
Range: 0.05~0.015mm
Fail: 0.50mm



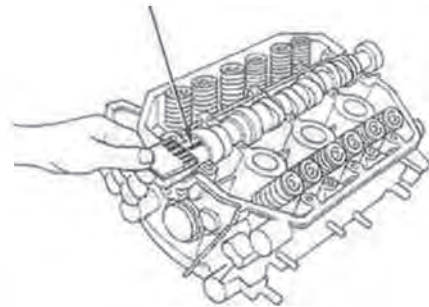
Camshaft

Dial Gage

Oil Clearance

To Check Clearance Remove Camshaft Holders. Use a Plastigage as Shown Below

Plastigage



Oil Clearance

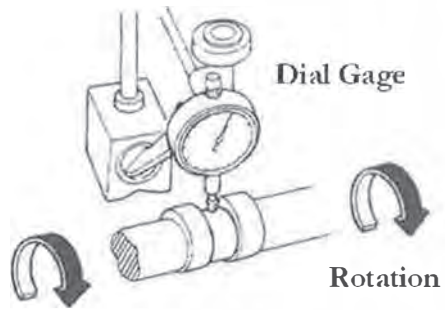
Range: 0.050~0.089mm
Fail: 0.150mm

Note: For Detailed Specifications See Service Data Section

Engine

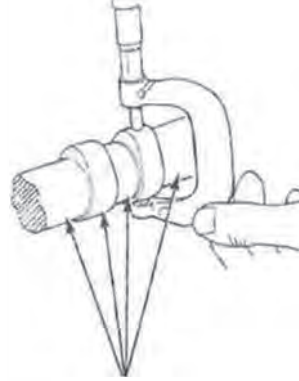
Cylinder Head and Valve Train

Camshaft Round-Out



Range: 0.015mm
Fail: 0.030mm

Camshaft Lobe Measurement



Note: Uneven Wear, Pitting is Found
Replace Camshaft

Range: Intake Lobe 35.122mm
Exhaust Lobe 33.944mm

Note: Camshaft Can Not Be Reground

Engine

Specialty Tools

1. 07973-6570500 Piston Base
2. 07973-6570600 Piston Base Spring
3. 07JAF-PN40101 Piston Base Head
4. 07973-SA70100 Drive Pin Inside Attachment
5. 07973-SA70200 Adjustable Inside Attachment
6. 07LAF-PZ10200 Pilot Collar



① ②



③



④



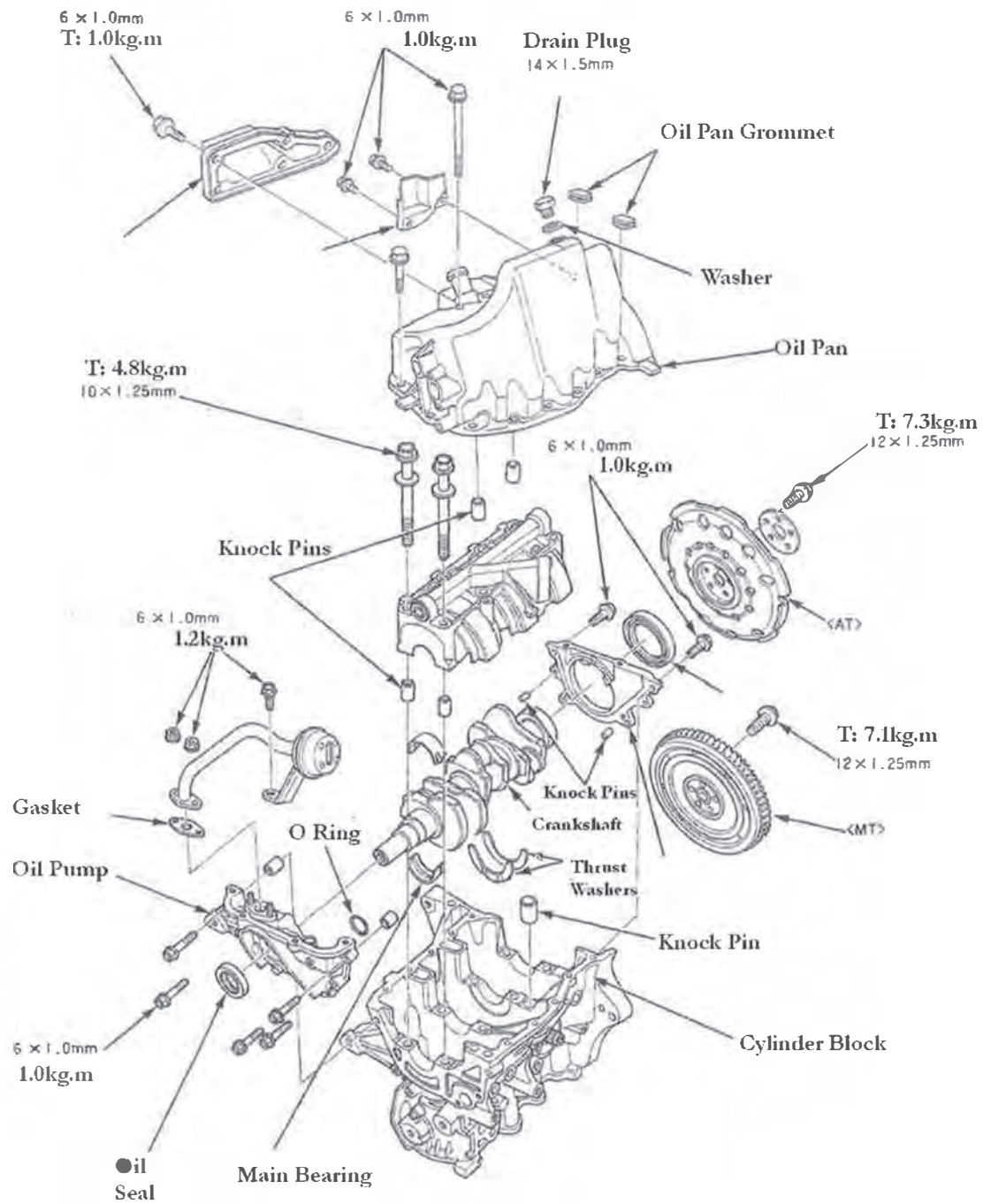
⑤



⑥

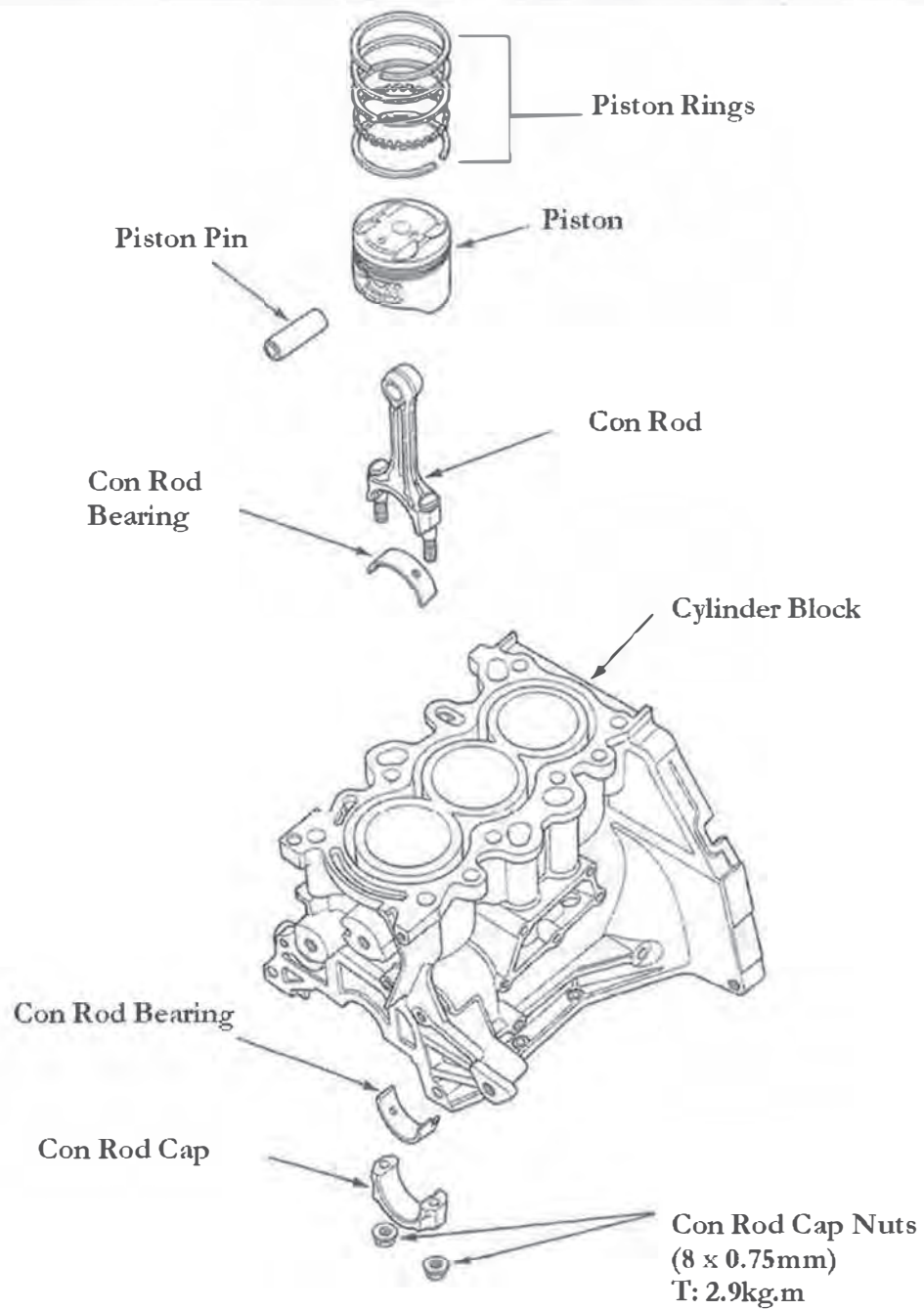
Piston Crankshaft Cylinder Block

Exploded View



Engine

Engine Block Exploded View



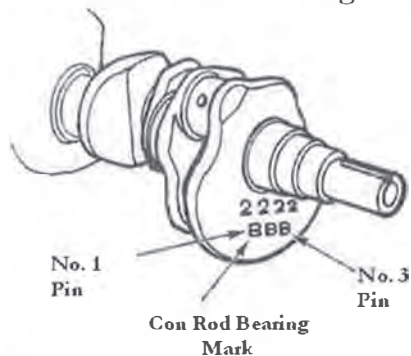
Engine

Connecting Rod Bearings

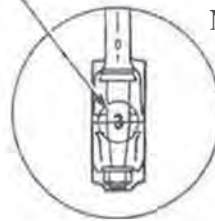
Note: When Changing Connecting Rod Bearings You Must Check The Information Marked on the Crankshaft

Crankshaft Pin Marks	Con Rod Markings			
	1	2	3	4
	Bearing Indication			
A	Red	Peach	Yellow	Green
B	Peach	Yellow	Green	Brown
C	Yellow	Green	Brown	Black
D	Green	Brown	Black	Blue

Crankshaft Markings



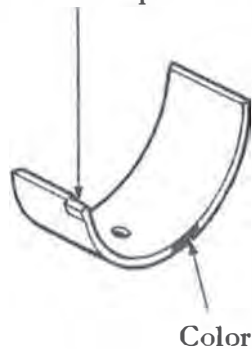
Number Stamp



Note: Bearing Central Wall Thickness 1.5mm

Mark	Color	Measurement
G	Red	-0.005 - -0.008mm
F	Peach	-0.002 - -0.005mm
E	Yellow	+0.001 - -0.002mm
D	Green	+0.004 - +0.001mm
C	Brown	+0.007 - +0.004mm
B	Black	+0.010 - +0.007mm
A	Blue	+0.013 - +0.010mm

Line Up With Cap Point

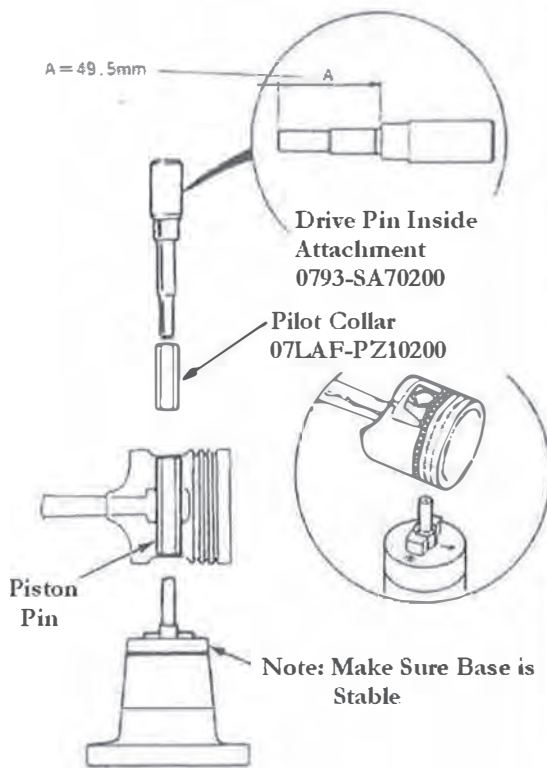
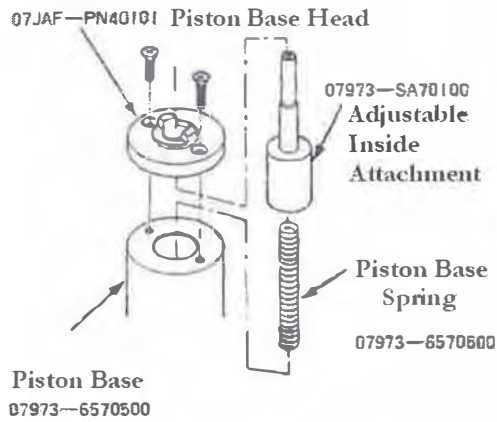


Engine

Piston Pin

Disassembly

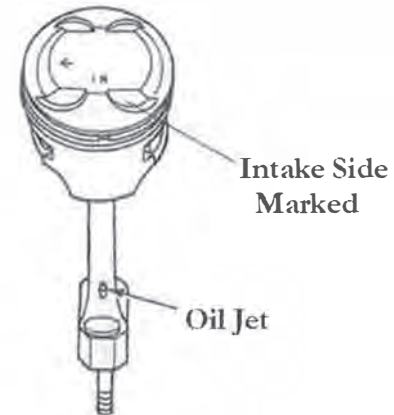
Note: A High Pressure Press Is Required For Removing & Installing Pins



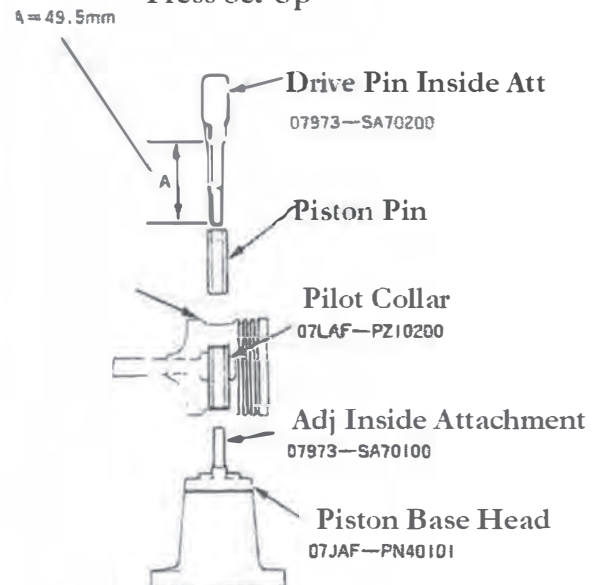
Using The Above Mentioned Tools and Press Remove Pins

Assembly

To FRONT



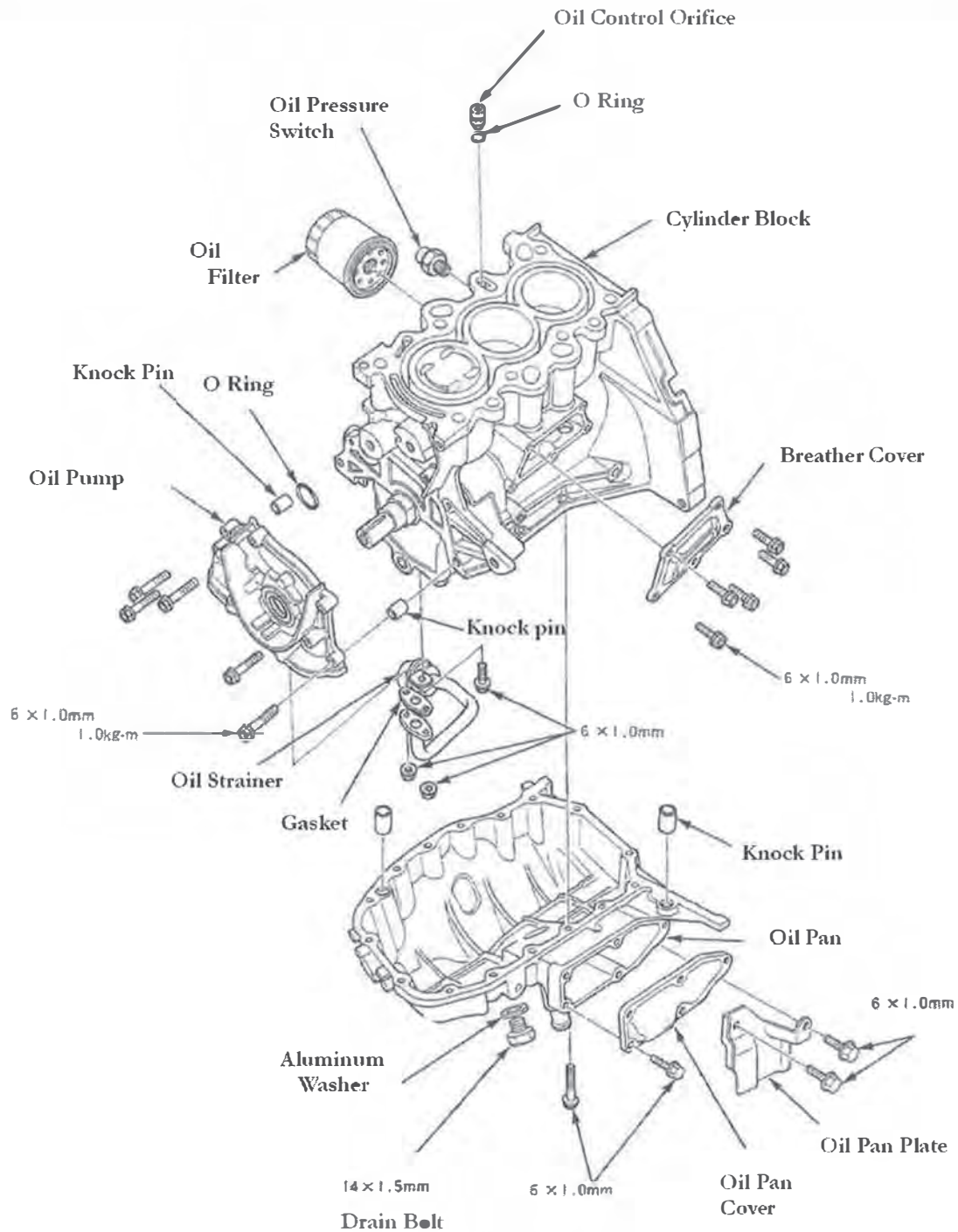
Press Set Up



Note: While Attaching or Pressing Piston Pins Pay Attention to Proper Setting

Engine

Oiling System

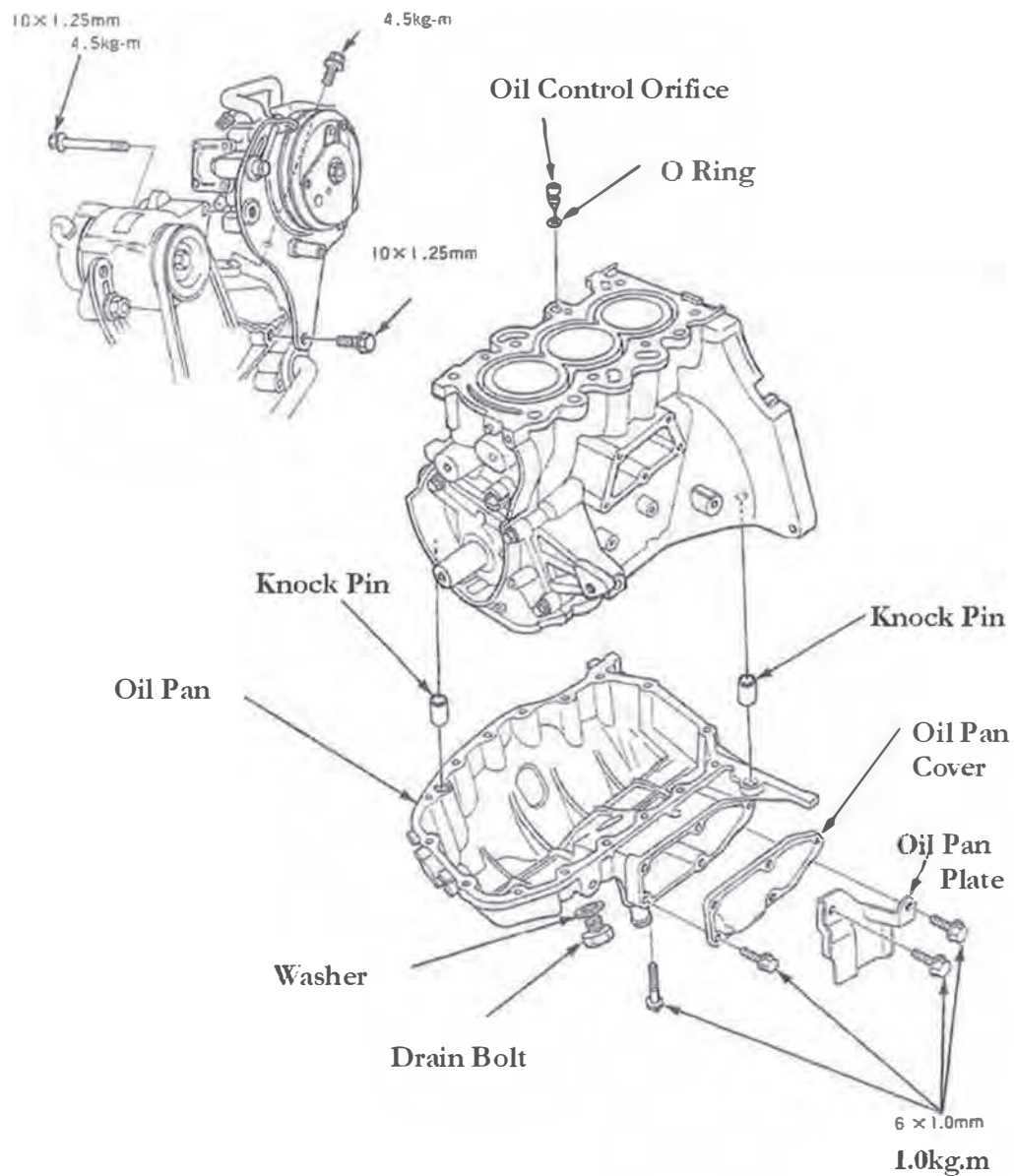


Engine

Oil Pan Removal

1. Drain Oil & Remove Oil Filter
2. Remove Driveshaft
3. Loosen A.C.G & AC if Equiped
4. AC Vehide: Remove AC Bracket and Move Away Compressor (Dont Disconnect)
5. Remove Oil Pan Plate Remove Transmission Attachment Bolt
6. Remove All (16) Oil Pan Bolts
7. Assemble in Reverse Order

Note: Do Not Re-Use Gaskets or Seals



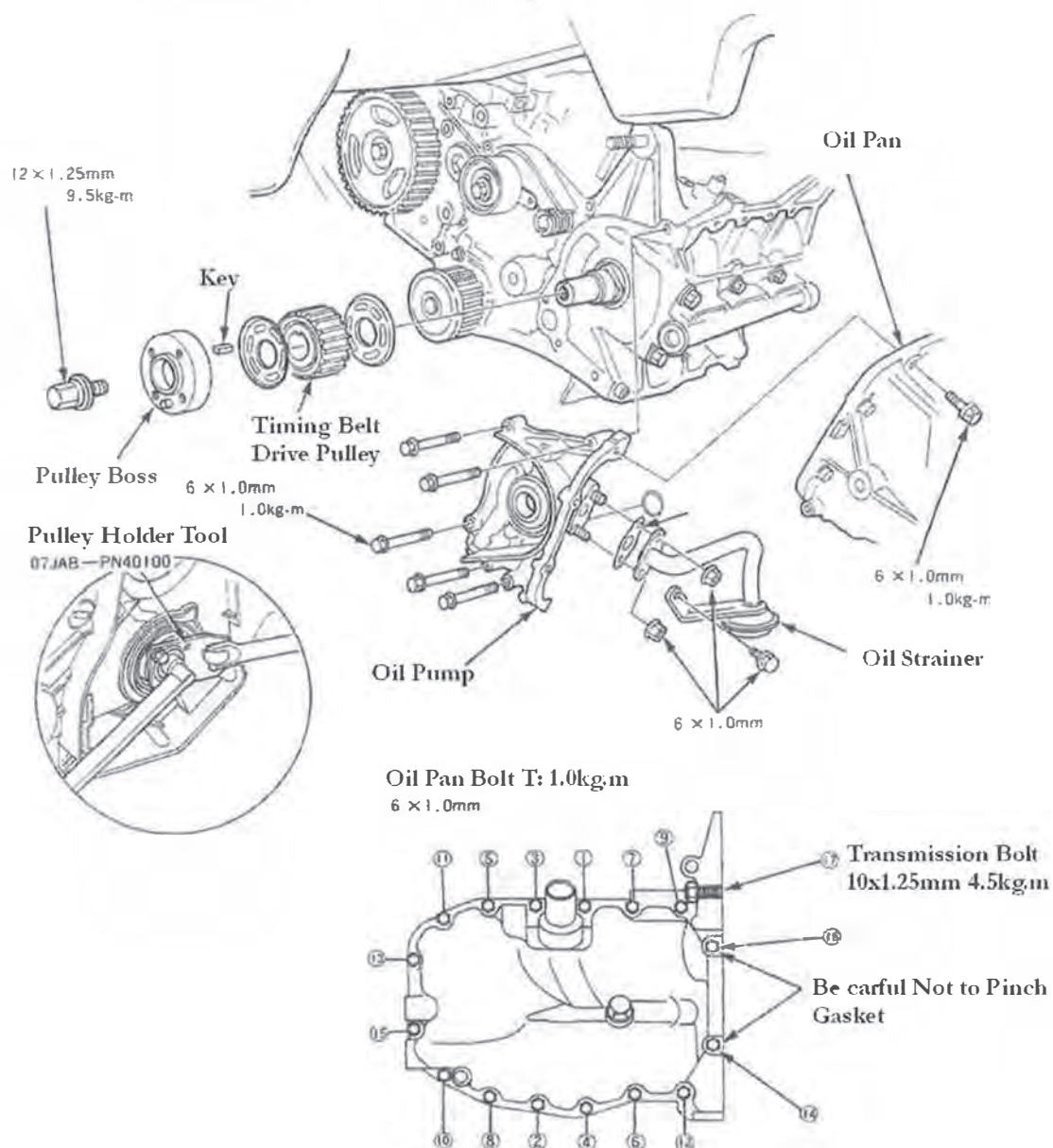
Engine

Oil Pump Removal

1. Remove Timing Belt
2. Remove Idler
3. Remove Remove Timing Belt back Cover
4. Drain Oil and Remove Oil Pan

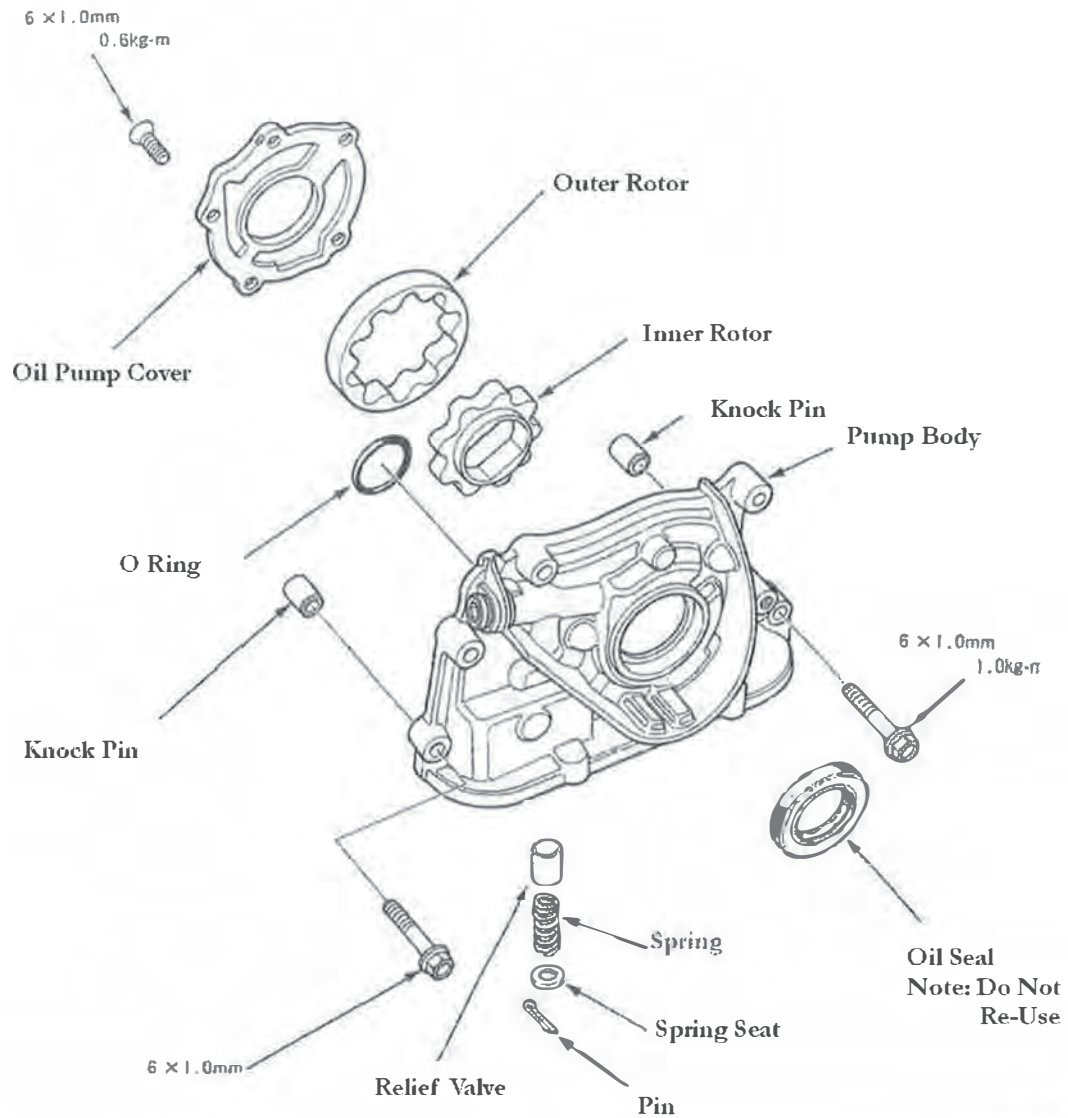
5. Remove Oil Strainer
6. Remove (5) Oil Pump Retaining Bolts
7. Remove Oil Pump

Note: See Next Section For Oil Pump Breakdown



Engine

Oil Pump Diagram



Inner Rotor & Outer Rotor Clearance
Range: 0.14mm
Fail: 0.20mm

Outer Rotor & Body Clearance
Range: 0.100~0.175mm
Fail: 0.200mm

Rotor & Side Body Clearance
Range: 0.03~0.08mm
Fail: 0.15mm
Note: Use Straight Edge & Feeler gage

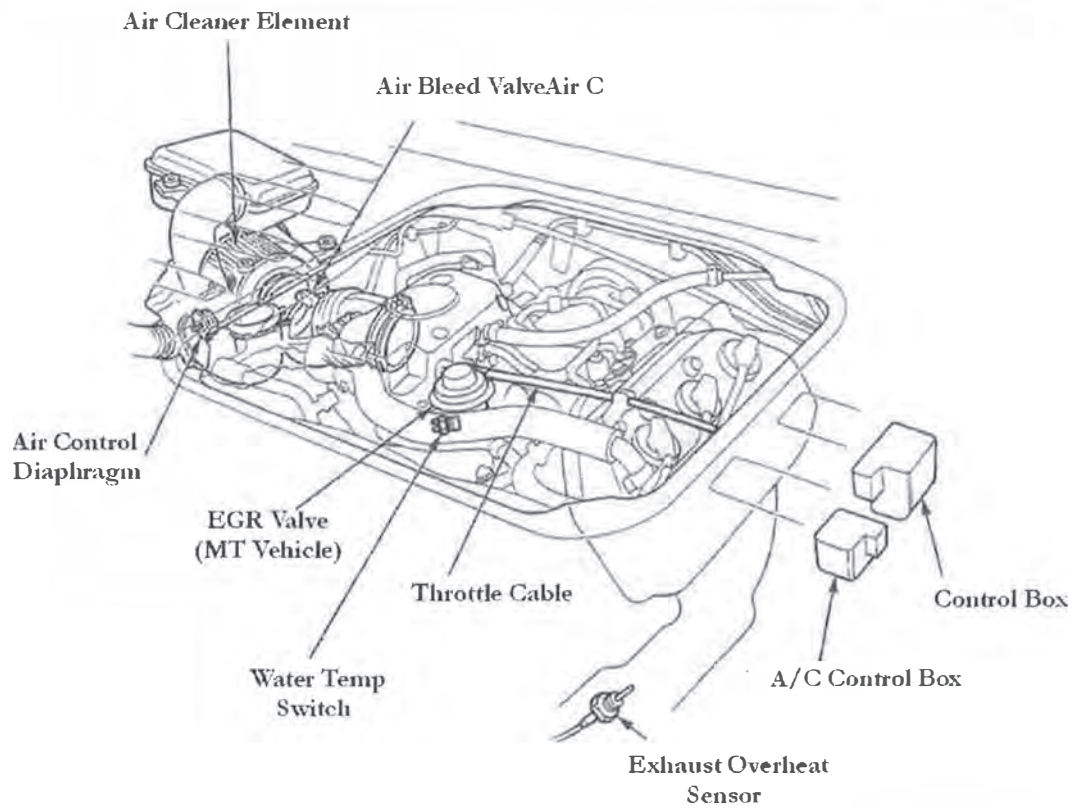
Chapter 6

Fuel System & Emission Control

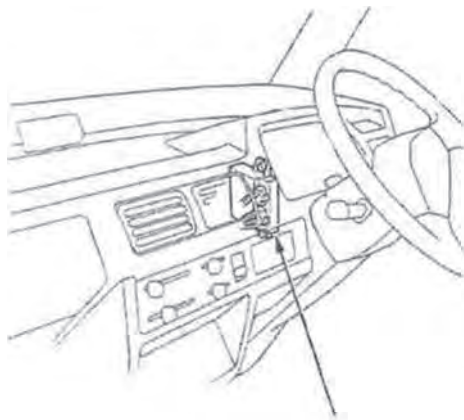
- Components
- Van & Truck Full System Diagram
- Vacuum Routing Schematic (MT Vehicle)
- Vacuum Routing Schematic (AT Vehicle)
- Emission Control Main Control Box (MT & AT)
- Emission Control Full Schematic (MT)
- Emission Control Full Schematic (AT)
- Emission Control Electrical Schematic (MT)
- Emission Control Electrical Schematic (AT)
- Air Intake & Carburetor
- Carburetor Complete Exploded Parts View Diagram
- Float Bowl Setting (Sea Level~2500 Feet Altitude Setting)
- Fuel Filter & Fuel Pump
- Fuel Pump Replacement
- Gasoline Tank & Removal
- Overheat Indicator (Dash Light)
- Exhaust Overheat Sensor
- Idle Control Unit & Testing

Fuel System & Emission Control

Components

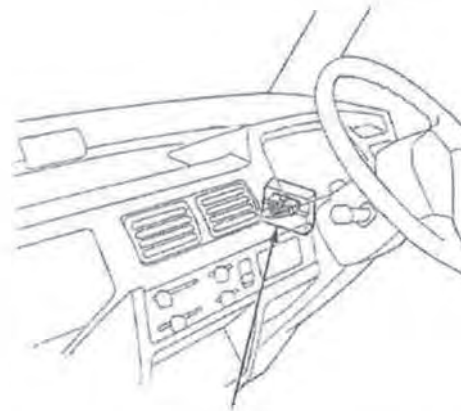


AT Vehicle



Device Control Unit

AT Vehicle

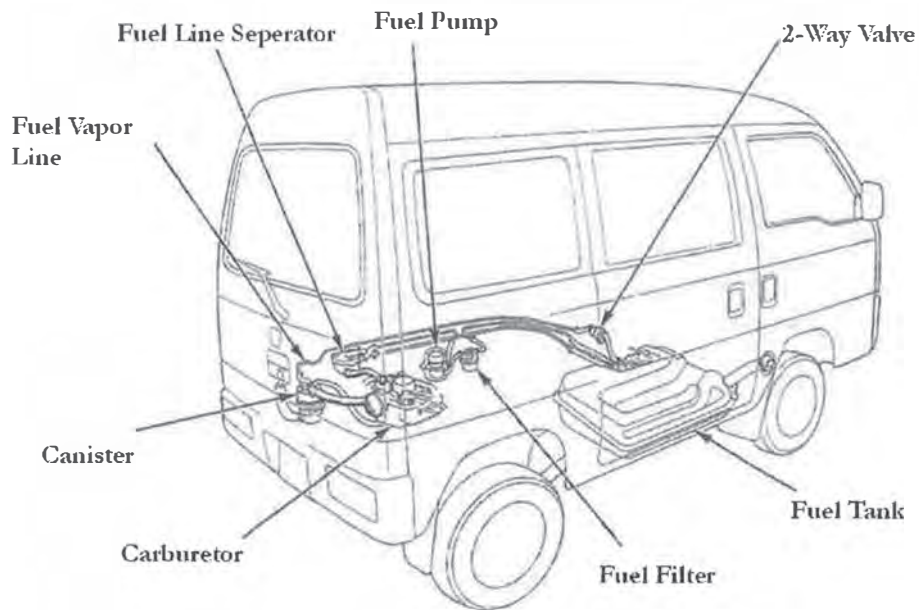


Idle Control Unit

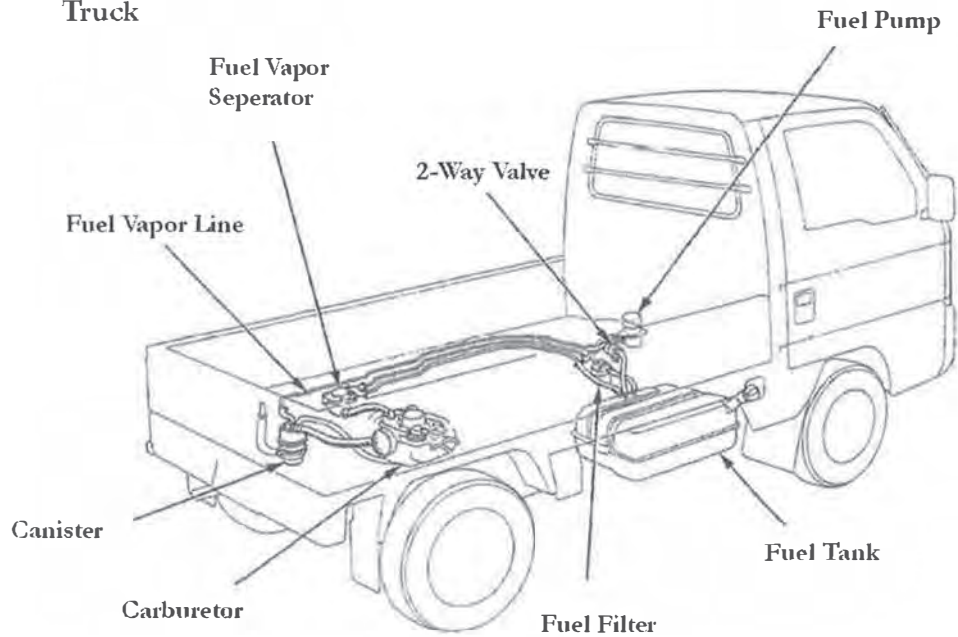
Fuel System & Emission Control

Components

Van



Truck

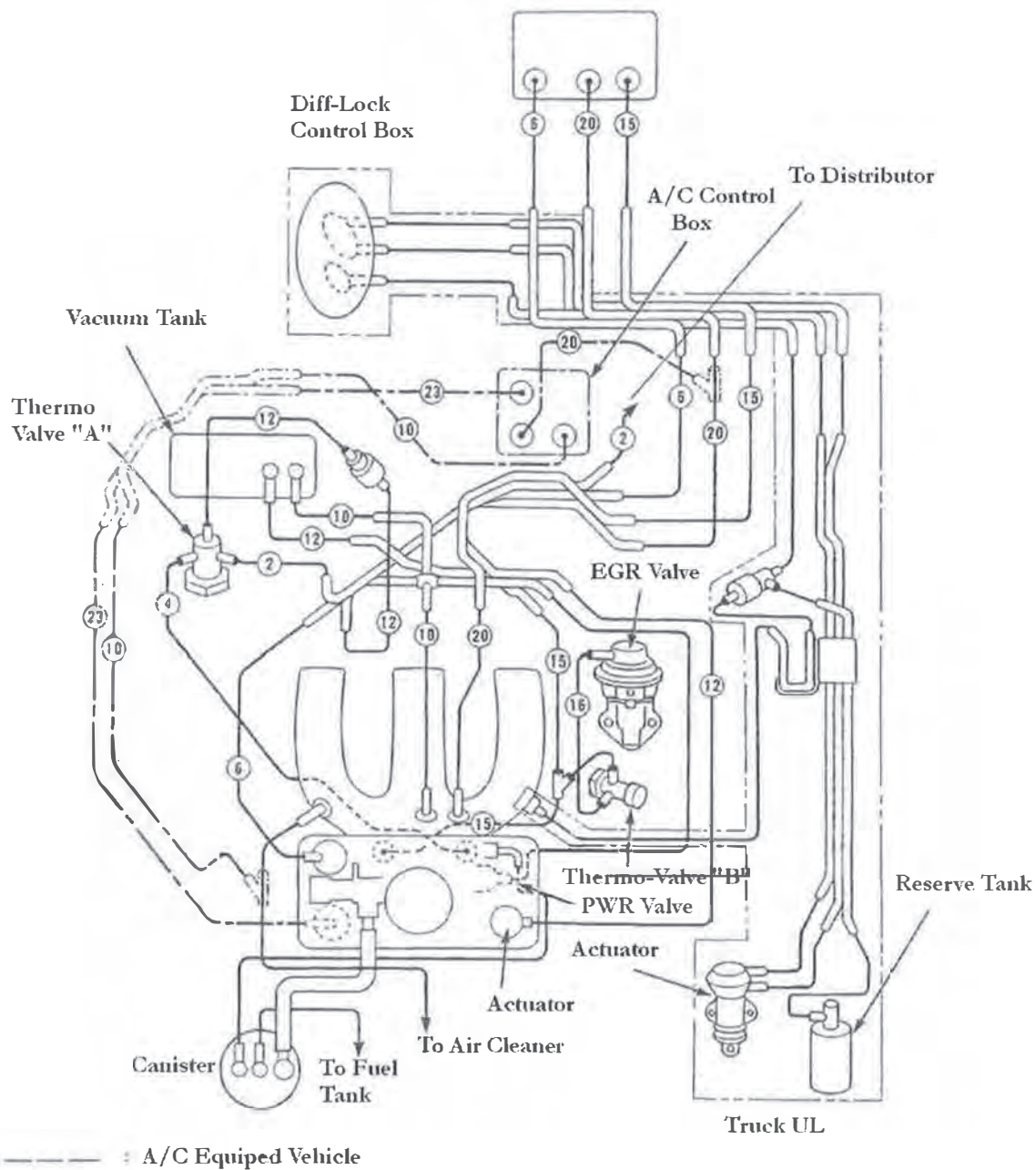


Fuel System & Emission Control

Vacuum Routing

MT Vehicle

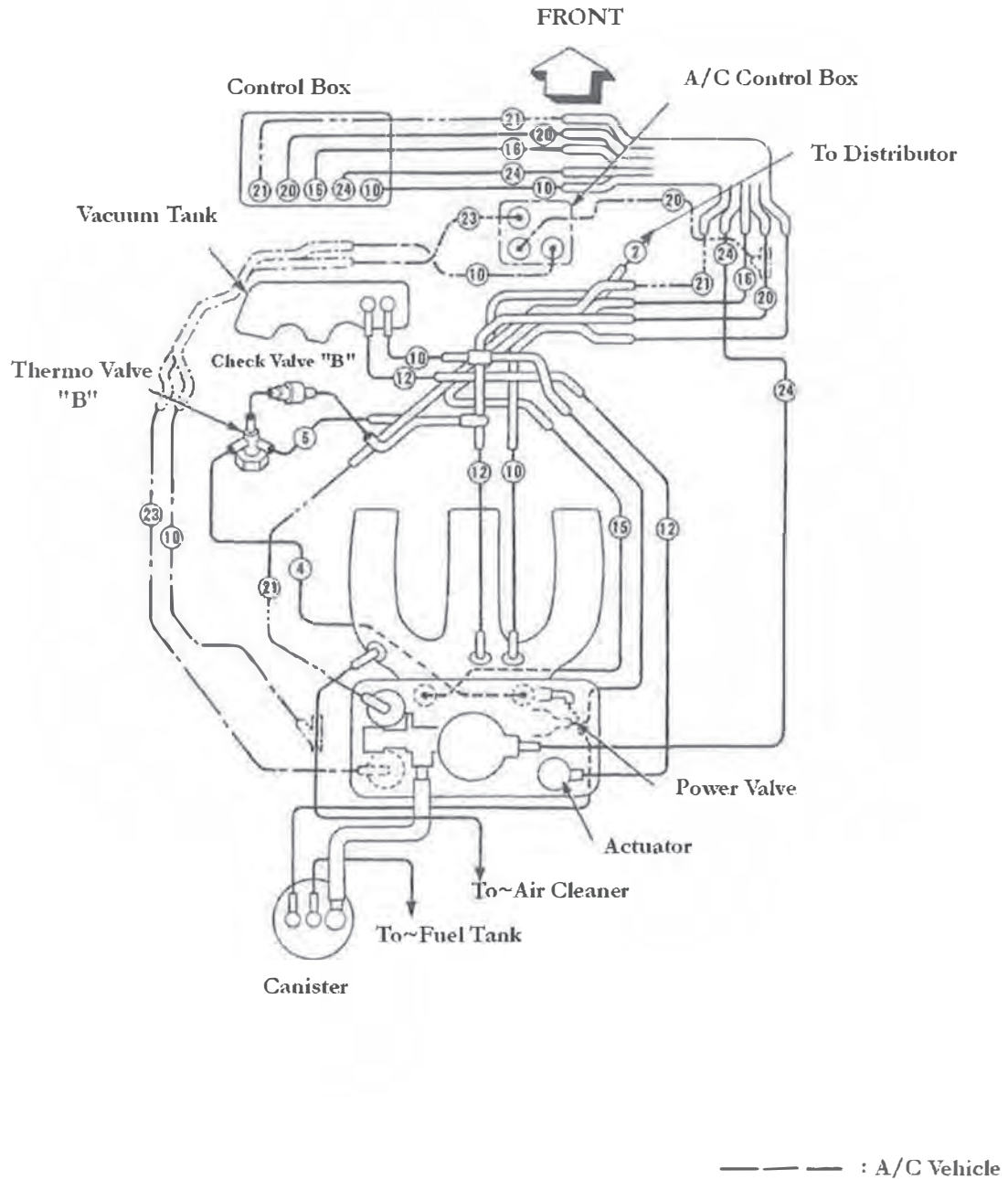
FRONT



Fuel System & Emission Control

Vacuum Routing (AT)

AT Vehicle



Emission Control Box

Throttle Control Valve

Throttle Control Solenoid

Van

Truck

20 6 15

6 20

Idle Up SOL.V (Fast Idle)

Vacuum Piston Control SOL.V

Vacuum Switch "B"

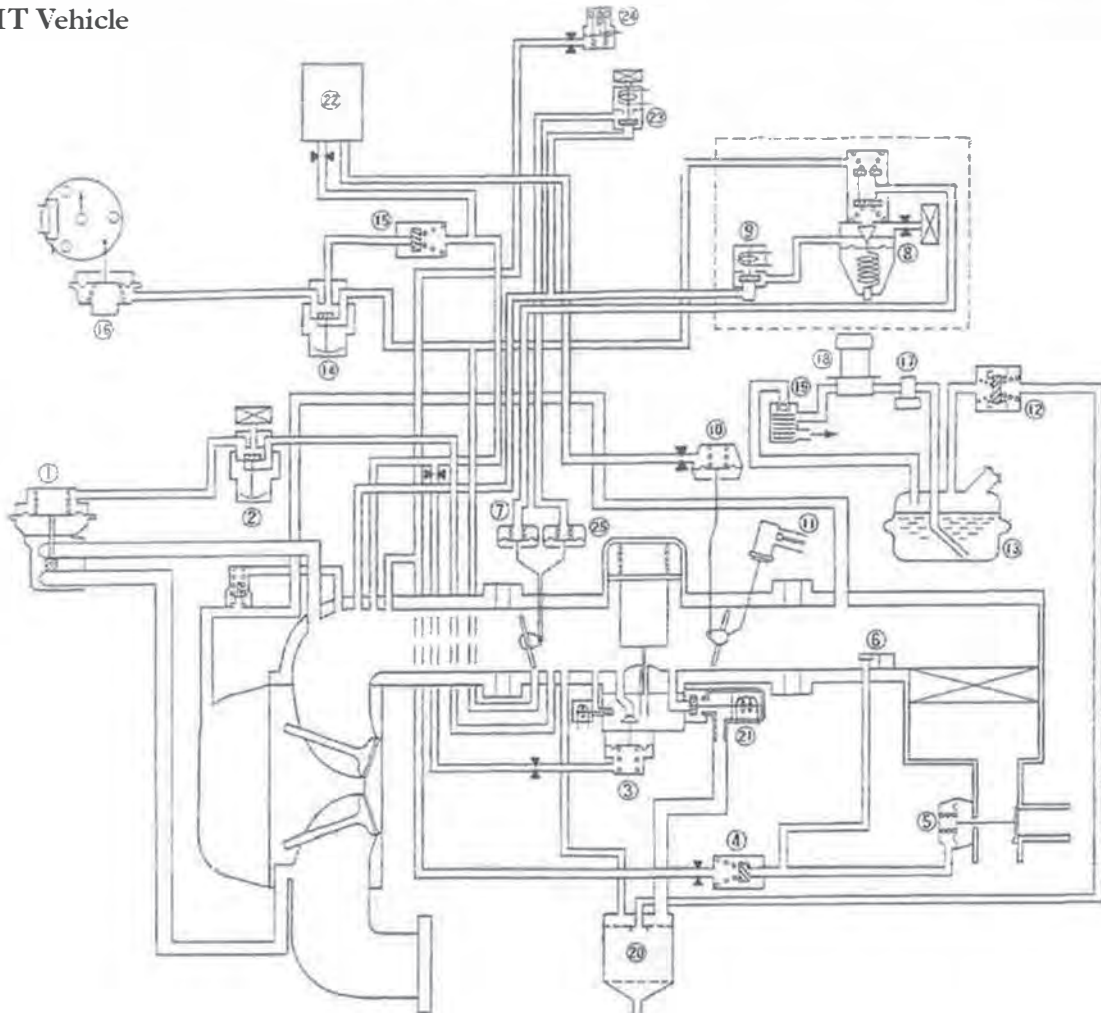
Vacuum Switch "A"

10, 16, 20, 21, 24

Fuel System & Emission Control

Emission Control Full Schematic (MT)

MT Vehicle

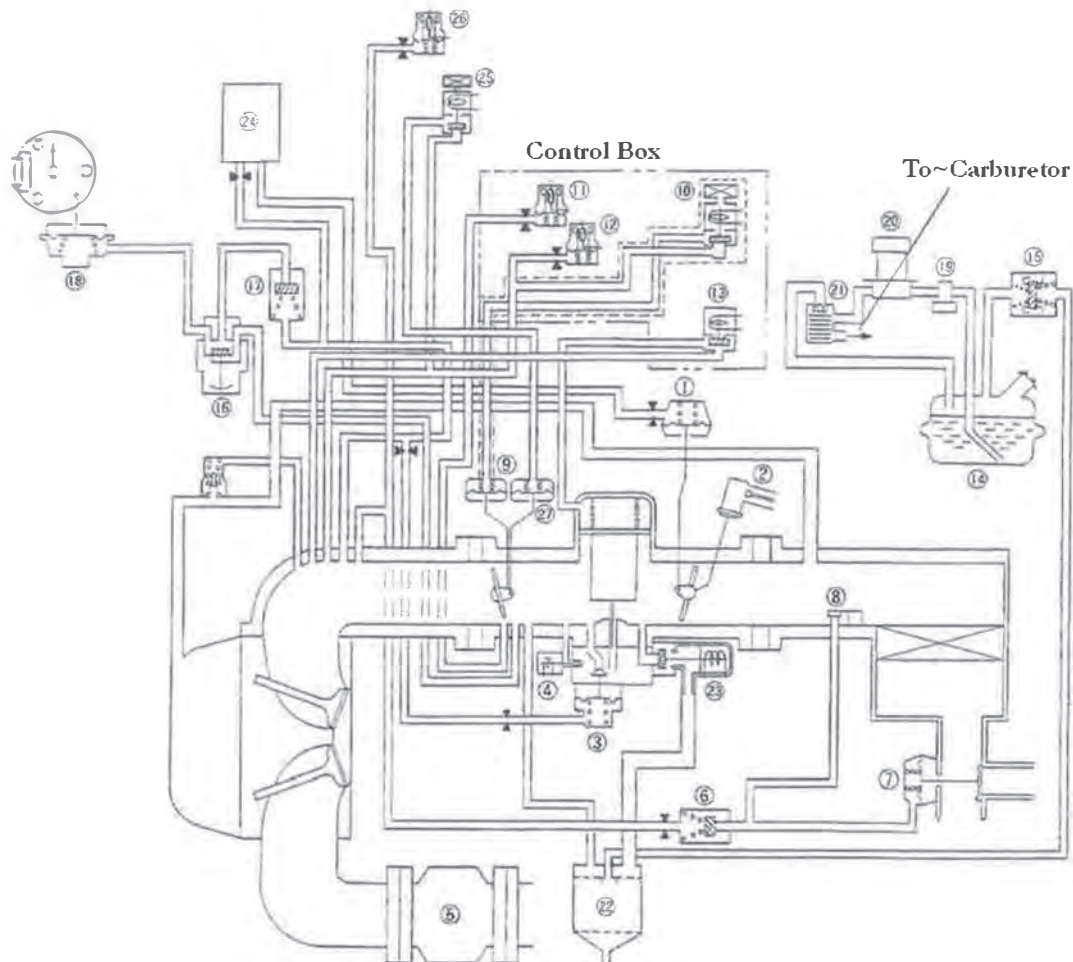


- | | |
|-------------------------------|---------------------------------|
| 1. EGR Valve | 14. Thermo-Valve "A" |
| 2. Thermo-Valve "B" | 15. Check Valve "B" |
| 3. Power Valve | 16. Vacuum Advance Diaphragm |
| 4. Check Valve "A" | 17. Fuel Filter |
| 5. Air Control Diaphragm | 18. Fuel Pump |
| 6. Air Bleed Valve | 19. Fuel Vapor Selector |
| 7. Throttle Control Diaphragm | 20. Canister |
| 8. Throttle Control Valve | 21. Air Vent Cut-Off SOL.V |
| 9. Throttle Control SOL.V | 22. Vacuum Tank |
| 10. Actuator | 23. A/C Idle Up SOL.V |
| 11. Thermo-Wax Valve | 24. Vacuum Switch (A/C Equiped) |
| 12. 2-Way Valve | 25. A/C Idle Control Diaphragm |
| 13. Fuel Tank | |

Fuel System & Emission Control

Emission Control Full Schematic (AT)

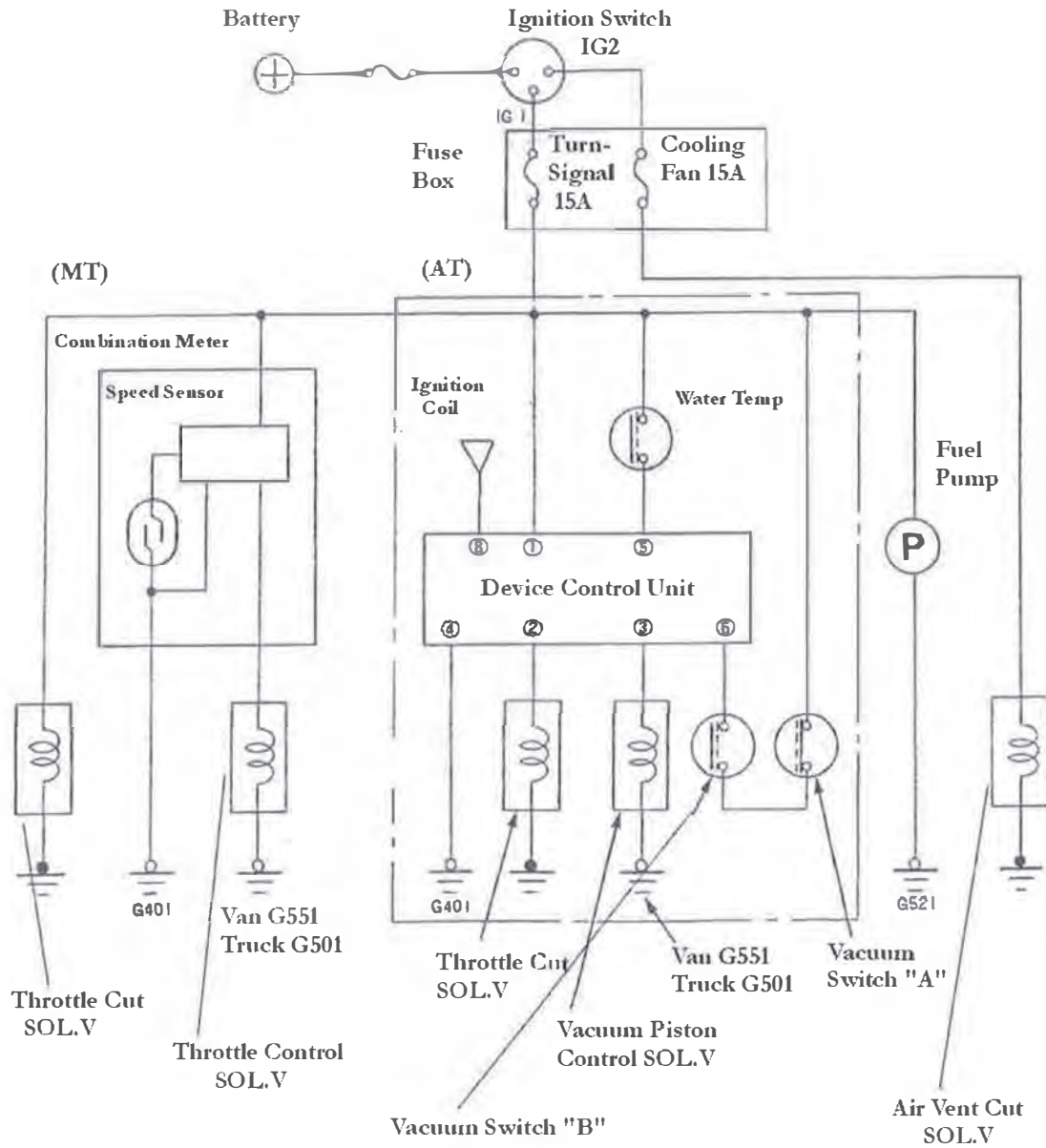
AT Vehicle



- | | |
|---------------------------------|---------------------------------|
| 1. Actuator | 15. 2-Way Valve |
| 2. Thermo-Wax Valve | 16. Thermo-Valve "A" |
| 3. Power Valve | 17. Check Valve "B" |
| 4. Throttle Cut SOL.V | 18. Vacuum Advance Diaphragm |
| 5. Convertor | 19. Fuel Filter |
| 6. Check Valve "A" | 20. Fuel Pump |
| 7. Air Control Diaphragm | 21. Fuel Vapor Selector |
| 8. Air Bleed Valve | 22. Canister |
| 9. Idle Control Diaphragm | 23. Air Vent Cut SOL.V |
| 10. Idle Up SOL.V | 24. Vacuum Tank |
| 11. Vacuum Switch "A" | 25. A/C Idle Up SOL.V |
| 12. Vacuum Switch "B" | 26. Vacuum Switch (A/C Vehicle) |
| 13. Vacuum Piston Control SOL.V | 27. A/C Idle Control Diaphragm |
| 14. Fuel Tank | |

Fuel System & Emission Control

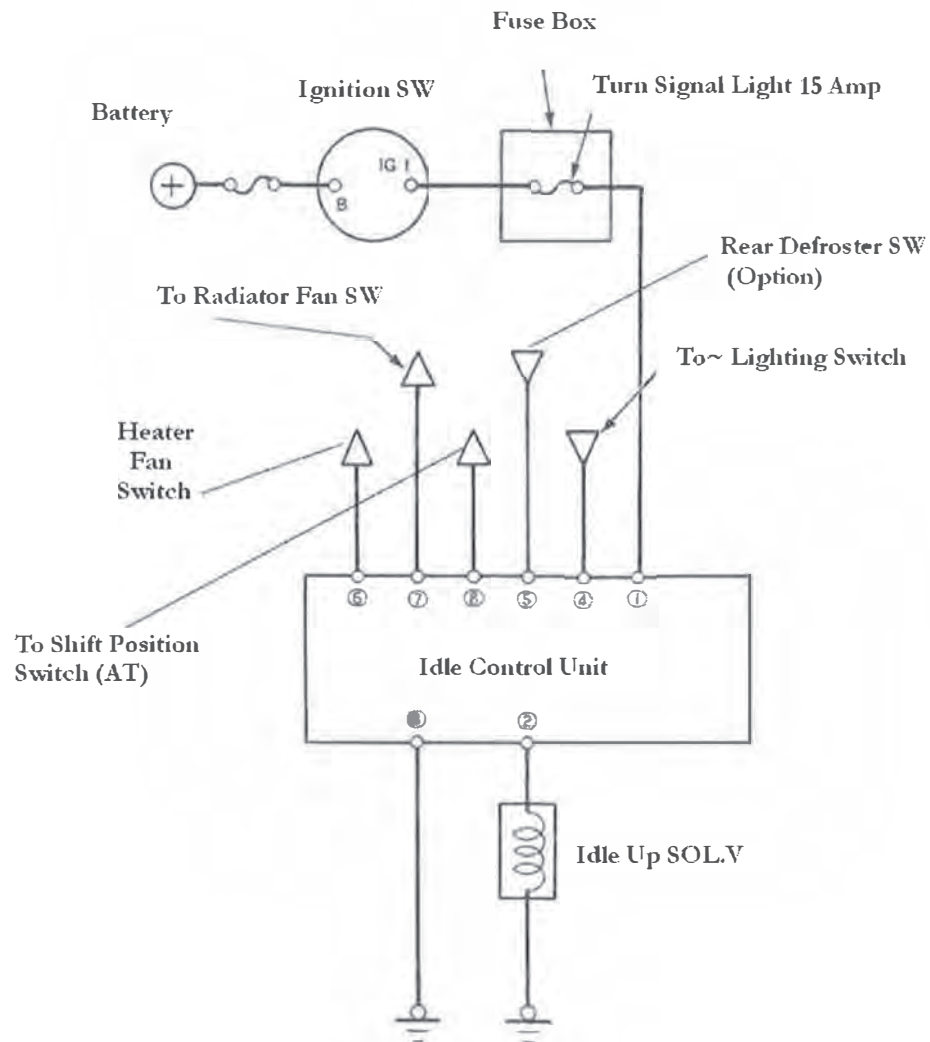
Emission Control Electrical Schematic (Carbureted Vehicle)



Fuel System & Emission Control

Idle Control Circuit (Carbureted)

AT Vehicle



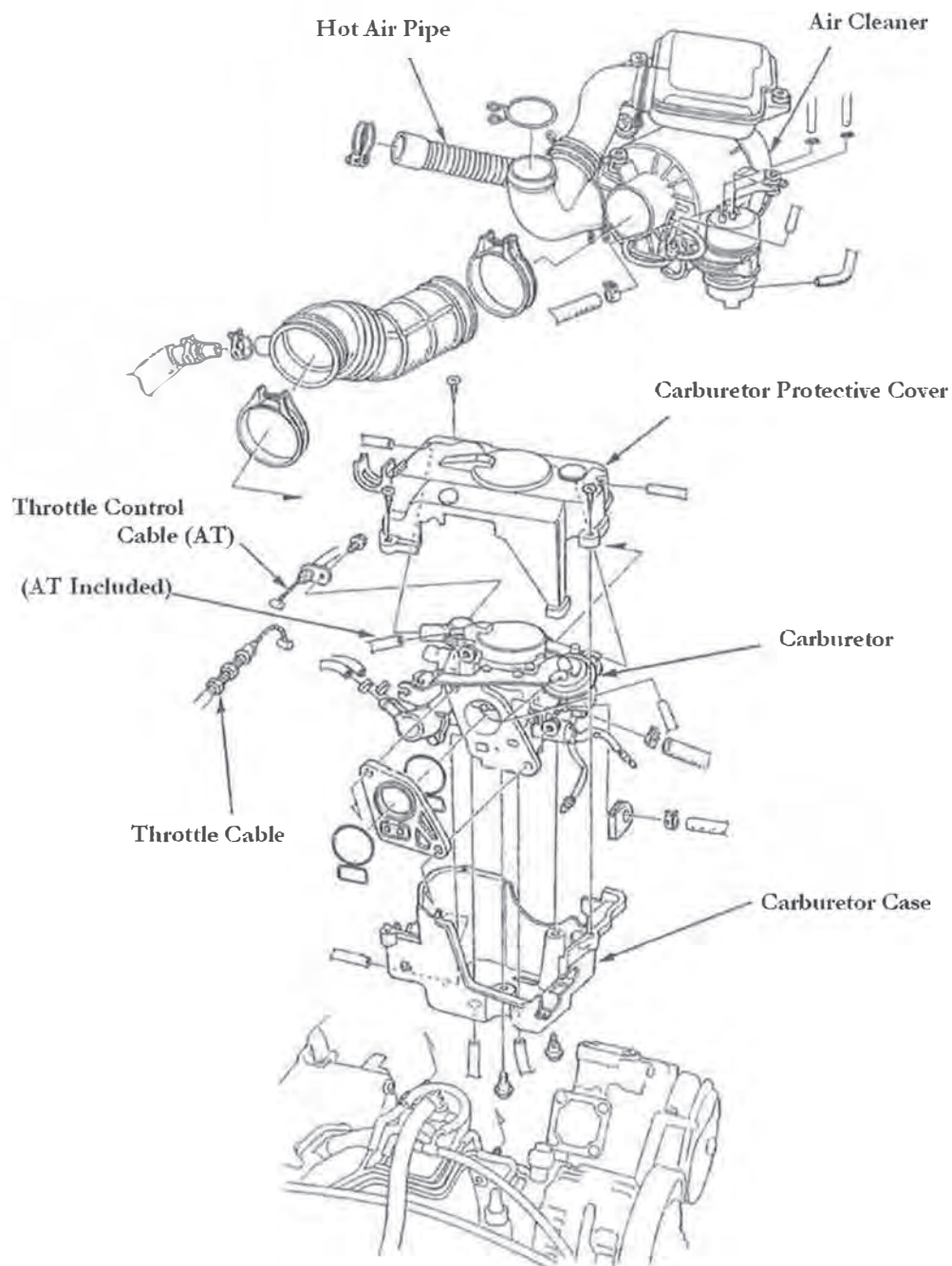
Troubleshooting Tip

Note: Removing Fuse (Turn-Signal Light 15A) for 10 Seconds
Resets Idle Control Unit to Default

Fuel System & Emission Control

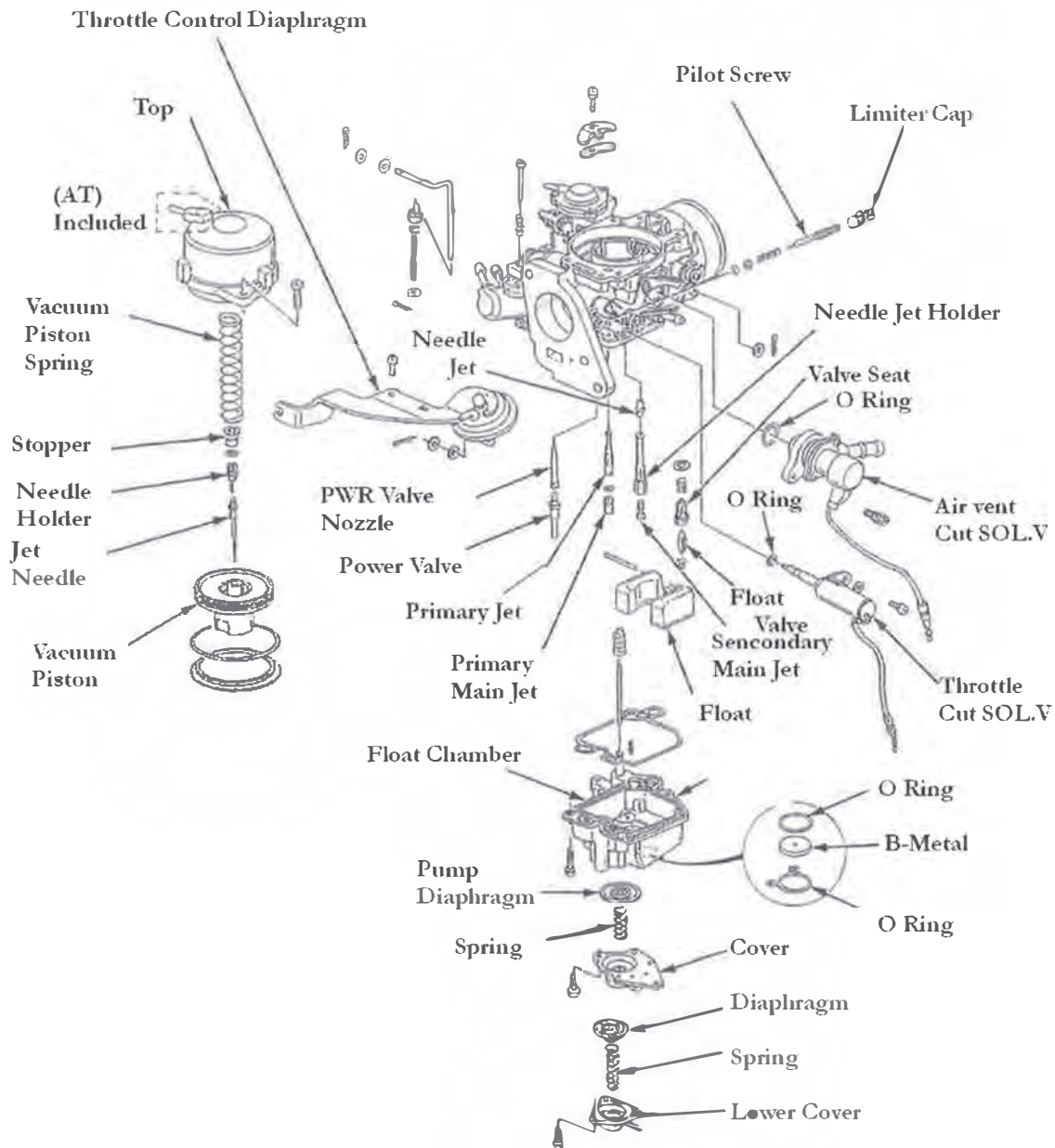
Air Intake & Carburetor

Main Components



Fuel System & Emission Control

Carburetor Exploded Parts View



Note: AT Vehicles May Have Some Differences Per Year of Manufacture

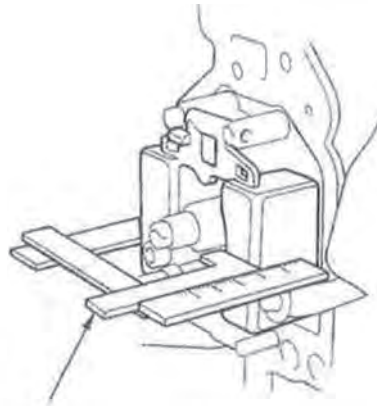
Fuel System & Emission Control

Carburetor Float Level

AT & MT Vehicle

Note: Use Float Level Gage to Verify Correct Level

Level: 16 \pm 1mm



Float Level Gage
07401-0010000

**Note: Setting For Altitude Below
3000 Feet Above Sea Level**

Fuel System & Emission Control

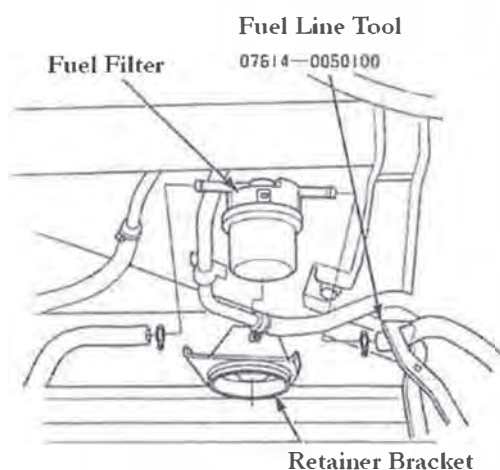
Fuel Filter & Fuel Pump

Fuel Filter

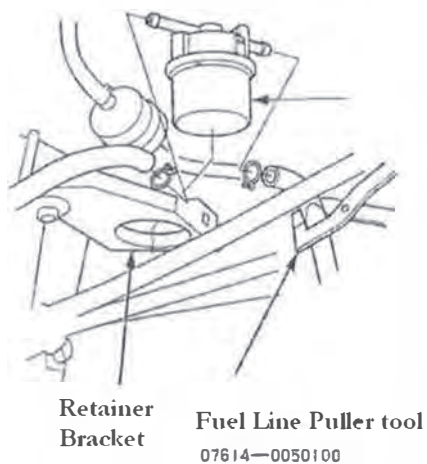
Note: Fuel Filter Must Be Changed Every 40,000 Kilometers

Remove & Replace

Van

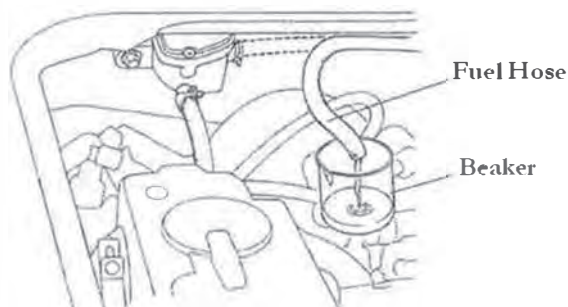


Truck



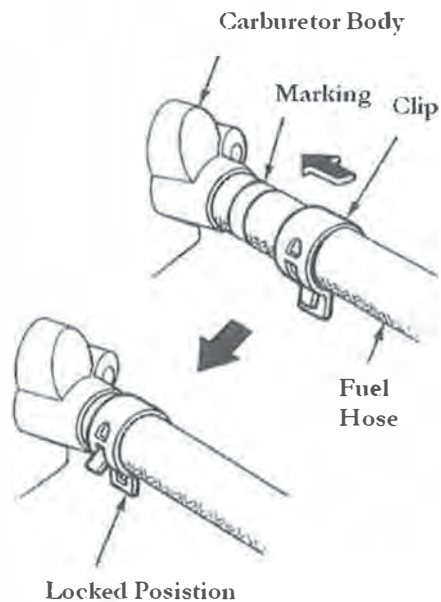
Fuel Pump Test

Note: Change Filter Before Testing Pump



1. Remove Fuel Hose From Carburetor (See Hose Removal Diagram Below)
2. Place End Of Hose Into (1) Liter Beaker
3. Turn Ignition Switch to ON Position For (1) Minute and Switch OFF

Results: Beaker Must Contain Minimum 400cc of Fuel. Below that Replace Pump and Re-Test

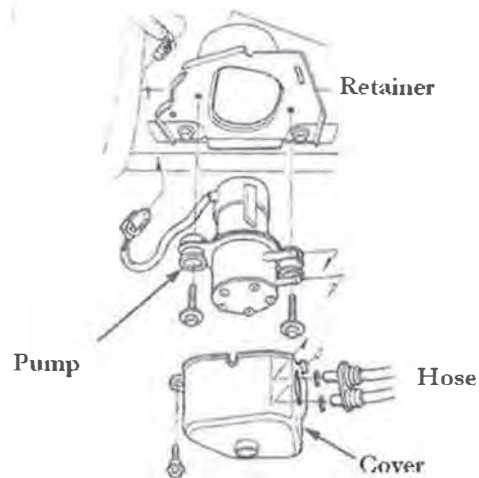


Fuel System & Emission Control

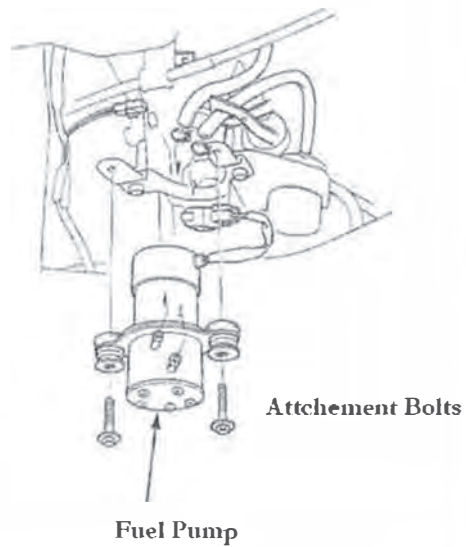
Fuel Pump Replacement

1. Jack Up Vehicle
2. Remove Fuel Pump Cover (Van)
3. Remove Fuel Pump Connector
4. Remove Pump Attachment Bolts
5. Remove Pump
6. Disconnect Fuel Lines
7. Reverse Order Intallation

Van



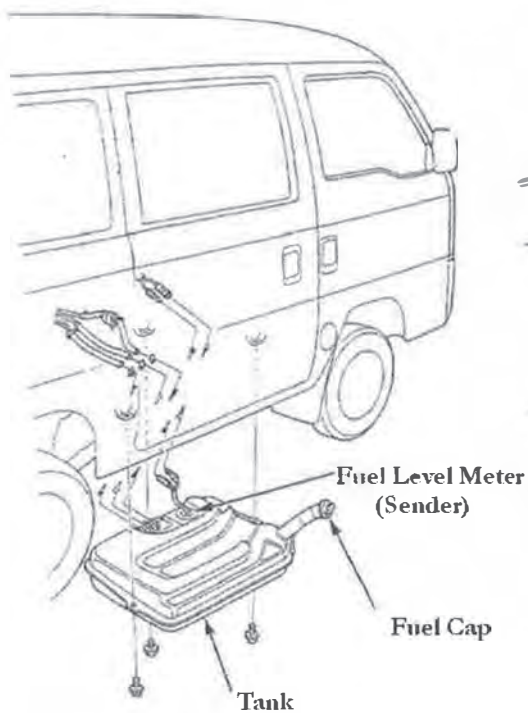
Truck



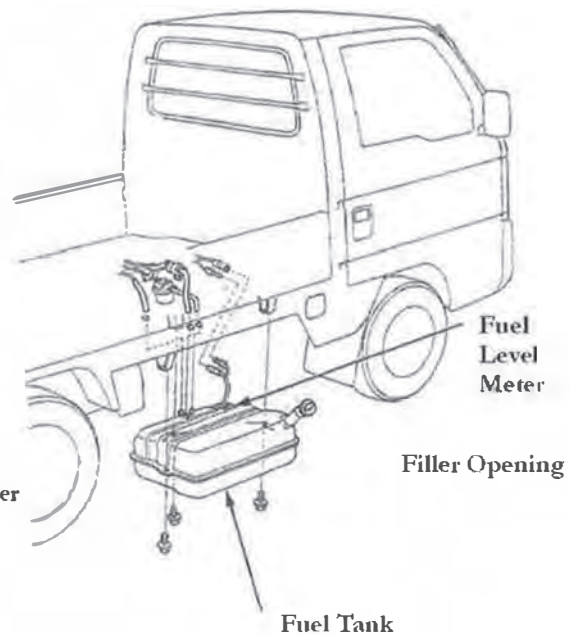
Fuel System & Emission Control

Gasoline Tank Removal

Van



Truck



Removal Procedure

1. Jack Up Vehicle
2. Disconnect Fuel Level Sender Connection
3. Disconnect Fuel Lines
4. Un Bolt Attachment Bolts
5. Lower Tank From Body

Fuel System & Emission Control

Exhaust Overheat Warning System

The Indicator Lamp Indicates The Exhaust Temperature Has Overheated And Engine Must be Shut Down For Repair

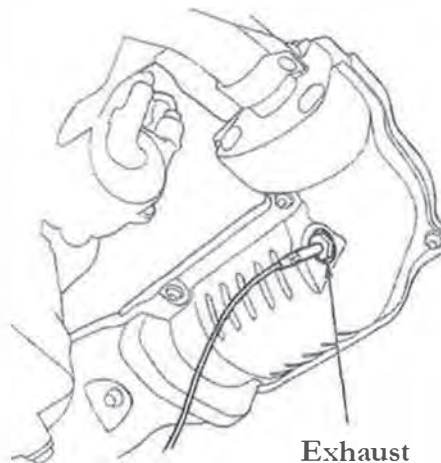
Exhaust Temp Overheat Indicator



Note: Continued Driving While Light is ON Can Cause Major Engine Internal Damage

Troubleshoot Fuel System to Determine Cause

Note: Do Not Confuse With O2 Sensor



Exhaust Overheat Sensor

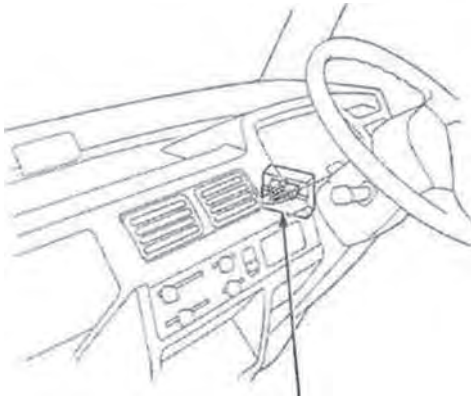
Note: Do NOT Cut Wires, Unit Will Be Destroyed

Note: Do NOT Ground Wires

Fuel System & Emission Control

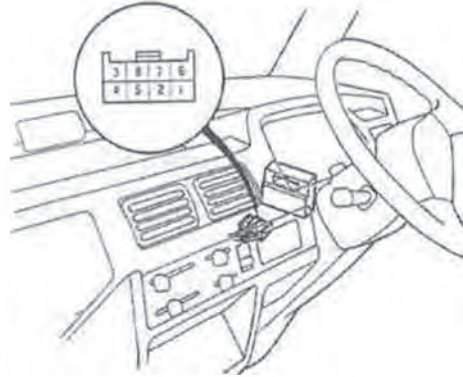
Idle Control Unit (AT)

Location



**Idle Control Unit Location
(Carbureted Vehicle)**

Idle Control Unit Connector



**Note: Improper Grounding Can Cause Failure
Check Pin Number #3 For Ground**

Unit Check

1. Ignition Switch To ON Position
2. Check Pin #1 for Power and #3 For Ground

**Note: To Re-Set Unit Remove "Turn Signal Light
(15A) Fuse" for 10 seconds**

Unit Failure

**Note: Failed Units Can Not Be Repaired and
Must Be Replaced**

Rear Defroster Equiped Vehicle

1. Start Engine and Warm
2. Test Defroster Switch
3. Test Pin #5(+)

Lighting Switch & Idle Control Unit

1. Ignition Switch to ON
2. Check Pin #4(+) and Pin#3(-)

Heater Fan Switch

1. Start Engine
 2. Check Pin #6 (+) and Pin #3(-)
- Failure: Replace Idle Control Unit**

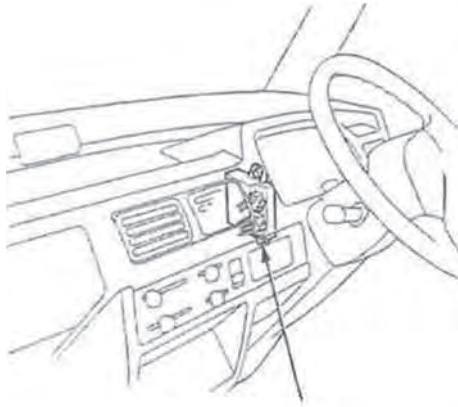
Radiator Fan

1. Start Engine and Warm
 2. Check Pin #7(+) and Pin#3(-)
- Fan Does Not Engage Replace Unit**

Fuel System & Emission Control

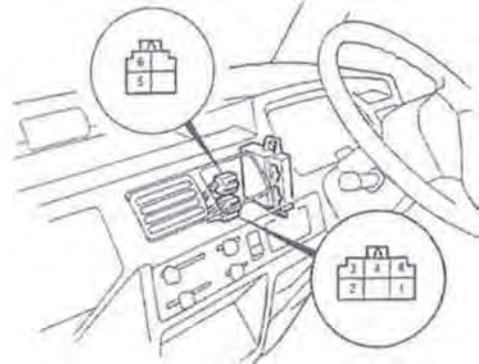
Device Control Unit (AT Vehicle)

Device Control Unit Location



Device Control Unit

Connectors



Connections & Pins

Device Control Ground 6P #4(-)

Ignition Switch (IG1)

1. Ignition Switch ON
2. 6P #1 (+) #4 (-)

Ignition Coil & Device Control Unit

1. Ignition Switch ON
2. 6P #8 (+) #4 (-)

Water Temp Switch

1. Engine ON
2. 4P #5 (+) & 6P #4(-)

**Reset Unit: Remove Turn Signal Lamp
15A Fuse 10 Seconds**

Chapter 7

Clutch

- **Specialty Tools**
- **Clutch System Diagram**
- **Clutch Pedal & Cable Adjustment**
- **Release Bearing Inspection & Replacement**
- **Pressure Plate**
- **Clutch Disk & Inspection**
- **Flywheel**
- **Clutch Assembly**

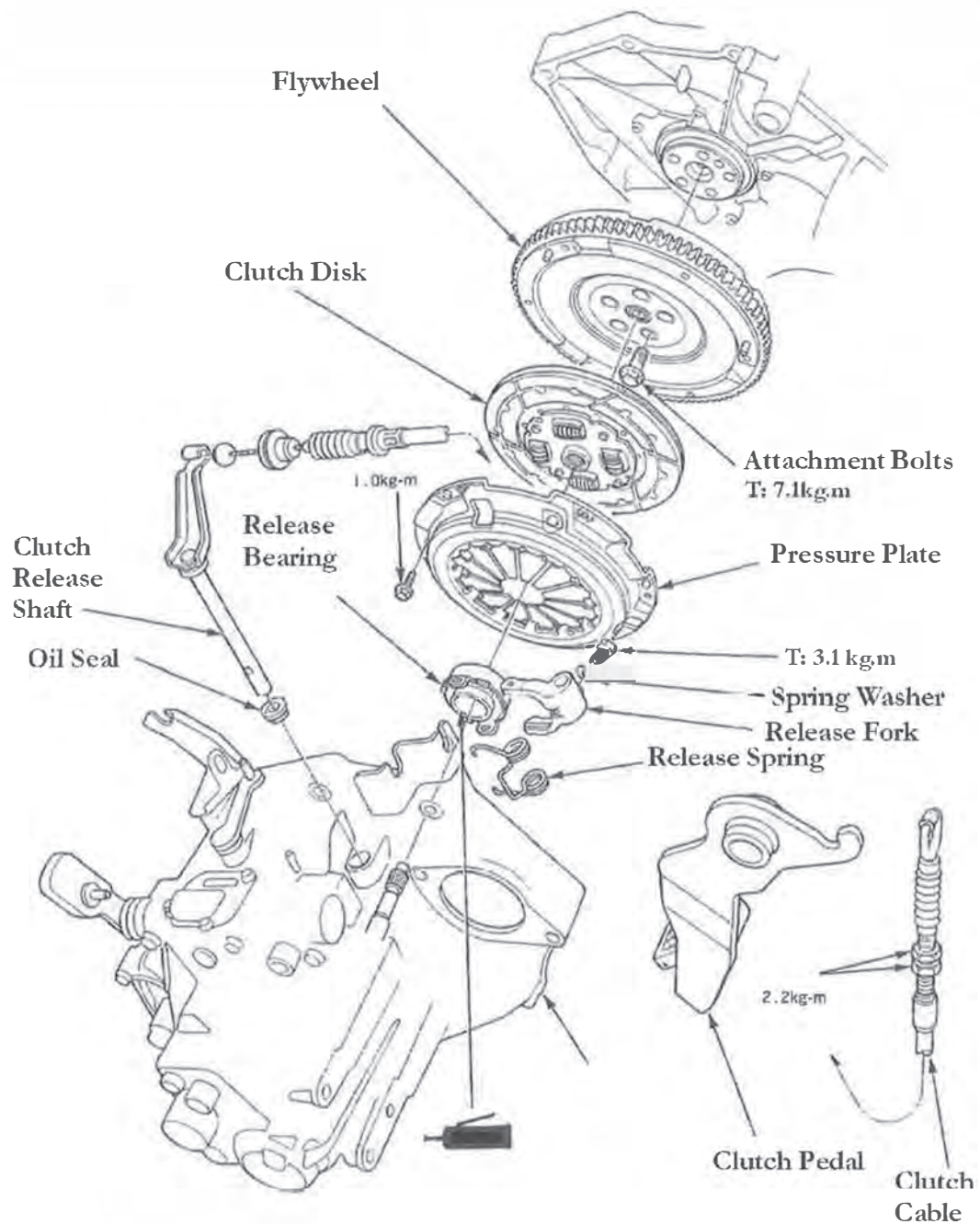
Clutch

Specialty Tools

No.	Part #	Description	
①	07924-PI20003	Flywheel Ring Gear Holder	
②-1	07LAF-PZ10110	Clutch Attachment Shaft	
②-2	07JAF-PM7011A	Clutch Attachment Disk	
②-3	07936-3710100	Ream Bar Handle	
③	07746-0010100	Outer 32x35mm	
④	07749-0010000	Handle "A"	

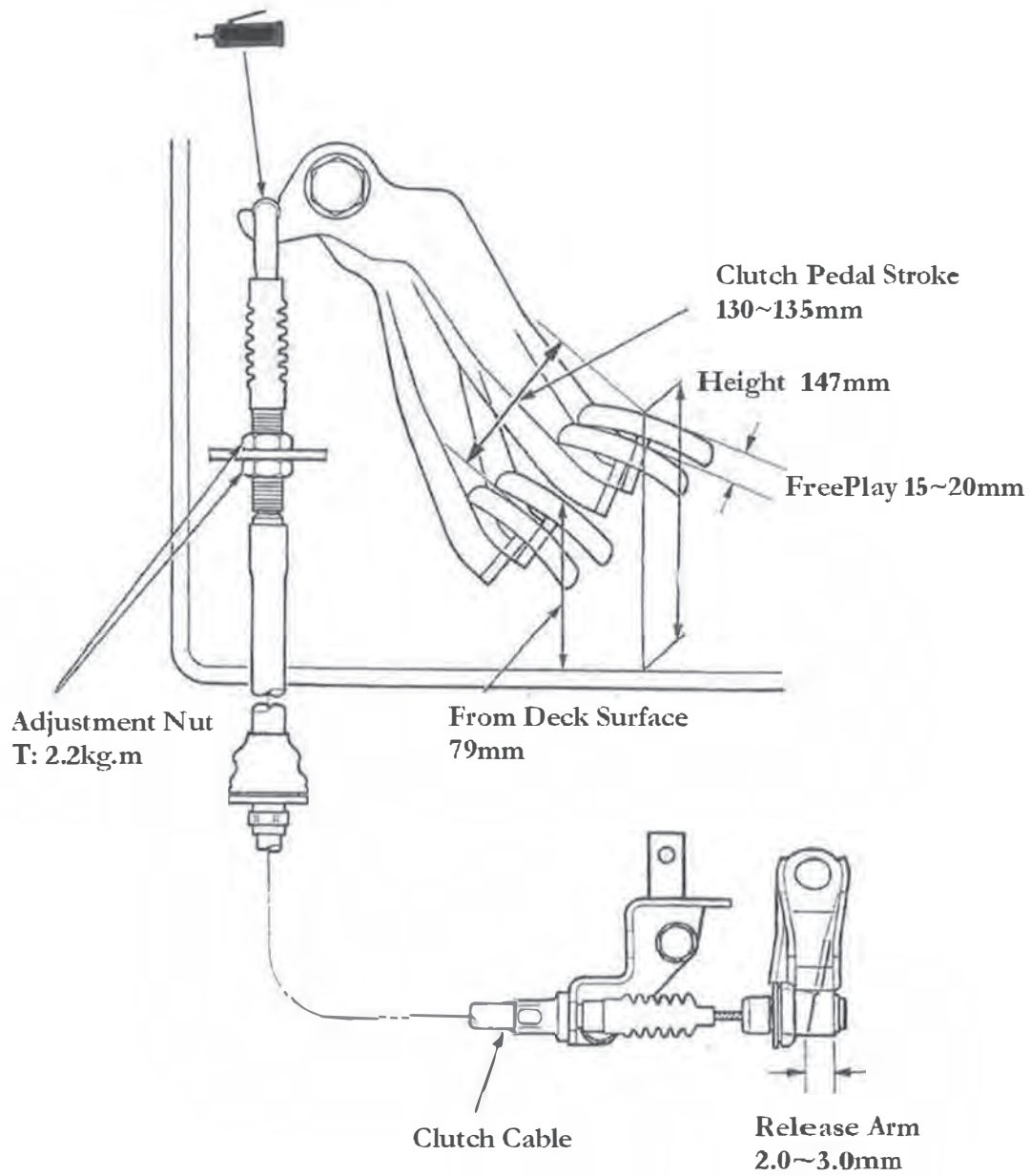
Clutch

Complete Diagram



Clutch

Clutch Pedal and Cable Adjustment

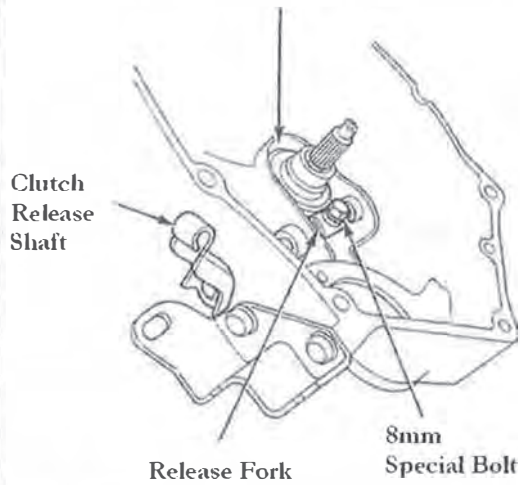


Clutch

Release Bearing

1. Remove 8mm Special Bolt

Release Bearing

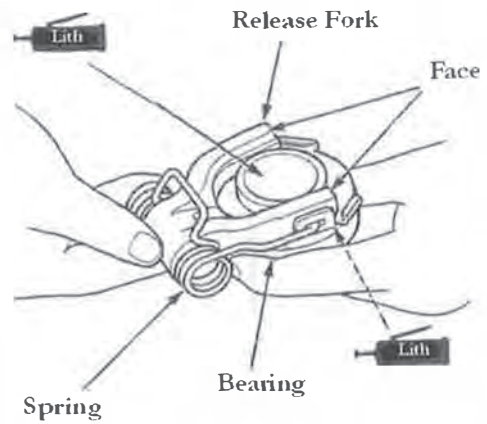


2. Remove Clutch Release Shaft, Release Bearing, and Release Fork

3. Separate Spring From Release Bearing

Grease Point

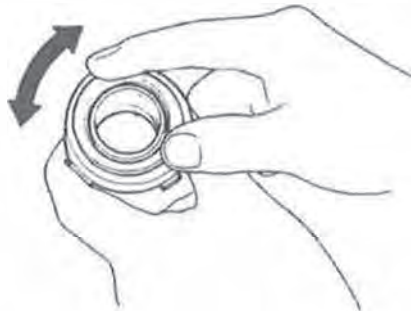
Note: Use High-Temp Molybdenum or Lithium



Bearing Check

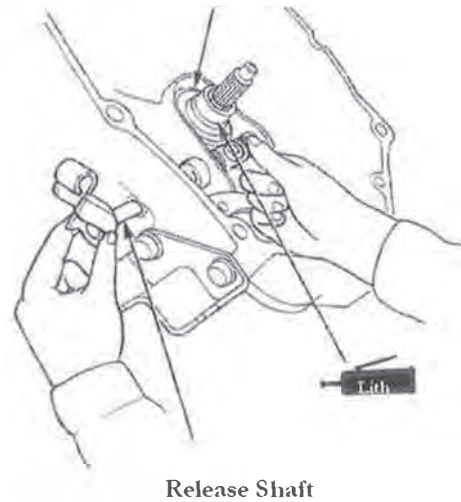
Note: Do NOT Soak in Cleaning Solvent
Unit Will Fail

1. Turn Left~Right & Check For Free Travel
Restrictions Replace Bearing



Note: Replace Bearing 100,000 Kilometer

Release Bearing



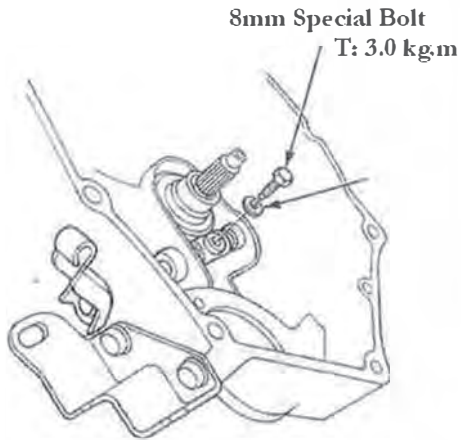
Note: Check Free Travel After Applying Grease

Clutch

Pressure Plate

Bearing Assembly

Assemble: Set Torque and Check Free Travel

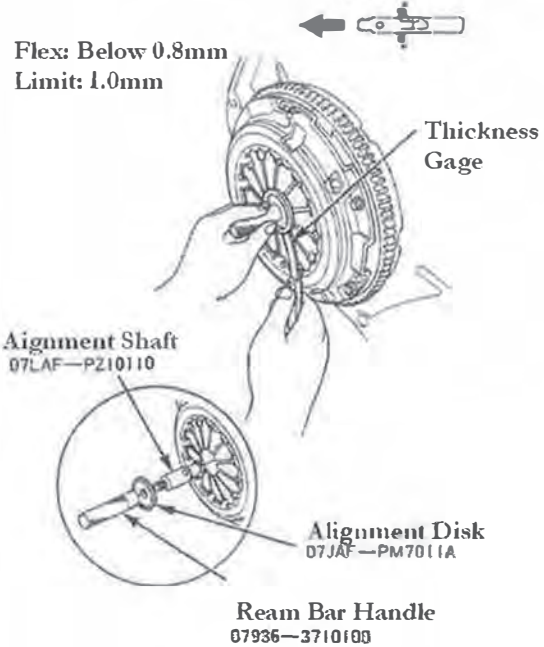


Note: Cover Area With Plastic Dust Cover if Not Immediate Installation

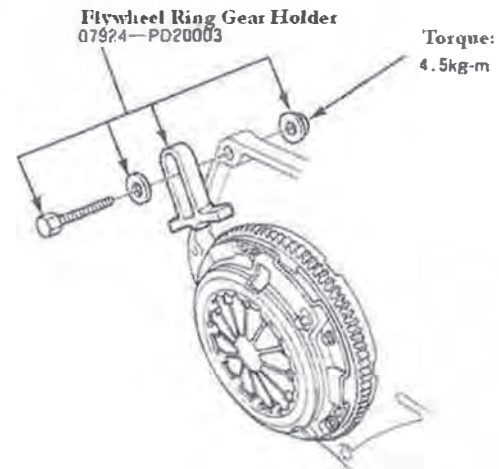
Note: If Unit to be Stored More Than One Week Replace Grease Before Installation

Pressure Plate Inspection

1. Use Specialty Tools and Check Following Correct Setup



2. Attach Flywheel Gear Holder



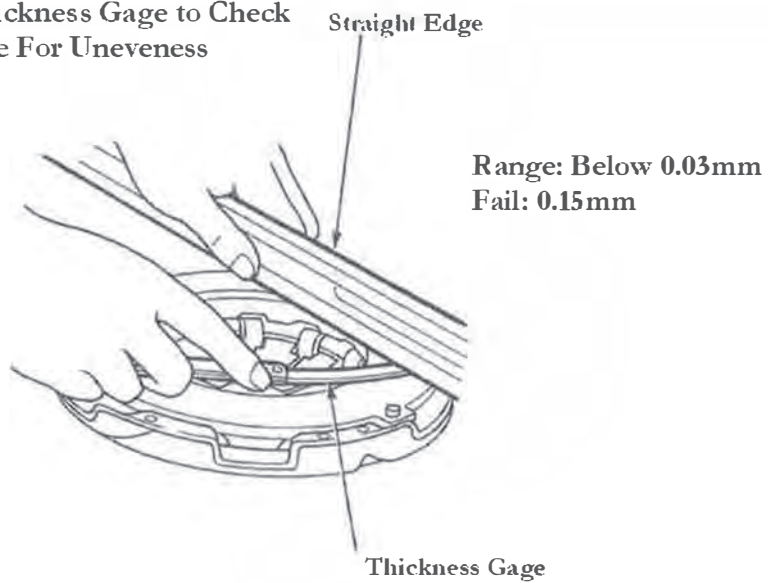
Replace Pressure Plate 100,000 Kilometers

Clutch

Pressure Plate

Disk Face Measurement

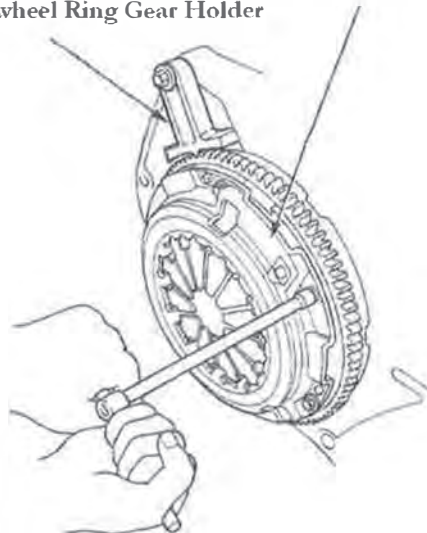
**Note: Use a Thickness Gage to Check
Disk Face For Unevenness**



07924—PD20003

Flywheel Ring Gear Holder

Pressure Plate

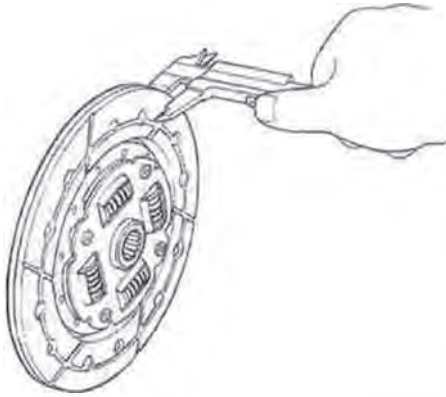


Clutch

Clutch Disk Inspection

**Note: Clutch Disk Must be Changed
100,000 Kilometers**

1. Visual Inspection: Burnt Face or Visual Damage Discard

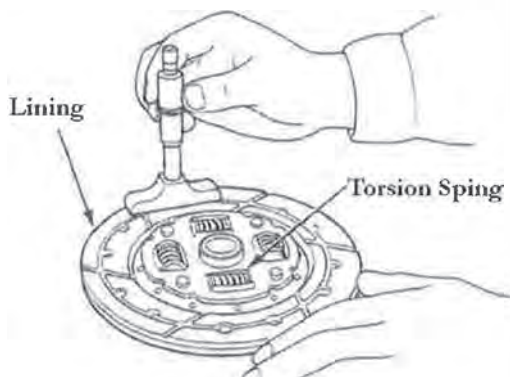


2. Measure Thickness

Range: 8.35~9.15mm

Fail: 5.75mm

Lining to Rivet Measurment

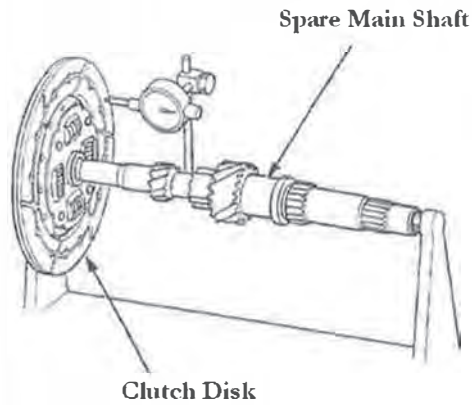


Range: Above 1.3mm

Fail: 0.2mm

Disk Round-Out

1. Place Unit on Stand
2. Use Spare Mainshaft and Dial Gage
3. Check Roundout Measurement



Range: Below 0.6mm

Fail: 1.0mm

Clutch

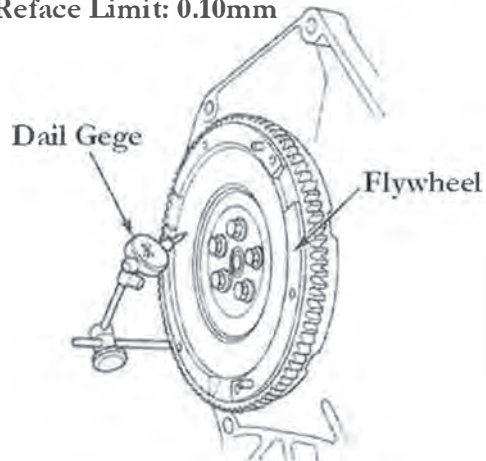
Flywheel

1. Inspect Flywheel Ring Gear Teeth
Broken or Missing Teeth Replace Unit
2. Use a Dial Gage and Check Round-Out
Measurement as in Diagram Below

Range: Below 0.05mm

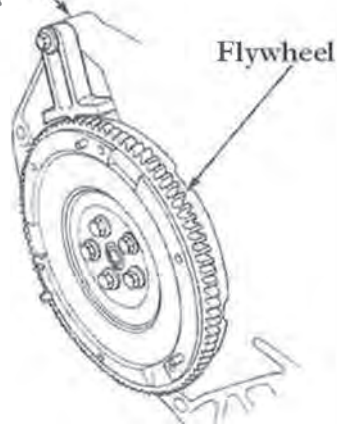
Fail: 0.15mm

Reface Limit: 0.10mm



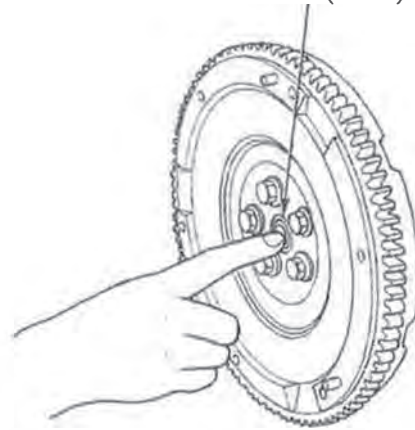
Flywheel Ring Holder

07924—PD20003



Inspect Flywheel Bearing

Flywheel Bearing
(Pilot)



Note: If Nicked or Rough Edges Replace

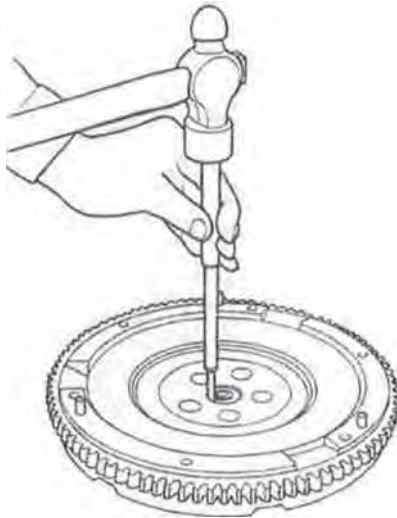
See Next Page For Replacement

Clutch

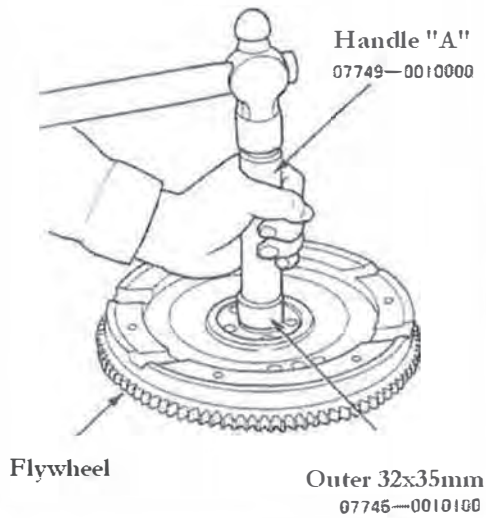
Assembly

Flywheel Bearing Replacement

1. Remove Flywheel
2. From Transmission Side Collapse Bearing



3. Flip Over Flywheel and Knock Out Bearing
4. Replace Bearing



Clutch Assembly

1. Attach Flywheel to Engine
2. Attach Flywheel Ring Gear Holder
3. Follow Torque Sequence Below and Set Bolts to T: 7.1kg.m

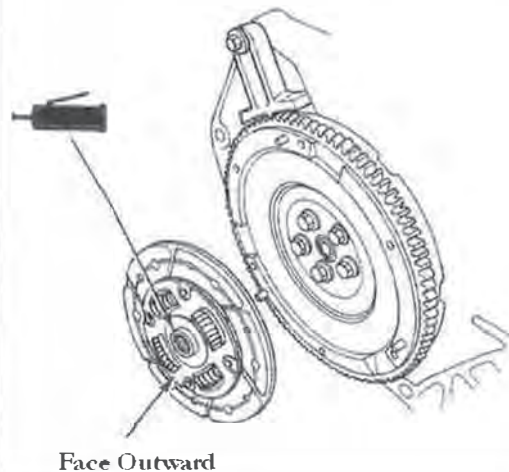
Ring Gear Holder
07924-PD20003

Flywheel

Torque
Sequence
T: 7.1 kg.m

4. Place Clutch Disk in Place
5. Grease Center Gear

Note: Do NOT Get Grease on Disk

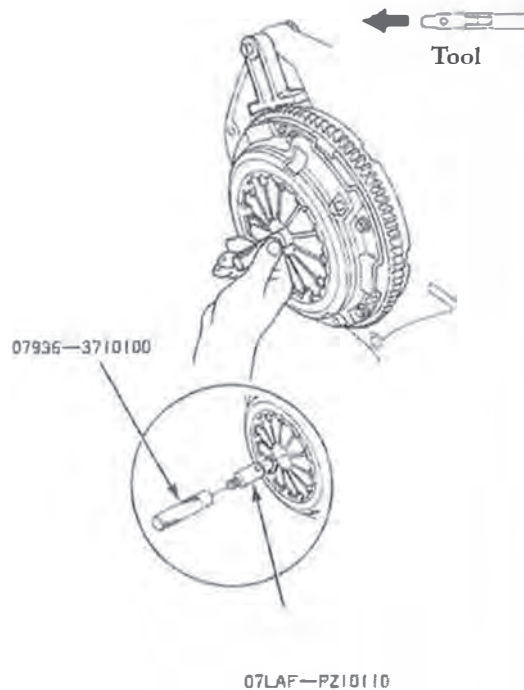


Clutch

Assembly

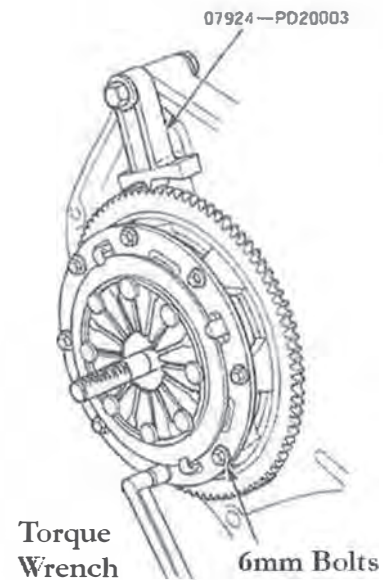
6. Attach Clutch Disk and Pressure Plate to Flywheel

7. Use Alignment Tools to Align Parts Before Setting Torque



Tool Diagram Close-up

8. Torque to Specifications



Torque: 1.0 kg.m

9. Remove Alignment Tools. Remove ring Gear Holder Tool.

Note: Place Plastic Bage Over Unit
Unit Assembly

Chapter 8

Driveshaft & Axel

- Specialty Tools
- Rear Driveshaft (Axel) Removal
- Rear Driveshaft (Axel) Rebuild (CV Joints)
- Components & Inspection
- Rear Driveshaft (Axel) Assembly
- Front Driveshaft (Axel) 4WD Vehicle
- Front Driveshaft (Axel) Removal
- Front Driveshaft Rebuild
- Propeller Shaft (Driveshaft)

Note: Honda uses the term “Driveshaft” for Axels and Propeller shaft for “Driveshaft”.

Driveshaft & Axle

Specialty Tools

Flare Nut Wrench
07921-00101000



①

Hub Puller
07935-6790000



②

**Hub Puller
Attachment**
07936-5670100



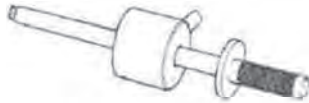
③

Attachment
07JAC-SJ60200
(M10x1.25mm)



④

Slide-Hammer
07936-5790001



⑤

**Slide-Hammer
Attachment**
07936-SC20001



⑥

Box Wrench
(10mm)



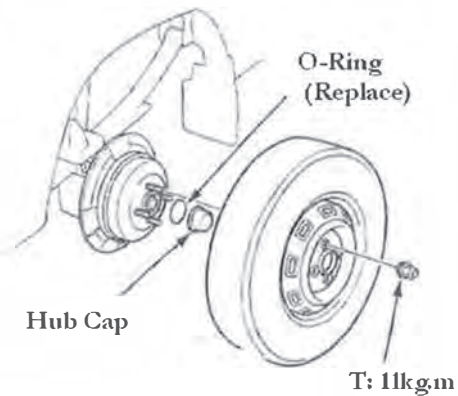
⑦

Driveshaft & Axel

Rear Driveshaft

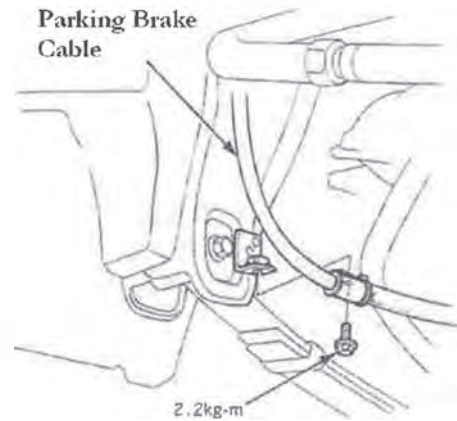
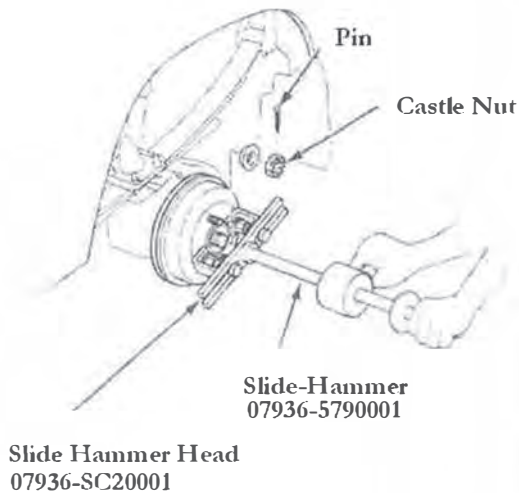
Removal

1. Jack Vehicle and Remove Tire
2. Drain Transission Oil
3. Remove Brake Drum Hub Cap



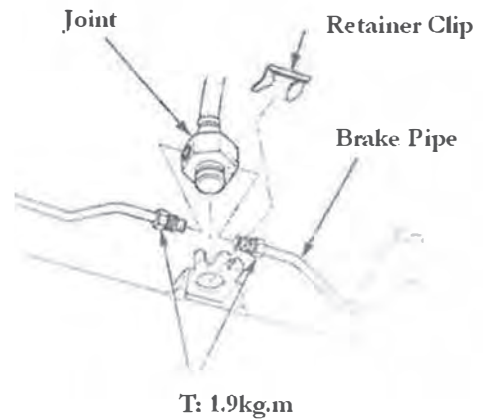
4. Remove Castle Nut Pin (Replace)
5. Remove Castle Nut
6. Attach Tools Listed Below and Remove Drum

Note: Make Sure Parking Brake is NOT Engaged



7. Remove Retaining Bolt from Rear Spring Bracket and Slide Away Parking Brake Cable

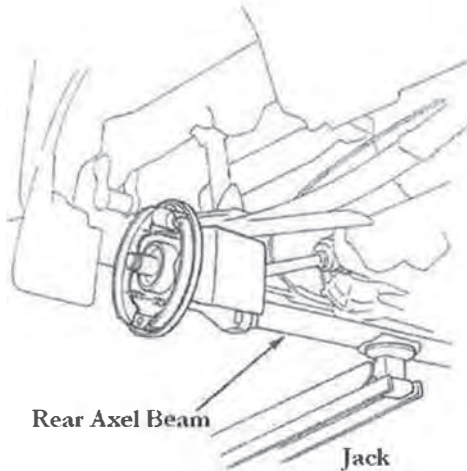
8. Disconnect Brake Pipe Joint as in Diagram Below. Cove Ends Will Plastic Cover



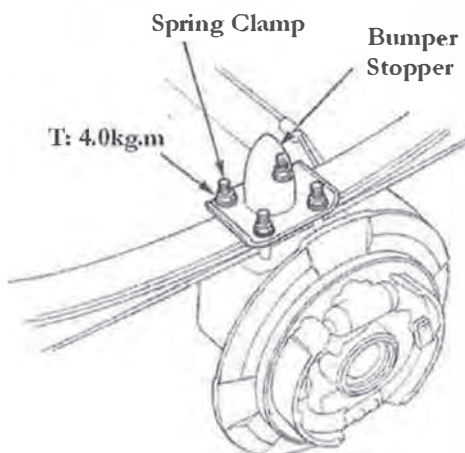
Driveshaft & Axel

Rear Driveshaft

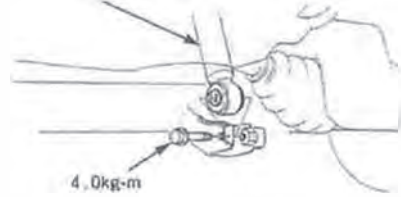
9. Place a Floor Jack Under Rear Axel Beam as in Diagram Below



10. Remove Spring Clamp and Bumper Stopper as Shown Below

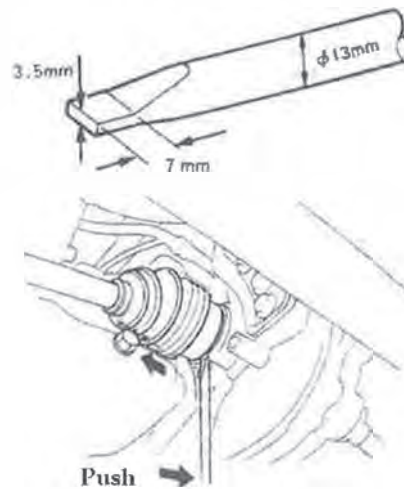


Rear Shock



11. Remove Rear Shock

Note: Create a Tool to Below Measurements

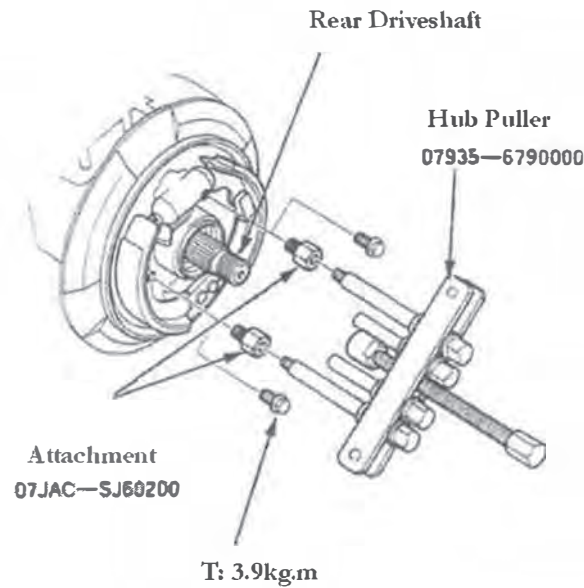


12. Using the Driver Tool Above Pry Back Inboard Joint. If Unit Fails to Pull Back Use Puller Setup on Next Page

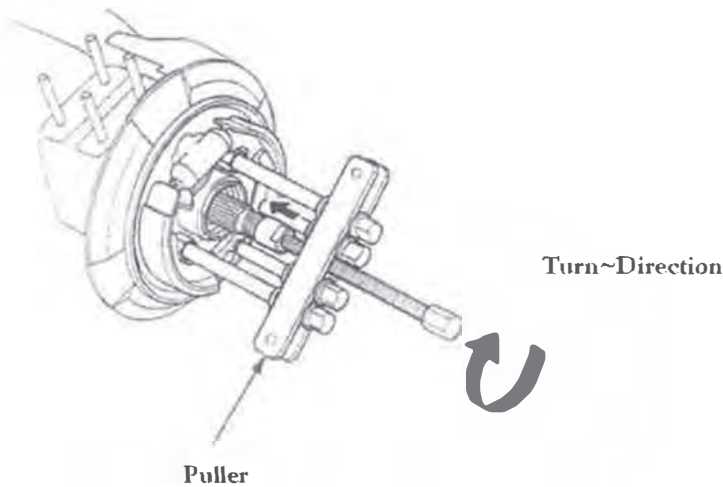
Caution: Do Not Damage Unit

Driveshaft & Axel

Rear Driveshaft



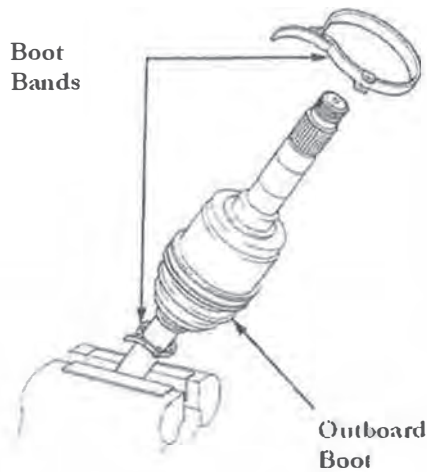
12. Use Appropriate Hub Puller & Attachments, Remove Driveshaft



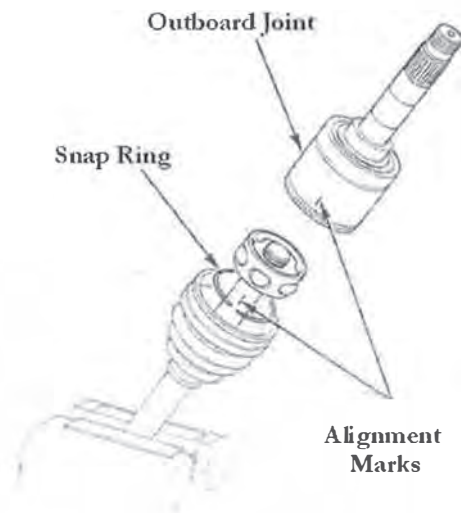
Driveshaft & Axel

Rear Driveshaft Rebuild

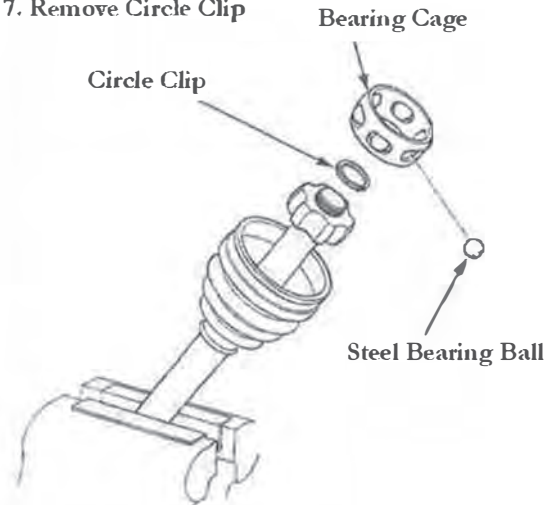
1. Wrap Shaft and Place in Vice
2. Remove Bot Band Retainer Straps



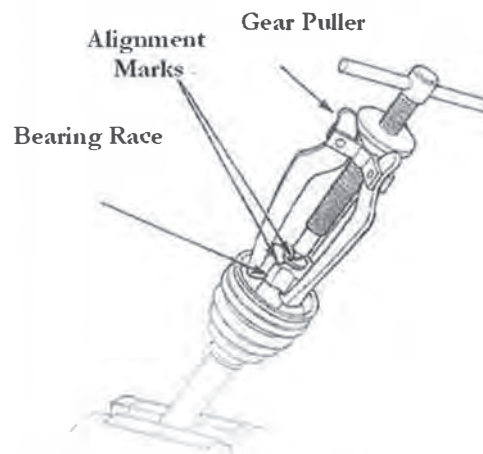
3. Line Up Marks and Remove Snap Ring
4. Remove Outboard Joint



5. Be Careful Not to Loose Steel Balls
6. Slide Off Bearing Cage
7. Remove Circle Clip

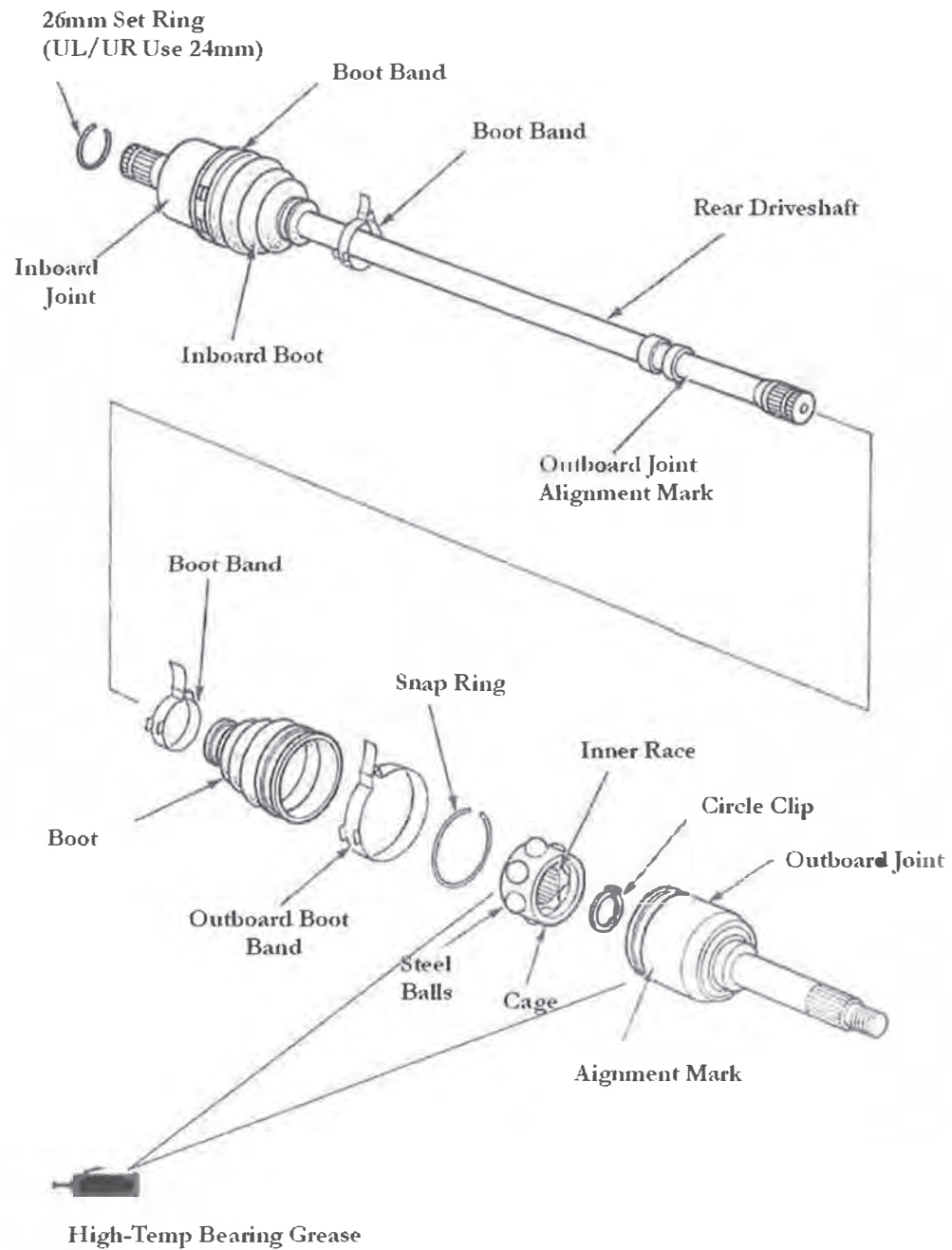


8. Line Up Alignment Marks as in Picture Below and Use Puller Remove Bearing Race



Driveshaft & Axel

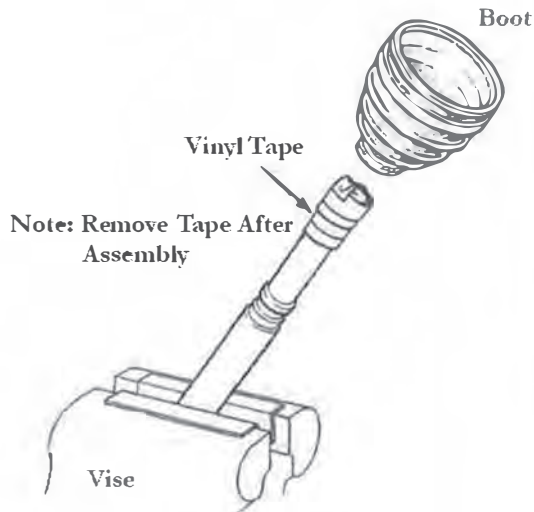
Inspection



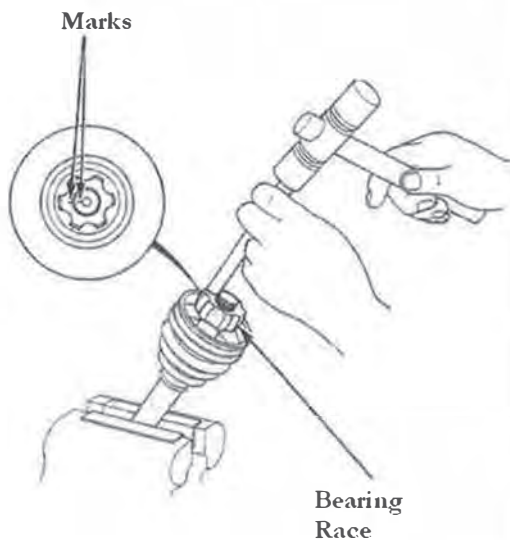
Driveshaft & Axel

Assembly

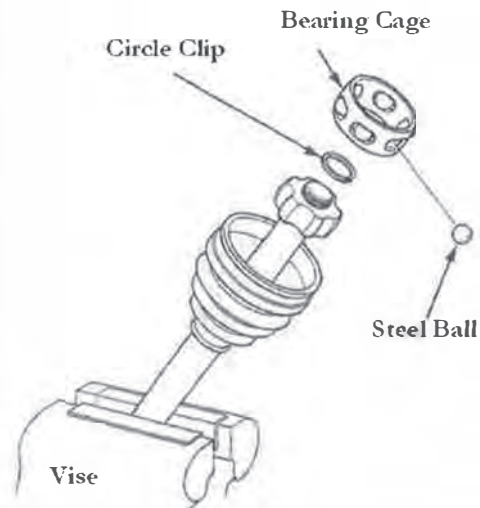
1. Place Vinyl Tape Over Shaft End. Put Grease on Tape and Slide on Boot. Remove Tape After Putting on Boot.



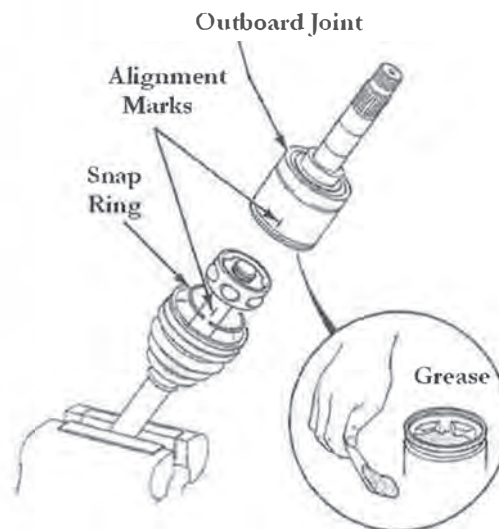
2. Line Up Bearing Race With Alignment Mark and Tap onto Shaft
- Note: Use a Brass Drift



3. Attach Circle Clip



4. Slide Over Bearing Cage and Insert Steel Ball Bearings
 5. Grease Outboard Joint
- Grease Amount: 100~120Grams
6. Align Marks and Assemble Unit
 7. Grease as in Diagram



Driveshaft & Axel Assembly

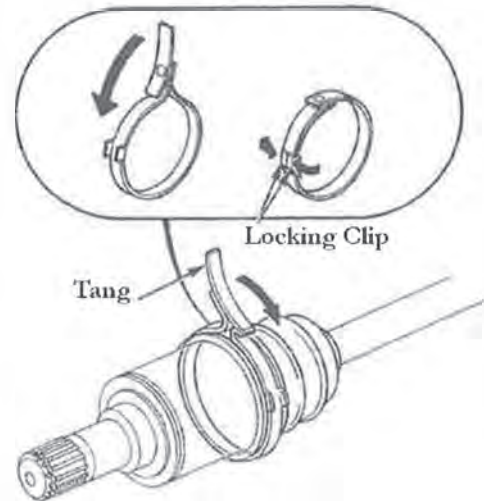
Grease Amount: 50~70 Grams

8. Add Grease To Boot as in Diagram Below



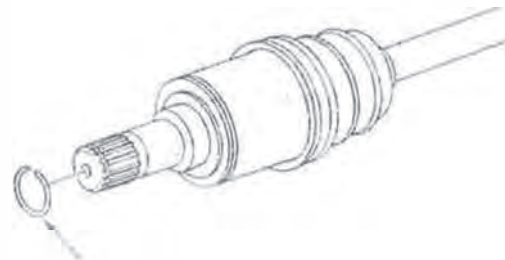
Right: 438-443mm
Left: 550-555mm
(UL/UR 477-482mm)

9. Attach Locking Bands as in Diagram Below



10. Attach Center Ring

Note: Unit to be Stored Place in Plastic Cover



UL/UR Vehicles 24mm

Driveshaft & Axel

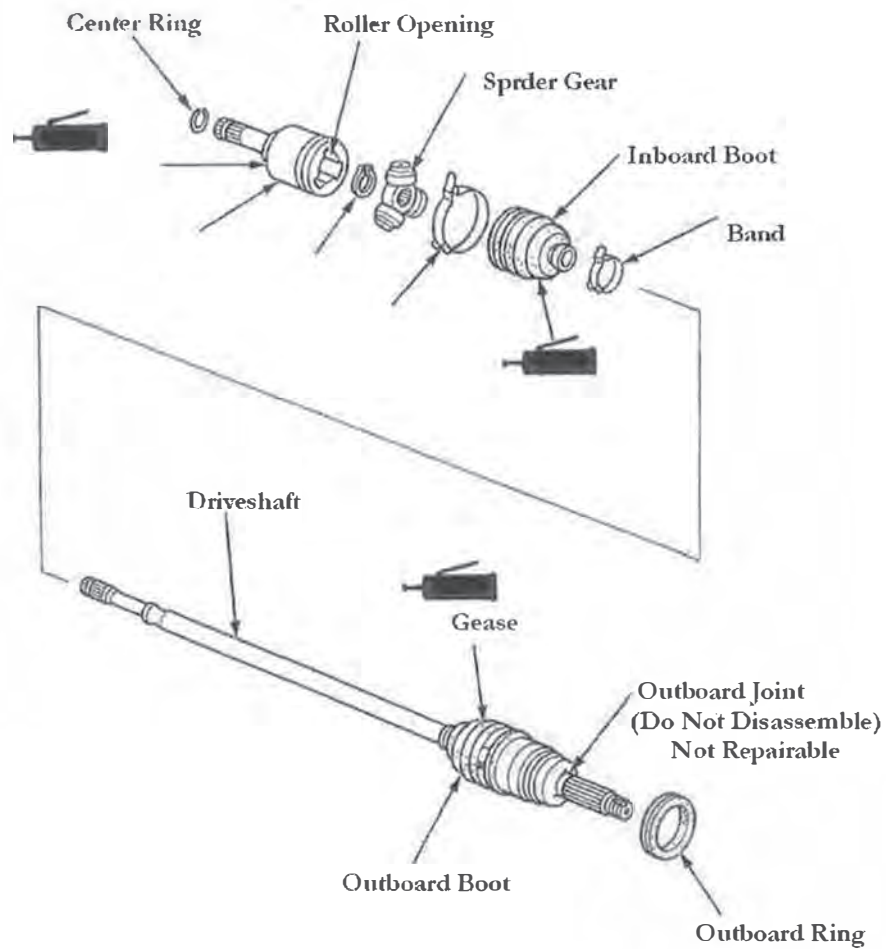
Front Driveshaft (4WD)

Exploded View

Grease Amount:

Inboard Joint: 80~100g

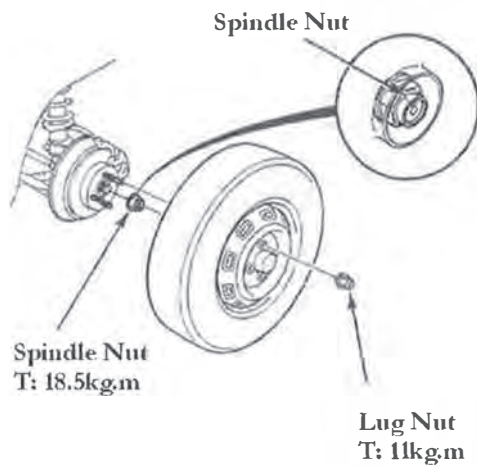
Outboard Joint 40~60g



Driveshaft & Axle

Front Driveshaft Removal (4WD)

1. Jack Vehicle and Remove Front Wheel
2. Remove Spindle Nut (32mm Socket)
3. Drain Front Differential Oil



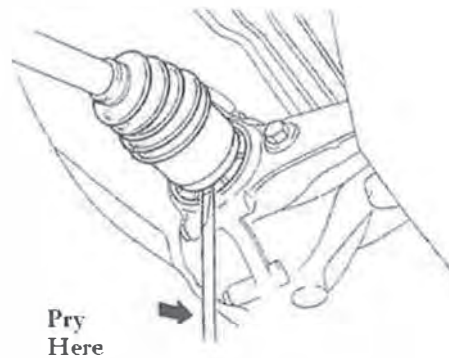
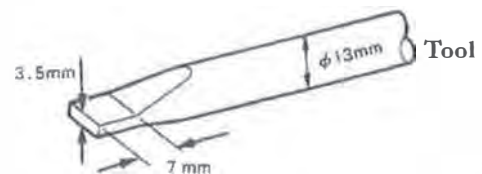
4. Separate Lower Bolt Joint



5. Separate Knuckle and Move to Side



6. Make Tool as in Diagram Below



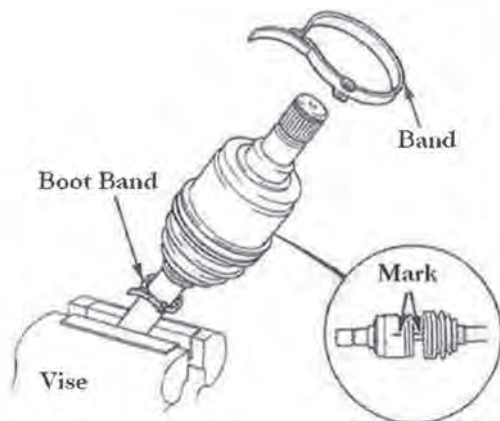
7. Remove Shaft and Rebuild

Driveshaft & Axel

Front Driveshaft Re-Pack

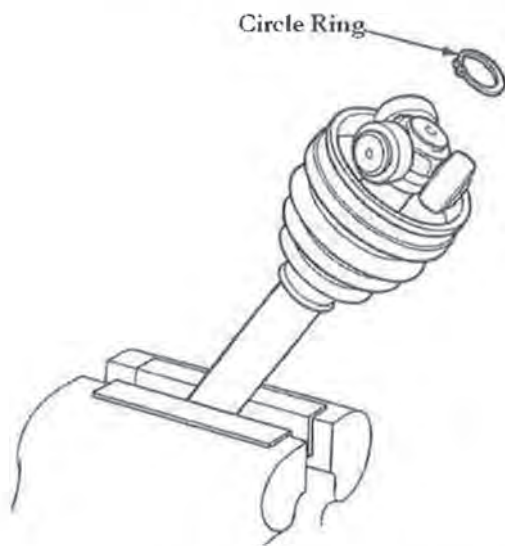
Disassembly

1. Remove Boot Retainer Bands
2. Line up Alignment Marks and Slide Off Inboard Joint

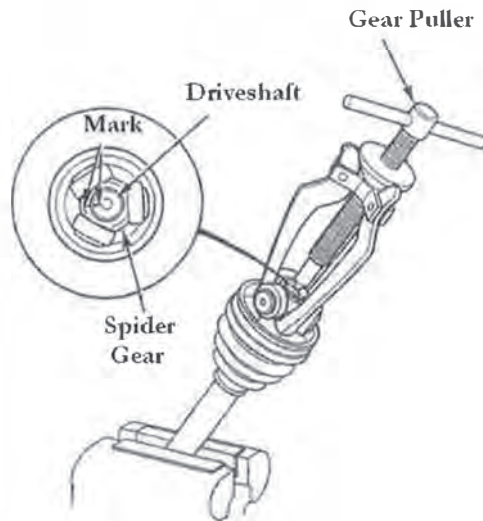


Note: Place Either Wood or Cloth On Shaft Before Placing in Vise

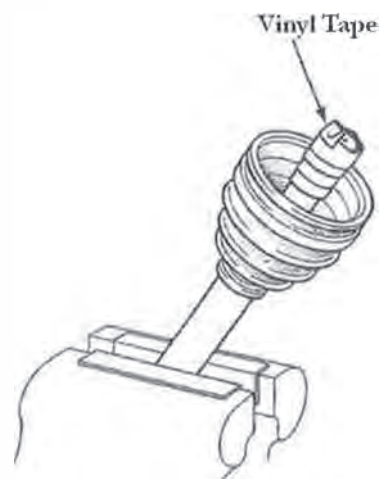
3. Remove Circle Ring



4. Use a Gear Puller and Remove Spider Gear



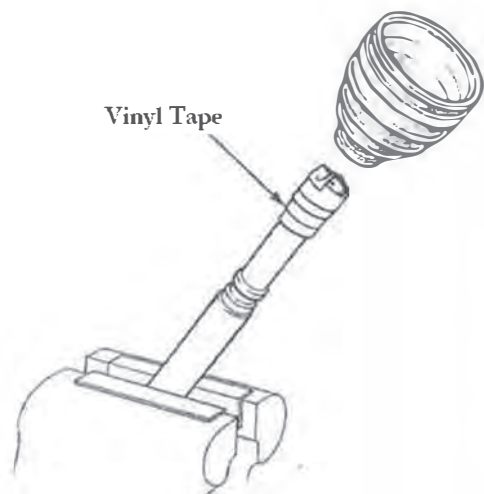
5. Place Vinyl Tape Over End of Shaft, Cover in Grease and Slide Boot Off



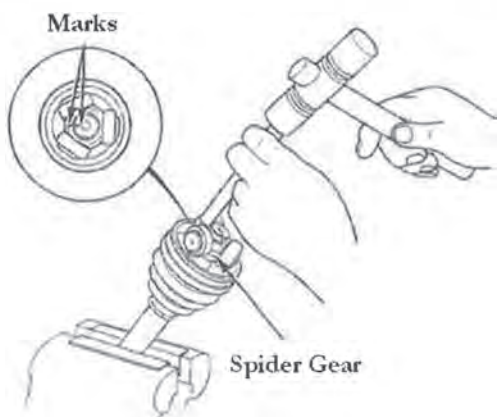
Driveshaft & Axel

Front Driveshaft Re-Pack

1. Coat Vinyl Tape With Grease and Slide on New Boot. Remove Vinyl Tape After Boot is On.

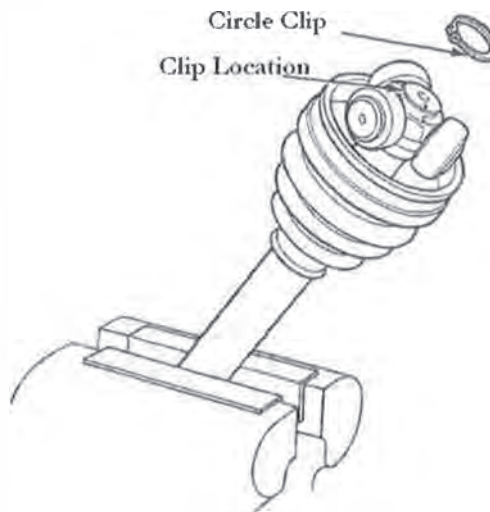


2. Align Marks and Tap On Spider Gear



Note: Use Brass Drift To Tap on Gear

3. Attach Circle Clip



4. Pack Outboard Boot With Grease

Grease Amount: 40~60grams



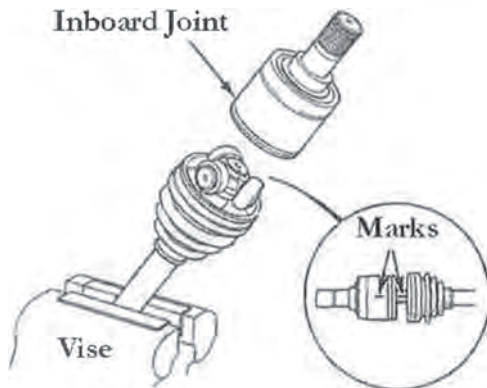
Driveshaft & Axel

Front Driveshaft Re-Pack

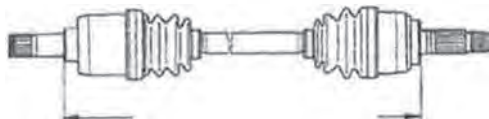
5. Before Assembling Inboard Joint Pack With Grease

Grease Amount: 80~100g

6. Align Marks and Connect



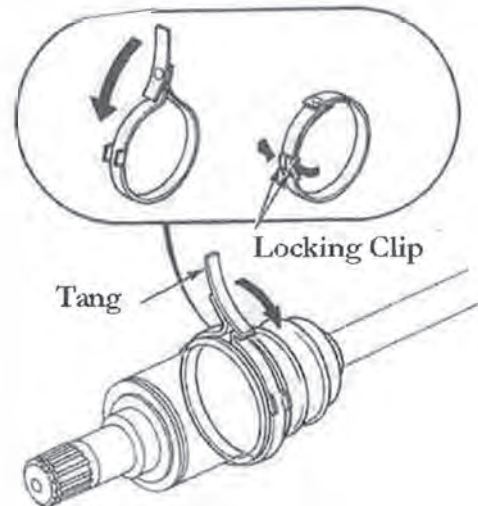
7. After Assembling Unit Check Measurement



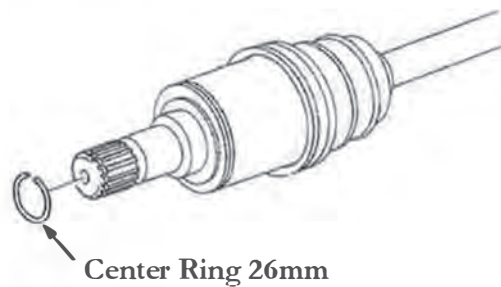
Right: 466.5-471.5mm

Left: 466.5-471.5mm

8. Attach Boot Bands as Shown in the Diagram Below



9. Attach Center Ring (26mm)

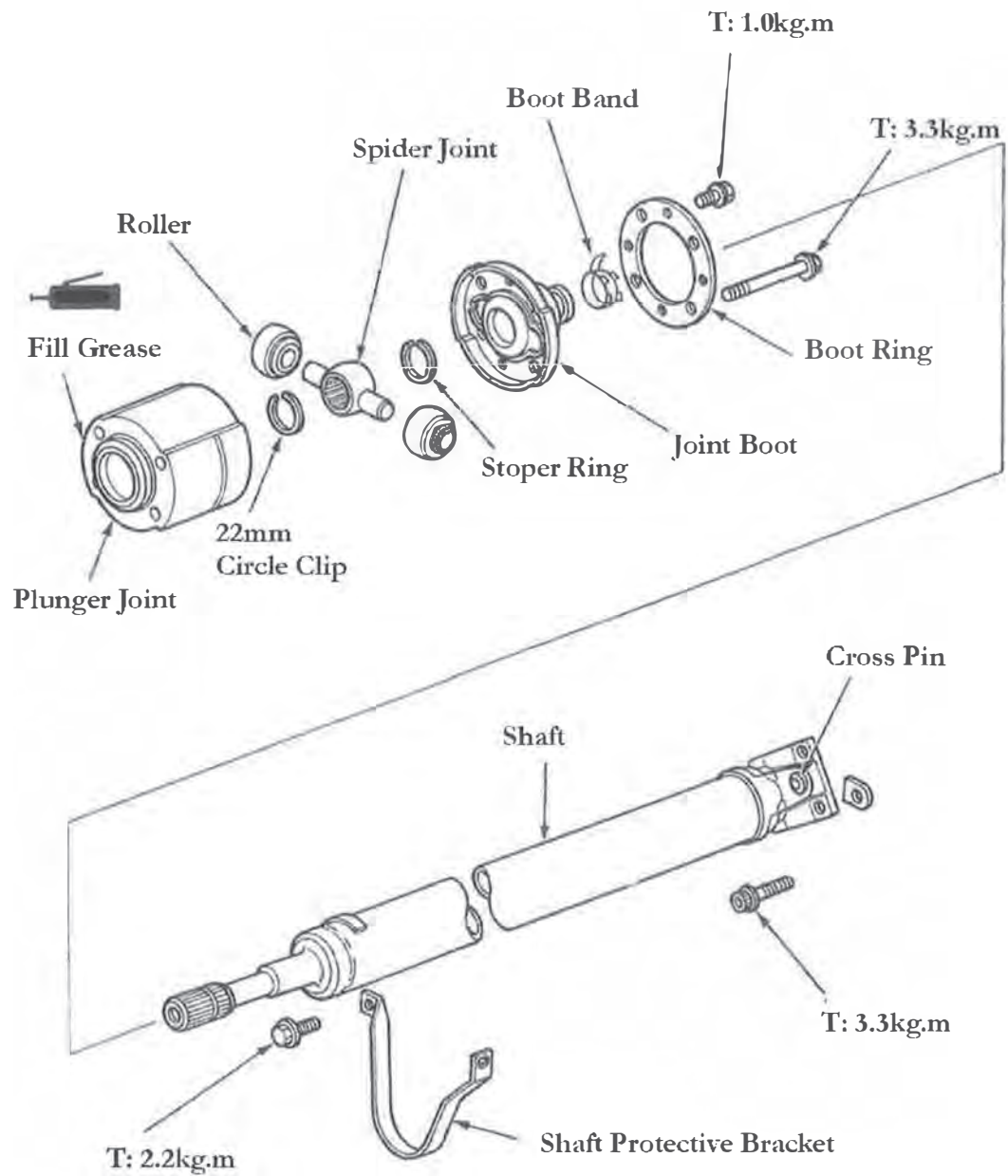


10. Install Shaft into Vehicle

Driveshaft & Axel

Propeller Shaft

Exploded View



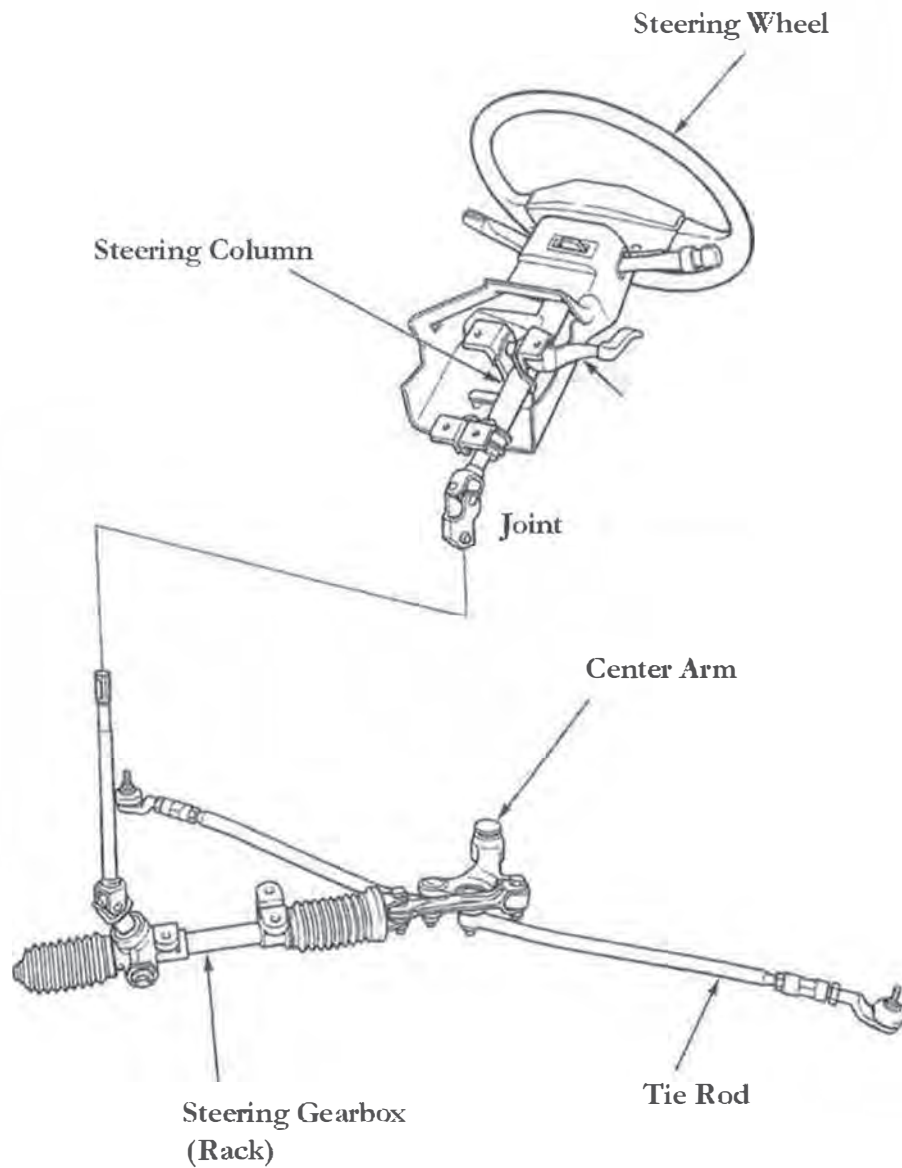
Chapter 9

Steering & Suspension

- **Steering Components Diagram**
- **Steering Box Removal (Rack & Pinion)**
- **Gearbox Parts Exploded View**
- **Gearbox Overhaul**
- **Gearbox Assembly**
- **Steering Wheel Components**
- **Steering Column (With & Without Tilt Option)**
- **Steering Column Removal**
- **Tie Rod & Center Arm**
- **Tie Rod & Center Arm Removal**
- **Front & Rear Suspension Overview Diagram**
- **Wheel Alignment (Camber & Caster) Van & Truck**
- **Toe In & Toe Adjustment Van & Truck**
- **Wheel (Rim) Inspection**
- **Front Strut System 2WD**
- **Front Strut System 4WD**
- **Front Knuckle & Hub System 2WD**
- **Front Knuckle & Hub System 4WD**
- **Lower Arm, Stabilizer Bar, and Torsion Bar**
- **Front Strut Assembly**
- **Front Strut Removal & Replace-Inspection**
- **Rear Suspension & Components**

Steering & Suspension

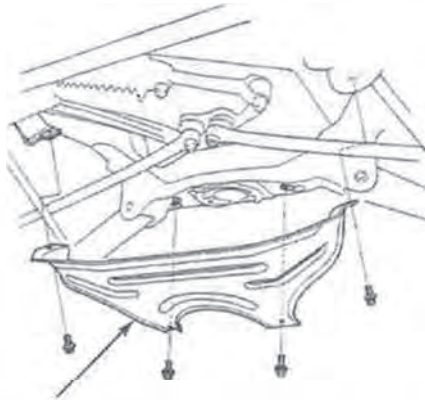
Components



Steering & Suspension

Steering Gearbox Removal

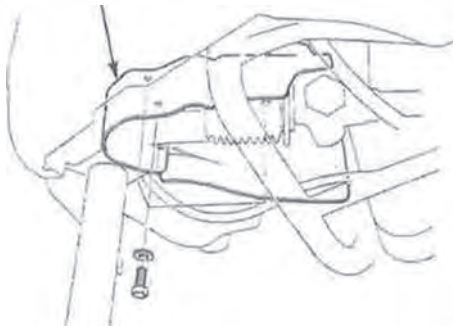
1. Use Diagram Below and Remove Front Air Duct (Cover Plate)



Front Air Duct

2. Remove Steering Splash Guard

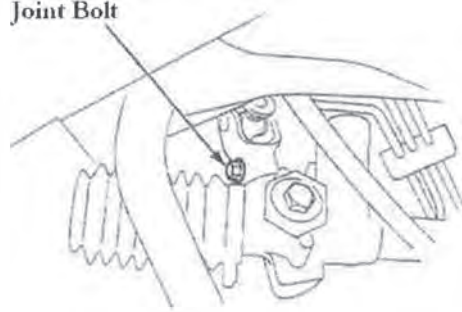
Steering Splash Guard



Note: Replace Splash Guard if Damaged

3. Remove the Steering Joint Bolt Between Gearbox & Shaft

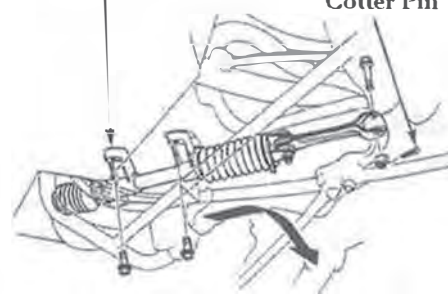
Joint Bolt



4. Disconnect Center Arm & Rack Link
5. Remove Attachment Gearbox Attachment Bolts and Remove Unit

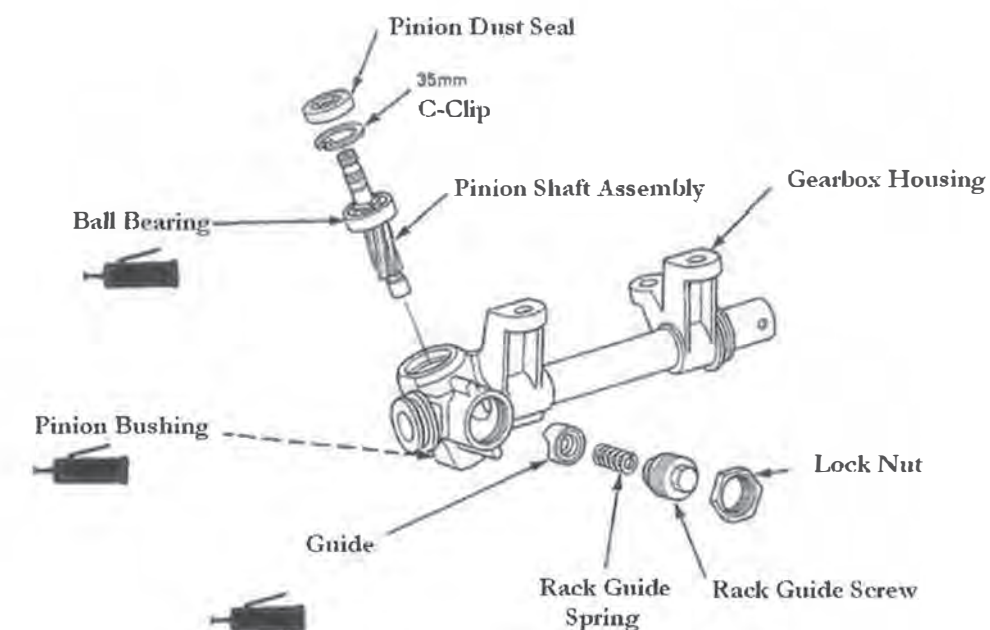
Gearbox Assembly

Cotter Pin



Note: Never Re-Use Cotter Pins

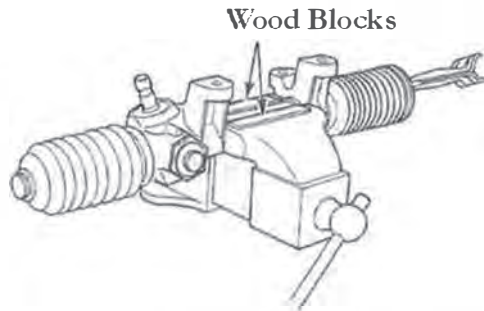
Gearbox Components Exploded View



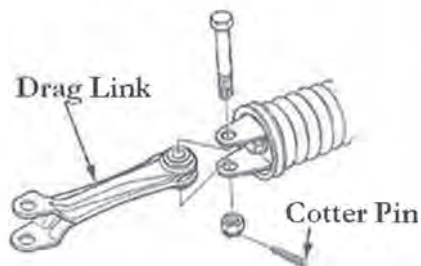
Steering & Suspension

Gearbox Overhaul

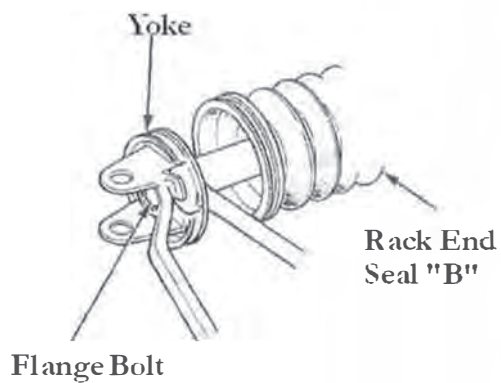
Note: Place in Vise With Wood Blocks



1. Remove Drag Link

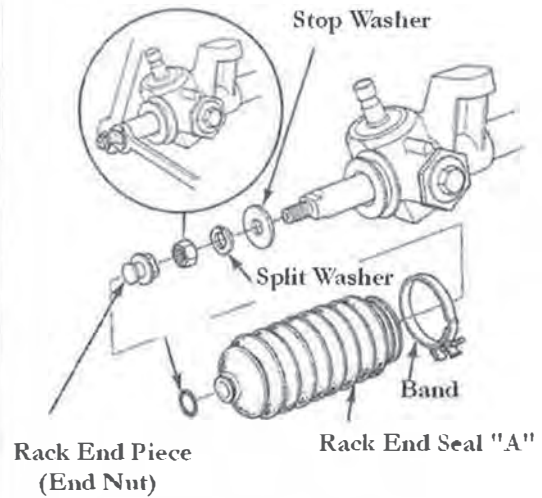


2. Remove Bellows Bands, Drag Link Yoke

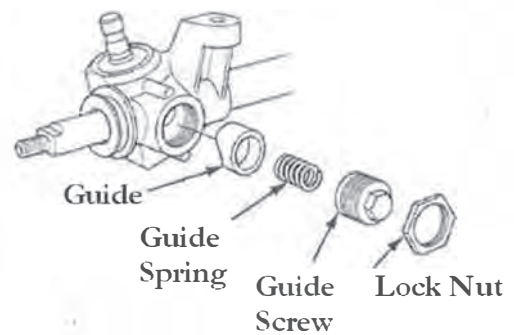


4. Remove Rack End "A", and Rack End Bolt

5. Remove Components as in Diagram Below



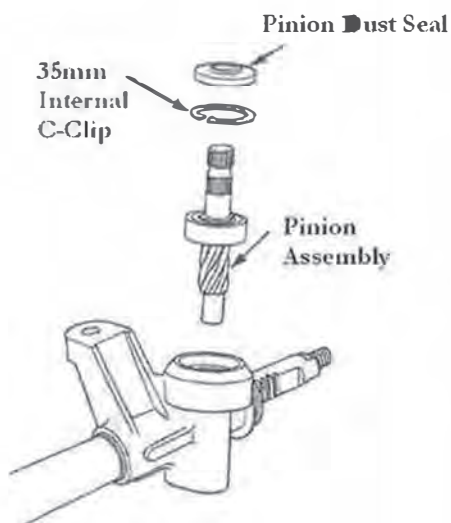
6. Disassemble the Following Below Components in the Diagram



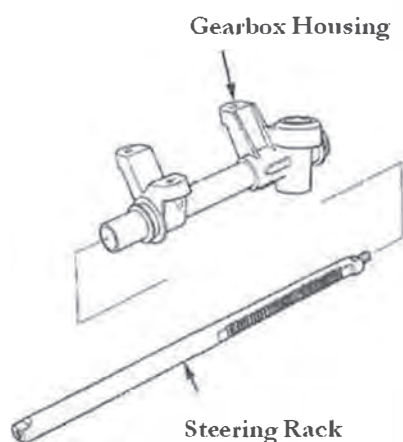
Steering & Suspension

Gearbox Overhaul

7. Remove Pinion Dust Seal
8. Remove 35mm Internal C-Clip
9. Remove Pinion Assembly



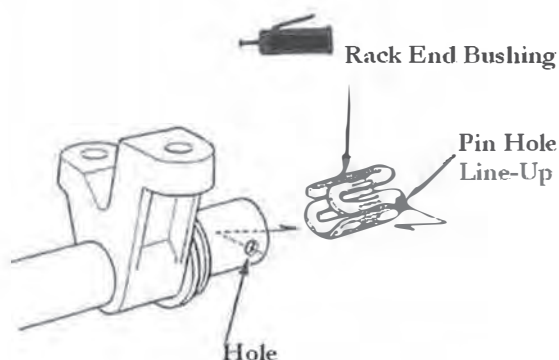
10. Slide Out Steering Rack



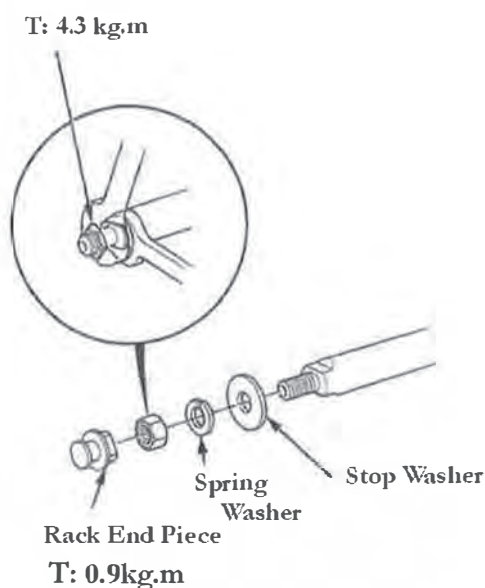
Note: Clean All Parts & Inspect. Replace All Damaged or Worn Parts. Individual Parts Can Not be Repaired

Assembly

1. Grease Rack End Bushing With Minimum 1~3g
2. Follow Diagram Below and Insert End Bushing With Dimple to Hole Configuration



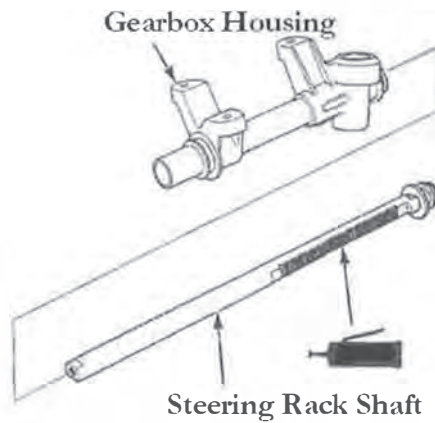
3. As in Below Diagram Assemble Parts and Torque Accordingly



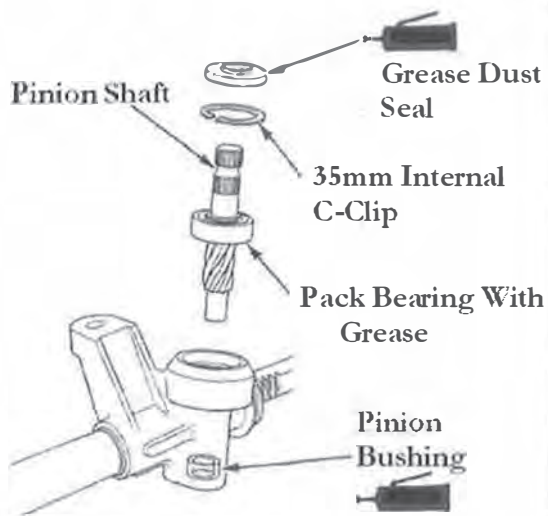
Steering & Suspension

Gearbox Assembly

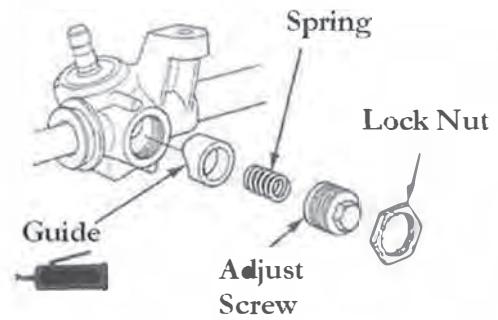
4. Coat Steering Rack Shaft With Grease And Slide Into Housing



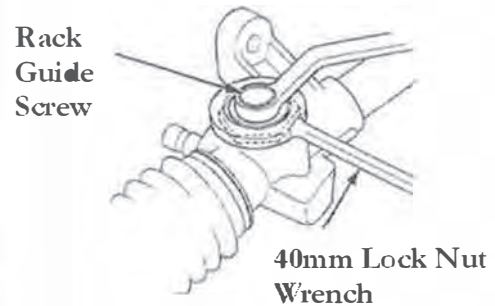
5. Assemble Pinion Shaft Assembly as in Diagram Below. Make Sure to Grease Pinion Bushing Before Assembling



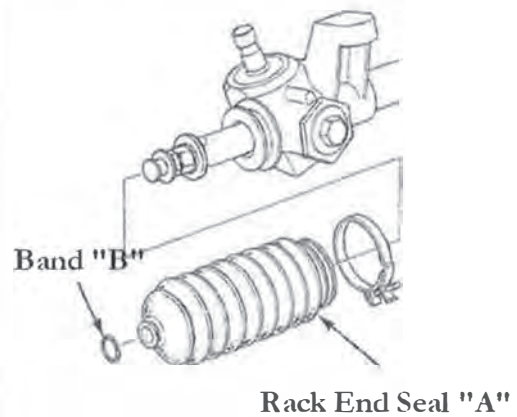
6. Assemble Guide System



7. Use 40mm Wrench and Torque 2~3kg.m



8. Assemble Rack End Seal "A" and Bands

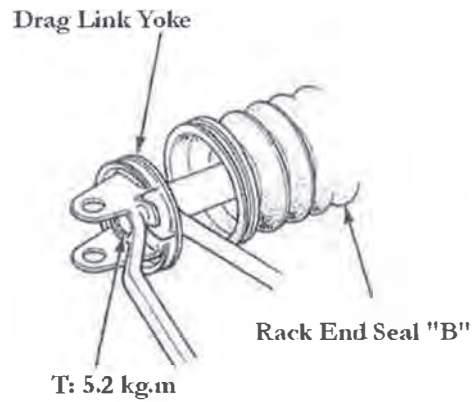


Steering & Suspension

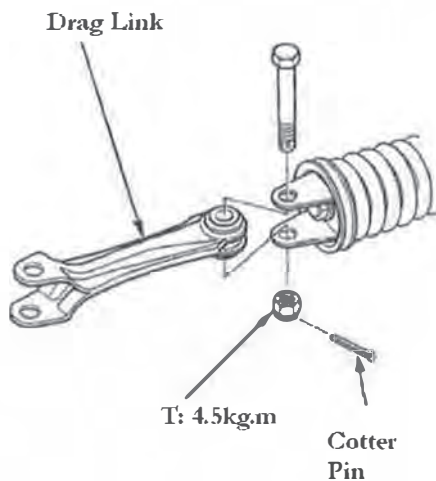
Gearbox Overhaul

4. Attach Rack End "B"

5. Attach Drag Link Yoke and Set Torque

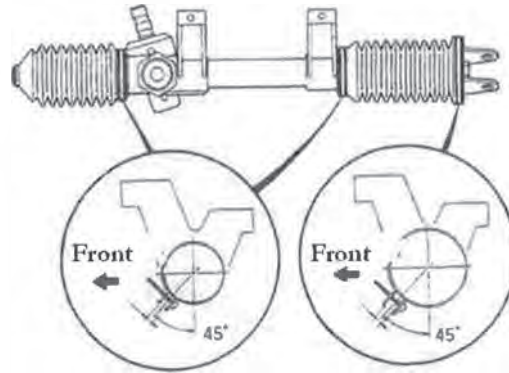


6. Attach Drag Link and Torque



Note: A New Cotter Pin Must be Used

7. Set Right~Left Bellows Bands to Diagram Below



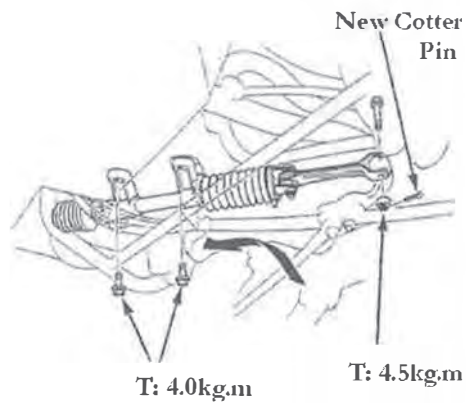
8. Install to Vehicle

Steering & Suspension

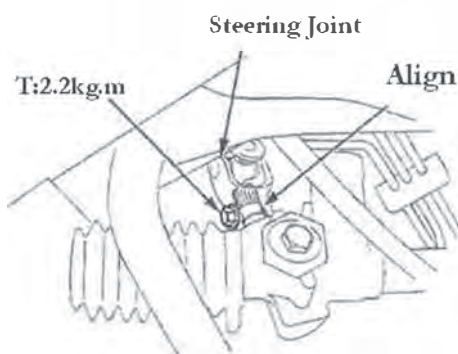
Gearbox Installation

1. Mount Gearbox and Torque to Setting Listed Below

2. Attach Drag Link and Torque



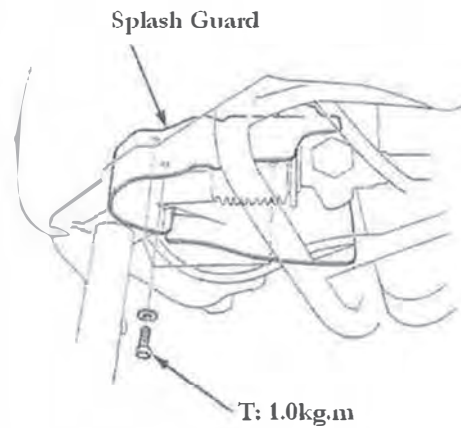
Note: Before Attaching Steering Shaft
Align Front Wheels & Center
Steering Wheel



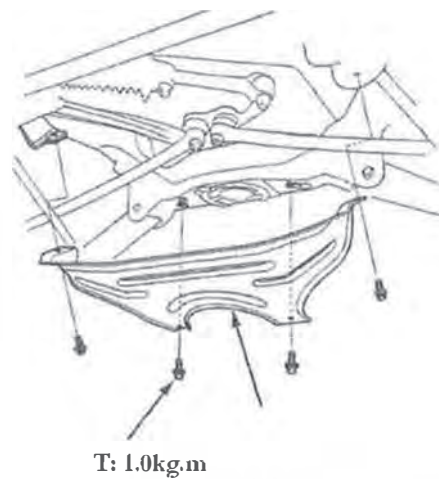
3. Attach Steering Shaft and Torque

Note: Be Careful Not to Over-Torque

4. Attach Splash Guard



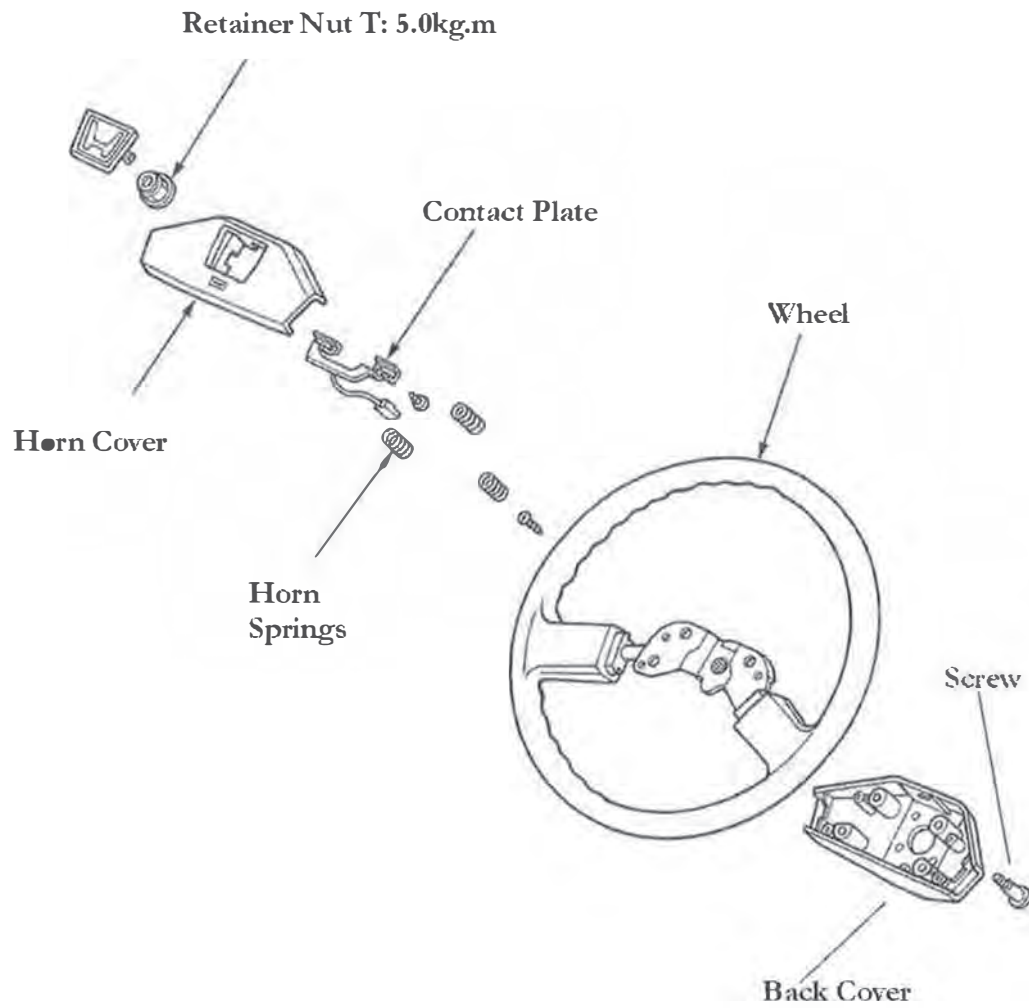
5. Attach Front Air Duct



6. Perform Front End Alignment

Steering & Suspension

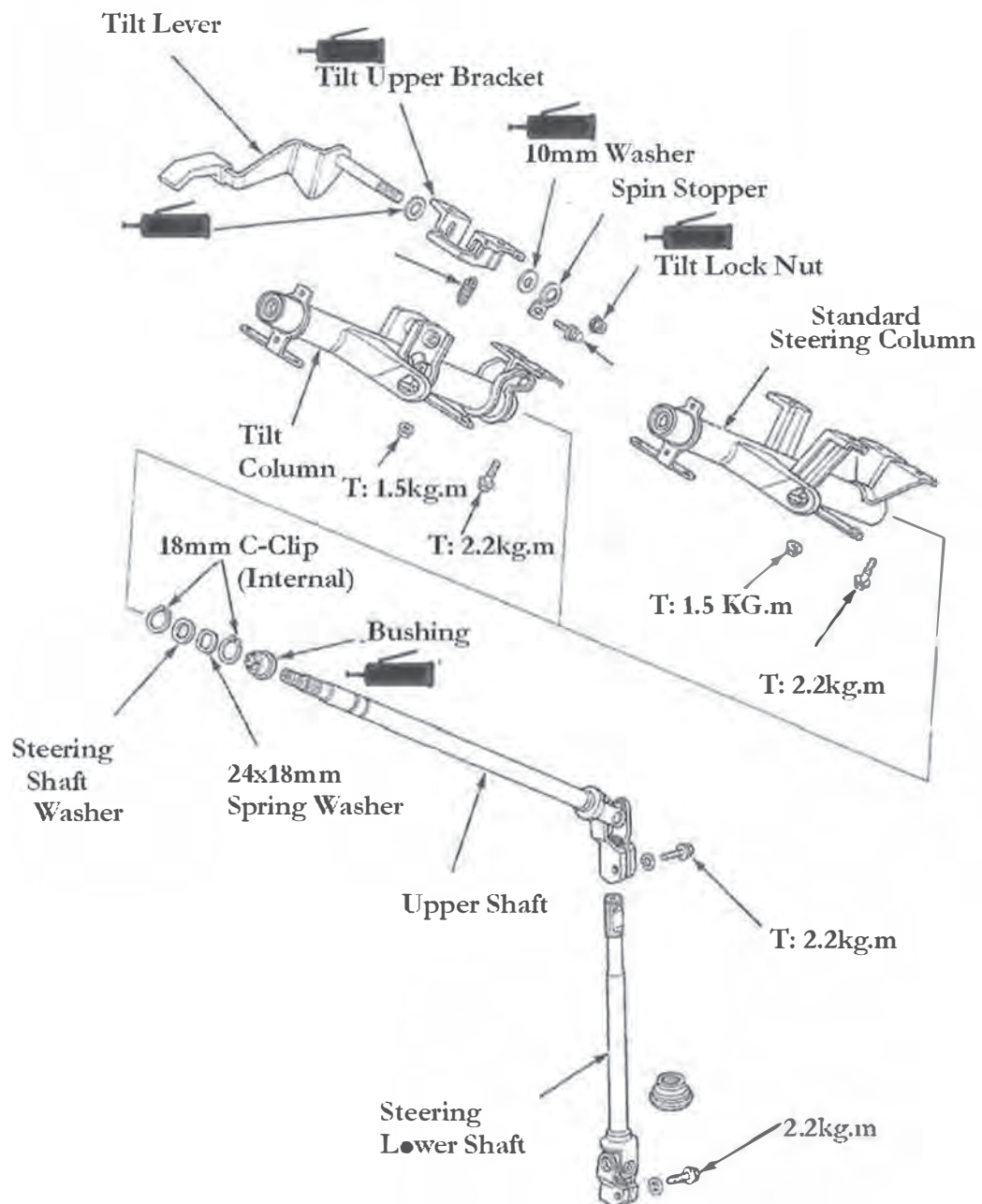
Steering Wheel Components



Steering & Suspension

Steering Column

With/Without Tilt Option



Steering & Suspension

Steering Column Removal

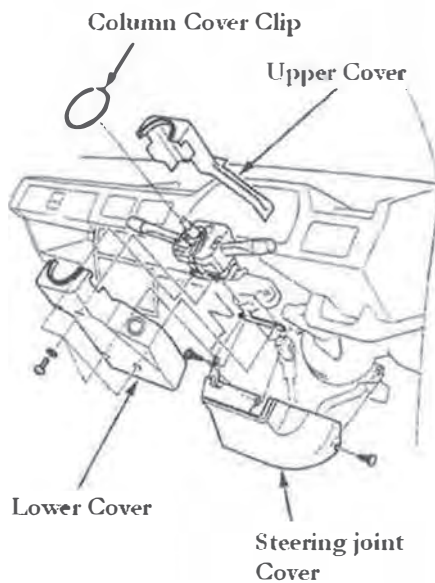
1. Remove Steering Wheel



2. Remove Column Cover Clip

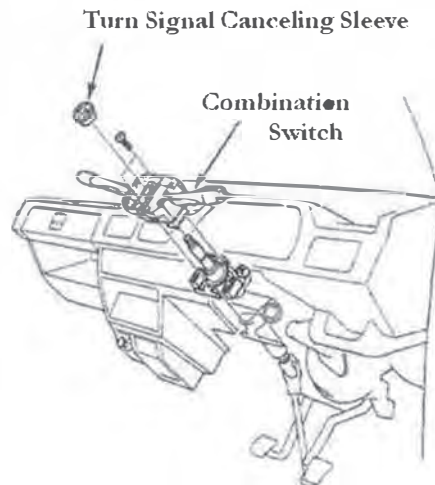
3. Remove Upper & Lower Covers

4. Remove Steering Joint Cover

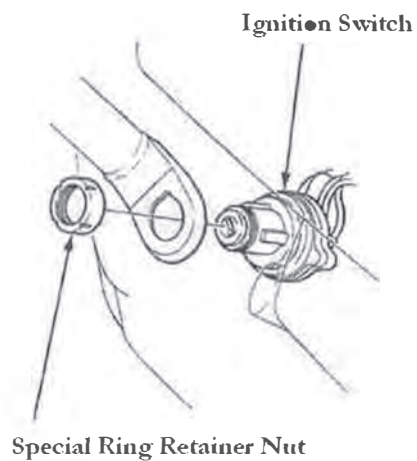


5. Disconnect Combination Switch Electrical Connector

6. Remove Sleeve and Switch Assembly



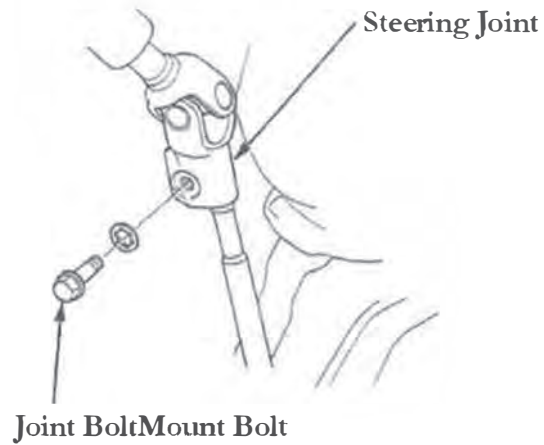
7. Remove Ring Nut and Slide Out Ignition Switch



Steering & Suspension

Steering Column Removal

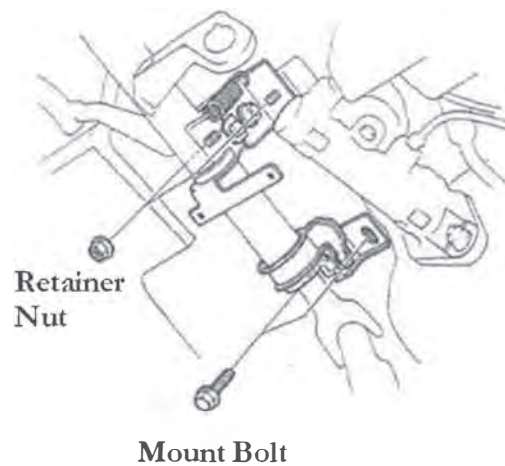
8. Remove Steering Joint Bolt



9. Remove Attachment Bolt and Retainer Nut

10. Remove Column

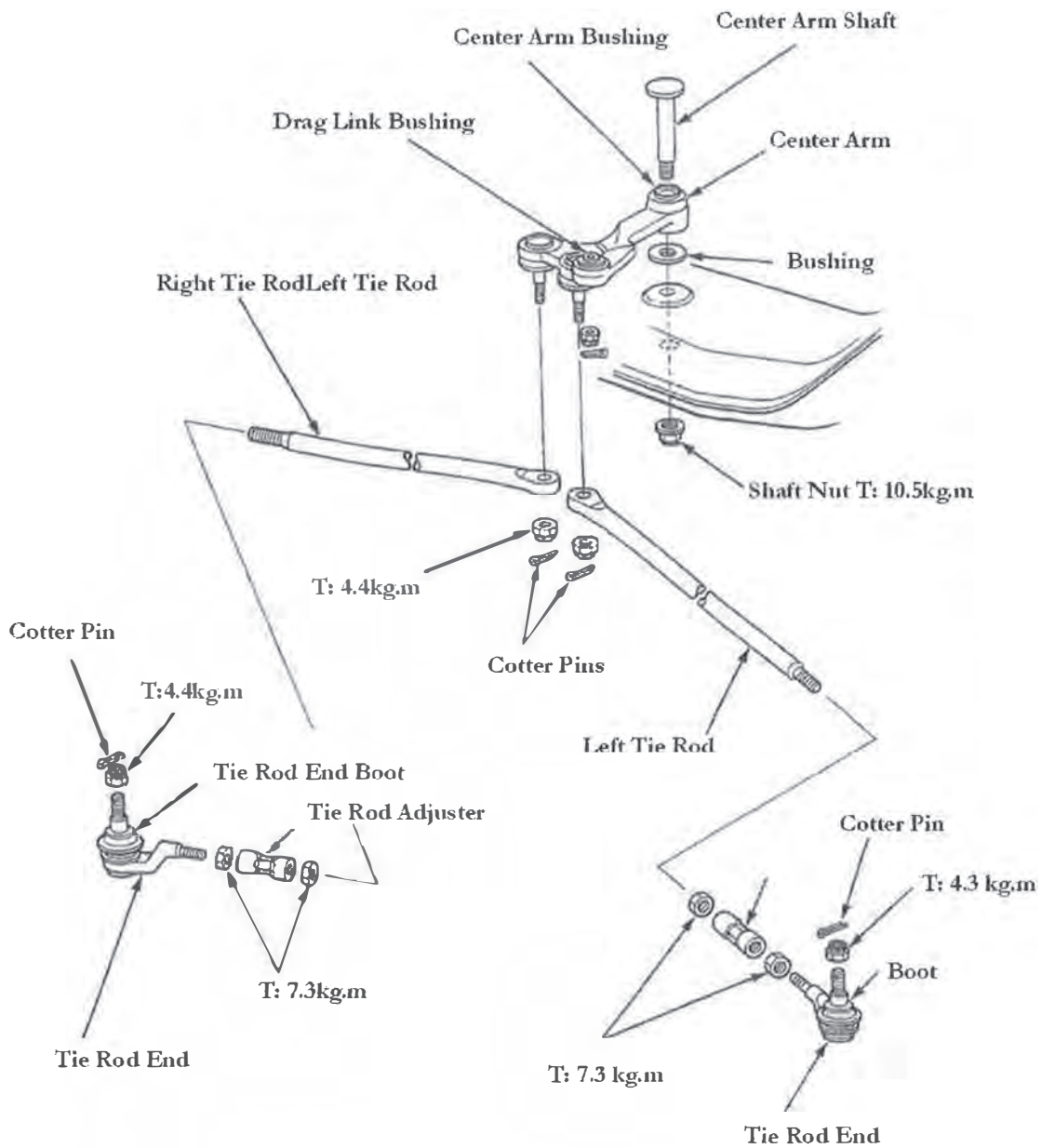
11. Install Reverse Order



Steering & Suspension

Tie Rod & Center Arm

Exploded View



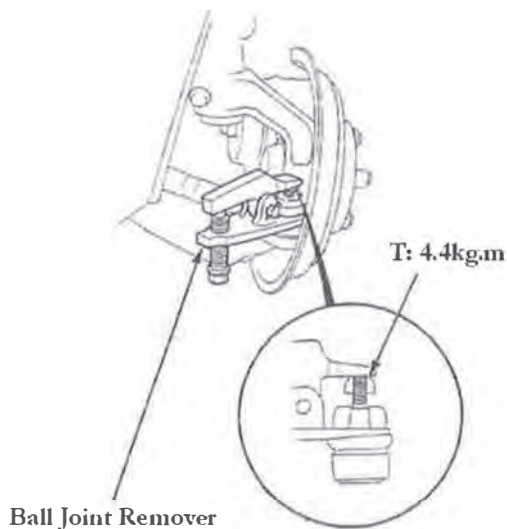
Note: Always Replace Cotter Pins

Steering & Suspension

Tie Rod & Center Arm

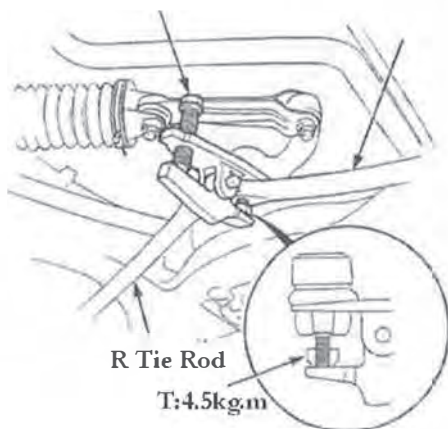
Removal

1. Remove Cotter Pin and Retainer Nut
2. Attach Ball Joint Removal Tool
(See Diagram Below) Press Out Joint



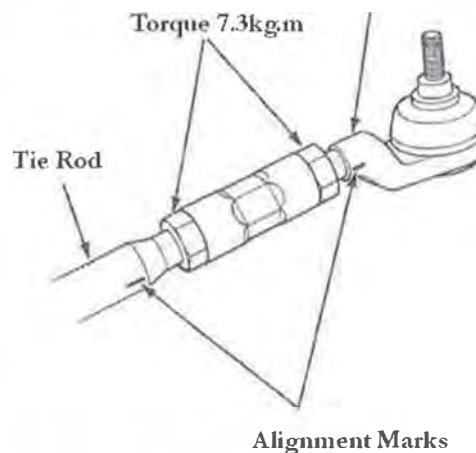
3. Center Arm Removal, Remove All Cotter Pins and Three Retaining Nuts. Press Out Ends

Ball Joint Remover Tool

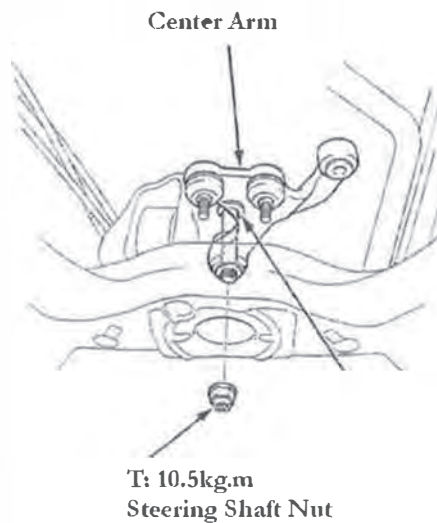


4. Separate Tie Rod End Loosen Lock Nut and Unscrew End

Tie Rod End



5. After Removing Center Arm Inspect Steering Arm Shaft For Straightness

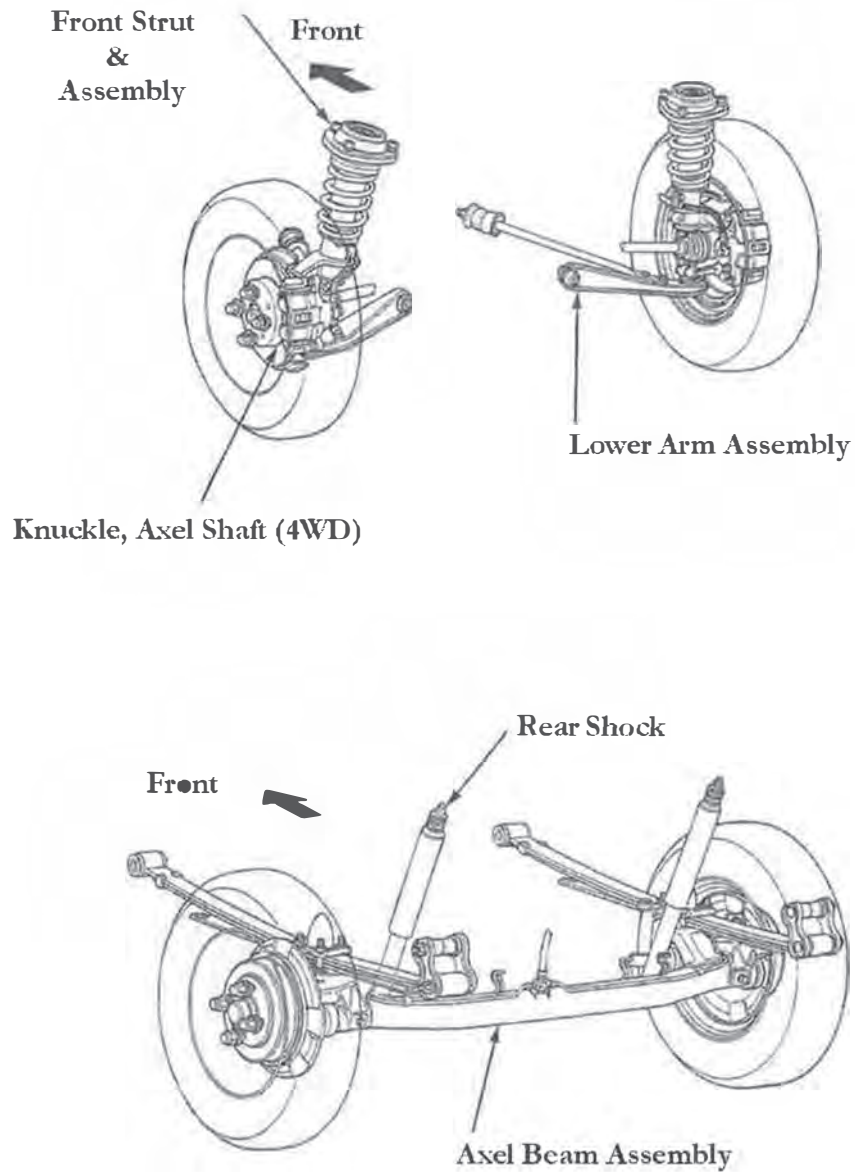


Note: Replace Steering Nut if Corroded or Rounded Sides

Steering & Suspension

Suspension Components

Exploded View



Steering & Suspension

Wheel Alignment

Camber Specifications:

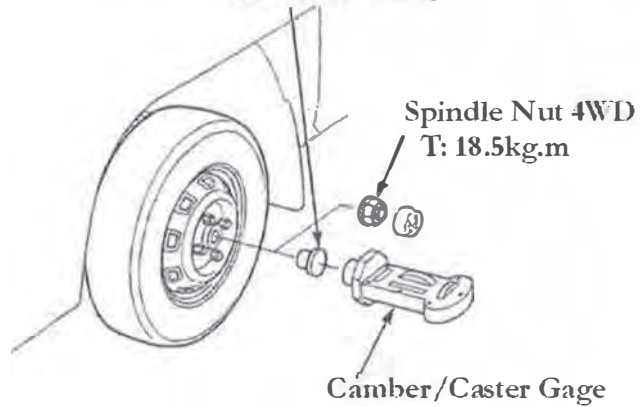
Vehicle

M-HA3 1*00'+-1*

M-HH3 1*20'+-1*

M-HA4, HH4 1*30'+-1*

4 WD : 07410-0010200
2 WD : 07HGK-0010100



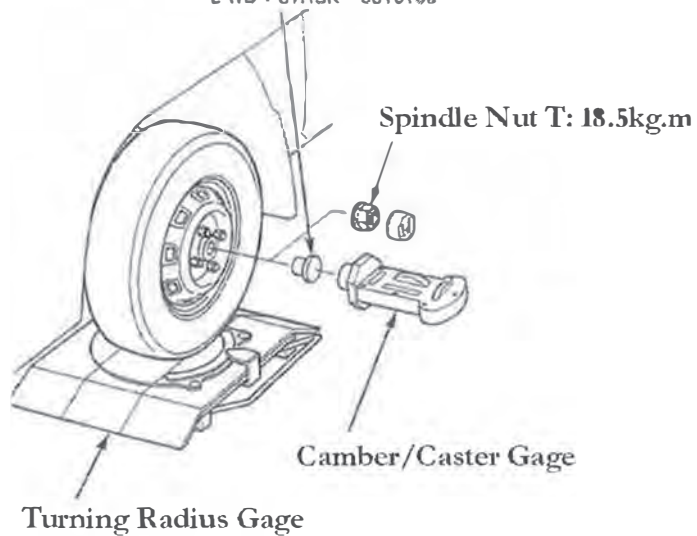
Caster Specifications:

Vehicle

M-HA3, HA4, HH4 2*30'+-1*

M-HH3 2*50'+-1*

4 WD : 07410-0010200
2 WD : 07HGK-0010100



Note: Make Sure Tires Are Properly Inflated and Correct Size

Note: (* Mark) = Degrees

Steering & Suspension

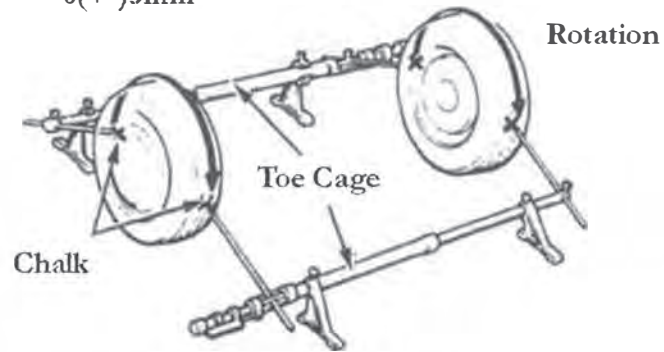
Toe In and Toe Adjustment Specifications

Note: Make Sure to Check Air Pressure and Tire Size Before Adjustments

Toe-In (All Models)

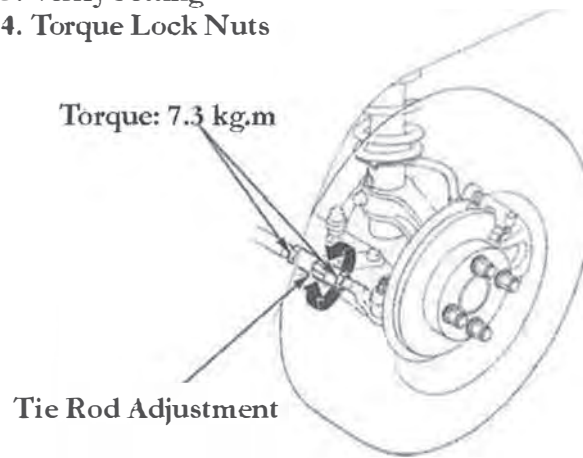
Front: IN 1(+/-)3mm

Rear: 0(+/-)3mm



Tie Rod Adjustment:

1. Loosen Lock Nuts
2. Set Adjustment
3. Verify Setting
4. Torque Lock Nuts



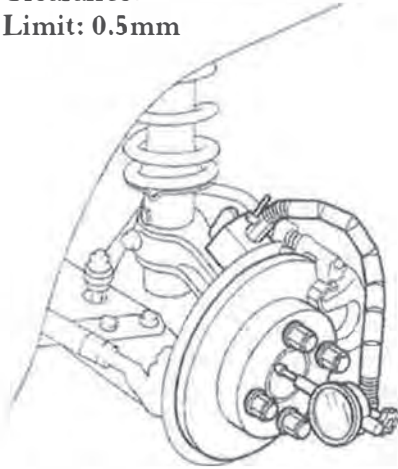
Side Slip Limitations: Front Wheels 0(+/-)3mm

Steering & Suspension

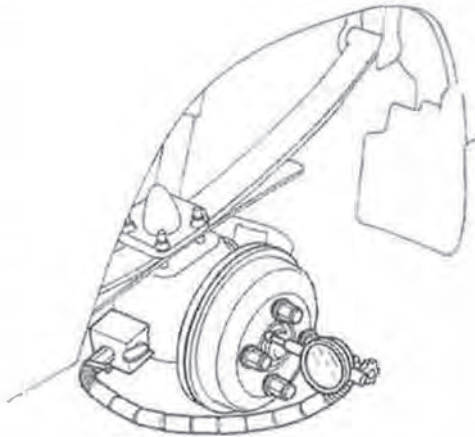
Wheel Inspection

Bearing End Check

1. Attach Dial Gage
2. Turn Rotor and Inspect Round-Out
Clearance:
Limit: 0.5mm

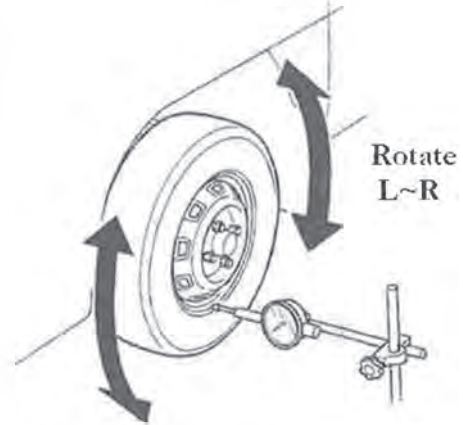


3. Rear Wheel Inspection
Limit: 0.3mm

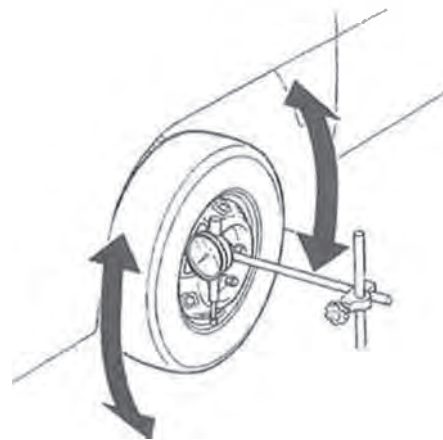


Wheel Rim Inspection

Rim Round-Out Limit:
Steel Wheel: 0~1.3mm
Aluminum: 0~0.7mm



Note: Rims Can Not Be Repaired,
Only Replaced



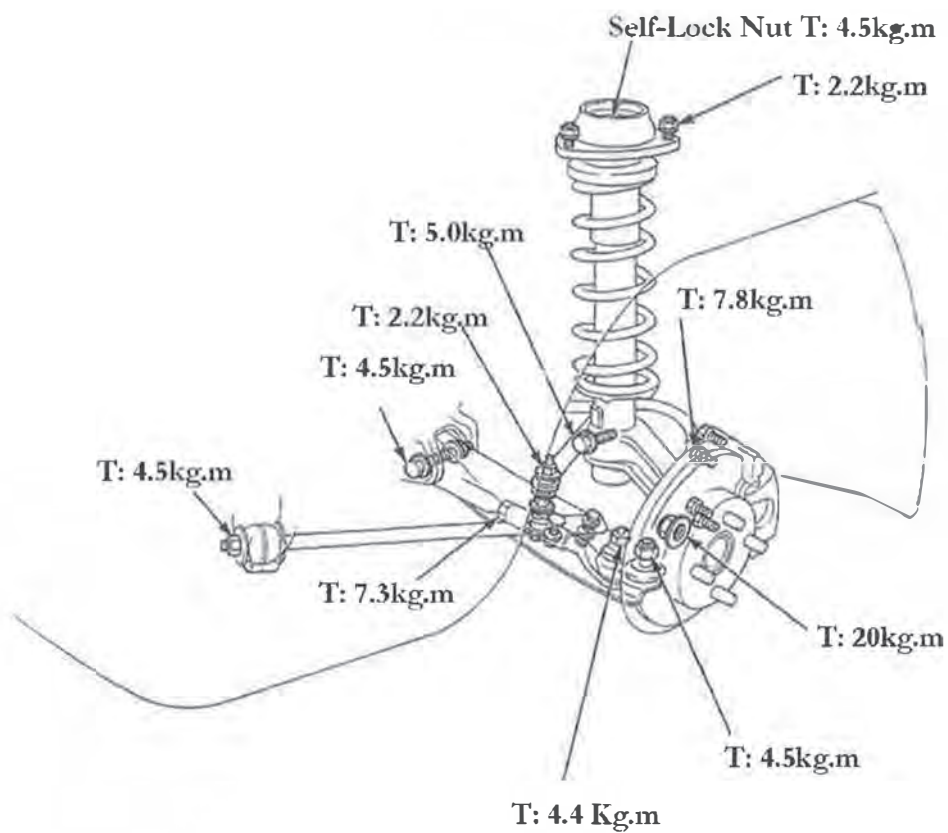
Inside Round-Out Clearance
Limit:
Steel Wheel: 0~1.0mm
Aluminum: 0~0.7mm

Steering & Suspension

Front Suspension 2WD

Exploded View

Torque Guide

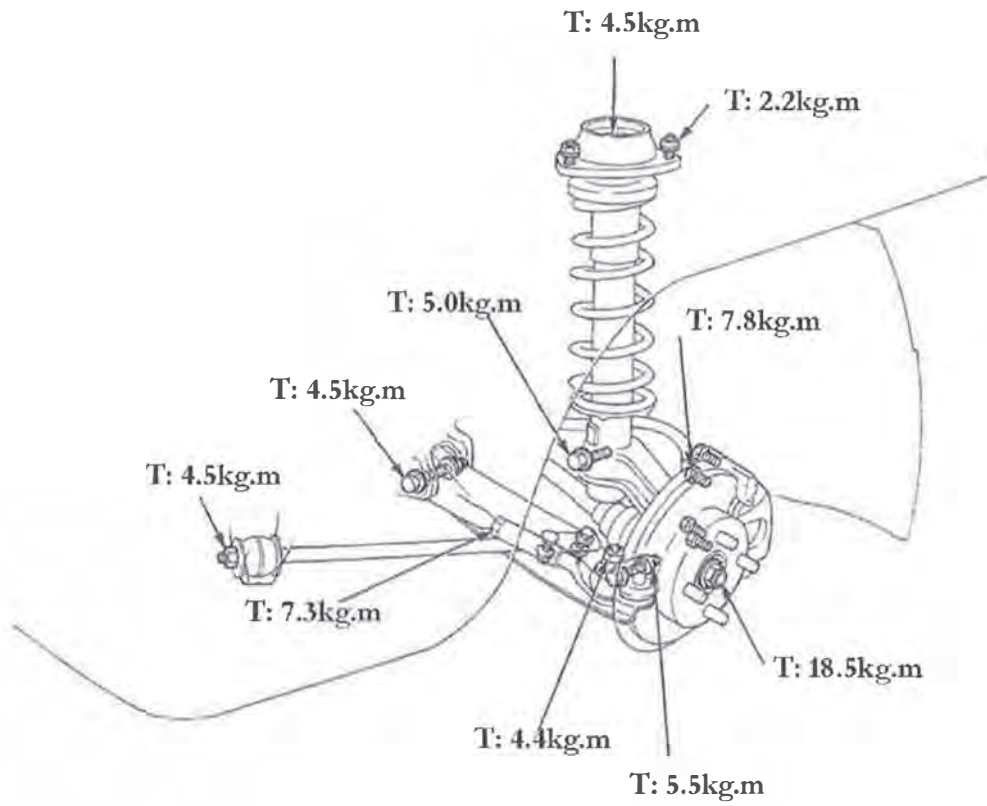


Steering & Suspension

Front Suspension 4WD

Exploded View

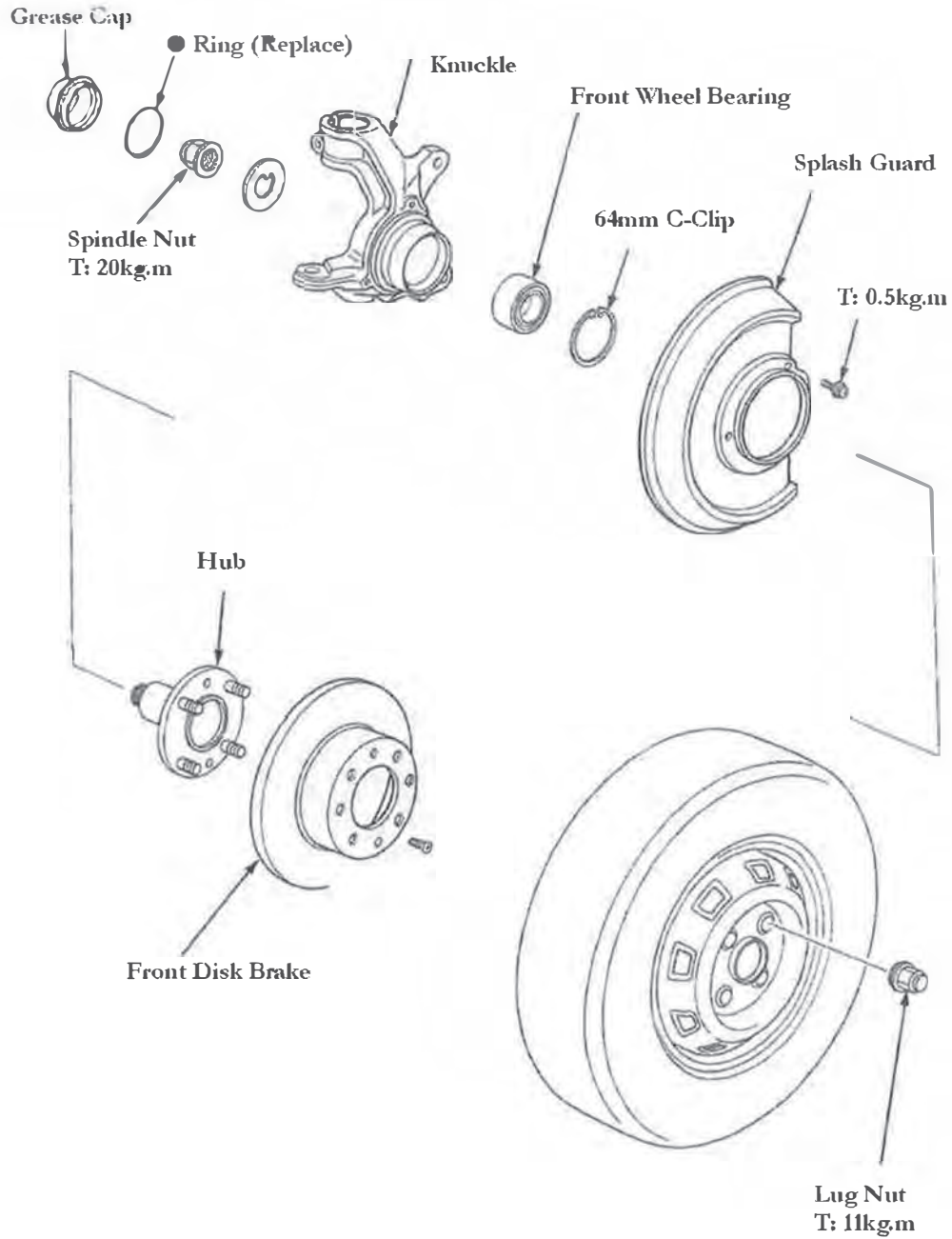
Torque Guide



Steering & Suspension

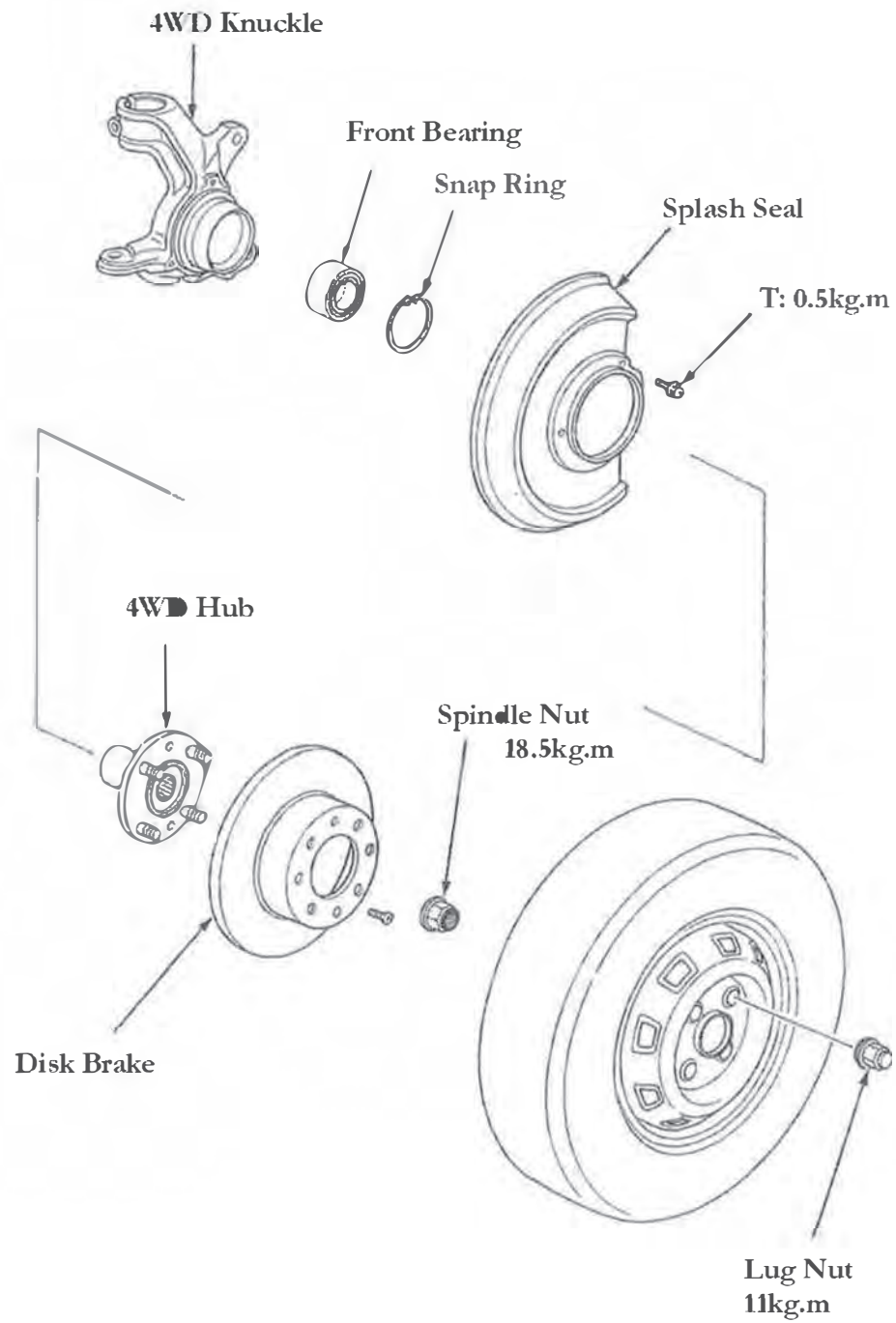
Front Suspension 2WD

Exploded View



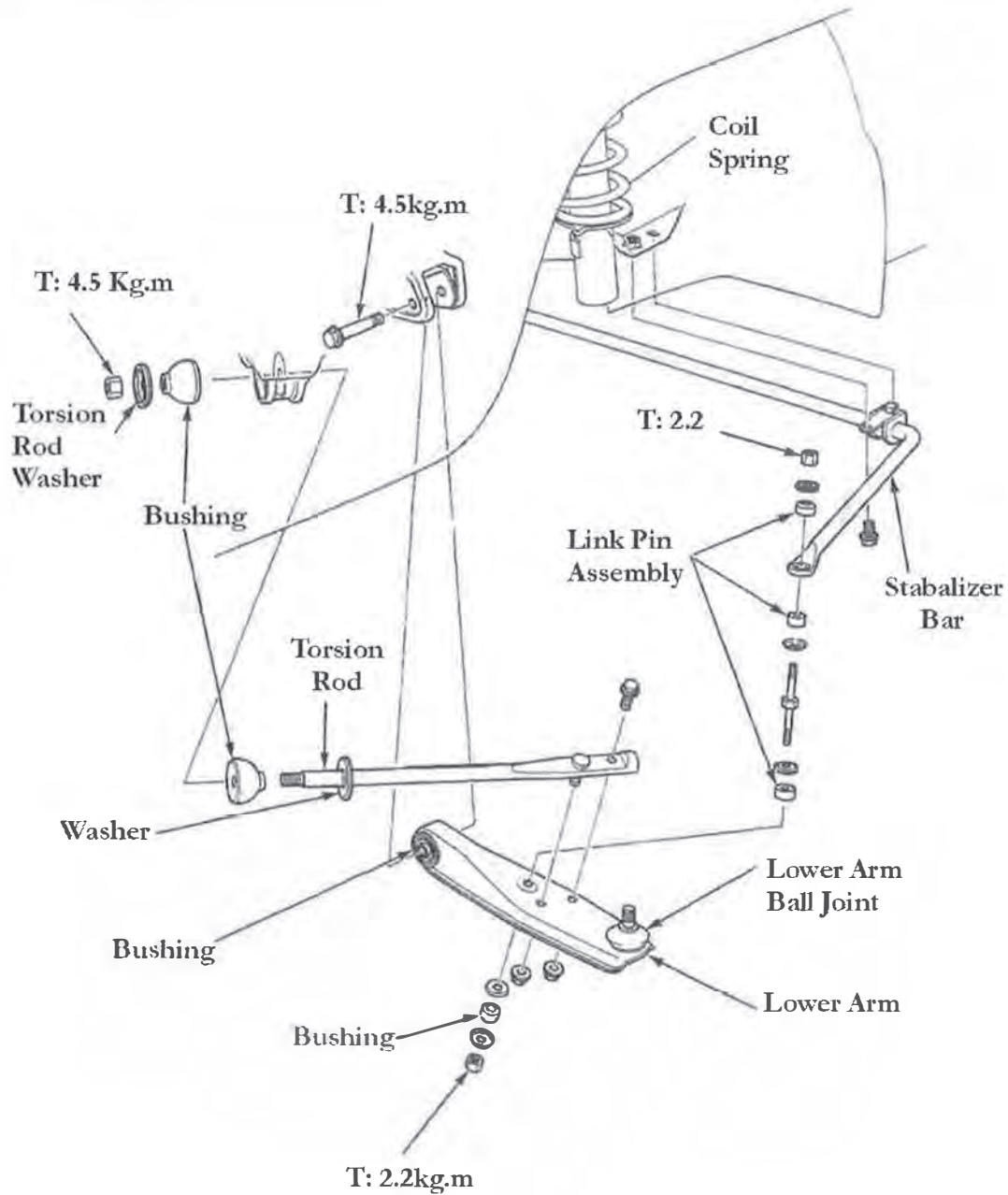
Steering & Suspension

Front Suspension 4WD



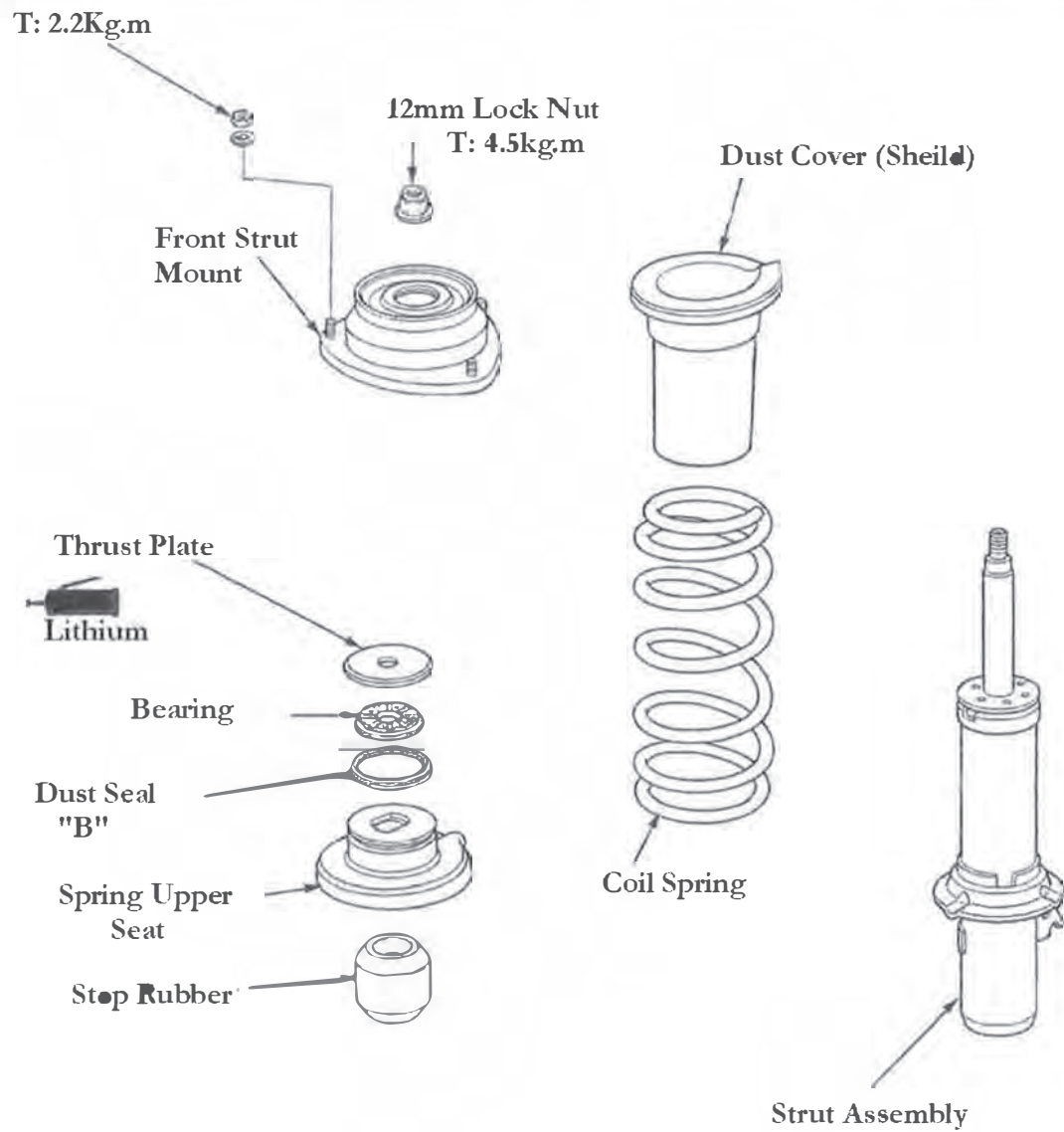
Steering & Suspension

Lower Arm - Stabilizer Bar - Torsion Bar



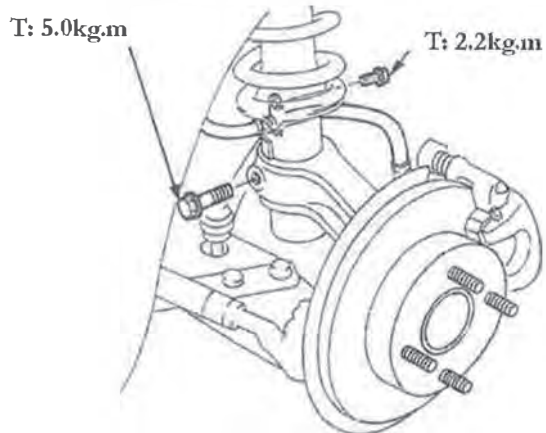
Steering & Suspension

Front Strut Assembly

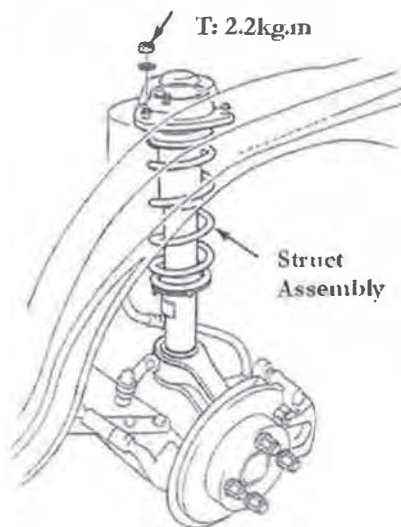


Steering & Suspension

Front Strut Removal



1. Jack Vehicle
2. Remove Front Wheel(s)
3. Remove Grease Cover
4. Remove Brake Hose Strut Clip
5. Remove Lower Strut Attachment Bolt



6. Lower Knuckle Assembly
7. Remove Upper Attachment Bolts
8. Slide Out Strut Assembly

Note: Check Strut for Up/Down Action

Correct

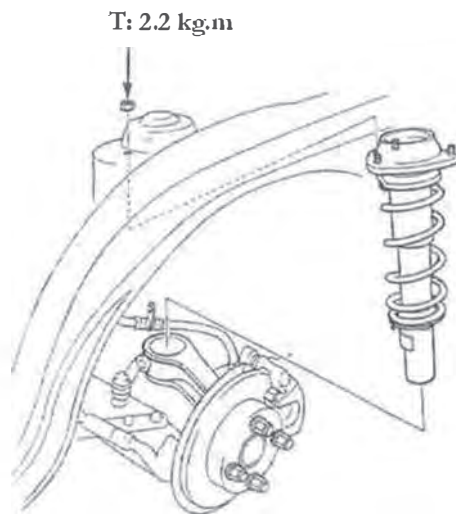


Fail (Replace)

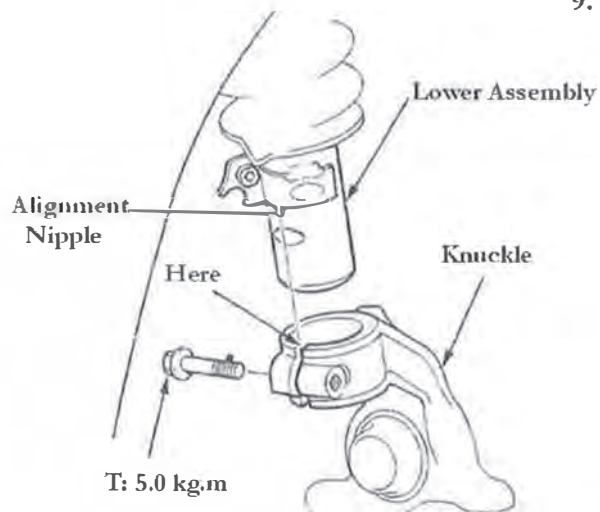


Steering & Suspension

Front Strut Attachment



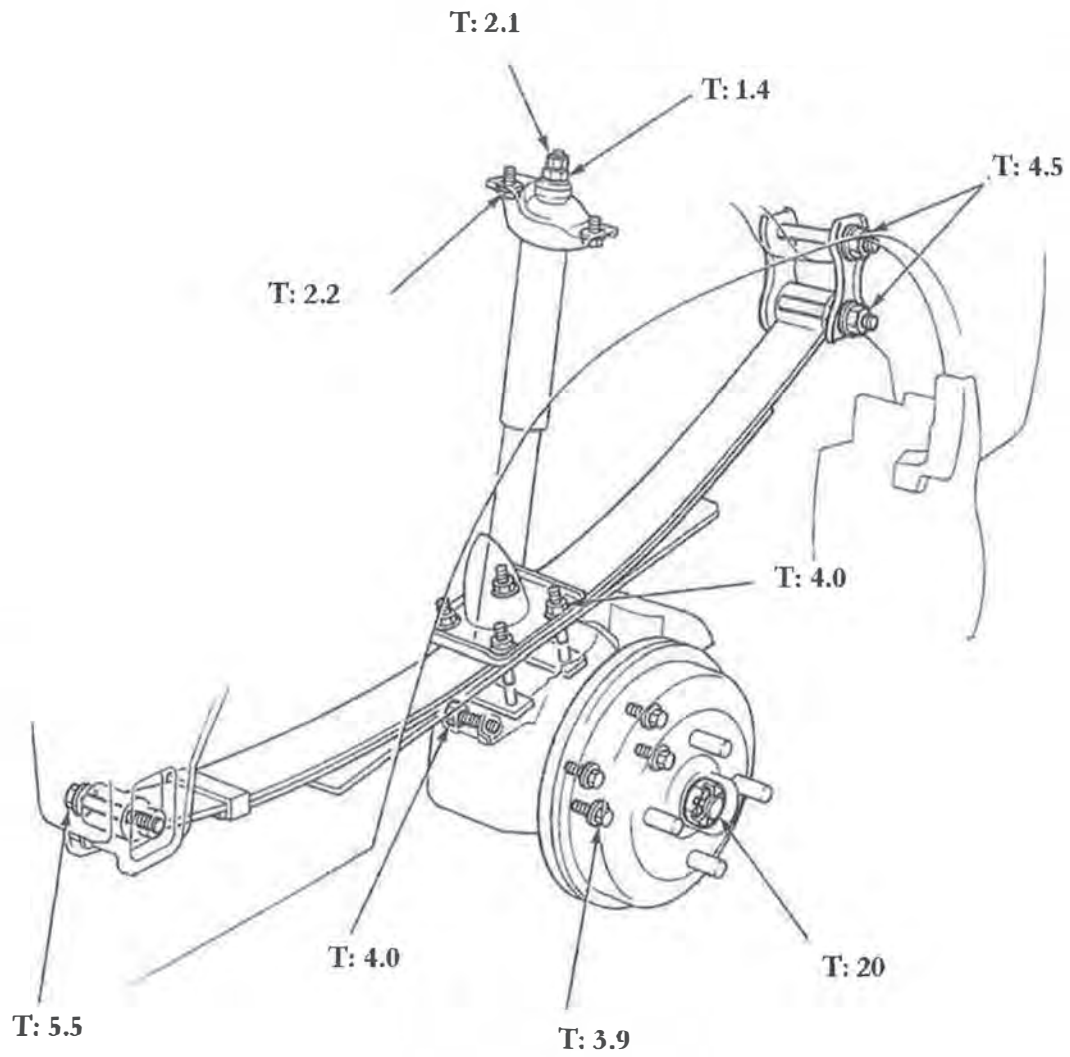
1. Use The Diagram on Left and Slide in Strut Assembly
2. Pay Attention to Alignment Nipple in Diagram Bottom Left
3. Attach Lower Bolt
4. Attach Upper Bolts
5. Attach Brake Line Clip
6. Torque All Bolts
7. Attach Grease Cap
8. Attach Tire(s)
9. Lower Vehicle



Steering & Suspension

Rear Suspension Torque

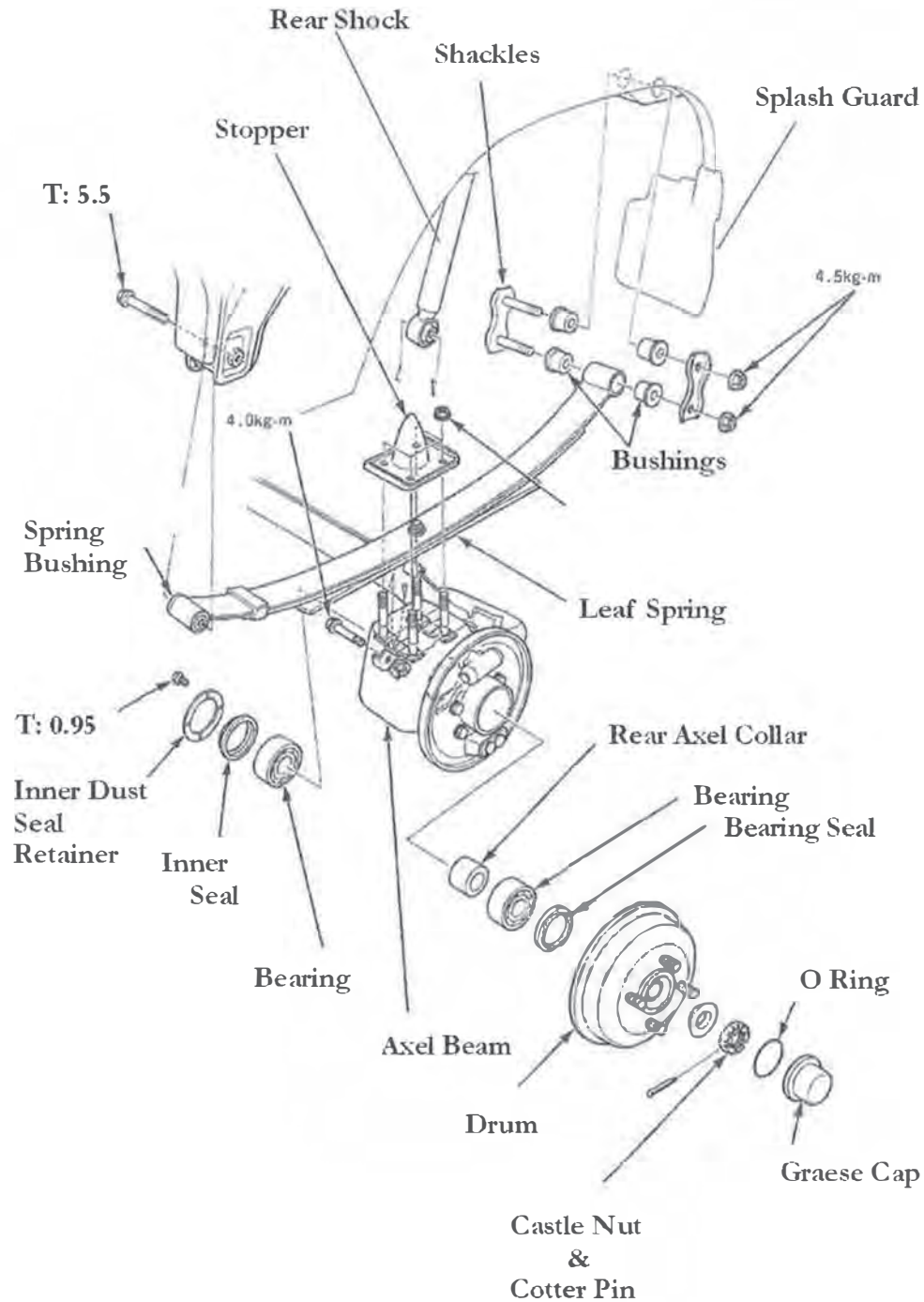
Torque=kg.m



Steering & Suspension

Rear Suspension Components

Torque=T: Kg.m



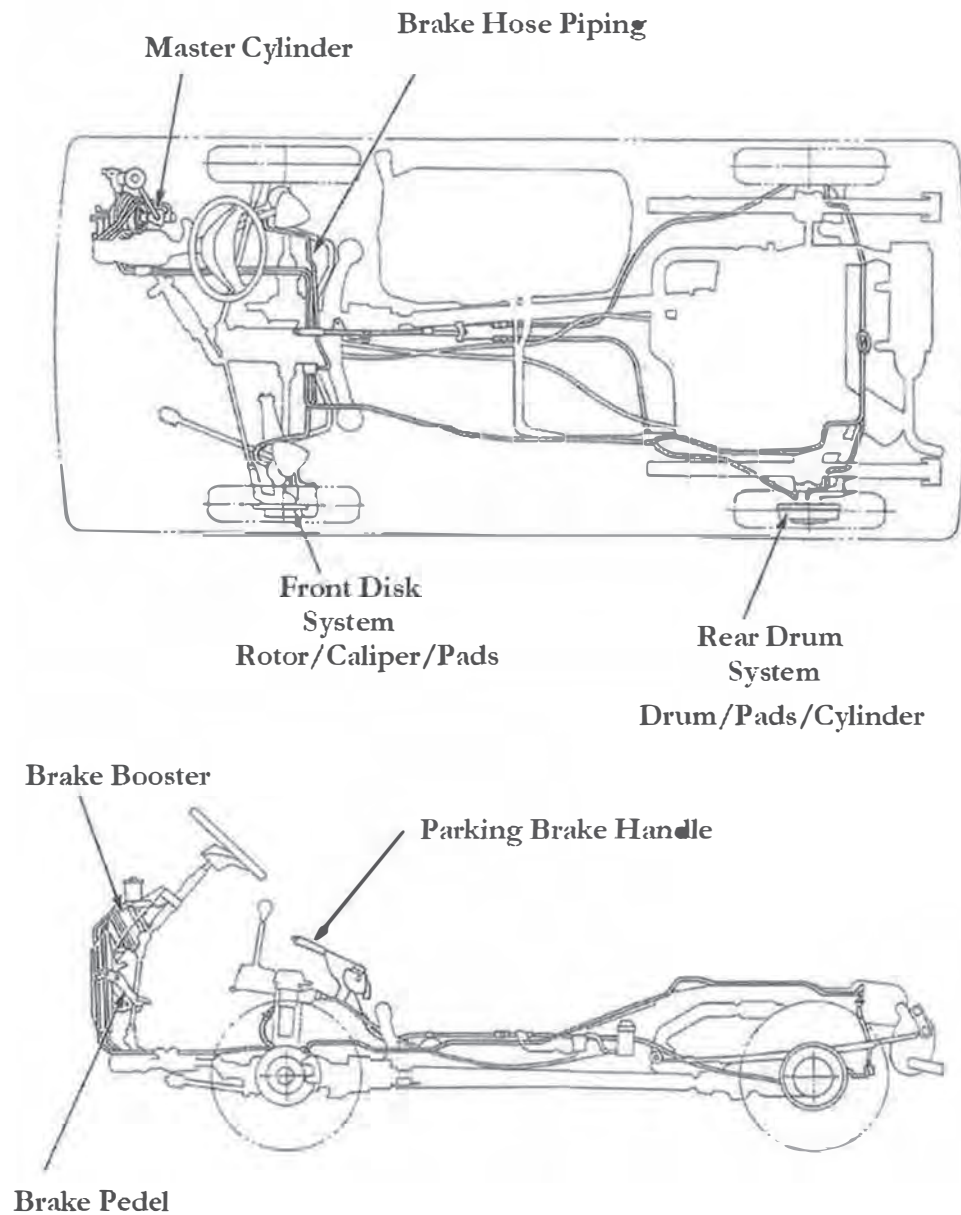
Chapter 10

Brake System

- Brake System Schematic Top & Side View
- Front Disk Brake Caliper System Components
- Front Disk Brake Pad Replacement
- Disk Brake Rotor Measurements & Inspection
- Master Cylinder System & 5 Way Directional Fluid Joint
- Master Cylinder Breakdown Components
- Brake Booster Components
- Rear Drum Brake System
- Pad & Drum Specifications
- Drum Brake Wheel Cylinder
- Parking Brake Handle and Cable System

Brake System

System Schematic

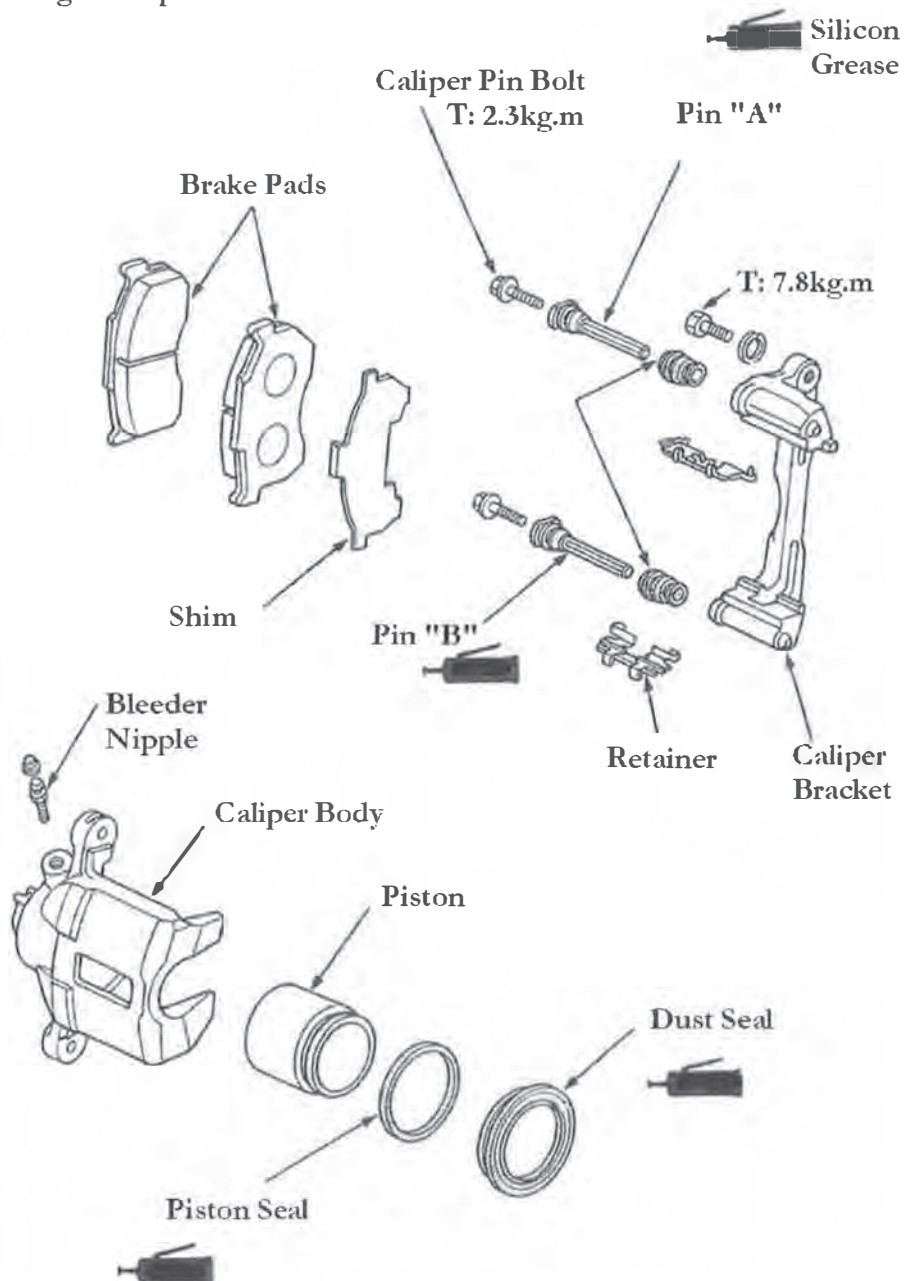


Note: Detailed Information on Each System Following Pages

Brake System

Front Brakes

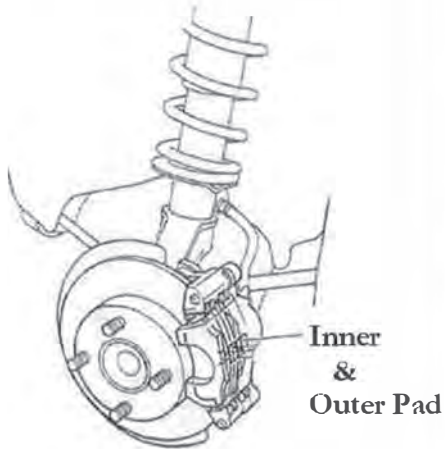
Note: Use High-Temp Silicon Grease at Indicated Points



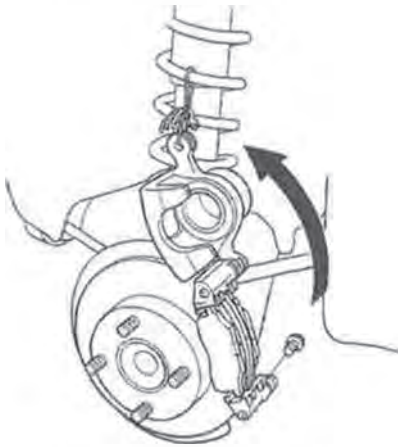
Brake System

Front Brake Pad Replacement

1. Jack Up Vehicle and Remove Tire(s)
2. Remove Caliper Pin Bolt (Remove- Both Pins if Complete Disassembly)

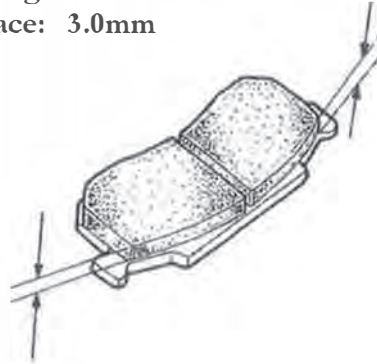


3. Swing Up Caliper and Use Tie Straps To Hold in Place



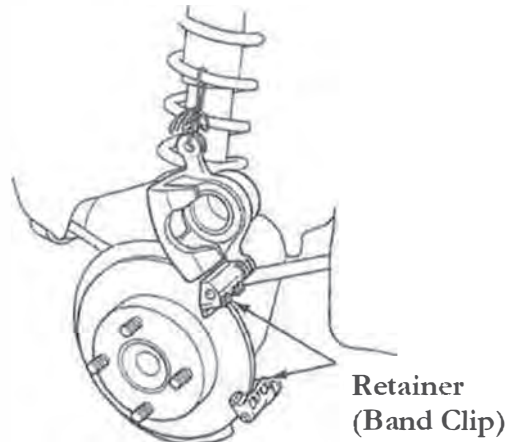
4. Measure Pad Thickness as Shown in diagram Below

In Range: 8.5mm
Replace: 3.0mm



Note: Rounded Edges or Chips Replace
(Oil Soaked Must Be Replaced)

5. Remove Retainer Clip and Clean All Areas With Proper Brake Cleaner

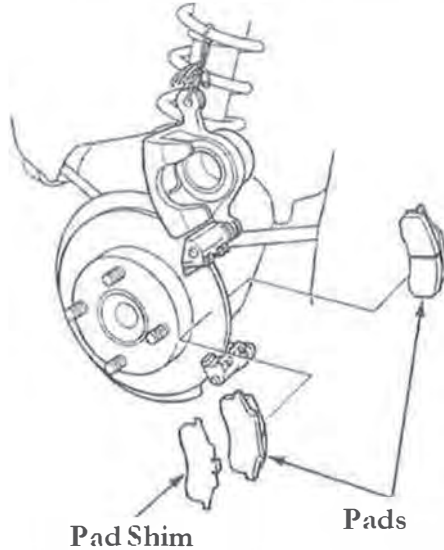


Brake System

Front Pad Replacement

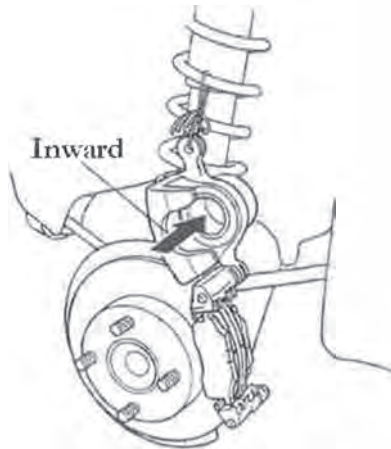
6. Place Pads In Retaining Bracket

Note: Pads Facing Disk Face



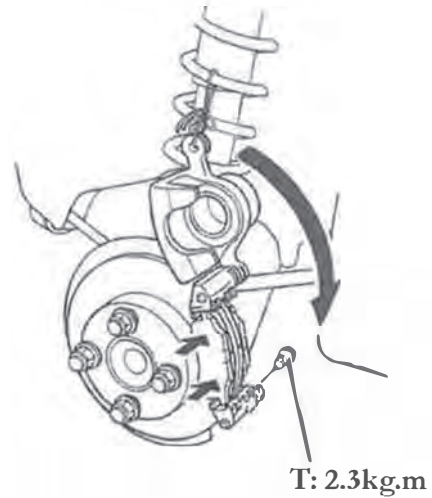
7. Remove Brake Oil Tank Cover

8. Use Hand or C-Clamp To Push Back Piston



9. Close Caliper and Attach Pin and Bolt

Note: Make Sure No Grease is on Disk Facing



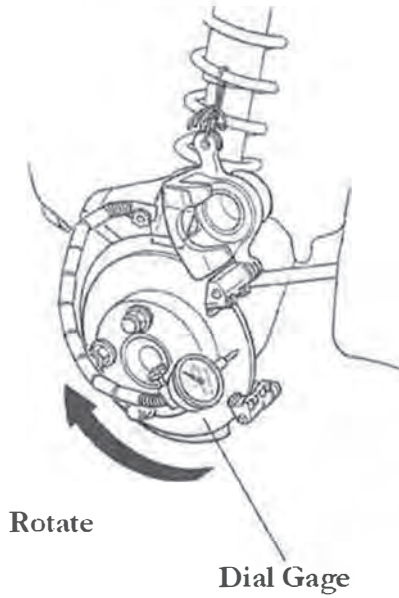
10. After Both Sides Have Been Changed Check Brake Fluid Reservoir. If Low Add DOT3 or DOT4 Approved Fluid

11. Pump Brake Pedal Until Hard

12. Attach Wheel, Lower Vehicle and Test Drive

Brake System

Disk Rotor Inspection

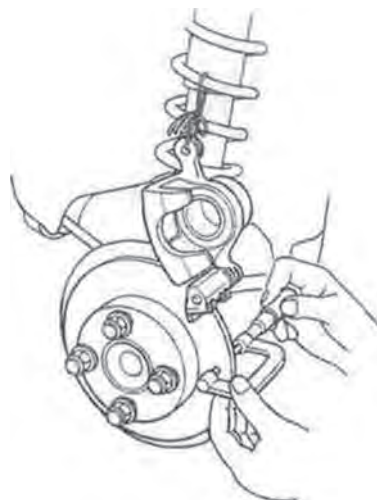


Remove Tire & Brake Caliper

Attach Dial Gage and Check Round Out

Limit: 0.1mm

Over: Turn Disk or Replace



Disk Thickness Inspection

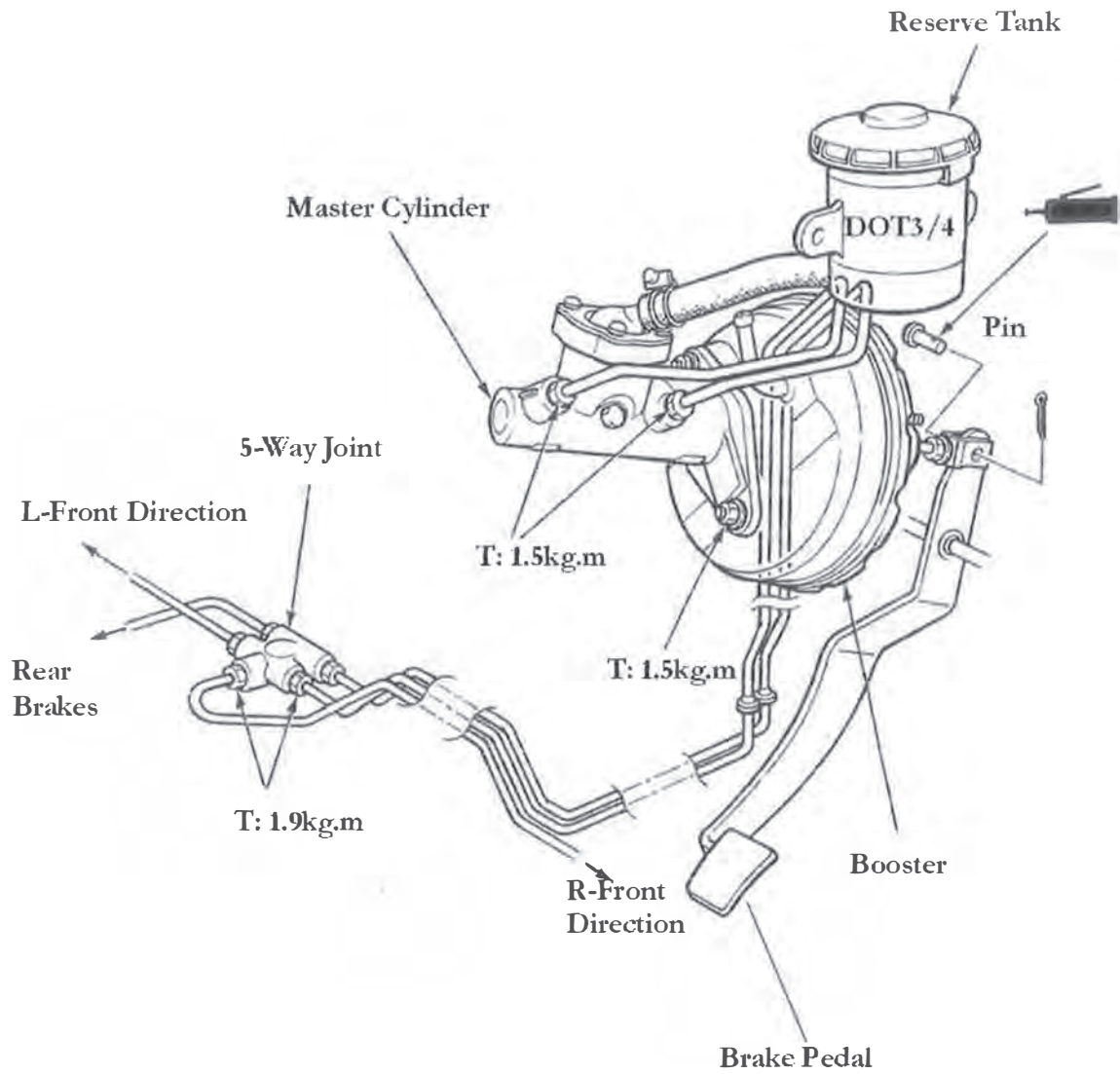
Normal: 12.0mm

Limit: (Include Turn) 10.mm

Turn (Resurface Rate): 0.015mm

Brake System

Master Cylinder System

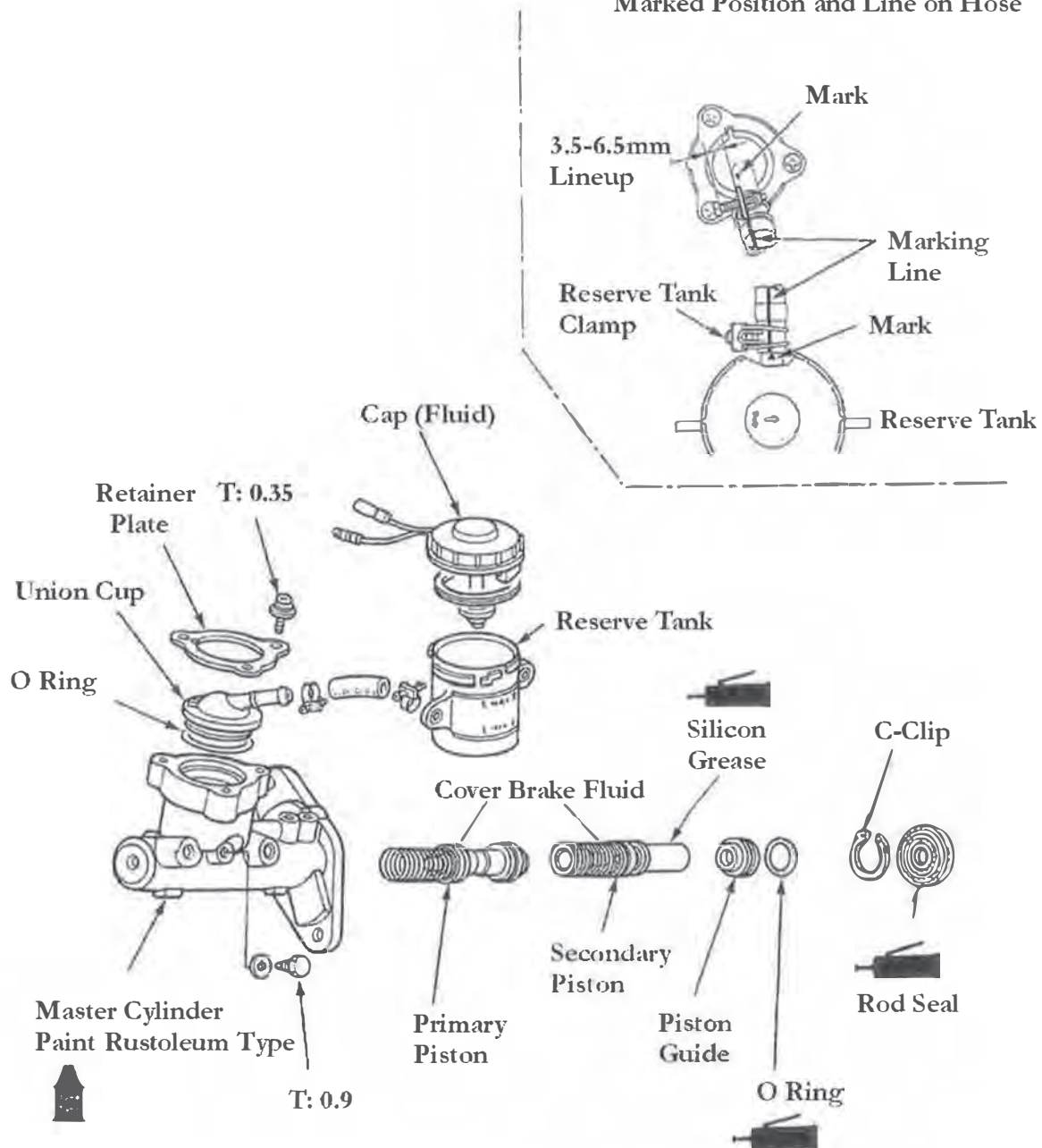


Brake System

Master Cylinder Components

Torque=Kg.m

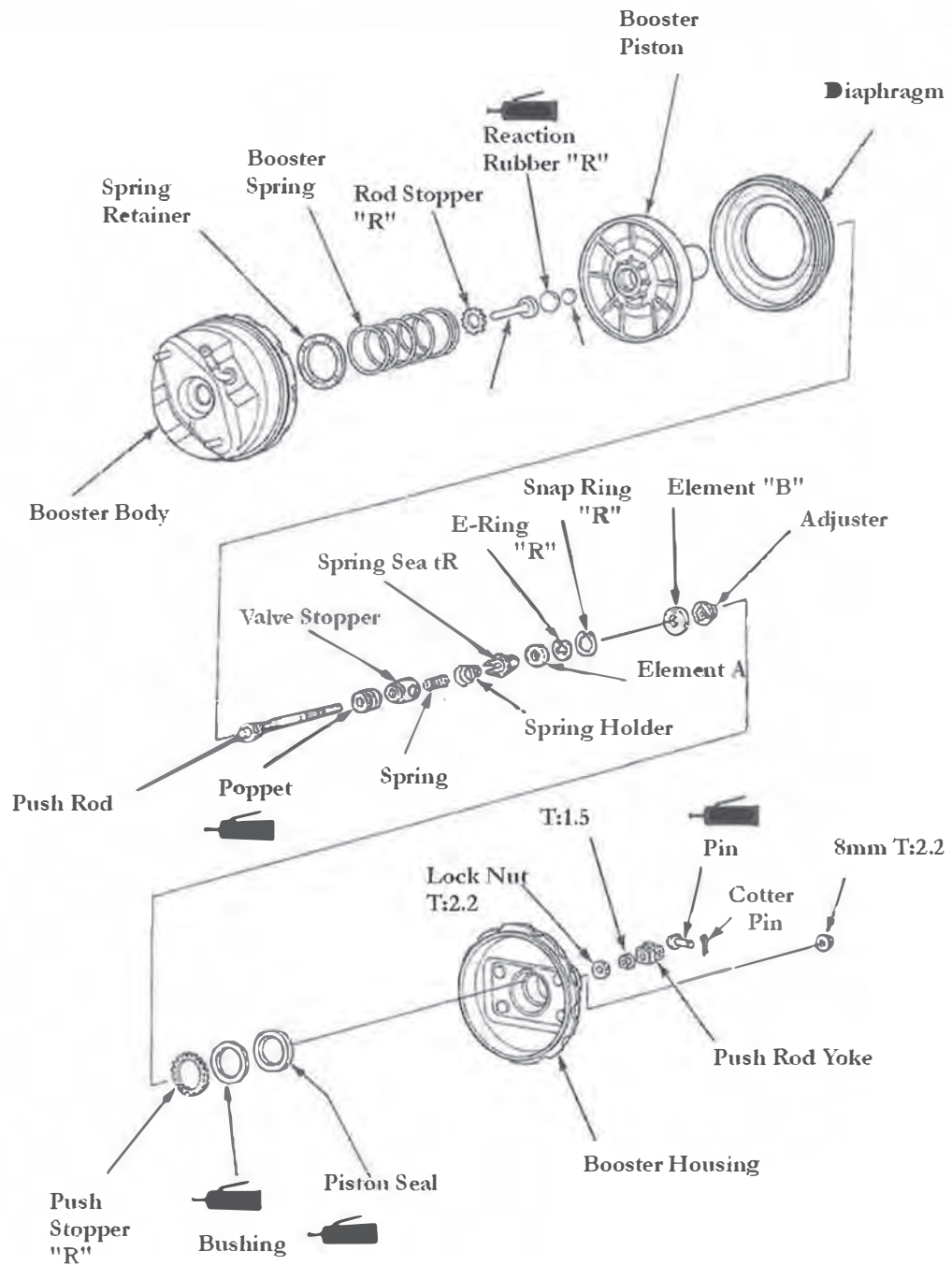
Note: Not to Twist Fluid Line, Follow Marked Position and Line on Hose



Note: When Painting Plug All Openings

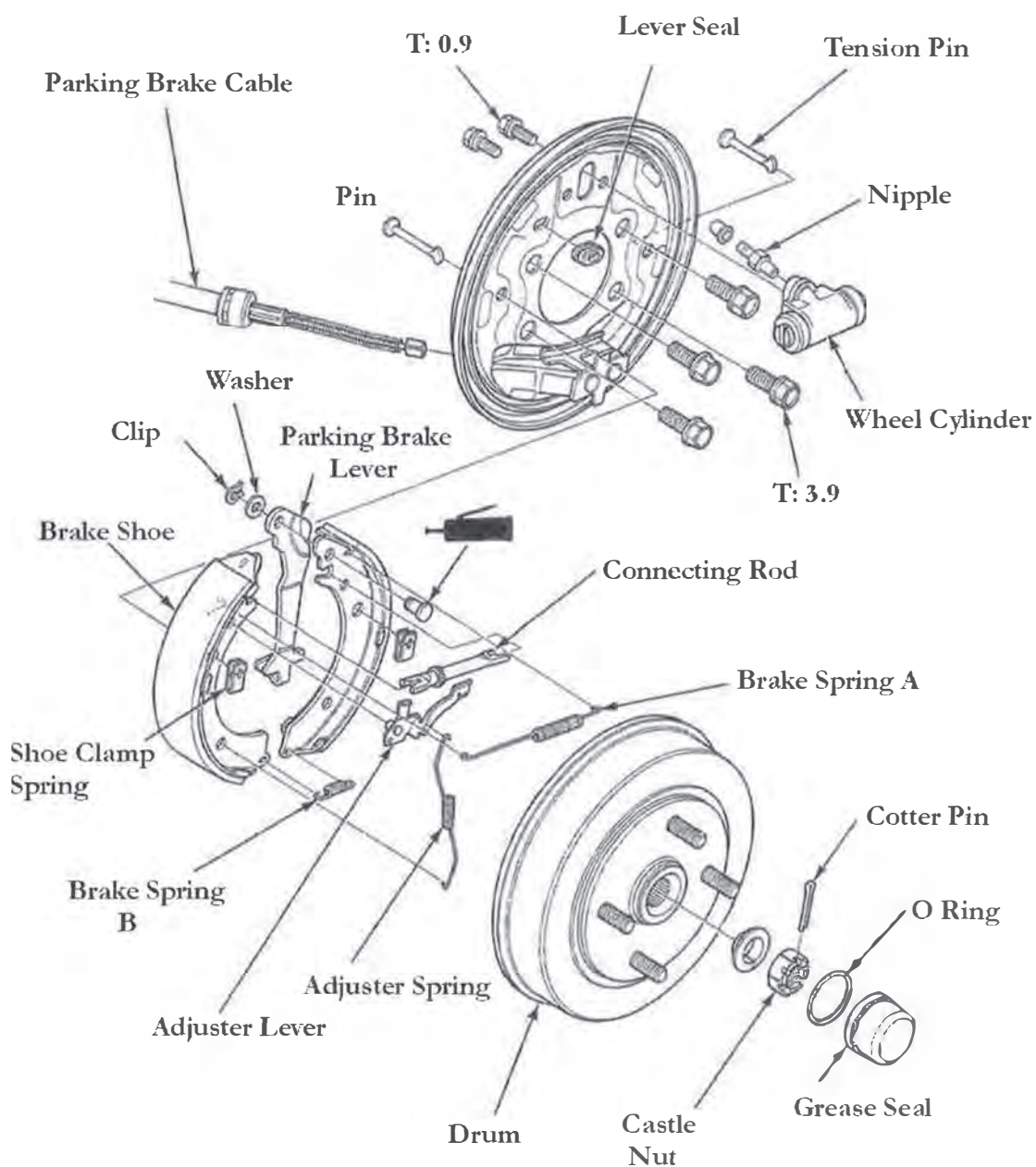
Brake System

Booster Assembly Components



Brake System

Drum Brake System



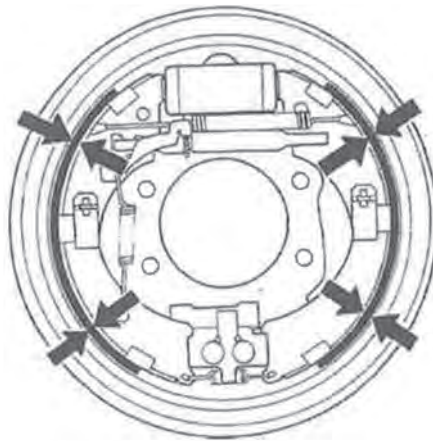
Brake System

Drum Inspection

Brake Lining Thickness Inspection

Normal: 4.5mm

Replace: 2.0mm

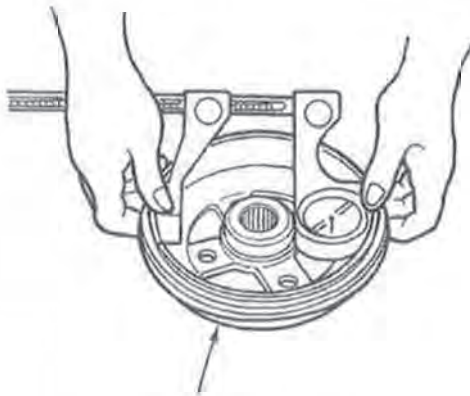


Measure Points

Drum Round-Out Inspection

Normal: 200mm

Replace: 201mm



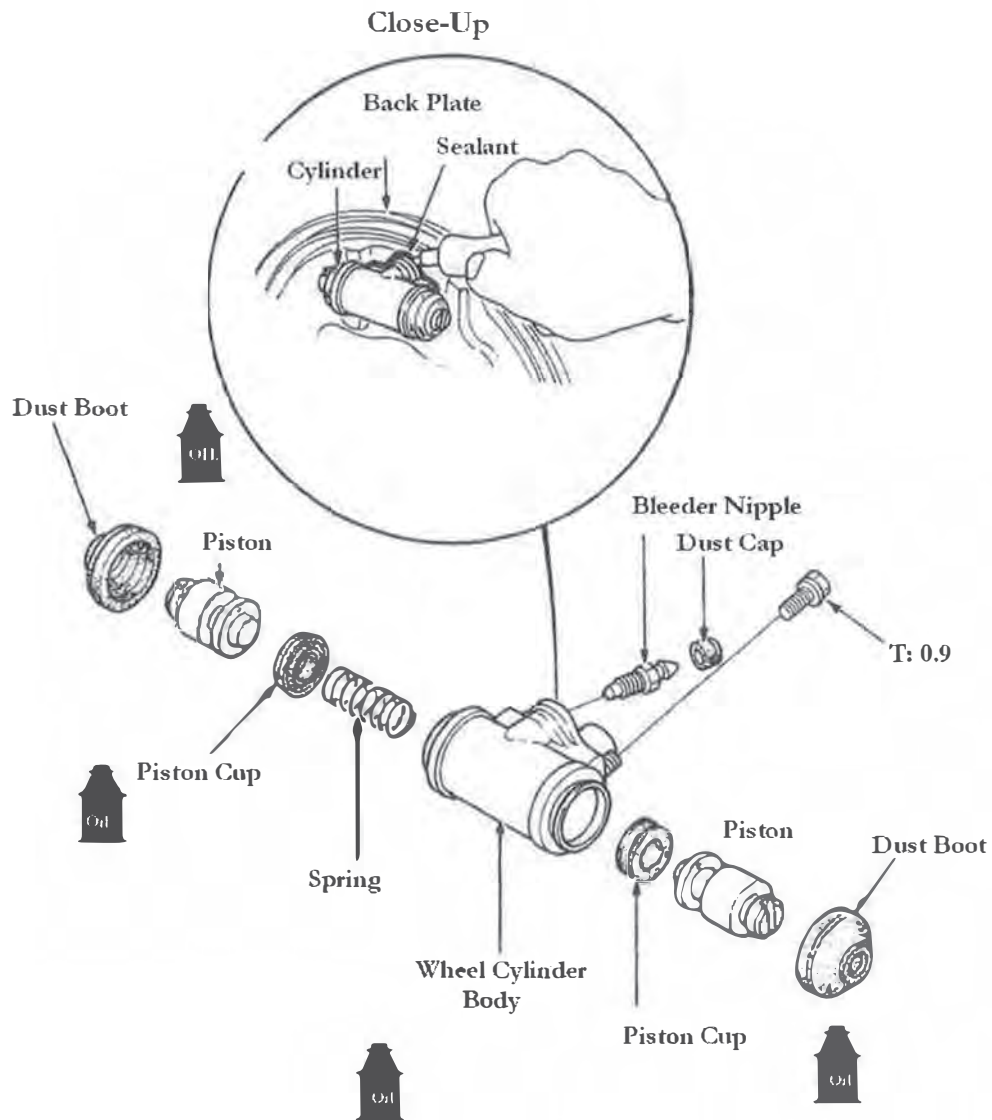
Drum

Brake System

Drum Brake Wheel Cylinder



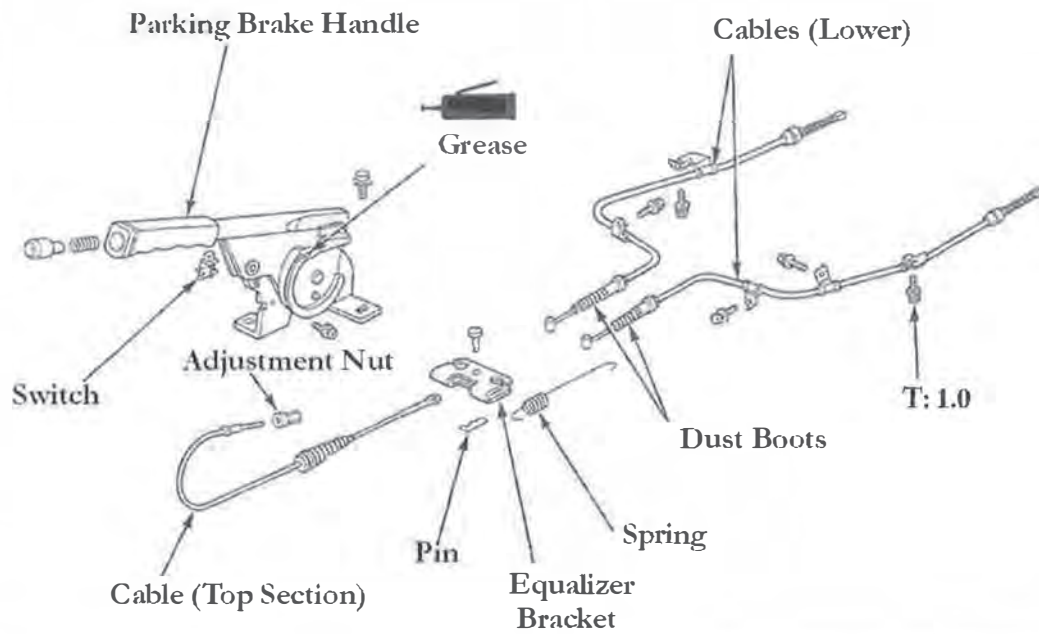
= Cover With Brake Fluid
DOT3 or DOT4



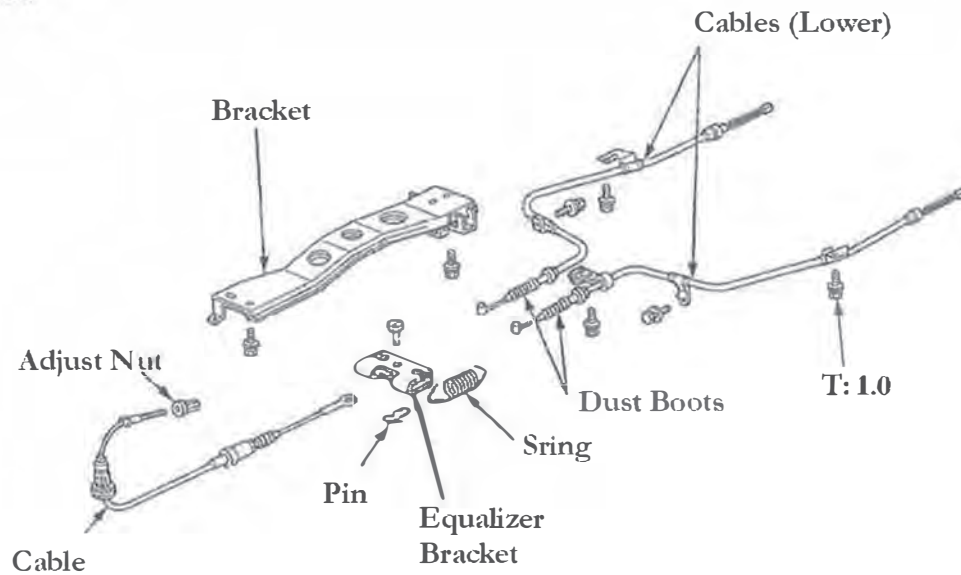
Brake System

Parking Brake Handle & Cable System

Truck



Van





Chapter 11

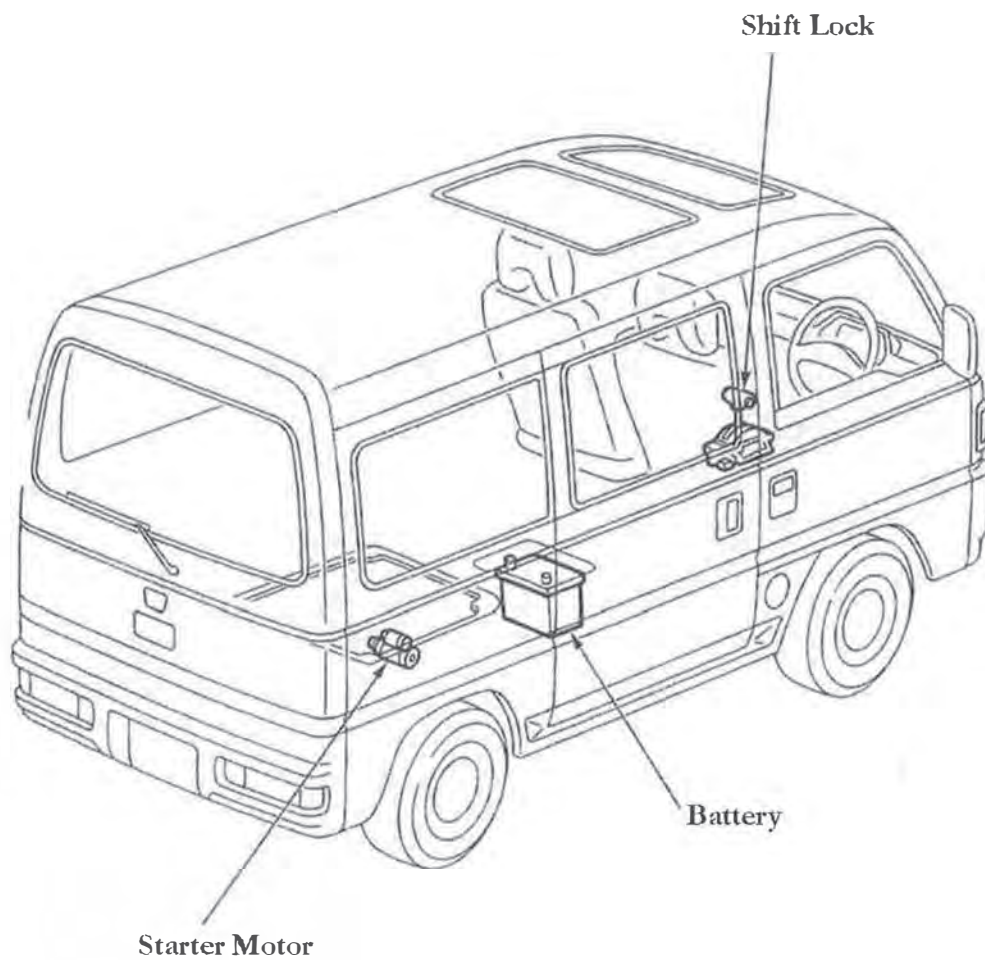
Starter and Alternator Charging System

- Starter Circuit Diagram
- Starter Terminal Identification (ND Nippon Denso & Hitachi)
- Starter Removal
- Starter Complete Schematic (ND Denso 0.6kw)
- Starter Complete Schematic (ND Denso 0.8 & 0.9kw Versions)
- Starter Complete Schematic (Hitachi 0.8kw Version)
- Vehicle Diagram
- Charging Circuit Diagram
- Alternator Circuit Test & Unit Removal
- Alternator Parts Schematic
- Rectifier Inspection & Circuit
- Brush Specifications

Starter & Alternator

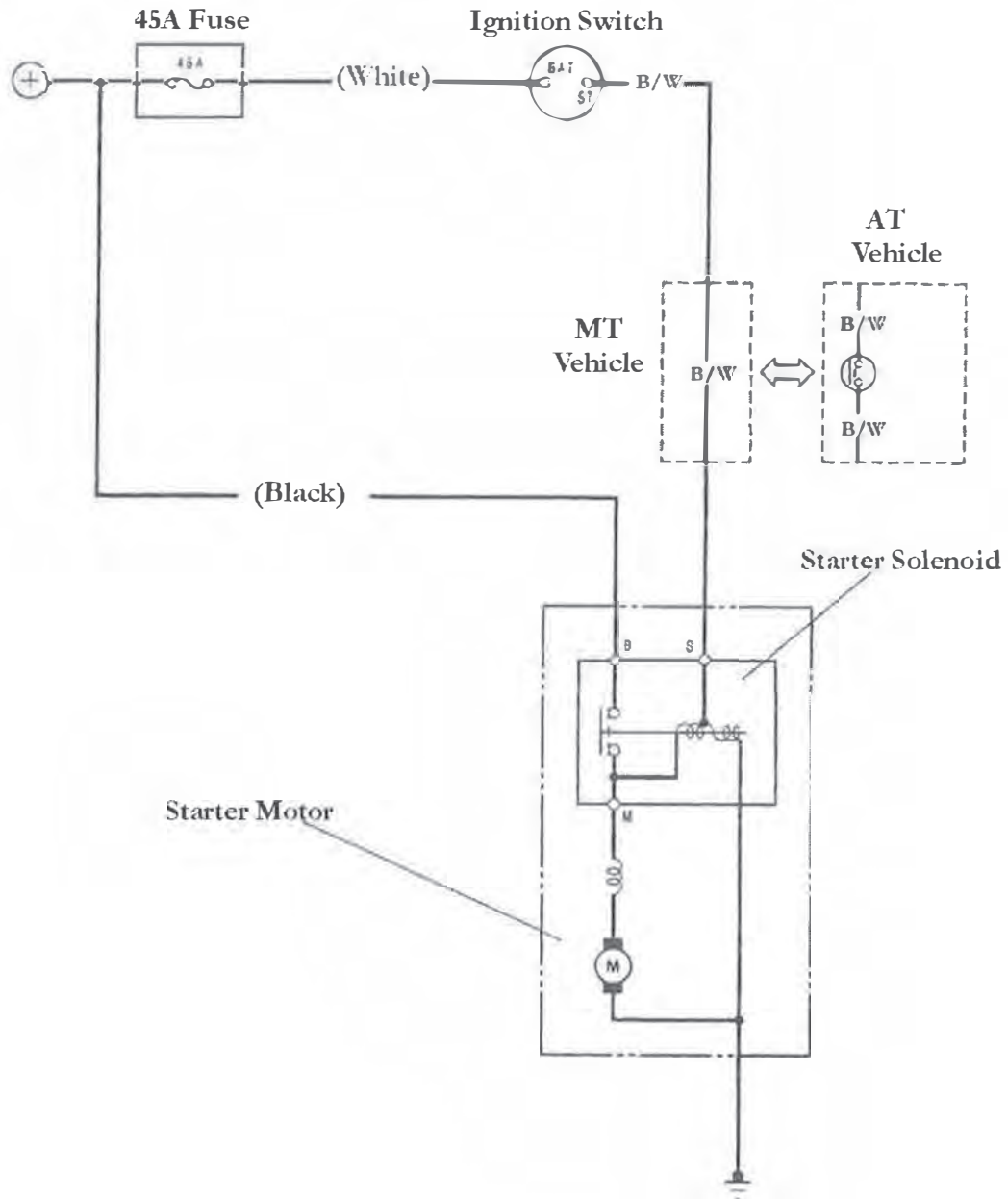
Starter Location

AT Vehicle



Starter & Alternator

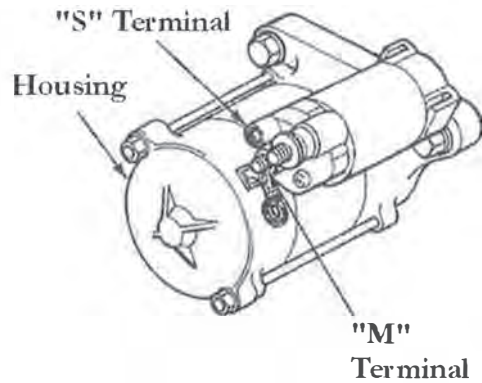
Starter Motor Circuit



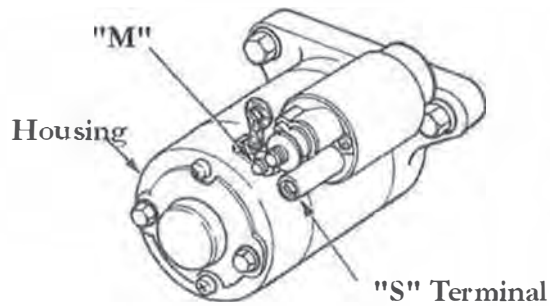
Starter & Alternator

Starter Terminals and Removal

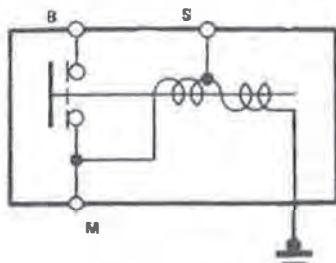
ND Version
(Nippon Denso)



Hitachi Version

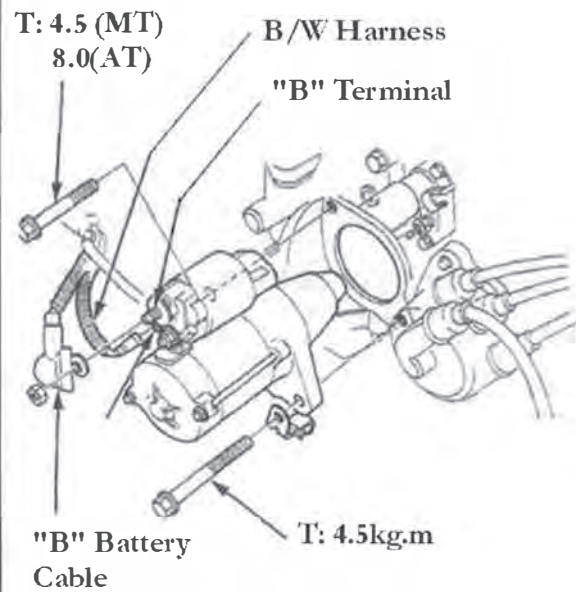


Solenoid Circuit



Starter Removal

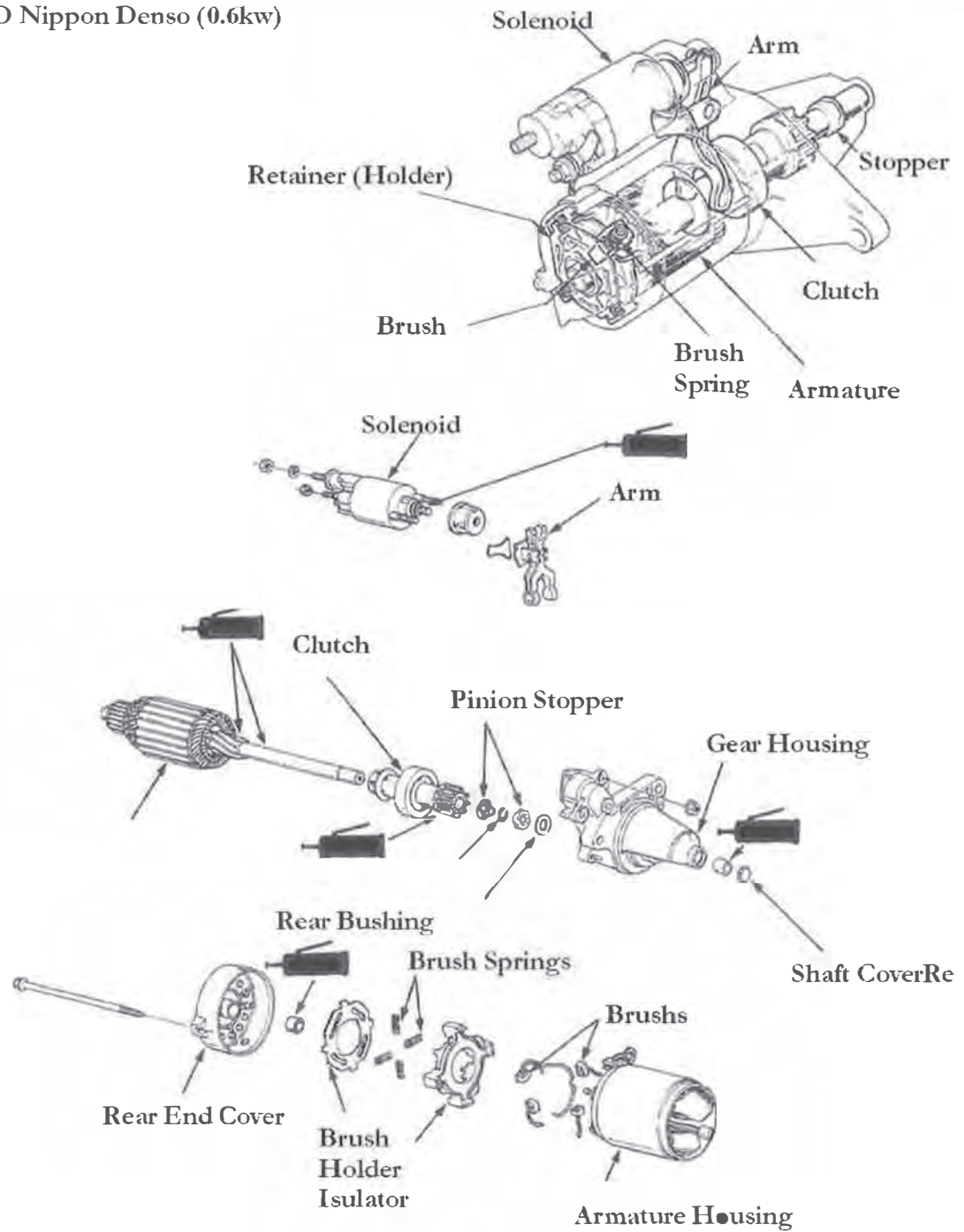
1. Disconnect Battery Terminals
2. Remove "B" Terminal
3. Disconnect "S" Terminal
4. Remove Attachment Bolts and Slide Starter Out



Starter & Alternator

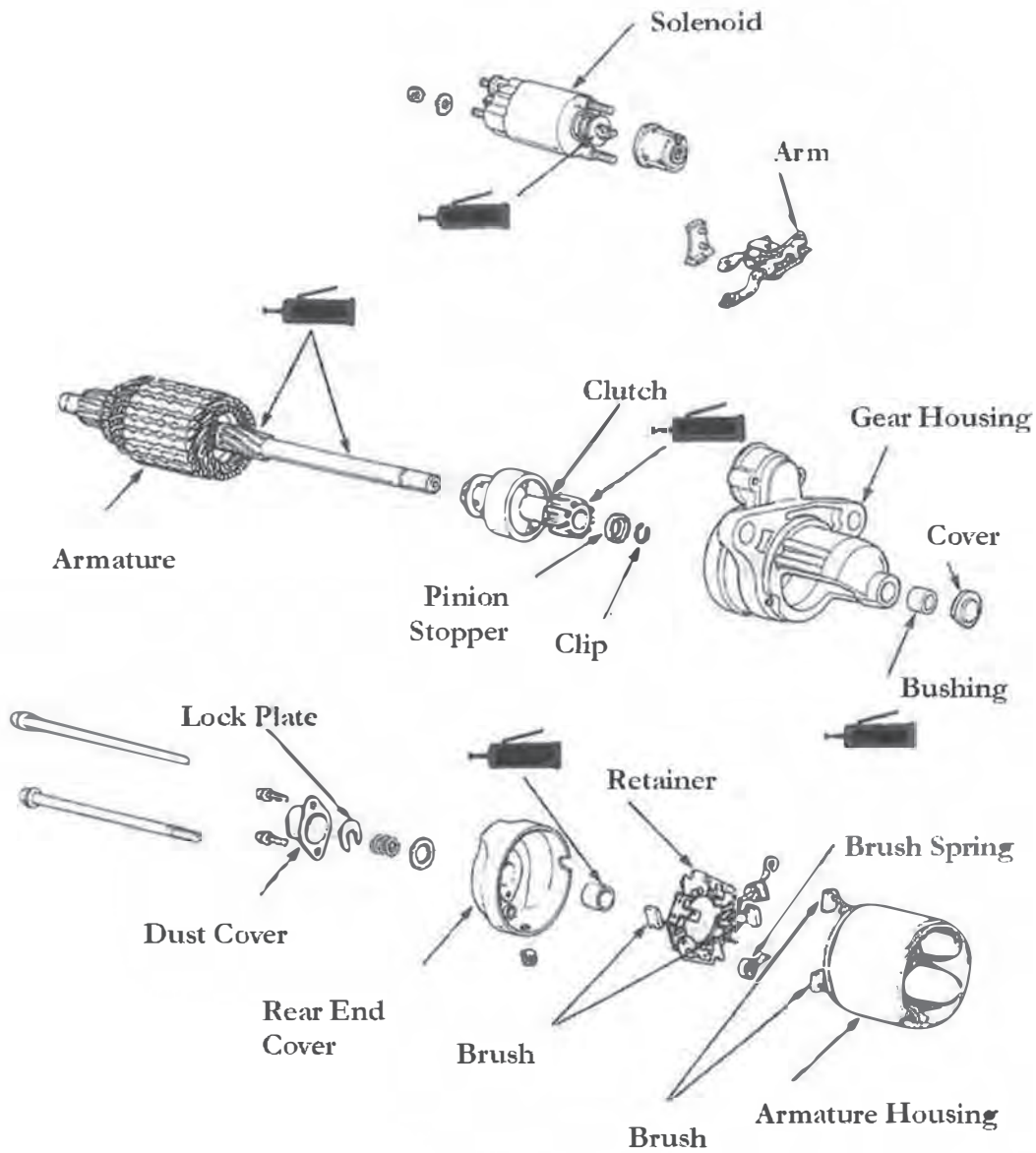
Starter Parts Schematic ND Nippon Denso●

ND Nippon Denso (0.6kw)



Starter & Alternator

Starter Parts Schematic ND 0.8 & 0.9kw Versions



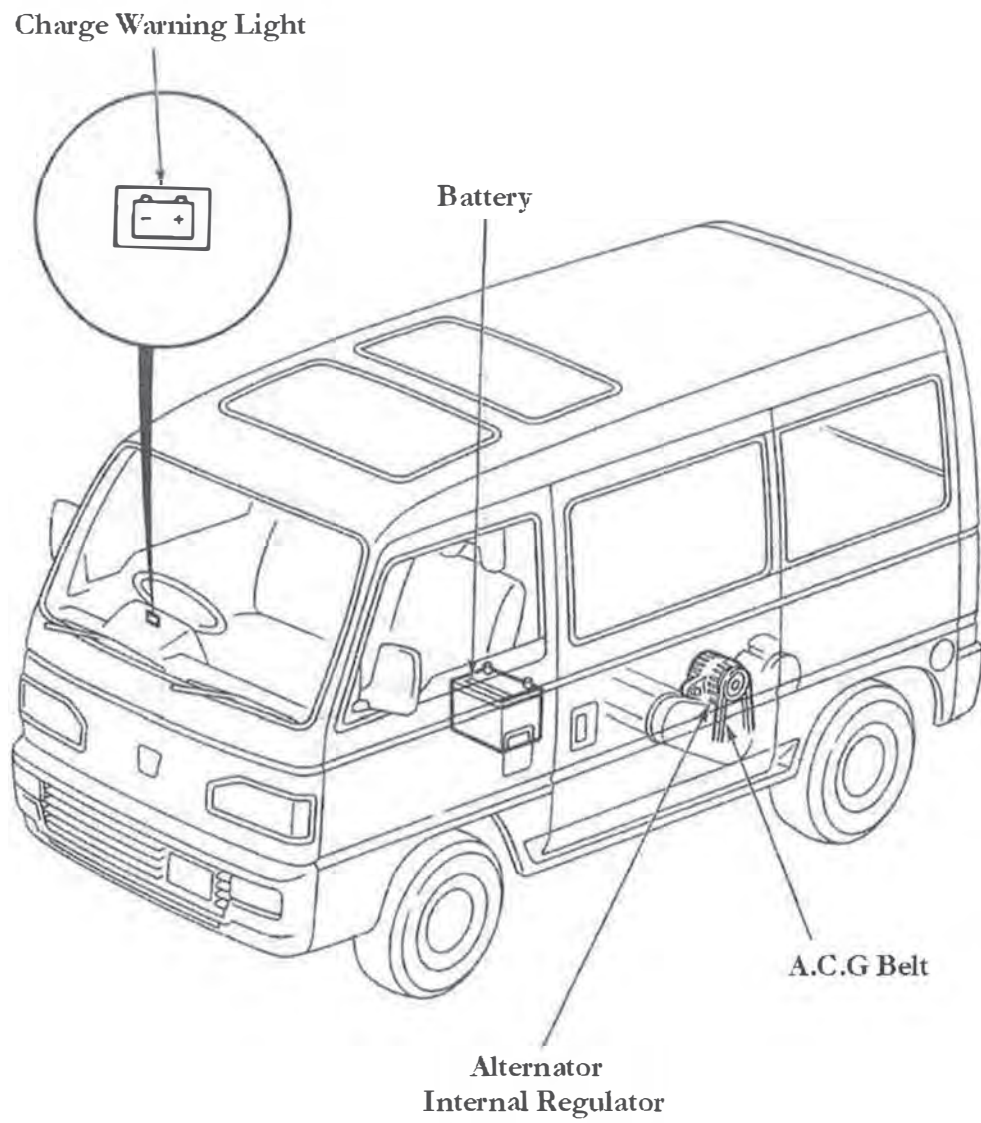
Starter Parts Schematic Hitachi 0.8kw

This diagram illustrates the exploded view of a motor assembly, showing the following components and their assembly sequence:

- Field Coil**: The main winding of the motor.
- Solenoid**: A coil that controls the clutch mechanism.
- Arm**: A lever that operates the clutch.
- Clutch**: A component that engages and disengages the drive gear.
- Drive Gear**: A gear that drives the armature.
- Armature**: The rotating part of the motor.
- Armature Housing**: The outer casing for the armature.
- Solenoid Body**: The main body of the solenoid.
- Dust Cover**: A cover for the solenoid.
- Spring**: A coiled spring that provides tension.
- Piston**: A component that moves the arm.
- Arm**: A lever that operates the clutch.
- Spring**: A coiled spring that provides tension.
- Cover**: A protective cover for the solenoid.
- Armature**: The rotating part of the motor.
- Moly B Grease**: A lubricant applied to the armature shaft.
- Clutch**: A component that engages and disengages the drive gear.
- Stopper**: A component that stops the armature.
- Clip**: A small component that holds the armature in place.
- Gear Housing**: The outer casing for the gear.
- Bushing**: A sleeve that fits over the armature shaft.
- Dust Cover**: A cover for the solenoid.
- C-Clip**: A C-shaped clip that holds the armature in place.
- Thrust Washers**: Washers that reduce friction between the armature and the housing.
- Rear End Cover**: The back cover of the motor.
- Brush Holder**: A component that holds the brushes.
- Brush**: A component that makes contact with the armature.
- Armature Housing**: The outer casing for the armature.
- Retainer Screw**: A screw that holds the armature in place.

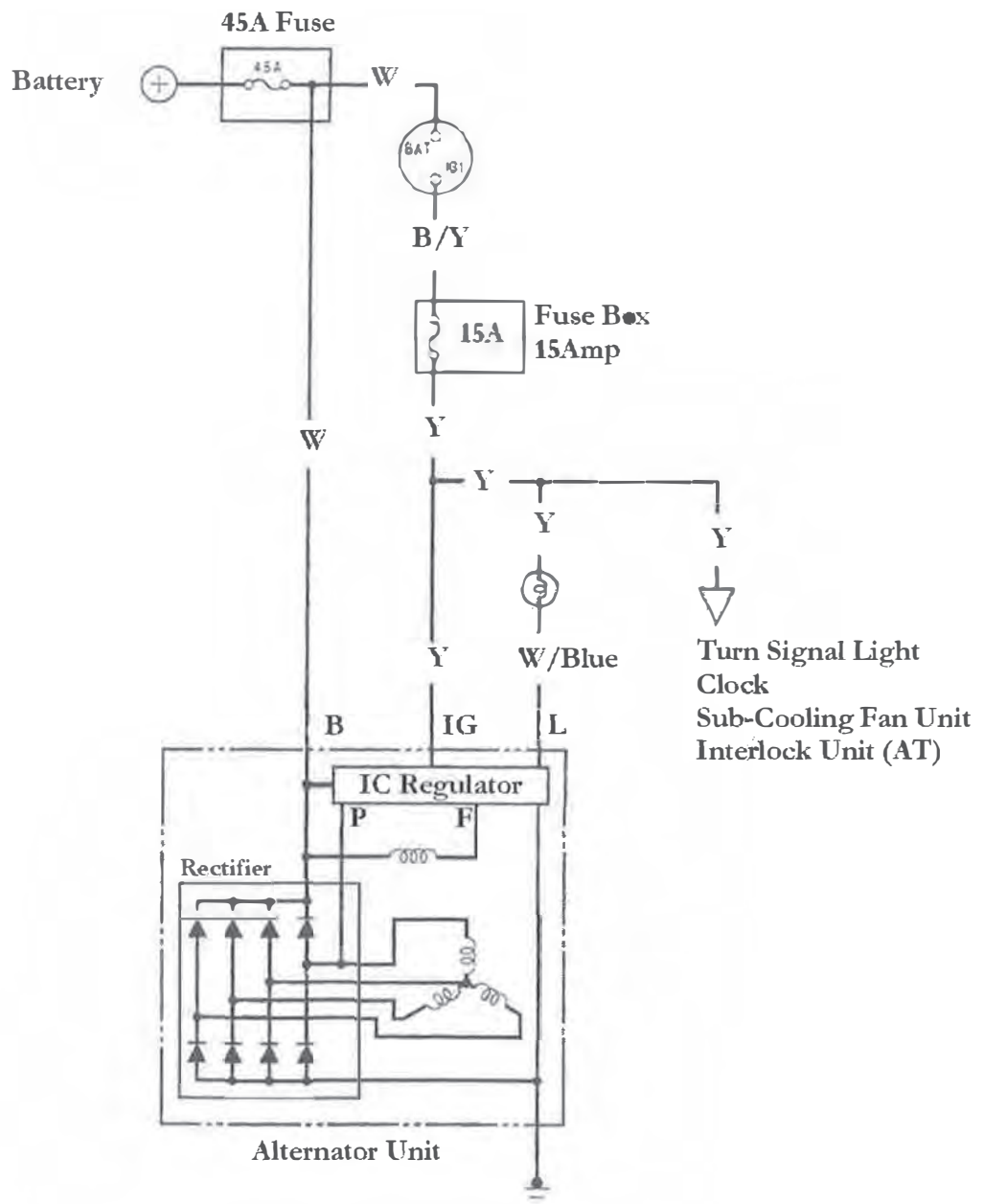
Starter & Alternator

Alternator Location



Starter & Alternator

Charging Circuit

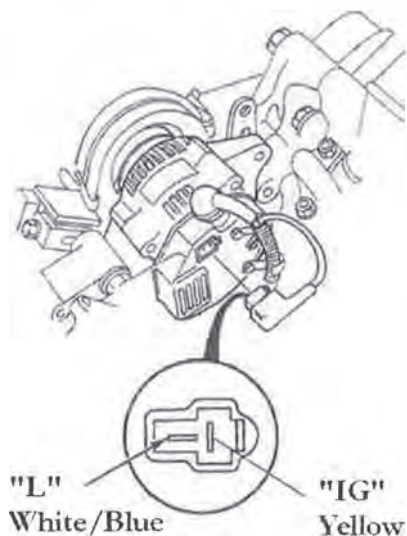


Starter & Alternator

Alternator Removal

Circuit Test

1. Turn Ignition Switch to ON Position. Check to Dash to See Warning Lamp is ON. Light is OFF Check Alternator Regulator



Note: Related Items

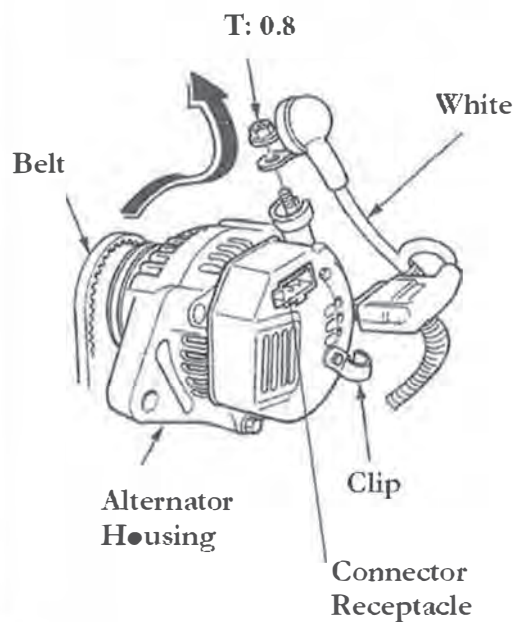
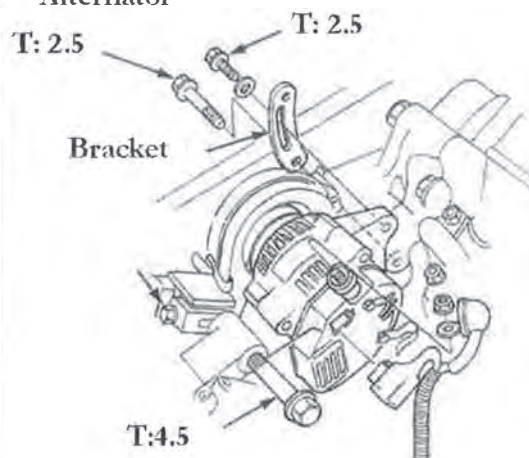
Warning Light Bulb 1.4W

Fuse: Turn Signal Fuse 15A

Check Circuit For Dead Paths
(Previous Page)

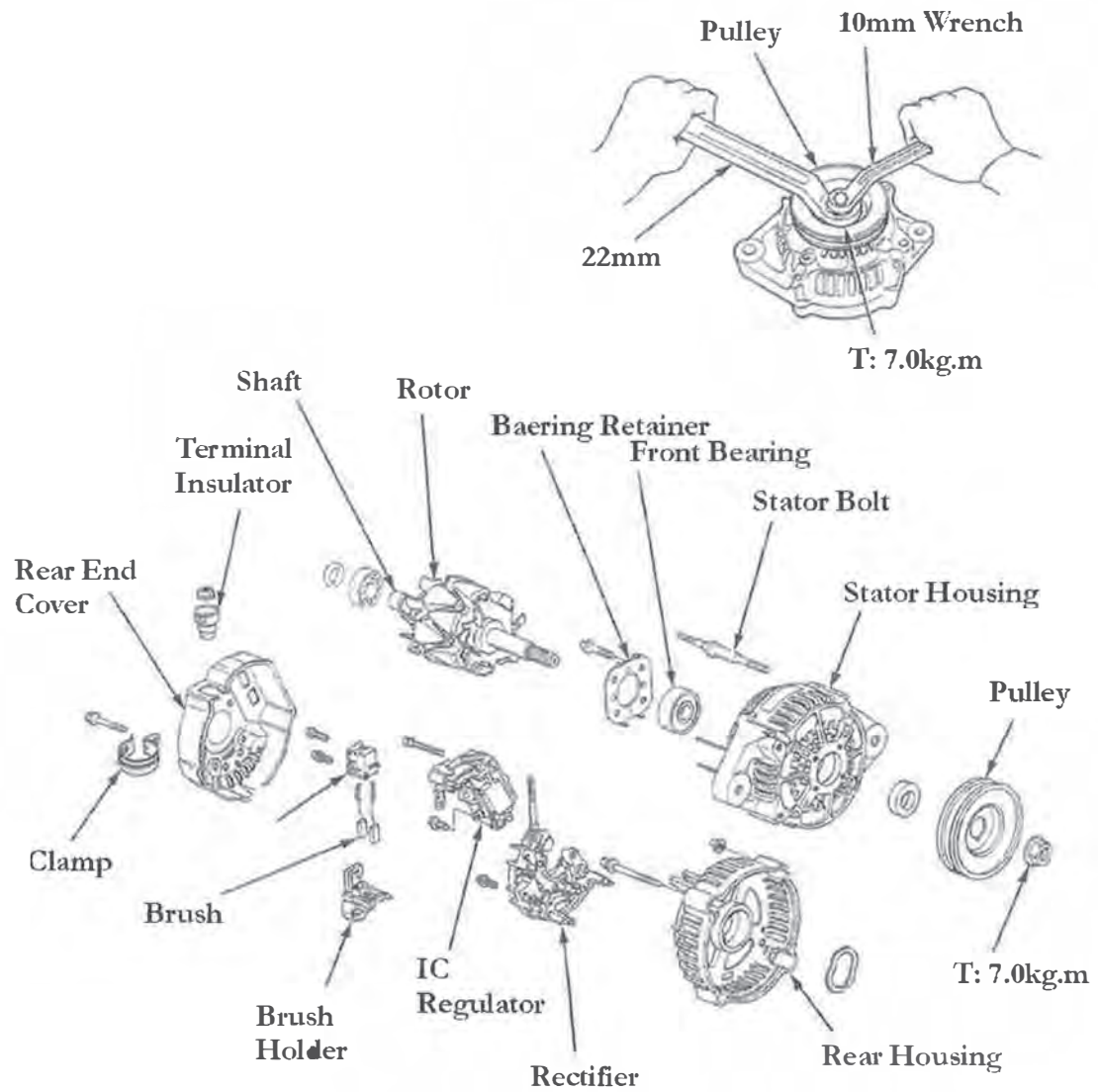
Alternator Removal

1. Disconnect Battery Terminals
2. Disconnect Alternator Electrical Connections
3. Loosen Retaining Bolts and Slide Off A.C.G Belt
4. Remove Retaining Bolts and Remove Alternator



Starter & Alternator

Alternator Parts Schematic

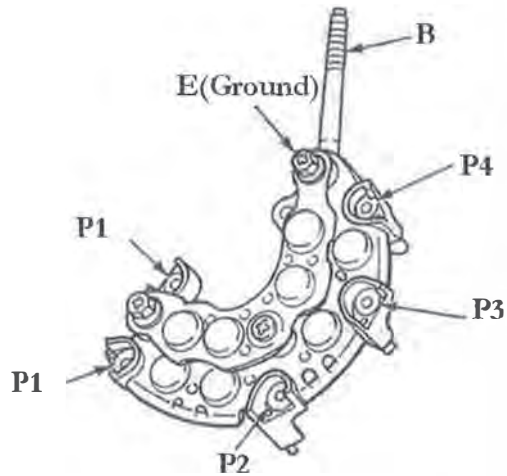


Note: Specifications See Service Data Section

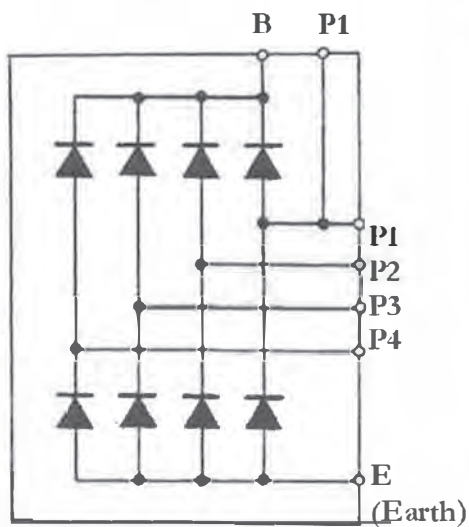
Starter & Alternator

Rectifier & Brush Inspection

Rectifier Inspection



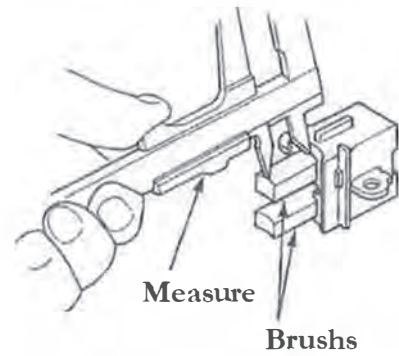
Circuit



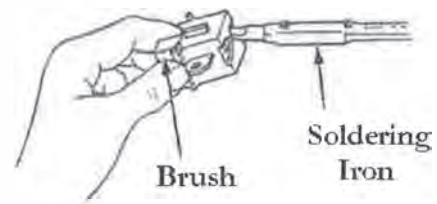
Brush Measurement

New: 10.5mm

Replace: 4.5mm



Note: Use Soldering Iron to Change Brush(S)



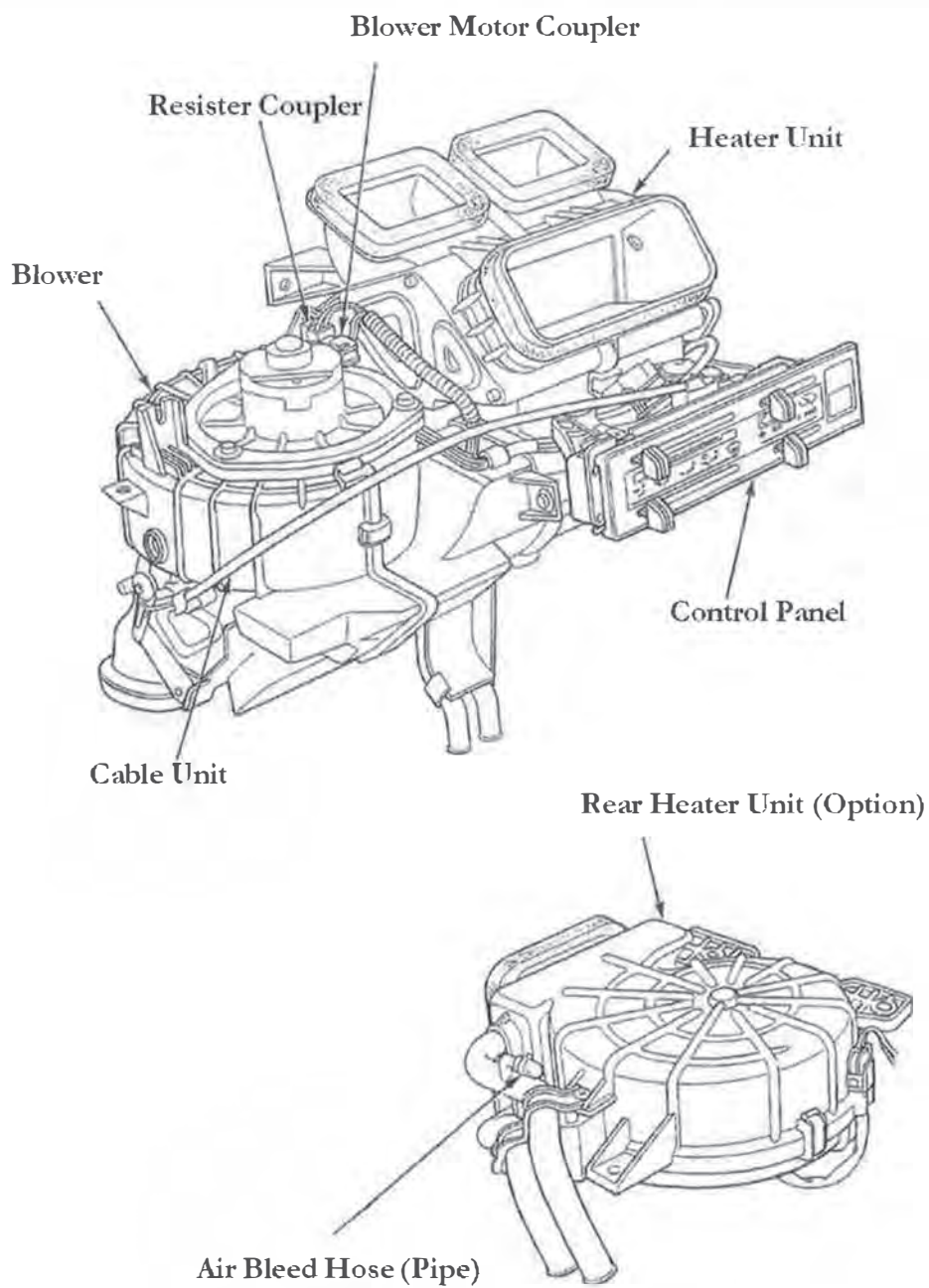
Chapter 12

Heater & Air-conditioning

- Front and Rear Heater Unit Components
- Heater Control Circuit Diagram
- Heater and Damper Valve Position
- Front Blower Fan Removal
- Front Blower Assembly Breakdown
- Heater Unit Schematic and Heater Core
- Rear Heater Components (Optional Rear Heater)
- Heater Fan Switch(s) Pin Contacts & Positions
- A/C System Schematic (Truck)
- A/C System Schematic (Van Type 1)
- A/C System Schematic (Van Type 2)
- A/C Electrical Circuit Diagram
- Condenser Schematic Van
- Condenser Schematic Truck
- Compressor Breakdown

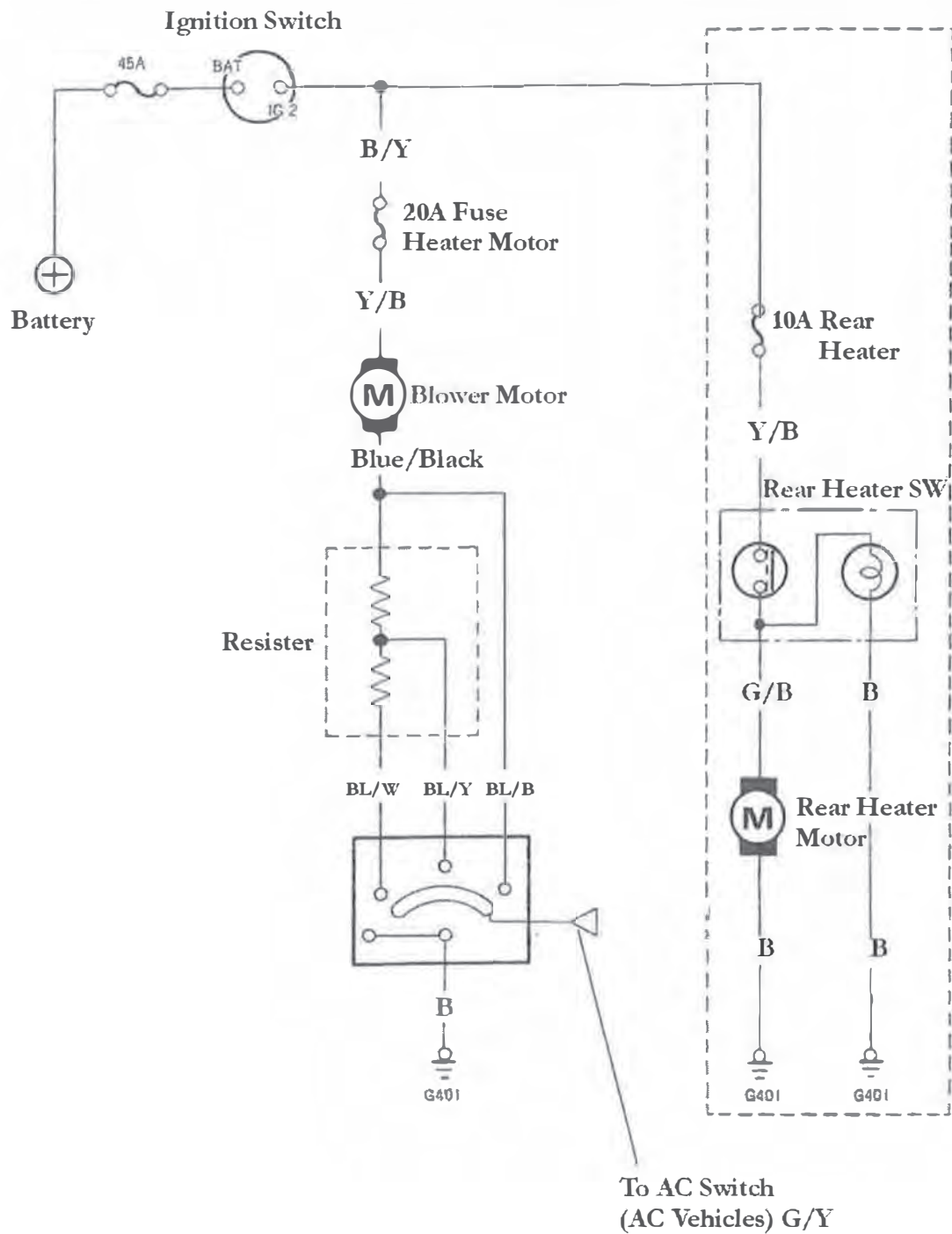
Heater & AC

Front & Rear Heater Units



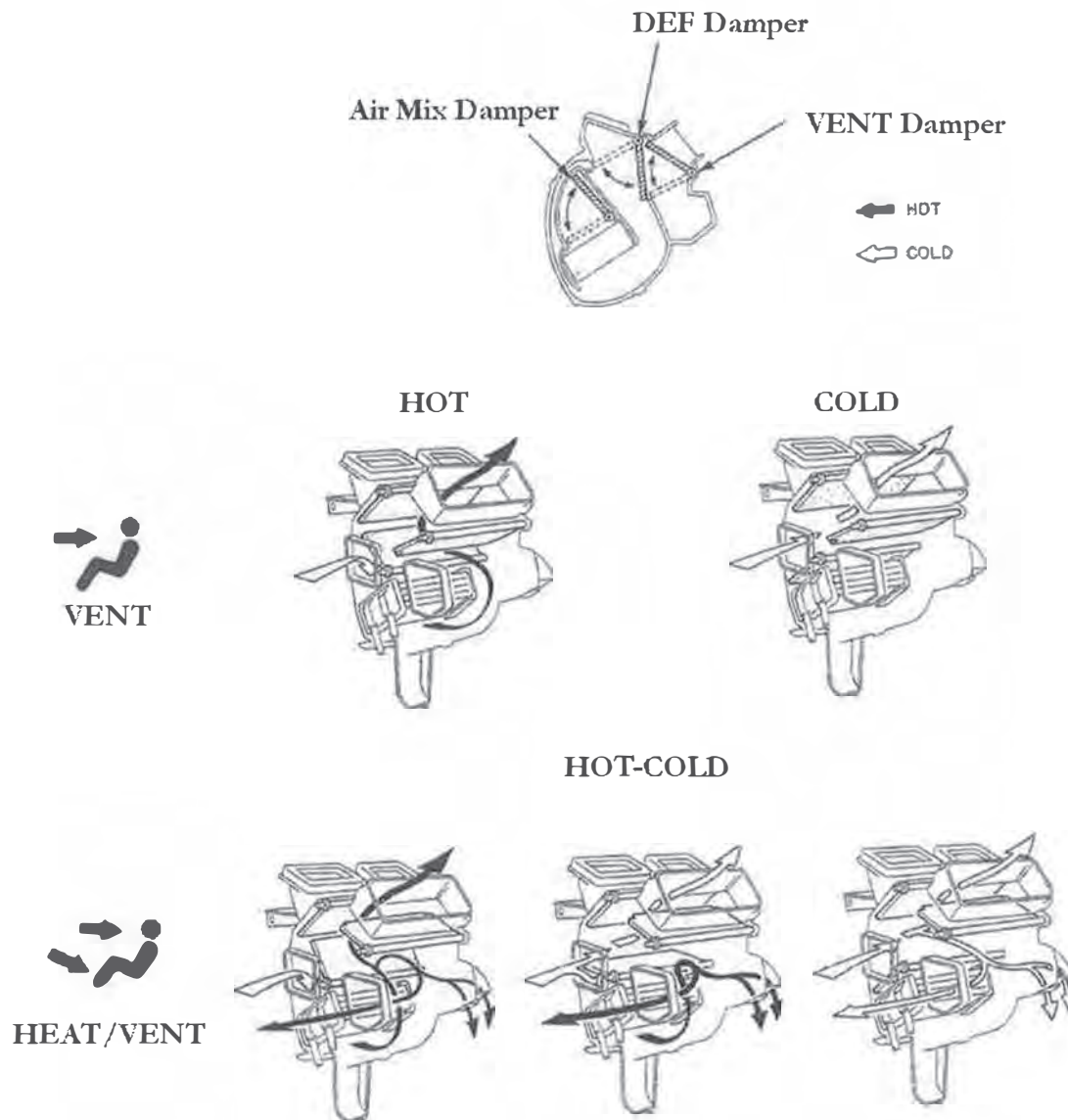
Heater & AC

Heater Control Circuit



Heater & AC

Control Posistions

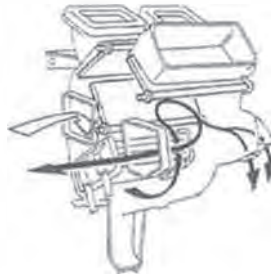


Heater & AC

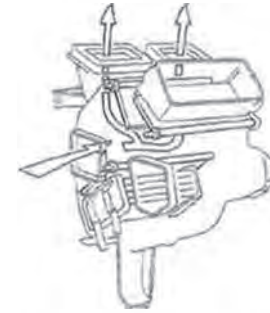
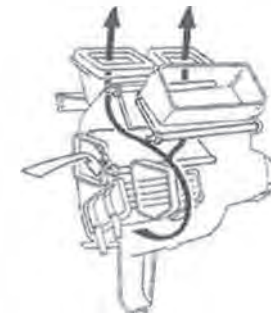
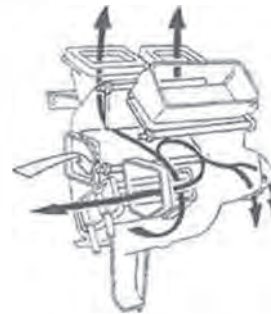
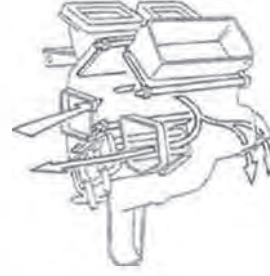
Control Posistions



HOT

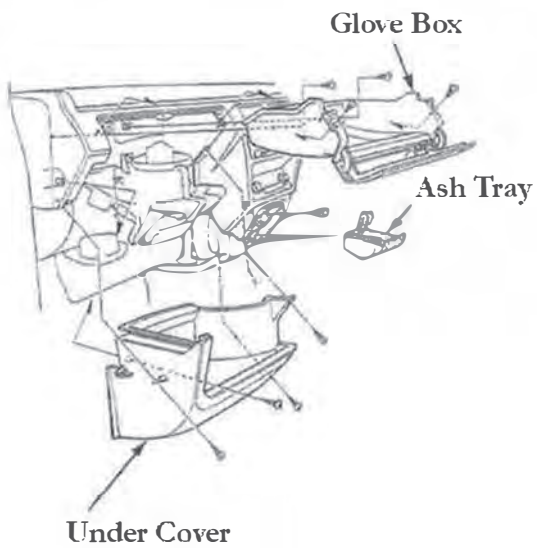


COLD

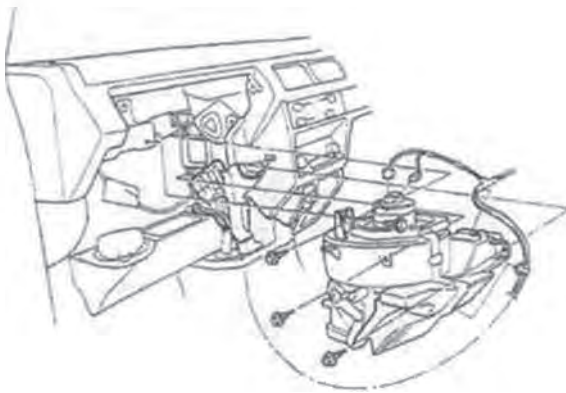


Heater & AC

Blower Fan Removal (Front)



1. Remove Glove Box & Under Cover
2. Slide Out Ash Tray and Remove Bracket
3. Disconnect Control Cable

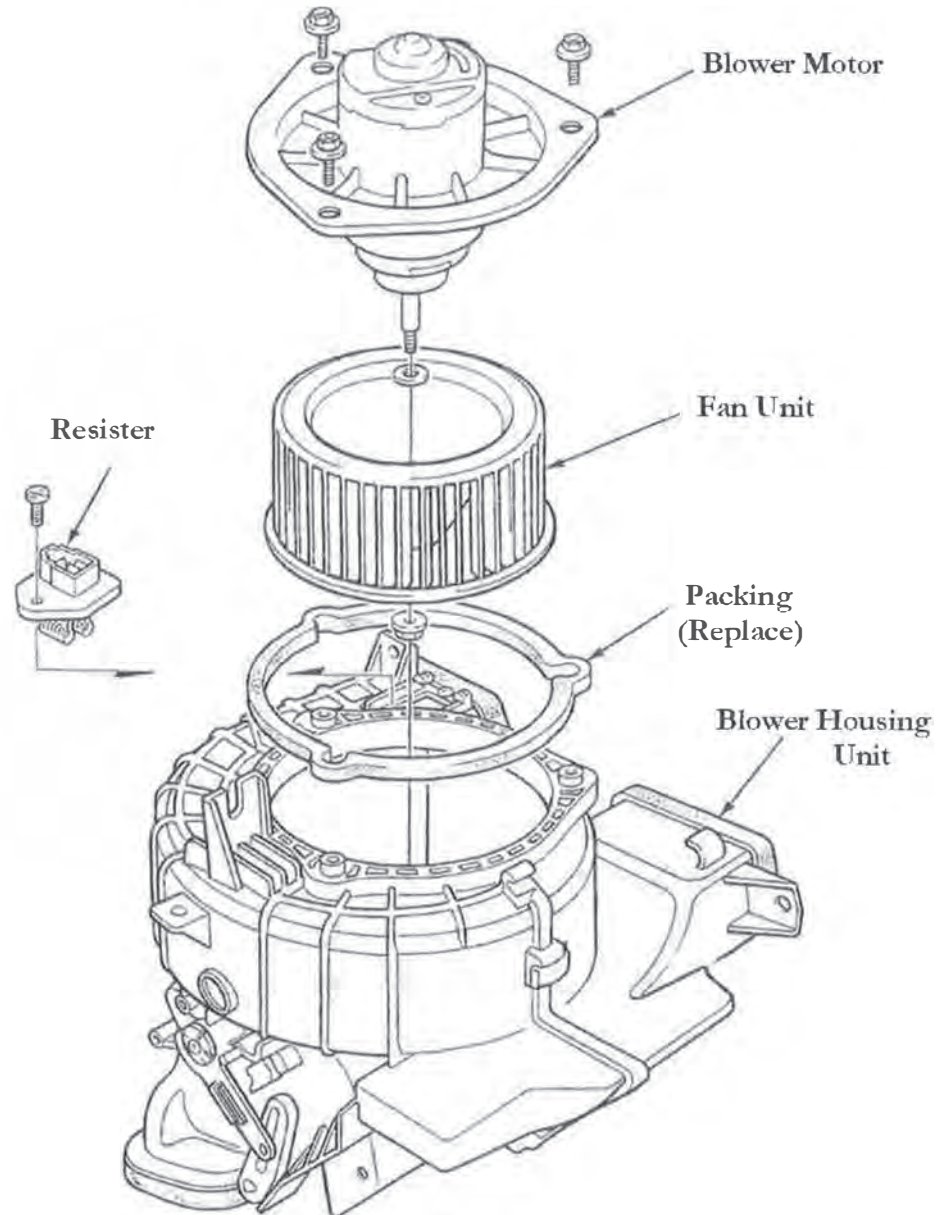


4. Disconnect Blower Motor Coupler & Blower Resister
5. Remove Attachment Screws
6. Remove Blower Unit

Heater & AC

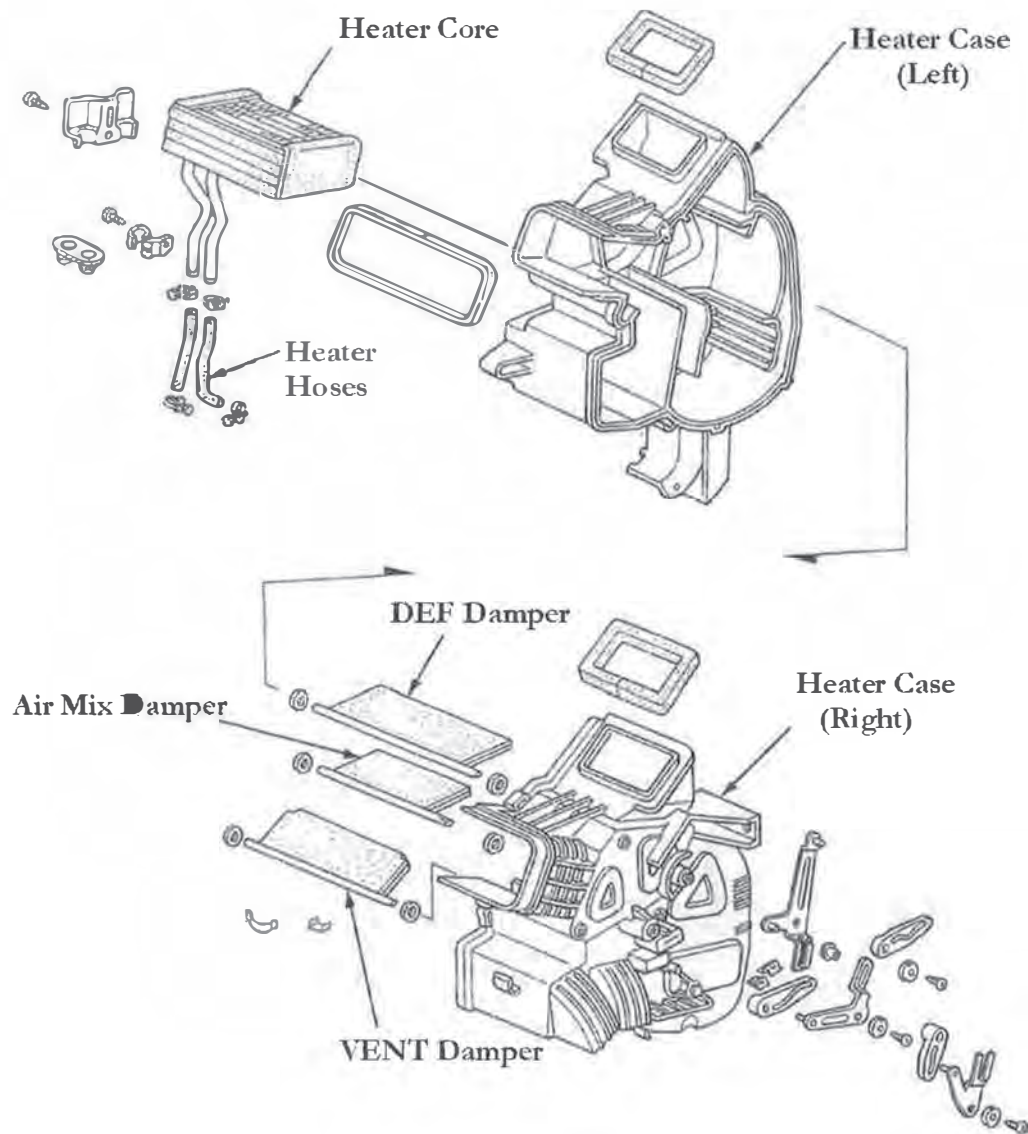
Front Blower Motor Schematic

Front Blower Assembly



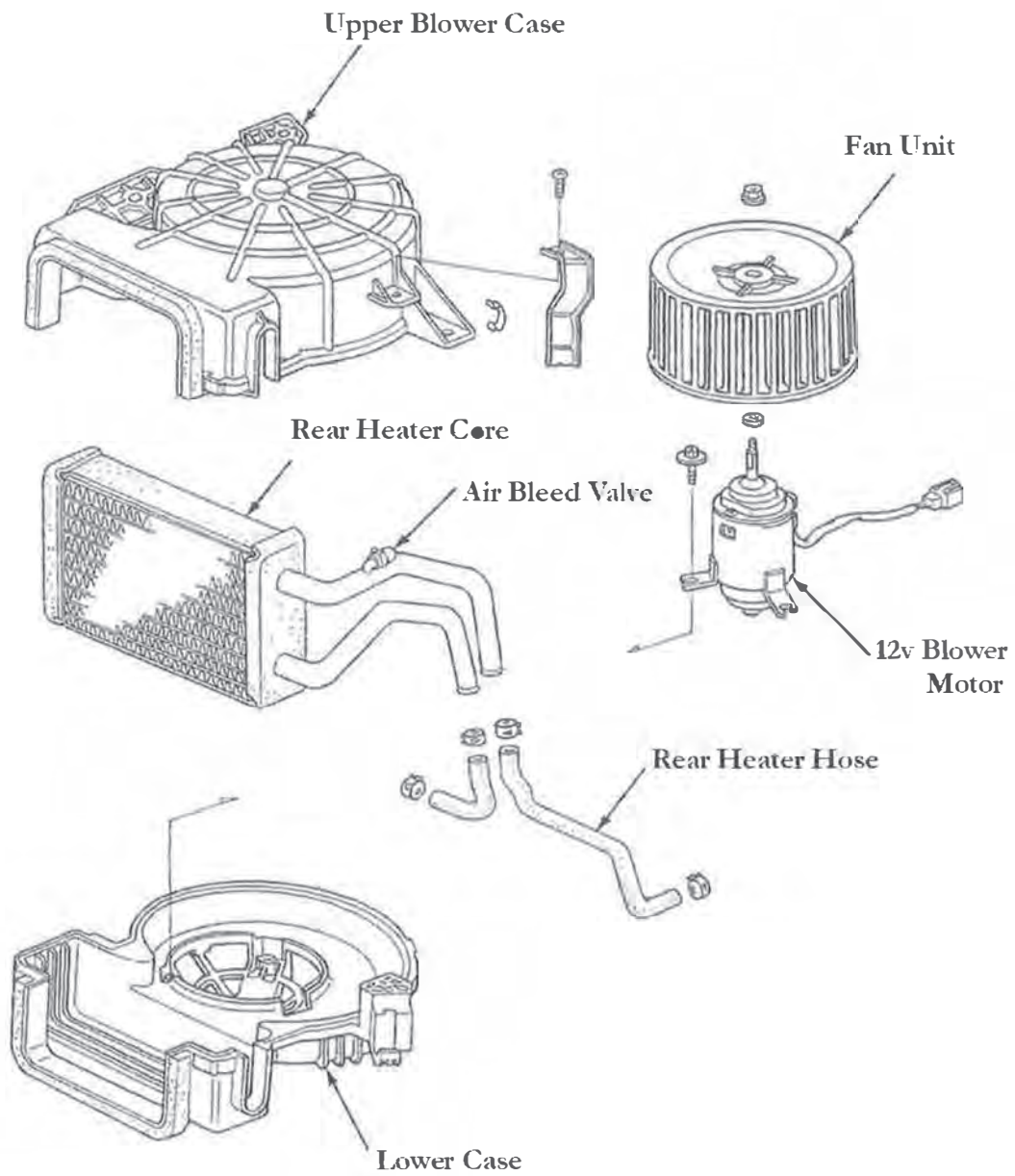
Heater & AC

Heater Unit and Heater Core



Heater & AC

Rear Heater Unit Components

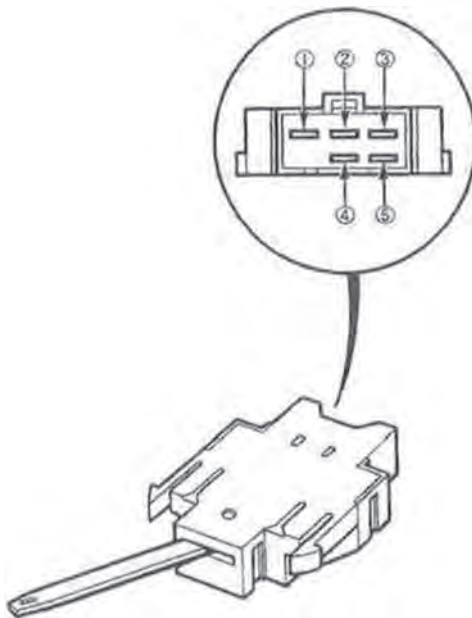


Heater & AC

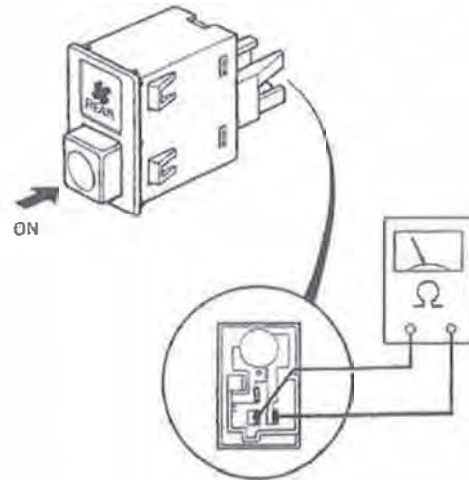
Fan Switches

Pin & Position Contact

Pin # Position	①	⑤	③	④	②
OFF					
I	○	○	○		
II	○	○		○	
MAX	○	○			○



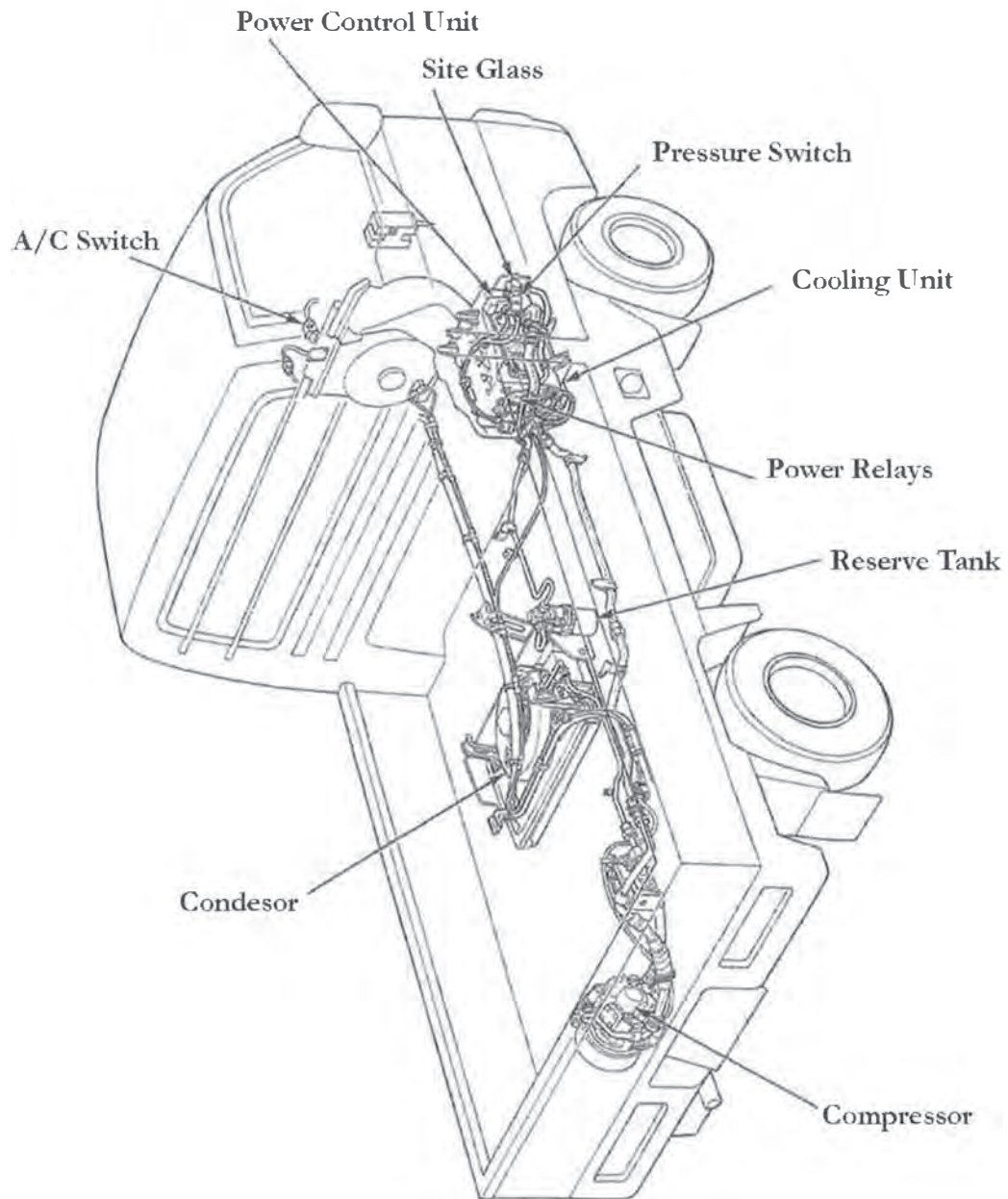
Rear Heater Switch



Heater & AC

AC Schematic Diagram

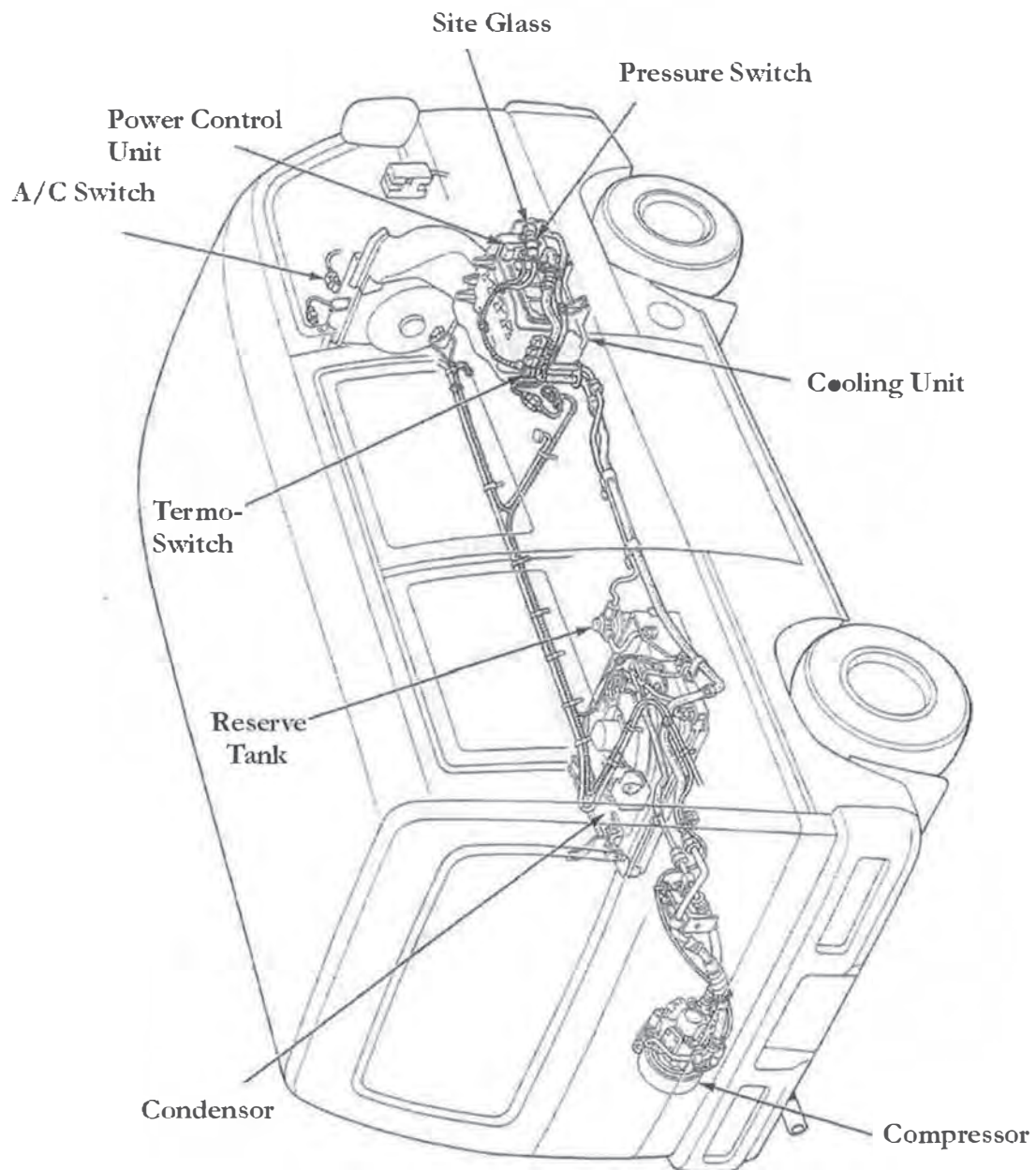
Truck



Heater & AC

AC Schematic Diagram Van Type 1

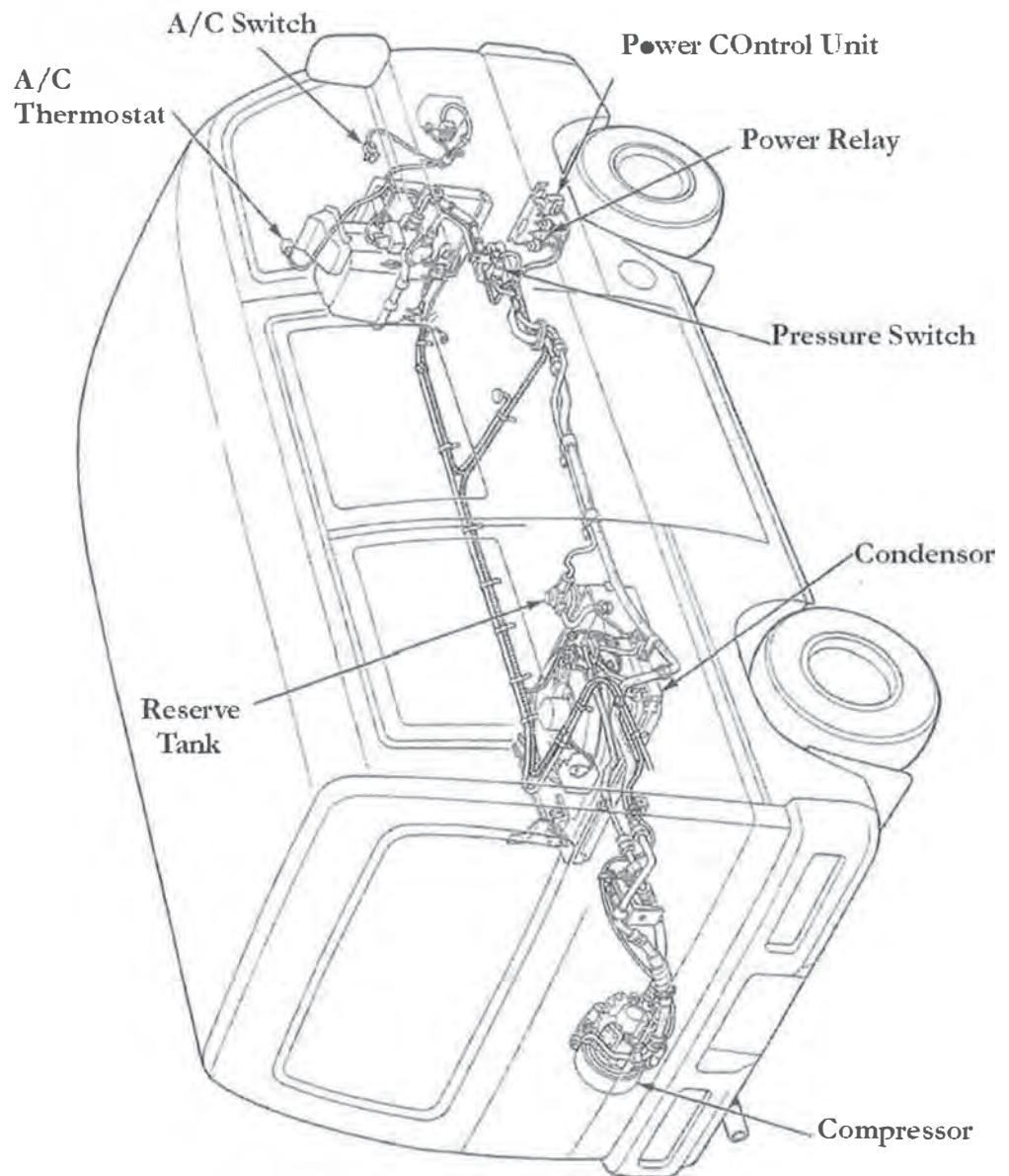
Van Type 1



Heater & AC

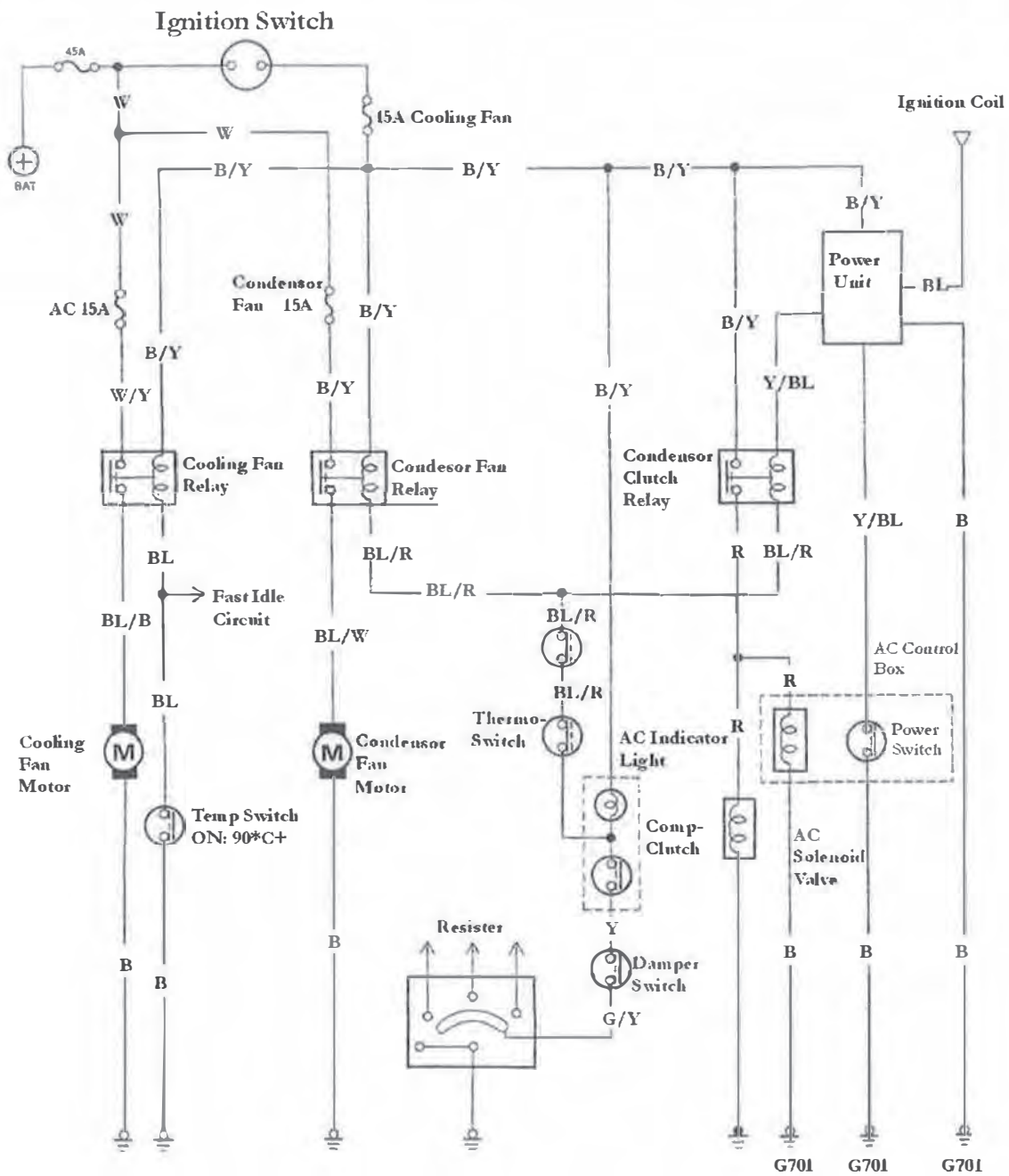
AC Schematic Diagram Van Type 2

Van Type 2



Heater & AC

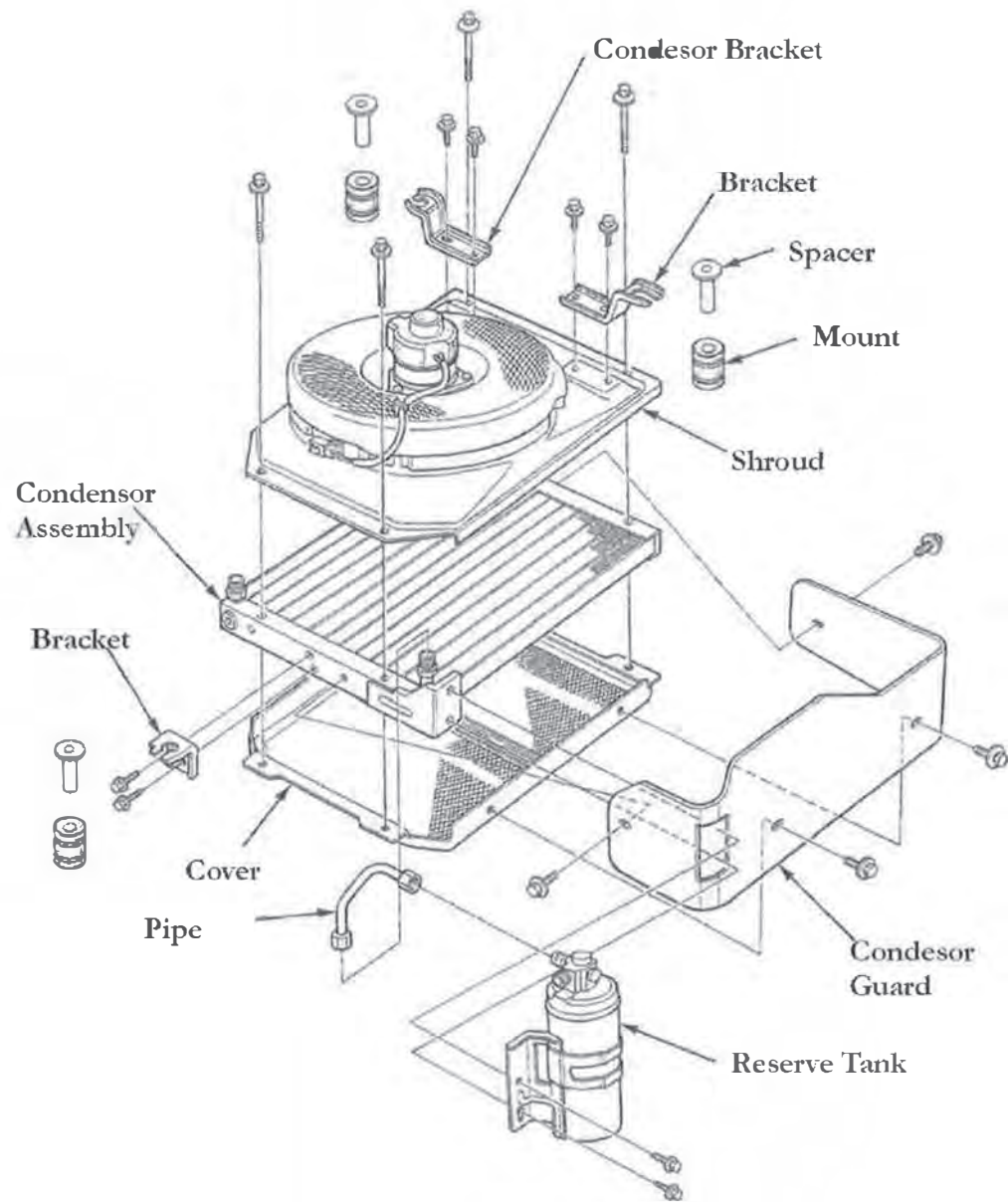
AC Circuit Diagram



Heater & AC

Condensor Schematic Van

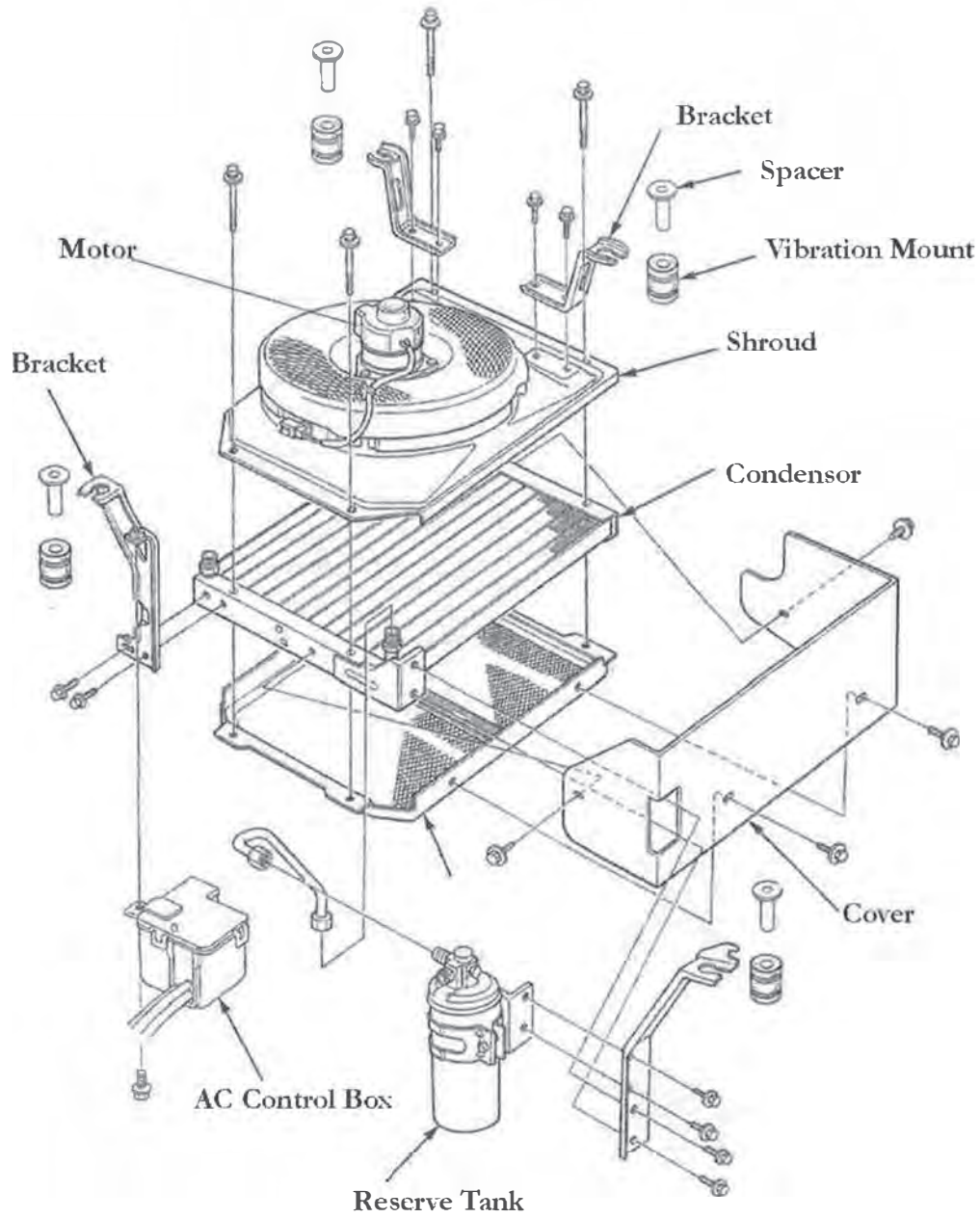
Van



Heater & AC

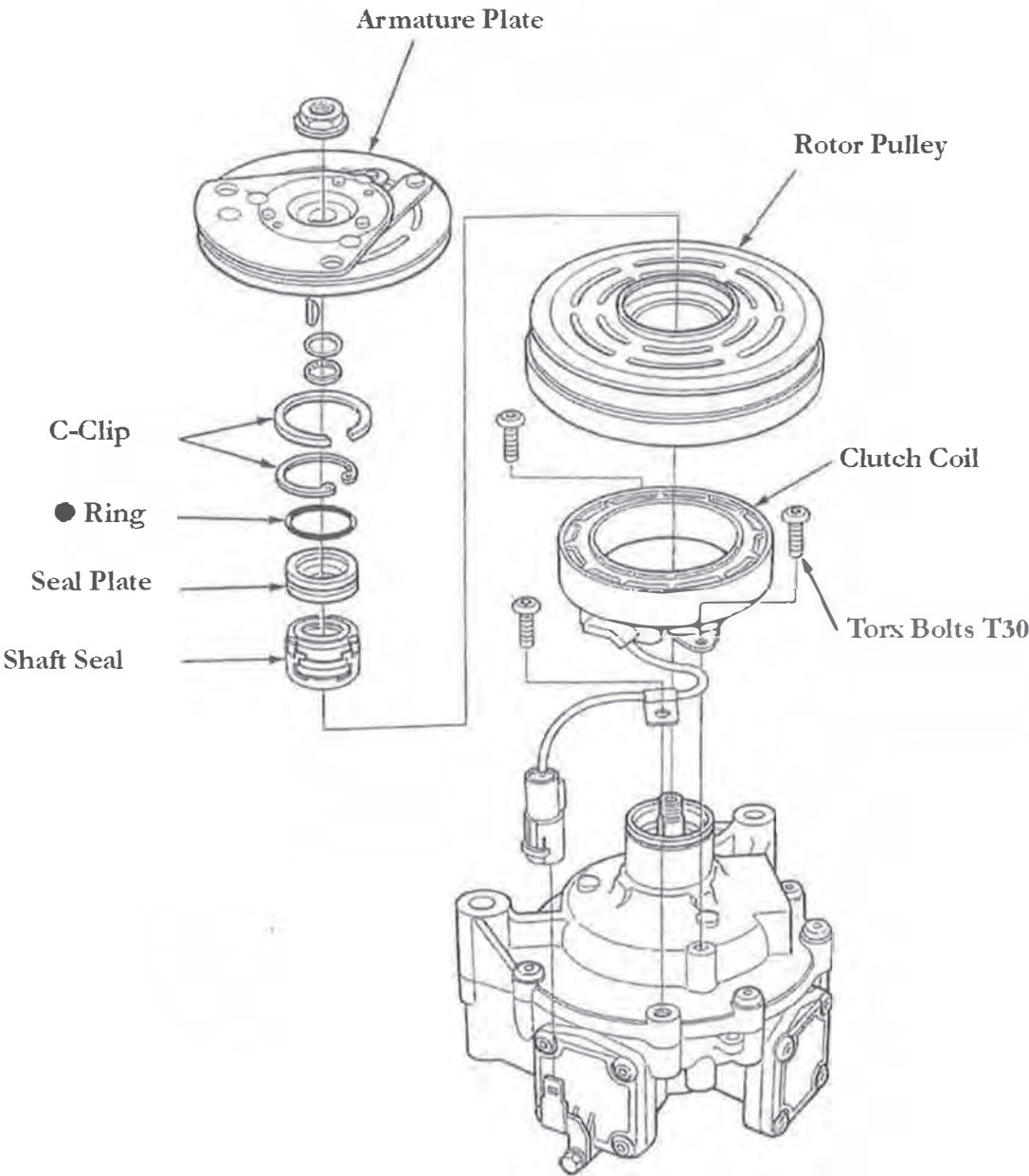
Condensor Schematic Truck

Truck



Heater & AC

Compressor



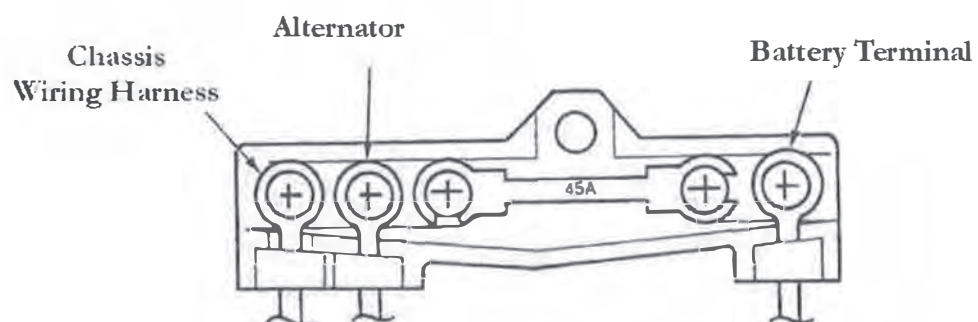
Chapter 13

Fuse and Relay Information

- Main Fuse Block 45A
- Fuse Box Universal Truck-Van Including A/C Vehicle
- Relay Locator
- 11. Idle Control Unit (AT)
- 12. Wiper Control
- 13. Turn Signal
- 14. Sub-Cooling Relays
- 15. Chime
- 16. AT Interlock
- 17. A/C Compressor
- 18. Radiator Fan
- 19. Condenser Fan
- 20. A/C Power Control Unit

Fuse & Relay

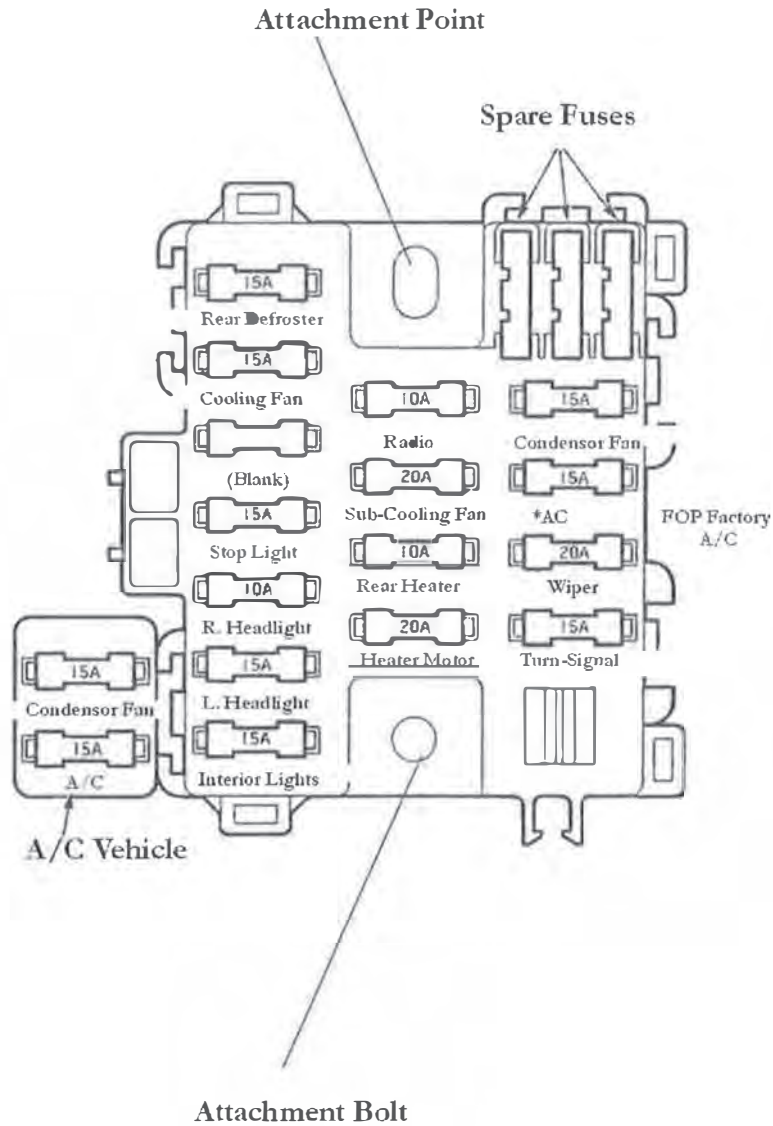
Main Fuse Block



Fuse & Relay

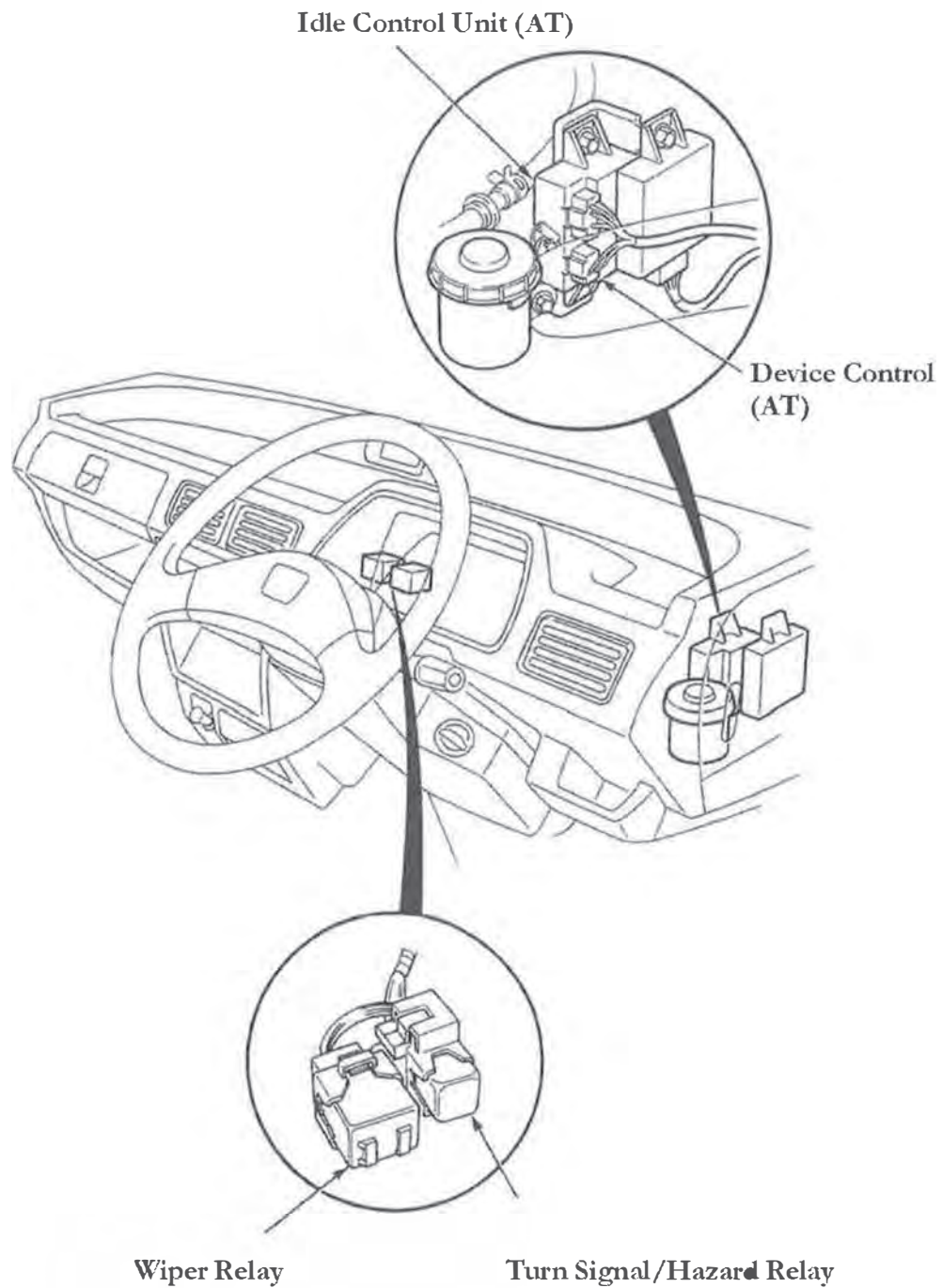
Fuse Box

Note: Slight Differences Between Models Possible. Check Owners Manual
Per Vehicle Specific & Dealer Options Attached



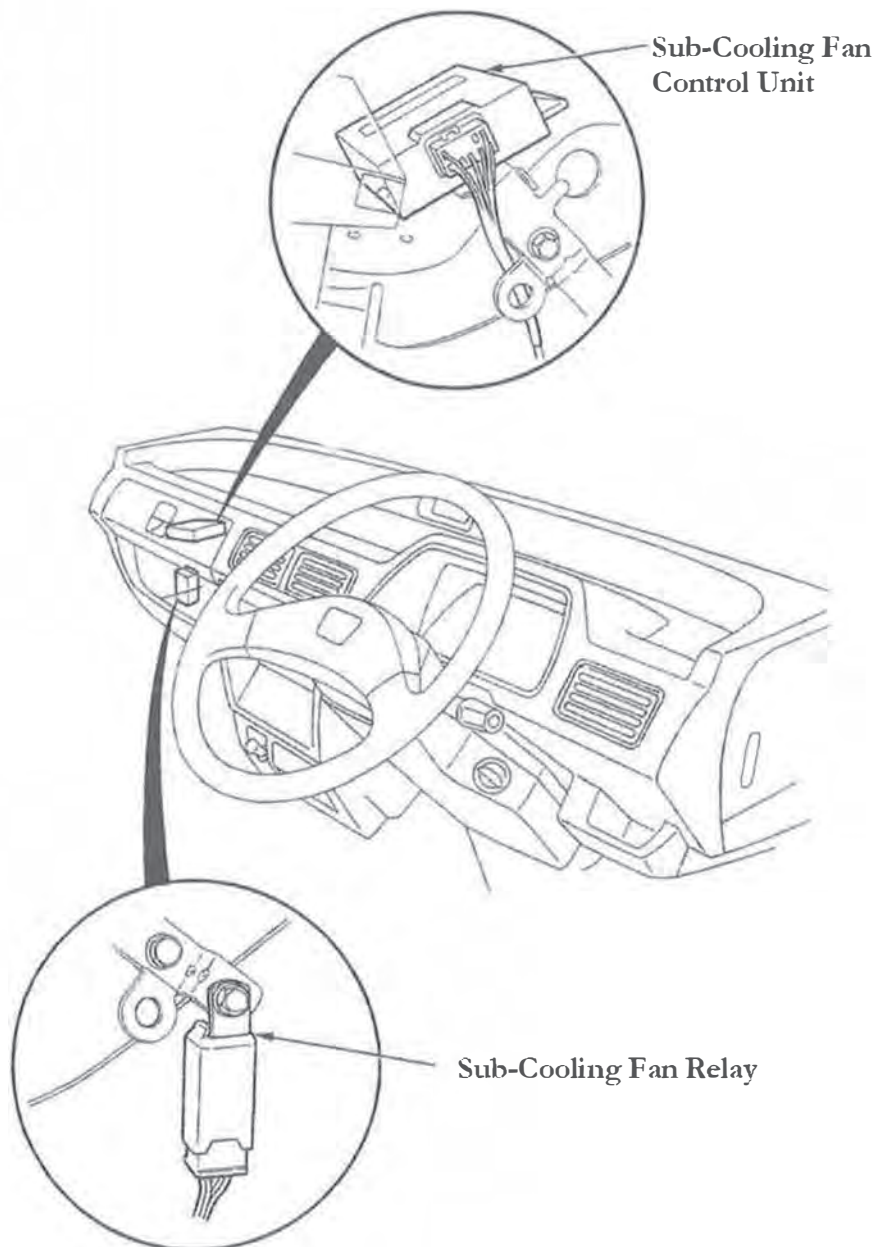
Fuse & Relay

Relay Control Unit



Fuse & Relay

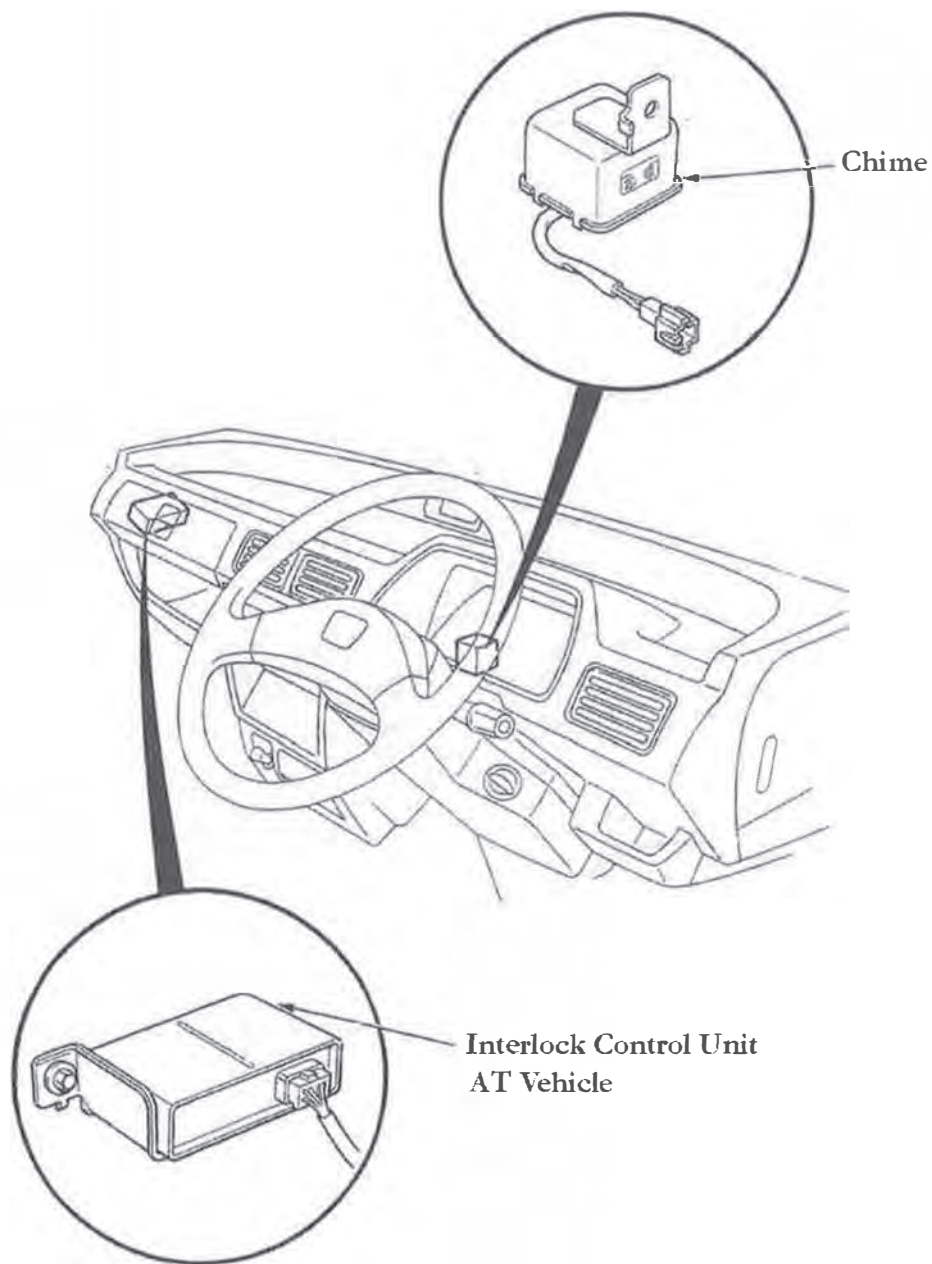
Sub-Cooling Fan Relay



Fuse & Relay

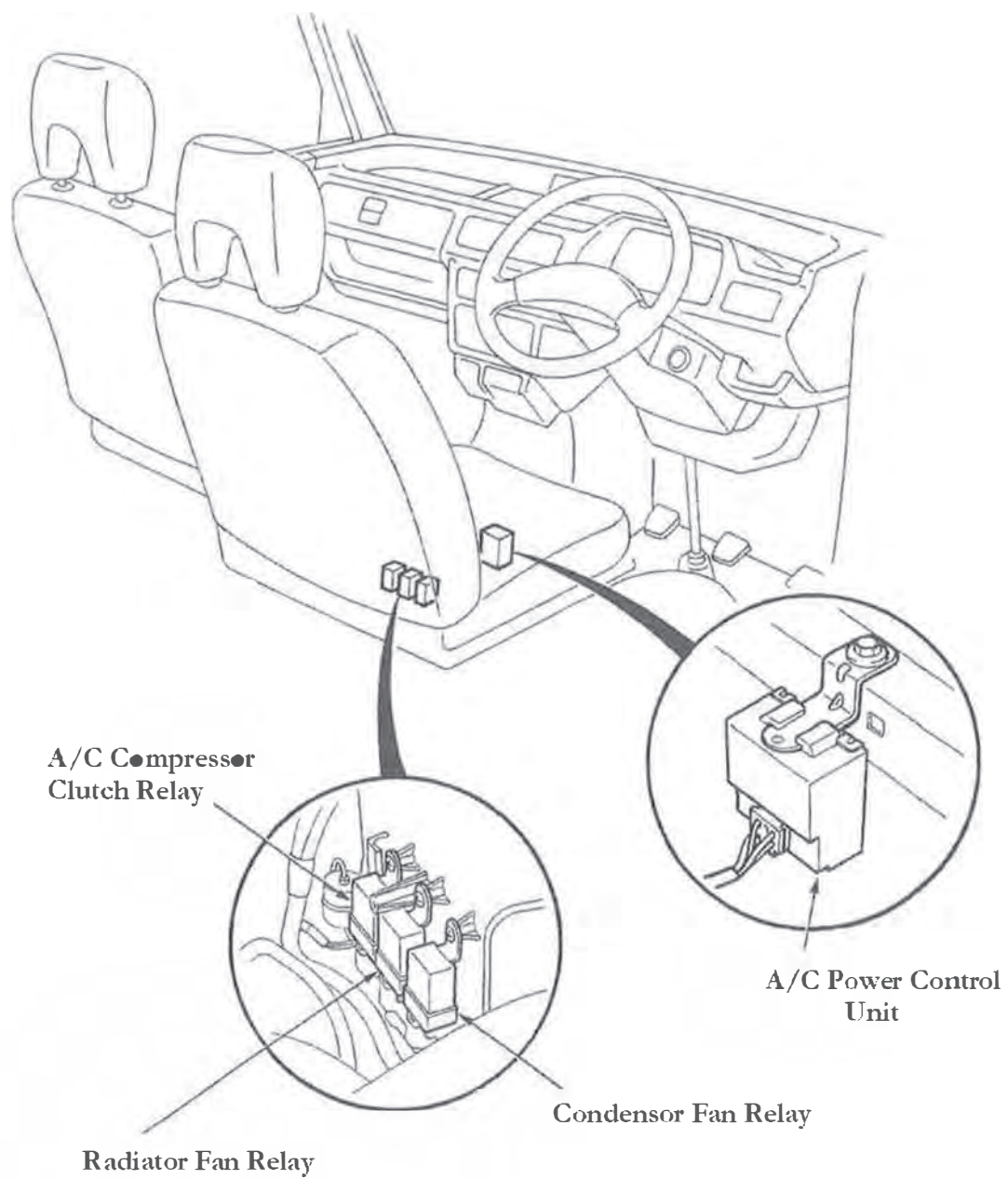
Relay Control Unit

AT Vehicle



Fuse & Relay

Relay Control units



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