

INTRODUCTION

How to Use This Manual

This supplement contains information for HONDA ACCORD. Refer to following shop manual for service procedures and data not included in this supplement.

HONDA ACCORD
MAINTENANCE, REPAIR AND CONSTRUCTION
(Code no. 62SN700)

This first page of each section is marked with a black tab that lines up with one of the thumb index tabs on this page. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.

Special Information

⚠ WARNING Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTE: Gives helpful information.

CAUTION: Detailed descriptions of *standard workshop* procedures, safety principles and service operations are not included. Please note that this manual contains warnings and cautions against some specific service methods which could cause **PERSONAL INJURY**, damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by HONDA MOTOR might be done, or of the possible hazardous consequences of every conceivable way, nor could HONDA MOTOR investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA MOTOR, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

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marked sections are not included in this manual.

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HONDA MOTOR CO., LTD.
Service Publication Office

General Info



Special Tools



Specifications

specs

Maintenance



Engine



Cooling



Fuel and Emissions



Transaxle



* Steering



Suspension



Brakes (Including ABS)



ABS

* Body



* Heater and Air Conditioning



* Electrical (Including SRS)



As sections with * include SRS components, special precautions are required when servicing.

Outline of Model Changes

The following summarizes changes made on the base shop manual (Code No. 62SN700).

ITEM	DESCRIPTION	CODE NO.	REFERENCE SECTION
		62SN720	
General	2.3 ℓ model added	○	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 19, 20, 23
	2.0 ℓ KS type added	○	1, 3, 4
Engine	H23A3 engine type added	○	1, 3, 5, 6, 7, 8, 9, 10
	F20Z1, F20Z2 engines valve clearance modified	○	
PGM-FI	Changed for 2.3 ℓ model addition <ul style="list-style-type: none"> • Vacuum connections • Electrical connections • Heated oxygen sensor (HO2S) • TDC/CKP/CYP sensor • Starting air valve • Fast idle thermo valve • Throttle body • Intake air bypass (IAB) control system • Intake air control system 	○	11
Automatic Transmission	Changed for 2.3 ℓ model addition <ul style="list-style-type: none"> • Road test shift schedule • Stall speed RPM • Pressure testing fluid pressure • 1st/2nd clutch assembly 	○	14
Brake	Application of brake pads changed due to 2.3 ℓ model addition	○	19
Body	Added <ul style="list-style-type: none"> • Front spoiler for 2.3 ℓ model • Trunk spoiler for 2.3 ℓ model 	○	20
Electrical	Changed <ul style="list-style-type: none"> • Ignition system (2.3 ℓ model) • Power supply circuit • Starter mounting bolt torque value changed (M/T) Keyless entry system added (KE)	○	23

General Information

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Please collect serial number of engine and add abbreviation for intake air bypass in your shop manual.

Applicable Materials and Corresponding Pages

Shop Manual	Number	Corresponding Page
ACCORD SUPPLEMENT 93	62SN720	1-2, 1-11

- Engine Serial Number (page 1-2)

<WRONG>

<CORRECT>

Engine Number _____

F20Z1-1000101

Engine Type _____

F20Z1: 2.0l Sequential Multi-port
Fuel-injected 131 PS engine
Unleaded gasoline with CATA

F20Z2: 2.0l Sequential Multi-port
Fuel-injected 115 PS engine
Unleaded gasoline with CATA

H23A3: 2.3l Sequential Multi-port
Fuel-injected 180 PS engine
Unleaded gasoline with CATA

Serial Number _____

Engine Number _____

F20Z1-1000101

Engine Type _____

F20Z1: 2.0l Sequential Multi-port
Fuel-injected 131 PS engine
Unleaded gasoline with CATA

F20Z2: 2.0l Sequential Multi-port
Fuel-injected 115 PS engine
Unleaded gasoline with CATA

H23A3: 2.3l Sequential Multi-port
Fuel-injected 160 PS engine
Unleaded gasoline with CATA

Serial Number _____

F20Z1 (Wako plant in Japan): 1000101~
F20Z1 (U.K. MFG. in England): E100001~
F20Z2 (U.K. MFG. in England): E100001~
H23A3 (U.K. MFG. in England): E100001~

- Abbreviation (page 1-11)
<Addition>

IAB Intake Air Bypass

Chassis and Engine Numbers

Vehicle Identification Number (VIN)

SHHCC75400U000001

Manufacturer, Make and Type of Vehicle

SHH: HONDA OF THE U.K. MFG., LTD. England.
HONDA Passenger car

Body Type

CC7: ACCORD

Body and Transmission Type

5: 4-door Sedan 5-speed Manual
6: 4-door Sedan 4-speed Automatic

Vehicle Grade

4: 2.0i
5: 2.0i S
6: 2.0i LS
7: 2.0i ES
8: 2.3i SR

Fixed Code

Auxiliary Number

Factory Code

U: Honda of the U.K. Manufacturing in England

Model Year

0: 1993

Serial Number

Engine Number

F20Z1-1000101

Engine Type

F20Z1: 2.0 l Sequential Multi-port
Fuel-injected 131 PS engine
Unleaded gasoline with CATA
F20Z2: 2.0 l Sequential Multi-port
Fuel-injected 115 PS engine
Unleaded gasoline with CATA
H23A3: 2.3 l Sequential Multi-port
Fuel-injected 160 PS engine
Unleaded gasoline with CATA

Serial Number

F20Z1 (Wako plant in Japan): 1000101 ~
F20Z1 (U.K. MFG. in England): E100001 ~
F20Z2 (U.K. MFG. in England): E100001 ~
H23A3 (U.K. MFG. in England): E100001 ~

Transmission Number

MP6A-2000001

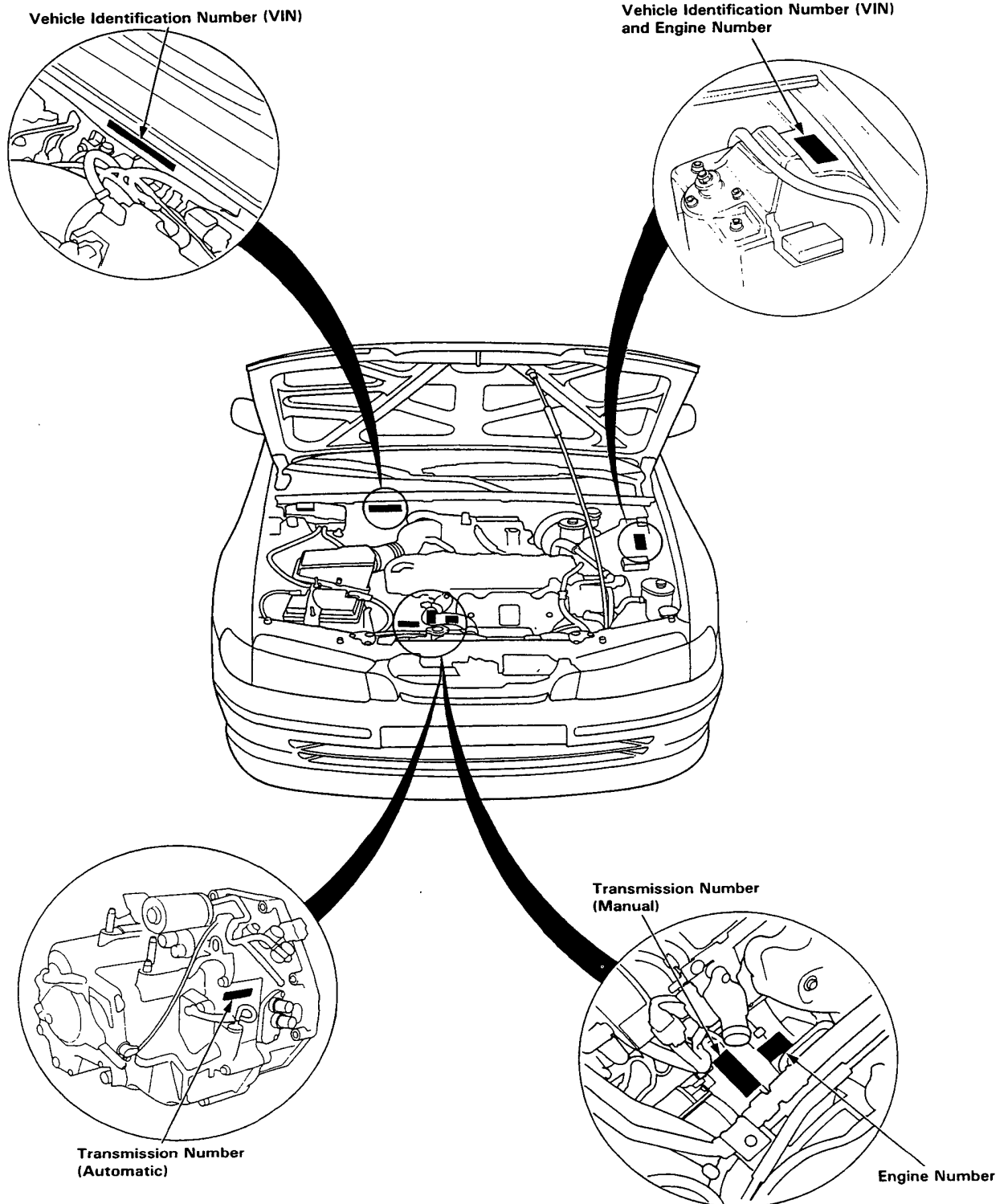
Transmission Type

MP6A: Automatic for F20Z1, H23A3 engines
N2C4: Manual for F20Z2 engine
N2D4: Manual for H23A3 engine
N2S4: Manual for F20Z1 engine

Serial Number

Automatic: 2000001 ~
Manual: 1000001 ~

Identification Number Locations



Warning/Caution Label Locations

A: MAINTENANCE LID CAUTION

注意

SRS

SRSメンテナンスは、イグニッション スイッチを切ってから行うこと。

CAUTION

SRS

BEFORE MAINTENANCE, SWITCH OFF THE IGNITION.

ATTENTION

AVANT TOUT ENTRETIEN, COUPER LE CONTACT.

ACHTUNG

VOR WARTUNG ZÜNDUNG AUSSCHALTEN.

LET OP

ZET HET KONTAKTSLOT AF ALVORENS MET HET ONDERHOUD TE BEGINNEN.

B: SLIP RING CAUTION

SRS

注意

分解、給油禁止

CAUTION

REFER TO THE SHOP MANUAL.

ACHTUNG

WERKSTATT HANDBUCH LESEN.

ATTENTION

SE REPORTER AU MANUEL D'ATELIER.

WAARSCHUWING LEES HET WERKPLAATS HANDBOEK.

C: MONITOR CAUTION

NOTICE

● REFER TO SERVICE (SHOP) MANUAL FOR DETAILED INSTRUCTIONS.

REMARQUE

● POUR LES INSTRUCTIONS DÉTAILLÉES, SE REPORTER AU MANUEL DE REPARAIONS.

LET OP

● RAADPLEEG HET WERKPLAASHANDDOEK VOOR NADERE AANWIJZINGEN.

ACHTUNG

● AUSFÜHRLICHE ANWEISUNGEN SIND DEM WERKSTATTSHANDBUCH ZU ENTNEHMEN.

D: DRIVER INFORMATION (SUNVISOR) KS

SRS

ALWAYS WEAR YOUR SEAT BELT

● THIS CAR IS EQUIPPED WITH A DRIVER AIRBAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (S.R.S.).

● IT IS DESIGNED TO SUPPLEMENT THE SEAT BELT.

● IF YOUR SRS INDICATOR LIGHTS WHILE DRIVING SEE YOUR AUTHORIZED HONDA DEALER.

SRS ANVÄND ALLTID BILBÄLTET

● DETTA FORDON HAR EN LUFTKUDDE FÖR FÖRARSÄTET SOM ETT KOMPLETTERANDE SKYDDSSYSTEM (S.R.S.).

● DET ÄR ÄMHAAT ATT KOMPLETTERA BILBÄLTET.

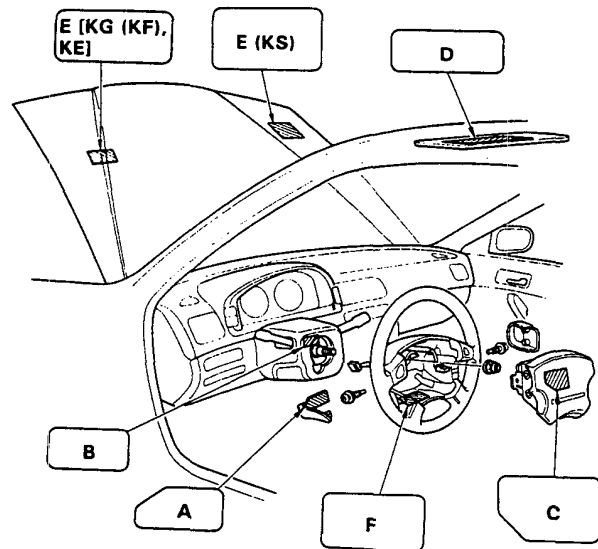
● OM SRS-INDIKATORN TÄNDS UNDER KÖRNING SKALL DU KONTAKTA EN AUKTORISERAD HONDA-ÅTERFÖRSÄLJARE.

SRS KÄYTÄ AINA TURVAVYÖTÄ

● TÄMÄ AUTO ON VARUSTETTU AJAJAN ILMATYNYLLX JOKA ON LISÄSUOJAJÄRJESTELMÄNÄ (S.R.S.).

● SE ON SUUNNITELTU TÄYDENTÄMÄÄN TURVAVYÖTÄ.

● JOS SRS-MERKKIVALO SYTTY Y AJON AIKANA. OTTAKAA YHTEYS VALTUUTETTUUN HONDA-HUOLTOON.



D: KG (KF)

SRS

ALWAYS WEAR YOUR SEAT BELT

● THIS CAR IS EQUIPPED WITH A DRIVER AIRBAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (S.R.S.).

● IT IS DESIGNED TO SUPPLEMENT THE SEAT BELT.

● IF YOUR SRS INDICATOR LIGHTS WHILE DRIVING SEE YOUR AUTHORIZED HONDA DEALER.

SRS ATTACHEZ TOUJOURS VOTRE CEINTURE

● CE VEHICULE EST EQUIPE D'UN COUSSIN D'AIR QUI CONSTITUE UN SYSTEME DE SECURITE COMPLEMENTAIRE POUR LE CONDUCTEUR (S.R.S.).

● CE COUSSIN D'AIR COMPLETE LA FONCTION DE LA CEINTURE DE SECURITE.

● SI LE TEMOIN SRS S'ALLUME PENDANT LA CONDUITE. ADRESSEZ-VOUS A VOTRE CONCESSIONNAIRE OFFICIEL HONDA.

SRS SICHERHEITSGURTE BEI JEDER FAHRT ANLEGEN

● DIESES FAHRZEUG BESITZT EINEN FAHRER-AIRBAG ALS ZUSÄTZLICHES RÜCKHALTESYSTEM (S.R.S.).

● DAS RÜCKHALTESYSTEM IST EINE ERGÄNZUNG ZUM SICHERHEITSGURT.

● SOLLTE WÄHREND DER FAHRT DIE SRS-KONTROLLEUCHTE AUFLEUCHTEN, SUCHEN SIE BITTE EINEN HONDA HÄNDLER ZUR FAHRZEUG ÜBERPRÜFUNG AUF.

SRS DRAAG UW VEILIGHEIDSGORDEL ALTIJD

● DIT VOERTUIG IS UITGERUST MET EEN AIRBAG (S.R.S.) AAN DE BESTUURDESKANT VOOR EXTRA VEILIGHEID.

● DIT IS ONTWORPEN ALS EXTRA BESCHERMING NAAST DE VEILIGHEIDSGORDELS.

● ALS HET SRS-WAARSCHUWINGSLAMPJE ONDER HET RIJDEN GAAT BRANDEN, NEEM DAN KONTAKT OP MET EEN HONDA DEALER.



D: KE

SRS ALWAYS WEAR YOUR SEAT BELT

- THIS CAR IS EQUIPPED WITH A DRIVER AIRBAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (S.R.S.).
- IT IS DESIGNED TO SUPPLEMENT THE SEAT BELT.
- IF YOUR SRS INDICATOR LIGHTS WHILE DRIVING SEE YOUR AUTHORIZED HONDA DEALER.

E: WARNING (ENGINE HOOD) KS

WARNING **SRS**

THIS VEHICLE IS EQUIPPED WITH A AIRBAG SYSTEM AS A SUPPLEMENTAL RESTRAINT SYSTEM. (S.R.S.)
ALL S.R.S. ELECTRICAL WIRING AND CONNECTORS ARE COLORED YELLOW.

DO NOT USE ELECTRICAL TEST EQUIPMENT ON THESE CIRCUITS.

TAMPERING WITH OR DISCONNECTING THE S.R.S. WIRING COULD RESULT IN ACCIDENTAL FIRING OF THE INFLATOR OR MAKE THE SYSTEM INOPERATIVE, WHICH MAY RESULT IN SERIOUS INJURY.

VARNING **SRS**

DETTA FORDON HAR EN LUFTKUDDE FÖR FÖRARSÄTET SOM ETT KOMPLETTERANDE SKYDDSSYSTEM (S.R.S.). SAMTLIGA ELLEDNINGAR OCH KONTAKTER I SRS-SYSTEMET ÄR GULFÄRGADE.

ANVÄND INTE ELEKTRISK PROVUTRUSTNING FÖR DESSA KRETSAR. OM DU ÄNDRAR ELLER LOSSAR EN SRS-LEDNING KAN DET RESULTERA I EN OAVSIKTIG UTLÖSNING AV TRYCKPUMPEN ELLER GÖRA ATT SYSTEMET SLUTAR FUNGERA. DÅ KAN EN ALLVARLIG OLYCKA UPPSTÅ.

VAROITUS **SRS**

TÄSSÄ AUTOSSA ON YLIMÄÄISENÄ TUKIJÄRJESTELMÄNÄ AJAJAN ILMATYÖNY. (S.R.S.)

KAIKKI SRS-SÄHKÖJOHDOT JA -LIITTIMET OVAT KELTAISET.

ÄLÄ KÄYTÄ SÄHKÖKOELAITTEITA NÄISSÄ VIRTAPIIREISÄÄ. SRS-JOHTOJEN TUKKEAMINEN TAI IRROTTAMINEN SAATTAA SYTYTTÄÄ VAHINGOSSA PUMPUN TAI TEHDÄ JÄRJESTELMÄN KÄYTTÖKELVOTTOMAKSI.

TÄSTÄ TAAS SAATTAA AIHEUTUA VAKAVIA VAURIOITA.

E: KG (KF), KE

WARNING **SRS**

THIS VEHICLE IS EQUIPPED WITH A AIRBAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (S.R.S.).

ALL S.R.S. ELECTRICAL WIRING AND CONNECTORS ARE COLORED YELLOW. DO NOT USE ELECTRICAL TEST EQUIPMENT ON THESE CIRCUITS. TAMPERING WITH OR DISCONNECTING THE S.R.S. WIRING COULD RESULT IN ACCIDENTAL FIRING OF THE INFLATOR OR MAKE THE SYSTEM INOPERATIVE, WHICH MAY RESULT IN SERIOUS INJURY.

ATTENTION **SRS**

CE VEHICULE EST EQUIPE D'UN COUSSIN D'AIR QUI CONSTITUE UN SYSTEME DE RETENUE COMPLEMENTAIRE (S.R.S.).

TOUR LES FILS ET CONNECTEURS ELECTRIQUES DU SYSTEME DE RETENUE COMPLEMENTAIRE (S.R.S.) SONT DE COULEUR JAUNE. N'UTILISEZ PAS UN EQUIPEMENT D'ESSAIS ELECTRIQUES SUR CES CIRCUITS. NE TOUCHEZ PAS ET NE DEBRANCHEZ PAS LES FILS DU SYSTEME S.R.S. CAR CECI POURRAIT DE TRADUIRE PAR LE DECLENCHEMENT ACCIDENTEL DU GONFLEUR OU RENDRE LE SYSTEME INOPERANT ET VOUS EXPOSER AINSI A DE GRAVES BLESSURES.

WARNUNG **SRS**

DIESES FAHRZEUG IST MIT EINEM FAHRER-AIRBAG (S.R.S.) ALS ZUSÄTZLICHEM RÜCKHALTESYSTEM AUSGERÜSTET.

ALLE ELEKTRISCHEN KABEL, SOWIE DIE ZUGEHÖRIGEN STECKVERBINDER DES S.R.S. -SYSTEMS SIND IN GELBER FARBE AUSGEFÜHRT.

KEINE ELEKTRISCHEN PRÜGERÄTE AN DIE S.R.S. -VERKABELUNG ANSCHLIEßEN. VERÄNDERN ODER UNTERBRECHEN DER S.R.S. -VERKABELUNG KANN UNKONTROLLIERTES ZÜNDEN DES GASGENERATORS AUSLÖSEN. ODER DAS SYSTEM AUßER FUNKTION SETZEN. WAS ZU ERNSTHAFTEN VERLETZUNGEN FÜHREN KANN.

WAARSCHUWING **SRS**

DIT VOERTUIG IS UITGERUST MET EEN LUCHTKUSSEN AAN DE BESTUURDESKANT ALS EXTRA BESCHERMING (S.R.S.).

ALLE ELEKTRISCHE LEIDINGEN EN AANSLUITINGEN VAN DE S.R.S. ZIJN GEEL GEKLEURD. GEBRUIK GEEN ELEKTRISCHE TESTAPPARATUUR VOOR DEZE CIRCUITS. KNOEIJEN MET OF LOSKOPPELEN VAN DE S.R.S. LEIDINGEN KAN LEIDEN TOT BRAND IN DE VULINRICHTING OF TOT UITSCHAKELEN VAN HET SYSTEEM: DIT KAN TO ERNSTIGE ONGELUKKEN LEIDEN.

F: COVER CAUTION

SRS

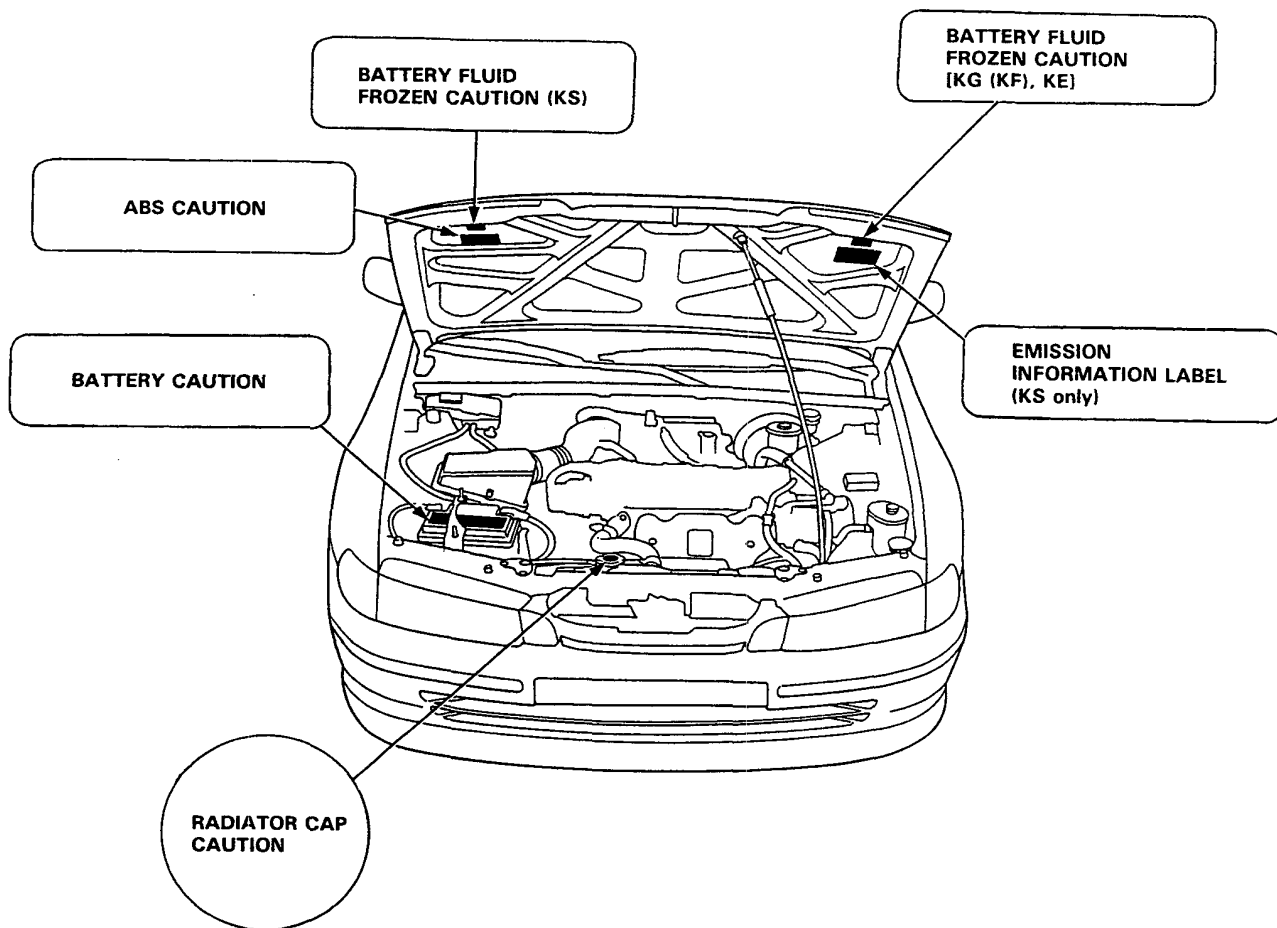
注意 **CAUTION**
ACHTUNG

- SRSメンテナンス時は サービス マニュアルを参照すること。
- REFER TO THE SHOP MANUAL.
- SE REPORTER AU MANUEL D'ATELIER.
- WERKSTATT HANDBUCH LESEN.
- LEES HET WERKPLAATSHANDBOEK.

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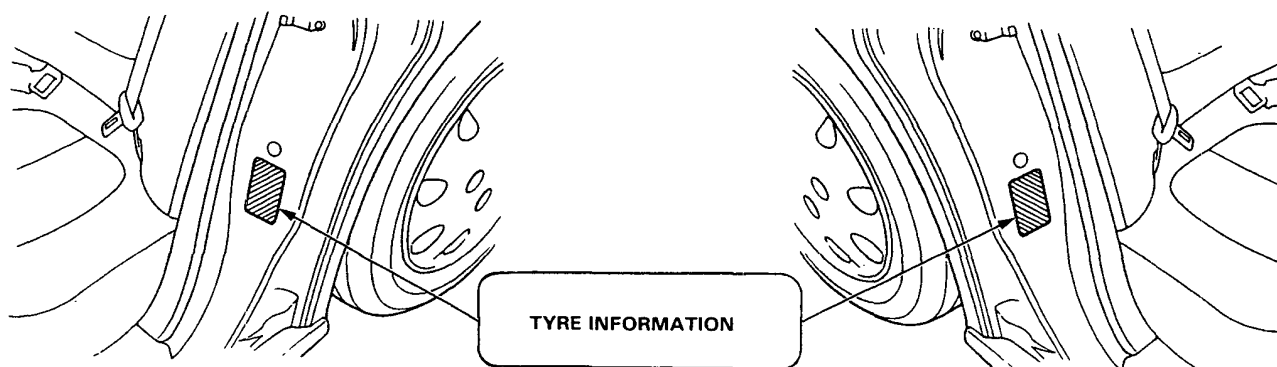
Warning/Caution Label Locations

(cont'd)



LHD

RHD





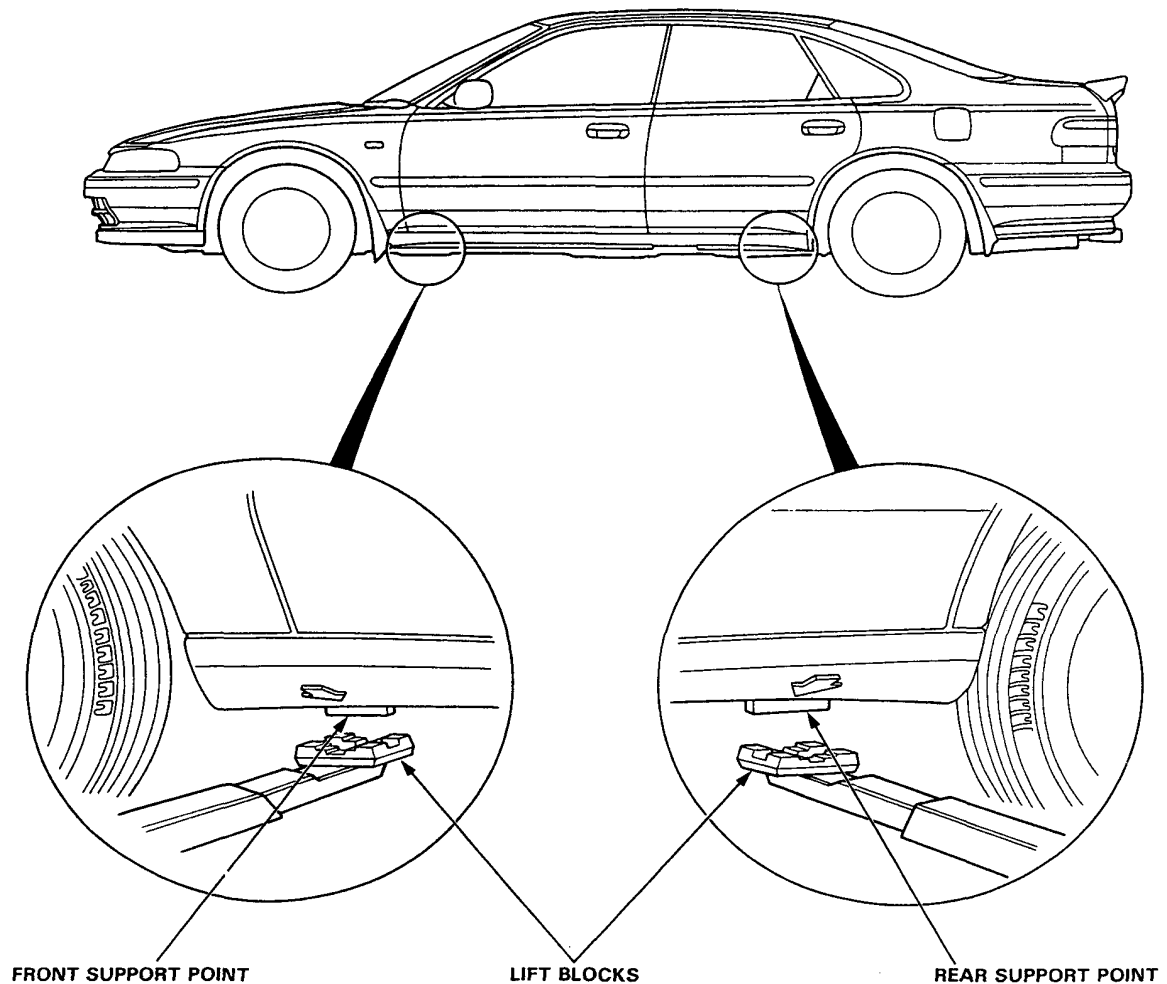
Lift and Support Points

Lift

⚠ WARNING When heavy rear components such as suspension, fuel tank, spare tyre and trunk lid are to be removed, place additional weight in the trunk before hoisting. When substantial weight is removed from the rear of the car, the center of gravity may change and can cause the car to tip forward on the hoist.

NOTE: Since each tyre/wheel assembly weighs approximately 14 kg (30 lbs), placing the front wheels in the trunk can assist with weight distribution.

1. Place the lift blocks as shown.
2. Raise the hoist until the tyres are slightly off the ground and rock the car to be sure it is firmly supported.
3. Raise the hoist to full height and inspect lift points for solid support.



Lift and Support Points

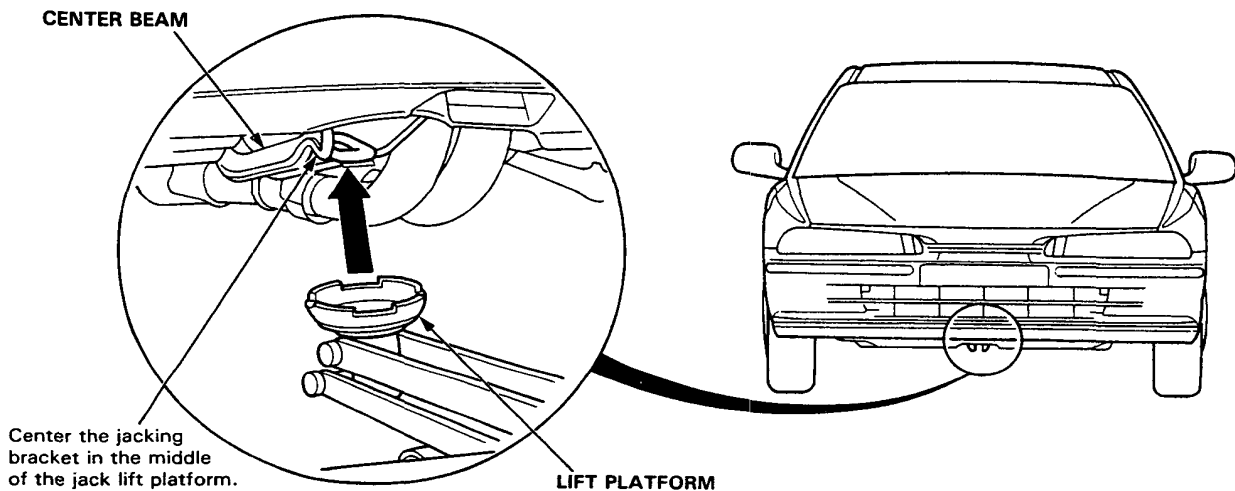
Floor Jack

1. Set the parking brake and block the wheels that are not being lifted.
2. When lifting the rear of the car, put the gearshift lever in reverse (Automatic transmission in **P** position).
3. Raise the car high enough to insert the safety stands.
4. Adjust and place the safety stands as shown on page 1-9 so the car will be approximately level, then lower the car onto them.

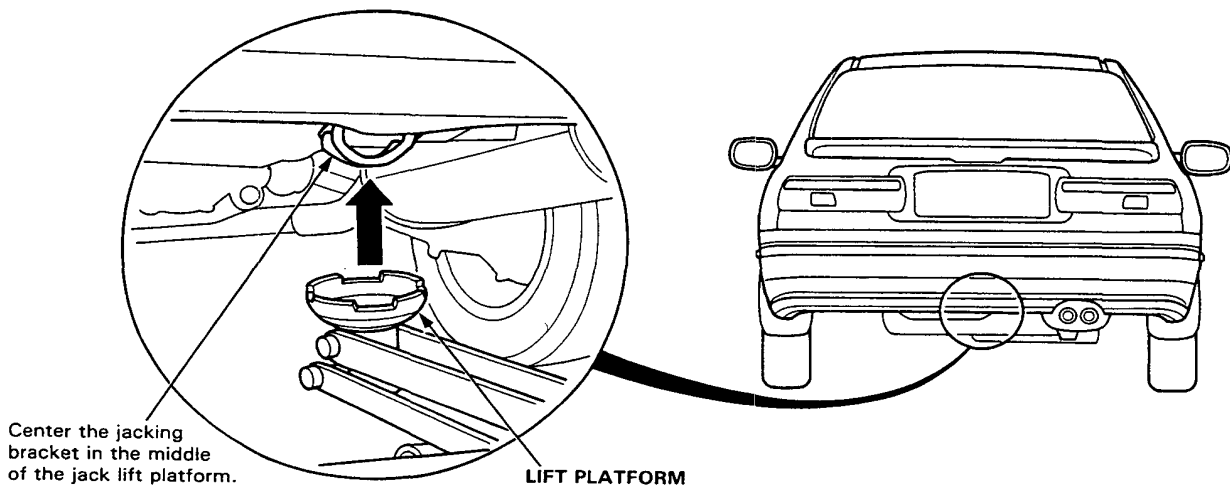
⚠ WARNING

- Always use safety stands when working on or under any vehicle that is supported only by a jack.
- Never attempt to use a bumper jack for lifting or supporting the car.

Front

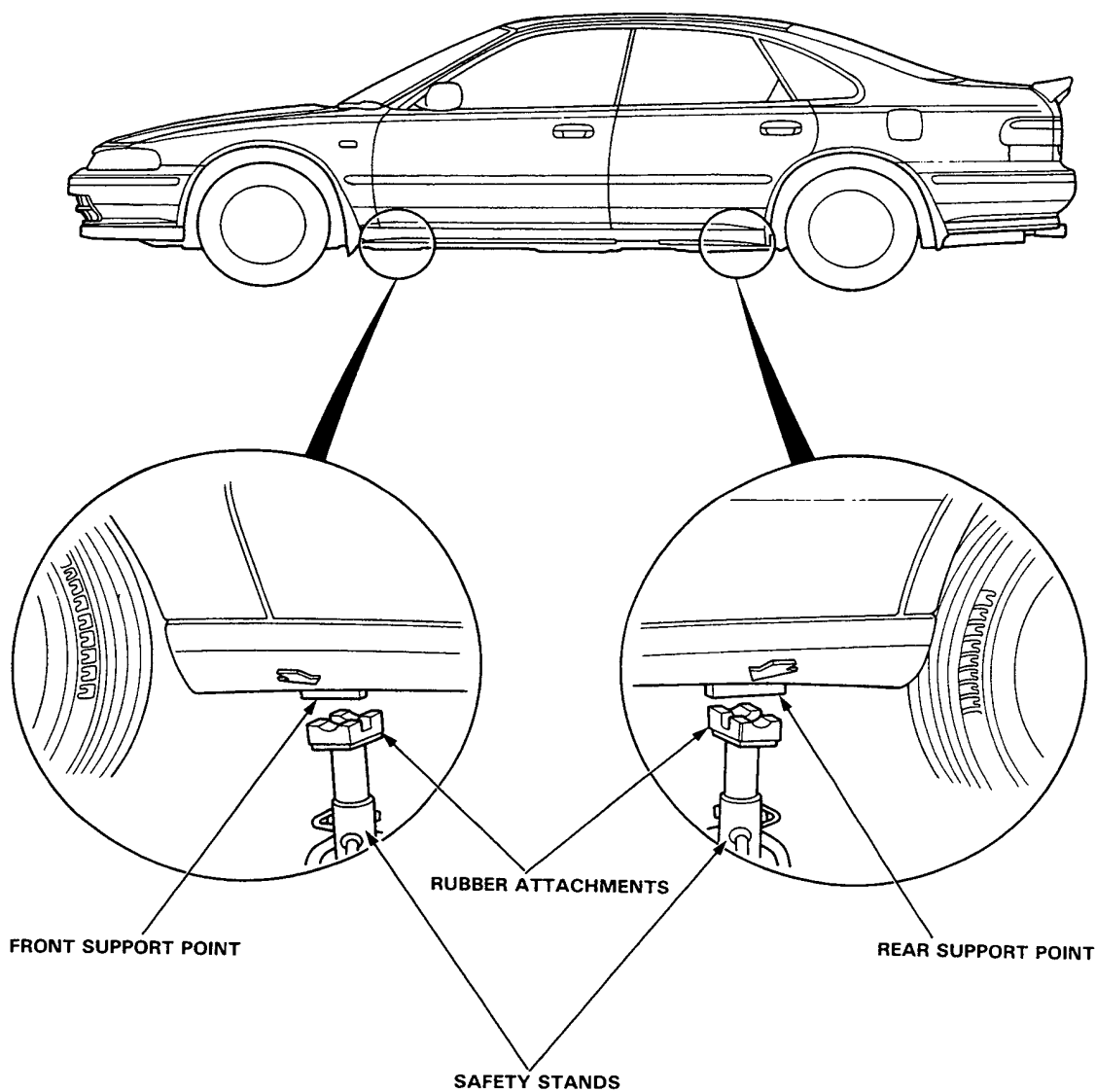


Rear





Safety Stands



Towing

If the car needs to be towed, call a professional towing service. Never tow the car behind another car with just a rope or chain. It is very dangerous.

Emergency Towing

There are three popular methods of towing a car:

Flat-bed Equipment — The operator loads the car on the back of a truck. This is the best way of towing the car.

Wheel Lift Equipment — The tow truck uses two pivoting arms that go under the tyres (front or rear) and lifts them off the ground. The other two wheels remain on the ground.

Sling-type Equipment — The tow truck uses metal cables with hooks on the ends. These hooks go around parts of the frame or suspension and the cables lift that end of the car off the ground. The car's suspension and body can be seriously damaged if this method of towing is attempted.

If the car cannot be transported by flat-bed, it should be towed with the front wheels off the ground. If due to damage, the car must be towed with the front wheels on the ground, do the following:

Manual Transmission

- Release the parking brake.
- Shift the transmission to Neutral.

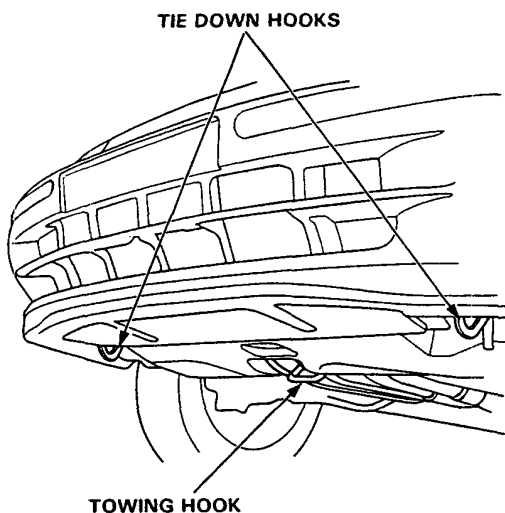
Automatic Transmission

- Release the parking brake.
- Start the engine.
- Shift to **D4** position, then to **N** position.
- Turn off the engine.

NOTICE: Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you can not shift the transmission or start the engine (automatic transmission), your car must be transported on a flat-bed.

- It is best to tow the car no farther than 50 miles (80 km), and keep the speed below 35 mph (55 km/h).

NOTICE: Trying to lift or tow the car by the bumpers will cause serious damage. The bumpers are not designed to support the car's weight.



Abbreviations



List of automotive abbreviations which may be used in shop manual.

A/C	Air Conditioning, Air conditioner	F	Front
ACG	Alternator	FP	Fuel Pump
ABS	Anti-lock Brake System	FWD	Front Wheel Drive
A/T	Automatic Transmission	FR	Front Right
ATF	Automatic Transmission Fluid	FL	Front Left
A/F	Air Fuel Ratio	FSR	Fail Safe Relay
AMP	Ampere (s)		
ANT	Antenna	GAL	Gallon
ASSY	Assembly	GND	Ground
AUX	Auxiliary		
APPROX.	Approximately	H/B	Hatchback
ATDC	After Top Dead Center	HO2S	Heated Oxygen Sensor
AUTO	Automatic	HC	Hydrocarbons
ATT	Attachment		
ACL	Air cleaner	IAB	Intake Air Bypass
API	American Petroleum Institute	IAC	Idle Air Control
		ICM	Ignition Control Module
BARO	Barometric	IAT	Intake Air Temperature
BAT	Battery	IMA	Idle Mixture Adjustment
BTDC	Before Top Dead Center	IN	Intake
BDC	Bottom Dead Center	IG or IGN	Ignition
		ID	Identification
CKP	Crankshaft Position	ID or I.D.	Inside Diameter
CYP	Cylinder Position	INJ	Injection
CAT	Catalytic Converter	INT	Intermittent
CO	Carbon Monoxide		
CYL	Cylinder	KS	Knock Sensor
CPC	Clutch Pressure Control		
CARB	Carburetor	L	Left
COMP	Complete	LH	Left Handle
CPU	Central Processing Unit	LHD	Left Handle Drive
CHG	Charge	L/C	Lock-up Clutch
		LSD	Limited Slip Differential
DI	Distributor Ignition	LF	Left Front
DLC	Data Link Connector	LR	Left Rear
DTC	Diagnostic Trouble Code	L-4	In-line four cylinder (engine)
DIFF	Differential	LED	Light Emitting Diode
DOHC	Double Overhead Camshaft		
DPI	Dual Point Injection		
EVAP	Evaporative		
EGR	Exhaust Gas Recirculation		
ECM	Engine Control Module		
ECT	Engine Coolant Temperature		
EX	Exhaust		
ELD	Electrical Load Detector		
EFI	Electronic Fuel Injection		
EPS	Electrical Power Steering		

(cont'd)

Abbreviations

(cont'd)

M/S	Manual Steering	SCS	Service Check Signal
MAP	Manifold Absolute Pressure	SEC	Second
MIL	Malfunction Indicator Light		Secondary
M/T	Manual Transmission		
MCK	Motor Check	T	Torque
MAX.	Maximum	TCM	Transmission Control Module
MIN.	Minimum	TWC	Three Way Catalytic Converter
MPI	Multi Point Injection	TDC	Top Dead Center
		TB	Throttle Body
N	Neutral	TP	Throttle Position
NOx	Nitrogen. Oxides of	TC	Torque Converter
		T/B	Timing Belt
O2S	Oxygen Sensor	T/N	Tool Number
OBD	On-Board Diagnostic	TCS	Traction Control System
OD or O.D.	Outside Diameter		
		VSS	Vehicle Speed Sensor
P	Park	VTEC	Variable Valve Timing & Valve Lift
PAIR	Pulsed Secondary Air Injection		Electronic Control
PSP	Power Steering Pressure	VC	Viscous Coupling
PCV	Positive Crankcase Ventilation	VIN	Vehicle Identification Number
	Proportioning Control Valve	VVIS	Variable Volume Intake System
P/S	Power Steering		
PGM-FI	Programmed-fuel Injection	W	With
PGM-IG	Programmed Ignition	W/O	Without
PRI	Primary	WOT	Wide Open Throttle
P/N	Part Number		
PL	Pilot Light	2WD	Two Wheel Drive
PMR	Pump Motor Relay	4WD	Four Wheel Drive
PSW	Pressure Switch	2WS	Two Wheel Steering
PSF	Power Steering Fluid	4WS	Four Wheel Steering
		4AT	4-speed Automatic Transmission
Qty	Quantity	5MT	5-speed Manual Transmission
		P	Park
R	Right	R	Reverse
RR	Rear Right	N	Neutral
RHD	Right Hand Drive	D4	Drive (1st through 4th gear)
REF	Reference	D3	Drive (1st through 3rd gear)
RL	Rear Left	2	Second
RON	Research Octane Number	1	First
		1ST	Low (gear)
SAE	Society of Automotive Engineers	2ND	Second (gear)
SOHC	Single Overhead Camshaft	3RD	Third (gear)
SOL	Solenoid	4TH	Fourth (gear)
SPEC	Specification	5TH	Fifth (gear)
S/R	Sun Roof		
SRS	Supplemental Restraint System		
STD	Standard		
SW	Switch		



Special Tools

Individual tool lists are located at the front of each section.

Specifications

Standards and Service Limits	3-2
Design Specifications	3-15
Body Specifications	3-18

Standards and Service Limits

Cylinder Head/Valve Train (F20Z1, F20Z2 engines) — Section 6

	MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Compression	250 min ⁻¹ (rpm) and wide open throttle kPa (kg/cm ² , psi)	Nominal Minimum Maximum variation		1,250 (12.5, 178) 950 (9.5, 135) 200 (2.0, 28)	
Cylinder head	Warpage Height			— 99.95 – 100.05 (3.935 – 3.939)	0.05 (0.002) —
Camshaft	End play Camshaft-to-holder oil clearance Total runout Cam lobe height	F20Z1 engine IN EX F20Z2 engine IN EX		0.05 – 0.15 (0.002 – 0.006) 0.050 – 0.089 (0.0020 – 0.0035) 0.03 (0.001) max. 38.741 (1.5252) 38.972 (1.5343) 38.095 (1.4998) 37.890 (1.4917)	0.5 (0.02) 0.15 (0.006) 0.04 (0.002) — — — —
Valve	Valve clearance Valve stem O.D. Stem-to-guide clearance	IN EX IN EX IN EX		0.24 – 0.28 (0.009 – 0.011) 0.28 – 0.32 (0.011 – 0.013) 5.485 – 5.495 (0.2159 – 0.2163) 5.450 – 5.460 (0.2146 – 0.2150) 0.020 – 0.045 (0.0008 – 0.0020) 0.055 – 0.080 (0.0022 – 0.0031)	— — 5.455 (0.2148) 5.420 (0.2134) 0.08 (0.003) 0.12 (0.005)
Valve seat	Width Stem installed height	IN EX IN EX		1.25 – 1.55 (0.049 – 0.061) 1.25 – 1.55 (0.049 – 0.061) 48.245 – 48.715 (1.8994 – 1.9179) 50.315 – 50.785 (1.9809 – 1.9994)	2.0 (0.08) 2.0 (0.08) 48.915 (1.9248) 51.035 (2.0092)
Valve spring	Free length	F20Z1 engine IN EX F20Z2 engine IN EX		53.16 (2.093) *1 53.15 (2.093) *2 55.80 (2.197) *1 55.78 (2.196) *2 54.55 (2.148) *1 54.54 (2.147) *2 59.88 (2.367)	— — — — — — —
Valve guide	I.D. Installed height	IN EX IN EX		5.515 – 5.530 (0.2171 – 0.2177) 5.515 – 5.530 (0.2171 – 0.2177) 23.75 – 24.25 (0.935 – 0.955) 15.05 – 15.55 (0.593 – 0.612)	5.53 (0.218) 5.53 (0.218) — —
Rocker arm	Arm-to-shaft clearance	IN EX		0.017 – 0.050 (0.0007 – 0.0020) 0.018 – 0.054 (0.0007 – 0.0021)	0.08 (0.003) 0.08 (0.003)

*1: CHUO HATSUJO manufactured valve spring.

*2: NIHON HATSUJO manufactured valve spring.

Engine Block (F20Z1, F20Z2 engines) — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.07 (0.003) max.	0.10 (0.004)
	Bore diameter	A or I B or II	85.010 – 85.020 (3.3468 – 3.3472) 85.000 – 85.010 (3.3465 – 3.3468)	85.070 (3.3492) 85.070 (3.3492)
	Bore taper		—	0.05 (0.002)
	Reboring limit		—	0.5 (0.02)
Piston	Skirt O.D.	(at 21 mm (0.8 in) from bottom of skirt)	84.980 – 84.990 (3.3457 – 3.3461) 84.970 – 84.980 (3.3453 – 3.3457)	84.970 (3.3453) 84.960 (3.3449)
	Clearance in cylinder	No Letter Letter B	0.020 – 0.040 (0.0008 – 0.0016)	0.05 (0.002)
	Groove width (for ring)	Top Second Oil	1.220 – 1.230 (0.0480 – 0.0484) 1.220 – 1.230 (0.0480 – 0.0484) 2.805 – 2.825 (0.1104 – 0.1112)	1.25 (0.049) 1.25 (0.049) 2.85 (0.112)
Piston ring	Ring-to-groove clearance	Top Second	0.035 – 0.060 (0.0014 – 0.0024) 0.030 – 0.055 (0.0012 – 0.0022)	0.13 (0.005) 0.13 (0.005)
	Ring end gap	Top Second Oil	0.20 – 0.35 (0.008 – 0.014) 0.40 – 0.55 (0.016 – 0.022) 0.20 – 0.70 (0.008 – 0.028)	0.60 (0.024) 0.70 (0.028) 0.80 (0.031)
Piston Pin	O.D.		21.994 – 22.000 (0.8659 – 0.8661)	—
	Pin-to-piston clearance		0.012 – 0.024 (0.0005 – 0.0009)	—
Connecting rod	Pin-to-rod interference		0.013 – 0.032 (0.0005 – 0.0013)	—
	Small end bore diameter		21.968 – 21.981 (0.8649 – 0.8654)	—
	Large end bore diameter	Nominal	48.0 (1.89)	—
	End play installed on crankshaft		0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
Crankshaft	Main journal diameter	No. 1 and 2 journals No. 3 journal No. 4 journal No. 5 journal	49.976 – 50.000 (1.9676 – 1.9685) 49.972 – 49.996 (1.9674 – 1.9683) 49.984 – 50.008 (1.9679 – 1.9688) 49.988 – 50.012 (1.9680 – 1.9690)	— — — —
	Rod journal diameter		44.976 – 45.000 (1.7707 – 1.7717)	—
	Taper		0.005 (0.0002) max.	0.006 (0.0004)
	Out-of-round		0.005 (0.0002) max.	0.006 (0.0004)
	End play		0.10 – 0.35 (0.004 – 0.014)	0.45 (0.018)
	Runout		0.03 (0.001)	0.04 (0.002)
Bearings	Main bearing-to-journal oil clearance	No. 1 and 2 journals No. 3 journal No. 4 journal No. 5 journal	0.021 – 0.045 (0.0008 – 0.0018) 0.025 – 0.049 (0.0010 – 0.0019) 0.013 – 0.037 (0.0005 – 0.0015) 0.009 – 0.033 (0.0004 – 0.0013)	0.050 (0.0020) 0.055 (0.0022) 0.050 (0.0020) 0.040 (0.0016)
	Rod bearing-to-journal oil clearance		0.015 – 0.043 (0.0006 – 0.0017)	0.050 (0.0020)
Balancer shaft	Journal diameter	No. 1 front journal No. 1 rear journal No. 2 front and rear journals No. 3 front and rear journals	42.722 – 42.734 (1.6820 – 1.6824) 20.938 – 20.950 (0.8243 – 0.8248) 38.712 – 38.724 (1.5241 – 1.5246) 34.722 – 34.734 (1.3670 – 1.3675)	42.71 (1.681) 20.92 (0.824) 38.70 (1.524) 34.71 (1.367)
	Journal taper		0.005 (0.0002)	—
	End play	Front Rear	0.10 – 0.35 (0.004 – 0.014) 0.06 – 0.18 (0.002 – 0.007)	— —
	Total runout		0.02 (0.001) max.	0.03 (0.001)
	Shaft-to-bearing oil clearance			
	No. 1 rear journal		0.050 – 0.075 (0.0020 – 0.0030)	0.09 (0.004)
	No. 1 front, No. 3 front and rear journals		0.066 – 0.098 (0.0026 – 0.0039)	0.12 (0.005)
	No. 2 front and rear journals		0.076 – 0.108 (0.0030 – 0.0043)	0.13 (0.005)
Balancer shaft bearing	I.D.	No. 1 front journal No. 1 rear journal No. 2 front and rear journals No. 3 front and rear journals	42.800 – 42.820 (1.6850 – 1.6858) 21.000 – 21.013 (0.8268 – 0.8273) 38.800 – 38.820 (1.5276 – 1.5283) 34.800 – 34.820 (1.3701 – 1.3709)	42.83 (1.686) 21.02 (0.828) 38.83 (1.529) 34.83 (1.371)

Standards and Service Limits

Cylinder Head/Valve Train (H23A3 engine) — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	250 min ⁻¹ (rpm) and wide open throttle kPa (kg/cm ² , psi)	Nominal Minimum Maximum variation	1,250 (12.5, 178) 950 (9.5, 135) 200 (2.0, 28)	
Cylinder head	Warpage Height		— 131.95 – 132.05 (5.195 – 5.199)	0.05 (0.002) —
Camshaft	End play Camshaft-to-holder oil clearance Total runout Cam lobe height	 IN EX	 0.05 – 0.15 (0.002 – 0.006) 0.050 – 0.089 (0.0020 – 0.0035) *1 0.100 – 0.139 (0.0039 – 0.0055) *2 0.03 (0.001) max. 33.661 (1.3252) 33.725 (1.3278)	 0.5 (0.02) 0.15 (0.006)*1 0.20 (0.008)*2 0.04 (0.002) — —
Valve	Valve clearance Valve stem O.D. Stem-to-guide clearance	IN EX IN EX IN EX	 0.07 – 0.11 (0.003 – 0.004) *3 0.15 – 0.19 (0.006 – 0.007) *3 6.580 – 6.590 (0.2591 – 0.2594) 6.550 – 6.560 (0.2579 – 0.2583) 0.02 – 0.05 (0.001 – 0.002) 0.05 – 0.08 (0.002 – 0.003)	 — — 6.55 (0.258) 6.52 (0.257) 0.08 (0.003) 0.11 (0.004)
Valve seat	Width Stem installed height	IN EX IN EX	 1.25 – 1.55 (0.049 – 0.061) 1.25 – 1.55 (0.049 – 0.061) 39.365 – 39.835 (1.5498 – 1.5683) 39.165 – 39.635 (1.5419 – 1.5604)	 2.0 (0.08) 2.0 (0.08) 40.085 (1.5781) 39.885 (1.5703)
Valve spring	Free length (Reference)	IN EX	47.14 (1.856) 47.14 (1.856)	— —
Valve guide	I.D. Installed height	IN EX IN EX	 6.61 – 6.63 (0.260 – 0.261) 6.61 – 6.63 (0.260 – 0.261) 13.25 – 13.75 (0.522 – 0.541) 13.75 – 14.25 (0.541 – 0.561)	 6.70 (0.264) 6.70 (0.264) — —

*1: Except exhaust No. 5 journal.

*2: Exhaust No. 5 journal.

*3: Measured between the camshaft and rocker arm.

Engine Block (H23A3 engine) — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.07 (0.003) max.	0.10 (0.004)
	Bore diameter	A	87.010 – 87.020 (3.4256 – 3.4260)	87.070 (3.4279)
	Bore taper	B	87.000 – 87.010 (3.4252 – 3.4256)	87.070 (3.4279)
	Reboring limit		—	0.05 (0.002) 0.25 (0.010)
Piston	Skirt O.D. (at 15 mm (0.6 in) from bottom of skirt)	No Letter Letter B	86.990 – 87.003 (3.4248 – 3.4253) 86.980 – 86.993 (3.4244 – 3.4249)	87.980 (3.4638) 87.970 (3.4634)
	Clearance in cylinder		0.007 – 0.030 (0.0003 – 0.0012)	0.04 (0.002)
	Groove width (for ring)	Top	1.230 – 1.245 (0.0484 – 0.0490)	1.265 (0.0498)
		Second	1.230 – 1.245 (0.0484 – 0.0490)	1.265 (0.0498)
		Oil	2.805 – 2.825 (0.1104 – 0.1112)	2.85 (0.112)
Piston ring	Ring-to-groove clearance	Top	0.045 – 0.075 (0.0018 – 0.0030)	0.13 (0.005)
		Second	0.040 – 0.070 (0.0016 – 0.0028)	0.13 (0.005)
	Ring end gap	Top	0.25 – 0.35 (0.010 – 0.014)	0.60 (0.024)
		Second	0.60 – 0.75 (0.024 – 0.030)	0.90 (0.035)
		Oil	0.20 – 0.50 (0.008 – 0.020) *1 0.20 – 0.70 (0.008 – 0.028) *2	0.60 (0.024) *1 0.80 (0.031) *2
Piston Pin	O.D.		21.994 – 22.000 (0.8659 – 0.8661)	—
	Pin-to-piston clearance		0.012 – 0.026 (0.0005 – 0.0010)	—
Connecting rod	Pin-to-rod interference		0.013 – 0.032 (0.0005 – 0.0013)	—
	Small end bore diameter		21.968 – 21.981 (0.8649 – 0.8654)	—
	Large end bore diameter	Nominal	51.00 (2.008)	—
	End play installed on crankshaft		0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
Crankshaft	Main journal diameter	No. 1 and 2 journals	49.976 – 50.000 (1.9676 – 1.9685)	—
		No. 3 journal	49.972 – 49.996 (1.9674 – 1.9683)	—
		No. 4 journal	49.984 – 50.008 (1.9679 – 1.9688)	—
		No. 5 journal	49.988 – 50.012 (1.9680 – 1.9690)	—
	Rod journal diameter		47.976 – 48.000 (1.8888 – 1.8898)	—
	Taper		0.005 (0.0002) max.	0.006 (0.0004)
	Out-of-round		0.005 (0.0002) max.	0.006 (0.0004)
	End play		0.10 – 0.35 (0.004 – 0.014)	0.45 (0.018)
	Runout		0.03 (0.001) max.	0.04 (0.002)
Bearings	Main bearing-to-journal oil clearance	No. 1 and 2 journals	0.021 – 0.045 (0.0008 – 0.0018)	0.050 (0.0020)
		No. 3 journal	0.025 – 0.049 (0.0010 – 0.0019)	0.055 (0.0022)
		No. 4 journal	0.013 – 0.037 (0.0005 – 0.0015)	0.050 (0.0020)
		No. 5 journal	0.009 – 0.033 (0.0004 – 0.0013)	0.040 (0.0016)
	Rod bearing-to-journal oil clearance		0.027 – 0.055 (0.0008 – 0.0019)	0.060 (0.0024)
Balancer shaft	Journal diameter	No. 1 front journal	42.722 – 42.734 (1.6820 – 1.6824)	42.71 (1.681)
		No. 1 rear journal	20.938 – 20.950 (0.8243 – 0.8248)	20.92 (0.824)
		No. 2 front and rear journals	38.712 – 38.724 (1.5241 – 1.5246)	38.70 (1.524)
		No. 3 front and rear journals	34.722 – 34.734 (1.3670 – 1.3675)	34.71 (1.367)
	Journal taper		0.005 (0.0002)	—
	End play	Front	0.10 – 0.35 (0.004 – 0.014)	—
		Rear	0.06 – 0.18 (0.002 – 0.007)	—
	Total runout		0.02 (0.001) max.	0.03 (0.001)
	Shaft-to-bearing oil clearance			
		No. 1 rear journal	0.050 – 0.075 (0.0020 – 0.0030)	0.09 (0.004)
Balancer shaft bearing	I.D.	No. 1 front journal	42.800 – 42.820 (1.6850 – 1.6858)	42.83 (1.686)
		No. 1 rear journal	21.000 – 21.013 (0.8268 – 0.8273)	21.02 (0.828)
		No. 2 front and rear journals	38.800 – 38.820 (1.5276 – 1.5283)	38.83 (1.529)
		No. 3 front and rear journals	34.800 – 34.820 (1.3701 – 1.3709)	34.83 (1.371)

*1: TEIKOKU PISTON RING manufactured piston ring.

*2: RIKEN manufactured piston ring.

Standards and Service Limits

Engine Lubrication — Section 8

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity F20Z1, F20Z2 engines ℓ (US qt, Imp qt) H23A3 engine	4.9 (5.2, 4.3) for engine overhaul 3.8 (4.0, 3.3) for oil change, including filter 3.5 (3.7, 3.1) for oil change, without filter 5.4 (5.7, 6.1) for engine overhaul 4.3 (4.6, 3.8) for oil change, including filter 4.0 (4.2, 3.5) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance Pump body-to-outer rotor clearance Pump body-to-rotor axial clearance	0.02 – 0.16 (0.001 – 0.006) 0.10 – 0.19 (0.004 – 0.007) 0.02 – 0.07 (0.001 – 0.003)	0.20 (0.008) 0.21 (0.008) 0.12 (0.005)
Relief valve	Pressure setting at engine oil temp. 80°C (176°F) kPa (kg/cm², psi) at idle at 3,000 min⁻¹ (rpm)	70 (0.7, 10) min. 350 (3.5, 50) min.	

Cooling — Section 10

	MEASUREMENT	STANDARD (NEW)
Radiator	Coolant capacity ℓ (US qt, Imp qt) F20Z1 engine (including engine, heater,) cooling line and reservoir) Reservoir capacity: 0.6 ℓ (0.63 US qt, 0.53 Imp qt) F20Z2 engine H23A3 engine	M/T: 6.3 (6.7, 5.5) for overhaul 2.7 (2.9, 2.4) for coolant change A/T: 6.2 (6.6, 5.5) for overhaul 2.6 (2.7, 2.3) for coolant change M/T: 6.3 (6.7, 5.5) for overhaul 2.7 (2.9, 2.4) for coolant change M/T: 7.0 (7.4, 6.2) for overhaul 3.3 (3.5, 3.0) for coolant change A/T: 6.9 (7.3, 6.1) for overhaul 3.2 (3.4, 2.8) for coolant change
Radiator cap	Opening pressure kPa (kg/cm², psi)	95 – 125 (0.95 – 1.25, 13.5 – 17.8)
Thermostat	Start to open °C (°F) Fully open °C (°F) Valve lift at fully open	76 – 80 (169 – 176) 90 (194) 8.0 (0.31) min.
Cooling fan	Thermoswitch “ON” temperature °C (°F) Thermoswitch “OFF” temperature °C (°F) Fan timer “ON” temperature °C (°F) Fan timer “OFF” temperature °C (°F)	90 – 96 (194 – 205) Subtract 2 – 7 (4 – 13) from actual “ON” temperature 103 – 109 (217 – 228) Subtract 2 – 5 (4 – 9) from actual “ON” temperature

Fuel and Emissions — Section 11

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Fuel pump	Displacement in 10 seconds ml (US oz, Imp oz)	230 (7.8, 8.1)	110 (3.7, 3.9)
	Relief valve opening pressure kPa (kg/cm ² , psi)	450 – 600 (4.5 – 6.0, 64 – 85)	
Pressure regulator	Pressure with regulator vacuum hose disconnected kPa (kg/cm ² , psi)	280 – 330 (2.8 – 3.3, 40 – 47)	
Fuel tank	Capacity ℓ (US gal, Imp gal)	65 (17.2, 14.3)	
Engine	Fast idle speed min ⁻¹ (rpm)	1,400 ± 200	
	Idle speed min ⁻¹ (rpm) (with headlights and cooling fan off)	770 ± 50 (M/T: neutral) 770 ± 50 (A/T: N or P position)	
	Idle CO %	0.2 % max.	

Clutch — Section 12

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Clutch pedal height to the floor	210 (8.27)	—
	Stroke at pedal	142 (5.8)	—
	Total clutch pedal free play	9 – 15 (0.4 – 0.6)	—
	Disengagement height to the floor to the carpet	90 (3.5) min. 80 (3.1) min.	—
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)
Clutch disc	Rivet head depth	1.4 (0.06) min.	0.2 (0.01)
	Surface runout	0.6 (0.02) max.	1.0 (0.04)
	Thickness	8.5 – 9.2 (0.33 – 0.36)	6.5 (0.26)
Pressure plate	Finger height	0.6 (0.02) max.	0.8 (0.03)
	Warpage	0.03 (0.001) max.	0.15 (0.006)

Manual Transmission — Section 13

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US qt, Imp qt)	1.9 (2.0, 1.7) for oil change 2.0 (2.1, 1.8) for overhaul	
Mainshaft	End play	0.10 – 0.16 (0.004 – 0.006)	Adjust with a shim.
	Diameter of ball bearing contact area C	27.977 – 27.990 (1.1015 – 1.1020)	27.93 (1.100)
	Diameter of needle bearing contact area B	37.984 – 38.000 (1.4954 – 1.4961)	37.93 (1.493)
	Diameter of ball bearing contact area A	27.987 – 28.000 (1.1018 – 1.1024)	27.94 (1.100)
	Runout	0.02 (0.001) max.	0.05 (0.002)
Mainshaft 3rd and 4th gears	I.D.	43.009 – 43.025 (1.6933 – 1.6939)	43.080 (1.6961)
	End play	0.06 – 0.21 (0.002 – 0.008)	0.30 (0.012)
	Thickness 3rd gear 4th gear	32.42 – 32.47 (1.276 – 1.278) 30.92 – 30.97 (1.217 – 1.219)	32.3 (1.27) 30.8 (1.21)
Mainshaft 5th gear	I.D.	43.009 – 43.025 (1.6933 – 1.6939)	43.080 (1.6961)
	End play	0.06 – 0.21 (0.002 – 0.008)	0.30 (0.012)
	Thickness	30.92 – 30.97 (1.217 – 1.219)	30.8 (1.21)
Countershaft	End play	0.05 – 0.40 (0.0019 – 0.0157)	0.50 (0.02)
	Diameter of needle bearing contact area A	38.000 – 38.015 (1.4961 – 1.4967)	37.95 (1.494)
	Diameter of ball bearing and needle bearing contact area C	24.987 – 25.000 (0.9837 – 0.9845)	24.94 (0.982)
	Diameter of 1st gear contact area B	39.984 – 40.000 (1.5742 – 1.5748)	39.93 (1.572)
Countershaft 1st gear	Runout	0.02 (0.001) max.	0.05 (0.002)
	I.D.	46.009 – 46.025 (1.8114 – 1.8120)	46.08 (1.814)
Countershaft 2nd gear	End play	0.04 – 0.10 (0.002 – 0.004)	Adjust with a shim.
	I.D.	47.009 – 47.025 (1.8507 – 1.8514)	47.08 (1.854)
	End play Thickness	0.04 – 0.10 (0.002 – 0.004) 34.62 – 34.67 (1.363 – 1.365)	Adjust with a collar. 34.5 (1.36)

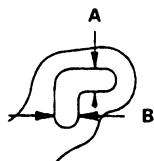
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Standards and Service Limits

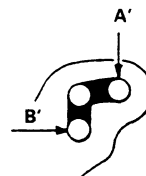
Manual Transmission — Section 13 (cont'd)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Spacer collar (Countershaft 2nd gear)	I.D.	36.48 – 36.49 (1.4362 – 1.4366)	36.50 (1.437)
	O.D.	41.989 – 42.000 (1.6531 – 1.6535)	41.94 (1.652)
	Length A (P/N 23917 – P21 – 010) B (P/N 23918 – P21 – 010)	29.02 – 29.04 (1.1425 – 1.1433)	—
		29.07 – 29.09 (1.1445 – 1.1453)	—
Spacer collar (Mainshaft 4th and 5th gears)	I.D.	31.002 – 31.012 (1.2205 – 1.2209)	31.06 (1.223)
	O.D.	37.989 – 38.000 (1.4956 – 1.4961)	37.94 (1.494)
	Length A B	56.45 – 56.55 (2.222 – 2.226)	—
		26.03 – 26.08 (1.025 – 1.027)	26.01 (1.024)
Reverse idler gear	I.D. Gear-to-reverse gear shaft clearance	20.016 – 20.043 (0.7880 – 0.7891) 0.036 – 0.084 (0.0014 – 0.0033)	20.09 (0.7909) 0.160 (0.0006)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)	0.85 – 1.10 (0.033 – 0.043)	0.40 (0.016)
Shift fork	Finger thickness	6.2 – 6.4 (0.24 – 0.25)	—
	Fork-to-synchro sleeve clearance	0.35 – 0.65 (0.014 – 0.026)	1.0 (0.039)
Reverse shift fork	Pawl groove width	13.0 – 13.3 (0.51 – 0.52)	—
	Fork-to-reverse idler gear clearance	0.5 – 1.1 (0.02 – 0.04)	1.8 (0.07)
	Groove width*1 at A at B	7.05 – 7.25 (0.278 – 0.285)	—
		7.4 – 7.7 (0.29 – 0.30)	—
	Fork-to-5th/reverse shift shaft clearance*2 at A' at B'	0.05 – 0.35 (0.002 – 0.014)	0.5 (0.02)
		0.4 – 0.8 (0.02 – 0.03)	1.0 (0.04)
Shift arm	I.D.	15.973 – 16.000 (0.6289 – 0.6299)	—
	Shift arm-to-shaft clearance	0.005 – 0.059 (0.0002 – 0.0023)	—
	Shift fork diameter at contact area	12.9 – 13.0 (0.508 – 0.512)	—
	Shift-arm-to-shift fork shaft clearance	0.2 – 0.5 (0.008 – 0.019)	0.6 (0.024)
Select lever	Shaft outer diameter	15.41 – 15.68 (0.607 – 0.617)	—
	Shift arm cover clearance	0.032 – 0.102 (0.0013 – 0.0040)	—
Shift lever	O.D.	15.941 – 15.968 (0.6276 – 0.6287)	—
	Transmission housing clearance	0.027 – 0.139 (0.0011 – 0.0055)	—
Interlock	Bore diameter	16.00 – 16.05 (0.630 – 0.632)	—
	Shift arm clearance	0.032 – 0.109 (0.0013 – 0.0043)	—

*1: Measuring points



*2: Measuring points



Automatic Transmission — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity ℓ (US qt, Imp qt)	6.0 (6.4, 5.2) for overhaul 2.4 (2.6, 2.1) for fluid change	
Hydraulic pressure (F20Z1 engine) kPa (kg/cm ² , psi)	Line pressure at 2,000 min ⁻¹ (rpm) (N) or (P) position	800 (8.0, 114) throttle fully-closed 850 (8.5, 121) throttle more than 3/16 open	750 (7.5, 107) throttle more than 3/16 open
	4th clutch pressure at 2,000 min ⁻¹ (rpm) (D₄) position	530 (5.3, 75) throttle fully-closed 850 (8.5, 121) throttle more than 3/16 open	480 (4.8, 68) throttle fully-closed 750 (7.5, 107) throttle more than 3/16 open
	3rd and 2nd clutch pressure at 2,000 min ⁻¹ (rpm) (D₄) position	500 (5.0, 71) throttle fully-closed 850 (8.5, 121) throttle more than 3/16 open	450 (4.5, 64) throttle fully-closed 750 (7.5, 107) throttle more than 3/16 open
	2nd clutch pressure at 2,000 min ⁻¹ (rpm) (2) position	800 – 850 (8.0 – 8.5, 114 – 121)	750 (7.5, 107)
	1st and 1st-hold clutch pressure at 2,000 min ⁻¹ (rpm) (1) position	800 – 850 (8.0 – 8.5, 114 – 121)	750 (7.5, 107)
	Throttle B pressure	Throttle fully closed Throttle fully open	0 (0, 0) 800 – 850 (8.0 – 8.5, 114 – 121)
			750 (7.5, 107)
Hydraulic pressure (H23A3 engine) kPa (kg/cm ² , psi)	Line pressure at 2,000 min ⁻¹ (rpm) (N) or (P) position	850 (8.5, 121) throttle fully-closed 900 (9.0, 128) throttle more than 3/16 open	800 (8.0, 114) throttle more than 3/16 open
	4th clutch pressure at 2,000 min ⁻¹ (rpm) (D₄) position	530 (5.3, 75) throttle fully-closed 900 (9.0, 128) throttle more than 3/16 open	480 (4.8, 68) throttle fully-closed 800 (8.0, 114) throttle more than 3/16 open
	3rd and 2nd clutch pressure at 2,000 min ⁻¹ (rpm) (D₄) position	500 (5.0, 71) throttle fully-closed 900 (9.0, 128) throttle more than 3/16 open	450 (4.5, 64) throttle fully-closed 800 (8.0, 114) throttle more than 3/16 open
	2nd clutch pressure at 2,000 min ⁻¹ (rpm) (2) position	850 – 900 (8.5 – 9.0, 121 – 128)	800 (8.0, 114)
	1st and 1st-hold clutch pressure at 2,000 min ⁻¹ (rpm) (1) position	850 – 900 (8.5 – 9.0, 121 – 128)	800 (8.0, 114)
	Throttle B pressure	Throttle fully closed Throttle fully open	0 (0, 0) 800 (8.0, 114)
			800 (8.0, 114)
Stall speed min ⁻¹ (rpm) (Check with car on level ground)	F20Z1 engine H23A3 engine	2,500 2,700	2,350 – 2,650 2,550 – 2,850

(cont'd)

Standards and Service Limits

Automatic Transmission — Section 14 (cont'd)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch	Clutch initial clearance 1st-hold 1st, 2nd 3rd, 4th Clutch return spring free length 1st, 2nd, 3rd, 4th Clutch disc thickness Clutch plate thickness 1st, 1st-hold 2nd, F20Z1 engine H23A3 engine 3rd, 4th	0.80 – 1.00 (0.031 – 0.039) 0.65 – 0.85 (0.026 – 0.033) 0.4 – 0.6 (0.016 – 0.024) 33.5 (1.32) 1.88 – 2.00 (0.074 – 0.079) 1.95 – 2.05 (0.077 – 0.081) 2.55 – 2.65 (0.089 – 0.093) 1.95 – 2.05 (0.077 – 0.081) 2.25 – 2.35 (0.089 – 0.093)	— — — 31.5 (1.24) Until grooves worn out. Discoloration ↑ ↓ Discoloration
	Clutch end plate thickness Mark 1 Mark 2 Mark 3 Mark 4 Mark 5 Mark 6 Mark 7 Mark 8 Mark 9	2.05 – 2.10 (0.081 – 0.083) 2.15 – 2.20 (0.085 – 0.087) 2.25 – 2.30 (0.089 – 0.091) 2.35 – 2.40 (0.093 – 0.094) 2.45 – 2.50 (0.096 – 0.098) 2.55 – 2.60 (0.100 – 0.102) 2.65 – 2.70 (0.104 – 0.106) 2.75 – 2.80 (0.108 – 0.110) 2.85 – 2.90 (0.112 – 0.114)	Discoloration ↑ ↓ Discoloration
Valve body	Stator shaft needle bearing contact I.D. Torque converter side Oil pump side Oil pump gear side clearance Oil pump gear-to-body clearance Oil pump driven gear I.D. Oil pump shaft O.D.	27.000 – 27.021 (1.0630 – 1.0638) 29.000 – 29.013 (1.1417 – 1.1422) 0.03 – 0.05 (0.001 – 0.002) 0.210 – 0.265 (0.0083 – 0.0104) 0.070 – 0.125 (0.0028 – 0.0049) 14.016 – 14.034 (0.5518 – 0.5525) 13.980 – 13.990 (0.5504 – 0.5508)	Wear or damage — 0.07 (0.003) — — Wear or damage Wear or damage
Shifting device, parking brake and throttle control system	Reverse shift fork finger thickness Parking brake ratchet pawl Parking brake gear Throttle cam stopper height	5.90 – 6.00 (0.232 – 0.236) — — 17.0 – 17.1 (0.669 – 0.673)	5.40 (0.213) Wear or other defect Wear or other defect —
Servo body	Shift fork shaft bore I.D. Shift fork shaft valve bore I.D.	14.000 – 14.010 (0.5512 – 0.5516) 37.000 – 37.039 (1.4567 – 1.4582)	— 37.045 (1.4585)
Regulator valve body	Sealing ring contact I.D.	35.000 – 35.025 (1.3780 – 1.3789)	35.05 (1.3799)
Accumulator body	Sealing ring contact I.D.	32.000 – 32.013 (1.2598 – 1.2604)	32.050 (1.2618)
Stator shaft	Sealing ring contact I.D.	29.000 – 29.013 (1.1417 – 1.1422)	29.050 (1.1437)
Transmission	Diameter of needle bearing contact area On mainshaft of stator shaft On mainshaft of 3rd gear collar On mainshaft of 4th gear collar On countershaft of 1st gear collar On countershaft of 4th gear On countershaft of parking gear On countershaft of reverse gear On secondary shaft of 1st gear On secondary shaft of 2nd gear On reverse idler gear shaft Inside diameter Mainshaft 3rd gear Mainshaft 4th gear Countershaft 1st gear Countershaft 4th gear Countershaft reverse gear Countershaft idler gear Secondary shaft 1st gear Secondary shaft 2nd gear Reverse idler gear shaft holder	22.984 – 23.000 (0.9049 – 0.9055) 45.984 – 46.000 (1.8104 – 1.8110) 31.984 – 32.000 (1.2592 – 1.2598) 40.984 – 41.000 (1.6135 – 1.6142) 31.975 – 31.991 (1.2589 – 1.2595) 39.984 – 40.000 (1.5742 – 1.5748) 35.979 – 36.000 (1.4165 – 1.4173) 31.975 – 31.991 (1.2589 – 1.2595) 31.975 – 31.991 (1.2589 – 1.2595) 13.990 – 14.000 (0.5508 – 0.5512) 52.000 – 52.019 (2.0472 – 2.0480) 38.005 – 38.021 (1.4963 – 1.4969) 47.000 – 47.016 (1.8504 – 1.8510) 38.000 – 38.016 (1.4961 – 1.4967) 42.000 – 42.016 (1.6535 – 1.6542) 48.000 – 48.016 (1.8898 – 1.8904) 37.000 – 37.016 (1.4567 – 1.4573) 37.000 – 37.016 (1.4567 – 1.4573) 14.416 – 1.434 (0.5676 – 0.5683)	Wear or damage ↑ ↓ Wear or damage

Automatic Transmission — Section 14

	MEASUREMENT	STANDARD (NEW)		SERVICE LIMIT	
Transmission (cont'd)	Mainshaft 3rd gear collar length	19.50 – 19.55 (0.768 – 0.770)		—	
	Mainshaft 4th gear collar length	47.50 – 47.55 (1.870 – 1.872)		Wear or damage	
	Countershaft 1st gear collar length	27.50 – 27.55 (1.083 – 1.085)		Wear or damage	
	Thrust washer thickness				
	Countershaft 1st gear	1.45 – 1.50 (0.057 – 0.059)		Wear or damage	
	Countershaft idler gear	3.45 – 3.55 (0.136 – 0.140)		Wear or damage	
	Countershaft parking gear length	25.030 – 25.048 (0.9854 – 0.9861)		Wear or damage	
	Secondary shaft 1st gear distance collar length	4.95 – 5.00 (0.195 – 0.197)		Wear or damage	
	Secondary shaft 2nd gear spline washer	4.02 – 4.05 (0.158 – 0.159)		—	
	thickness 35 x 53 mm	4.07 – 4.10 (0.160 – 0.161)		—	
		4.12 – 4.15 (0.162 – 0.163)		—	
		4.17 – 4.20 (0.164 – 0.165)		—	
		4.22 – 4.25 (0.166 – 0.167)		—	
		4.27 – 4.30 (0.168 – 0.169)		—	
	4.32 – 4.35 (0.170 – 0.171)		—		
	4.37 – 4.40 (0.172 – 0.173)		—		
	4.42 – 4.45 (0.174 – 0.175)		—		
	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Spring	Regulator valve spring A				
	F20Z1 engine	1.8 (0.071)	14.7 (0.579)	86.5 (3.406)	16.5
	H23A3 engine	1.8 (0.071)	14.7 (0.579)	88.6 (3.488)	16.5
	Regulator valve spring B	1.8 (0.071)	9.6 (0.378)	44.0 (1.732)	12.7
	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	36.4 (1.433)	12.0
	Relief valve spring	1.0 (0.039)	8.4 (0.331)	39.1 (1.539)	15.1
	Cooler relief valve spring	1.1 (0.043)	8.4 (0.331)	46.8 (1.843)	17.0
	2nd orifice control valve spring	0.6 (0.024)	6.6 (0.260)	58.3 (2.295)	15.8
	Orifice control valve spring	0.8 (0.031)	6.6 (0.260)	52.5 (2.067)	33.0
	4th exhaust valve spring	0.9 (0.035)	7.1 (0.280)	60.8 (2.394)	28.9
	Throttle valve B adjusting spring	0.8 (0.031)	6.2 (0.244)	30.0 (1.181)	8.0
	Throttle valve B spring	1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	10.5
		1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	11.2
		1.4 (0.055)	8.5 (0.335)	41.6 (1.638)	12.4
	1-2 shift valve spring	1.0 (0.039)	8.6 (0.339)	41.3 (1.626)	16.9
	2-3/3-4 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8
	1st-hold accumulator spring	4.0 (0.157)	25.0 (0.984)	64.7 (2.547)	7.3
	1st accumulator spring	1.8 (0.071)	16.3 (0.642)	115.4 (4.543)	18.6
	4th accumulator spring	2.9 (0.114)	22.0 (0.866)	90.1 (3.547)	10.9
	2nd accumulator spring	3.5 (0.138)	22.0 (0.866)	77.1 (3.035)	10.0
	3rd accumulator spring	2.8 (0.110)	17.5 (0.689)	94.2 (3.709)	16.1
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.229)	73.7 (2.902)	32.0
	Lock-up timing valve spring	0.8 (0.031)	6.6 (0.260)	51.1 (2.012)	14.7
	Servo control valve spring	1.0 (0.039)	8.1 (0.319)	52.6 (2.071)	22.4
	CPC valve spring	1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5
	Modulator valve spring	1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	38.0 (1.496)	14.1
	3rd kick-down spring	1.1 (0.043)	7.6 (0.299)	48.3 (1.902)	23.3
	3-2 kick-down spring	1.2 (0.047)	7.1 (0.280)	46.9 (1.846)	20.6

Standards and Service Limits

Differential (Manual transmission) — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Final driven gear	Backlash	0.085 – 0.145 (0.0033 – 0.0057)	0.20 (0.008)
Differential carrier	Pinion shaft contact area I.D. Carrier-to-pinion clearance Driveshaft contact area I.D. Carrier-to-driveshaft clearance	18.000 – 18.018 (0.7087 – 0.7094) 0.017 – 0.047 (0.0007 – 0.0019) 28.005 – 28.025 (1.1026 – 1.1033) 0.025 – 0.066 (0.0010 – 0.0026) 0.055 – 0.091 (0.0022 – 0.0036)	— 0.10 (0.004) — 0.12 (0.005) 0.15 (0.006)
Differential pinion gear	Backlash I.D. Pinion gear-to-pinion shaft clearance	0.05 – 0.15 (0.002 – 0.006) 18.042 – 18.066 (0.7103 – 0.7113) 0.059 – 0.095 (0.0023 – 0.0037)	— — 0.15 (0.006)
Tapered roller bearing preload	Starting torque N·m (kg·cm, lb·in)	1.4 – 2.6 (14 – 26, 12 – 23)	Adjust with a shim

Differential (Automatic transmission) — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Final driven gear	Backlash	0.085 – 0.142 (0.0033 – 0.0056)	0.20 (0.008)
Differential carrier	Pinion shaft contact area I.D. Carrier-to-pinion clearance Driveshaft contact area I.D. Carrier-to-driveshaft clearance	18.000 – 18.018 (0.7087 – 0.7094) 0.017 – 0.047 (0.0007 – 0.0019) 28.005 – 28.025 (1.1026 – 1.1033) 0.025 – 0.066 (0.0010 – 0.0026)	— 0.10 (0.004) — 0.12 (0.005)
Differential pinion gear	Backlash I.D. Pinion gear-to-pinion shaft clearance	0.05 – 0.15 (0.002 – 0.006) 18.042 – 18.066 (0.7103 – 0.7113) 0.059 – 0.095 (0.0023 – 0.0037)	Adjust with a shim — 0.12 (0.005)
Tapered roller bearing preload	Starting torque N·m (kg·cm, lb·in)	New bearing 2.8 – 4.0 (28 – 40, 24 – 35) Reused bearing 2.5 – 3.7 (25 – 37, 22 – 32)	Adjust with a shim

Steering — Section 17

	MEASUREMENT	STANDARD (NEW)
Steering wheel	Rotational play at steering wheel circumference	0 – 10 (0 – 0.4)
Gearbox	Angle of rack-guide-screw loosened from locked position	20° ± 5°
Pump	Pump pressure with shut-off valve closed kPa (kg/cm², psi)	8,000 – 9,000 (80 – 90, 1,138 – 1,280)
Power steering fluid	Recommended fluid Fluid capacity l (US qt, Imp qt)	Honda power steering fluid 1.8 (1.9, 1.6) 0.5 (0.5, 0.4)
Power steering belt*	Deflection with 100 N (10 kg, 22 lbs) between pulleys Belt tension N (kg, lbs) Measured with belt tension gauge	12.5 – 16.0 (0.50 – 0.62) with used belt 9.5 – 11.5 (0.37 – 0.45) with new belt 350 – 500 (35 – 50, 77 – 110) with used belt 700 – 900 (70 – 90, 154 – 200) with new belt

* When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Suspension — Section 18

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Wheel alignment	Camber	Front	$0^{\circ}00' \pm 1^{\circ}$	
		Rear	$-0^{\circ}30' \pm 30'$	
	Caster	Front	$3^{\circ}00' \pm 1^{\circ}$	
	Total toe	Front	$0 \pm 3.0 (0 \pm 0.12)$	
		Rear	$IN 2.0 \pm 2.0 (0.08 \pm 0.08)$	
	Front wheel turning angle	Inward wheel	$39^{\circ}00' \pm 2^{\circ}$	
		Outward wheel	$30^{\circ}00'$	
Wheel	Rim runout (Aluminum wheel)	Axial	$0 - 0.7 (0 - 0.03)$	2.0 (0.08)
		Radial	$0 - 0.7 (0 - 0.03)$	1.5 (0.06)
	Rim runout (Steel wheel)	Axial	$0 - 1.0 (0 - 0.04)$	2.0 (0.08)
		Radial	$0 - 1.0 (0 - 0.04)$	1.5 (0.06)
Wheel bearing	End play	Front	$0 - 0.05 (0 - 0.002)$	—
		Rear	$0 - 0.05 (0 - 0.002)$	—

Brakes — Section 19

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Parking brake lever	Play in stroke 200 N (20 kg, 44 lbs) lever force		To be locked when pulled 7 - 11 notches	—
Foot brake pedal	Pedal height (with floor mat removed)	M/T	190 (7.5)	—
		A/T	195 (7.7)	—
	Free play		1 - 5 (1/16 - 13/64)	—
Master cylinder	Piston-to-pushrod clearance		0 - 0.04 (0 - 0.016)	—
Disc brake	Disc thickness	Front	23.0 (0.09)	21.0 (0.83)
		Rear	10.0 (0.39)	8.0 (0.31)
	Disc runout	Front	—	0.10 (0.004)
		Rear	—	0.10 (0.004)
	Disc parallelism	Front and rear	—	0.015 (0.0006)
	Pad thickness	Front	12.5 (0.49)	1.6 (0.06)
		2.0 l' M/T	11.0 (0.43)	1.6 (0.06)
		2.0 l' A/T and 2.3 l' Rear	9.0 (0.35)	1.6 (0.06)
	Characteristics	Vacuum [mm (in) Hg]	Pedal Force kg (lbs)	Line Pressure kPa (kg/cm ² , psi)
	Without ABS	0 (0)	20 (44)	920 (9.4, 130) minimum
		300 (11.8)	20 (44)	5,500 (56, 800) minimum
		500 (19.7)	20 (44)	8,500 (87, 1,200) minimum
	With ABS	0 (0)	20 (44)	810 (8.3, 120) minimum
		300 (11.8)	20 (44)	6,100 (62, 880) minimum
		500 (19.7)	20 (44)	8,200 (83.2, 1,200) minimum

Standards and Service Limits

Unit of length: mm (in)

Air Conditioning — Section 22

	MEASUREMENT		STANDARD (NEW)
Air conditioning system	Lubricant capacity ml (fl oz, Imp oz)	Condenser Evaporator Line or hose Receiver	10 – 20 (1/3 – 2/3, 0.4 – 0.7) 20 – 30 (2/3 – 1, 0.7 – 1.1) 10 (1/3, 0.4) 10 (1/3, 0.4)
	Lubricant capacity ml (fl oz, Imp oz) Stator coil resistance at 20°C (68°F) Ω Pulley-to-pressure plate clearance		160 ⁺¹⁵ / ₋₅ (5-1/3 ^{+1/2} / ₋₀ , 5.6 ^{+0.5} / ₋₀) 3.6 ± 0.2 0.5 ± 0.15 (0.020 ± 0.006)
Compressor belt*	Deflection with 100 N (10 kg, 22 lbs) between the pulleys		10.0 – 12.0 (0.39 – 0.47) with used belt 4.5 – 7.0 (0.18 – 0.28) with new belt
	Belt tension N (kg, lbs) Measured with belt tension gauge		450 – 600 (45 – 60, 99 – 132) with used belt 950 – 1,150 (95 – 115, 209 – 254) with new belt

Electrical — Section 23

	MEASUREMENT		STANDARD (NEW)	
Ignition coil	Rated voltage V		12	
	Primary winding resistance Ω at 20°C (68°F)		0.6 – 0.8	
	Secondary winding resistance kΩ at 20°C (68°F)		13 – 19	
Spark Plug	Type Gap		See Section 23 1.0 – 1.1 (0.039 – 0.043)	
Ignition timing	At idling	° BTDC	15 ± 2 (Red)	
Alternator belt*	Without A/C	Deflection with 100 N (10 kg, 22 lbs) between pulleys	10 – 12 (0.39 – 0.47) with used belt 8.5 – 11 (0.33 0.43) with new belt	
		Belt tension N (kg, lbs) Measured with belt tension gauge	300 – 450 (30 – 45, 66 – 99) with used belt 450 – 650 (45 – 65, 99 – 143) with new belt	
	With A/C	Deflection with 100 N (10 kg, 22 lbs) between pulleys	10 – 12 (0.39 – 0.47) with used belt 4.5 – 7 (0.18 – 0.28) with new belt	
		Belt tension N (kg, lbs) Measured with belt tension gauge	450 – 600 (45 – 60, 99 – 132) with used belt 950 – 1,150 (95 – 115, 209 – 254) with new belt	
	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Alternator	Output 13.5 V at hot A		70/80	—
	Coil resistance (rotor) Ω		2.8 – 3.0	—
	Slip ring O.D.		14.4 (0.57)	14.0 (0.55)
	Brush length		10.5 (0.41)	5.5 (0.22)
	Brush spring tension g (oz)		300 – 360 (10.6 – 12.7)	—
Starter motor	Type		Spur gear reduction, permanent magnet	
	Mica depth		0.4 – 0.5 (0.016 – 0.020)	0.15 (0.006)
	Commutator runout		0 – 0.02 (0 – 0.0008)	0.05 (0.002)
	Commutator O.D.		28.0 – 28.1 (1.102 – 1.106)	27.5 (1.08)
	Brush length		15.8 – 16.2 (0.62 – 0.64)	10.0 (0.39)
	Brush spring tension (new) N (kg, lbs)		16 – 18 (1.6 – 1.8, 3.5 – 4.0)	—

* When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Design Specifications

	ITEM		METRIC	ENGLISH	NOTES			
DIMENSIONS	Overall Length		4,675 mm	184.1 in				
	Overall Width		1,715 mm	67.5 in				
	Overall Height		1,380 mm	54.3 in				
	Wheelbase		2,720 mm	107.1 in				
	Track (Front/Rear)		1,475/1,480 mm	58.1/58.3 in				
	Ground Clearance		155 mm	6.1 in				
	Seating Capacity		Five					
WEIGHT	Curb Weight	2.0i M/T	1,240 kg	2,734 lbs	Without ABS With ABS			
		2.0i S M/T	1,255 kg	2,767 lbs				
		2.0i S M/T	1,295 kg	2,855 lbs				
		2.0i S A/T	1,325 kg	2,921 lbs				
		2.0i LS M/T	1,300 kg	2,866 lbs				
		2.0i LS A/T	1,330 kg	2,932 lbs				
		2.0i ES M/T	1,335 kg	2,943 lbs				
		2.0i ES A/T	1,365 kg	3,009 lbs				
		2.3i SR M/T	1,320 kg	2,910 lbs				
		2.3i SR A/T	1,345 kg	2,965 lbs				
	Weight Distributions (Front/Rear)	2.0i M/T	745/495 kg	1,642/1,091 lbs	Without ABS With ABS			
		2.0i S M/T	755/500 kg	1,664/1,102 lbs				
		2.0i S M/T	780/515 kg	1,720/1,135 lbs				
		2.0i S A/T	810/515 kg	1,786/1,135 lbs				
		2.0i LS M/T	780/520 kg	1,720/1,146 lbs				
		2.0i LS A/T	810/520 kg	1,786/1,146 lbs				
		2.0i ES M/T	815/520 kg	1,797/1,146 lbs				
		2.0i ES A/T	845/520 kg	1,863/1,146 lbs				
		2.3i SR M/T	800/520 kg	1,764/1,146 lbs				
		2.3i SR A/T	825/520 kg	1,819/1,146 lbs				
	Max. Permissible Weight (European)	2.0i M/T	1,820 kg	4,012 lbs				
		2.0i A/T	1,880 kg	4,145 lbs				
		2.3i M/T and A/T	1,880 kg	4,145 lbs				
		ENGINE		Type		F20Z1, F20Z2 engines	Water-cooled, 4-stroke SOHC gasoline engine	
						H23A3 engine		Water-cooled, 4-stroke DOHC gasoline engine
Cylinder Arrangement				4-cylinders Inline, transverse				
Bore and Stroke	F20Z1, F20Z2 engines		85.0 x 88.0 mm	3.35 x 3.46 in				
	H23A3 engine		87.0 x 95.0 mm	3.42 x 3.74 in				
Displacement	F20Z1, F20Z2 engines		1,997 cm³ (ml)	121.8 cu-in				
	H23A3 engine		2,259 cm³ (ml)	137.8 cu-in				
Compression Ratio	F20Z1 engine		9.5 : 1					
	F20Z2 engine		9.0 : 1					
	H23A3 engine		9.8 : 1					
Valve Train	F20Z1, F20Z2 engines		Belt driven, 4 valves per cylinder, single overhead camshaft					
	H23A3 engine		Belt driven, 4 valves per cylinder, double overhead camshaft					
Lubrication System			Forced and wet sump, trochoid pump					
Oil Pump Displacement								
[At oil temp. 36.5°C (98°F)]	F20Z1, F20Z2 engines		53.7ℓ/minute at 6,000 pump min ⁻¹ (rpm)					
	H23A3 engine		59.1ℓ/minute at 6,000 pump min ⁻¹ (rpm)					
Fuel Required			Premium UNLEADED grade gasoline with 95 Research Octane Number or higher					
Water Pump Displacement								
[At coolant temp. 40°C (104°F)]	F20Z1, F20Z2 engines		150ℓ/minute at 6,000 pump min ⁻¹ (rpm)					
	H23A3 engine		152ℓ/minute at 6,000 pump min ⁻¹ (rpm)					

(cont'd)

Design Specifications

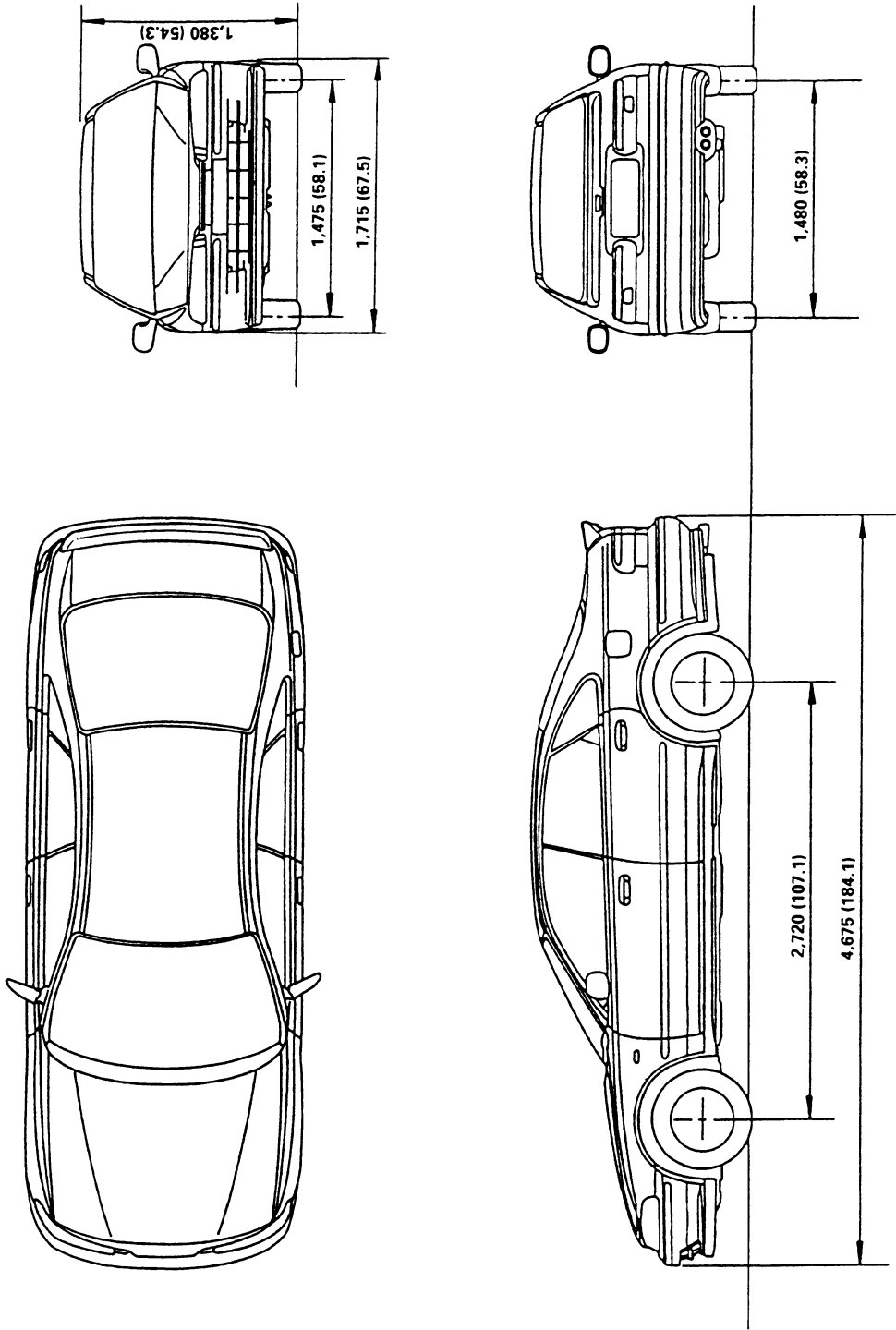
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	ITEM		METRIC		ENGLISH		NOTES	
STARTER	Type		Spur gear reduction, permanent magnet					
	Normal Output		1.4 kW, 1.6 kW					
	Nominal Voltage		12 V					
	Hour Rating		30 seconds					
	Direction of Rotation		Counterclockwise as viewed from gear end					
	Weight	1.4 kW	3.5 kg		7.7 lbs			
		1.6 kw	3.7 kg		8.2 lbs			
CLUTCH	Clutch Type	M/T	Single plate dry, diaphragm spring					
		A/T	Torque converter					
	Clutch Facing Area	M/T	217 cm²		33.6 sq-in			
TRANSMISSION	Transmission	M/T	Synchronized 5-speed forward, 1 reverse					
		A/T	Electronically controlled dual range					
	Primary Reduction		4-speed forward automatic, 1 reverse					
			Direct 1 : 1					
	Type		Manual			Automatic		
		Engine Type	F20Z1	F20Z2	H23A3			
	Gear Ratio	1st	3.307	3.307	3.307	2.705		
		2nd	1.809	1.809	1.809	1.366		
		3rd	1.230	1.185	1.269	1.028		
		4th	0.933	0.903	0.966	0.731		
	5th	0.757	0.735	0.757	—			
	Reverse	3.000	3.000	3.000	2.047			
	Final Reduction	Gear type	Single helical gear					
	Gear ratio		4.266					
AIR CONDITIONING	Cooling Capacity		4,100 Kcal/h		16,269 BTU/h		ND-OIL8	
	Compressor	Type/Makes	Swach-plate/NIPPONDENSO					
		No. of Cylinder	10					
		Capacity	178 cm³/rev		10.9 cu-in/rev			
		Max. Speed	8,800 min ⁻¹ (rpm)					
		Lubricant Capacity	160 ml ^l		5-1/3 fl oz, 5.6 Imp oz			
	Condenser	Type	Corrugated fin					
	Evaporator	Type	Corrugated fin					
	Blower	Type	Sirocco fan					
		Motor Input	209 W max./12 V					
	Speed Control	5-speed						
	Max. Capacity	420 m³/h		14,834 cu-ft/h				
	Temp. Control		Air-mix type					
	Compressor Clutch	Type	Dry, single plate, poly-V-belt drive					
		Power Consumption	40 W max./12 V					
	Refrigerant	Type	HFC-134a (R-134a)					
		Quantity	750 ^{±50} g		26.5 ^{±1.80} oz			

	ITEM	METRIC	ENGLISH	NOTES
STEERING SYSTEM	Type Overall Ratio Turns, Lock-to-Lock Steering Wheel Diameter	Power assisted, rack and pinion 16.4 3.13 380 mm	15.0 in	
SUSPENSION	Type, Front Type, Rear Shock Absorber, Front and Rear	Independent double wishbone, coil spring with stabilizer Independent double wishbone, coil spring with stabilizer Telescopic, hydraulic nitrogen gas-filled		
WHEEL ALIGNMENT	Camber Caster Total Toe Front Rear Front Rear	0° 00' -0° 30' 3° 00' 0 mm In 2.0 mm	0 in In 0.08 in	
BRAKE SYSTEM	Type: Front Rear Pad Surface Area: Front 2.0 l M/T 2.0 l A/T and 2.3 l Rear Parking Brake	Power-assisted self-adjusting ventilated disc Power-assisted self-adjusting solid disc 49.4 cm ² x 2 58.0 cm ² x 2 29.7 cm ² x 2 Mechanical actuating, rear two wheel brakes	7.66 sq-in x 2 8.99 sq-in x 2 4.60 sq-in x 2	
TYRE	Size and Pressure	See tyre information label (see page 1-6)		
ELECTRICAL	Battery Starter Alternator Fuses In the under-dash fuse/relay box In the under-hood fuse/relay box In the under-hood ABS fuse/relay box Headlights Front Turn Signal Lights Front Position Lights Side Turn Signal Lights Rear Turn Signal Lights Stop/Taillights Back-up Lights Rear Fog Light License Plate Lights Ceiling (Interior) Lights Front Rear Trunk (Boot) Lights Door Courtesy Lights Glove Box Lights Gauge Lights Indicator Lights/Lamps Warning Lights Illumination and Pilot Lights Heater Illumination Lights	KG (KF): 12 V - 57 AH/20 HR KE: 12 V - 47 AH/20 HR KS: 12 V - 55 AH/20 HR 12 V - 1.4 kW, 1.6 kW 12 V - 80 A, 70 A 7.5 A, 10 A, 15 A, 30 A 7.5 A, 10 A, 15 A, 20 A, 30 A, 40 A, 50 A, 80 A 7.5 A, 15 A, 50 A 12 V - 55 W (H1) 12 V - 21 W (AMBER) 12 V - 5 W 12 V - 5 W 12 V - 21 W 12 V - 21/5 W 12 V - 21 W 12 V - 21 W 12 V - 5 W 12 V - 5 W 12 V - 5 W 12 V - 5 W 12 V - 1.4, 3 W 12 V - 0.84, 1.12, 1.4 W, LED 12 V - 1.4 12 V - 0.56, 0.84, 1.12, 1.4 W 12 V - 1.4 W		

Body Specifications

Unit: mm (in)



Maintenance



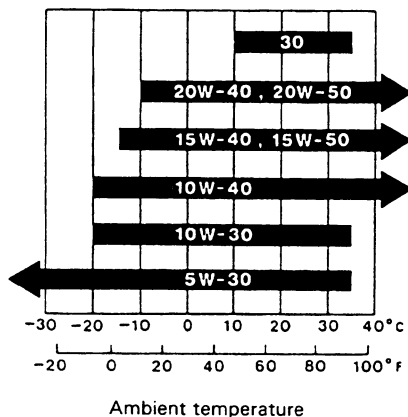
Lubrication Points	4-2
Maintenance Schedule	4-4

Lubrication Points

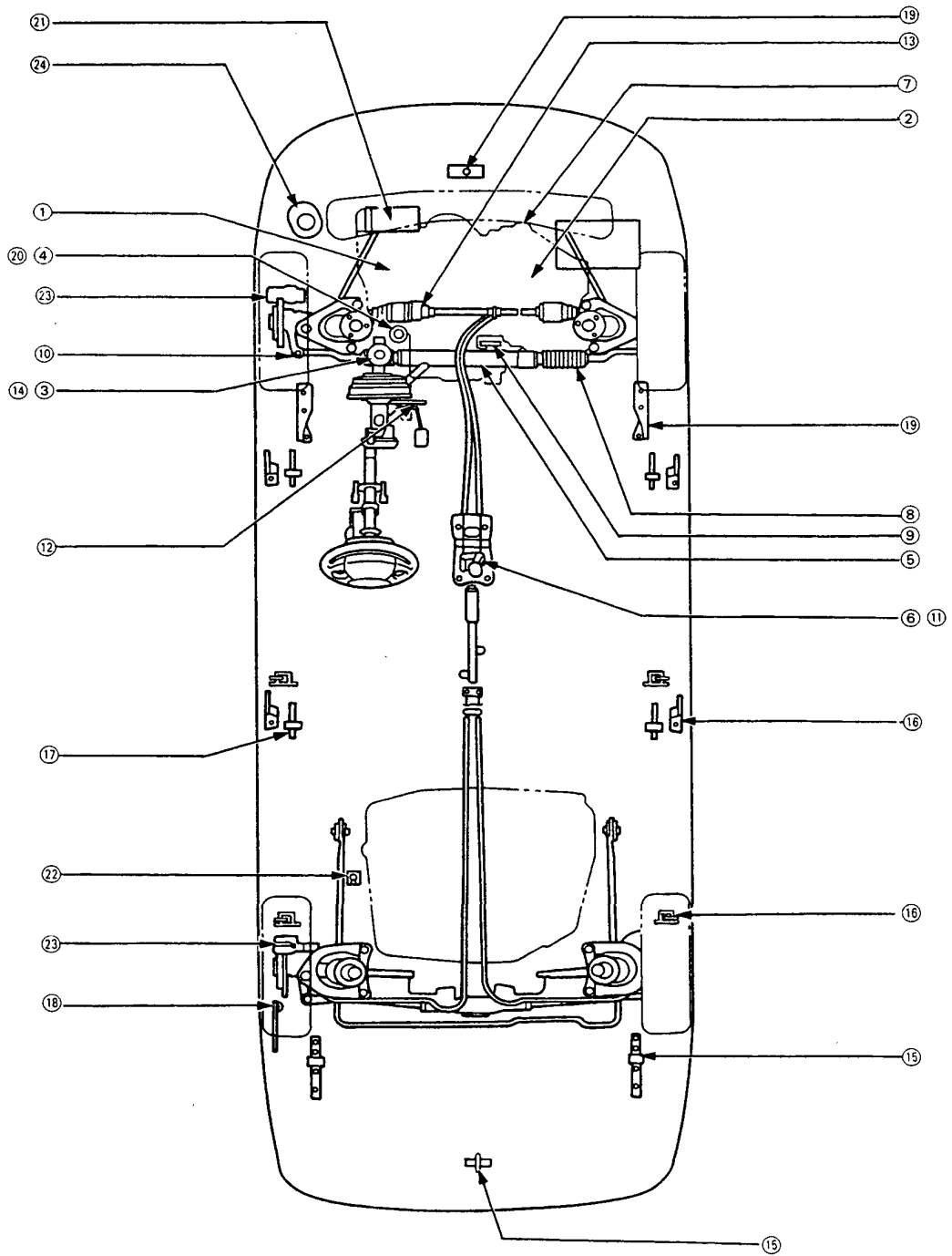
For the details of lubrication points and types of lubricants to be applied, refer to the Illustrated Index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

No.	LUBRICATION POINTS	LUBRICANT
1	Engine	Always use a fuel-efficient oil is that says "API Service SF or SG." SAE Viscosity: See chart below.
2	Transmission Manual Automatic	API Service Grade: SF or SG SAE Viscosity: 10 W-30 or 10 W-40 Honda Premium Formula Automatic Transmission Fluid or an equivalent DEXRON® II Automatic transmission fluid
3	Brake Line	Brake fluid DOT3 or DOT4
4	Clutch Line	Brake fluid DOT3 or DOT4
5	Power steering gearbox	Steering grease P/N 08733-B070E
6	Shift lever pivots (Manual Transmission)	Grease with molybdenum disulfide
7 8 9 10 11 12 13 14 15 16 17 18 19 20	Release fork (Manual Transmission) Steering boots Throttle cable end Steering ball joints Select lever (Automatic Transmission) Pedal linkage Intermediate shaft Brake master cylinder pushrod Trunk hinges and latches Door hinges upper/lower and latches Door opening detents Fuel fill lid Engine hood hinges and engine hood latch Clutch master cylinder pushrod	Multi-purpose grease
21	A/C compressor	Compressor oil ND-OIL8 P/N 38899-PR7-003
22	Brake pipe joint (Front and rear wheel house)	Rust-preventive agent
23	Caliper Piston seal, Dust seal, Caliper pin, Piston	Silicone grease
24	Power steering system	Honda power steering fluid

Select the oil for the car according to this chart:



CAUTION: Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.



Maintenance Schedule

R—Replace I—Inspect: After inspection, clean, adjust, fill up, repair or replace if necessary.

Service at the interval listed x 1,000 km (or miles) or after that number of months, whichever comes first.			x 1,000 km											
			x 1,000 miles											
			20	40	60	80	100	120	140	160	180	200		
Maintenance item			12	24	36	48	60	72	84	96	108	120		
			12	24	36	48	60	72	84	96	108	120		
• Engine oil and oil filter			Replace every 10,000 km (6,000 miles) or 12 months											
• Transmission oil					R					R		R		
Valve clearance				I		I				I			I	
Belt tension and conditions (Alternator, P/S pump, A/C compressor)				I		I				I			I	
Timing belt and timing balancer belt							R						R	
Water pump								I					I	
Cooling system hoses and connections				I		I				I			I	
• Engine coolant						R				R		R	R	
Spark plugs				R*1						R		R	R	
Air cleaner element				R		R				R		R	R	
Tank, fuel lines and connections				I		I				I		I	I	
Fuel filter				R		R				R		R	R	
Positive crankcase ventilation valve								I					I	
Idle speed and idle CO			I*2	I*2	I*2	I*2	I	I	I	I	I	I	I	
Front brake pads			Inspect every 10,000 km (6,000 miles) or 12 months											
Front brake discs and calipers			I	I	I	I	I	I	I	I	I	I	I	
Rear brake discs, calipers and pads				I		I				I			I	
Parking brake operation				I		I				I			I	
Brake fluid (Including ABS)				R		R				R			R	
Brake hoses and lines (Including ABS)			I	I	I	I	I	I	I	I	I	I	I	
Anti-lock brake system operation (Equipped for ABS)			I	I		I				I			I	
Anti-lock brake system high pressure hose (Equipped for ABS)						R					R			
Exhaust system and condition			I	I	I	I	I	I	I	I	I	I	I	
Catalytic converter heat shield								I					I	

• Day to day care (engine oil, ATF and coolant level) should be done practically according to the owner's manual by the customer.

*1 For KS type, replace every 2 years or 40,000 km, whichever comes first after 30,000 km.

*2 For KS type, recommended by manufacturer only.



R—Replace I—Inspect: After inspection, clean, adjust, fill up, repair or replace if necessary.

Maintenance item	Service at the interval listed x 1,000 km (or miles) or after that number of months, whichever comes first.	x 1,000 km	20	40	60	80	100	120	140	160	180	200
		x 1,000 miles	12	24	36	48	60	72	84	96	108	120
Suspension components		months	12	24	36	48	60	72	84	96	108	120
Steering function, tie rod ends, gearbox and boots			I	I	I	I	I	I	I	I	I	I
Power steering function, hoses and connections			I	I	I	I	I	I	I	I	I	I
All fluid levels			Inspect every 10,000 km (6,000 miles) or 12 months									
Battery condition			I	I	I	I	I	I	I	I	I	I
Tyres condition, wear and pressure (Including spare)			Inspect every 10,000 km (6,000 miles) or 12 months									
Lights operation and head light beam			Inspect every 10,000 km (6,000 miles) or 12 months									
Paint damages and body work			I	I	I	I	I	I	I	I	I	I
Test drive (Noise, stability, dashboard operations)			I	I	I	I	I	I	I	I	I	I
Cleanliness of controls, door handles etc.			Inspect after every service									
Supplemental Restraint System			Inspect system and replace slip ring 10 years first registration									

Severe Driving Conditions

The following items must be serviced more frequently on cars normally used under severe driving conditions. Refer to the chart below for the appropriate maintenance intervals.

Severe driving conditions include:

- A: Repeated short distance driving.
- B: Driving in dusty conditions.
- C: Driving in severe cold weather.
- D: Driving in areas using road salt or other corrosive materials.
- E: Driving in rough and/or muddy roads.
- F: Towing trailer.

Condition	Maintenance Item	Operation	Interval
A B • • • F	Engine oil and oil filter	R	Every 5,000 km (3,000 miles) or 6 months
• • • • • F	Transmission oil	R	Every 20,000 km (12,000 miles) or 12 months
• B • • • E •	Air cleaner element	R	Every 20,000 km (12,000 miles) or 12 months
A B • D E F	Front brake discs and calipers	I	Every 10,000 km (6,000 miles) or 6 months
A B • D E F	Rear brake discs, calipers and pads	I	Every 20,000 km (12,000 miles) or 12 months
• B C • E •	Power steering system	I	Every 10,000 km (6,000 miles) or 6 months

R = Replace

I = Inspect: After inspection, adjust, clean, fill up, repair or replace if necessary.

Engine

Engine Removal/Installation	5-1
Cylinder Head/Valve Train	6-1
Engine Block	7-1
Engine Lubrication	8-1
Intake Manifold/Exhaust System	9-1
Cooling	10-1



Engine Removal/Installation

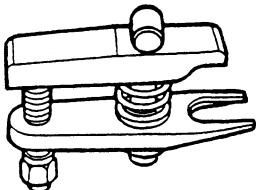


Outline of Model Change

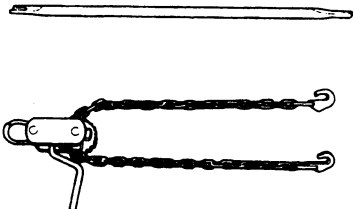
- The H23A3 engine type has been added.

Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07MAC-SL00100	Ball Joint Remover, 32 mm	1	5-9
②	07KAK-SL40101	Engine Tilt Hanger Set	1	5-10



①



②

Engine Removal/Installation



⚠ WARNING

- Make sure jacks and safety stands are placed properly and hoist brackets are attached to the correct positions on the engine.
- Make sure the car will not roll off stands and fall while you are working under it.

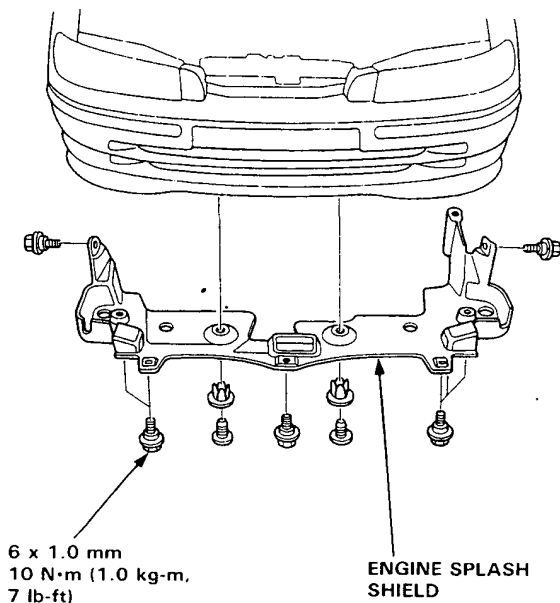
CAUTION:

- Use fender covers to avoid damaging painted surface.
- Unspecified items are common.
- Unplug the wiring connectors carefully while holding the connector portion to avoid damage.
- Make all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses or interference with other parts.

1. Secure the hood as far open as possible.
2. Disconnect the battery negative terminal first, then the positive terminal.
3. Remove the radiator cap.

⚠ WARNING Use care when removing the radiator cap to avoid scalding by hot coolant or steam.

4. Raise the hoist to full height.
5. Remove the front wheels and the engine splash shield.



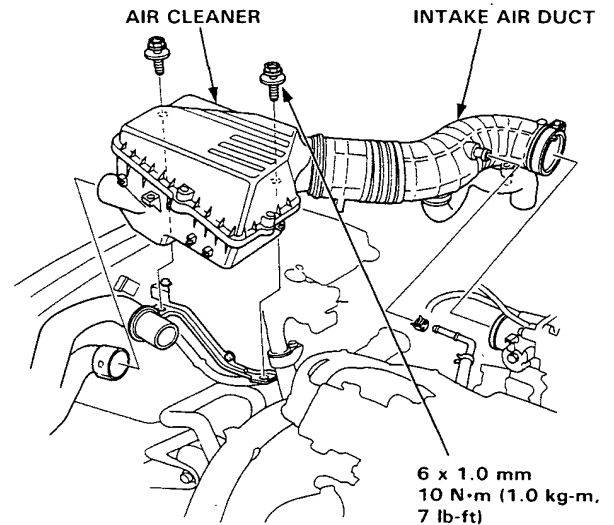
6. Loosen the drain plug from the radiator.

7. Drain the transmission oil or fluid. Reinstall the drain plug using a new washer.

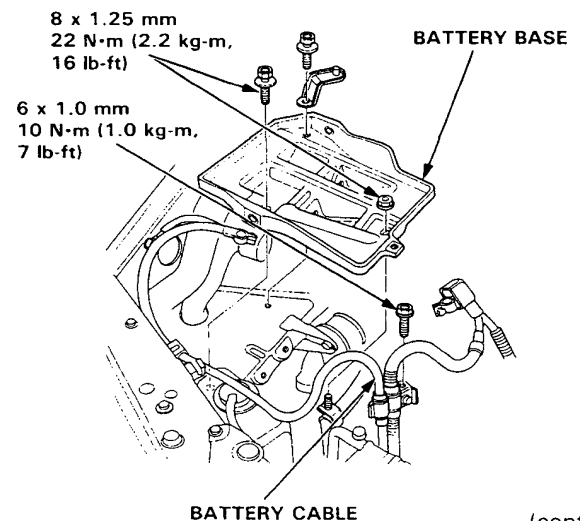
8. Drain the engine oil. Reinstall the drain bolt using a new washer, then lower the hoist.

CAUTION: Do not overtighten the drain bolt.

9. Remove the intake air duct and air cleaner.



10. Remove the battery, battery base and battery cable.

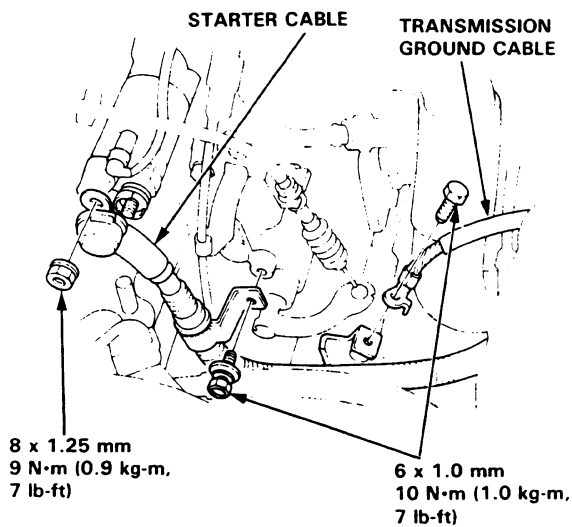


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Engine Removal/Installation

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11. Remove the starter cable and transmission ground cable.



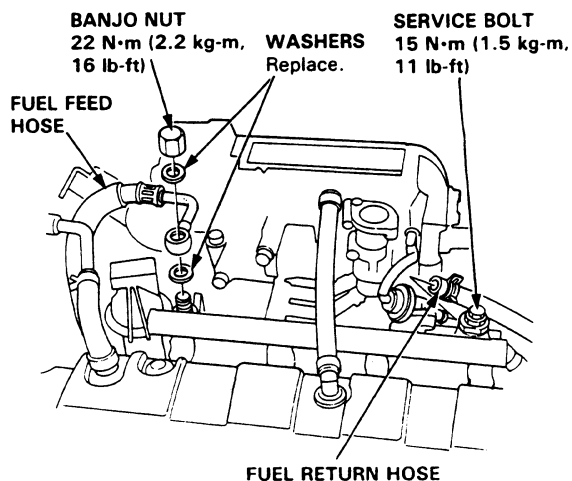
12. Relieve fuel pressure by slowly loosening the service bolt on the fuel rail about one turn.

⚠ WARNING Do not smoke while working on the fuel system. Keep away from work area. Drain fuel only into an approved container.

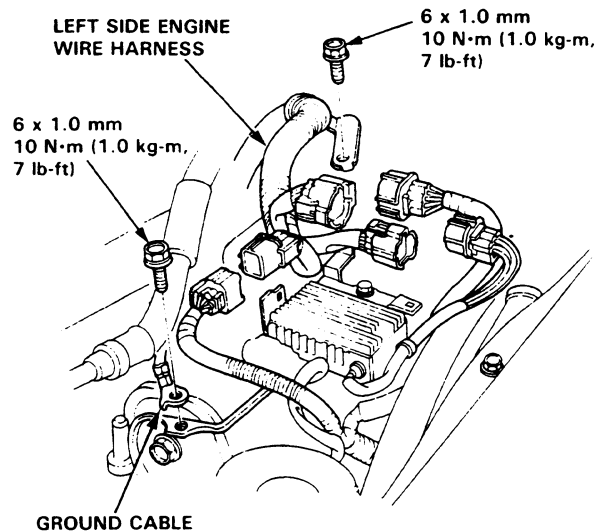
CAUTION:

- Before disconnecting any fuel line, relieve the fuel pressure as described above.
- Place a shop towel over the fuel rail to prevent pressurized fuel from splaying over the engine.

13. Remove the fuel feed hose and fuel return hose.



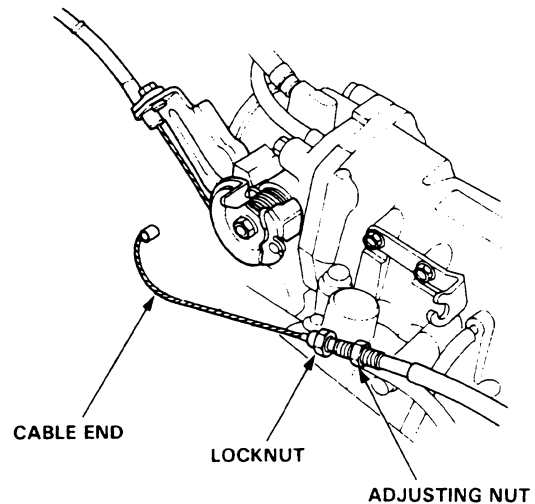
14. Remove the left side engine wire harness and ground cable.



15. Remove the throttle cable by loosening the locknut, then slip the cable end out of the throttle linkage.

NOTE:

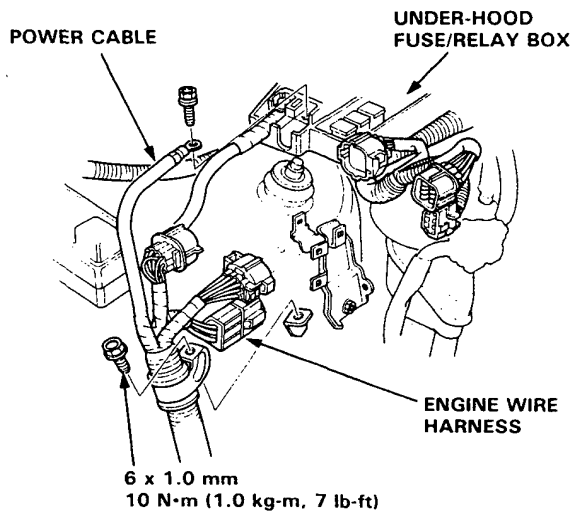
- Do not loosen the adjusting nut.
- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the throttle cable when installing.



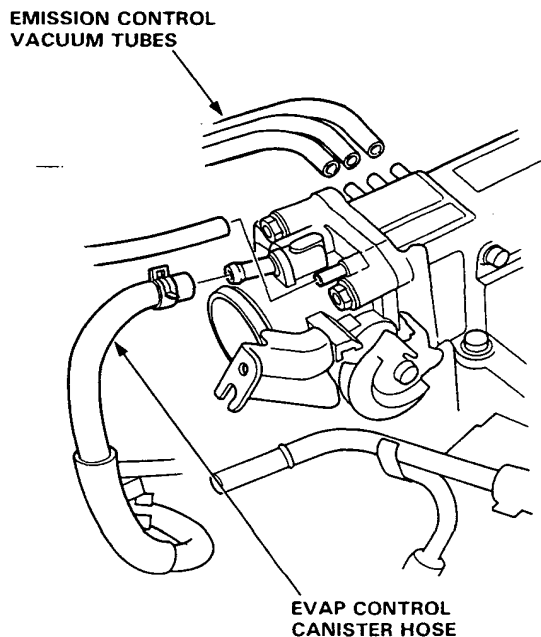
16. Remove the engine wire harness connectors, terminal and clamps on the right side of engine compartment.



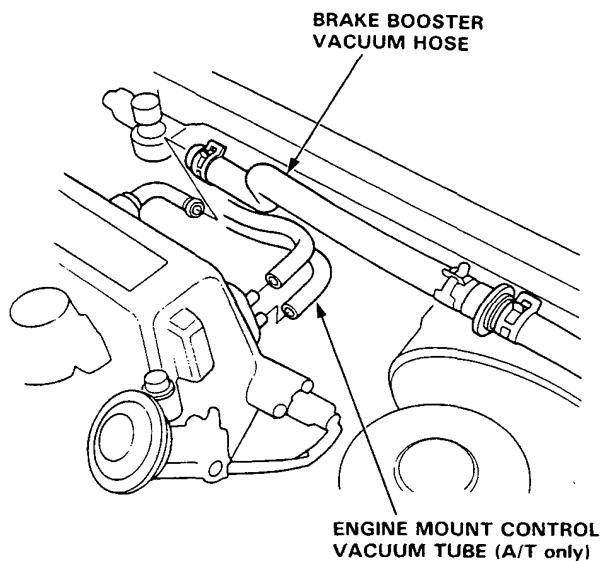
17. Remove the power cable from the under-hood fuse/relay box.



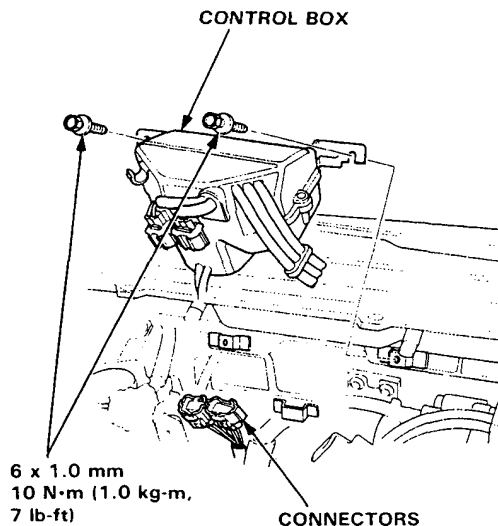
18. Remove the evaporative emission (EVAP) control canister hose and emission control vacuum tubes from the intake manifold.



19. Remove the brake booster vacuum hose and engine mount control vacuum tube (A/T only) from the intake manifold.



20. Remove the connectors and the control box.



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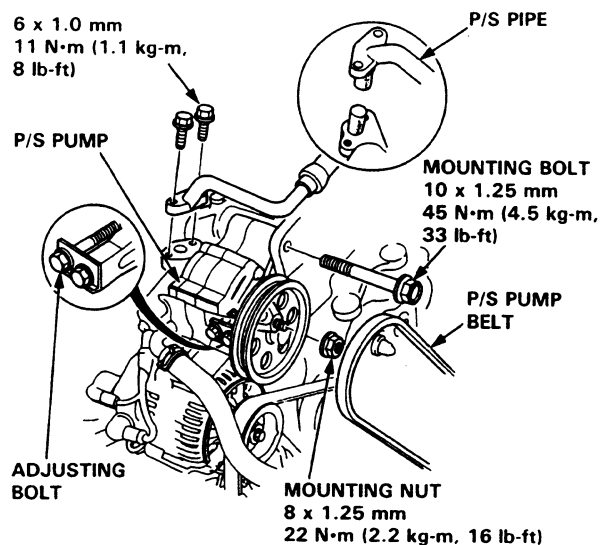
Engine Removal/Installation

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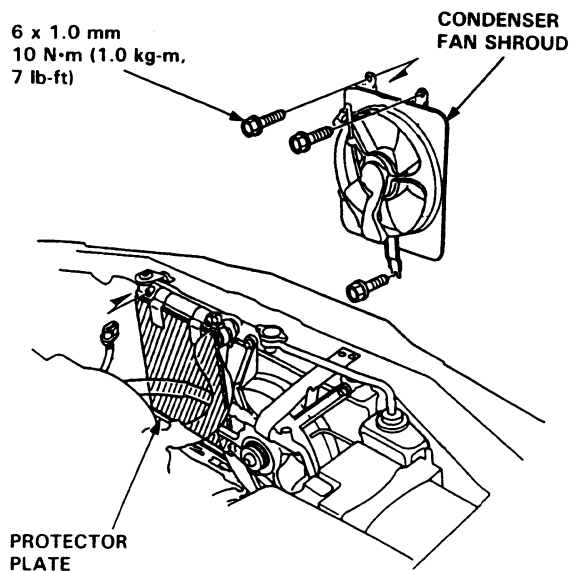
21. Remove the engine ground cable on the cylinder head.
22. Remove the power steering (P/S) pipe and mounting bolt/nut. Loosen the adjusting bolt, then remove the P/S pump belt and pump.

NOTE:

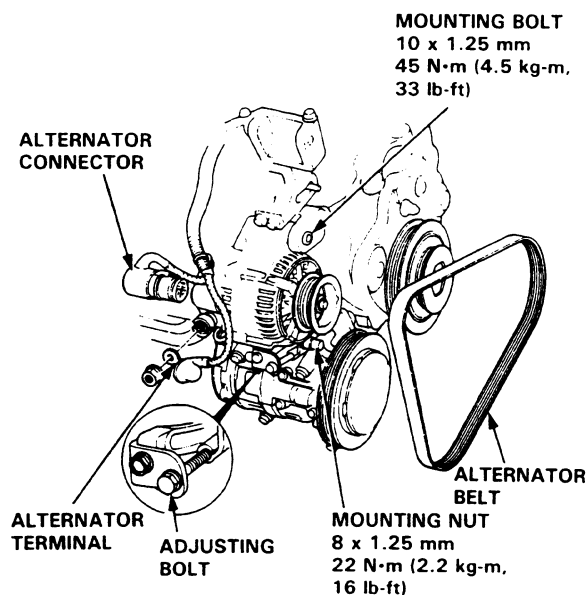
- Plug the pipe and the pump port.
- Do not disconnect the hose.



23. Remove the condenser fan shroud then install a protector plate to the radiator.



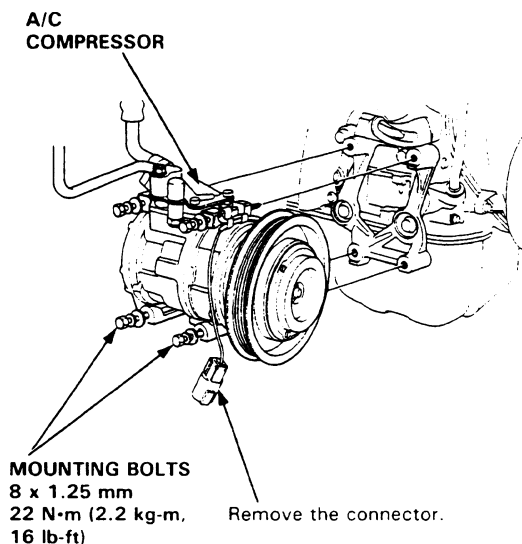
24. Loosen the adjusting bolt and mounting bolt/nut from the alternator, then remove the alternator belt.



25. Loosen the mounting bolt, then remove the air conditioning (A/C) compressor.

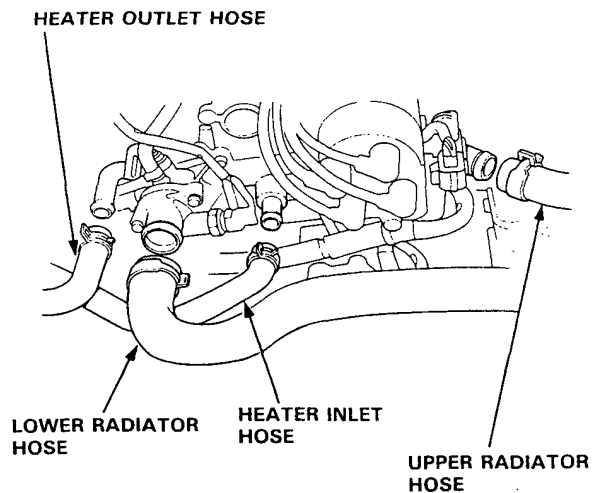
NOTE:

- Do not disconnect the A/C hose.
- Disconnect the connector.

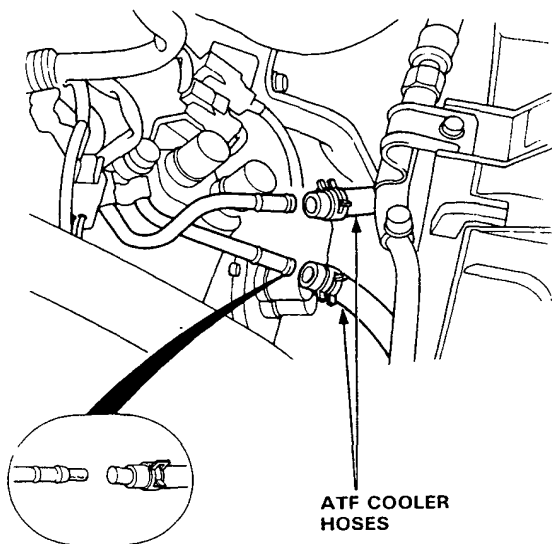




26. Remove the upper and lower radiator hoses and the heater hoses.



27. Remove the automatic transmission fluid (ATF) cooler hoses (A/T).

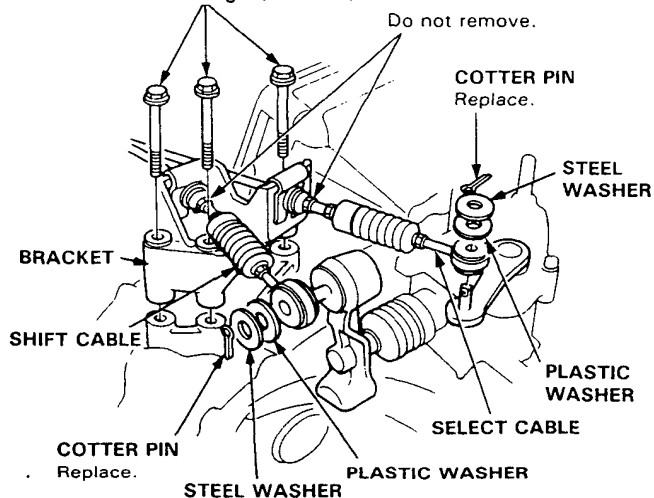


28. Remove the shift cable and select cable (M/T).

NOTE:

- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the shift cable and select cable when installing.

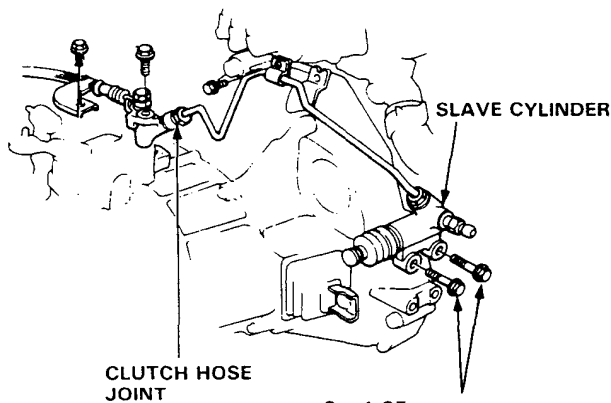
8 x 1.25 mm
22 N·m (2.2 kg-m, 16 lb-ft)



29. Remove the clutch slave cylinder and the pipe/hose assembly (M/T).

NOTE:

- Do not operate the clutch pedal once the slave cylinder has been removed.
- Take care, not to bend the pipe.



8 x 1.25 mm
22 N·m (2.2 kg-m,
16 lb-ft)

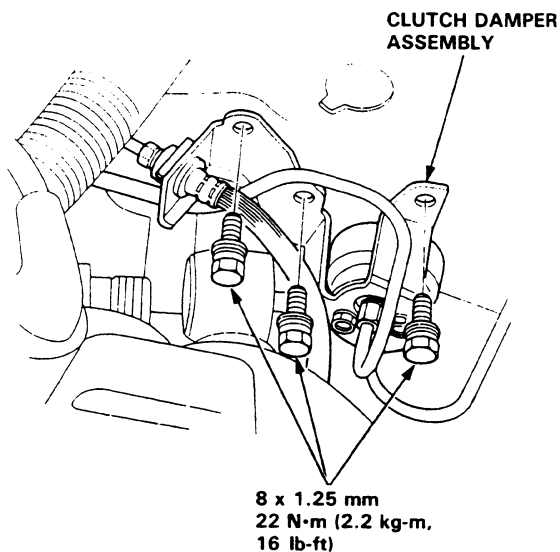
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Engine Removal/Installation

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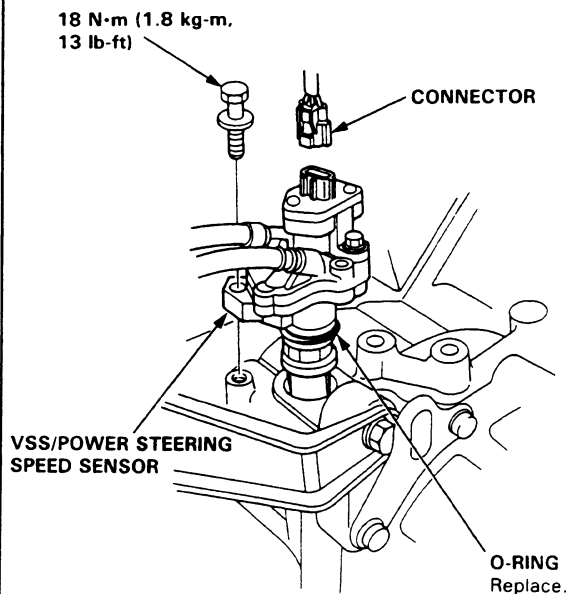
30. Remove the clutch damper assembly (M/T).

NOTE: Take care, not to bend the pipe.



31. Remove the vehicle speed sensor (VSS)/power steering speed sensor assembly.

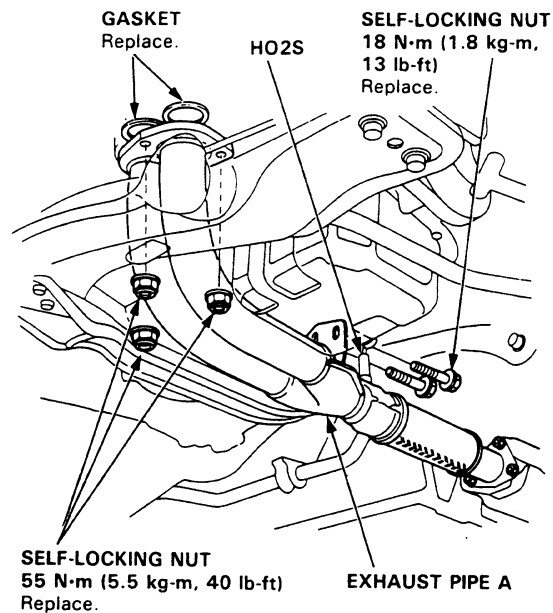
NOTE: Do not disconnect the hoses.



32. Raise the hoist to full height.

33. Remove the exhaust pipe A.

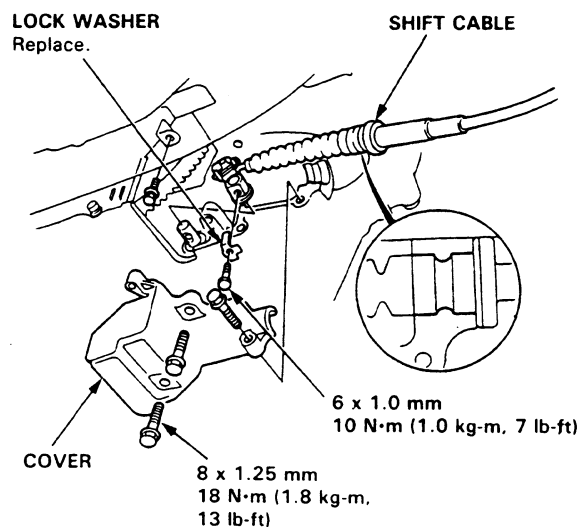
NOTE: Remove the heated oxygen sensor (HO2S) connector.



34. Remove the A/T shift cable (A/T).

NOTE:

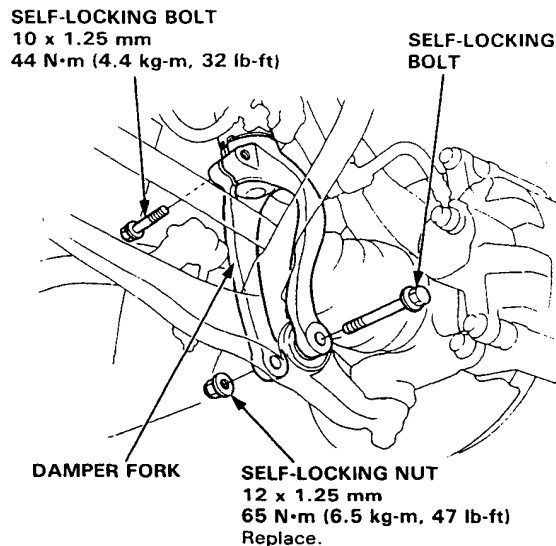
- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the shift cable when installing.



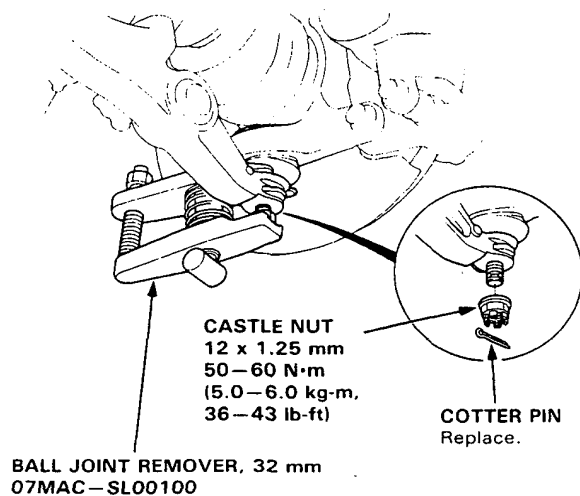


35. Remove the damper fork.

CAUTION: Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts (It should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).



36. Disconnect the suspension lower arm ball joint with the special tool.

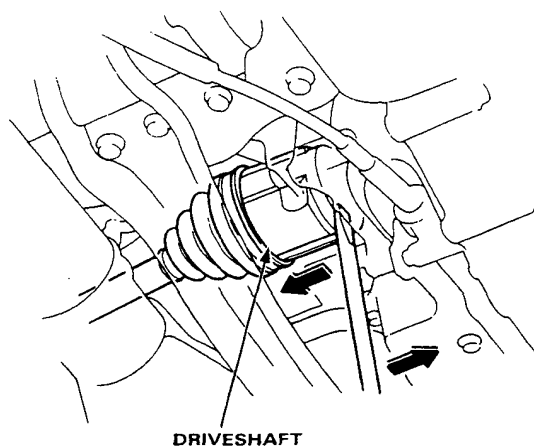


37. Remove the driveshafts.

CAUTION: Take care not to damage the oil seal when removing the driveshaft.

NOTE:

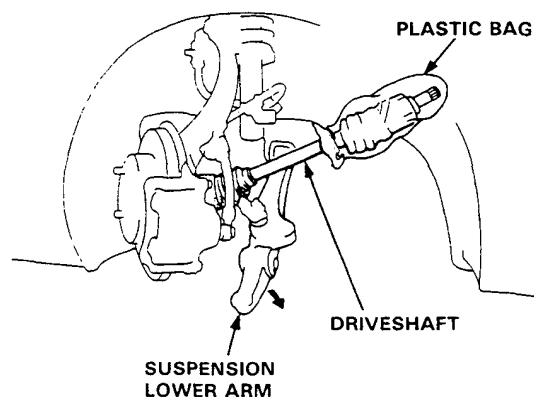
- Coat all precision finished surfaces with clean engine oil or grease.
- Tie plastic bags over the driveshaft ends.



38. Swing the driveshaft under the fender.

NOTE:

- Coat all precision-finished surfaces with clean engine oil or grease.
- Tie plastic bags over the driveshaft ends.



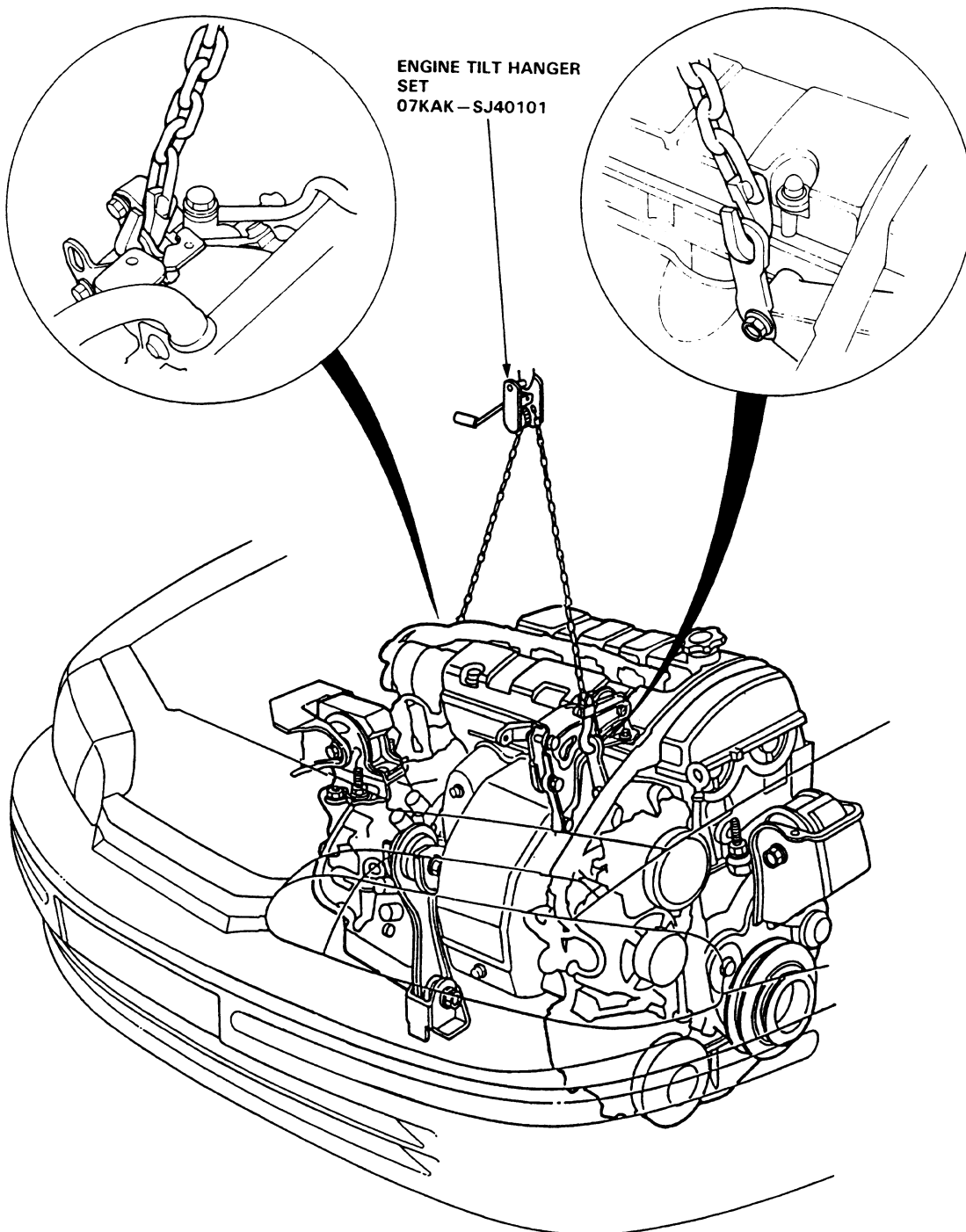
(cont'd)

Engine Removal/Installation

(cont'd)

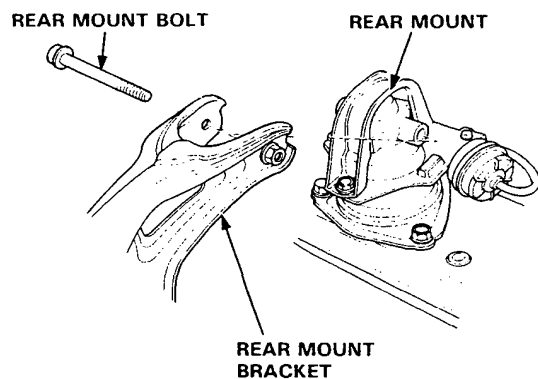
39. Lower the hoist.

40. Attach the chain hoist to the engine.

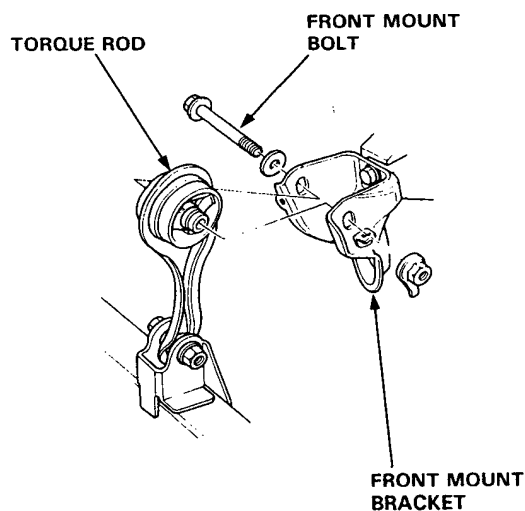




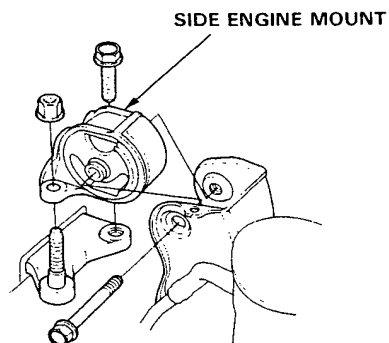
41. Remove the rear mount bolt.



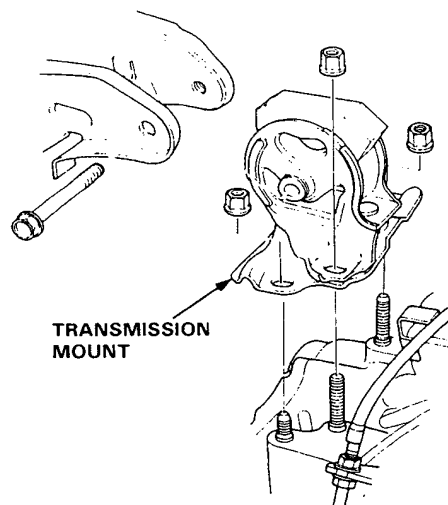
42. Remove the front mount bolt.



43. Remove the left side engine mount.



44. Remove the transmission mount.



45. Raise the chain hoist to remove all slack from the chain.

46. Check that the engine is completely free of vacuum hoses, fuel and coolant hoses, and electrical wiring.

47. Slowly raise the engine approximately 150 mm (6 in).
Check once again that all hoses and wires have been disconnected from the engine.

48. Raise the engine all the way and remove it from the car.

(cont'd)

Engine Removal/Installation

(cont'd)

49. Install the engine in the reverse order of removal.

NOTE:

After the engine is in place:

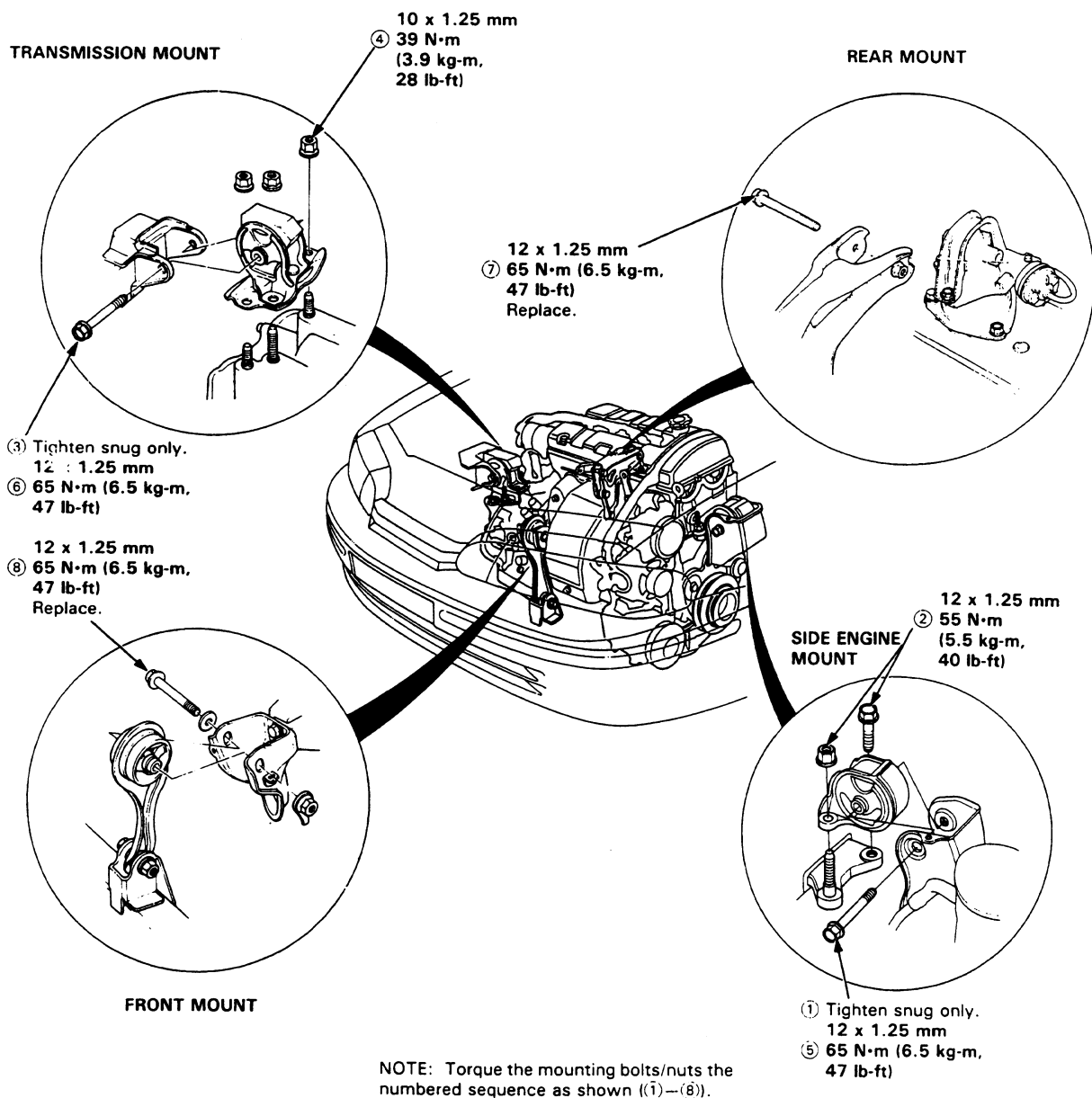
- Torque the engine mount bolts/nuts in the sequence shown below.

CAUTION: Failure to tighten the bolts/nuts in the proper sequence can cause excessive noise and vibration, and reduce bushing life; check that the bushings are not twisted or offset.

- Check that the spring clip on the end of each driveshaft clicks in to place.

CAUTION: Install new spring clips.

- Bleed air from the cooling system at the bleed bolt with the heater valve open.
- Adjust the throttle cable tension.
- Check the clutch pedal freeplay (M/T).
- Check that the transmission shift into gear smoothly.

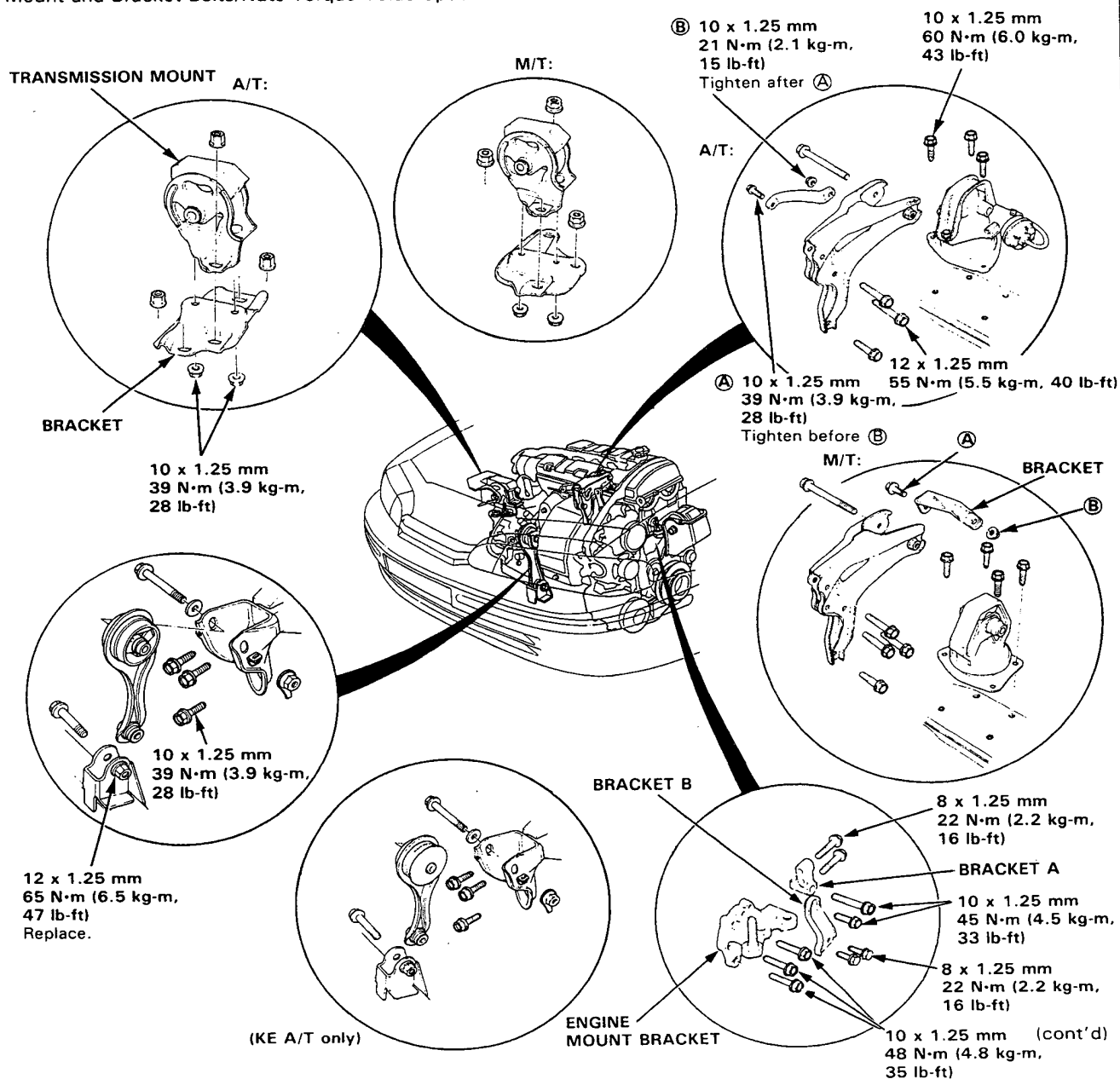




- Adjust the tension of the following drive belts:
Alternator belt.
Power steering pump belt.
Air conditioning compressor belt.
- Clean battery posts and cable terminals with sandpaper, assemble, then apply grease to prevent corrosion.

- Inspect for fuel leakage.
After connecting all fuel line parts, turn on the ignition switch (do not operate the starter) so that the fuel pump operates for approximately two seconds and the fuel line is pressurized. Repeat this operation two or three times and check whether any fuel leakage has occurred at any point in the fuel line.

Mount and Bracket Bolts/Nuts Torque Value Specifications:

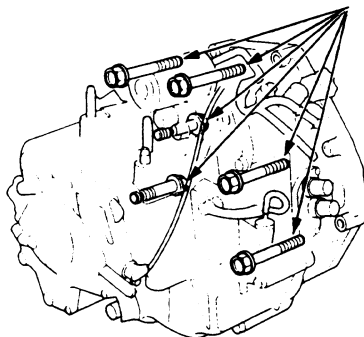


Engine Removal/Installation

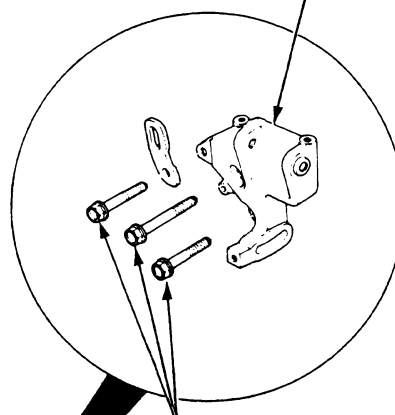
(cont'd)

Additional Torque Value Specifications;

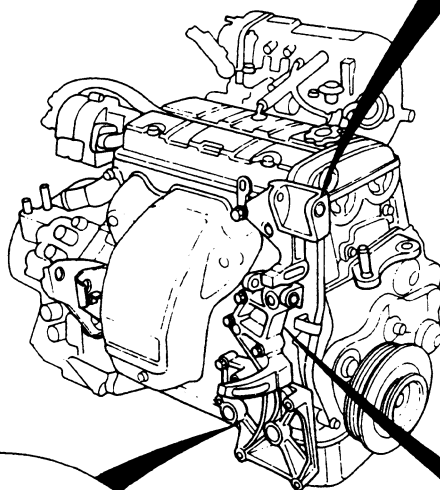
TRANSMISSION MOUNT BOLTS
65 N·m (6.5 kg-m, 47 lb-ft)



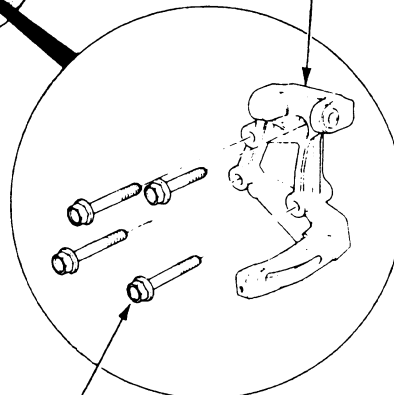
P/S BRACKET



10 x 1.25 mm
50 N·m (5.0 kg-m,
36 lb-ft)



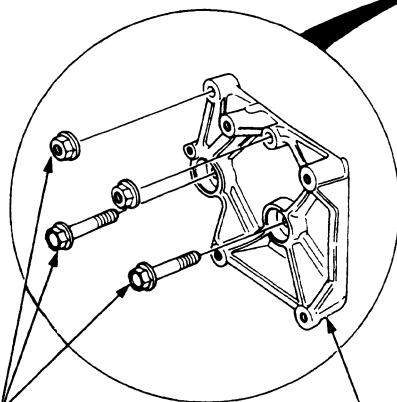
ALTERNATOR BRACKET



10 x 1.25 mm
50 N·m (5.0 kg-m,
36 lb-ft)
Apply liquid gasket
to the bolt threads.

10 x 1.25 mm
50 N·m (5.0 kg-m,
36 lb-ft)

A/C BRACKET



Cylinder Head/Valve Train

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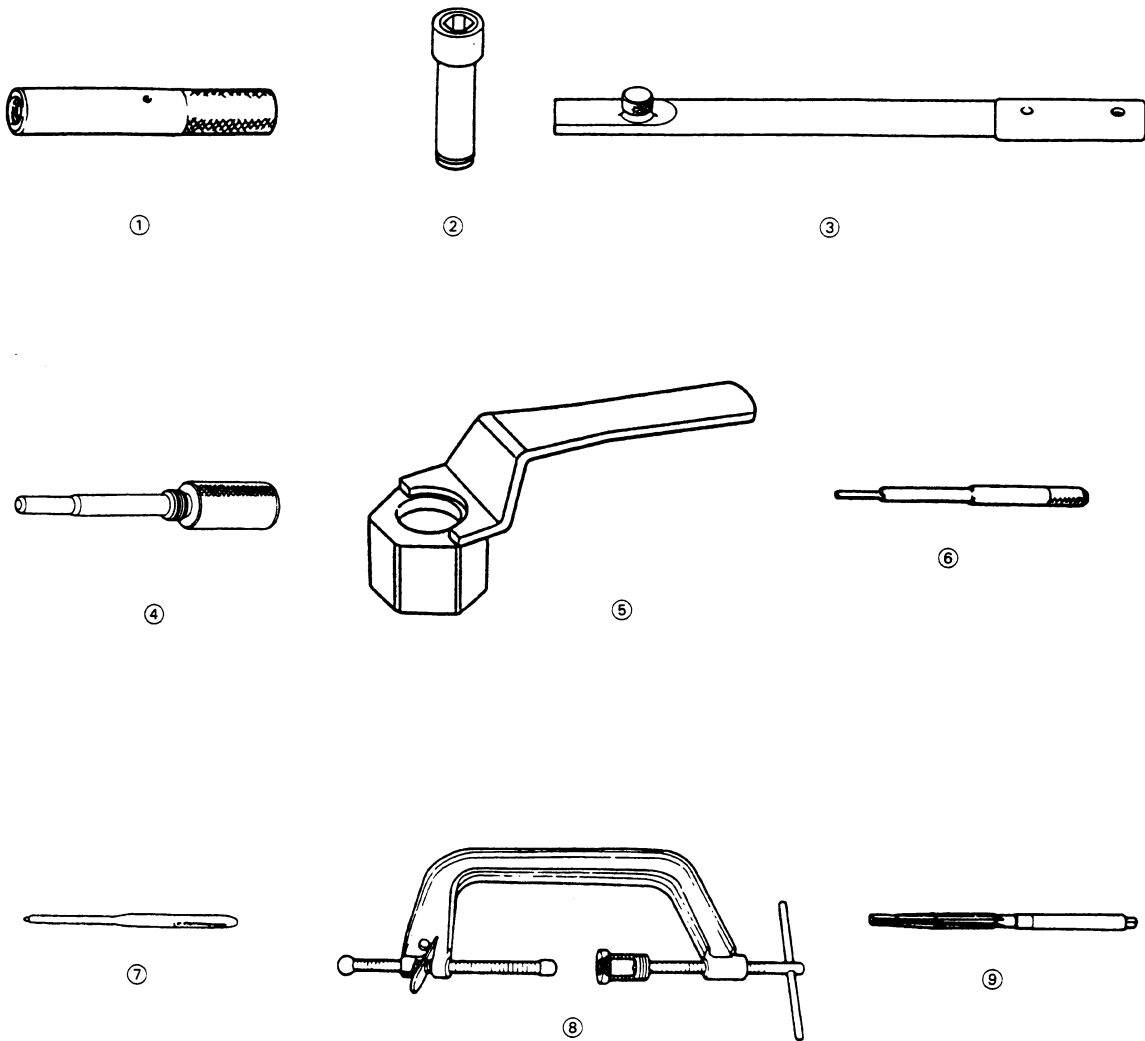


Outline of Model Change

- The H23A3 engine type has been added.

Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAD-PH70100	Valve Seal Installer	1	6-16
②	07JAA-0010200	Socket Wrench, 19 mm	1	6-25, 28
③	07JAB-0010200	Handle	1	6-25, 28
④	07LAG-PT20100	Balancer Shaft Lock Pin	1	6-27
⑤	07MAB-PY30100	Pulley Holder Attachment, HEX 50 mm	1	6,25, 28
⑥	07742-0010200	Valve Guide Driver, 6.6 mm	1	6-15
⑦	07744-0010400	Pin Driver, 5.0 mm	2	6-8, 10, 19, 23
⑧	07757-0010000	Valve Spring Compressor	1	6-12
⑨	07984-6570101	Valve Guide Reamar, 6.6 mm	1	6-15

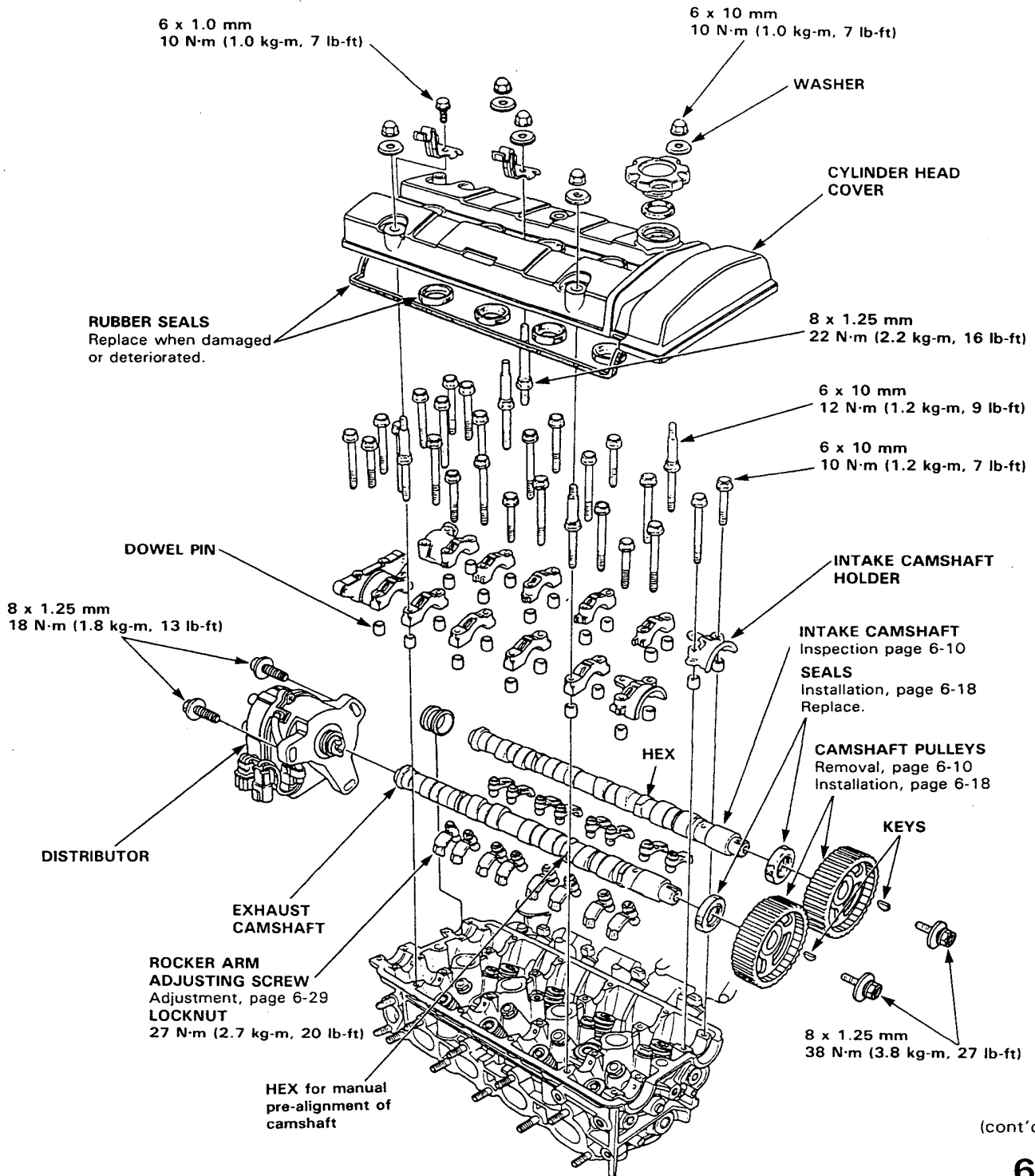


Illustrated Index



CAUTION: To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 38°C (100°F) before removing it.

NOTE: Use new O-rings and gaskets when reassembling.



(cont'd)

Illustrated Index

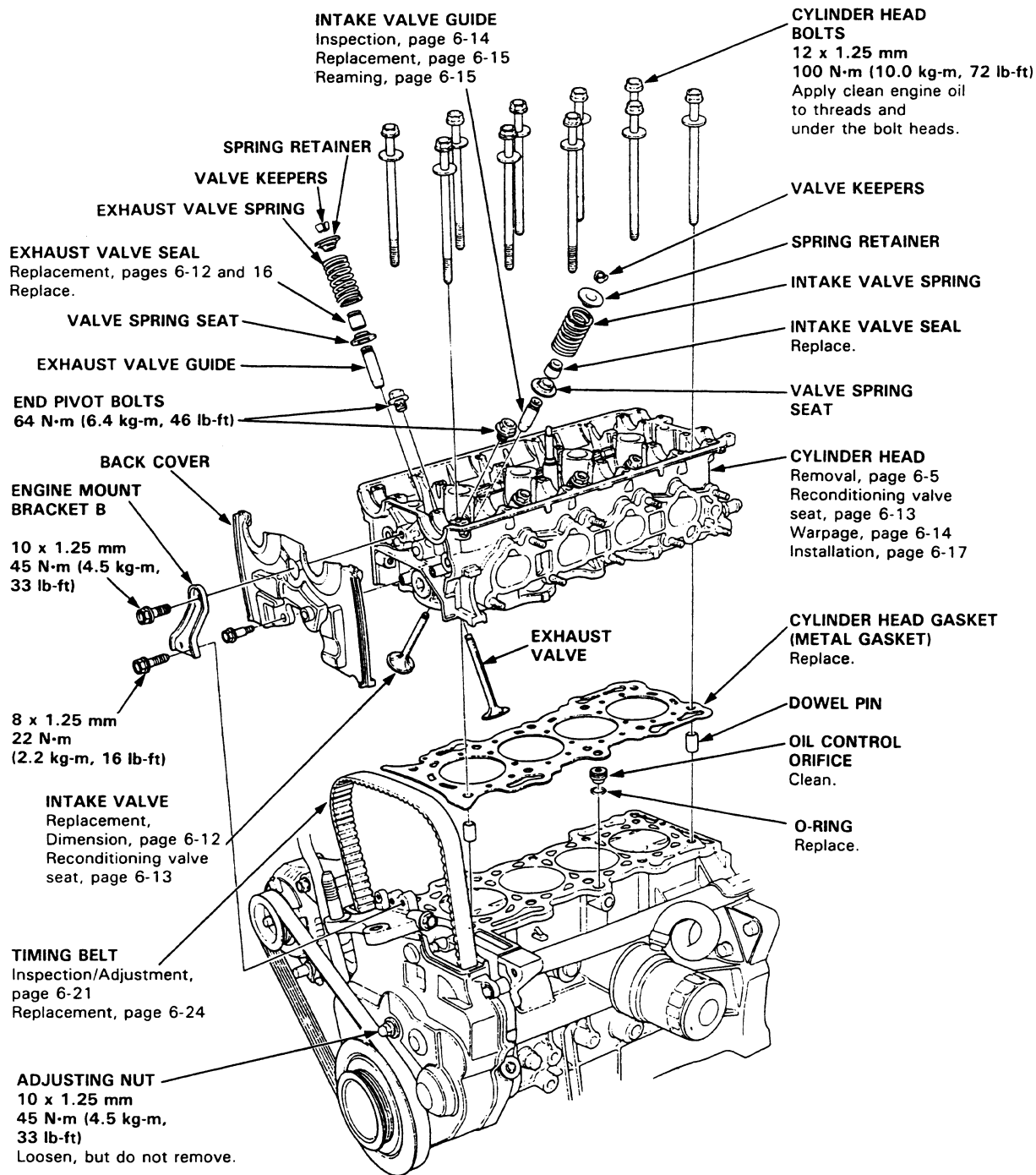
(cont'd)

CAUTION: In handling a metal gasket, take care not to fold it or damage the contact surface of the gasket.

NOTE: Clean the oil control orifice before installing.



Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact parts.





Cylinder Head

Removal

Engine removal is not required for this procedure.

⚠ WARNING

- Make sure jacks and safety stands are placed properly and hoist brackets are attached to the correct positions on the engine.
- Make sure the car will not roll off stands and fall while you are working under it.

CAUTION:

- Use fender covers to avoid damaging painted surface.
- Unspecified items are common.
- Unplug the wiring connectors carefully while holding the connector portion to avoid damage.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses or interfere with other parts.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 38°C (100°F) before loosening the retaining bolts.

NOTE:

- Inspect the timing belt before removing the cylinder head.
- Turn the crankshaft pulley so that the No. 1 piston is at top dead center (TDC) {see page 6-23}.
- Mark all emission hoses before disconnecting them.

1. Disconnect the negative terminal from the battery.
2. Drain the engine coolant.
 - Remove the radiator cap to speed draining.
3. Relieve the fuel pressure.

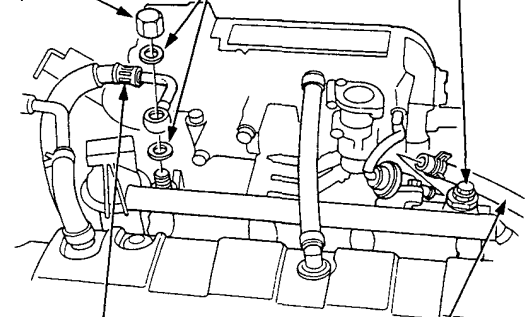
⚠ WARNING Do not smoke while working on fuel system, keep open flame or spark away from work area. Drain fuel only into an approved container.

4. Remove the fuel feed hose and fuel return hose.

BANJO NUT
22 N·m (2.2 kg-m,
16 lb-ft)

WASHERS
Replace.

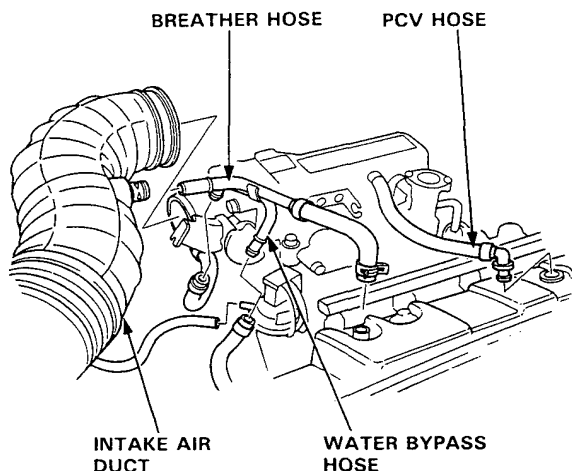
SERVICE BOLT
15 N·m (1.5 kg-m, 11 lb-ft)



FUEL FEED HOSE

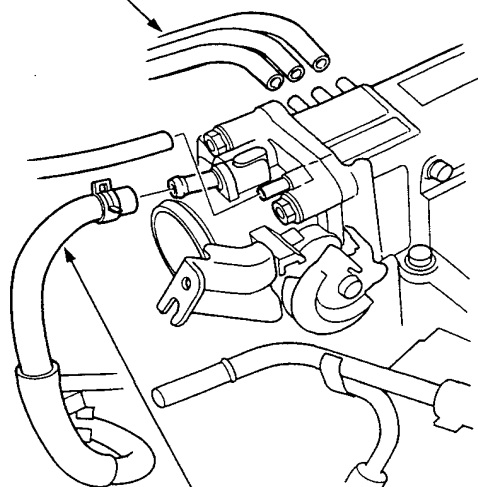
FUEL RETURN HOSE

5. Remove the water bypass hose, breather hose and intake air duct.
6. Remove the positive crankcase ventilation (PCV) hose.



7. Remove the evaporative emission (EVAP) control canister hose and emission control vacuum tubes from the intake manifold.

**EMISSION CONTROL
VACUUM TUBES**



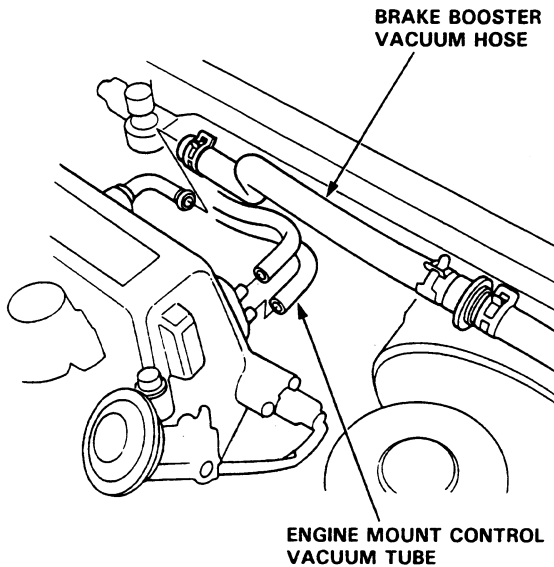
EVAP HOSE

(cont'd)

Cylinder Head

Removal (cont'd)

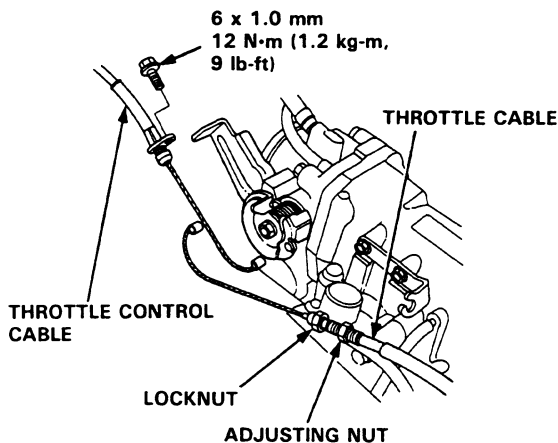
8. Remove the brake booster vacuum hose and engine mount control vacuum tube (A/T only) from the intake manifold.



9. Remove the throttle control cable from the throttle body (A/T only).

NOTE:

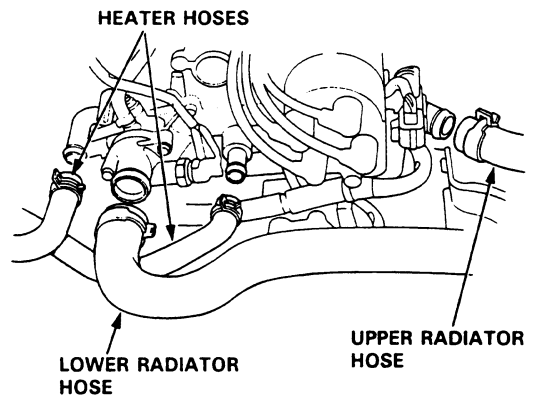
- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the throttle cable when installing.



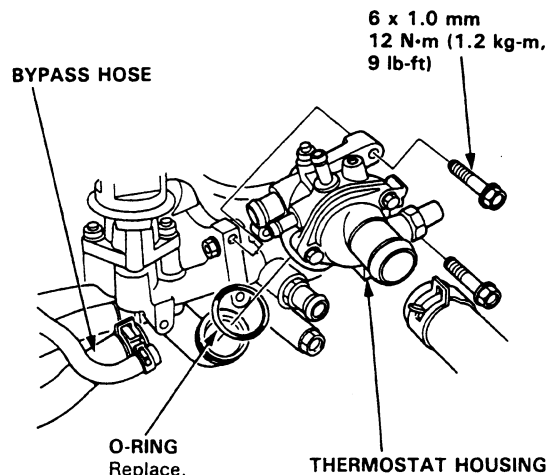
10. Remove the following engine wire harness connectors and clamps from the cylinder head and the intake manifold.

- Four fuel injector connector
- Intake air temperature (IAT) sensor connector
- Idle air control (IAC) valve connector
- Throttle position (TP) sensor connector
- Exhaust gas recirculation (EGR) valve lift sensor connector
- Ground cable terminals
- Engine coolant temperature (ECT) switch A connector
- Heated oxygen sensor (HO2S) connector
- ECT sensor connector
- ECT gauge sending unit connector
- Vehicle speed sensor connector
- TDC/CKP/CYP sensor connector
- Ignition coil connector

11. Remove the upper and lower radiator hoses and heater hoses.



12. Remove the water bypass hose and the thermostat housing.



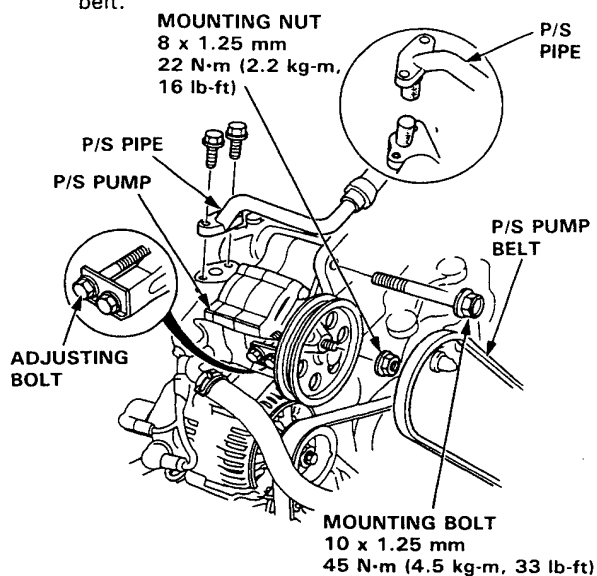


13. Remove the engine ground cable from the cylinder head cover.

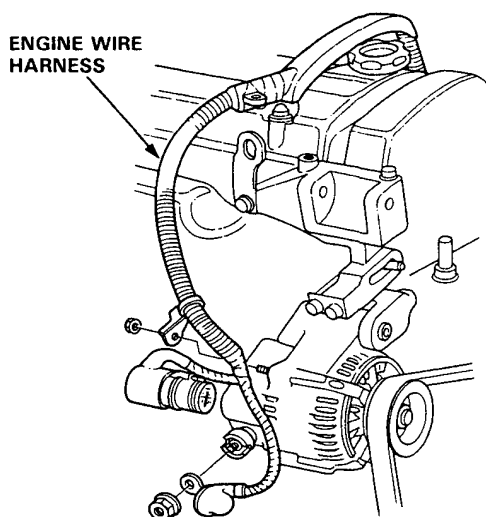
14. Remove the power steering (P/S) pipe and mounting bolt/nut. Loosen the adjusting bolt, then remove the P/S pump belt and pump.

NOTE:

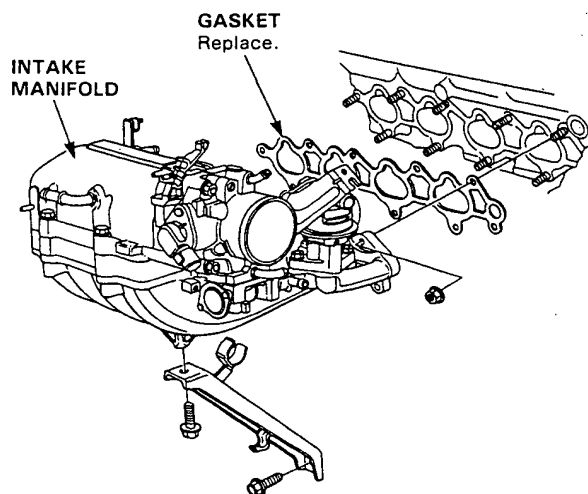
- Plug the pipe and the pump port.
- Do not disconnect the hose.
- After installing, adjust the tension of the P/S pump belt.



15. Disconnect the alternator terminal and connector, then remove the engine wire harness from the cylinder head cover.

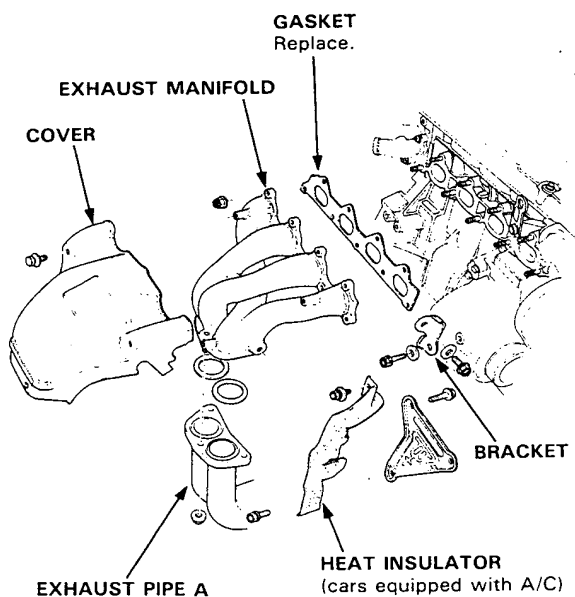


16. Remove the intake manifold bracket and intake manifold.



17. Remove the self-locking nuts and disconnect the exhaust manifold and exhaust pipe A.

18. Remove the heat insulator (cars equipped with A/C), exhaust manifold bracket and exhaust manifold.

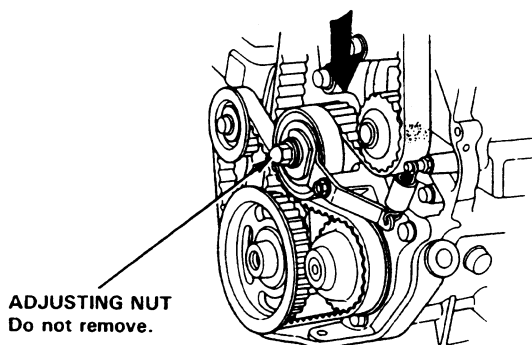


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Cylinder Head

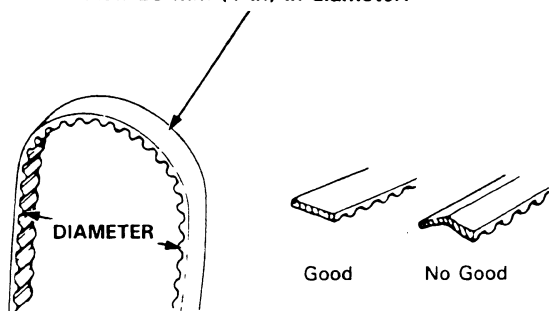
Removal (cont'd)

19. Remove the cylinder head cover.
20. Remove the middle cover.
21. Loosen the adjusting nut 180°.
22. Push the tensioner to release tension from the timing belt, then retighten the adjusting nut.



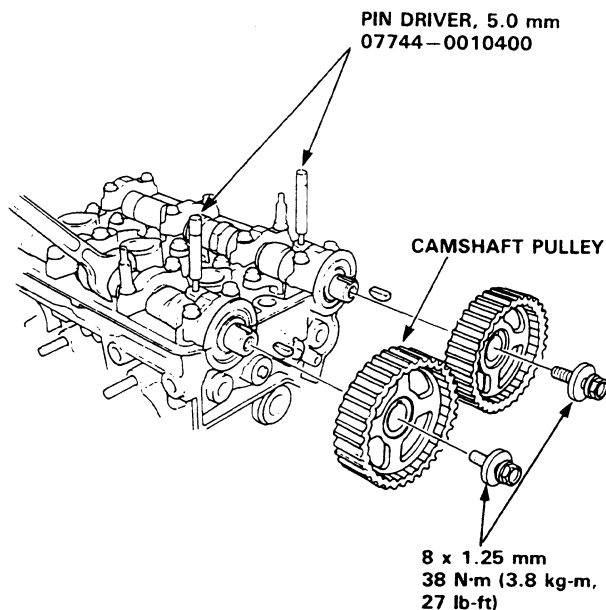
23. Remove the timing belt from the camshaft pulleys.

CAUTION: Do not crimp or bend the timing belt more than 90 ° or less than 25 mm (1 in) in diameter.

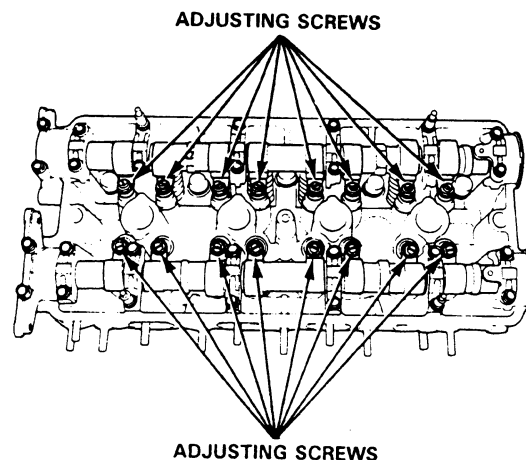


24. Remove the camshaft pulleys.

NOTE: To set the camshafts at TDC for No. 1 piston, align the holes in the camshafts with the holes in the No.1 camshaft holders and insert 5.0 mm pin driver.

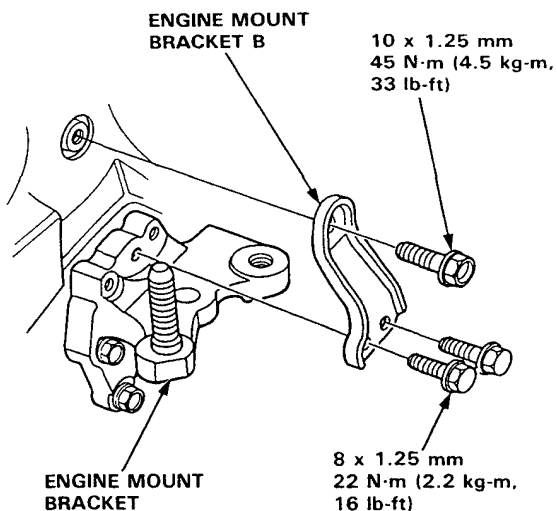


25. Loosen the rocker arm adjusting screws, then remove the camshaft holders and camshafts.





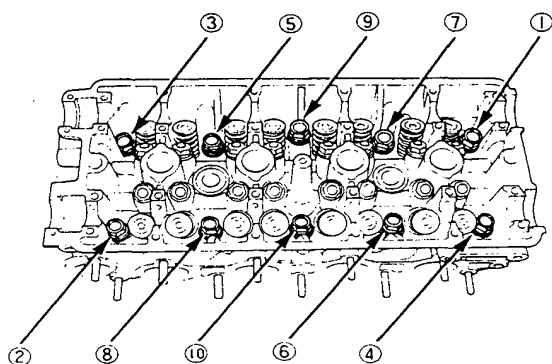
26. Remove the side engine mount bracket B and back cover.



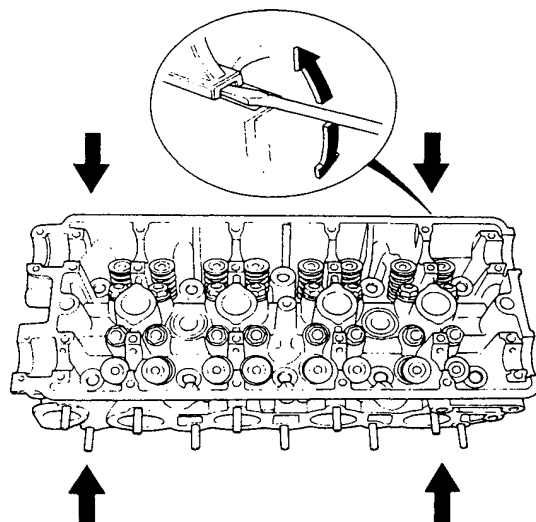
27. Remove the cylinder head bolts, then remove the cylinder head.

CAUTION: To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat until all bolts are loosened.

CYLINDER HEAD BOLT LOOSENING SEQUENCE



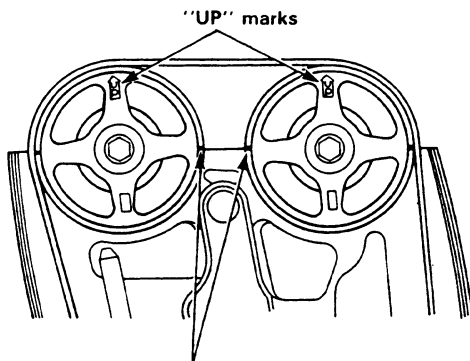
NOTE: Separate the cylinder head from the block with a flat blade screwdriver as shown.



Camshaft Pulleys

Removal

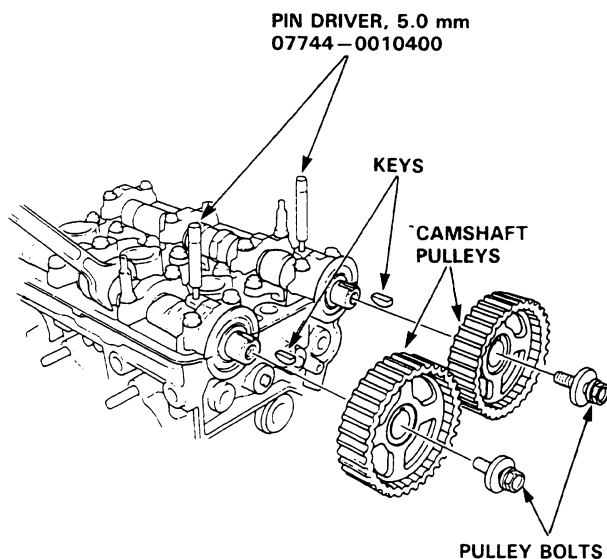
1. To ease reassembly, turn the pulley until the "UP" marks face up, and the front timing marks are aligned with the marks on the pulleys.



Align the marks on the pulleys.

2. Remove the timing belt.
3. Remove the pulley bolts, then remove the camshaft pulleys.

NOTE: To set the camshafts at TDC for No. 1 piston, align the holes in the camshafts with the holes in the No.1 camshaft holders and insert 5.0 mm pin driver.



Camshafts

Inspection

NOTE: Do not rotate camshaft during inspection.

1. Remove the rocker arms.

NOTE: Rocker arms must be installed in the same position if reused.

2. Put the camshafts and the camshaft holders on the cylinder head, then tighten the bolts to the specified torque.

Specified torque:

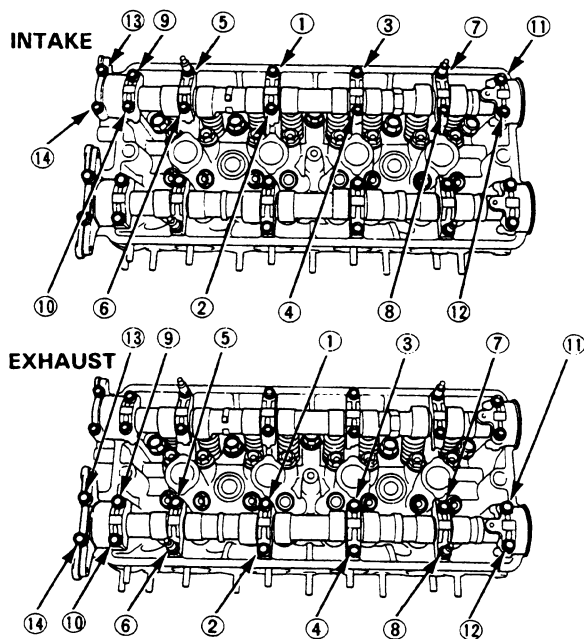
Except Intake ⑤, ⑦. Exhaust ⑥, ⑧:

10 N·m (1.0 kg-m, 7 lb-ft)

Intake ⑤, ⑦. Exhaust ⑥, ⑧:

12 N·m (1.2 kg-m, 9 lb-ft)

TIGHTENING SEQUENCE



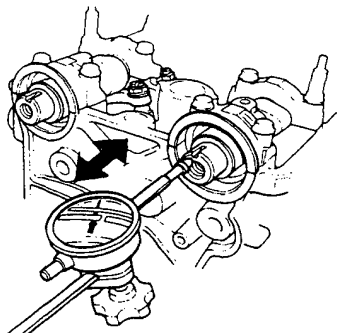


3. Seat camshafts by pushing them toward distributor end of cylinder head.
4. Zero dial indicator against end of camshaft, then push camshaft back and forth, and read the end play.

Camshaft End Play:

Standard (New): 0.05–0.15 mm
(0.002–0.006 in)

Service Limit: 0.5 mm (0.02 in)



5. Remove the camshaft holder bolts from the cylinder head.
 - Lift camshaft out of cylinder head, wipe clean, then inspect lift ramps. Replace camshaft if lobes are pitted, scored, or excessively worn.
 - Clean the camshaft bearing surfaces in the cylinder head, then set camshaft back in place.
 - Insert plastigage strip across each journal.
 - Install the camshaft holders and torque bolts to the values and in the sequence shown on page 6-10.
6. Measure widest portion of plastigage on each journal.

Camshaft-to-Holder Oil Clearance:

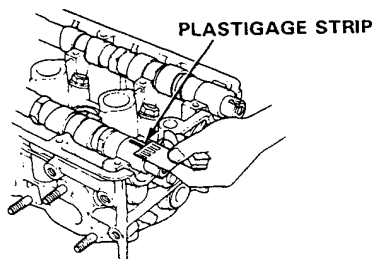
Standard (New): 0.050–0.089 mm
(0.0020–0.0035 in)

Service Limit: 0.15 mm (0.006 in)

Exhaust No. 5 Journal:

Standard (New): 0.100–0.139 mm
(0.0039–0.0055 in)

Service Limit: 0.20 mm (0.008 in)



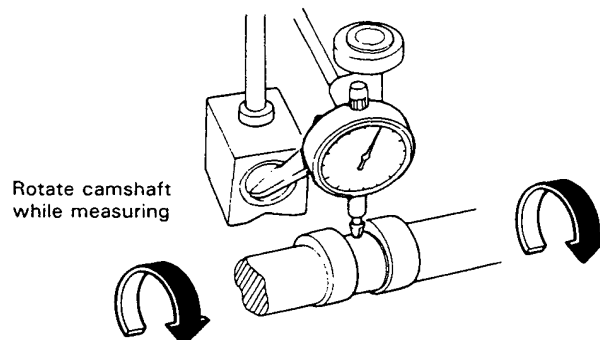
7. If camshaft-to-holder oil clearance is out of tolerance:

- And the camshaft has already been replaced, you must replace the cylinder head.
- If camshaft has not been replaced, first check total runout with the camshaft supported on V-blocks.

Camshaft Total Runout:

Standard (New): 0.03 mm (0.001 in) max.

Service Limit: 0.04 mm (0.002 in)

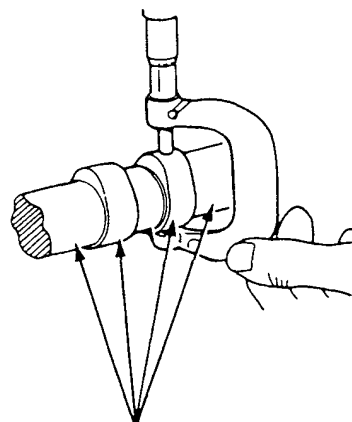


- If the total runout of the camshaft is within tolerance, replace the cylinder head.
- If the total runout is out of tolerance, replace the camshaft and recheck. If the oil clearance is still out of tolerance, replace the cylinder head.

8. Measure camshaft lobe height.

Intake Standard: 33.661 mm (1.3252 in)

Exhaust Standard: 33.725 mm (1.3278 in)



Inspect this area for wear.

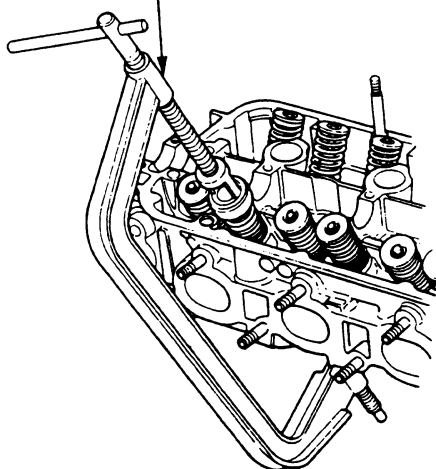
Valves, Valve Springs and Valve Seals

Removal

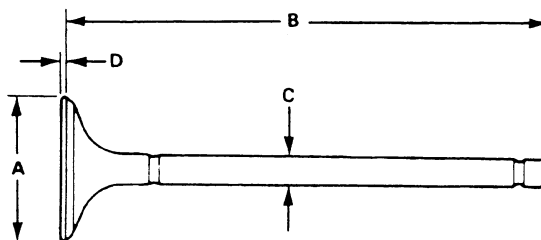
NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Tap each valve stem with a plastic mallet to loosen valve keepers before installing the spring compressor.
2. Install the spring compressor. Compress spring and remove valve keeper.

VALVE SPRING COMPRESSOR
07757-0010000



3. Install the special tools as shown.
4. Remove the valve guide seal.



Intake Valve Dimensions

- A Standard (New): 33.90–34.10 mm
(1.335–1.343 in)
B Standard (New): 102.50–102.80 mm
(4.035–4.047 in)
C Standard (New): 6.580–6.590 mm
(0.2591–0.2594 in)
C Service Limit: 6.55 mm (0.258 in)
D Standard (New): 0.85–1.15 mm
(0.033–0.045 in)
D Service Limit: 0.65 mm (0.026 in)

Exhaust Valve Dimensions

- A Standard (New): 28.90–29.10 mm
(1.138–1.146 in)
B Standard (New): 101.40–101.70 mm
(3.992–4.004 in)
C Standard (New): 6.550–6.560 mm
(0.2579–0.2583 in)
C Service Limit: 6.52 mm (0.257 in)
D Standard (New): 1.05–1.35 mm
(0.041–0.053 in)
D Service Limit: 0.85 mm (0.033 in)

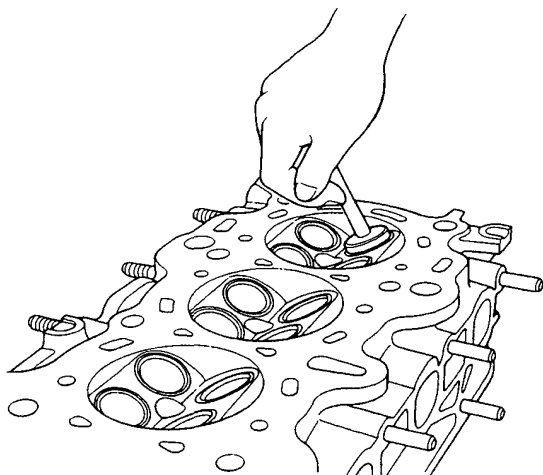


Valve Seats

Reconditioning

1. Renew the valve seats in the cylinder head using a valve seat cutter.

NOTE: If guides are worn (see page 6-14), replace them (see page 6-15) before cutting the valve seats.

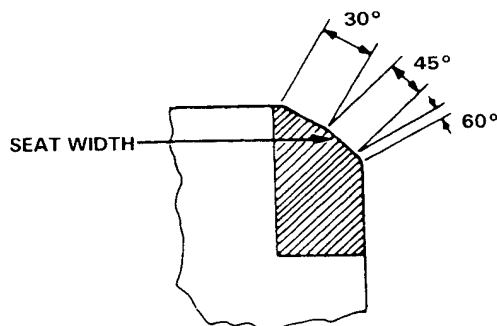


2. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
3. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check width of seat and adjust accordingly.
4. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

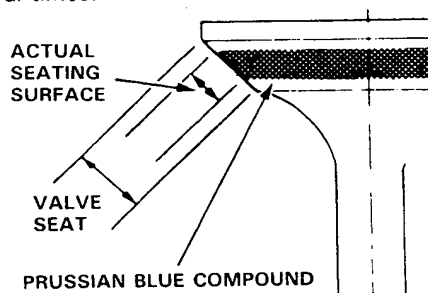
Valve Seat Width (Intake and exhaust):

Standard: 1.25–1.55 mm
(0.049–0.061 in)

Service Limit: 2.0 mm (0.08 in)



5. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue compound to the valve face, and insert valve in original location in the head, then lift it and snap it closed against the seat several times.



6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.
 - If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
 - If it is too low (close to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

NOTE: The final cut should always be made with the 45° cutter.

7. Insert intake and exhaust valves in the head and measure valve stem installed height.

Intake Valve Stem Installed Height:

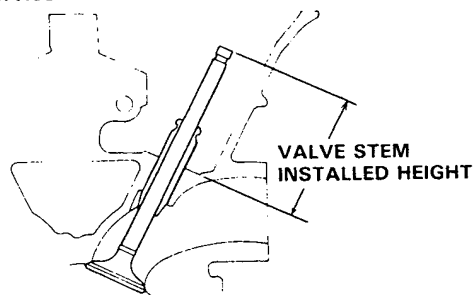
Standard (New): 39.365–39.835 mm
(1.5498–1.5683 in)

Service Limit: 40.085 (1.5781 in)

Exhaust Valve Stem Installed Height:

Standard (New): 39.165–39.635 mm
(1.5419–1.5604 in)

Service Limit: 39.885 mm (1.5703 in)



8. If valve stem installed height is over the service limit, replace valve and recheck. If still over the service limit, replace cylinder head; the valve seat in the head is too deep.

Cylinder Head

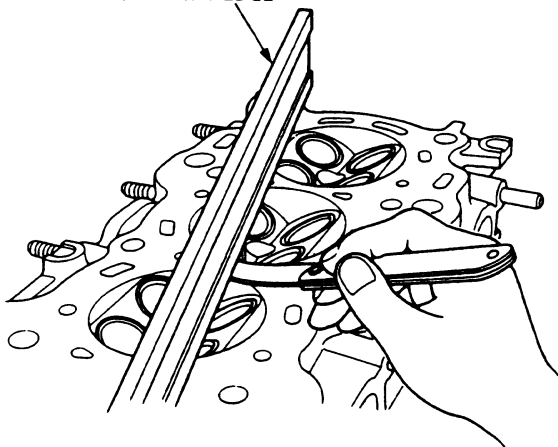
Warpage

NOTE: If camshaft-to-holder oil clearances (see page 6-11) are not within specification, the cylinder head cannot be resurfaced.

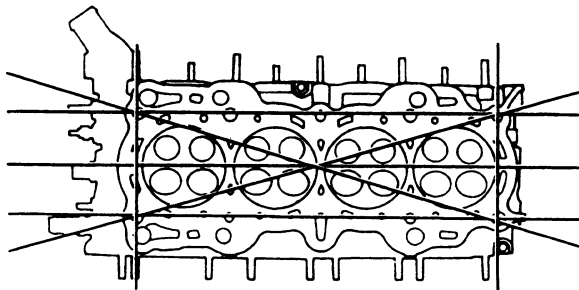
If camshaft-to-holder oil clearances are within specifications, check the cylinder head for warpage.

- If warpage is less than 0.05 mm (0.002 in) cylinder head resurfacing is not required.
- If warpage is between 0.05 mm (0.002 in) and 0.2 mm (0.008 in), resurface cylinder head.
- Maximum resurface limit is 0.2 mm (0.008 in) based on a height of 132.0 mm (5.20 in)

PRECISION STRAIGHT EDGE



Measure along edges, and 3 ways across center.



Cylinder Head Height:

Standard (New): 131.95–132.05 mm
(5.195–5.199 in)

Valve Guides

Valve Movement

Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

Intake Valve Stem-to-Guide Clearance:

Standard (New): 0.04–0.10 mm
(0.002–0.004 in)

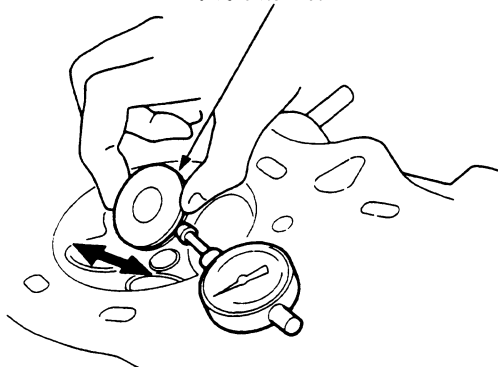
Service Limit: 0.16 mm (0.006 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.10–0.16 mm
(0.004–0.006 in)

Service Limit: 0.22 mm (0.009 in)

Valve extended 10 mm out from seat.



- If measurement exceeds the service limit, recheck using a new valve.
- If measurement is now within the service limit, reassemble using a new valve.
- If measurement still exceeds limit, recheck using alternate method below, then replace valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge.

Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

Intake Valve Stem-to-Guide Clearance:

Standard (New): 0.02–0.05 mm
(0.001–0.002 in)

Service Limit: 0.08 mm (0.003 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.05–0.08 mm
(0.002–0.003 in)

Service Limit: 0.11 mm (0.004 in)



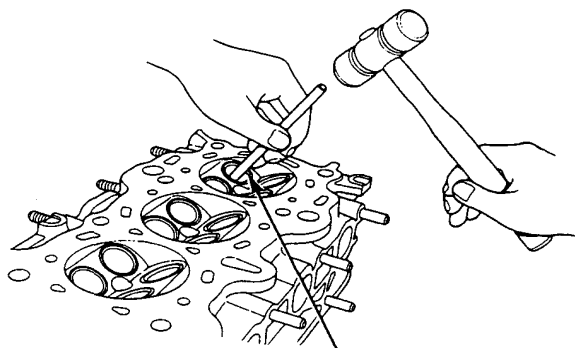
Replacement

NOTE:

- For best results, heat cylinder head to 150 °C (300 °F) before removing or installing guides.
- It may be necessary to use an air hammer to guides. Remove some valve guides.

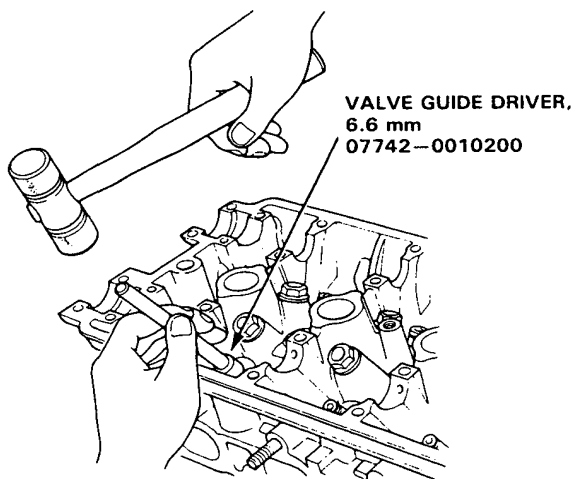
CAUTION: To avoid burns, use heavy gloves when handling heated cylinder head.

1. Drive the valve guide out from the bottom of the cylinder head.



VALVE GUIDE DRIVER,
6.6 mm
07742-0010200

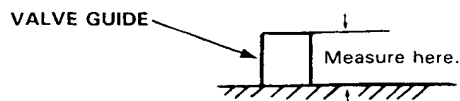
2. Drive in a new valve guide to the specified depth.



VALVE GUIDE DRIVER,
6.6 mm
07742-0010200

Valve Guide Installed Height:

Intake: 13.25–13.75 mm (0.522–0.541 in)
Exhaust: 13.75–14.25 mm (0.541–0.561 in)



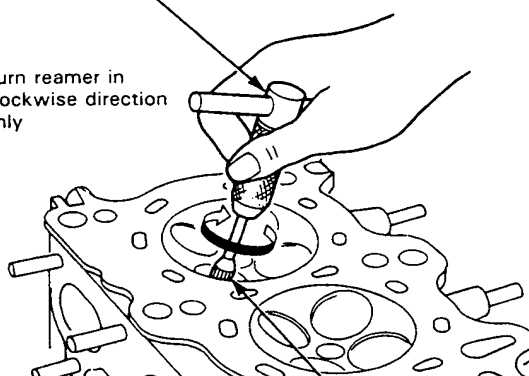
Reaming

NOTE: For new valve guides only.

1. Coat both reamer and valve guide with cutting oil.
2. Rotate the reamer clockwise the full length of the valve guide bore.
3. Continue to rotate the reamer clockwise while removing it from the bore.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check clearance with a valve (see page 6-14).
 - Verify that the valve slides in the intake and exhaust valve guides without exerting pressure.

REAMER HANDLE

Turn reamer in
clockwise direction
only

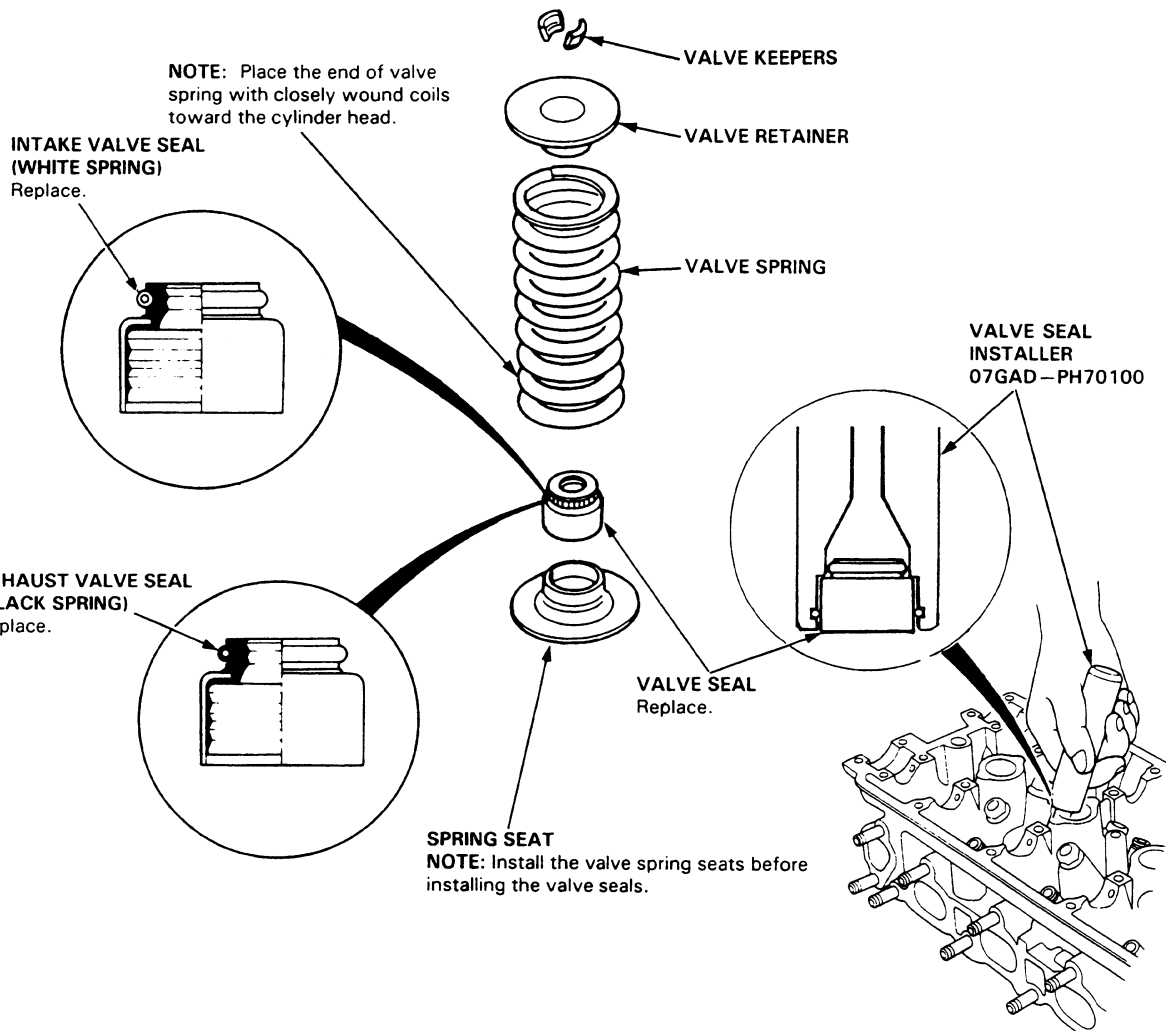


VALVE GUIDE REAMER, 6.6 mm
07984-6570101

Valves, Valve Springs and Valve Seals

Installation Sequence

NOTE: Exhaust and intake valve seals are NOT interchangeable.

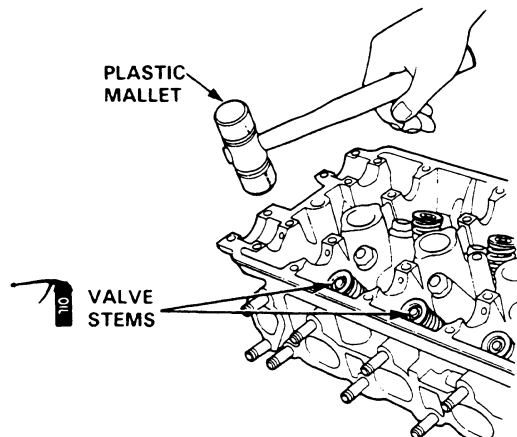


Valve Installation

When installing valves in cylinder head, coat valve stems with oil before inserting into valve guides, and make sure valves move up and down smoothly.

When valves and springs are in place, lightly tap the end of each valve stem two or three times with a plastic mallet to ensure proper seating of valve and valve keepers.

NOTE: Tap the valve stem only along its axis so you do not bend the stem.





Cylinder Head

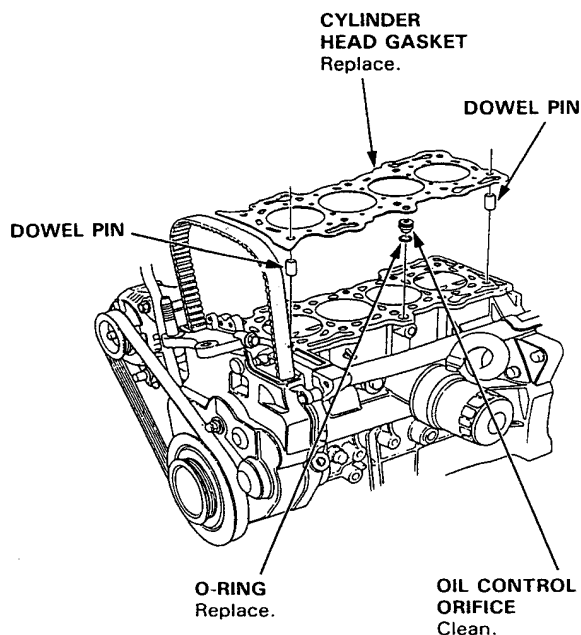
Installation

Install the cylinder head in the reverse order of removal:

NOTE:

- Always use a new head gasket.
- Cylinder head and engine block surface must be clean.
- "UP" marks on camshaft pulleys should be at the top.
- Turn the crankshaft so the No. 1 piston is at TDC (see page 6-23).
- Clean the oil control orifice before installing.

1. Cylinder head dowel pins and oil control orifice must be aligned.



2. Tighten the cylinder head bolts sequentially in three steps.

1st step torque: 40 N·m (4.0 kg-m, 29 lb-ft)

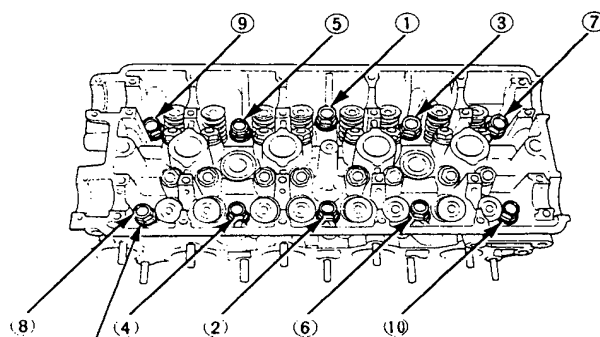
2nd step torque: 70 N·m (7.0 kg-m, 51 lb-ft)

3rd step torque: 100 N·m (10.0 kg-m, 72 lb-ft)

NOTE:

- We recommend using a beam-type torque wrench. When using a preset-type torque wrench, be sure to tighten slowly and not to overtighten.
- If a bolt makes any noise while you are torquing it, loosen the bolt and retighten it from the 1st step.

CYLINDER HEAD BOLTS TORQUE SEQUENCE



CYLINDER HEAD BOLTS

12 x 1.25 mm

100 N·m (10.0 kg-m, 72 lb-ft)

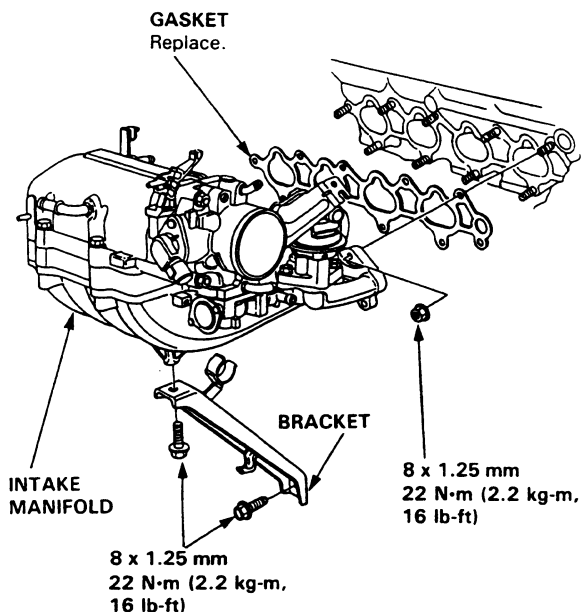
Apply engine oil bolt threads
and under bolt heads.

(cont'd)

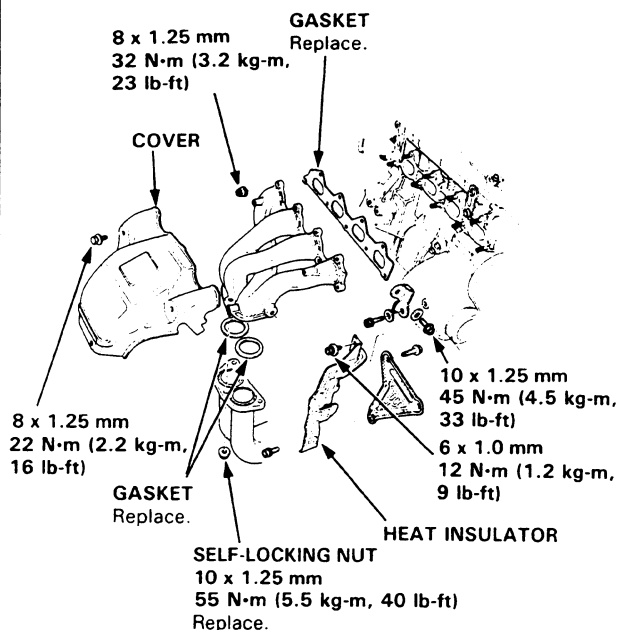
Cylinder Head

Installation (cont'd)

3. Install the intake manifold and tighten the nuts in a crisscross pattern in 2 or 3 steps, beginning with the inner nuts.



4. Install the exhaust manifold and bracket. Tighten the nuts in a crisscross pattern in 2 or 3 steps, beginning with the inner nuts.



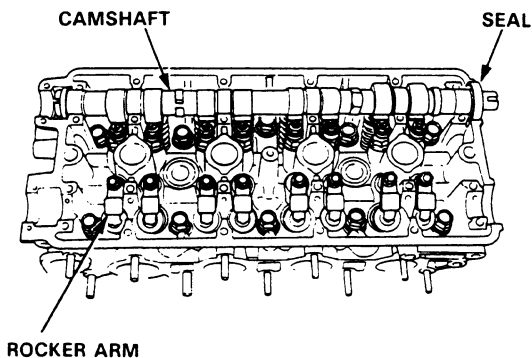
Rocker Arms/Camshafts and Seals/Pulleys

Installation

CAUTION:

- Make sure that the keyways on the camshafts are facing up. (No. 1 piston TDC).
- Valve locknuts should be loosened and before screws backed off before installation.
- Replace the rocker arms in their original positions.

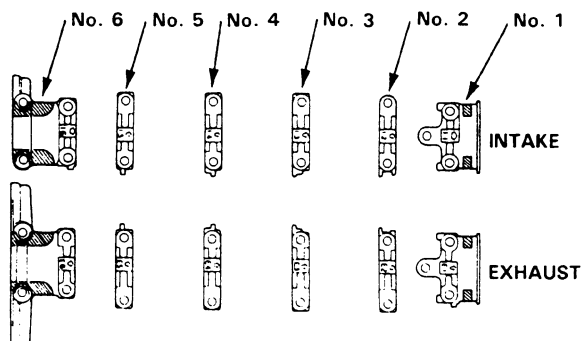
1. Place the rocker arms on the pivot bolts and the valve stems.
2. Install the camshafts and seals with the open side (spring) facing in.



3. Apply liquid gasket to the head mating surfaces of the No.1 and No. 6 camshaft holders, then install them, along with No. 2, 3, 4 and 5.

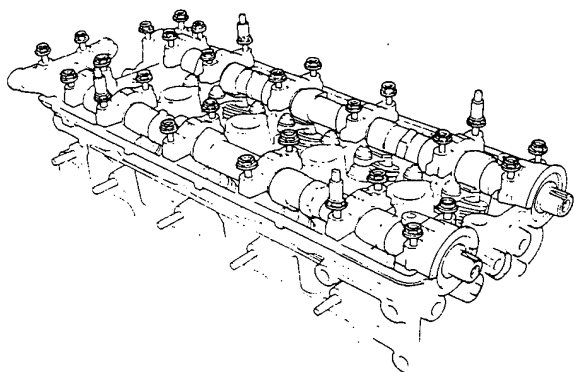
NOTE:

- "I" or "E" marks are stamped on the camshaft holders.
- Do not apply oil to the holder mating surface of seals.
- Apply liquid gasket to the shaded areas.
- The arrows marked on the camshaft holders should point toward the timing belt.

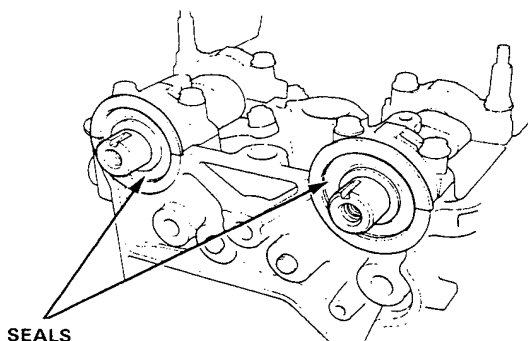




4. Tighten the camshaft holders temporarily.
 - Make sure that the rocker arms are properly positioned on the valve stems.



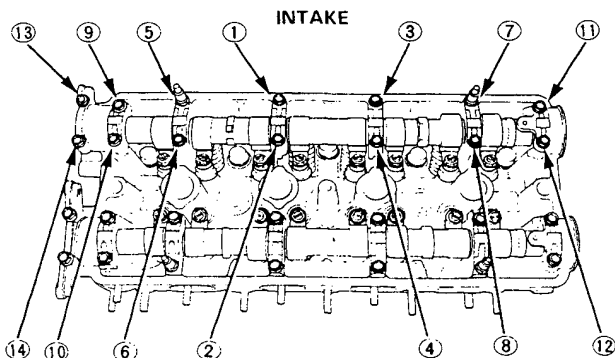
5. Press in the seals securely.



6. Tighten each bolt in two steps to ensure that the rockers do not bind on the valves.

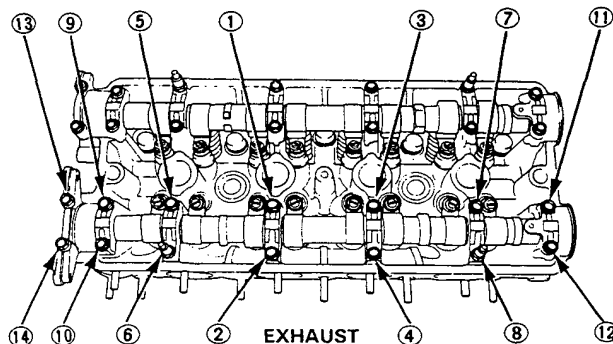
Specified Torque: Intake

Except ⑤, ⑦: 10 N·m (1.0 kg-m, 7 lb-ft)
 ⑤, ⑦: 12 N·m (1.2 kg-m, 9 lb-ft)



Specified Torque: Exhaust

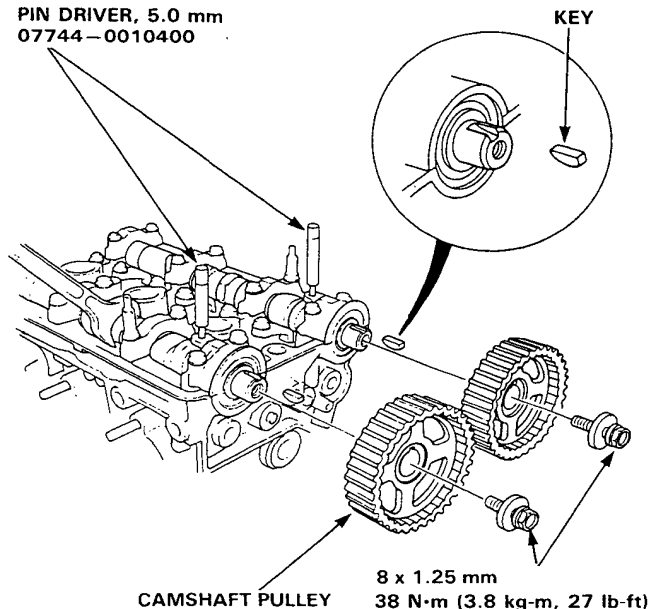
Except ⑥, ⑧: 10 N·m (1.0 kg-m, 7 lb-ft)
 ⑥, ⑧: 12 N·m (1.2 kg-m, 9 lb-ft)



7. Install the back cover.
8. Install keys into camshaft grooves.

NOTE: To set the camshafts at TDC position for No. 1 piston, align the holes in the camshafts with the holes in No. 1 camshaft holders and insert 5.0 mm pin driver in the holes.

PIN DRIVER, 5.0 mm
 07744-0010400



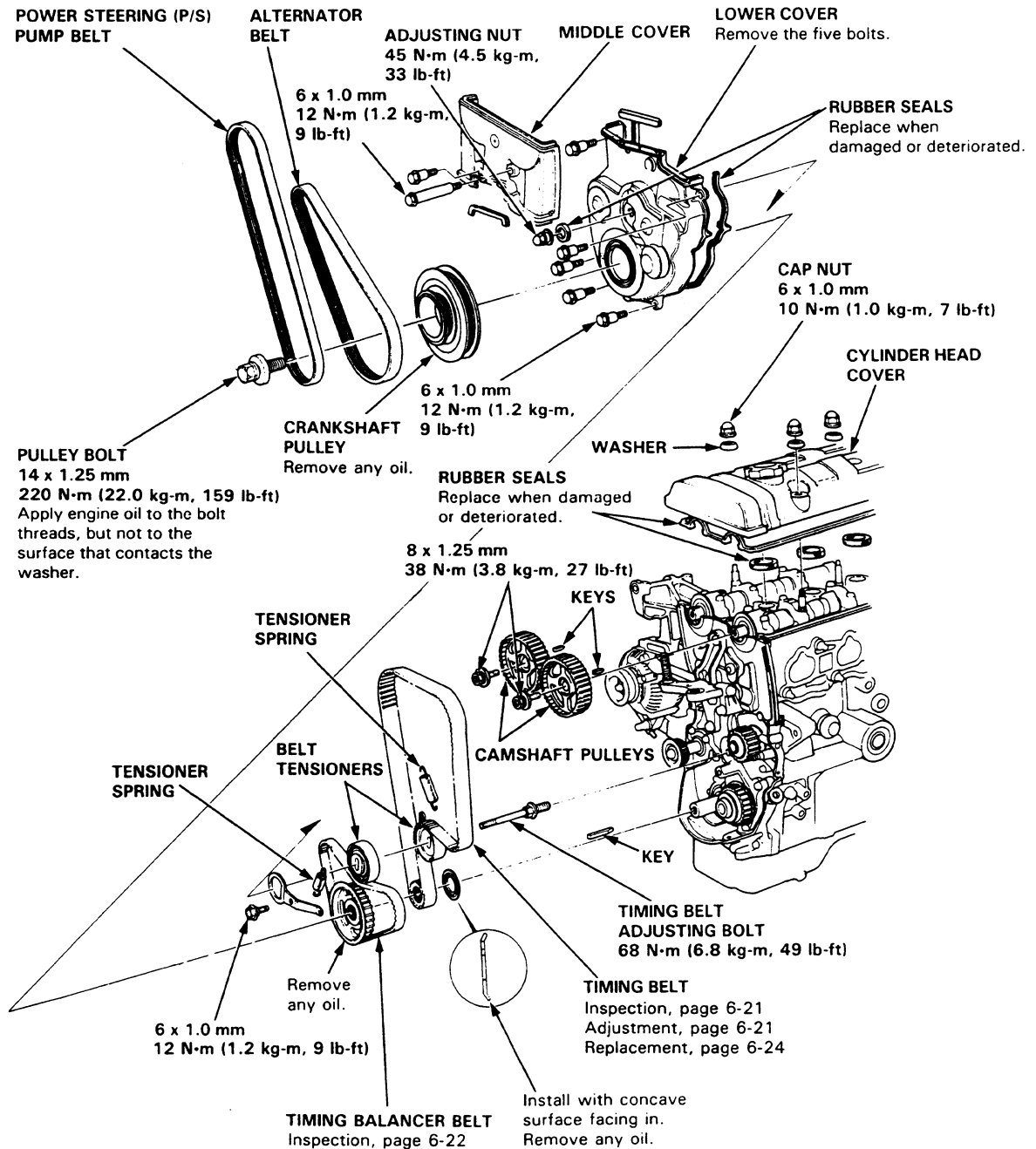
9. Push camshaft pulleys onto camshafts, then tighten the retaining bolts to the torque specified.
10. Adjust the valve clearance (see page 6-29).
11. After installation, check that the all tubes, hoses and connectors are installed correctly.

Timing Belt and Timing Balancer Belt

Illustrated Index

NOTE:

- Refer to page 6-23 for positioning crankshaft and pulley before installing timing belt.
- Before removing, mark direction of rotation on each belt.





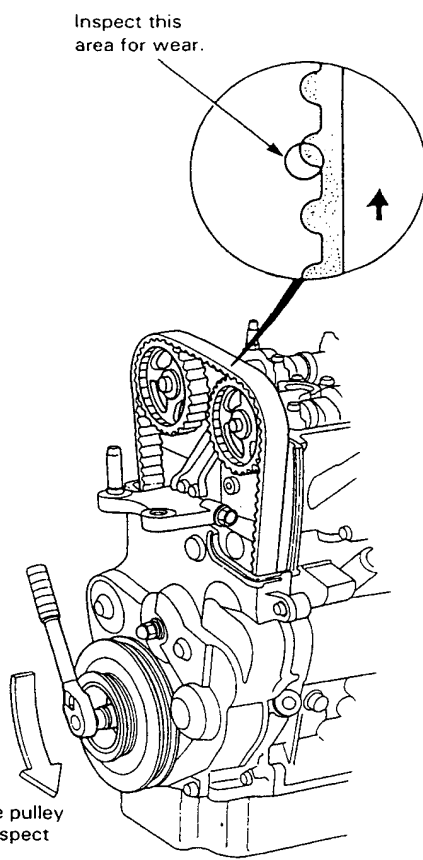
Timing Belt

Inspection

1. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
2. Remove the cylinder head cover.
3. Remove the middle cover.
4. Inspect the timing belt for cracks and oil or coolant soaking.

NOTE:

- Replace the belt if oil or coolant soaked.
- Remove any oil or solvent that gets on the belt.



5. After inspecting, retorque the crankshaft pulley bolt to 220 N·m (22.0 kg-m, 159 lb-ft).

Tension Adjustment

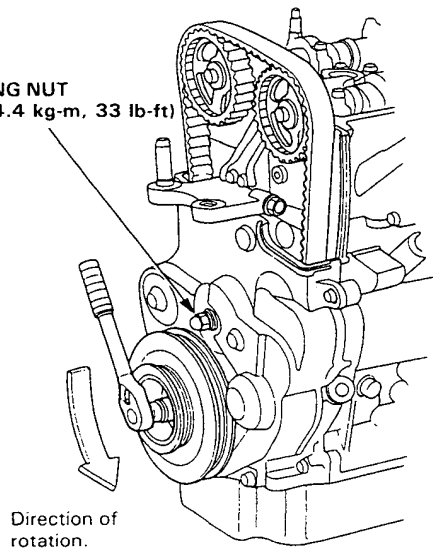
CAUTION: Always adjust timing belt tension with the engine cold.

NOTE:

- The tensioner is spring-loaded to apply proper tension to the belt automatically after making the following adjustment.
- Always rotate the crankshaft counterclockwise when viewed from the pulley side. Rotating it clockwise may result in improper adjustment of the belt tension.
- Inspect the timing balancer belt before adjusting the belt tension.
- Do not loosen the adjusting nut more than one full turn.

1. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
2. Remove the cylinder head cover.
3. Set the No. 1 piston at TDC (see page 6-23).
4. Loosen the adjusting nut 2/3-1 turn, then tighten it.

ADJUSTING NUT
45 N·m (4.4 kg-m, 33 lb-ft)



5. Rotate the crankshaft counterclockwise 3-teeth on the camshaft pulley, then retighten the adjusting nut to create tension on the timing belt.
6. Tighten the adjusting nut.
7. After adjusting, retorque the crankshaft pulley bolt to 220 N·m (22.0 kg-m, 159 lb-ft).

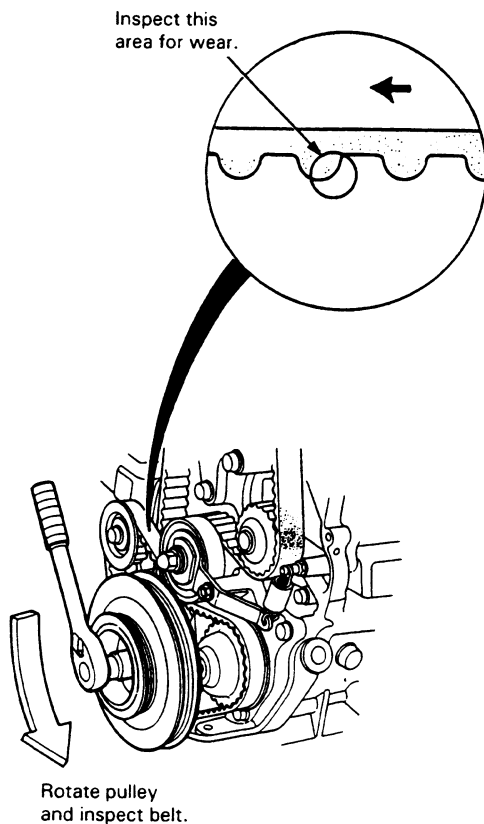
Timing Balancer Belt

Inspection

1. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
2. Remove the cylinder head cover.
3. Remove the middle cover.
4. Remove the crankshaft pulley.
5. Remove the lower cover.
6. Install the crankshaft pulley.
7. Inspect the timing balancer belt for cracks and oil or coolant soaking.

NOTE:

- Replace the belt if oil or coolant soaked.
- Remove any oil or solvent that gets on the belt.



8. After inspecting, retorque the crankshaft pulley bolt to 220 N·m (22.0 kg-m, 159 lb-ft).

NOTE: Refer to page 6-27 for timing balancer belt tension adjustment.



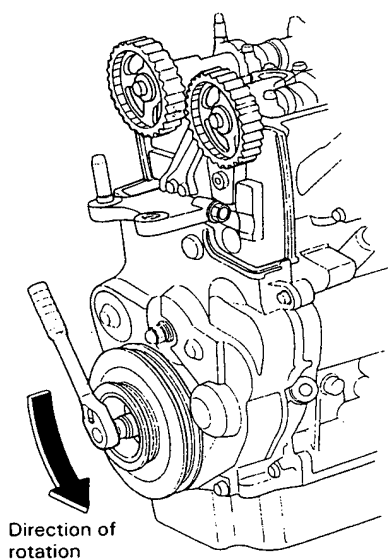
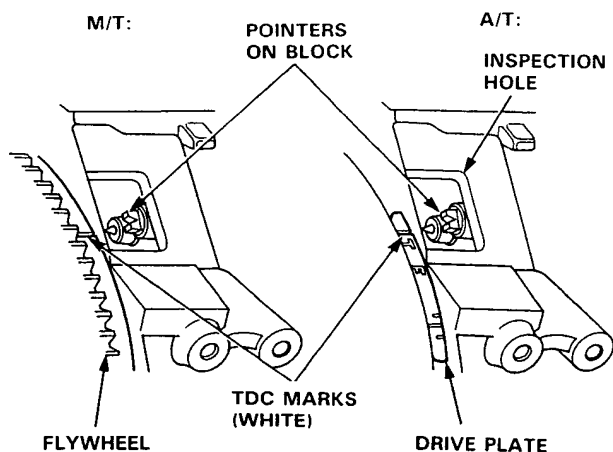
Timing Belt

Positioning Crankshaft Before Installing Timing Belt

NOTE:

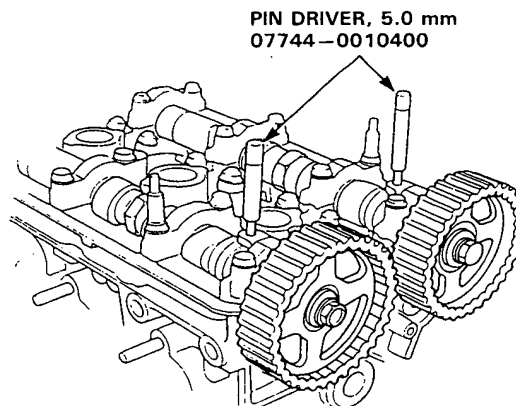
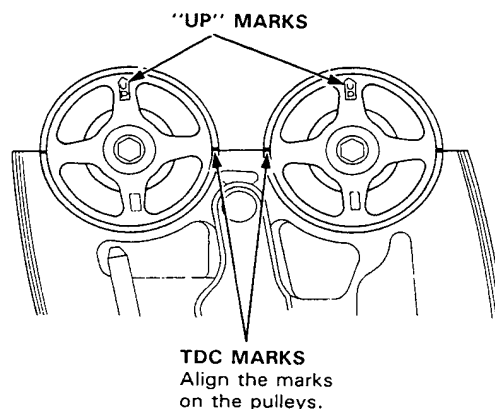
- Install the timing belt with the No. 1 piston at TDC.
- After installing, retorque the crankshaft pulley bolt to 220 N·m (22.0 kg-m, 159 lb-ft).

CRANKSHAFT TDC POSITION:



NOTE: When turning the crankshaft with a socket wrench, install the crankshaft pulley and the pulley bolt.

CAMSHAFT TDC POSITION:



CAUTION: Remove the pin driver after installing the timing belt.

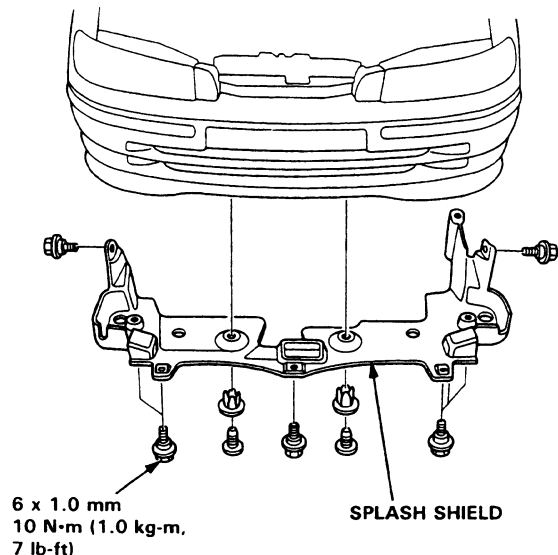
Timing Belt and Timing Balancer Belt

Replacement

CAUTION: Inspect the water pump when replacing the timing belt.

NOTE: Turn the crankshaft so that the No. 1 piston is at TDC (see page 6-23).

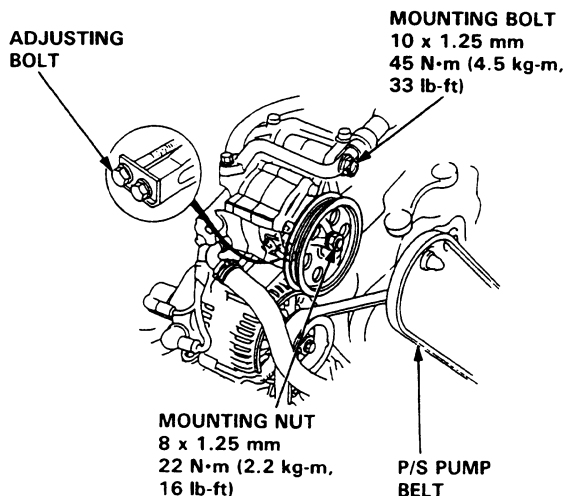
1. Remove the splash shield.



2. Loosen the adjusting bolt and mounting bolt/nut then remove the power steering (P/S) pump belt.

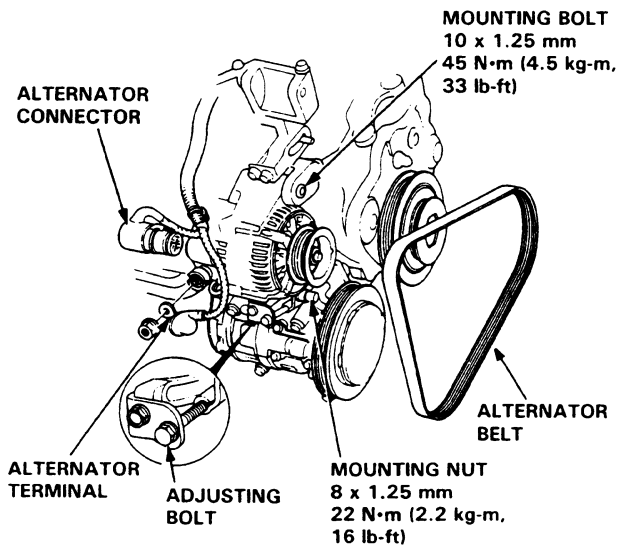
NOTE:

- Do not disconnect the P/S pipe and hose.
- After installing, adjust the tension of the P/S pump belt.



3. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
4. Loosen the mounting bolt/nut and the adjusting bolt then remove the alternator belt.

NOTE: After installing, adjust the tension of the alternator belt.



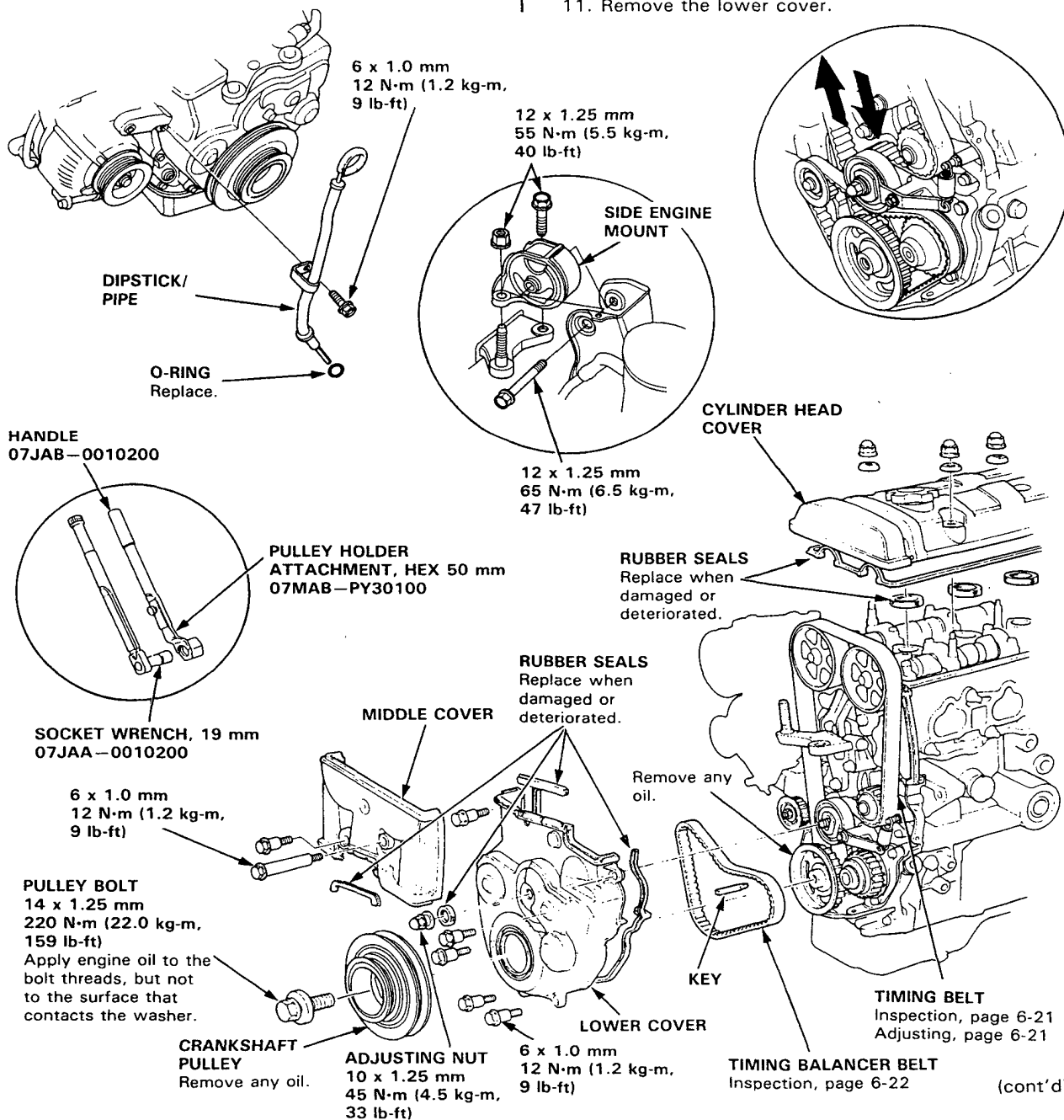


5. Remove the cylinder head cover.
6. Remove the middle cover.
7. Remove the side engine mount.
8. Remove the dipstick and the pipe.

9. Remove the pulley bolt and the crankshaft pulley. Remove the two rear bolts from the center beam to allow the engine to drop down and give clearance to remove the lower cover.

10. Remove the rubber seal around the adjusting nut. Do not loosen the adjusting nut.

11. Remove the lower cover.



(cont'd)

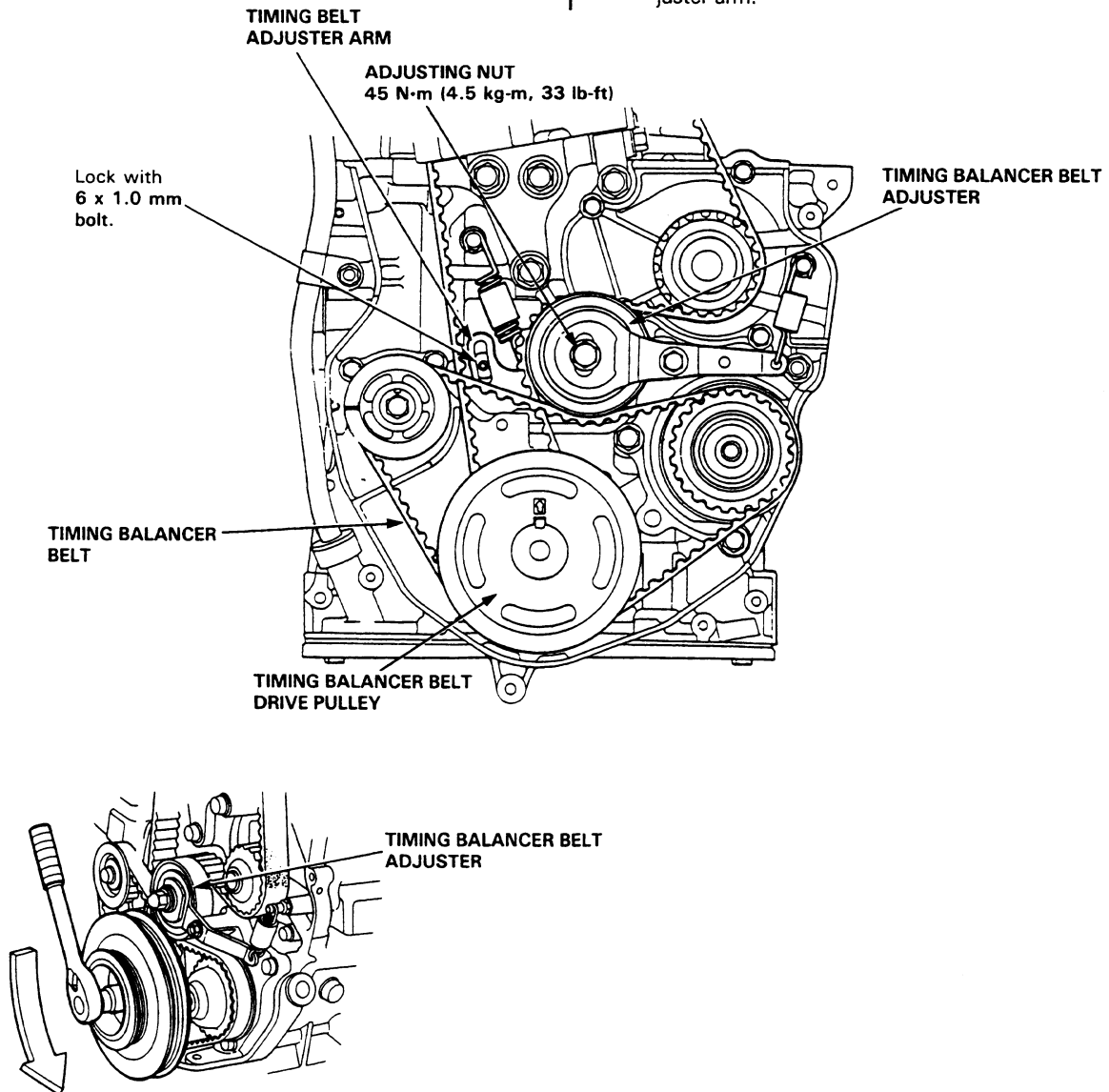
Timing Belt and Timing Balancer Belt

Replacement (cont'd)

12. Lock the timing belt adjuster arm in place by installing one of the 6 x 1.0 mm lower cover mounting bolts.
13. Loosen the timing belt adjusting nut. Push on the pulley to remove tension from the timing balancer belt, then tighten the adjusting nut.
14. Remove the timing balancer belt.

NOTE: If you are removing only the timing balancer belt, go to step 20. If you are removing both belts, continue with this procedure.

15. Loosen 6 x 1.0 mm lock bolt and the adjusting nut. Push on the timing belt adjuster pulley to remove tension from the belt, then tighten the adjusting nut.
16. Remove the timing belt.
17. Install the timing belt in the reverse order of removal.
 - Before installing the timing belt, position the crankshaft and camshaft pulleys as shown on page 6-23.
18. Perform the timing belt tension adjustment (see page 6-21).
19. Tighten the 6 x 1.0 mm bolt to lock the timing belt adjuster arm.

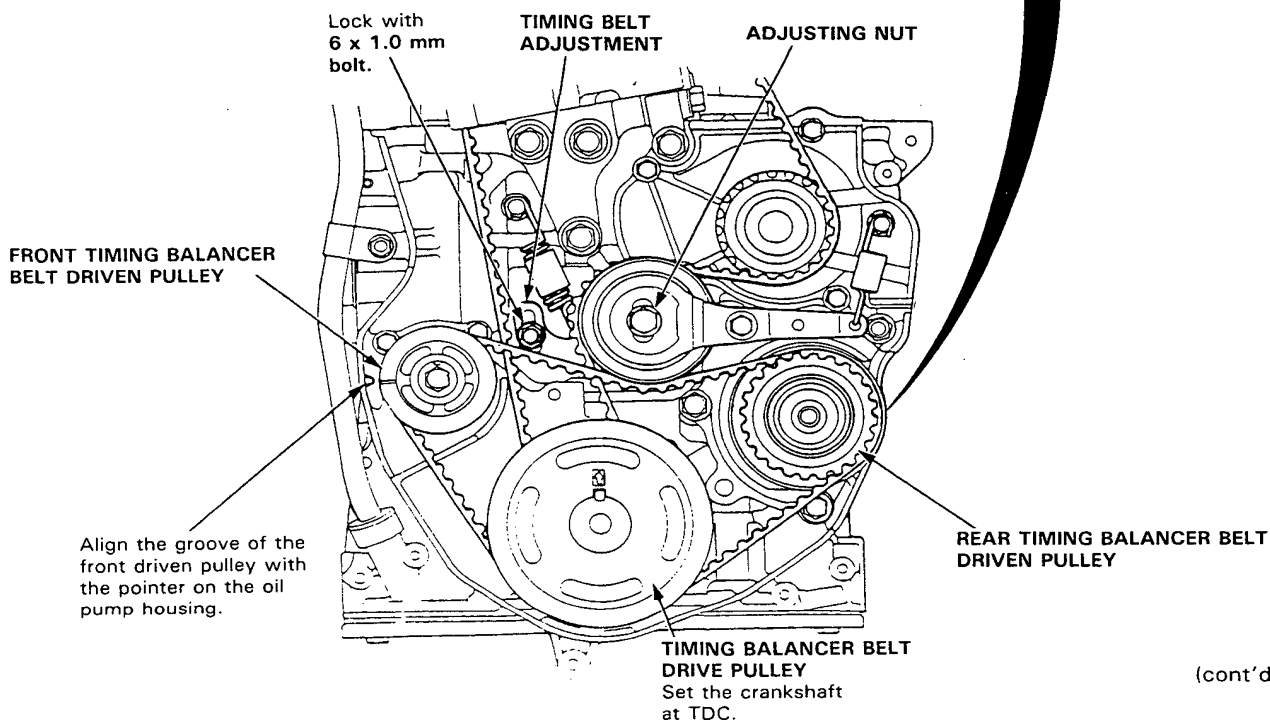
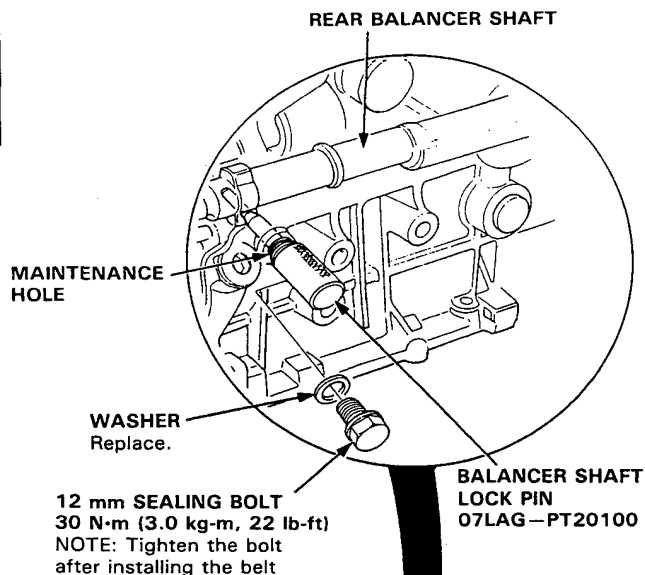
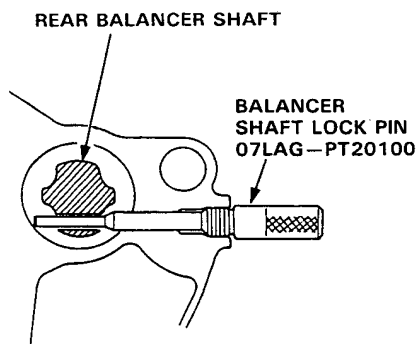




20. Make sure the crankshaft is positioned with the No. 1 piston at TDC.
21. Align the groove on the front balancer shaft pulley with the pointer on the oil pump housing as shown.
22. Align the rear timing balancer belt driven pulley by inserting the special tool through the maintenance hole.
23. Loosen the adjusting nut and verify that the timing balancer belt adjuster moves freely.
24. Install the timing balancer belt.

25. Turn the crankshaft pulley about one turn counter-clockwise, then tighten the adjusting nut to the specified torque.

NOTE: Both belt adjusters are spring-loaded to properly tension the belts. Do not apply any extra pressure to the pulleys or tensioners while performing the adjustment.



(cont'd)

Timing Belt and Timing Balancer Belt

Replacement (cont'd)

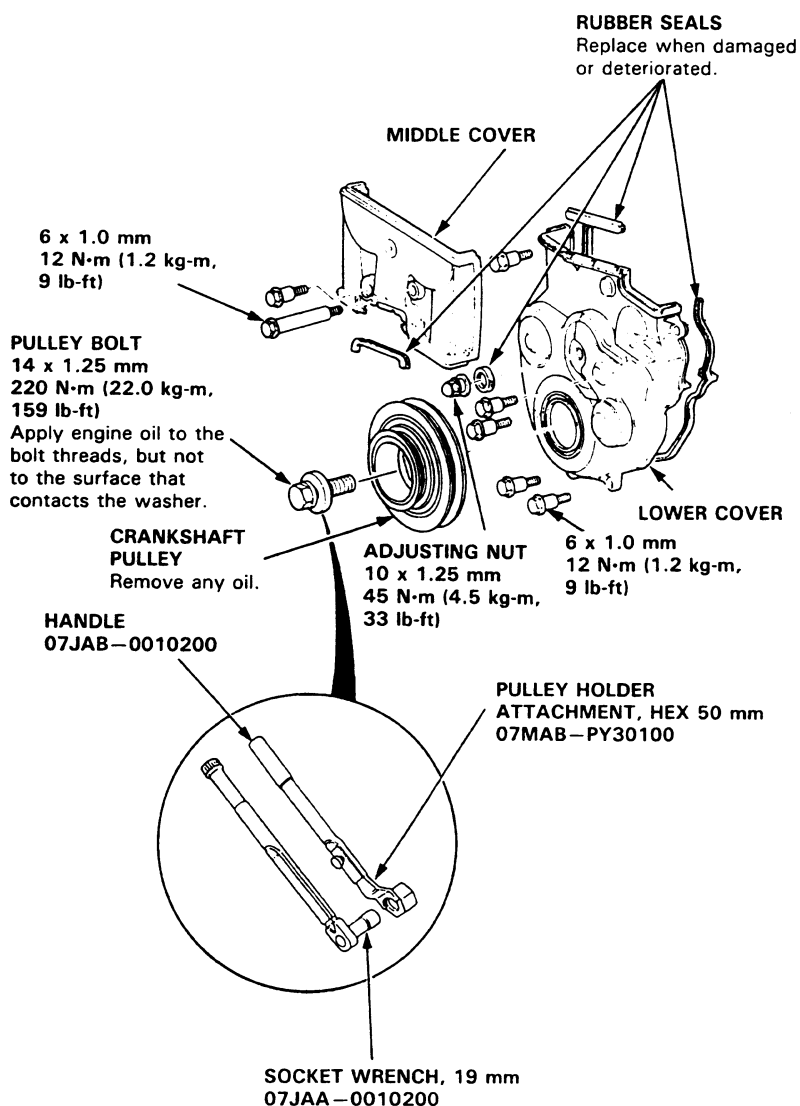
26. Remove the 6 x 1.0 mm bolt from the timing belt adjuster arm.
27. Remove the crankshaft pulley.
28. Install the lower cover.
29. Install a rubber seal around the adjusting nut. Do not loosen the nut.

30. Install the middle cover.

31. Install the crankshaft pulley.

32. Coat the threads and seating face of the pulley bolt with engine oil. Install and tighten to the specified torque.

Specified torque: 220 N·m (22.0 kg-m, 159 lb-ft)





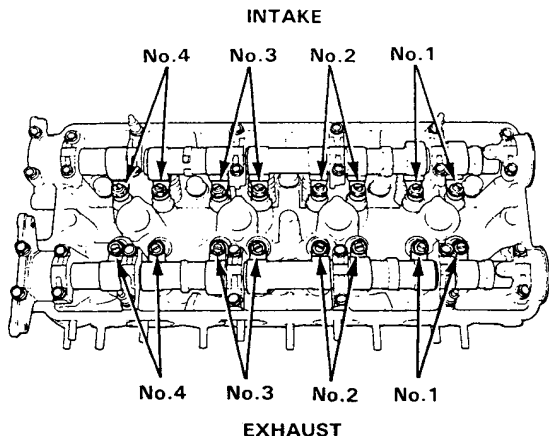
Valve Clearance

Adjustment

NOTE:

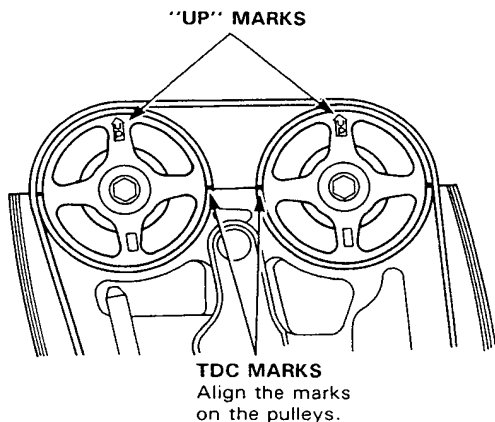
- Valves should be adjusted cold when the cylinder head temperature is less than 38°C (100°F).
- After adjusting, retorque the crankshaft pulley bolt to 220 N·m (22.0 kg-m, 159 lb-ft)

1. Remove the cylinder head cover.



2. Set No. 1 piston at TDC. "UP" marks on the camshaft pulleys should be at top, and TDC grooves on the camshaft pulleys should align with cylinder head surface.

Number 1 piston at TDC:



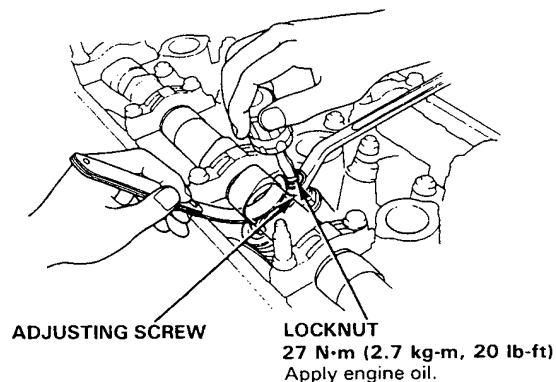
3. Adjust valves on No. 1 cylinder.

Valve Clearance:

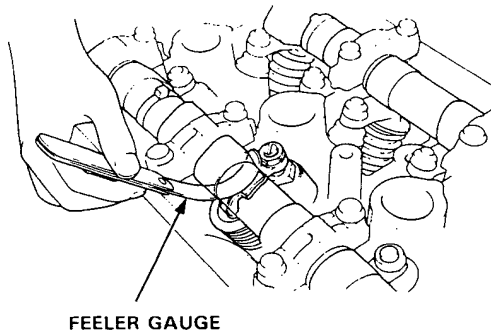
Intake: 0.07—0.11 mm (0.003—0.004 in)

Exhaust: 0.15—0.19 mm (0.006—0.007 in)

4. Loosen locknut and turn adjusting screw until feeler gauge slides back and forth with slight amount of drag.



5. Tighten the locknut and check clearance again. Repeat adjustment if necessary.



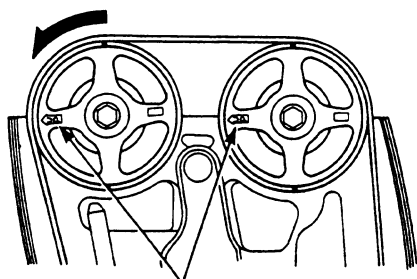
(cont'd)

Valve Clearance

Adjustment (cont'd)

6. Rotate crankshaft 180° counterclockwise (Camshaft pulleys turn 90°). The "UP" marks should be at exhaust side. Adjust valves on No. 3 cylinder.

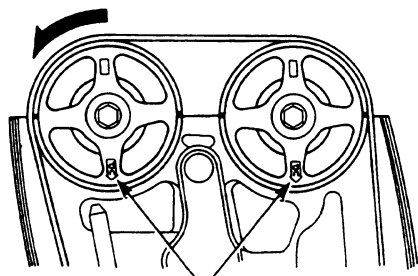
Number 3 piston at TDC:



"UP" MARKS

7. Rotate crankshaft 180° counterclockwise to bring No. 4 piston to TDC. The TDC grooves are once again aligned. Adjust valves on No. 4 cylinder.

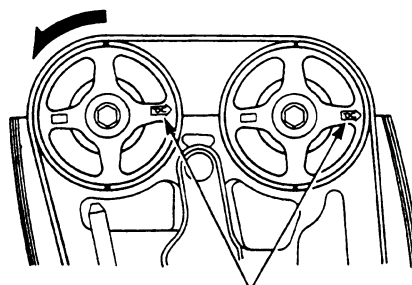
Number 4 piston at TDC:



"UP" MARKS

8. Rotate crankshaft 180° counterclockwise to bring No. 2 piston to TDC. The "UP" marks should be at intake side. Adjust valves on No. 2 cylinder.

Number 2 piston at TDC:



"UP" MARKS

Engine Block


Illustrated Index	7-2
Cylinder Block	
Bore Honing	7-5
Piston Rings	
Alignment	7-6

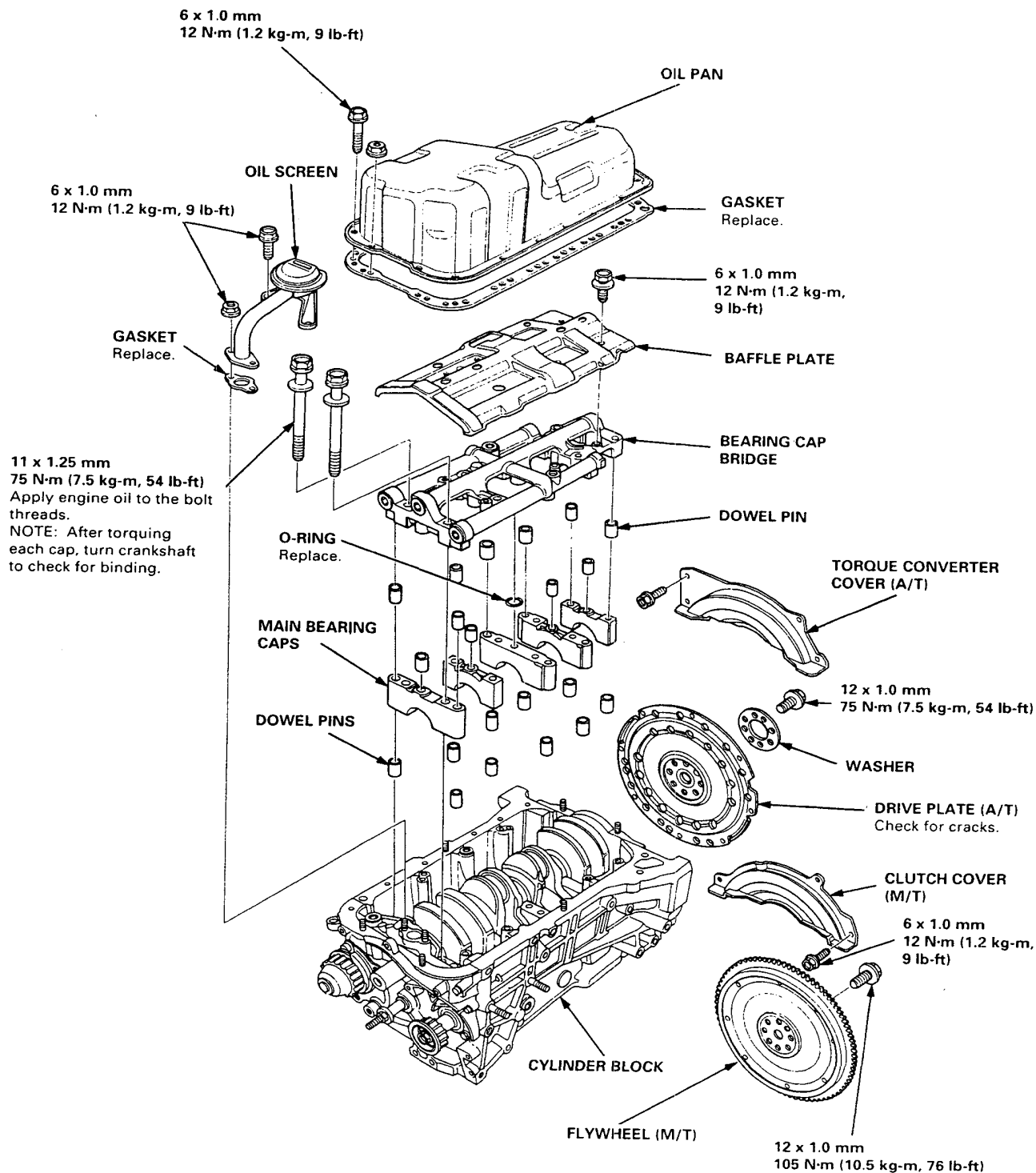


Outline of Model Change

- The H23A3 engine type has been added.

Illustrated Index

 Lubricate all internal parts with engine oil during reassembly.

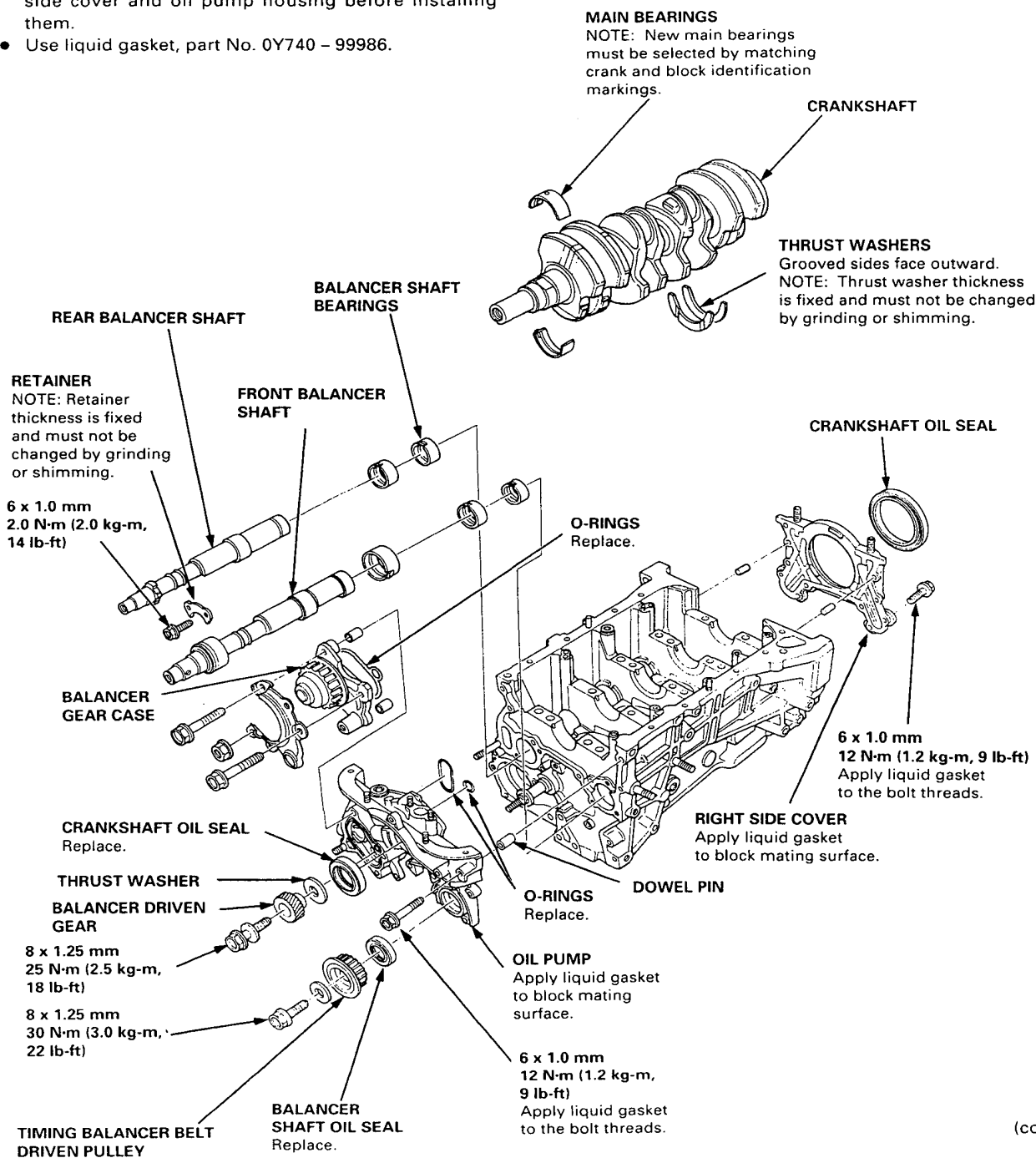




10 Lubricate all internal parts with engine oil during reassembly.

NOTE:

- Apply liquid gasket to the mating surfaces of the right side cover and oil pump housing before installing them.
- Use liquid gasket, part No. 0Y740 – 99986.



(cont'd)

Illustrated Index

(cont'd)

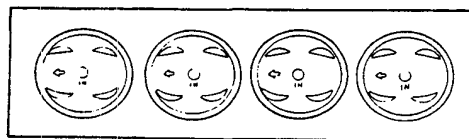


Lubricate all internal parts with engine oil during reassembly.

NOTE: New rod bearings must be selected by matching connecting rod and crankshaft identification markings.

PISTON INSTALLATION DIRECTION

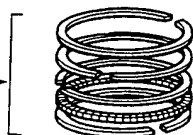
EXHAUST



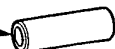
INTAKE

PISTON RINGS

Alignment, page 7-6



PISTON PIN

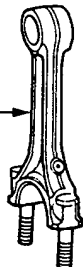


PISTON

NOTE: To maintain proper clearance, match the letter on the piston top with the letter for each cylinder stamped on the block.

On the piston top	On the block
No letter	A or I
B	B or il

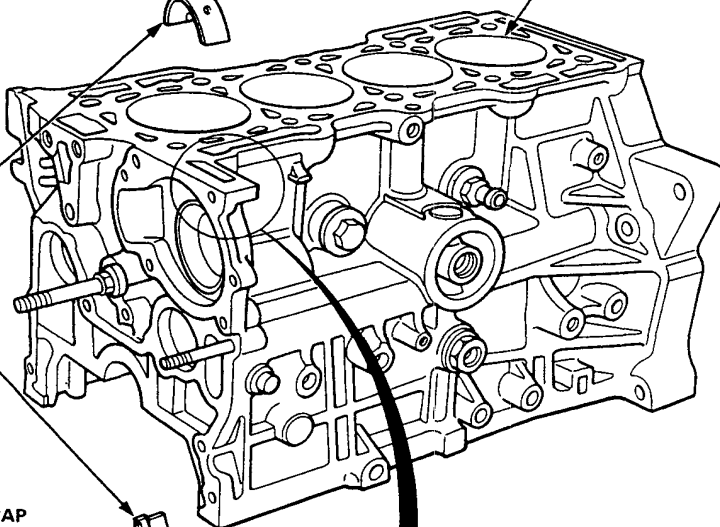
CONNECTING ROD



CYLINDER BLOCK

Cylinder bore honing, page 7-5
Inspect top of each cylinder bore for carbon build-up or ridge before removing piston.

CONNECTING ROD BEARINGS



CONNECTING ROD BEARING CAP

NOTE: Install cap so the bearing recess is on the same side as the recess in the rod.



CONNECTING ROD NUT

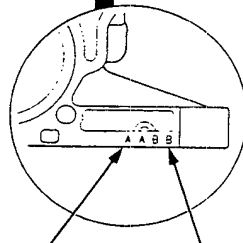
9 x 0.75 mm
47 N·m (4.7 kg·m, 34 lb·ft)
After torquing each bearing cap, rotate crankshaft to check for binding.

CYLINDER BORE SIZES

(A or I, B or il)

NOTE: To maintain proper piston clearance, match these letters with the letters on the pistons. The letters on the block read from left to right, No. 1 through No. 4 cylinders.

On the block	On the piston top
A or I	No letter
B or il	B



No. 1

No. 4



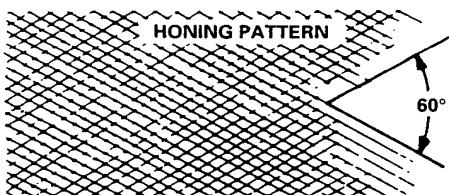
Cylinder Block

Bore Honing

CAUTION: This cylinder liner uses FRM (Fiber Reinforced Metal). Hone only as directed below.

1. Measure cylinder bores, if the block is to be reused, hone the cylinders and remeasure the bores.
2. To hone cylinder bores:
 - Use only a rigid hone.
 - Honing stone: GC – 600 – J or finer stone (for nonferrous metals)
 - Pressure: 200 – 300 kPa (2 – 3 kg/cm², 28 – 43 psi)
 - Honing rpm: 45 – 50 rpm
 - Honing thickness: Less than 0.02 mm (0.0008 in) Do not hone more than 20 cycles
 - Honing lubricant: Oil type
 - Roughness of finished surfaces: $\nabla\nabla\nabla$ or 1.2S
 - Honing pattern: 60 degree cross-hatch

CAUTION: Clean the honing stone every 5 cycles.

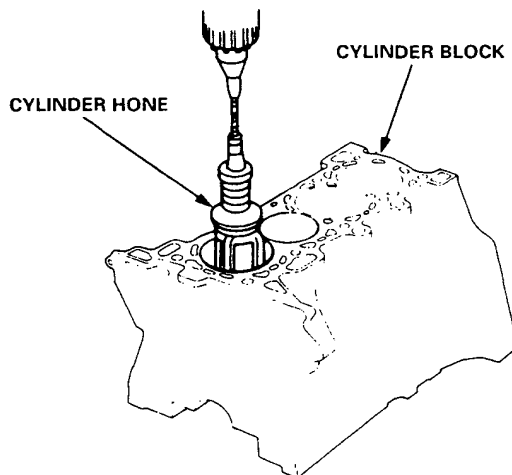


3. When honing is complete, thoroughly clean the cylinder block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil immediately to prevent rusting.

NOTE: Never use solvent, it will only redistribute the grit on the cylinder walls.

4. If scoring or scratches are still present in cylinder bores after honing to service limit, rebore the cylinder block.

NOTE: Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.



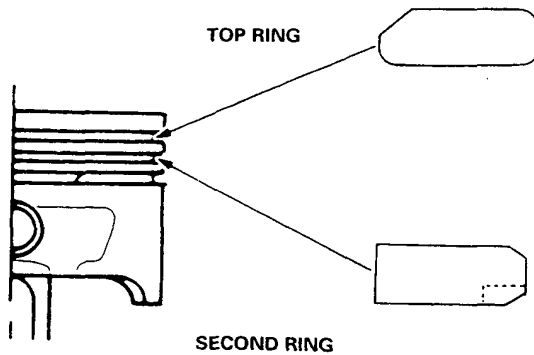
Piston Rings

Alignment

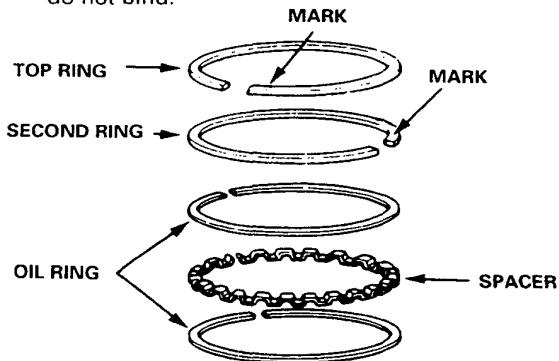
1. Install the rings as shown.

Identify top and second rings by the chamfer on the edge. Make sure they are in their proper grooves on the piston.

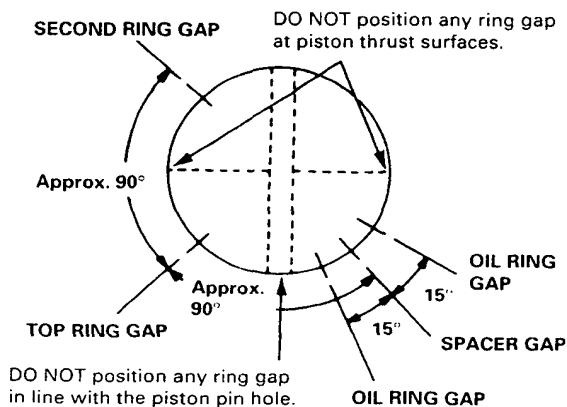
NOTE: The manufacturing marks must be facing upward.



2. Rotate the rings in their grooves to make sure they do not bind.



3. Position the ring end gaps as shown:



Engine Lubrication

Special Tools	8-2
Illustrated Index	8-3
Oil Filter	
Replacement	8-4
Oil Pressure	
Testing	8-7



Outline of Model Change

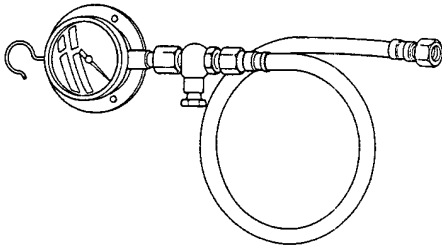
- The H23A3 engine type has been added.

Special Tools

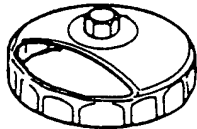
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07406 – 0030000	Oil Pressure Gauge Adapter	1	8-7
②	07506 – 3000000	Oil Pressure Gauge Set	1	8-7
③	07912 – 6110001	Oil Filter Wrench	1	8-4
④	—	RABINAL-Purflux 76	1	8-6



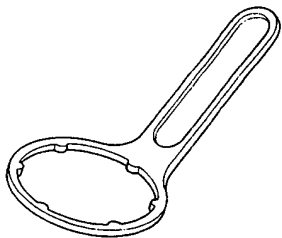
①



②



③



④

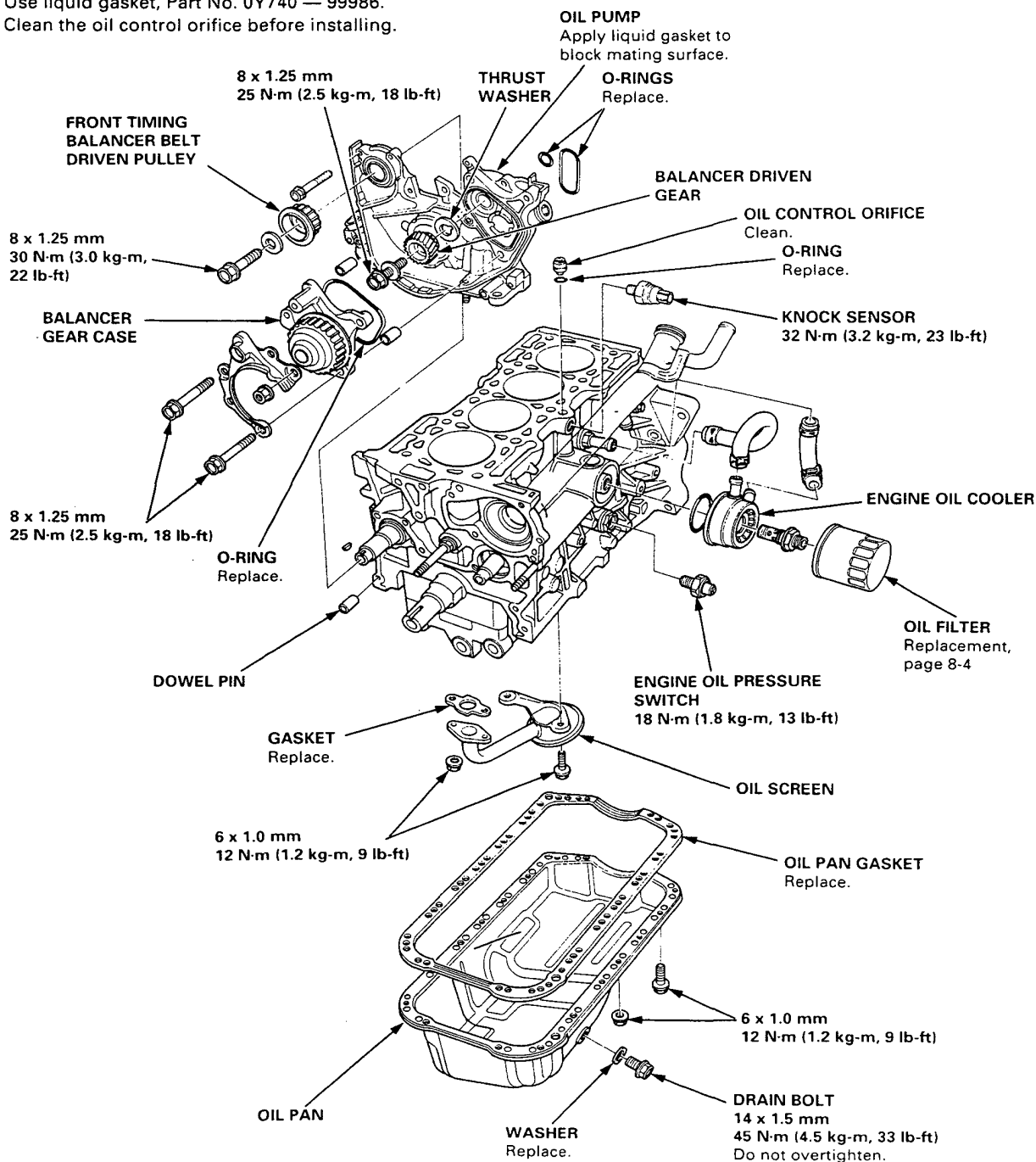
Illustrated Index



NOTE:

- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 0Y740 — 99986.
- Clean the oil control orifice before installing.

CAUTION: Do not overtighten the drain bolt.



Oil Filter

Replacement

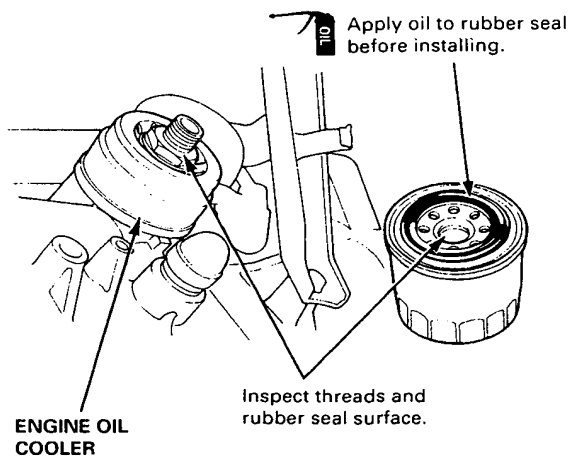
JAPAN-MADE oil filter:

⚠ WARNING

- After the engine has been run, the exhaust pipe will be hot; be careful when working around the exhaust pipe.
- Be careful when loosening the drain bolt while the engine is hot. Burns can result because the oil temperature is very high.

1. Remove the oil filter with the special oil filter wrench.
2. Inspect the threads and rubber seal on the new filter. Wipe off seat on engine block, then apply a light coat of oil to the filter rubber seal.

NOTE: Use only filters with a built-in bypass system.



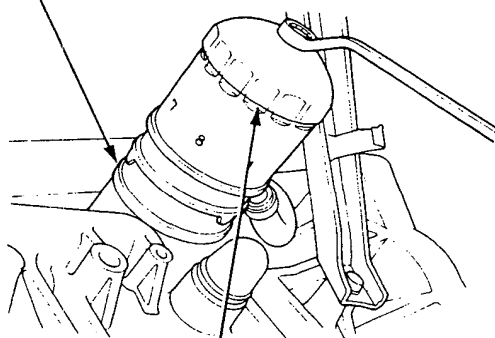
3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

Tighten: 7/8 turn clockwise.

Tightening torque: 22 N·m (2.2 kg-m, 16 lb-ft)

CAUTION: Installation using other than the above procedure could result in serious engine damage due to oil leakage.

ENGINE OIL COOLER



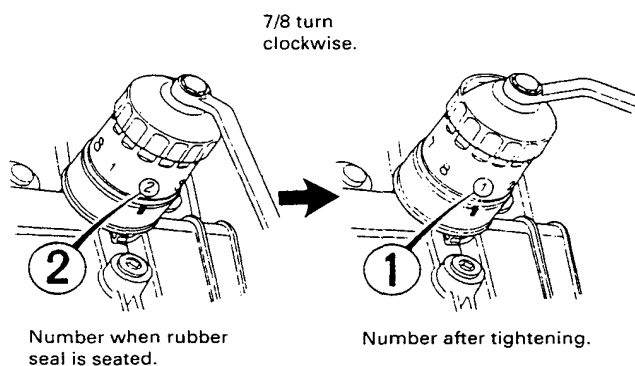
OIL FILTER WRENCH
07912 - 6110001



Eight numbers (1 to 8) are printed on the surface of the filter.

The following explains the procedure for tightening filters using these numbers.

- 1) Make a mark on the engine oil cooler under the number that shows at the bottom of the filter when the rubber seal is seated.
- 2) Tighten the filter by turning it clockwise seven numbers from the marked point. For example, if a mark is made under the number 2 when the rubber seal is seated, the filter should be tightened until the number 1 comes up to the marked point.



Number when rubber seal is seated	1	2	3	4	5	6	7	8
Number after tightening	8	1	2	3	4	5	6	7

5. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

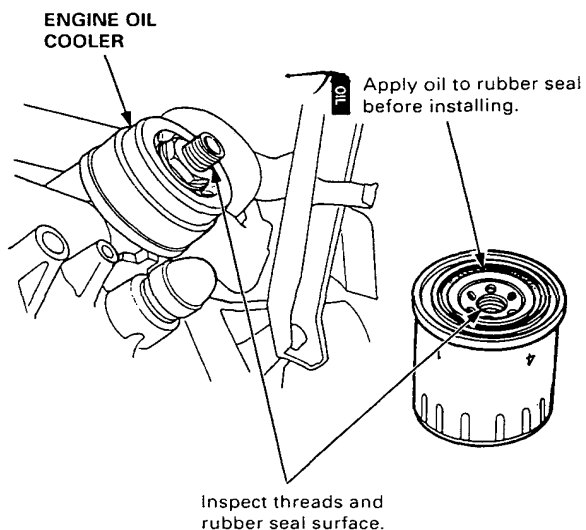
FRANCE-MADE oil filter:

⚠ WARNING

- After the engine has been run, the exhaust pipe will be hot; be careful when working around the exhaust pipe.
- Be careful when loosening the drain bolt while the engine is hot. Burns can result because the oil temperature is very high.

1. Remove the oil filter with the special oil filter wrench.
2. Inspect the threads and rubber seal on the new filter. Wipe off seat on engine block, then apply a light coat of oil to the filter rubber seal.

NOTE: Use only filters with a built-in bypass system.



(cont'd)

Oil Filter

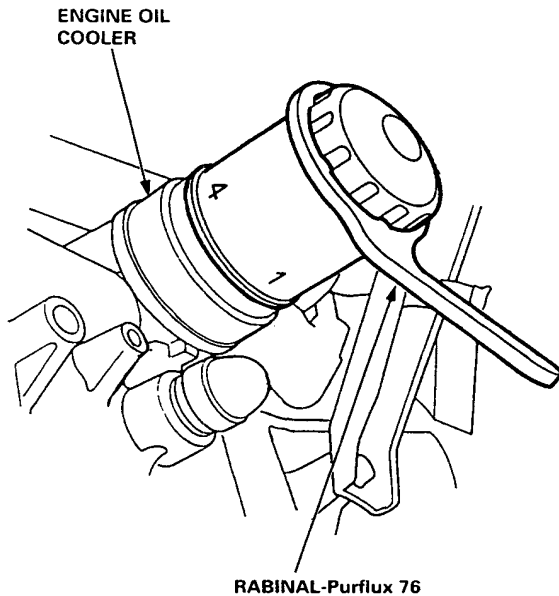
Replacement (cont'd)

3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

Tighten: three quarter turn clockwise.

Tightening torque: 22 N·m (2.2 kg·m, 16 lb·ft)

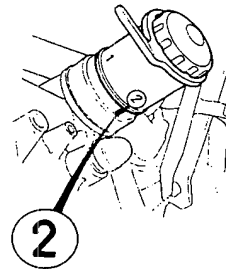
CAUTION: Installation using other than the above procedure could result in serious engine damage due to oil leakage.



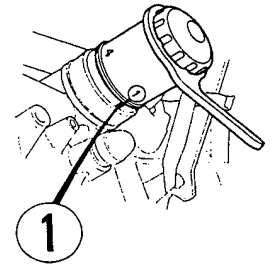
Four numbers (1 to 4) are printed on the surface of the filter.

The following explains the procedure for tightening filters using these numbers.

- 1) Make a mark on the engine oil cooler under the number that shows at the bottom of the filter when the rubber seal is seated.
- 2) Tighten the filter by turning it clockwise three numbers from the marked point. For example, if a mark is made under the number 2 when the rubber seal is seated, the filter should be tightened until the number 1 comes up to the marked point.



Number when rubber seal is seated.



Number after tightening.

Number when rubber seal is seated	1	2	3	4
Number after tightening	4	1	2	3

5. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.



Oil Pressure

Testing

If the oil pressure warning light stays on with the engine running, check the engine oil level. If the oil level is correct:

1. Connect a tachometer.
2. Remove the engine oil pressure switch and install an oil pressure gauge.
3. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.
4. Allow the engine to reach operating temperature (fan comes on at least twice). The pressure should be:

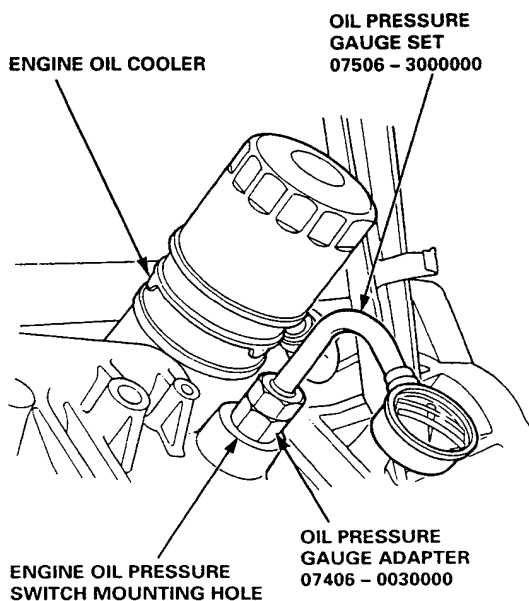
Engine Oil Temperature: 80°C (176°F)

Engine Oil Pressure:

**At Idle: 70 kPa (0.7 kg/cm², 10 psi)
minimum**

**At 3,000 rpm: 350 kPa (3.5 kg/cm², 50 psi)
minimum**

- If oil pressure is within specifications, replace the oil pressure switch and recheck.
- If oil pressure is NOT within specifications, inspect the oil pump.



Intake Manifold/Exhaust System

Intake Manifold

Replacement 9-2

Exhaust Manifold

Replacement 9-3

Exhaust Pipe and Muffler

Replacement 9-4



Outline of Model Change

- The H23A3 engine type has been added.

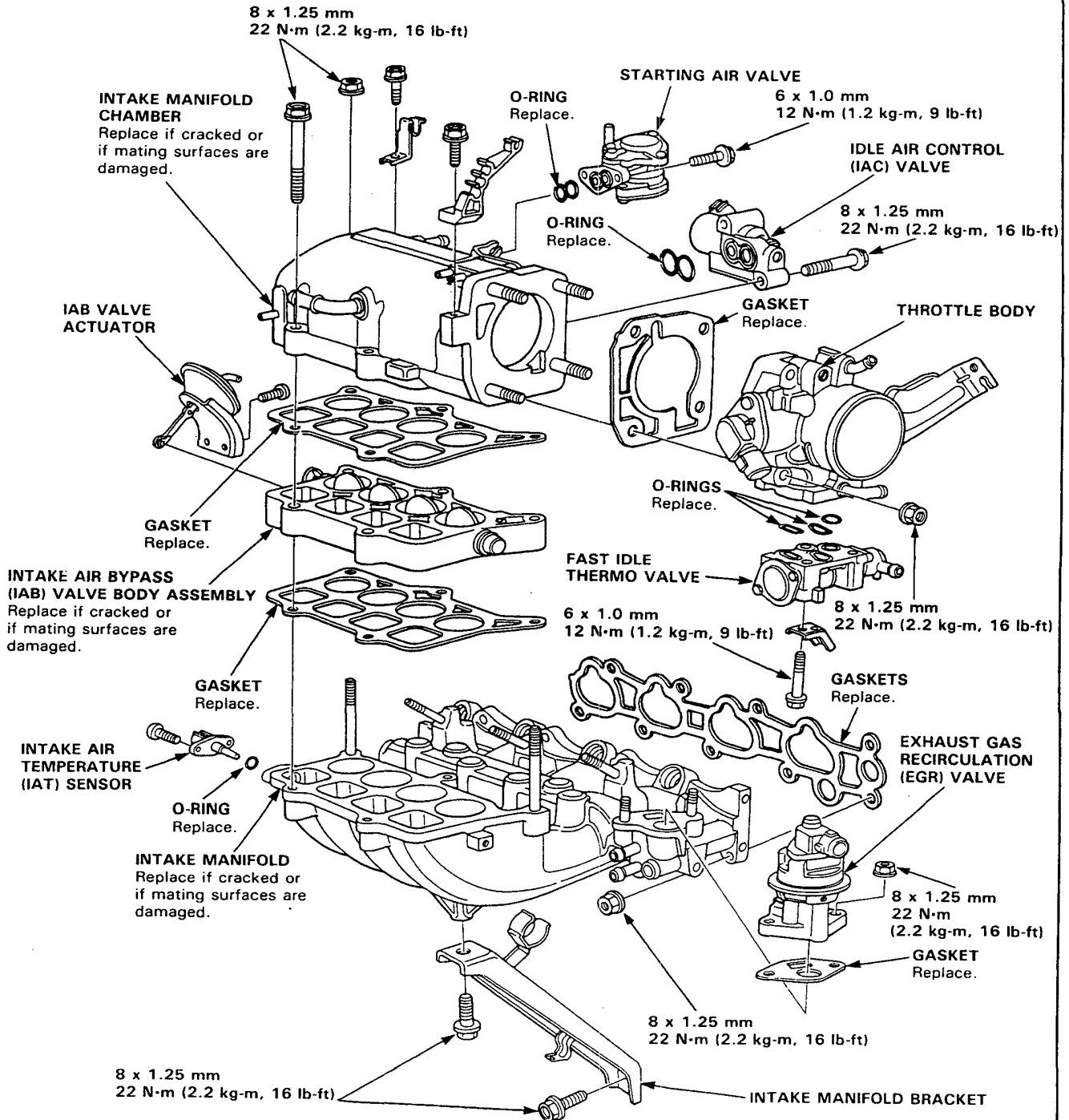
Intake Manifold

Replacement

NOTE: Use new O-rings and gaskets when reassembling.

CAUTION:

- Check for folds or scratches on the surface of the gasket.
- Replace with a new gasket if damaged.





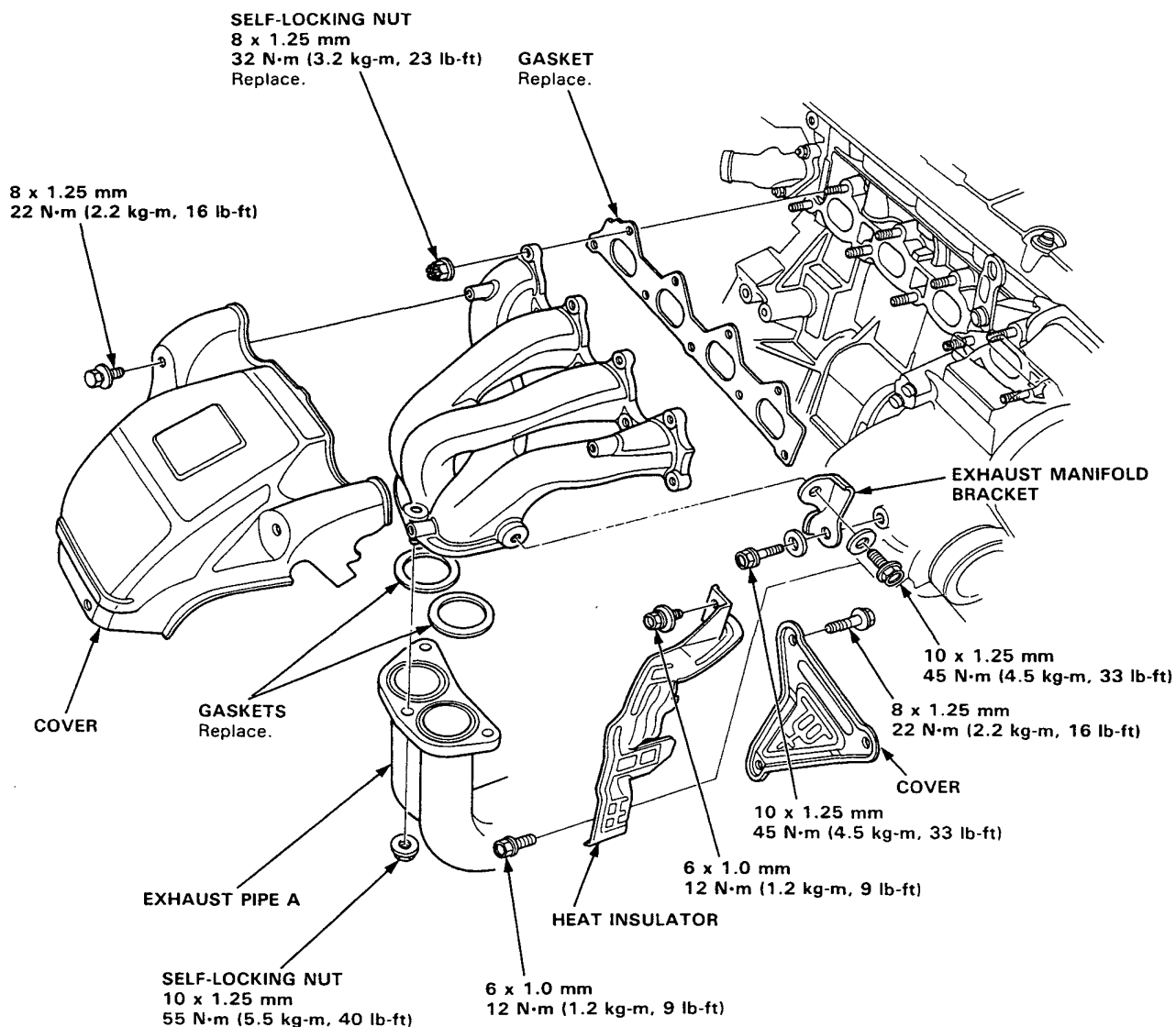
Exhaust Manifold

Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.

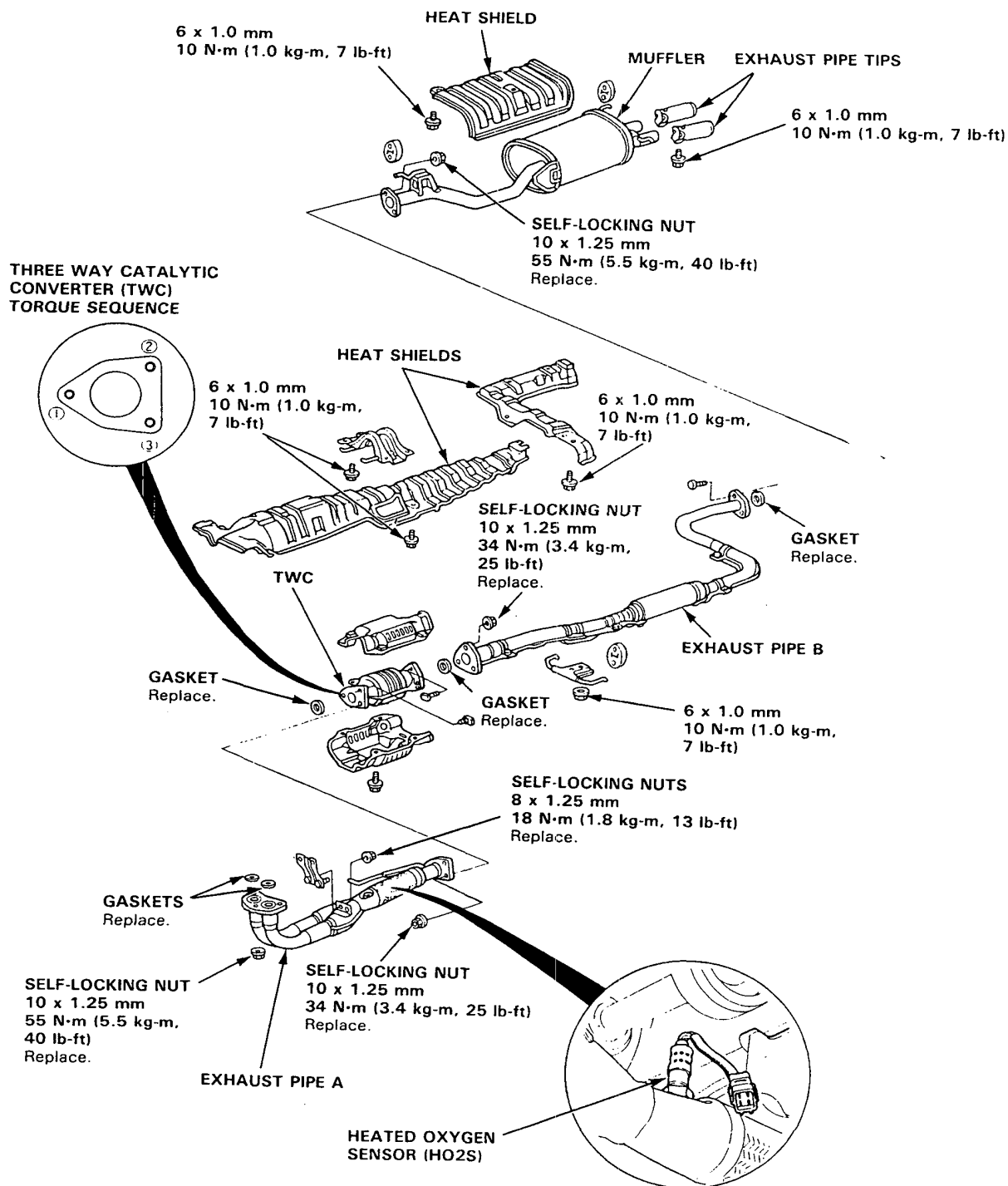
CAUTION:

- Check for folds or scratches on the surface of the gasket.
- Replace with a new gasket if damaged.



Exhaust Pipe and Muffler Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.



Cooling

Radiator

Illustrated Index 10-2

Water Pump

Illustrated Index 10-4



Outline of Model Change

- The H23A3 engine type has been added.

Radiator

Illustrated Index

⚠ WARNING System is under high pressure when engine is hot. To avoid danger of releasing scalding engine coolant, remove cap only when engine is cold.

Total Cooling System Capacity (Including heater and reservoir)

M/T: 7.0 ℓ (7.4 US qt, 6.2 Imp qt)

A/T: 6.9 ℓ (7.3 US qt, 6.1 Imp qt)

Reservoir capacity: 0.6 ℓ (0.6 US qt, 0.5 Imp qt)

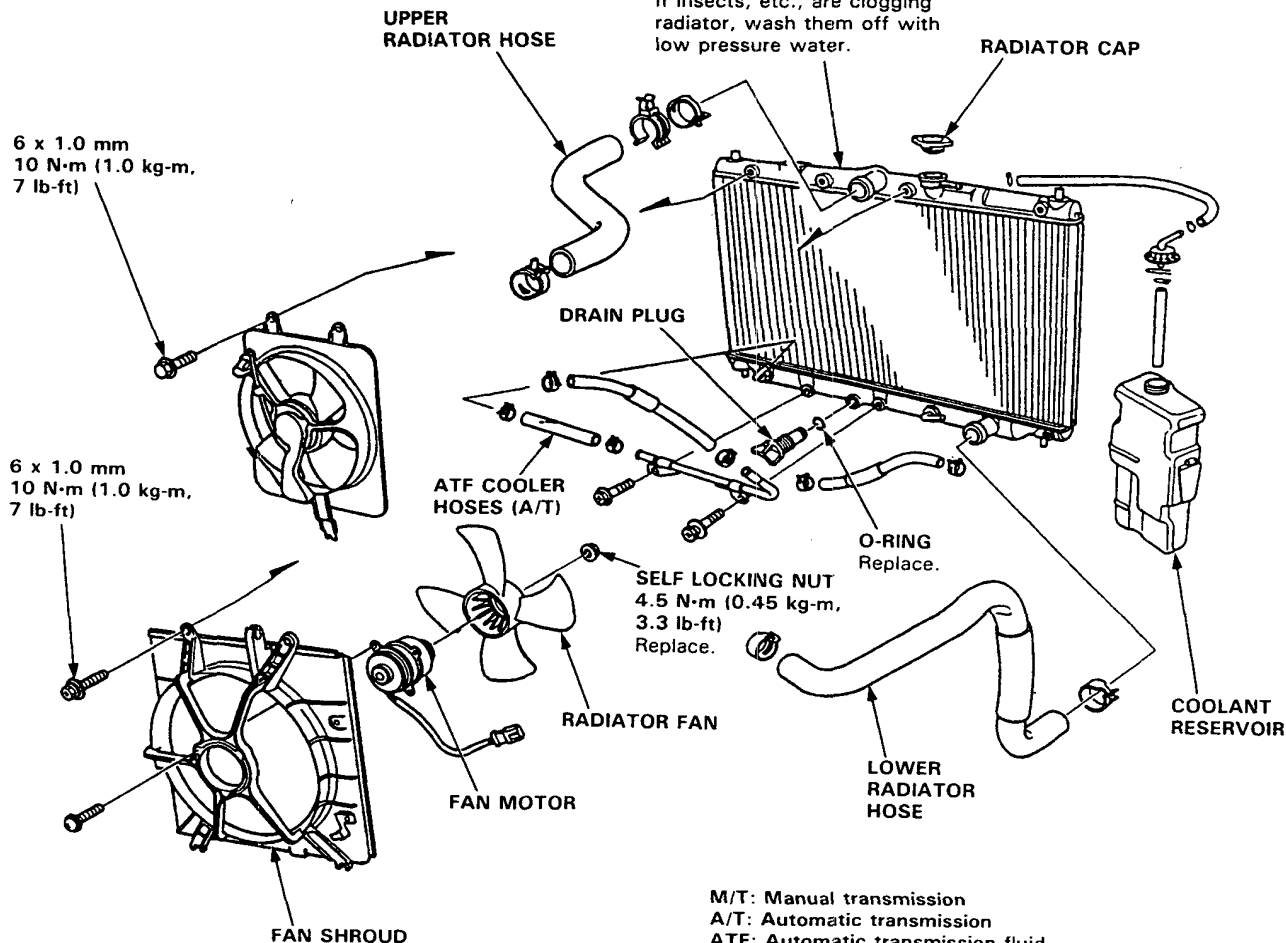
CAUTION: When pouring engine coolant, be sure to shut the relay box lid and not to let coolant spill on the electrical parts or the paint. If any coolant spills, rinse it off immediately.

NOTE:

- Check all cooling system hoses for damage, leaks or deterioration and replace if necessary.
- Check all hose clamps and retighten if necessary.
- Use new O-rings when reassembling.

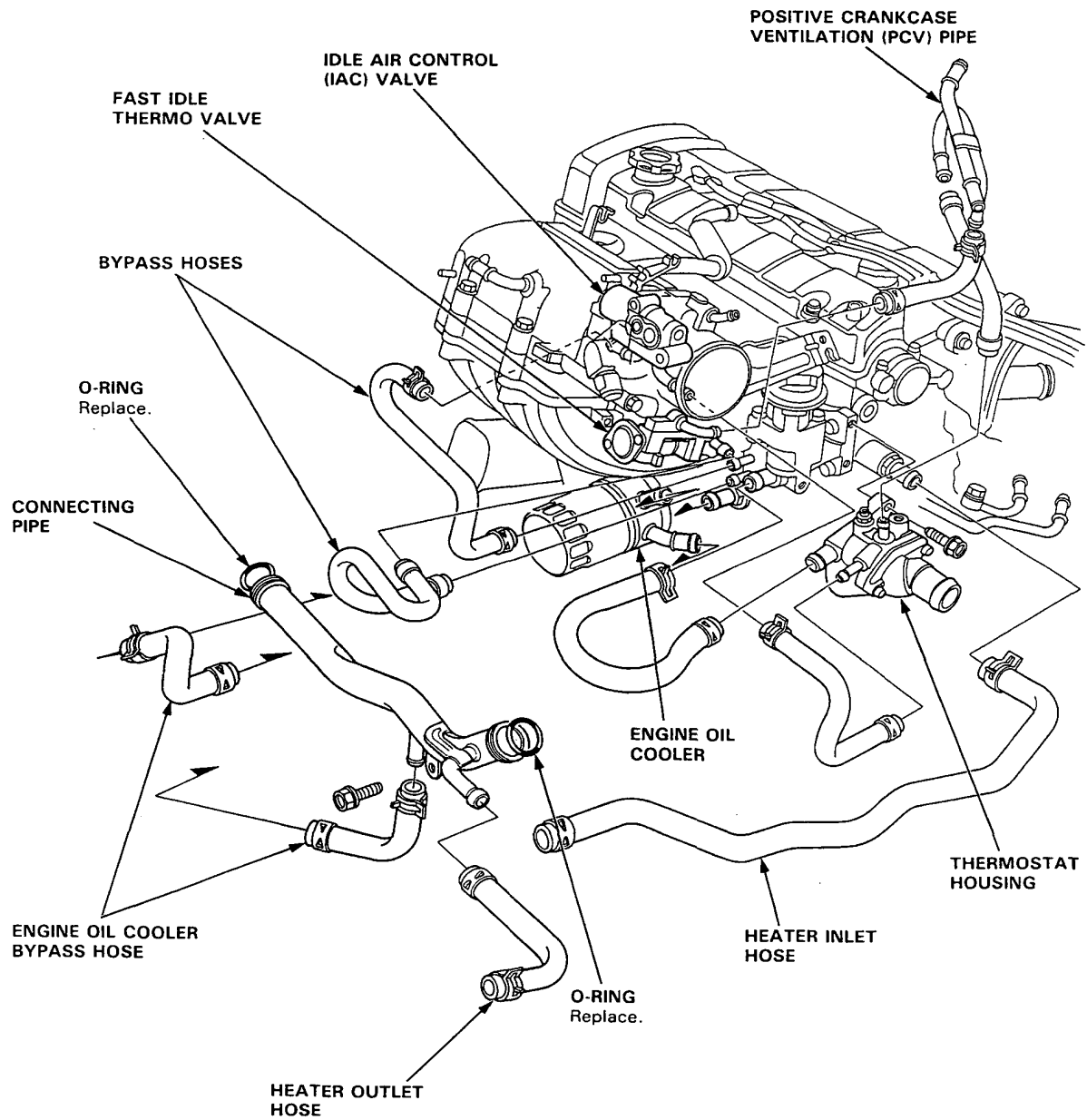
RADIATOR

Inspect soldered joints and seams for leaks.
Blow out dirt from between core fins with compressed air.
If insects, etc., are clogging radiator, wash them off with low pressure water.





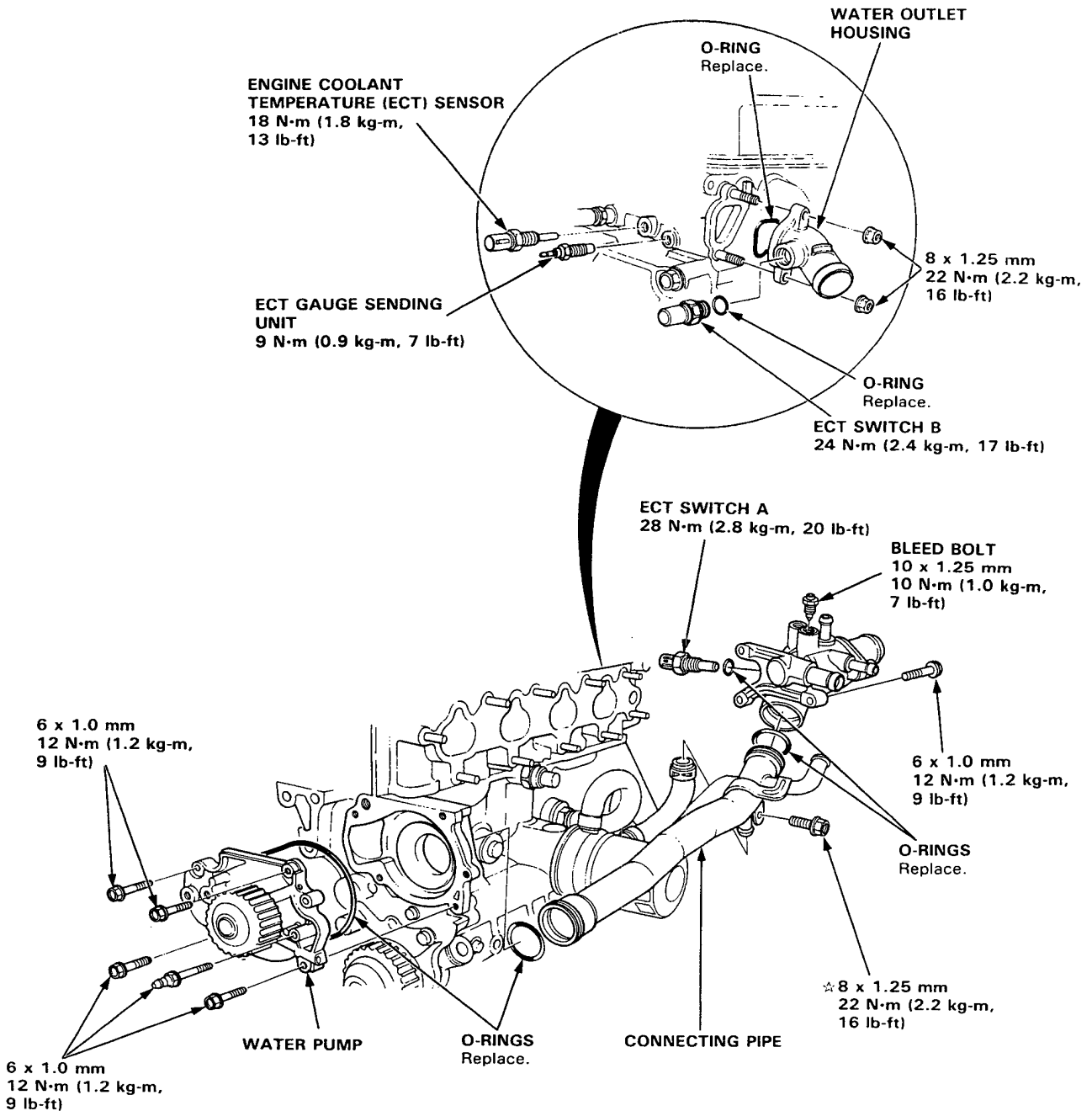
Engine Hose Connections:



Water Pump

Illustrated Index

NOTE: Use new O-rings when reassembling.



☆: CORROSION RESISTANT BOLT

Fuel and Emissions

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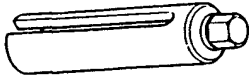
Outline of Model Changes

The H23A3 engine has been added. Compare to F20Z1, F20Z2 engine main differences are:

- Vacuum Connections
- Electrical Connections
- Heated Oxygen Sensor (HO2S)
- Top Dead Center/Crankshaft Position/Cylinder Position (TDC/CKP/CYP) Sensor
- Starting Air Valve
- Fast Idle Thermo Valve
- Throttle Body
- Intake Air Bypass (IAB) Control System
- Intake Air Control System

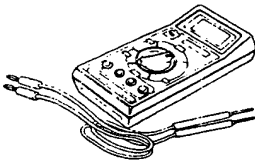
Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07LAA - PT50101	Oxygen Sensor Socket Wrench	1	
②	07411 - 0020000	Digital Circuit Tester	1	



A line drawing of a specialized wrench for oxygen sensors. It has a long, cylindrical handle with a hexagonal socket at the end, designed to fit around the base of an oxygen sensor.

①

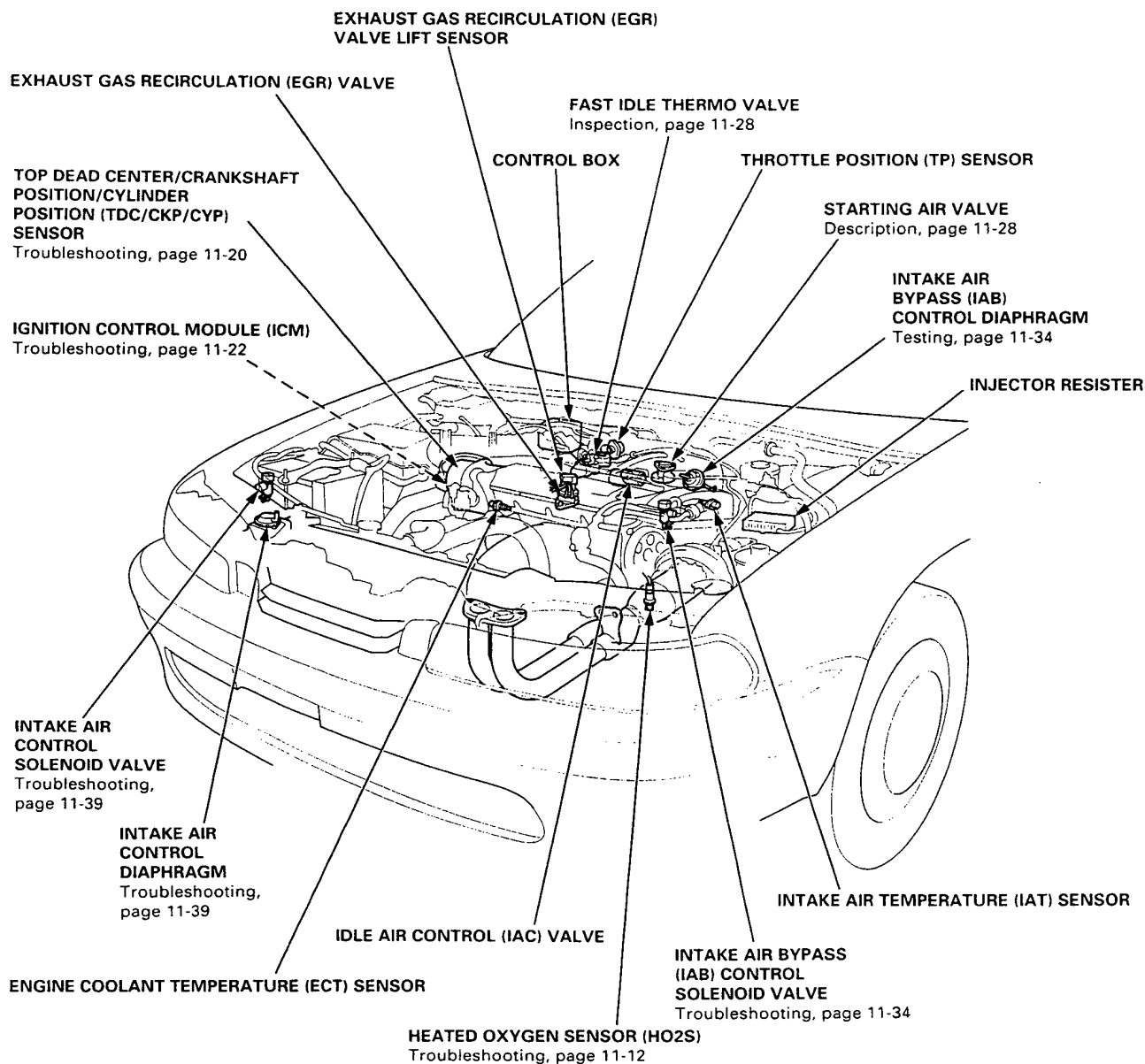


A line drawing of a digital circuit tester. It is a handheld device with a digital display screen, several buttons, and a rotary dial. Two test leads are attached to the bottom of the device.

②

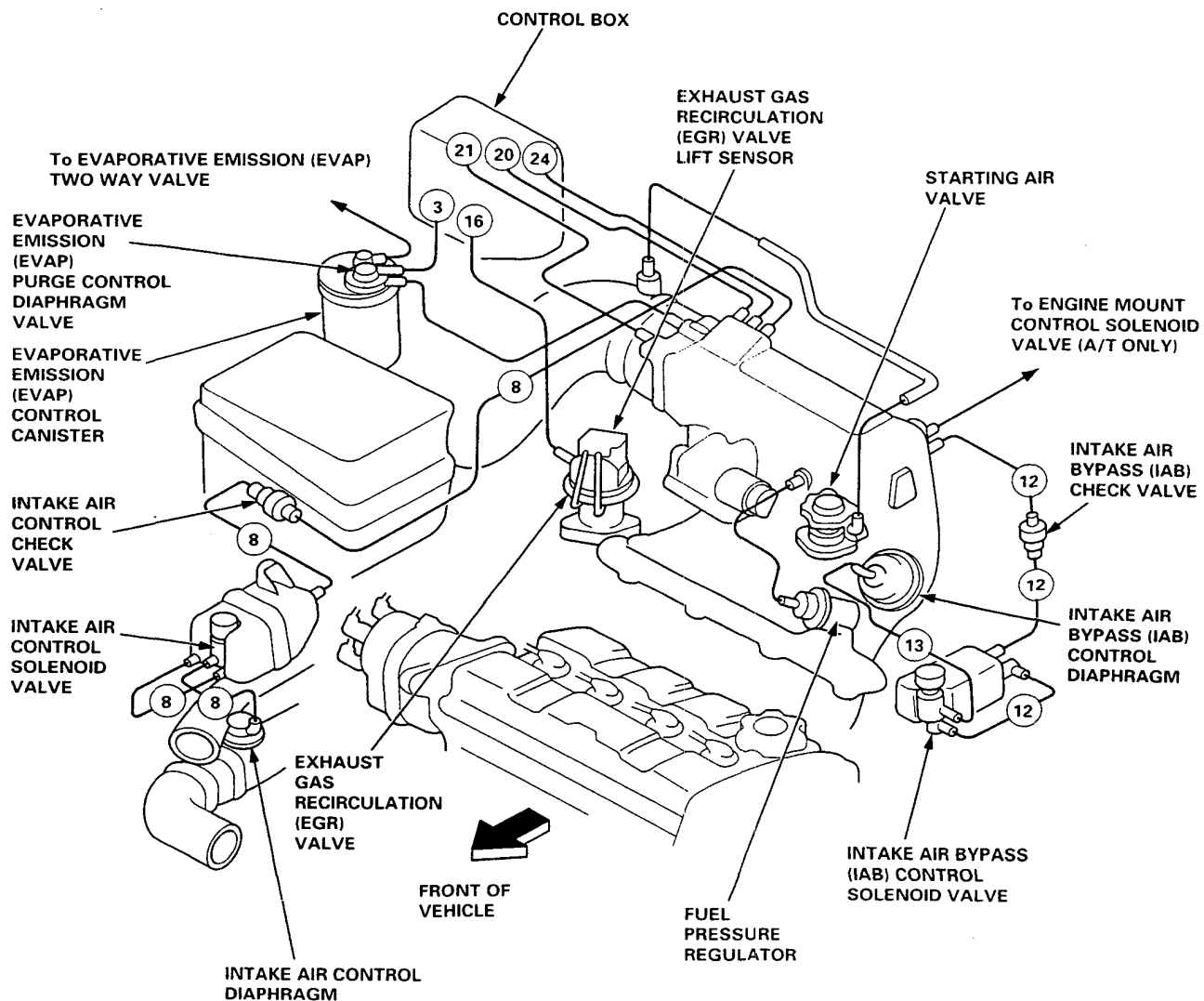
Component Locations

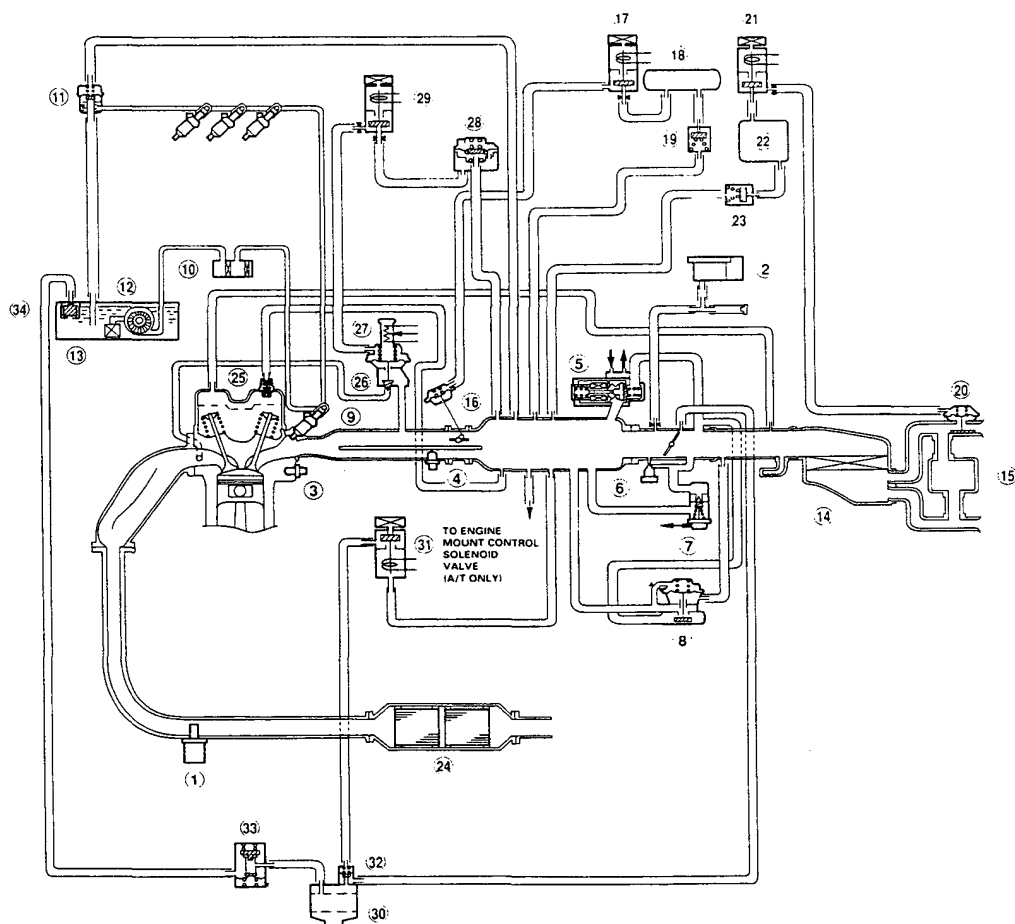
Index



System Description

Vacuum Connections

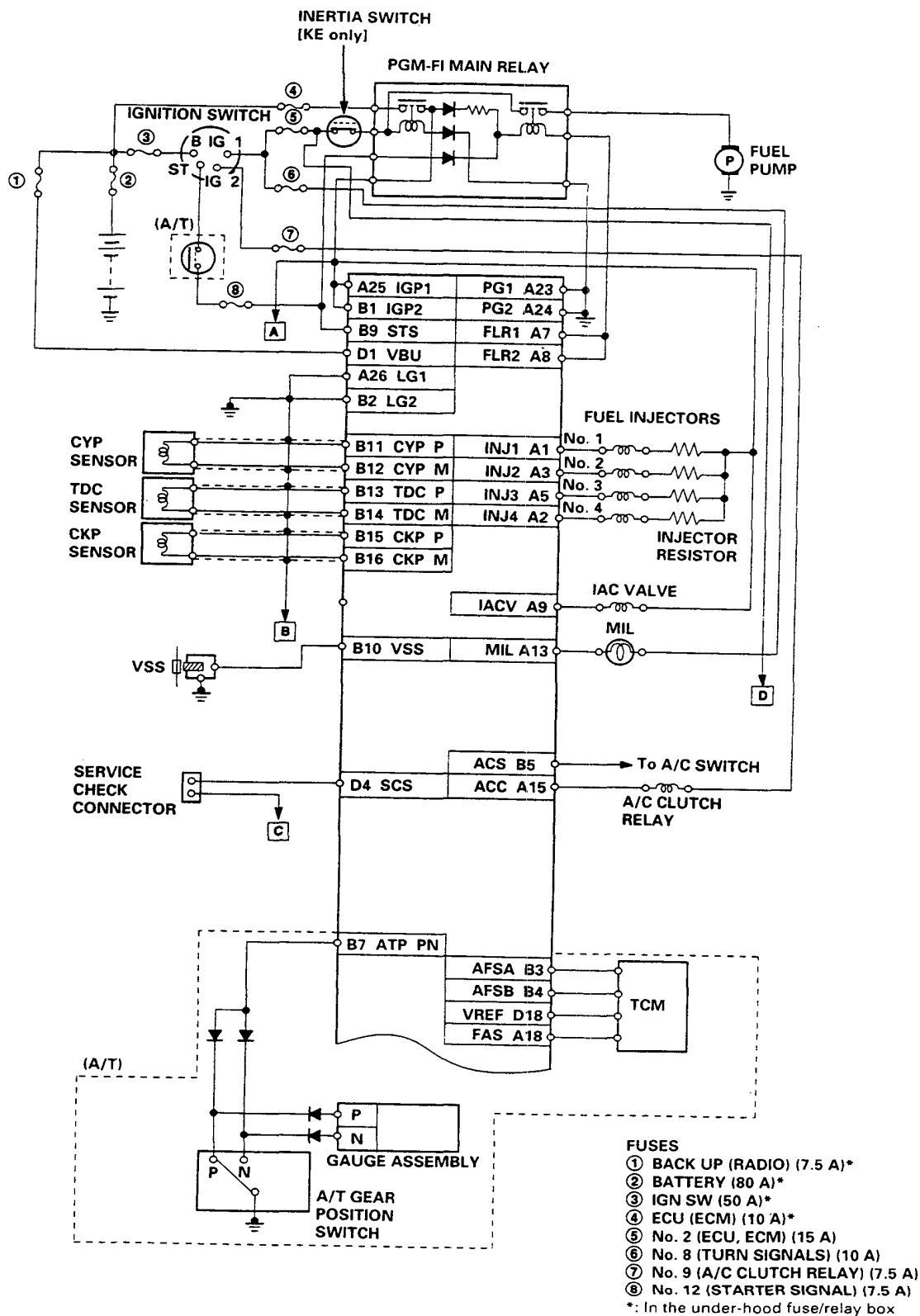




- | | |
|--|--|
| ① HEATED OXYGEN SENSOR (HO2S) | ②① INTAKE AIR CONTROL DIAPHRAGM |
| ② MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR | ②② INTAKE AIR CONTROL SOLENOID VALVE |
| ③ ENGINE COOLANT TEMPERATURE (ECT) SENSOR | ②③ INTAKE AIR CONTROL VACUUM TANK |
| ④ INTAKE AIR TEMPERATURE (IAT) SENSOR | ②④ INTAKE AIR CONTROL CHECK VALVE |
| ⑤ IDLE AIR CONTROL (IAC) VALVE | ②⑤ THREE WAY CATALYTIC CONVERTER (TWC) |
| ⑥ IDLE ADJUSTING SCREW | ②⑥ POSITIVE CRANKCASE VENTILATION (PCV) VALVE |
| ⑦ FAST IDLE THERMO VALVE | ②⑦ EXHAUST GAS RECIRCULATION (EGR) VALVE |
| ⑧ STARTING AIR VALVE | ②⑧ EXHAUST GAS RECIRCULATION (EGR) VALVE LIFT SENSOR |
| ⑨ FUEL INJECTOR | ②⑨ EXHAUST GAS RECIRCULATION (EGR) VACUUM CONTROL VALVE |
| ⑩ FUEL FILTER | ②⑩ EXHAUST GAS RECIRCULATION (EGR) CONTROL SOLENOID VALVE |
| ⑪ FUEL PRESSURE REGULATOR | ③① EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER |
| ⑫ FUEL PUMP | ③② EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE |
| ⑬ FUEL TANK | ③③ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL DIAPHRAGM VALVE |
| ⑭ AIR CLEANER | ③④ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE |
| ⑮ RESONATOR | ③⑤ FUEL TANK EVAPORATIVE EMISSION (EVAP) VALVE |
| ⑯ INTAKE AIR BYPASS (IAB) CONTROL DIAPHRAGM | |
| ⑰ INTAKE AIR BYPASS (IAB) CONTROL SOLENOID VALVE | |
| ⑱ INTAKE AIR BYPASS (IAB) VACUUM TANK | |
| ⑲ INTAKE AIR BYPASS (IAB) CHECK VALVE | |

System Description



















Electrical Connections



Troubleshooting

Troubleshooting Guide

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE	SYSTEM	PGM-FI							
		ENGINE CONTROL MODULE	HEATED OXYGEN SENSOR	MANIFOLD ABSOLUTE PRESSURE SENSOR	TOP DEAD CENTER/ CRANKSHAFT POSITION/ CYLINDER POSITION SENSOR	ENGINE COOLANT TEMPERATURE SENSOR	THROTTLE POSITION SENSOR	INTAKE AIR TEMPERATURE SENSOR	BAROMETRIC PRESSURE SENSOR
	SYMPTOM	—	11-12, 14, 18	—	11-20	—	—	—	—
	MALFUNCTION INDICATOR LAMP (MIL) TURNS ON	 or 							
	MALFUNCTION INDICATOR LAMP (MIL) BLINKS	 or 	 or 						
	ENGINE WON'T START	③			③				
	DIFFICULT TO START ENGINE WHEN COLD	(BU)		③	③	①			③
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPEC	(BU)				③			
	ROUGH IDLE	(BU)		③					
	WHEN WARM ENGINE SPEED TOO HIGH	(BU)							
	WHEN WARM ENGINE SPEED TOO LOW	(BU)							
FREQUENT STALLING	WHILE WARMING UP	(BU)				③			
	AFTER WARMING UP	(BU)							③
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	(BU)		②	③				
	FAILS EMISSION TEST	(BU)	③	②					
	LOSS OF POWER	(BU)		③			②		

* If codes other than those listed above are indicated, count the number of blinks again. If the MIL is in fact blinking these codes, replace the ECM.

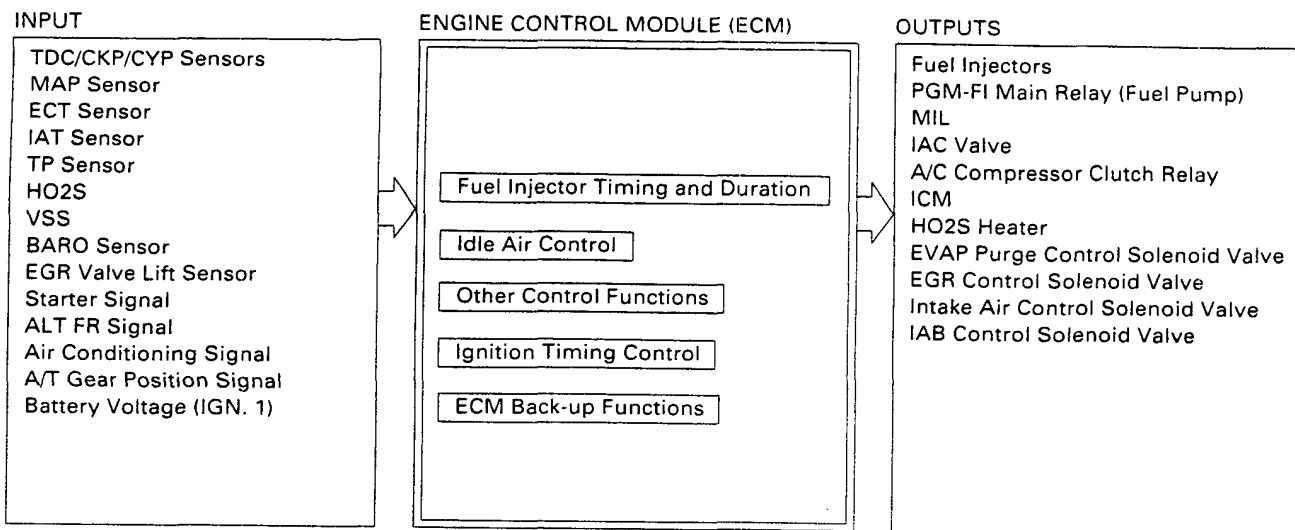
(BU) If the MIL is on while the engine is running, jump the service check connector. If no code is displayed (MIL stays on steady), the back-up system is in operation.
Substitute a known-good ECM and recheck. If the indication goes away, replace the original ECM.



PGM-FI				IDLE CONTROL		FUEL SUPPLY		INTAKE AIR SYSTEM	EMISSION CONTROL	
IGNITION OUTPUT SIGNAL	VEHICLE SPEED SENSOR	A/T FI SIGNAL A	A/T FI SIGNAL B	IDLE AIR CONTROL VALVE	OTHER IDLE CONTROLS	FUEL INJECTOR	OTHER FUEL SUPPLY		EXHAUST GAS RECIRCULATION CONTROL SYSTEM	OTHER EMISSION CONTROL SYSTEM
11-22	—	—	—	—	11-24	—	—	11-30	—	—
①						②	③			
					②					
				①	②					
				①		②			③	
				①	②					
				①		②				
				①	②		③			
				③	①		②		③	
				③		①			③	
						②	③			①
						③	①	③		③

PGM-FI System

System Description



PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration

The ECM contains memories for the basic discharge durations at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

Idle Air Control

Idle Air Control Valve (IAC Valve)

When the engine is cold, the A/C compressor is on, the transmission is in gear (A/T only) or the alternator (ALT) is charging, the ECM controls current to the IAC valve to maintain correct idle speed.

Ignition Timing Control

The ECM contains memories for basic ignition timing at various engine speeds and manifold pressures. Ignition timing is also adjusted for engine coolant temperature.

Other Control Functions

1. Starting Control

When the engine is started, the ECM provides a rich mixture by increasing fuel injector duration.

2. Fuel Pump Control

- When the ignition switch is initially turned on, the ECM supplies ground to the PGM-FI main relay that supplies current to the fuel pump for two seconds to pressurize the fuel system.
- When the engine is running, the ECM supplies ground to the PGM-FI main relay that supplies current to the fuel pump.
- When the engine is not running and the ignition is on, the ECM cuts ground to the PGM-FI main relay which cuts current to the fuel pump.



3. Fuel Cut-off Control

- During deceleration with the throttle valve closed, current to the fuel injectors is cut off to improve fuel economy at speeds over $1,500 \text{ min}^{-1}$ (rpm).
- Fuel cut-off action also takes place when engine speed exceeds $6,800 \text{ min}^{-1}$ (rpm) regardless of the position of the throttle valve to protect the engine from over-revving.

4. A/C Compressor Clutch Relay

When the ECM receives a demand for cooling from the air conditioning system, it delays the compressor from being energized, and enriches the mixture to assure smooth transition to the A/C mode.

5. Intake Air Control Solenoid Valve

When the engine speed is below $3,900 \text{ min}^{-1}$ (rpm), the ECM supplies a ground to the intake air control solenoid valve. This opens the solenoid valve sending intake manifold vacuum to the intake air control diaphragm.

6. Intake Air Bypass (IAB) Control Solenoid Valve

When the engine speed is below $4,800 \text{ min}^{-1}$ (rpm) the IAB control solenoid valve is activated by a signal from the ECM, intake air flows through the long intake path, then high torque is delivered. At speeds higher than $4,800 \text{ min}^{-1}$ (rpm), the solenoid valve is deactivated by the ECM, and intake air flows through the short intake path in order to reduce the resistance in airflow.

7. Evaporative Emission (EVAP) Purge Control Solenoid Valve

When the engine coolant temperature is below 167°F (75°C), the ECM supplies a ground to the EVAP purge control solenoid valve which cuts vacuum to the EVAP purge control diaphragm valve.

8. Exhaust Gas Recirculation (EGR) Control Solenoid Valve

When the EGR is required for control of oxides of nitrogen (NO_x) emissions, the ECM supplies ground to the EGR control solenoid valve which supplies regulated vacuum to the EGR valve.

ECM Fail-safe/Back-up Functions

1. Fail-safe Function

When an abnormality occurs in a signal from a sensor, the ECM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.

2. Back-up Function

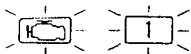
When an abnormality occurs in the ECM itself, the fuel injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.

3. Self-diagnosis Function [Malfunction Indicator Lamp (MIL)]

When an abnormality occurs in a signal from a sensor, the ECM lights the MIL and stores the Diagnostic Trouble Code (DTC) in erasable memory. When the ignition is initially turned on, the ECM supplies ground for the MIL for two seconds to check MIL bulb condition.

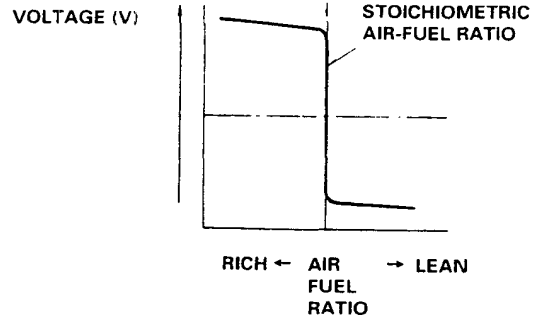
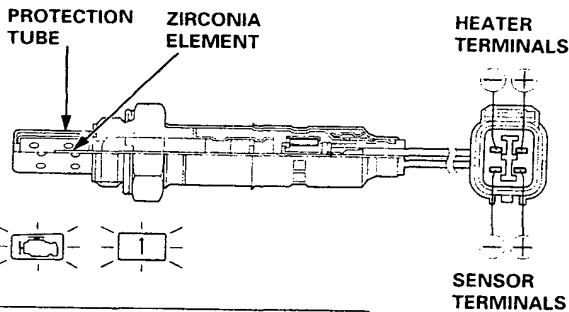
PGM-FI System

Troubleshooting Flowchart — Heated Oxygen Sensor (HO2S)



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 1: A problem in the Heated Oxygen Sensor (HO2S) circuit.

The heated oxygen sensor detects the oxygen content in the exhaust gas and signals the ECM. In operation, the ECM receives the signals from the sensor and varies the duration during which fuel is injected. The heated oxygen sensor has an internal heater. The heater stabilizes the sensor's output. The heated oxygen sensor is installed in the exhaust pipe A.



- The MIL has been reported on.
- With service check connector jumped, code 1 is indicated.

Do the ECM Reset Procedure.

Warm up engine to normal operating temperature (the radiator fan comes on).

Run engine for 60 seconds.

Road test with the automatic transmission in **[2]** position (M/T: 4th gear). Starting at 1,600 min⁻¹ (rpm), accelerate using wide open throttle for at least 5 seconds. Then decelerate for at least 5 seconds with the throttle completely closed.

Is the MIL on and does it indicate code 1?

NO

Intermittent failure, system is OK at this time. Check for poor connections or loose wires between the HO2S and ECM.

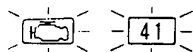
YES

Go to page 11-18 and perform test for code 43.



PGM-FI System

Troubleshooting Flowchart — Heated Oxygen Sensor Heater



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 41: A problem in the Heated Oxygen Sensor (HO2S) Heater circuit.



- Engine is running.
- The MIL has been reported on.
With service check connector jumped, code 41 is indicated.

Do the ECM Reset Procedure.

Start the engine.

Is the MIL on and does it indicate code 41?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the HO2S and ECM.

YES

Turn the ignition switch OFF.

Disconnect the 4P connector from the HO2S.

Measure resistance between terminals C and D on the HO2S.

Is there 10 — 40 Ω ?

NO

Replace the HO2S.

YES

Check for continuity to body ground on each terminal on the HO2S.

Is there continuity?

YES

Replace the HO2S.

NO

Check for continuity between terminal A and terminals C and D individually.

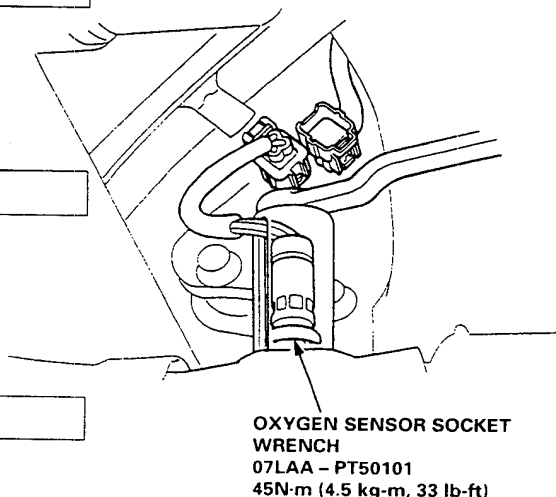
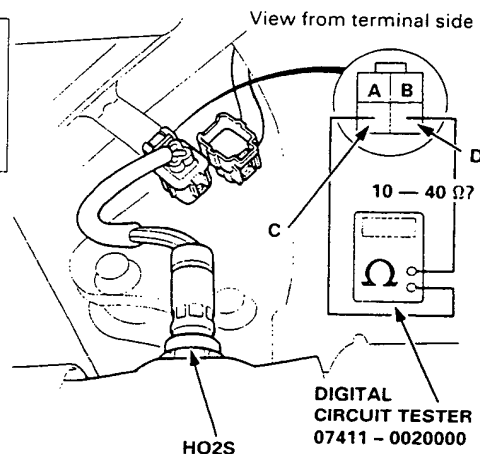
Is there continuity?

YES

Replace the HO2S.

NO

(To page 11-15)

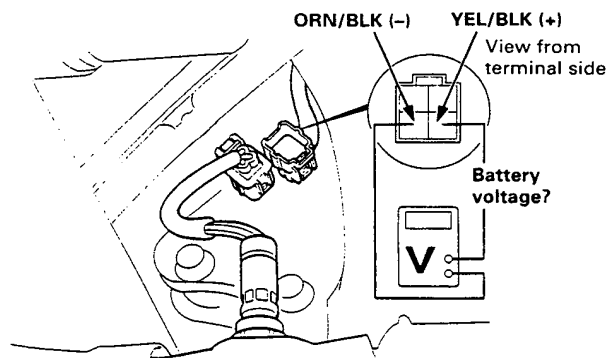




(From page 11-14)

Turn the ignition switch ON.

At HO2S harness, measure voltage between YEL/BLK (+) terminal and ORN/BLK (-) terminal.



Is there battery voltage?

YES

Turn the ignition switch OFF.

NO

Measure voltage between YEL/BLK (+) terminal and body ground.

Disconnect the "A" connector from the ECM.

Turn the ignition switch ON.

At HO2S harness, measure voltage between YEL/BLK (+) terminal and ORN/BLK (-) terminal.

Is there battery voltage?

YES

Repair short in ORN/BLK wire between ECM (A6) and the HO2S.

NO

Is there battery voltage?

NO

Repair open in YEL/BLK wire between HO2S and PGM-FI main relay.

YES

Turn the ignition switch OFF.

Turn the ignition switch OFF.

Reconnect the HO2S connector.

Reconnect the 4P connector to the HO2S.

Connect the test harness "A" connector to the main wire harness only, not the ECM.

Connect an ammeter between terminals A6 (+) and A26 (-).

*Monitor over a 5 minutes period.

Turn the ignition switch ON.

Is the current less than 0.1 A?*

YES

Replace the HO2S.

NO

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

(To page 11-16)

(cont'd)

PGM-FI System

Troubleshooting Flowchart — Heated Oxygen Sensor Heater (cont'd)

(From page 11-15)

Turn the ignition switch ON.

Measure voltage between A6 (+) terminal and A23 (-) terminal.

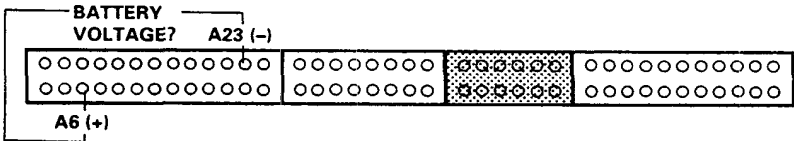
Is there battery voltage?

NO

Repair open in ORN/BLK wire between ECM (A6) and the HO2S.

YES

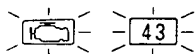
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.



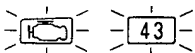


PGM-FI System

Troubleshooting Flowchart — Fuel Supply System



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 43: A problem in the Heated Oxygen Sensor (HO2S) circuit or a problem in the Fuel Supply System.



- The MIL has been reported on.
- With service check connector jumped, code 43 is indicated.

From code 1 troubleshooting (page 11-12).

Is the 43 code accompanied by the MIL and poor driveability?

YES

Go to Fuel Supply System.

NO

Do the ECM Reset Procedure.

Warm up engine to normal operating temperature (the radiator fan comes on).

Hold engine at 3,000 min⁻¹ (rpm) for 2 minutes (A/T: Transmission in **N** or **P** position).

Is the MIL on and does it indicate code 43?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the HO2S and ECM.

YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors.

With the ignition switch OFF, wait for at least 2 minutes.

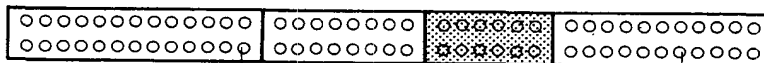
Turn the ignition switch ON.

Measure voltage between D14 (+) terminal and A26 (-) terminal as soon as the ignition switch is turned on.

(To page 11-19)

NOTE

- Use DIGITAL CIRCUIT TESTER (07411 - 0020000) or equivalent.
- Use 2 Volt range.



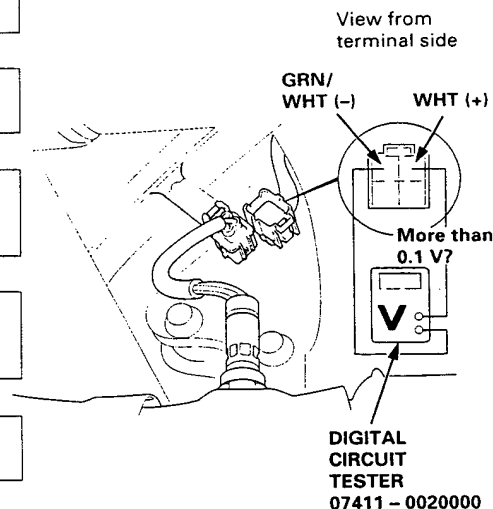
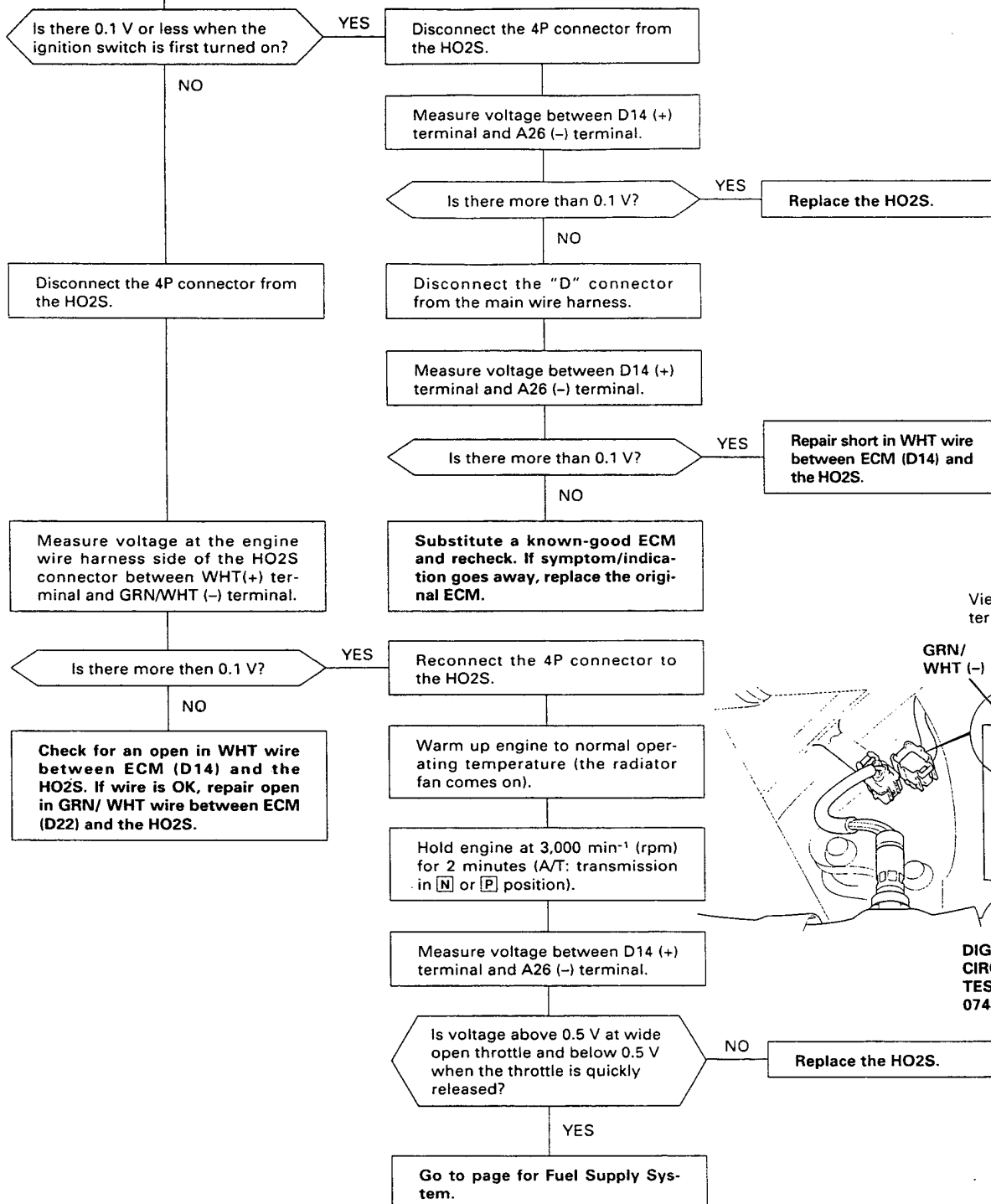
A26 (-)

Voltage should start at 0.4 — 0.5 V when the ignition switch is first turned on, and decrease to below 0.1 V in less than 2 minutes.

D14 (+)









(From page 11-18)

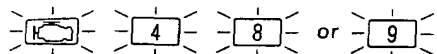
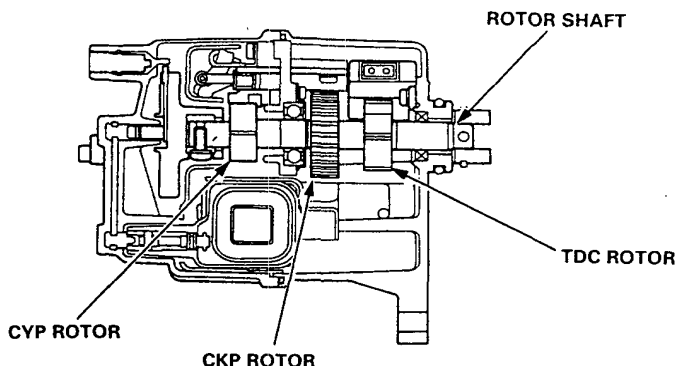


PGM-FI System

Troubleshooting Flowchart — TDC/CKP/CYP Sensor

-   The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 4: A problem in the Crankshaft Position (CKP) Sensor circuit.
-   The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 8: A problem in the Top Dead Center (TDC) Sensor circuit.
-   The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 9: A problem in the Cylinder Position (CYP) Sensor circuit.

The CKP Sensor determines timing for fuel injection and ignition of each cylinder and also detects engine speed. The TDC Sensor determines ignition timing at start-up (cranking) and when crank angle is abnormal. The CYP Sensor detects the position of No. 1 cylinder for sequential fuel injection to each cylinder.



- The MIL has been reported on.
- With service check connector jumped, code 4, 8 and/or 9 are indicated.

Do the ECM Reset Procedure.

Start the engine.

Is the MIL on and does it indicate code 4, 8 and/or 9?

NO

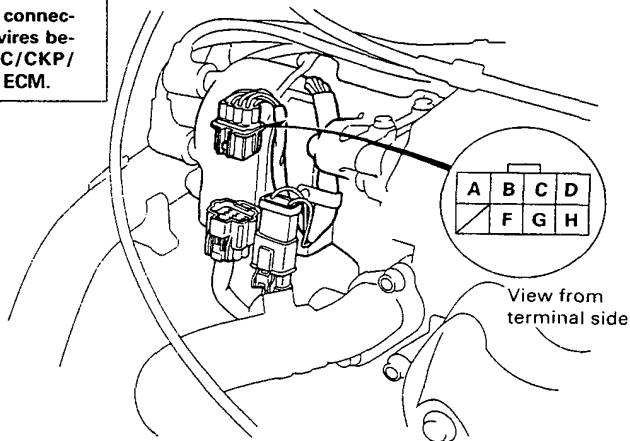
YES

Turn the ignition switch OFF.

Disconnect the 8P connector from the TDC/CKP/CYP sensor.

(To page 11-21)

Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the TDC/CKP/CYP sensor and ECM.





(From page 11-20)

Measure resistance between terminals of the indicated sensor (see table).

SENSOR	DTC	SENSOR TERMINAL	ECM TERMINAL	WIRE COLOR
CKP	4	B	B15	BLU/GRN
		F	B16	BLU/YEL
TDC	8	C	B13	ORN/BLU
		G	B14	WHT/BLU
CYP	9	D	B11	ORN
		H	B12	WHT

Is there 260 — 500 Ω ?

NO

Replace the distributor housing.

YES

Check for continuity to body ground on both terminals of the indicated sensor.

Is there continuity?

YES

Replace the distributor housing.

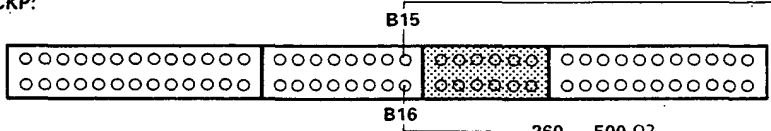
NO

Reconnect the connector.

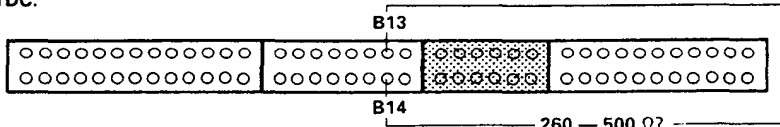
Connect the test harness to the main wire harness only, not to the ECM.

Measure resistance between terminals of the indicated sensor on test harness (see table).

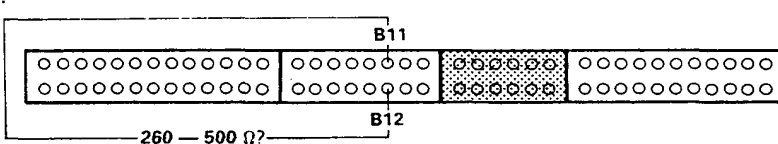
CKP:



TDC:



CYP:



Is there 260 — 500 Ω ?

NO

Repair open in the indicated sensor wires (see table).

YES

Check for continuity to body ground on B15, B13 and B11 terminals.

Is there continuity?

YES

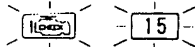
Repair short to body ground in the indicated sensor wires (see table).

NO

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

PGM-FI System

Troubleshooting Flowchart — Ignition Output Signal



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 15: A problem in the Ignition Output Signal circuit.

- The MIL has been reported on.
- With service check connector jumped, code 15 is indicated.

Do the ECM Reset Procedure.

Start the engine.

Is the MIL on and does it indicate code 15?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the distributor and ECM.

YES

Turn the ignition switch OFF.

Disconnect the 2P connector from the distributor.

Turn the ignition switch ON.

Measure voltage between BLK/YEL (+) terminal and body ground.

Is there battery voltage?

NO

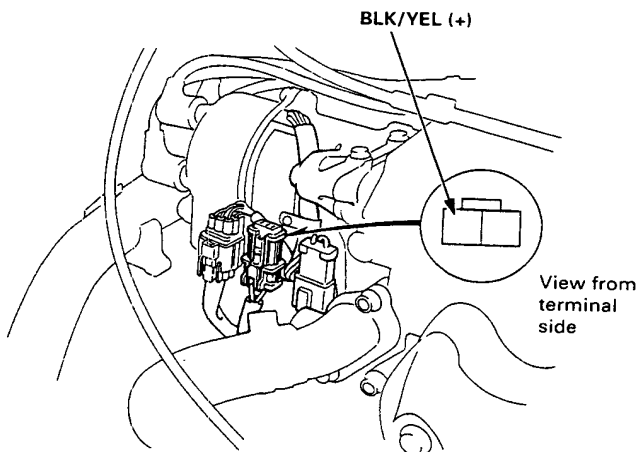
Repair open in BLK/YEL wire between 2P connector and ignition switch.

YES

Turn the ignition switch OFF.

Reconnect the 2P connector.

(To page 11-23)





(From page 11-22)

Disconnect the 8P connector from the distributor.

Turn the ignition switch ON.

Measure voltage between terminal A and body ground.

Is there approx. 10 V?

NO

Replace the ICM in the distributor.

YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors.

Turn the ignition switch ON.

Measure voltage individually between A21 (+), A22 (+) terminals and A26 (-) terminal.

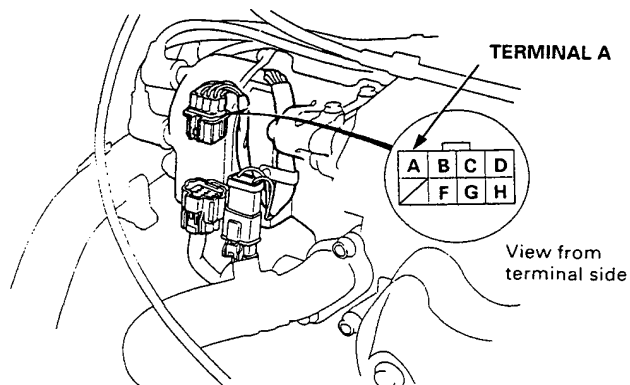
Is there approx. 10 V?

NO

Repair open or short YEL/GRN wires between the distributor and ECM (A21 or A22).

YES

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.



Idle Control System

System Troubleshooting Guide

NOTE:

- Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.
- If the idle speed is out of specification and the Malfunction Indicator Lamp (MIL) does not blink Diagnostic Trouble Code (DTC) 14, go to inspection described on page 11-27.

PAGE	SUB-SYSTEM	IDLE ADJUST-ING SCREW	IDLE AIR CONTROL VALVE	AIR CONDI-TIONING SIGNAL	ALTER-NATOR FR SIGNAL	AUTOMATIC TRANSAXLE GEAR POSITION SIGNAL	STARTER SWITCH SIGNAL	STARTING AIR VALVE	FAST IDLE THERMO VALVE	HOSES AND CONNec-TIONS
SYMPTOM		—	—	—	—	—	—	11-28	11-28	*
DIFFICULT TO START ENGINE WHEN COLD									①	
WHEN COLD FAST IDLE OUT OF SPEC (1,000 — 2,000 min ⁻¹ (rpm))		③	②						①	
ROUGH IDLE			②							①
WHEN WARM ENGINE SPEED TOO HIGH		③	①						②	③
WHEN WARM ENGINE SPEED TOO LOW	Idle speed is below specified engine speed (no load)	②	①							
	Idle speed does not increase after initial start up		①							
	On models with auto-matic transmission, the idle speed drops in gear		②			①				
	Idle speeds drops when air conditioner is ON		②	①						
	Idle speed fluctuates with electrical load		②							①
FREQUENT STALLING	WHILE WARMING UP		①							
	AFTER WARMING UP	①								
FAILS EMISSION TEST										①

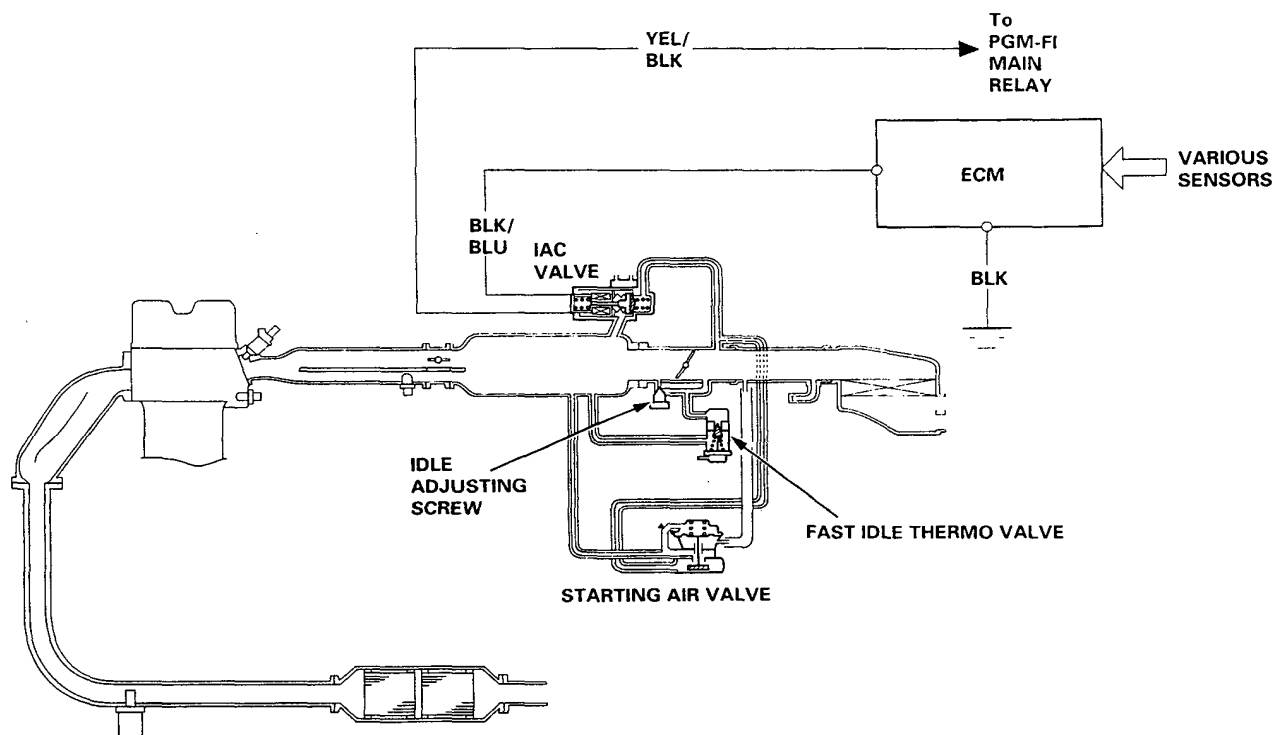


System Description

The idle speed of the engine is controlled by the Idle Air Control (IAC) Valve.

The valve changes the amount of air bypassing into the intake manifold in response to electric current controlled by the ECM.

When the IAC Valve is activated, the valve opens to maintain the proper idle speed.

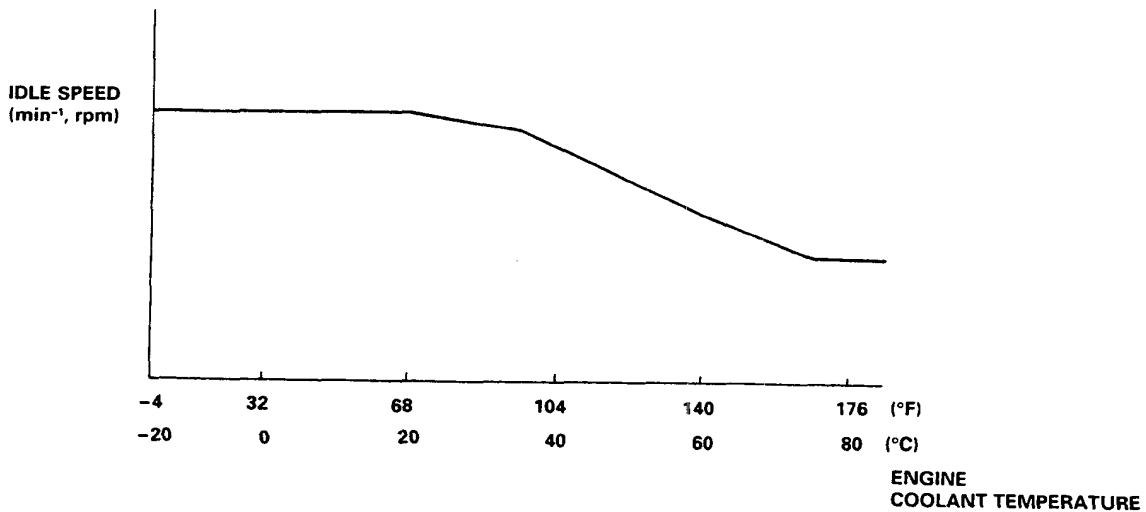


(cont'd)

Idle Control System

System Description (cont'd)

1. After the engine starts, the IAC valve opens for a certain time. The amount of air is increased to raise the idle speed about $150 - 300 \text{ min}^{-1} \text{ (rpm)}$.
2. When the engine coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is thus controlled in relation to the engine coolant temperature.





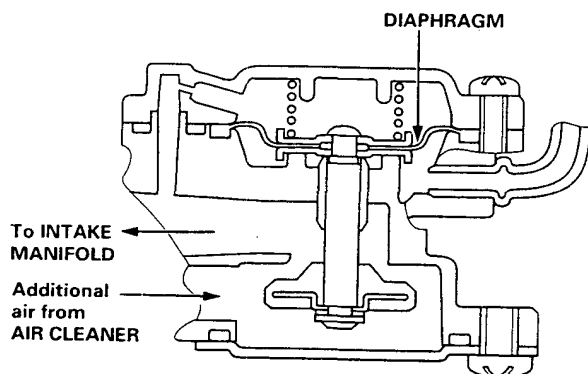
1. When the idle speed is out of specification and the Malfunction Indicator Lamp (MIL) does not blink Diagnostic Trouble Code (DTC) 14, check the following items:
 - Adjust the idle speed.
 - Air conditioning signal.
 - Alternator FR signal.
 - A/T gear position signal.
 - Starter switch signal.
 - Starting air valve (see page 11-28).
 - Fast idle thermo valve (see page 11-28).
 - Hoses and connections
 - IAC valve and its mounting O-rings
2. If the above items are normal, substitute a known-good IAC valve and readjust the idle speed.
 - If the idle speed still cannot be adjusted to specification (and the MIL does not blink code 14) after IAC valve replacement, substitute a known-good ECM and recheck. If symptom goes away, replace the original ECM.

Idle Control System

Starting Air Valve

Description

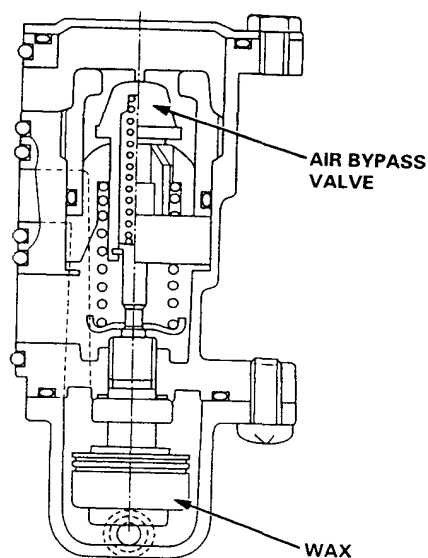
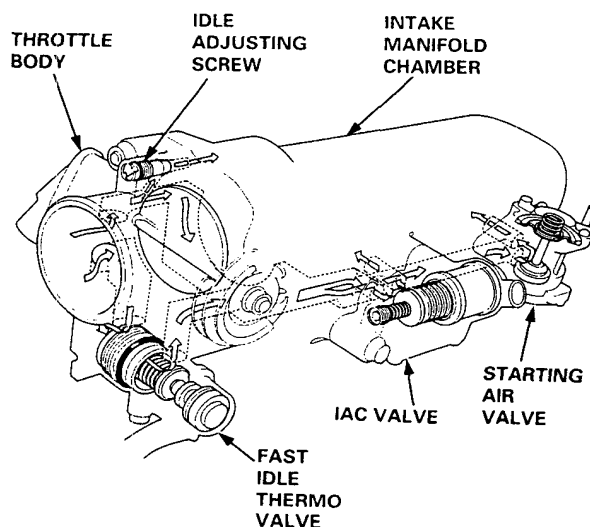
When cracking the engine, the starting air valve supplies additional air to the intake manifold to ease engine starting.



Fast Idle Thermo Valve

Description

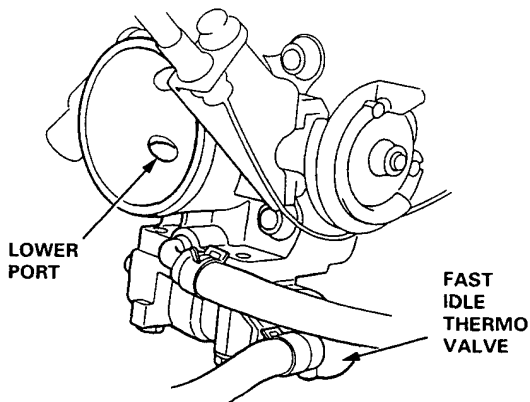
To prevent erratic running when the engine is warming up, it is necessary to raise the idle speed. The fast idle thermo valve is controlled by a thermowax plunger. When the engine is cold, the engine coolant surrounding the thermowax contracts the plunger, allowing additional air to be bypassed into the intake manifold so that the engine idles faster. When the engine reaches operating temperature, the valve closes, reducing the amount of air bypassing into the intake manifold.



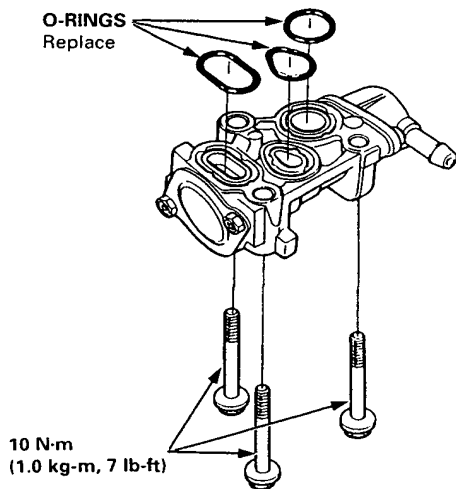


NOTE: The fast idle thermo valve is factory adjusted; it should not be disassembled.

1. Remove the intake air duct from the throttle body.
2. Start the engine.
3. Put your finger over the lower port in throttle body and make sure that there is air flow with the engine cold (engine coolant temperature below 30°C, 86°F).



- If not, replace the fast idle thermo valve and retest.



4. Warm up the engine (the radiator fan comes on).
5. Check that the valve is completely closed. If not, air suction can be felt at the lower port in the throttle body.
 - If any suction is felt, the valve is leaking. Check coolant level and for air in the cooling system (see section 10).
If OK, replace the fast idle thermo valve and recheck.

Intake Air System

System Troubleshooting Guide

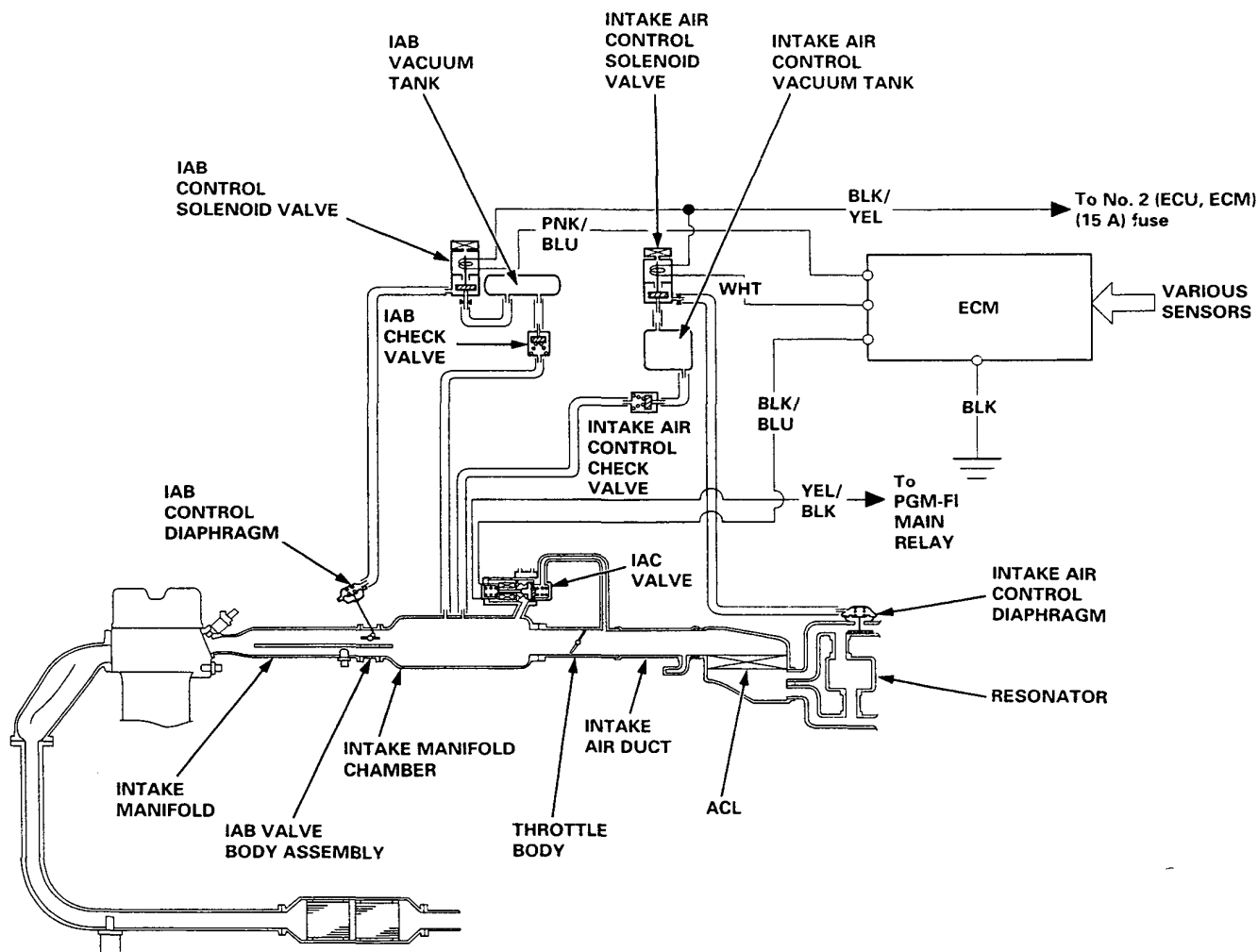
NOTE: Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE	SUB-SYSTEM	THROTTLE CABLE	THROTTLE BODY	INTAKE AIR BYPASS (IAB) CONTROL	INTAKE AIR CONTROL SYSTEM	AIR CLEANER AND INTAKE AIR DUCT
SYMPTOM		—	11-32	11-33	11-38	—
WHEN WARM IDLE SPEED TOO HIGH		②	①			
LOSS OF POWER			①	②	③	③



System Description

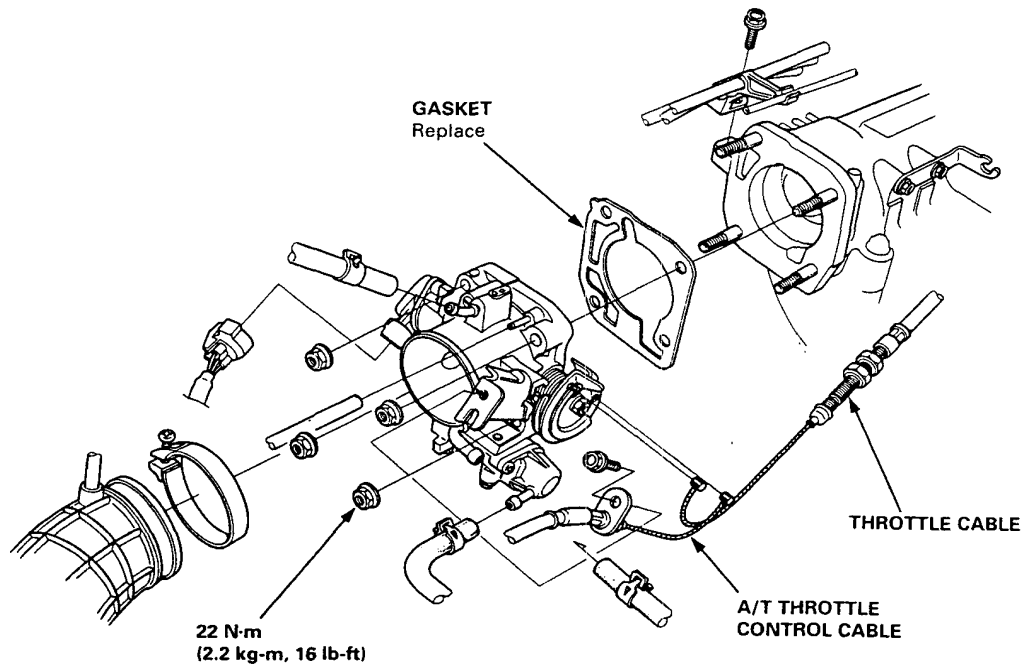
The system supplies air for all engine needs. It consists of the intake air control system, Air Cleaner (ACL), intake air duct, Throttle Body (TB), Idle Air Control (IAC) valve, Intake Air Bypass (IAB) control system and intake manifold. A resonator in the intake air pipe provides additional silencing as air is drawn into the system.



Intake Air System

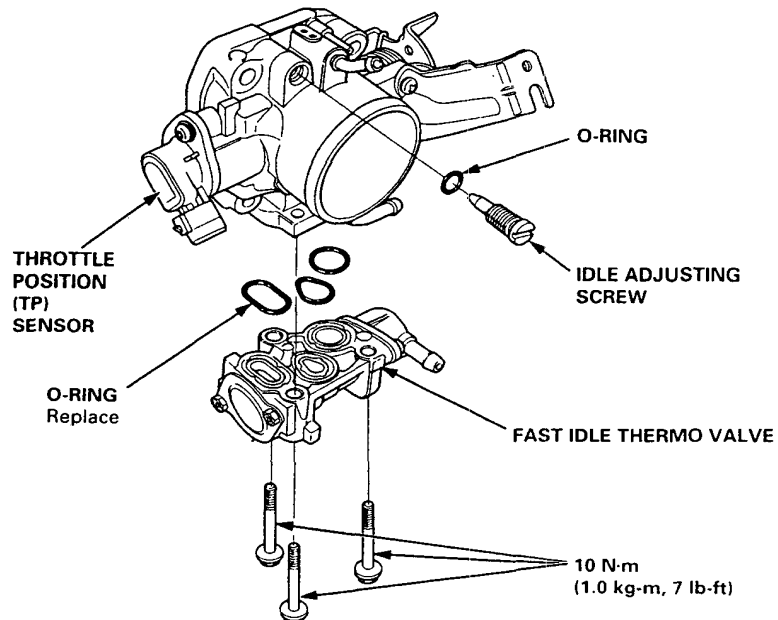
Throttle Body

Disassembly:



CAUTION:

- The throttle stop screw is non-adjustable.
- After reassembly, adjust the throttle cable, and A/T throttle control cable (see section 14) for cars with A/T.



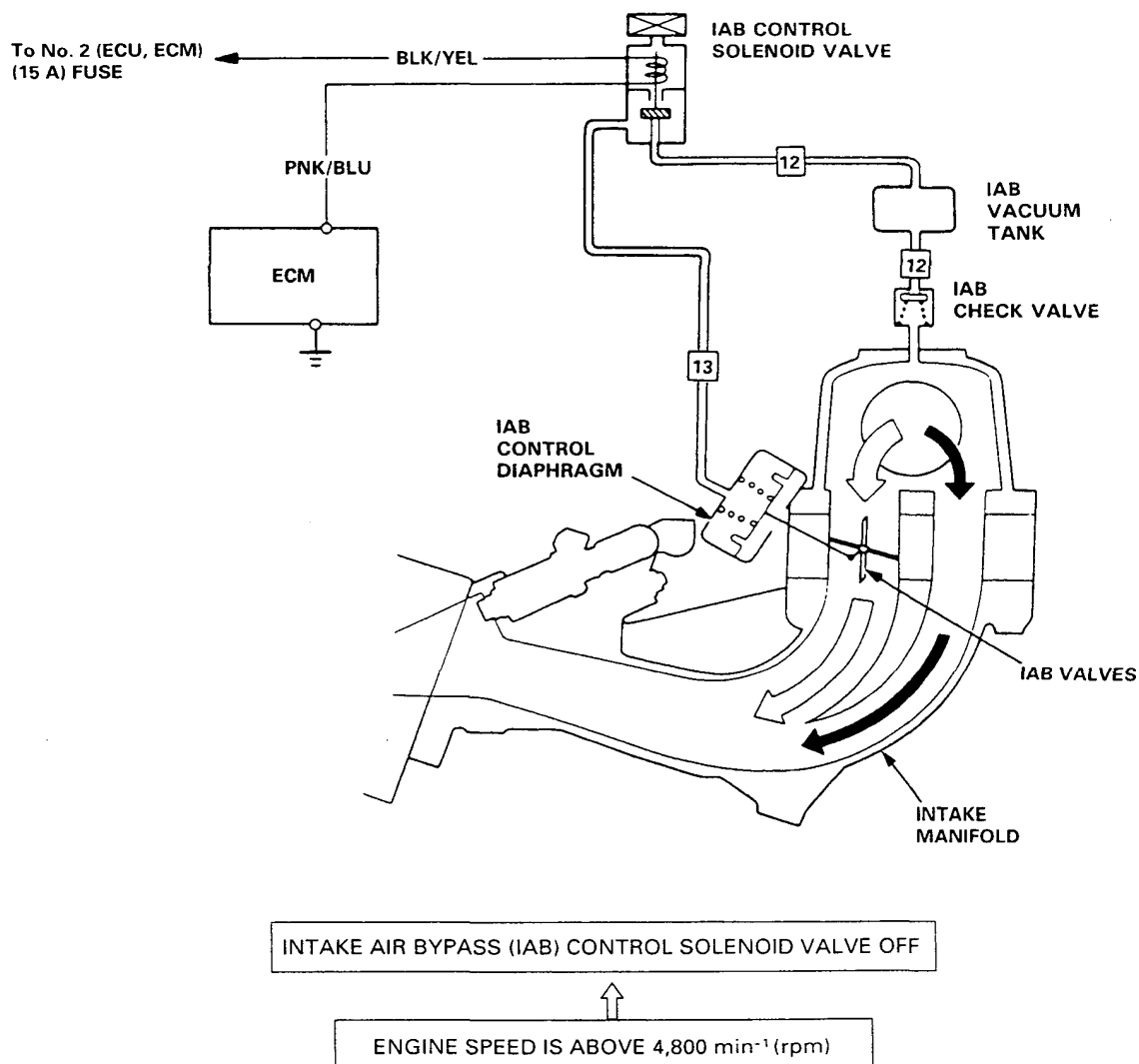


Intake Air Bypass (IAB) Control System

Description

Two air intake paths are provided in the intake manifold to allow the selection of the intake path most favorable for a given engine speed.

Satisfactory power performance is achieved by closing and opening the Intake Air Bypass (IAB) control valves. High torque at low engine speed is achieved when the valves are closed, whereas high power at high engine speed is achieved by when the valves are opened.



Intake Air System

Intake Air Bypass (IAB) Control System

Troubleshooting Flowchart

Inspection of IAB Control System

Start engine and allow to idle.

Remove #13 vacuum hose from the IAB control diaphragm and connect vacuum gauge to the hose.

Is there vacuum?

YES

NO

Remove #12 vacuum hose from the IAB vacuum tank, then check for vacuum at the IAB vacuum tank.

Is there vacuum?

YES

NO

Repair the blockage or vacuum leak between the IAB vacuum tank and the intake manifold.

Disconnect the 2P connector from the IAB control solenoid valve.

Measure voltage between BLK/ YEL (+) terminal and PNK/ BLU (-) terminal.

#13 HOSE

IAB CONTROL SOLENOID VALVE

#12 HOSE

BLK/ YEL (+)

PNK/ BLU (-)

View from terminal side

Is there battery voltage?

NO

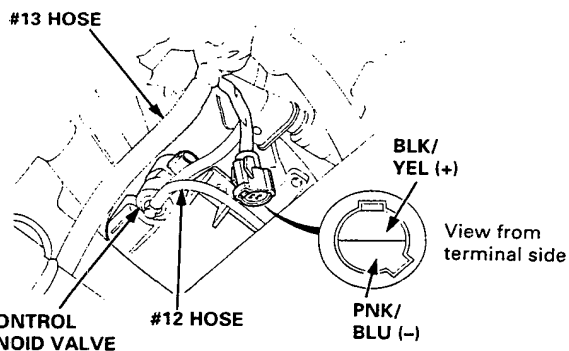
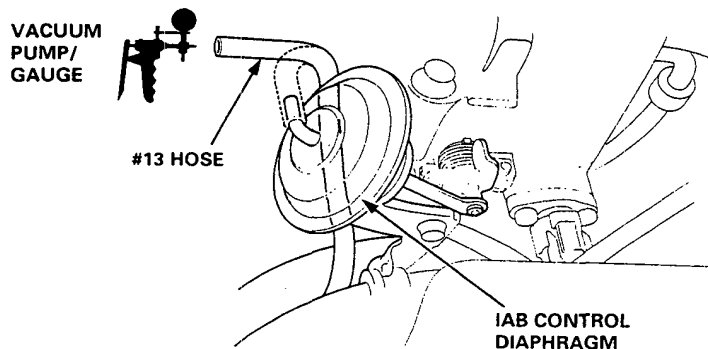
YES

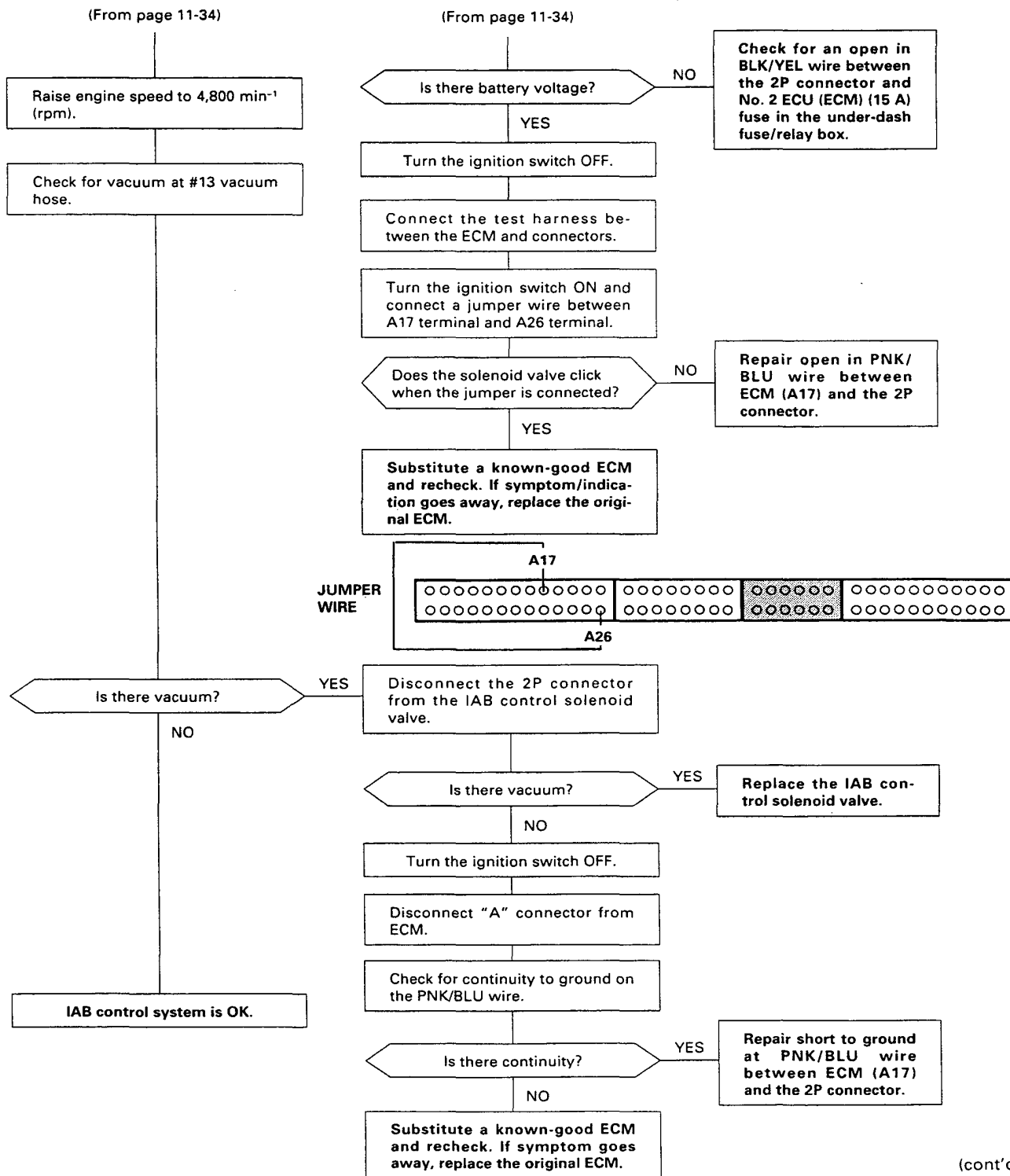
Replace the IAB control solenoid valve.

Measure voltage between BLK/ YEL (+) terminal and body ground.

(To page 11-35)

(To page 11-35)





(cont'd)

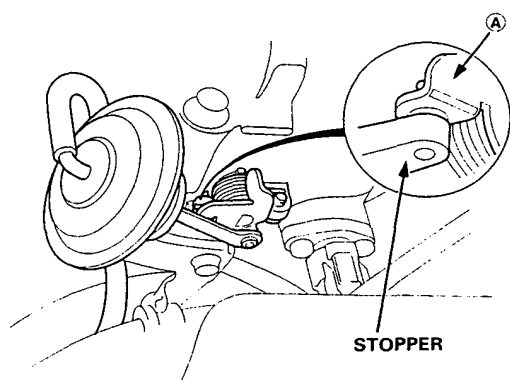
Intake Air System

Intake Air Bypass (IAB) Control System (cont'd)

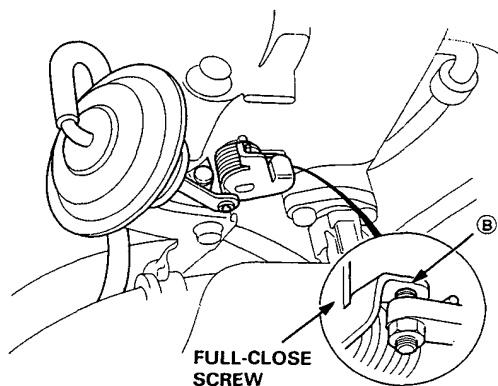
Intake Air Bypass (IAB) Valve Testing

CAUTION: Do not adjust the IAB valve full-close screw. It is preset at the factory.

- 1 Check the IAB valve shaft for binding or sticking.
- 2 Check the IAB valve for smooth movement.
- 3 With the engine at idle, check that (A) of the IAB valve is in close contact with the stopper when vacuum hose is disconnected.



- 4 With the engine at idle, check that (B) of the IAB valve is in close contact with the full-close screw when the vacuum hose is connected.



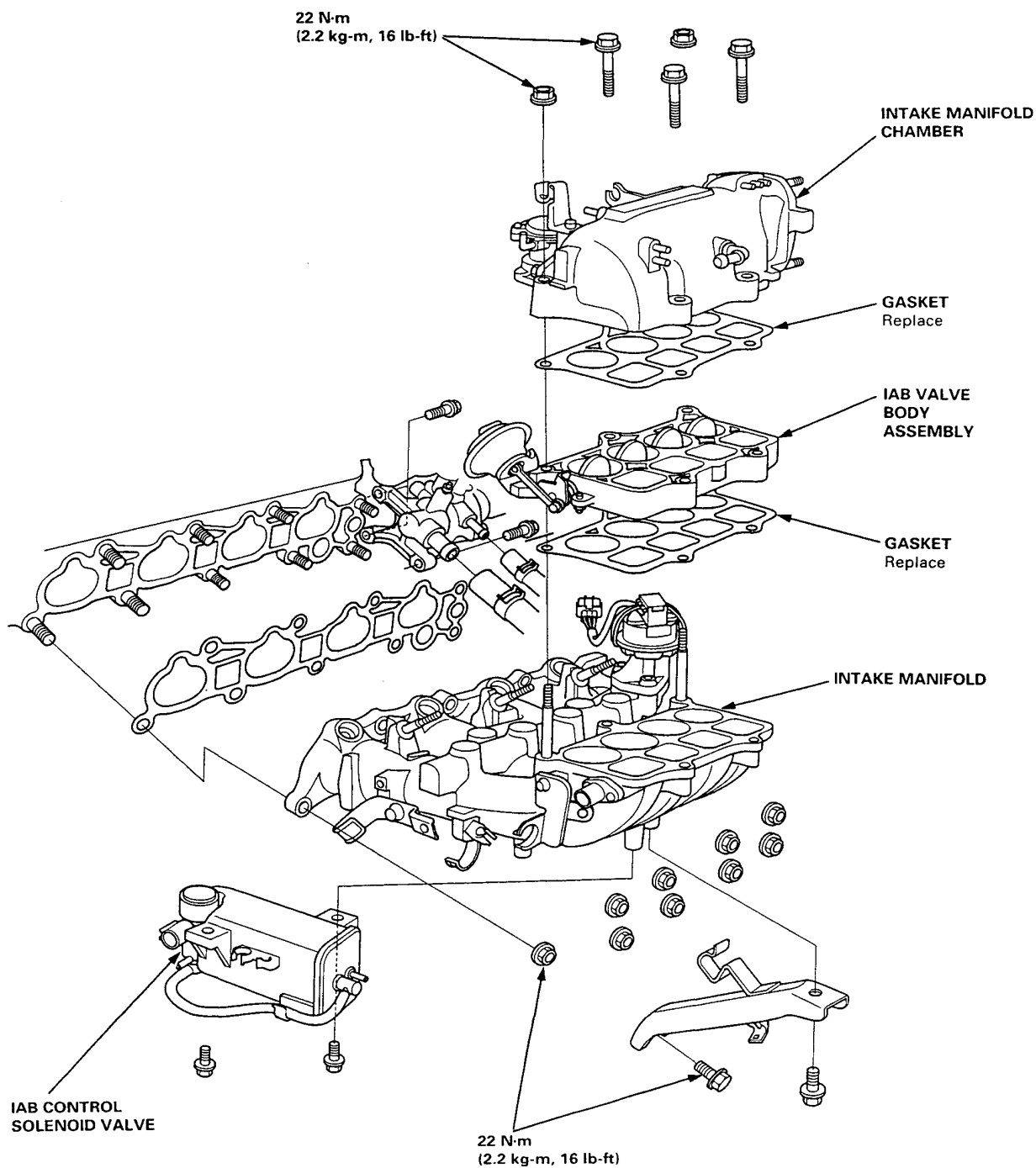
- If any fault is found, clean the linkage and shafts with carburetor cleaner.
- If the problem still exists after cleaning, disassemble the intake manifold and check the IAB valve body assembly (see page 11-37).

(cont'd)



Intake Air Bypass (IAB) Control System (cont'd)

Disassembly

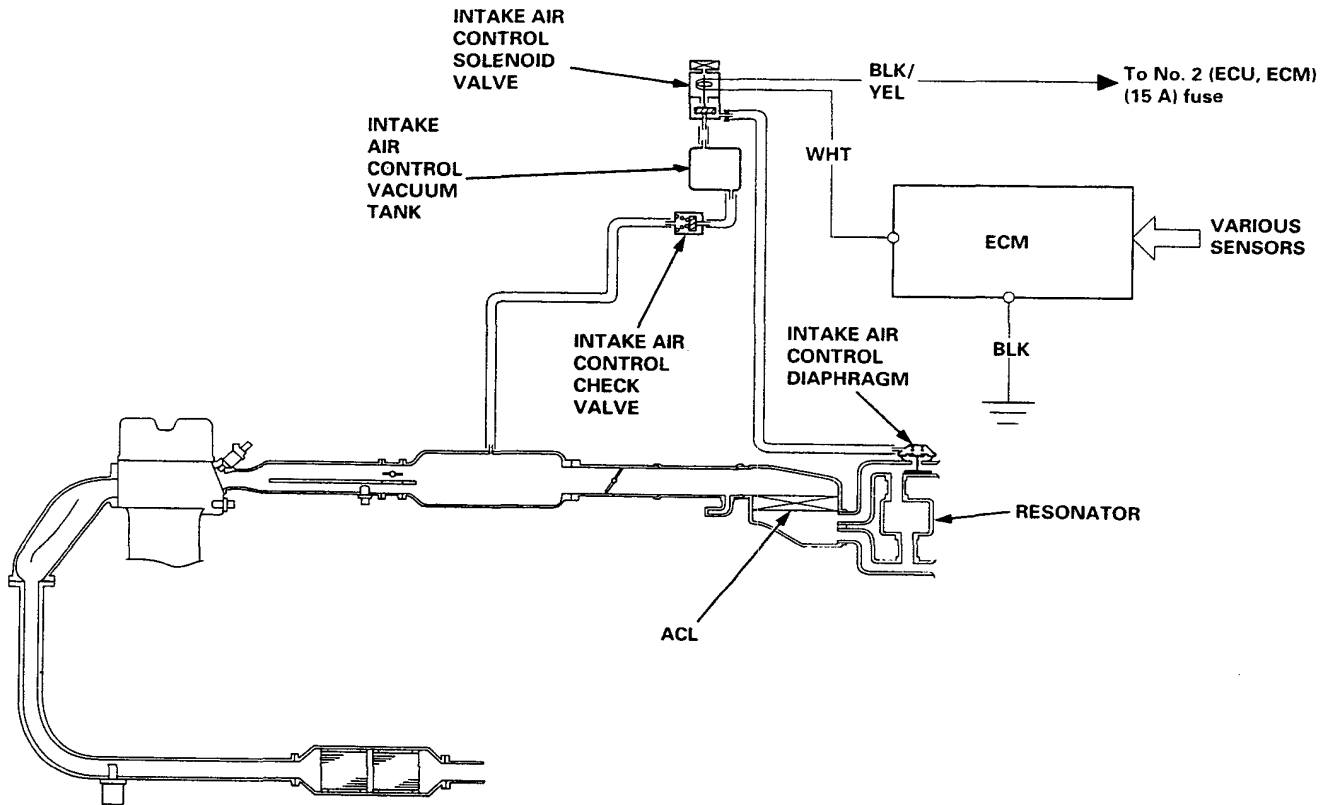


Intake Air System

Intake Air Control System

Description

The intake air control system decreases air intake noise.



When the engine speed is below 3,900 min⁻¹ (rpm), the ECM supplies current to the intake air control solenoid valve. This opens the solenoid valve sending intake manifold vacuum to the intake air control diaphragm.

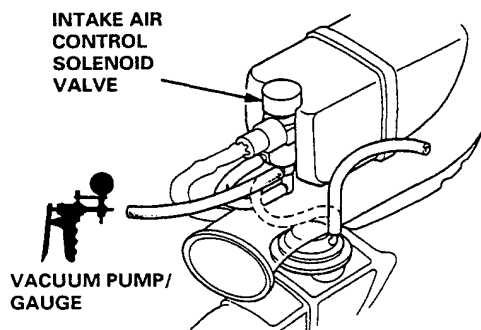


Troubleshooting Flowchart

Inspection of Intake Air Control System.

Start engine and allow to idle.

Remove the upper vacuum hose from the intake air control solenoid valve and connect a vacuum gauge to the solenoid valve.



Is there vacuum?

NO

Disconnect the lower vacuum hose of the intake air control solenoid valve from the intake air control vacuum tank and connect a vacuum gauge to the hose.

Is there vacuum?

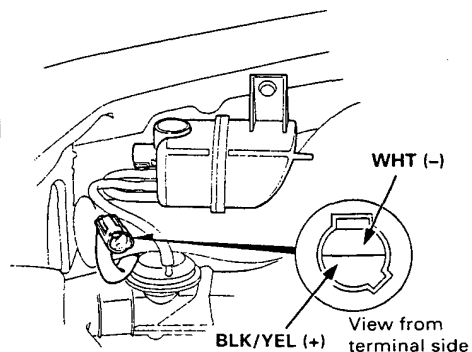
YES

NO

- Check the vacuum line for proper connection, cracks, blockage or disconnected hose.
- Clean manifold port.

Disconnect the 2P connector from the intake air control solenoid valve.

Measure voltage between BLK/ YEL (+) terminal and WHT (-) terminal.



Is there battery voltage?

YES

Replace the intake air control solenoid valve.

NO

Measure voltage between BLK/ YEL (+) terminal and body ground.

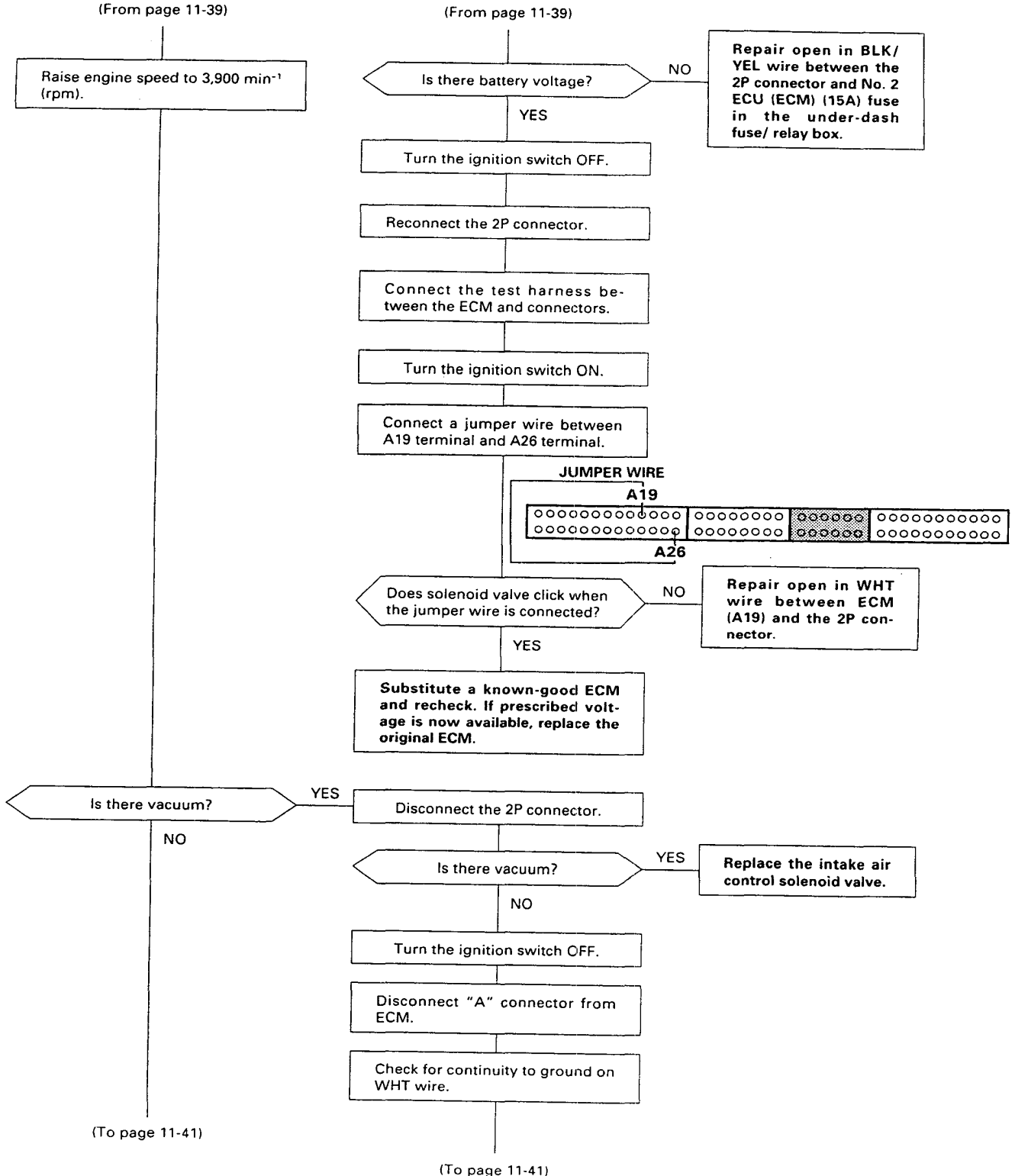
(To page 11-40)

(To page 11-40)

(cont'd)

Intake Air System

Intake Air Control System (cont'd)





(From page 11-40)

(From page 11-40)

Is there continuity?

YES

Check for a short to ground in WHT wire between ECM (A19) and the 2P connector.

NO

Substitute a known-good ECM and recheck. If symptom goes away, replace the original ECM.

Connect a vacuum pump to the #8 vacuum hose.

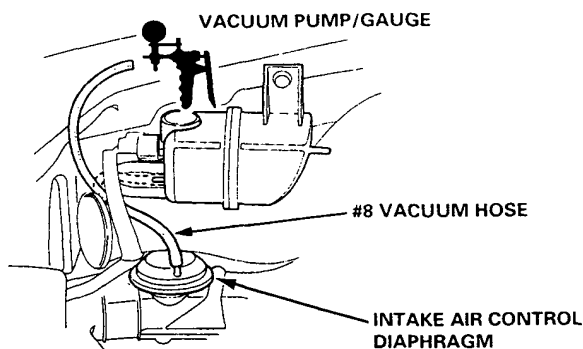
Apply the vacuum.

Does it hold vacuum?

NO

YES

Intake air control system is OK.



Check the vacuum line for proper connection or disconnected hose. If OK, replace the intake air control diaphragm.

Automatic Transmission

Special Tools	14-2
Road Test	14-3
Stall Speed	
Test	14-6
Pressure Testing	14-7
Clutch	
Illustrated Index	14-12



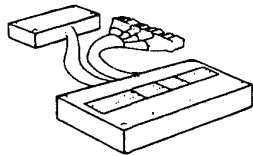
Outline of Model Changes

The H23A3 engine model has been added. Compare to F20Z1/F20Z2 engine models main differences are:

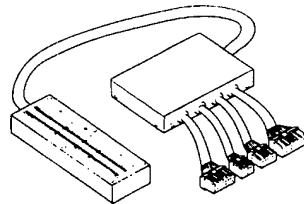
- Road test shift schedule
- Stall speed RPM
- Pressure testing fluid pressure
- 1st/2nd clutch assembly

Special Tools

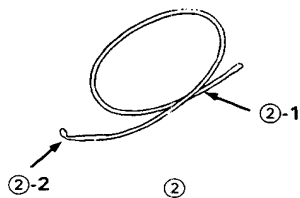
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07LAJ-PT30100 or 07LAJ-PT3010A	Test Harness	1	14-3
②	07MAJ-PY40100	A/T Pressure Gauge Hose Assembly	1	14-7
②-1	07MAJ-PY40110	Oil Pressure Gauge Hose	(1)	14-7
②-2	07MAJ-PY40120	Oil Pressure Joint	(1)	14-7
③	07406-0020003	A/T Oil Pressure Gauge Set	1	14-7
③-1	07406-0020201	A/T Oil Pressure Gauge Hose	(1)	14-7
④	07406-0070000	A/T Low Pressure Gauge	1	14-7
⑤	07411-0020000	Digital Circuit Tester	1	14-3



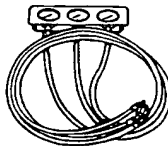
①



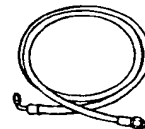
(1)



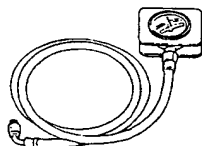
②



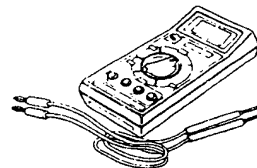
③



③-1



④



⑤

Road Test



NOTE:

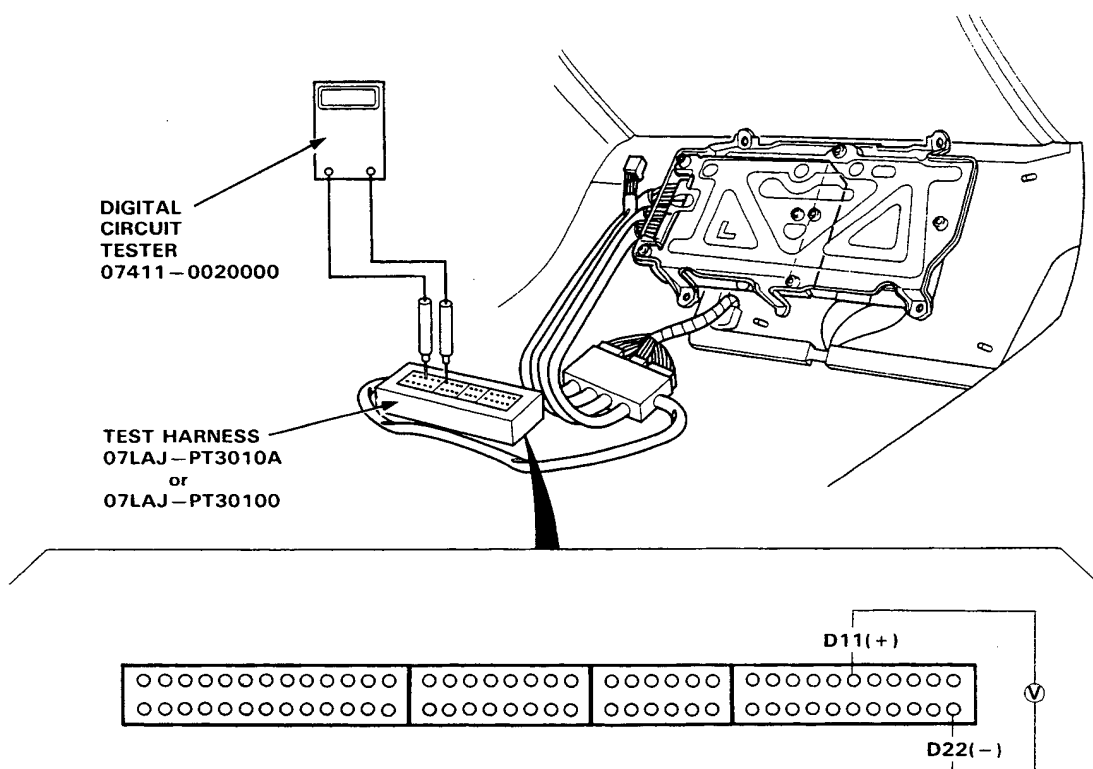
Warm up the engine to normal operating temperature (the radiator fan comes on).

1. Apply parking brake and block the wheels. Start the engine, then move the selector lever to **D4** position while depressing the brake pedal. Depress the accelerator pedal and release it suddenly. Engine should not stall.
2. Repeat same test in **D3** position.
3. Shift the selector lever to **D4** position and check that the shift points occur at approximate speeds shown. Also check for abnormal noise and clutch slippage.

NOTE:

Throttle position sensor voltage represents the throttle opening.

- 1. Connect the Test Harness between the ECM and connector (see section 11).
- 2. Set the digital multimeter to check voltage between D11 (+) terminal and D22 (–) terminal for the throttle position sensor.



(cont'd)

Road Test

(cont'd)

D4 Position: Normal Mode (S Switch OFF)

• Upshift

		1st → 2nd	2nd → 3rd	3rd → 4th	Lock-up Clutch ON
Throttle position sensor voltage: 0.836 V (0.7/8 throttle) Coasting down-hill from a stop	km/h	22–24	41–45	58–64	22–26
	mph	14–15	25–28	36–40	14–16
Throttle position sensor voltage: 2.184 V (3.5/8 throttle) Acceleration from a stop	km/h	28–34	62–68	91–99	95–103
	mph	17–21	39–42	57–62	59–64
Full-throttle Acceleration from a stop	km/h	47–54	107–115	145–154	138–146
	mph	29–34	66–71	90–96	86–91

• Downshift

		Lock-up Clutch OFF	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.836 V (0.7/8 throttle) Coasting or braking to a stop	km/h	21–25	—	24–30 (4th → 2nd)	10–16
	mph	13–16	—	15–19 (4th → 2nd)	6–10
Throttle position sensor voltage: 2.184 V (3.5/8 throttle) When car is slowed by increased grade, wind, etc.	km/h	76–84	—	—	—
	mph	47–52	—	—	—
Full-throttle When car is slowed by increased grade, wind, etc.	km/h	131–139	126–135	86–94	39–46
	mph	81–86	78–84	53–58	24–29

D4 Position: S Mode (S Switch ON)

• Upshift

		1st → 2nd	2nd → 3rd	3rd → 4th	Lock-up Clutch ON
Throttle position sensor voltage: 0.836 V (0.7/8 throttle) Coasting down-hill from a stop	km/h	23–25	46–50	77–83	37–41
	mph	14–16	29–31	48–52	23–25
Throttle position sensor voltage: 2.184 V (3.5/8 throttle) Acceleration from a stop	km/h	32–38	70–76	100–108	105–113
	mph	20–24	43–47	62–67	65–70
Full-throttle Acceleration from a stop	km/h	47–54	107–115	145–154	138–146
	mph	29–34	66–71	90–96	86–91

• Downshift

		Lock-up Clutch OFF	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.836 V (0.7/8 throttle) Coasting or braking to a stop	km/h	35–39	—	28–35 (4th → 2nd)	10–16
	mph	22–24	—	18–22 (4th → 2nd)	6–10
Throttle position sensor voltage: 2.184 V (3.5/8 throttle) When car is slowed by increased grade, wind, etc.	km/h	83–91	—	—	—
	mph	52–57	—	—	—
Full-throttle When car is slowed by increased grade, wind, etc.	km/h	131–139	126–135	86–94	39–46
	mph	81–86	78–84	53–58	24–29



4. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th, then shift **D₄** to **2** position. The car should immediately begin slowing down from engine braking.

CAUTION: Do not shift from **D₄** or **D₃** position to **2** or **1** position at speeds over 62 mph (100 km/h); you may damage the transmission.

5. Check for abnormal noise and clutch slippage in the following positions.

1 (1st Gear) Position

- 1. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
- 2. Upshifts should not occur with the selector in this position.

2 (2nd Gear) Position

- 1. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
- 2. Upshifts and downshifts should not occur with the selector in this position.

R (Reverse) Position

Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

6. Test in **P** (Parking) Position

Park car on slope (approx. 16°), apply the parking brake, and shift into **P** position. Release the brake; the car should not move.

Stall Speed

Test

CAUTION:

- To prevent transmission damage, do not test stall speed for more than 10 seconds at a time.
- Do not shift the lever while raising the engine speed.
- Be sure to remove the pressure gauge before testing stall speed.

1. Engage parking brake and block the front wheels.
2. Connect tachometer, and start the engine.
3. Make sure the A/C switch is OFF.
4. After the engine has warmed up to normal operating temperature (the radiator fan comes on), shift into **[2]** position.
5. Fully depress the brake pedal and accelerator for 6 to 8 seconds, and note engine speed.
6. Allow 2 minutes for cooling, then repeat same test in **[D₄]**, **[1]**, and **[R]** positions.

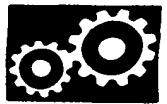
NOTE:

- Stall speed tests should be used for diagnostic purposes only.
- Stall speed should be the same in **[D₄]**, **[2]**, **[1]**, and **[R]** positions.

Stall Speed RPM: 2,550—2,850 min⁻¹ (rpm)

TROUBLE	PROBABLE CAUSE
Stall rpm high in [D₄] , [2] , [1] and [R] positions	<ul style="list-style-type: none">• Low fluid level or oil pump output• Clogged ATF strainer• Pressure regulator valve stuck closed• Slipping clutch
Stall rpm high in [R] position	<ul style="list-style-type: none">• Slippage of 4th clutch
Stall rpm high in [2] and [D₄] positions	<ul style="list-style-type: none">• Slippage of 2nd clutch
Stall rpm high in [1] position	<ul style="list-style-type: none">• Slippage of 1st clutch or 1st gear one-way clutch
Stall rpm low in [D₄] , [2] , [1] and [R] positions	<ul style="list-style-type: none">• Engine output low• Torque converter one-way clutch slipping

Pressure Testing



⚠ WARNING

- While testing, be careful of the rotating front wheels.
- Make sure lifts, jacks, and safety stands are placed properly (see section 1).

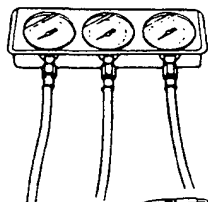
CAUTION: Before testing, be sure the transmission fluid is filled to the proper level.

1. Raise the car. (see section 1).
2. Warm up the engine (the radiator fan comes on), then stop the engine and connect a tachometer.
3. Connect the oil pressure gauge to each inspection hole.

TORQUE: 18 N·m (1.8 kg-m, 13 lb-ft)

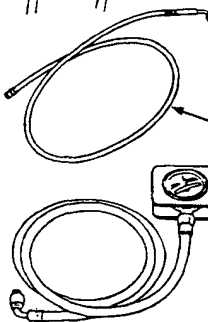
CAUTION:

Connect the oil pressure gauge securely; be sure not to allow dust and other foreign particles to enter the inspection hole.



A/T OIL PRESSURE GAUGE SET
07406-0020003

A/T OIL PRESSURE GAUGE HOSE ASSEMBLY
07MAJ-PY40100



OIL PRESSURE JOINT
07MAJ-PY40120

OIL PRESSURE GAUGE HOSE
07MAJ-PY40110

A/T LOW PRESSURE GAUGE
07406-0070000

NOTE:

- Use the A/T Oil Pressure Gauge Set (07406-0020003) or A/T Low Pressure Gauge (07406-0070000), and the oil pressure gauge hoses and joints shown above.
- The A/T Oil Pressure Gauge Hose (07406-0020201) may also be used.

4. Start the engine, and measure the respective pressure as follows:
 - Line Pressure
 - Clutch Pressure
 - Throttle B Pressure
 - Clutch Low/High Pressure
5. Install a new washer and the sealing bolt in the inspection hole, and tighten to the specified torque.

TORQUE: 18 N·m (1.8 kg-m, 13 lb-ft)

NOTE:

Do not reuse old aluminum washers.

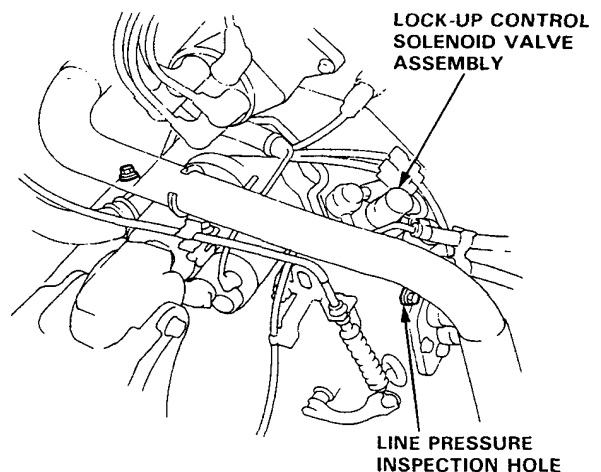
• Line Pressure Measurement

- 1. Set the parking brake and block both rear wheels securely.
- 2. Run the engine at 2,000 min⁻¹ (rpm).
- 3. Shift the select lever to **N** or **P** position.

NOTE:

Higher pressures may be indicated if measurements are made in selector positions other than **N** or **P** position.

- 4. Measure line pressure.



PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Line	N or P	No (or low) line pressure	Torque converter, oil pump, pressure regulator, torque converter check valve	850–900 kPa (8.5–9.0 kg/cm ² , 121–128 psi)	800 kPa (8.0 kg/cm ² , 114 psi)

(cont'd)

Pressure Testing

(cont'd)

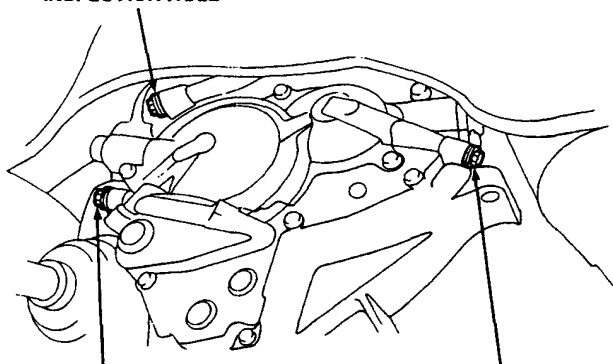
• Clutch Pressure Measurement

▲ WARNING

While testing, be careful of the rotating front wheels.

- 1. Set the parking brake and block both rear wheels securely.
- 2. Raise the front of the car and support it with safety stands.
- 3. Allow the front wheels to rotate freely.
- 4. Run the engine at 2,000 min⁻¹ (rpm).
- 5. Measure each clutch pressure.

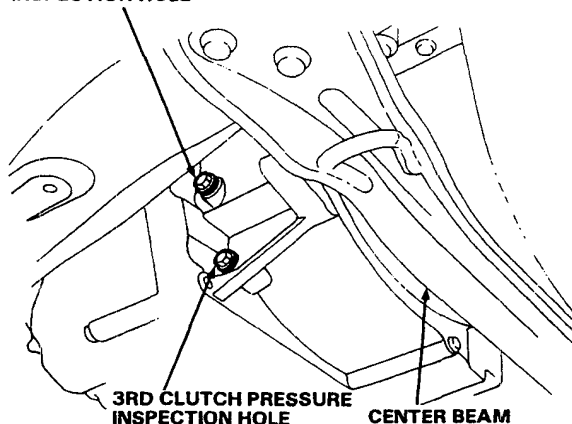
1ST CLUTCH PRESSURE
INSPECTION HOLE



1ST-HOLD CLUTCH PRESSURE
INSPECTION HOLE

4TH CLUTCH PRESSURE
INSPECTION HOLE

2ND CLUTCH PRESSURE
INSPECTION HOLE



3RD CLUTCH PRESSURE
INSPECTION HOLE

CENTER BEAM

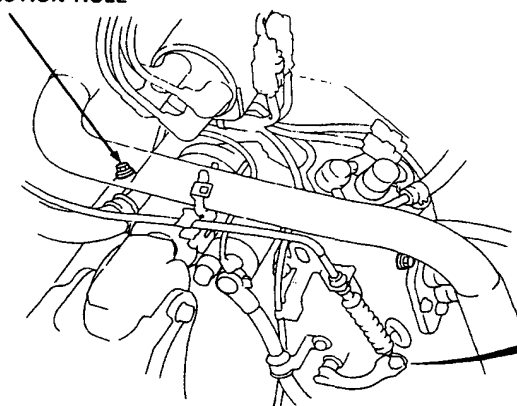
PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
1st Clutch	1 or D4	No or low 1st pressure	1st Clutch	850–900 kPa (8.5–9.0 kg/cm ² , 121–128 psi)	800 kPa (8.0 kg/cm ² , 114 psi)
1st-hold Clutch	1	No or low 1st-hold pressure	1st-hold Clutch		
2nd Clutch	2	No or low 2nd pressure	2nd Clutch		
2nd Clutch	D4 or D3	No or low 2nd pressure	2nd Clutch	500 kPa (5.0 kg/cm ² , 71 psi) (Throttle fully closed)	450 kPa (4.5 kg/cm ² , 64 psi) (Throttle fully closed)
3rd Clutch		No or low 3rd pressure	3rd Clutch	900 kPa (9.0 kg/cm ² , 128 psi) (Throttle more than 3/16 opened)	800 kPa (8.0 kg/cm ² , 114 psi) (Throttle more than 3/16 opened)
4th Clutch	D4	No or low 4th pressure	4th Clutch	530 kPa (5.3 kg/cm ² , 75 psi) (Throttle fully closed) 900 kPa (9.0 kg/cm ² , 128 psi) (Throttle more than 3/16 opened)	480 kPa (4.8 kg/cm ² , 68 psi) (Throttle fully closed) 800 kPa (8.0 kg/cm ² , 114 psi) (Throttle more than 3/16 opened)
	R		Servo Valve or 4th Clutch	850–900 kPa (8.5–9.0 kg/cm ² , 121–128 psi)	800 kPa (8.0 kg/cm ² , 114 psi)



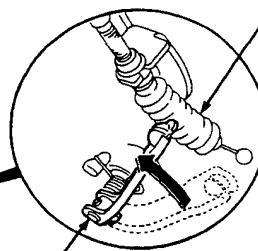
● **Throttle B Pressure Measurement**

1. Set the parking brake securely and block the wheels.
2. Run the engine at $1,000 \text{ min}^{-1}$ (rpm).
3. Disconnect the throttle control cable from the throttle control lever and set the throttle control lever in full throttle position.

**THROTTLE B PRESSURE
INSPECTION HOLE**



**THROTTLE CONTROL
CABLE**



**THROTTLE CONTROL
LEVER**

PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Throttle B	D4	Pressure too high	Throttle Valve B	0 kPa (0 kg/cm ² , 0.0 psi) throttle lever fully-closed	—
		No or low pressure		850—900 kPa (8.5—9.0 kg/cm ² , 121—128 psi) throttle lever fully-opened	800 kPa (8.0 kg/cm ² , 114 psi) throttle lever fully-opened

(cont'd)

Pressure Testing

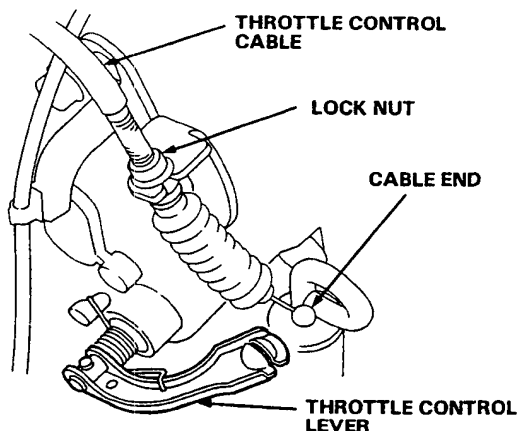
(cont'd)

• Low/High Pressure Test

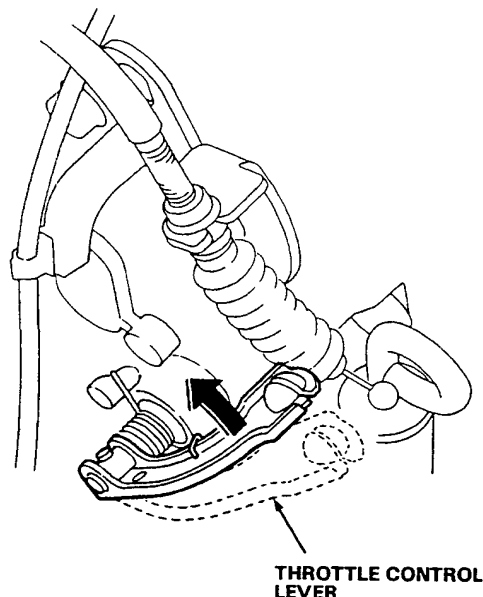
1. Set the parking brake and block the rear wheels securely.
2. Raise the car and support with safety stands.
3. Attach the gauge set to the appropriate pressure inspection holes.
4. Remove the throttle control cable end of the throttle control lever.

NOTE:

Do not loosen the locknuts; simply unhook the throttle control cable end.

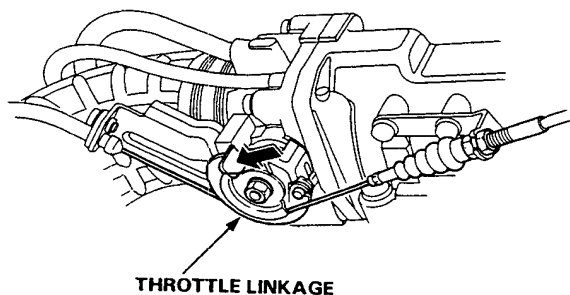


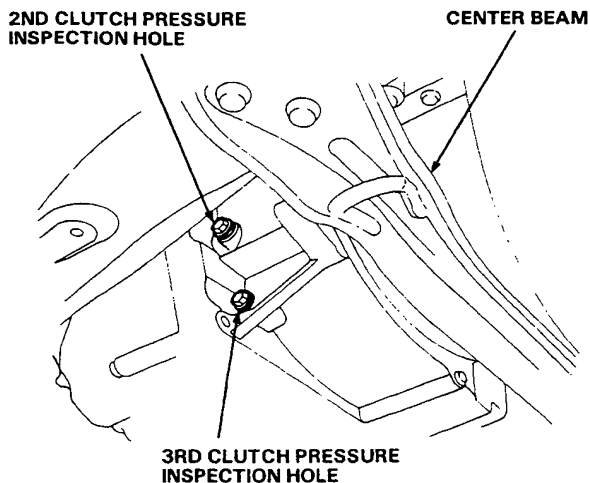
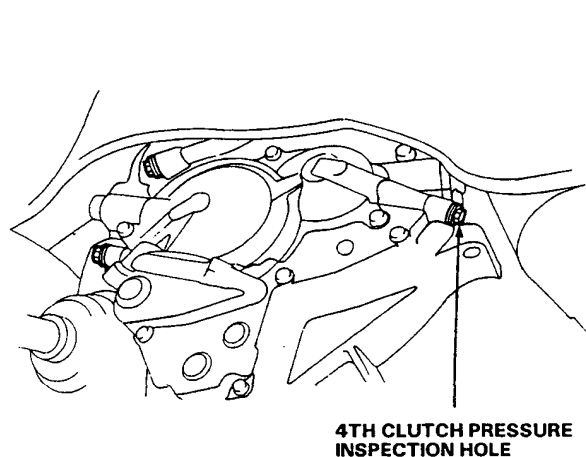
8. With the engine idling, lift the throttle control lever up approximately 1/2 of its possible travel and increase the engine rpm until pressure is indicated on the appropriate gauge. Record the highest pressure reading obtained.



9. Repeat steps 7 and 8 for each clutch pressure being inspected.

5. Warm up the engine to normal operating temperature (the radiator fan comes on).
6. With the engine idling, move the selector lever to **D4** position.
7. Slowly move the throttle linkage to increase engine rpm until pressure is indicated on the appropriate gauge. Then release the throttle linkage, allowing the engine to return to an idle, and record the pressure reading.



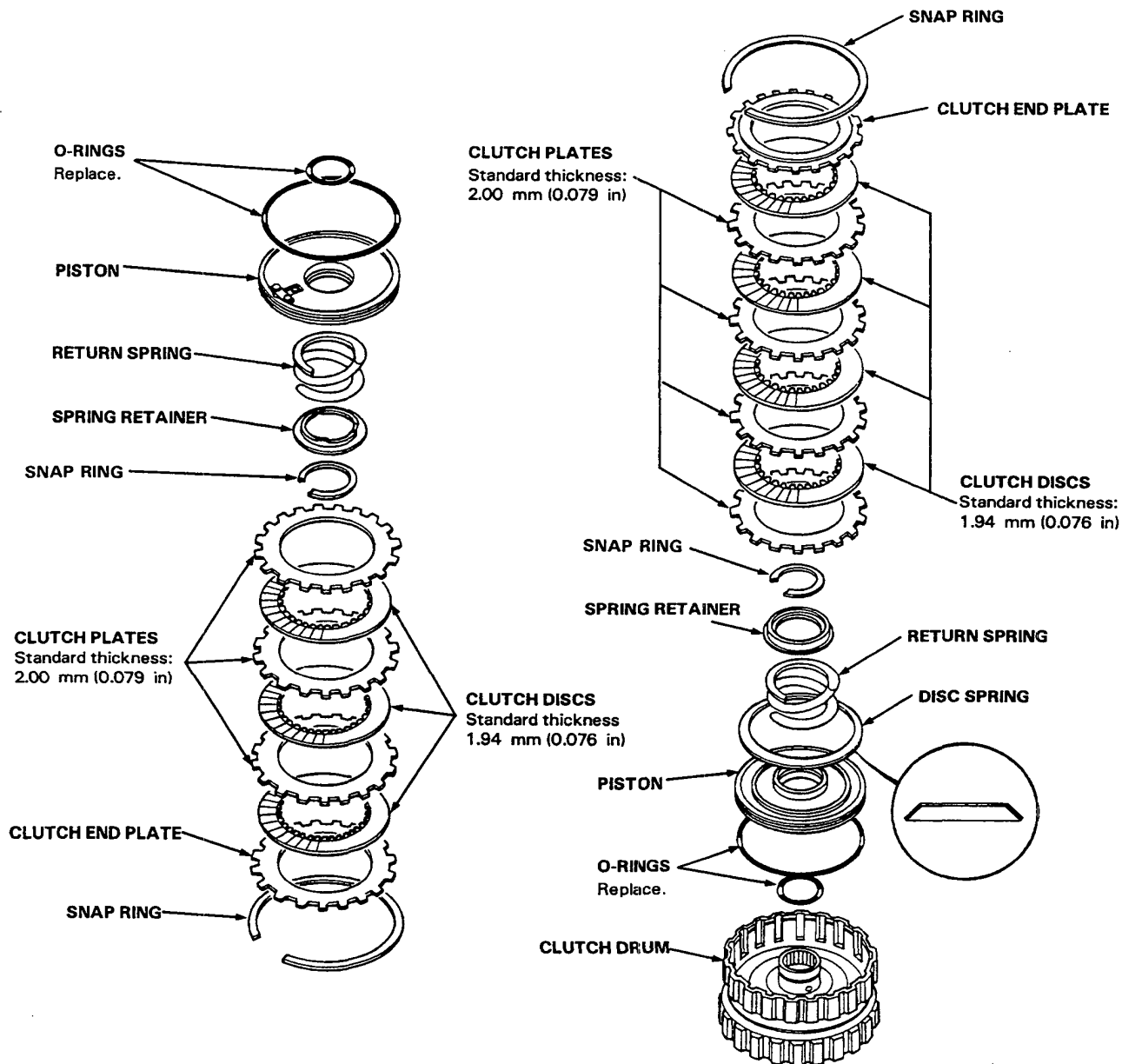


PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
2nd Clutch	D ₄	No or low 2nd pressure	2nd Clutch	500–900 kPa (5.0–9.0 kg/cm ² , 71–128 psi) varies with throttle opening	450kPa (4.5 kg/cm ² , 64 psi) (Throttle fully closed) 800 kPa (8.0 kg/cm ² , 114 psi) (Throttle more than 3/16 opened)
3rd Clutch		No or low 3rd pressure	3rd Clutch		
4th Clutch		No or low 4th pressure	4th Clutch		

Clutch

Illustrated Index

1ST/2ND CLUTCH ASSEMBLY



Conventional Brakes

Front Brake Pads

Inspection and Replacement 19-2



Outline of Model Change

- The front brake pad inspection and replacement descriptions has been changed for the 2.3 ℓ model. Refer to the '93 Accord Shop Manual (No. 62SN700) for 2.0 ℓ KS models.

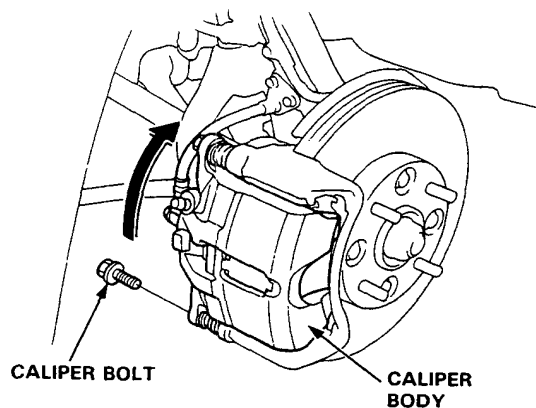
Front Brake Pads

Inspection and Replacement

⚠ WARNING

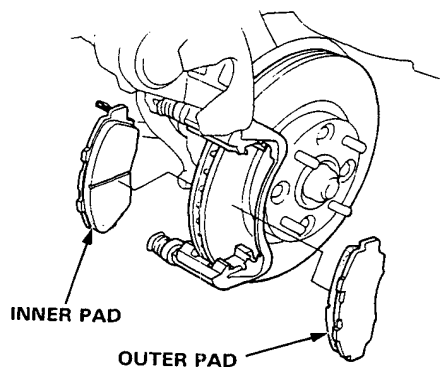
- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner, to avoid breathing brake dust.

1. Loosen the front wheel nuts slightly, then raise the car and support on safety stands. Remove the front wheels.
2. Remove the caliper bolt and pivot the caliper body up out of the way.



NOTE: Check the hoses and pin boots for damage or deterioration.

3. Remove the inner and outer pads.



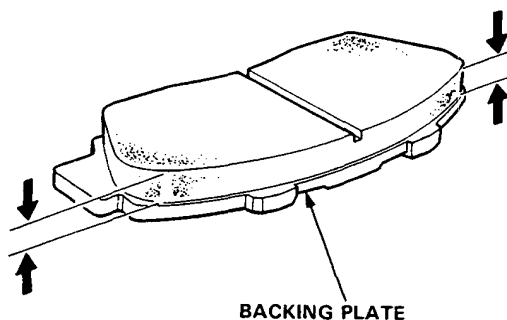
4. Using vernier calipers, measure the thickness of each brake pad lining.

Brake Pad Thickness:

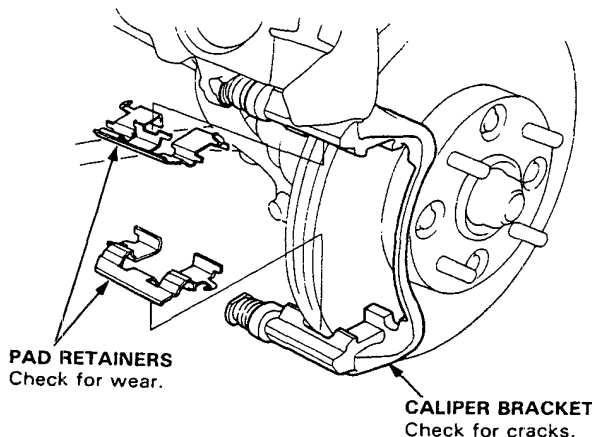
Standard: 11.0 mm (0.43 in)

Service Limit: 1.6 mm (0.06 in)

NOTE: Measurement does not include pad backing plate thickness.



5. If the brake pad thickness is less than service limit, replace the front pads as a set.
6. Remove the pad retainers.
7. Clean the caliper thoroughly; remove any rust, and check for grooves or cracks.
8. Check the brake disc for damage or cracks.
9. Install the pad retainers.



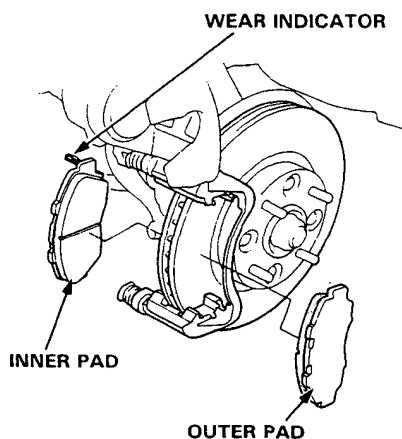


10. Install the brake pads correctly.

⚠ WARNING

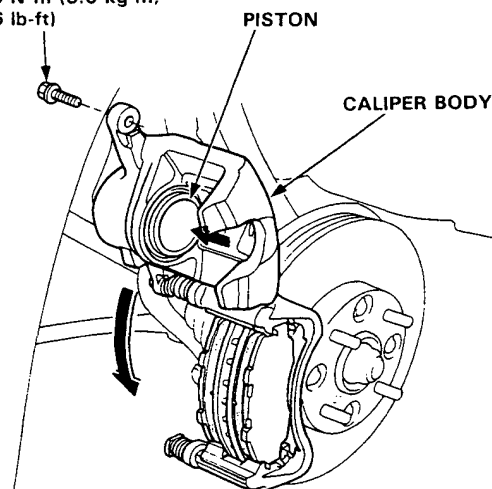
- When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.

NOTE: Install the inner pad with the wear indicator on the inside.



11. Push in the piston so that the caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down.
12. Pivot the caliper down into position, then install caliper bolt and tighten it.

CALIPER BOLT
50 N·m (5.0 kg-m,
36 lb-ft)



13. Depress the brake pedal several times to make sure the brakes work, then road-test.

NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

14. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

Body

Front Spoiler
 Replacement 20-2

Trunk Spoiler
 Replacement 20-3



Outline of Model Changes

- The front spoiler has been added (for some type).
- The trunk spoiler has been added (for some type).

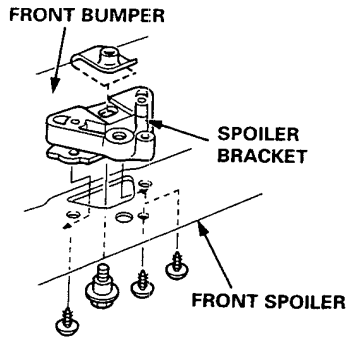
Front Spoiler

Replacement

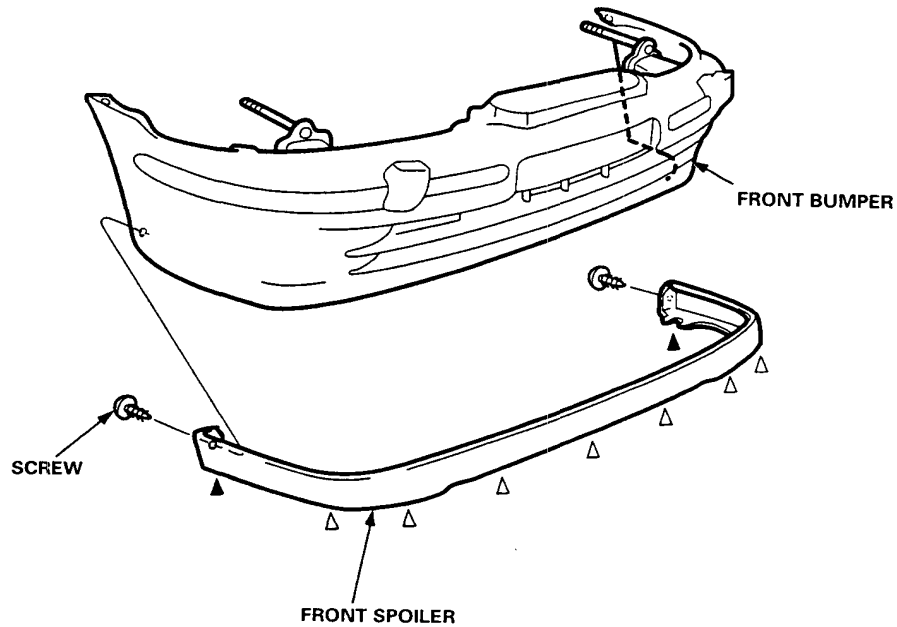
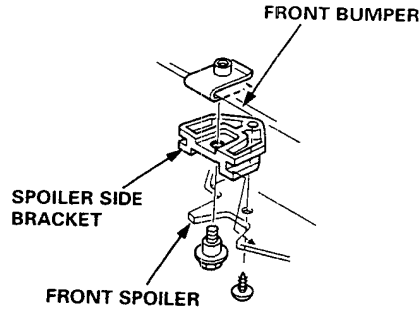
Remove the front spoiler as shown.

NOTE: Take care not to scratch the front bumper and front spoiler.

△: Spoiler bracket locations, 7



▲: Spoiler side bracket locations, 2



Installation is the reverse of the removal procedure.

NOTE: Check that the front spoiler is securely attached to the front bumper.



Trunk Spoiler

Replacement

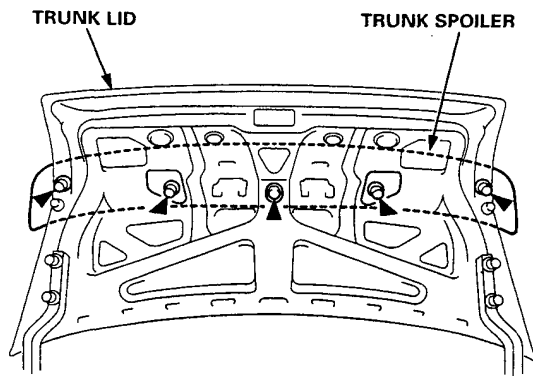
NOTE: Take care not to scratch the body.

1. Open the trunk lid.
2. Remove the nuts.

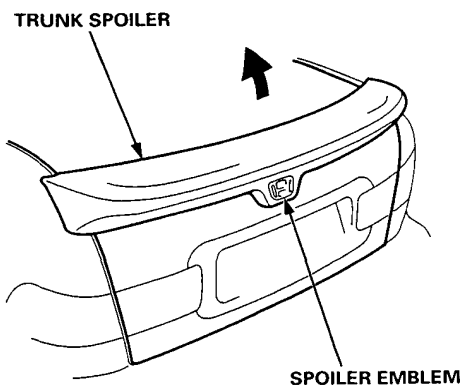
NOTE: Take care not to drop the nuts inside the trunk lid.

▲: Nut locations, 5

6 x 1.0 mm
10 N·m (1.0 kg-m,
7.2 lb-ft)

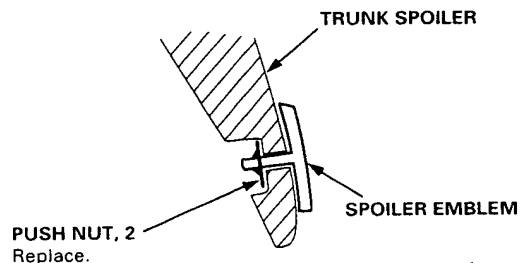


3. Lift and remove the trunk spoiler.



4. Remove the push nuts, then remove the spoiler emblem.

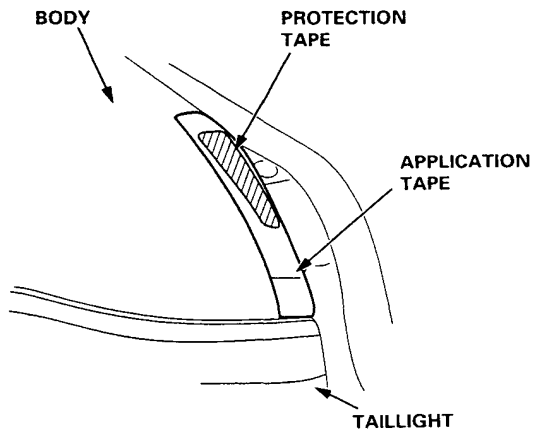
NOTE: The numbers after the part name show the quantities of the parts used.



5. If necessary, replace the protection tapes on each side.
Align the application tape with the outer taillight and body as shown, then press the protection tape into place.
Remove the application tape.

NOTE:

- Before applying, clean the body surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease or water from getting on the surface.



6. Installation is the reverse of the removal procedure.

Electrical

Special Tools 23-2

Relay and Control Unit Locations 23-3

Wire Harness and
Ground Locations 23-4

Power Distribution 23-9

Ground Distribution 23-11

Starting System

 Starter Replacement 23-12

* Ignition System

 Ignition Timing Inspection
 and Setting 23-13

 Idle Speed Inspection 23-14

 Spark Plug Inspection 23-15

Keyless Entry System (KE)

 Circuit Diagram 23-16

 Control Unit Input Test 23-17

 Passenger's Door Lock Actuator
 Test 23-19

 Key Cylinder Switch Test 23-19

 Wiring Diagrams 23-20

* Read SRS precautions on page 23-306 in the Shop Manual (62SN700) before working in these areas.

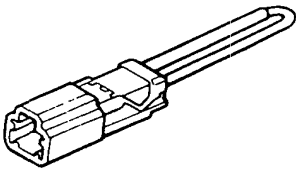
Outline of Model Changes

- **Relay and Control Unit Locations:** As the Keyless Entry System has been added, the related items have been rewritten.
- **Wire Harness and Ground Locations:** As the wire harness has partly changed, the related items have been rewritten.
- **Starting System:** Starter Replacement has partly changed.
- **Ignition System:** As the 2.3 l (H23A3) type engine has been added, the related items have been rewritten.
- **Keyless Entry System (KE):** As the Keyless Entry System has been added, the related items have been rewritten.
- All of the above-mentioned changes have been reflected in Power Distribution, Ground Distribution and Wiring Diagrams.



Special Tools

Ref. No.	Tool Number	Description	Qty.	Page Reference
①	07PAZ – 0010100	SCS short connector	1	23-13

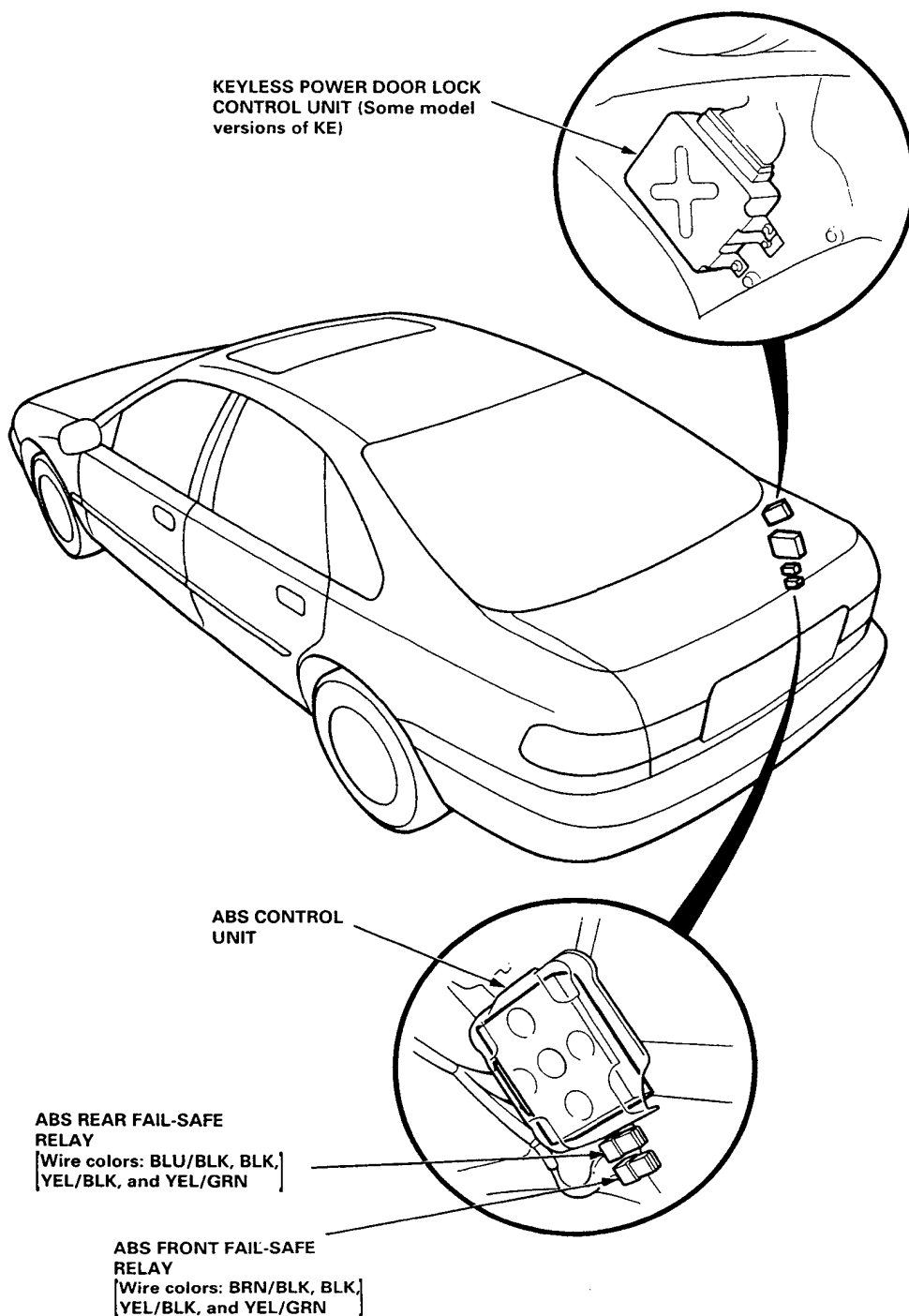


①

Relay and Control Unit Locations



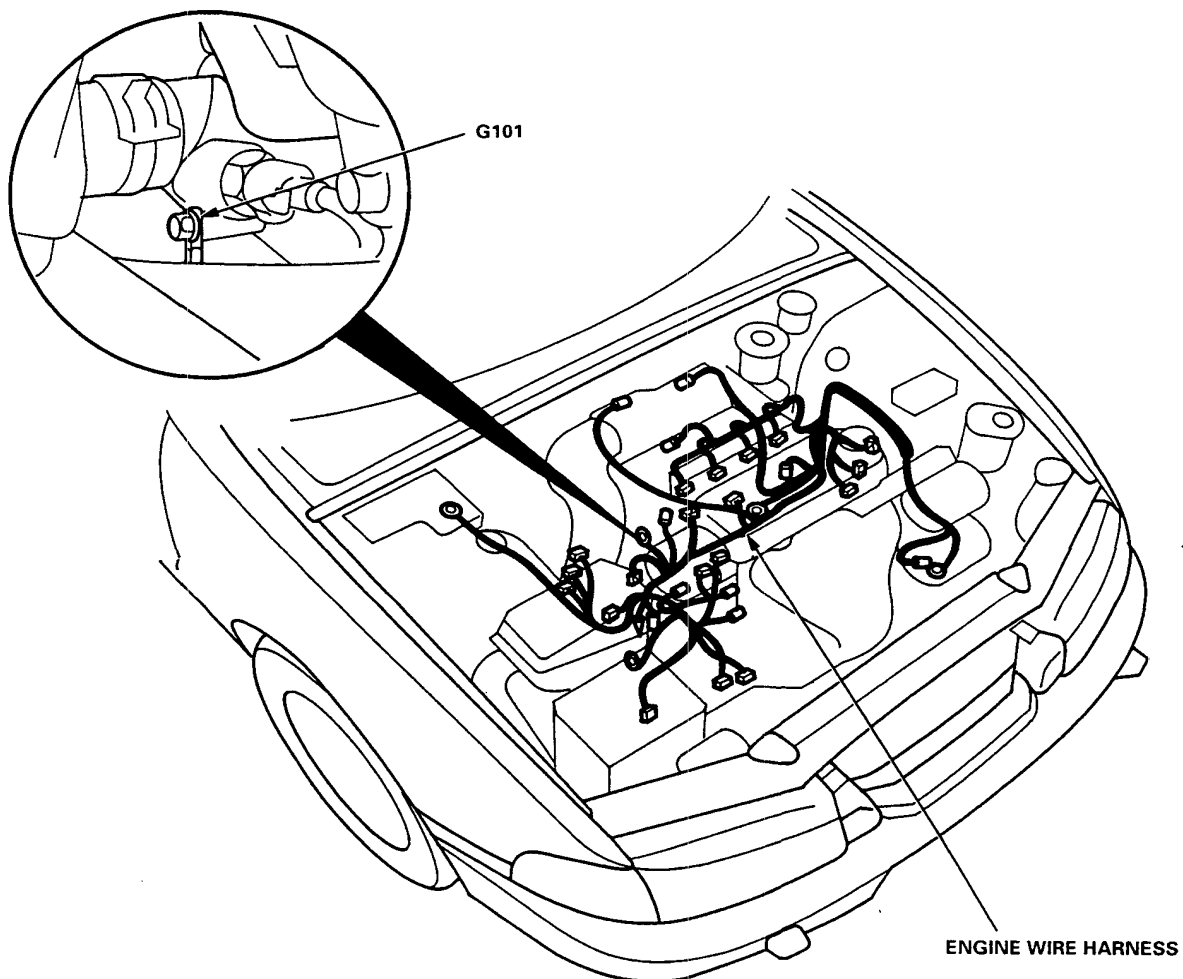
Trunk



Wire Harness and Ground Locations

Engine Compartment

NOTE: LHD type is shown, RHD type is similar.

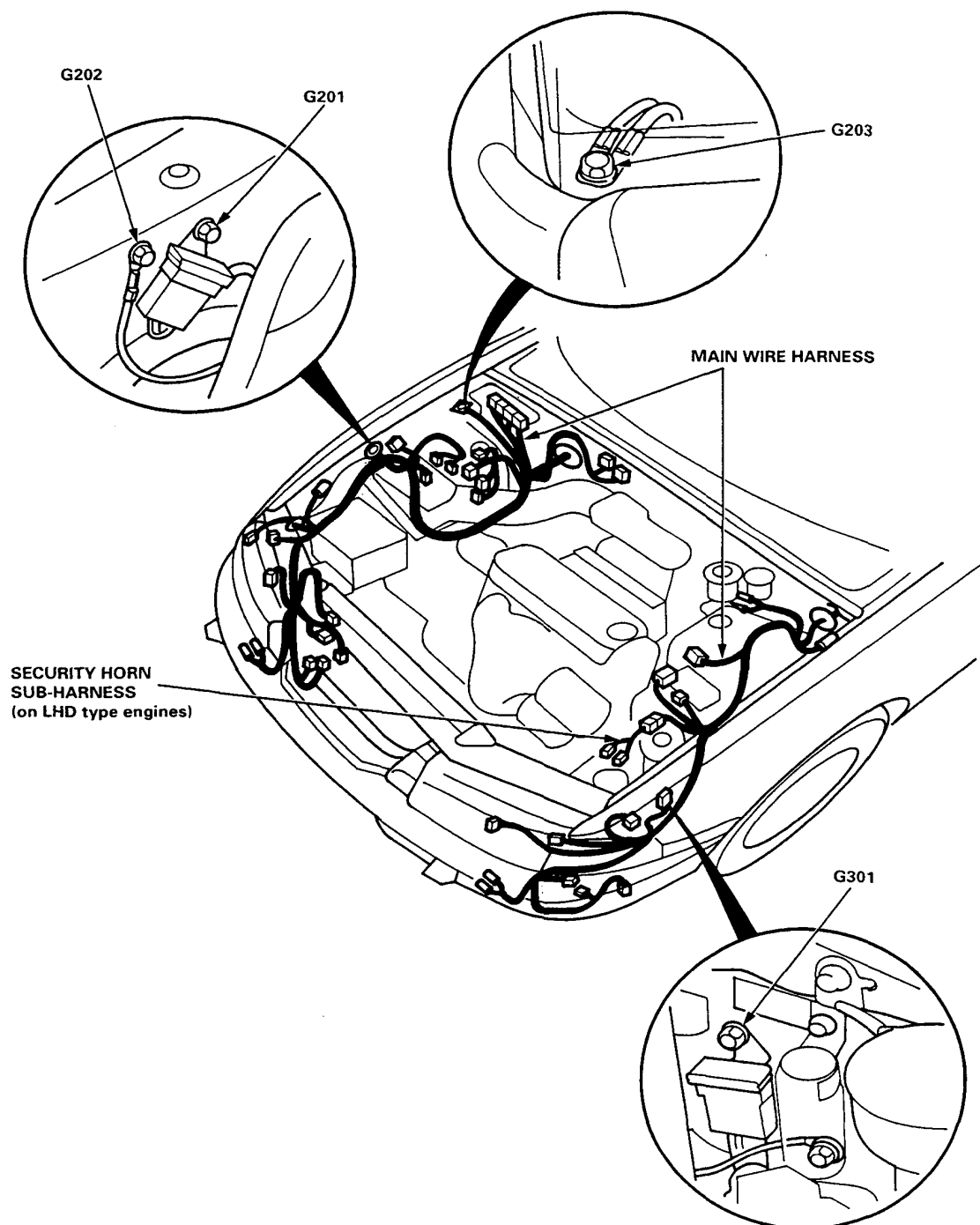




Engine Compartment

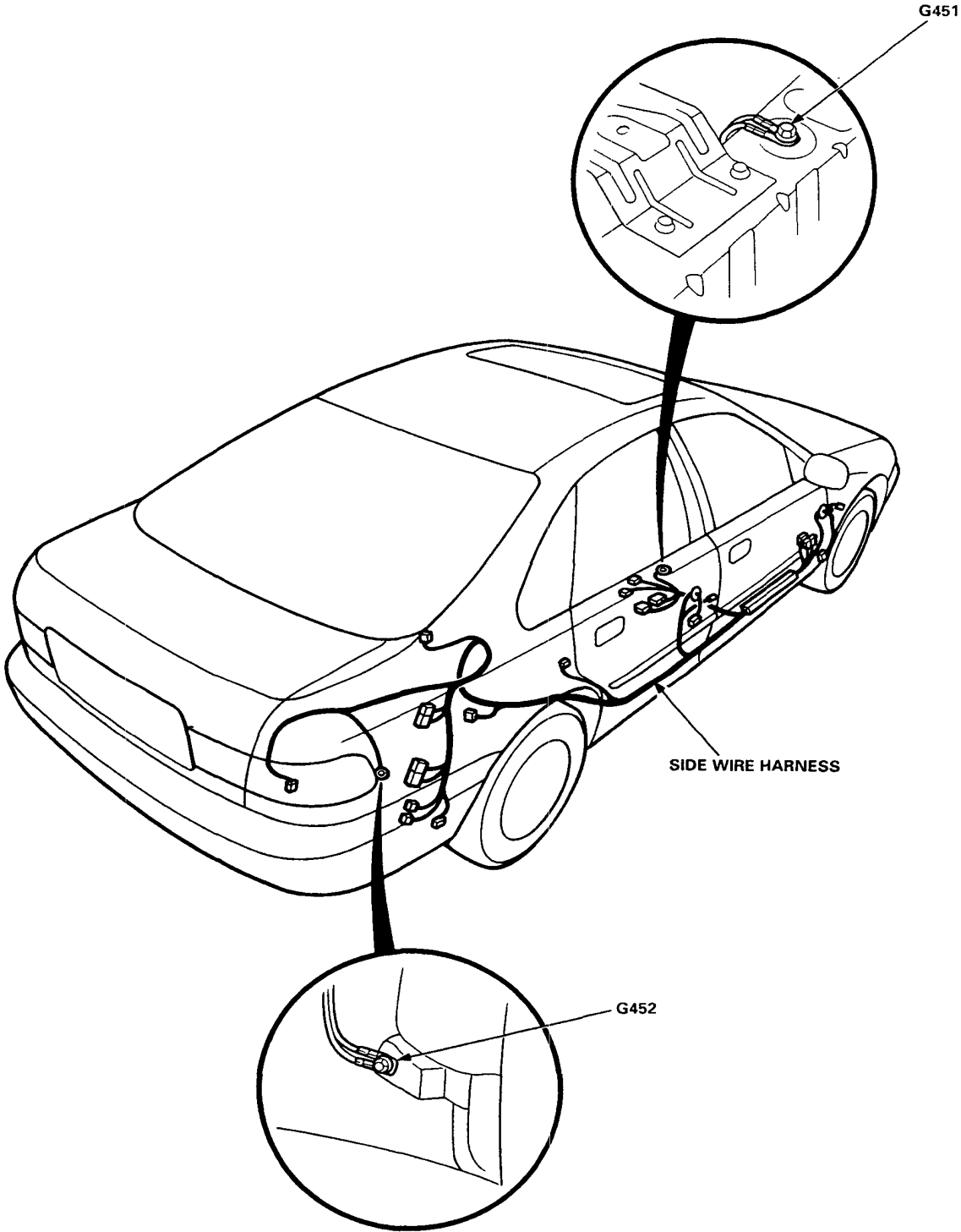
NOTE:

- LHD type 2.3 ℓ engine is shown, RHD type is similar.
- The security horn sub-harness is installed only on the LHD type 2.0 ℓ and 2.3 ℓ engines.



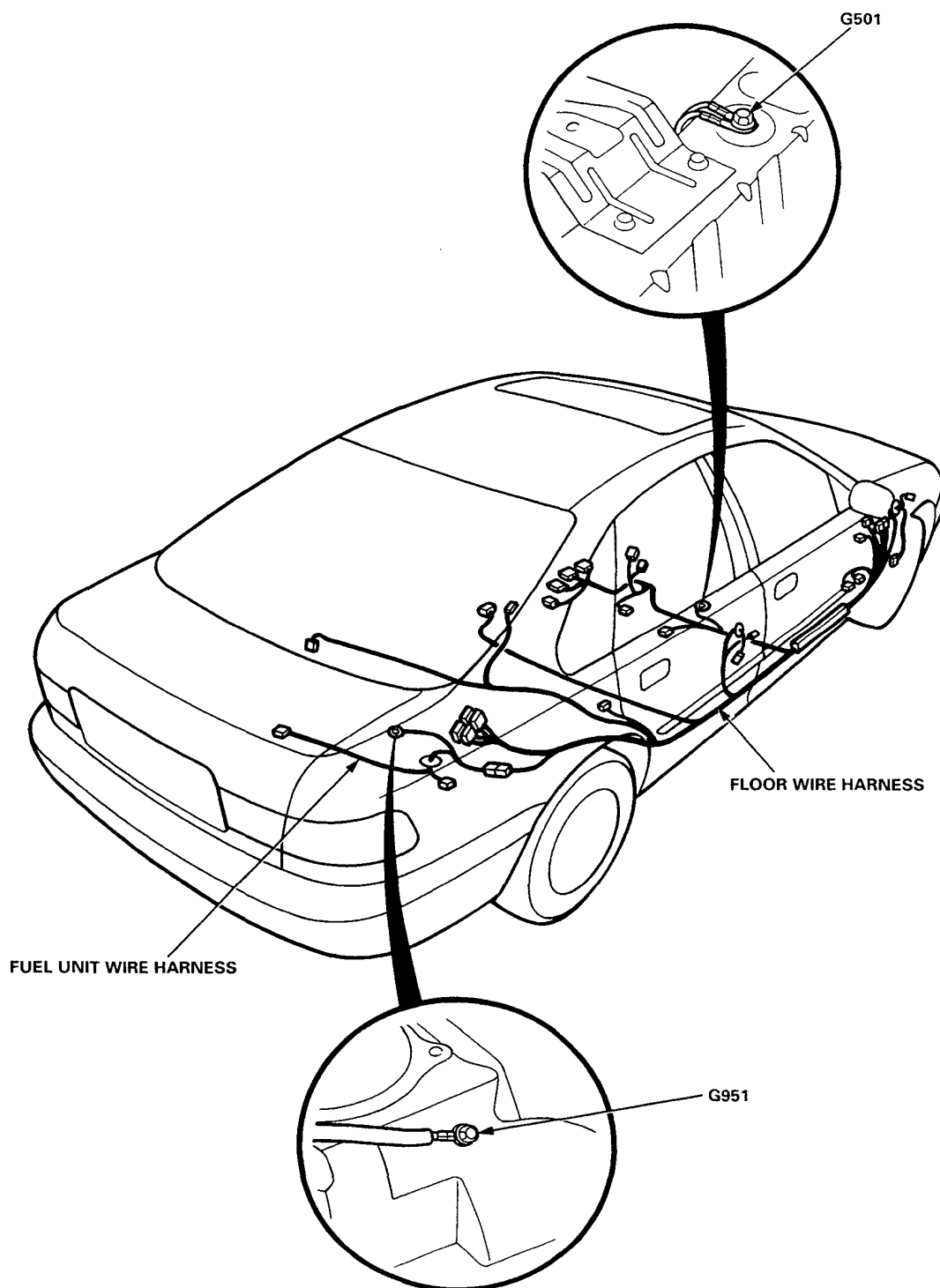
Wire Harness and Ground Locations

Floor (LHD)



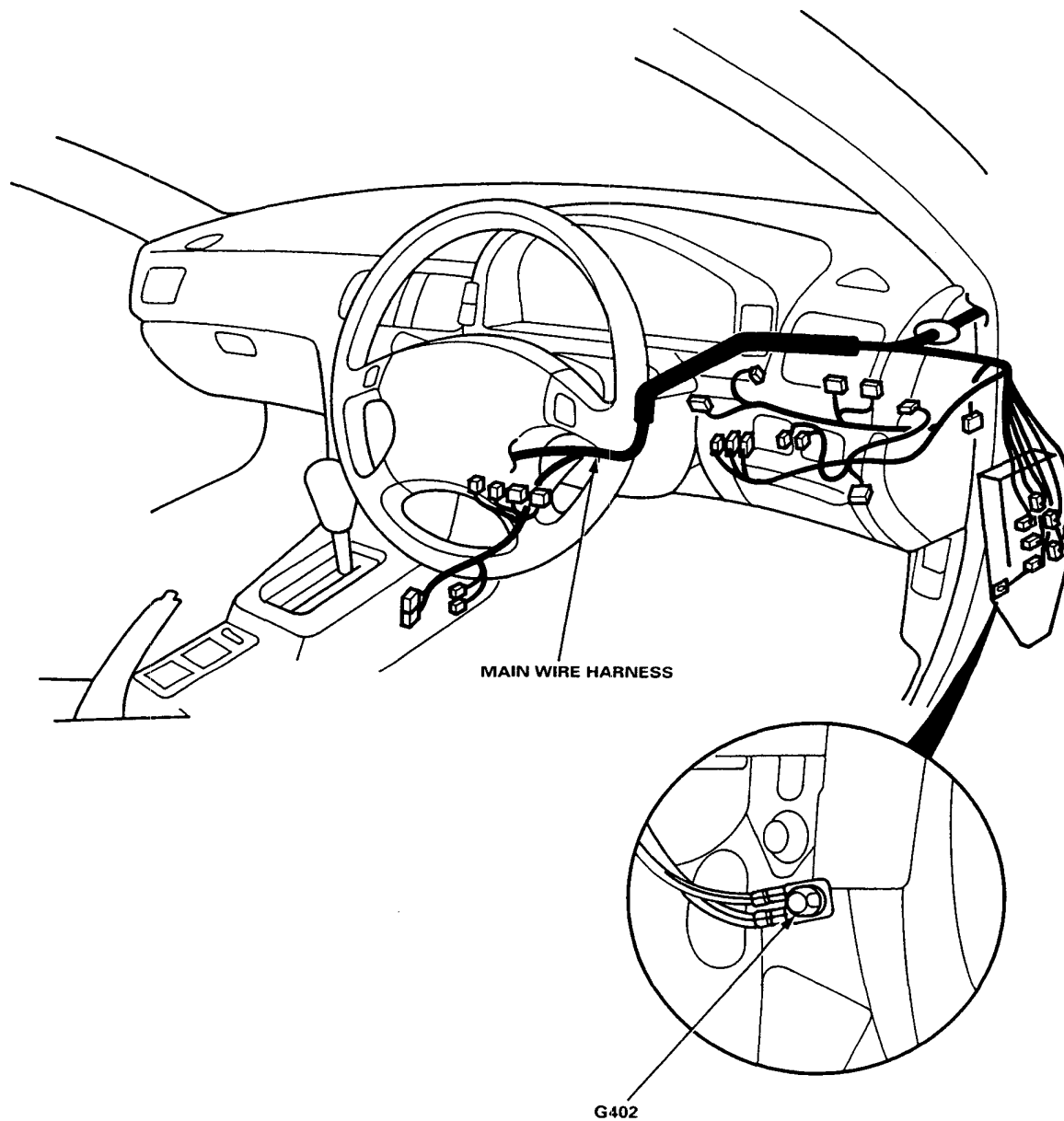


Floor (RHD)



Wire Harness and Ground Locations

Dashboard (RHD)

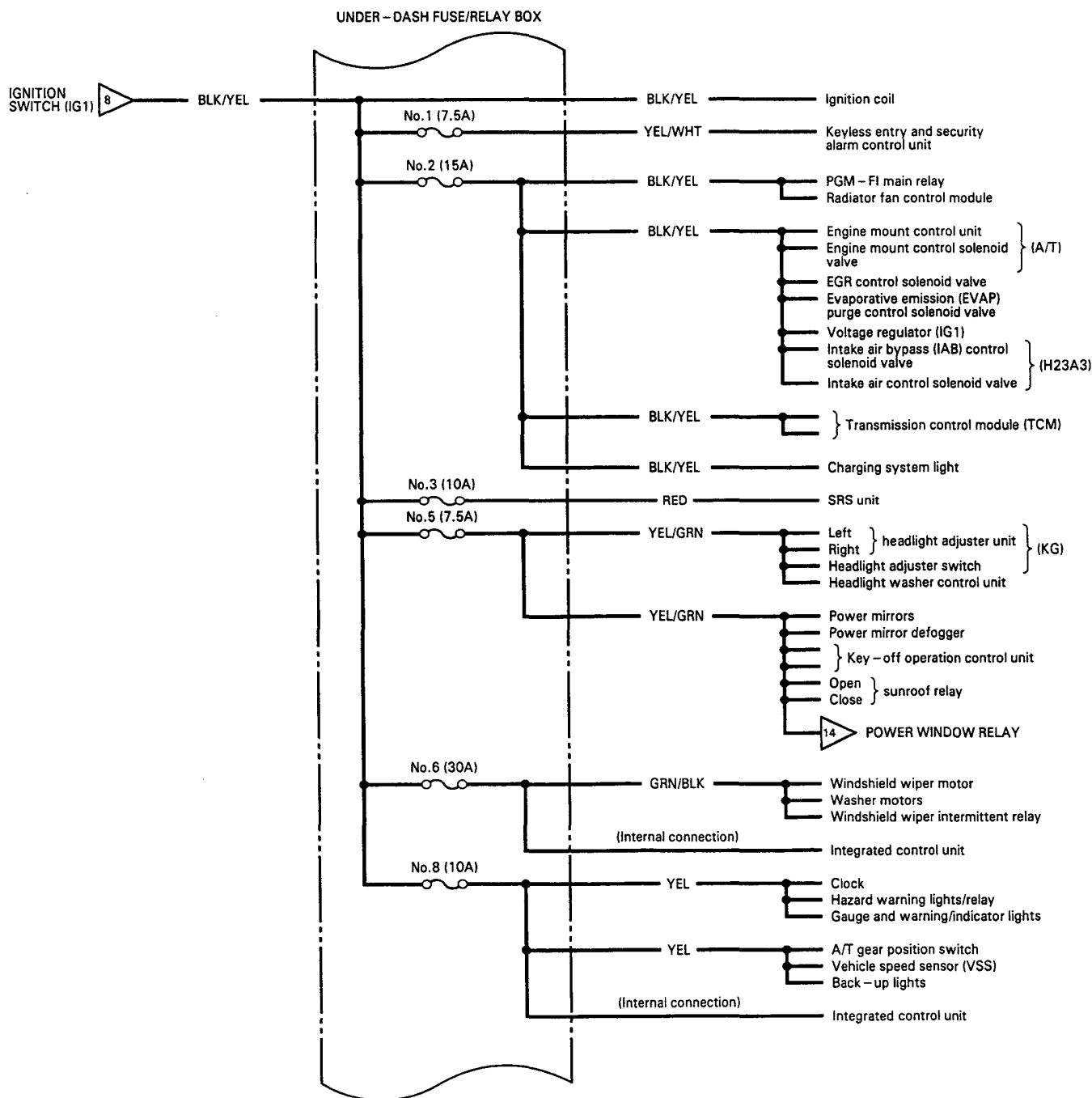


Power Distribution

Circuit Identification (LHD)



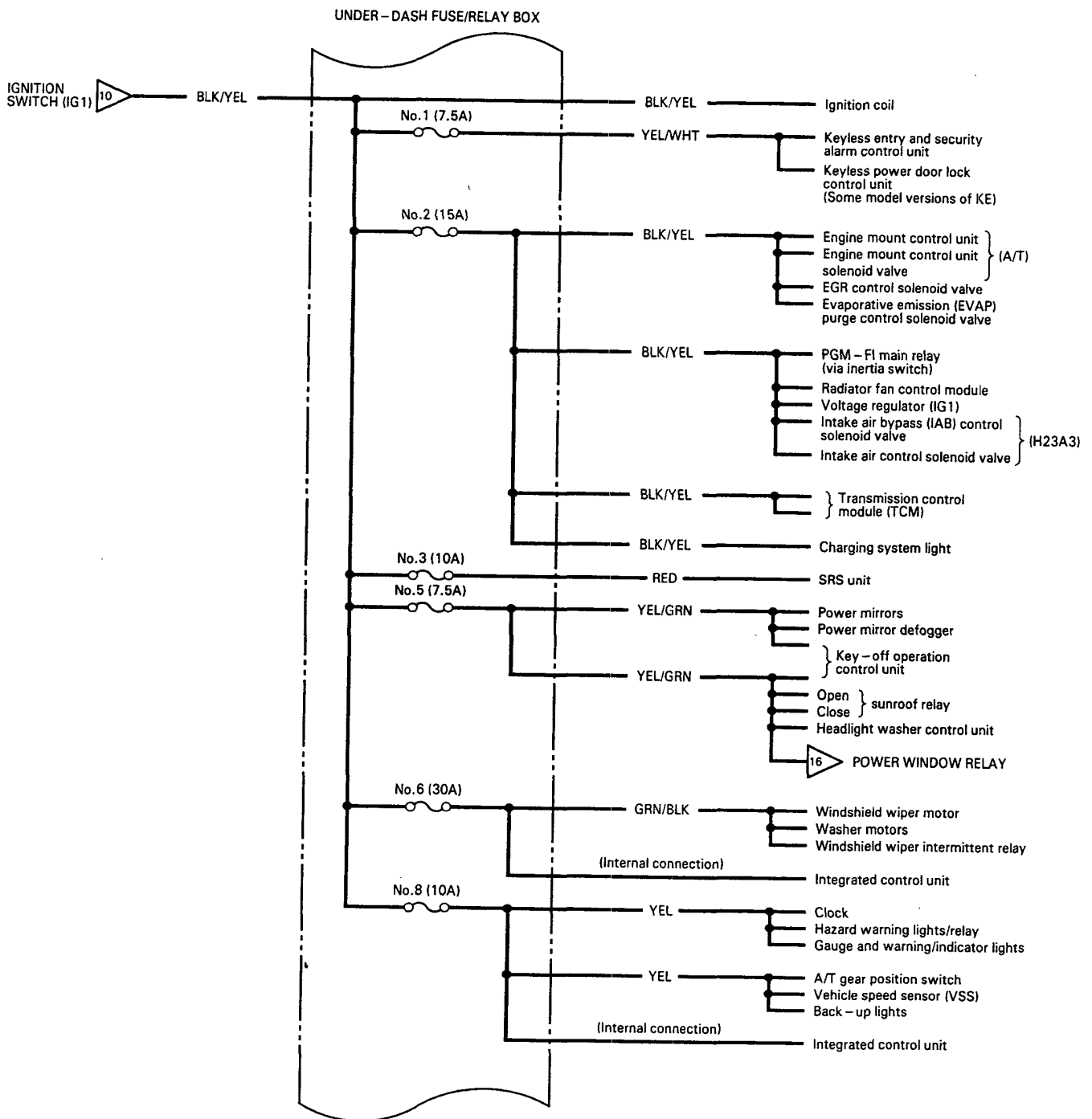
NOTE: This page corresponds to page 23 – 41 in the Shop Manual (62SN700) and reflects the model changes.



Power Distribution

Circuit Identification (RHD)

NOTE: This page corresponds to page 23 – 48 in the Shop Manual (62SN700) and reflects the model changes.

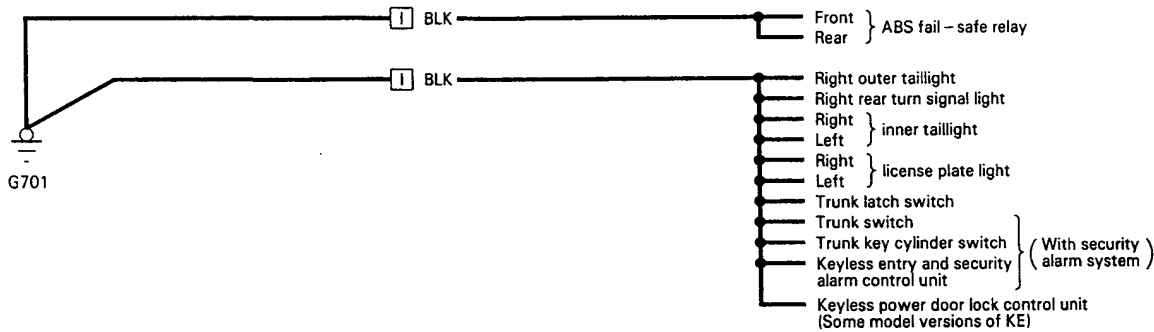




Ground Distribution

Circuit Identification (RHD)

NOTE: This page corresponds to page 23 – 58 in the Shop Manual (62SN700) and reflects the model changes.



1 : Rear wire harness

Starting System

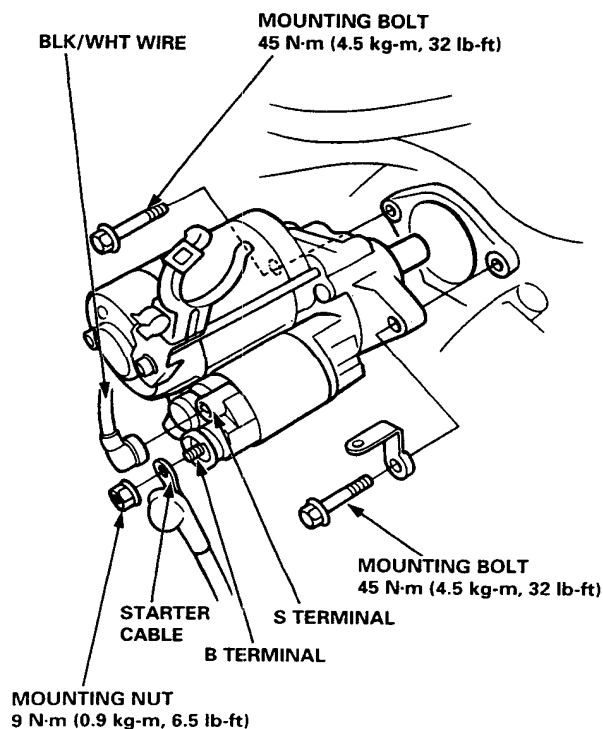
Starter Replacement

1. Disconnect the negative cable from the battery.
2. Remove the engine wire harness from the harness clip on the starter motor.
3. Disconnect the starter cable from the B terminal on the solenoid by removing the mounting nut, and disconnect the BLK/WHT wire from the S terminal.

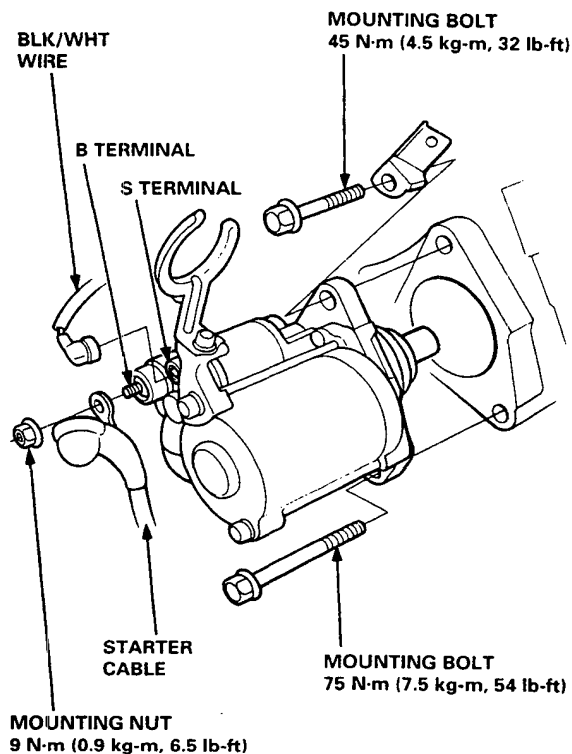
NOTE: In case of an A/T model, the starter cable also has to be removed from the bracket on the transmission housing.

4. Remove the two mounting bolts holding the starter, then remove the starter motor.

A/T:

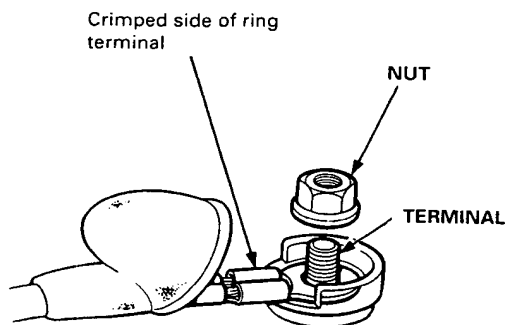


M/T:



5. Install in the reverse order of removal.

NOTE: When installing the starter cable, make sure that the crimped side of the ring terminal is facing out.



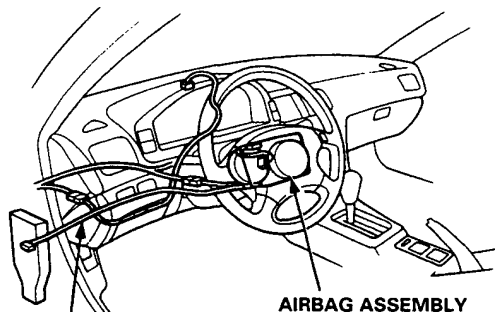
Ignition System



Ignition Timing Inspection and Setting (H23A3)

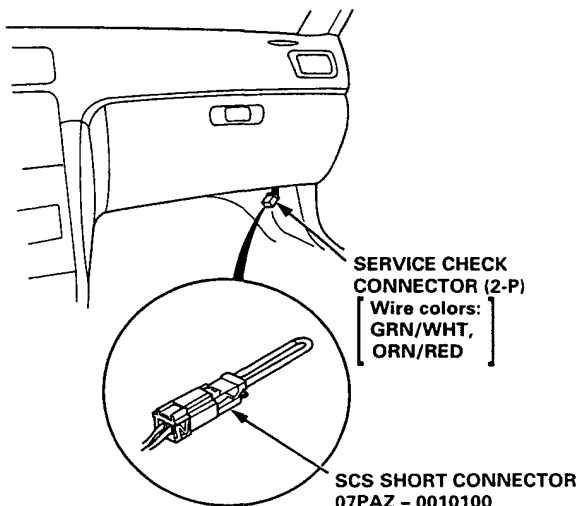
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS
(Covered with yellow outer insulation)

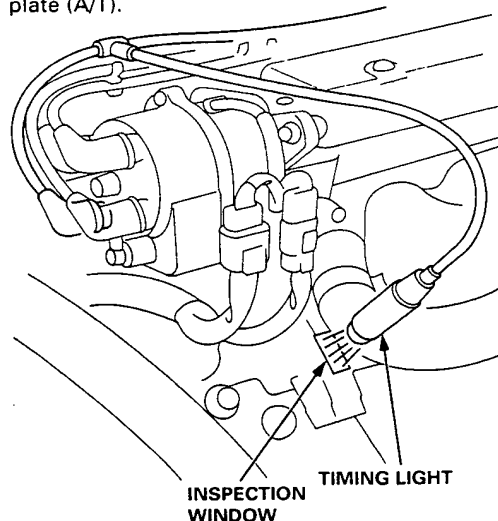
1. Start the engine and allow it to warm up (radiator fan comes on two times). Then let it run for more than two minutes at 3000 min⁻¹ (rpm) with the shift lever in **P** (A/T) or neutral (M/T).
2. Pull out the service check connector located under the passenger's side of dash. Connect the GRN/WHT and ORN/RED terminals with the SCS short connector.



NOTE: The illustration shows LHD type, RHD type is symmetrical.

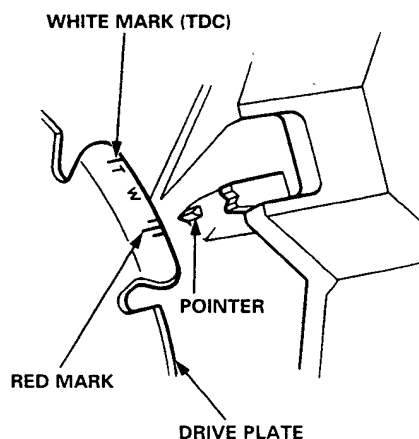
3. Check the idle speed (see next page).

4. Connect a timing light to the No. 1 ignition wire and remove the rubber plug from the inspection window in the flywheel or drive plate housing.
5. While the engine idles, point the light toward the pointer on the flywheel (for M/T) or on the drive plate (A/T).



6. Check if the pointer and the red mark are aligned. If necessary, adjust ignition timing to the following specifications:

Ignition Timing: $15 \pm 2^\circ$ BTDC (RED)
at 770 ± 50 min⁻¹ (rpm) with shift lever in neutral position and electrical systems turned off

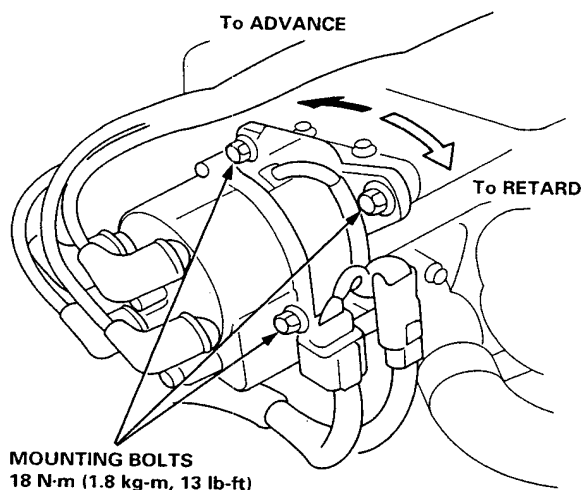


NOTE: The illustration shows A/T.

Ignition System

Ignition Timing Inspection and Setting (H23A3 cont'd)

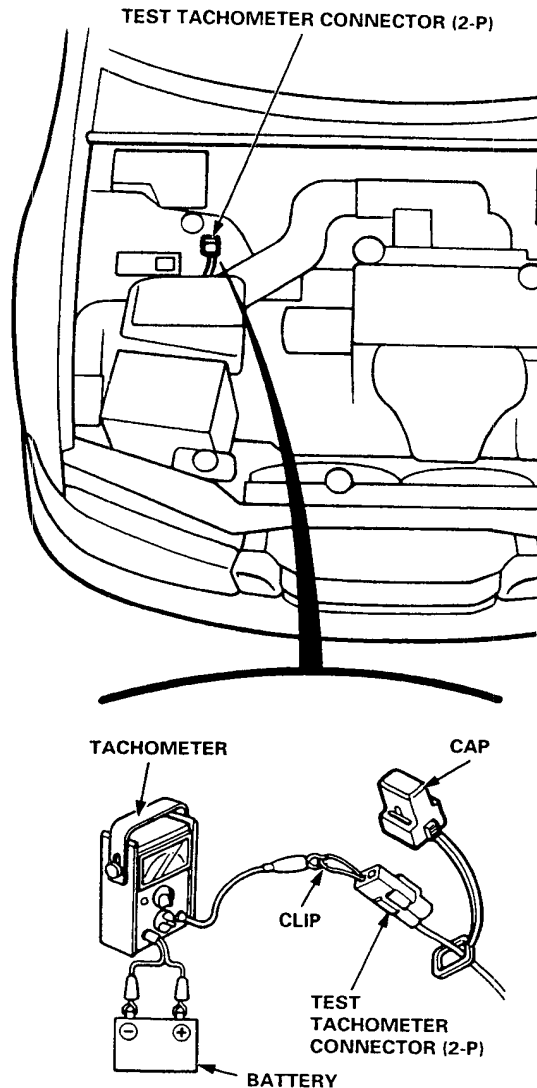
7. To adjust the ignition timing, loosen the distributor mounting bolts, and turn the distributor housing counterclockwise to advance the timing, or clockwise to retard the timing.



8. Tighten the mounting bolts and recheck timing.
9. Remove the SCS short connector from the service check connector (2-P) and reinstall the rubber plug into the inspection window.

Idle Speed Inspection (H23A3)

1. Start the engine and allow it to warm up (radiator fan comes on two times). Then let it run for more than two minutes at 3000 min⁻¹ (rpm) with the shift lever in **P** (A/T) or neutral (M/T).
2. Connect a tachometer to the test tachometer connector

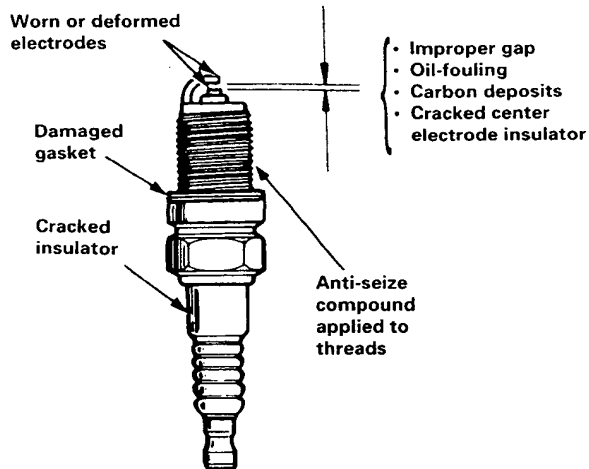


3. Adjust the idle speed if necessary (see section 11).



Spark Plug Inspection (H23A3)

1. Inspect the electrodes and ceramic insulator for:



Burned or worn electrodes may be caused by:

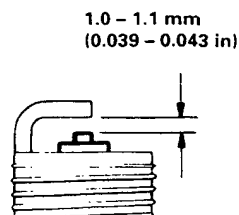
- advanced ignition timing.
- loose spark plug.
- too low plug heat range.
- insufficient cooling.

Fouled plug may be caused by:

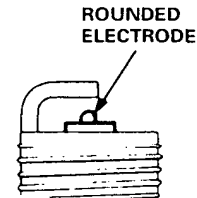
- retarded ignition timing.
- oil in combustion chamber.
- too high plug heat range.
- excessive idling/low speed running.
- clogged air cleaner element.
- deteriorated ignition coil or ignition wires.
- incorrect spark plug gap.

2. Adjust the gap with a suitable gapping tool.

Electrode Gap: 1.0 – 1.1 mm (0.039 – 0.043 in)



3. Replace the plug if the center electrode is rounded as shown below.



4. Replace the plug if it is fouled or worn.

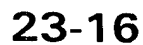
NOTE: Use only the spark plugs listed below.

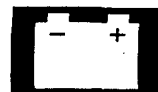
ZFR6F-11 (NGK) KJ20CR-L11 *(ND)	For all normal driving
ZFR7F-11 (NGK) KJ22CR-L11 *(ND)	For hot climates or continuous high speed driving

*(ND): NIPPONDENSO

5. Apply a small quantity of anti-seize compound to the plug threads.
6. Screw the plugs into the cylinder head finger-tight, then torque them to 18 N·m (1.8 kg-m, 13 lb-ft).

Circuit Diagram

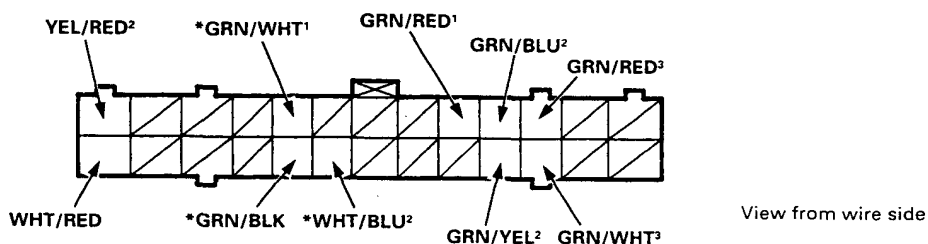
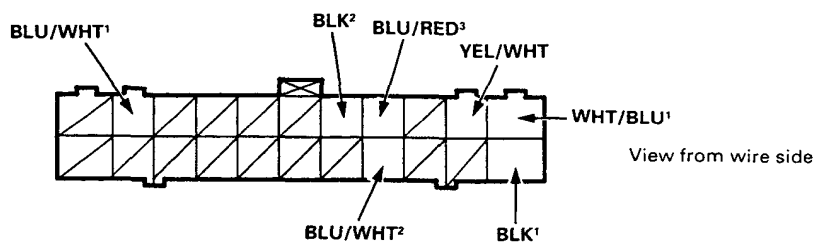




Control Unit Input Test

1. Remove the right trunk side trim panel, then disconnect the 26-P and 22-P connectors from the keyless power door lock control unit.
2. Inspect the connector and the socket terminals to be sure they are all making good contact.
 - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - If the terminals look OK, make the following input tests at the connector.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input test prove OK, the control unit must be faulty; replace it.

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, GRN/WHT¹ and GRN/WHT³ are not the same).



*: Check for continuity in this wire between control unit and receiver. For details refer to "Keyless Entry System Test" on page 23-292 in Shop Manual (62SN700).

Keyless Entry System (KE)

Control Unit Input Test (cont'd)

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK ¹	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G701) • An open in the wire
2	BLK ²	Under all conditions	Check for continuity to ground: There should be continuity.	
3	WHT/BLU ¹	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 21 (20 A) fuse in the under-hood fuse/relay box • An open in the wire
4	YEL/WHT	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 1 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
5	BLU/WHT ¹	Ignition key inserted into the ignition switch	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Faulty ignition key switch • Poor ground (G401) • An open in the wire
6	GRN/RED ¹	Driver's door open	*Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Faulty driver's door switch • An open in the wire
7	GRN/RED ³	Driver's door key cylinder switch in UNLOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Faulty driver's door key cylinder switch • Poor ground (G501) • An open in the wire
8	GRN/WHT ³	Driver's door key cylinder switch in LOCK		
9	GRN/BLU ²	Front passenger's door key cylinder switch in UNLOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Faulty front passenger's door key cylinder switch • Poor ground (G451) • An open in the wire
10	GRN/YEL ²	Front passenger's door key cylinder switch in LOCK		
11	BLU/WHT ²	Driver's door lock knob in LOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G501) • An open in the wire
12	BLU/RED ³	Driver's door lock knob in UNLOCK		
13	WHT/RED and YEL/RED ²	Connect the YEL/RED ² and WHT/BLU ¹ terminals and the WHT/RED and BLK ¹ terminals momentarily.	Check the door lock actuators: All doors should unlock as the battery is connected momentarily.	<ul style="list-style-type: none"> • Faulty actuator • An open in the wire
		Connect the WHT/RED and WHT/BLU ¹ terminals and the YEL/RED ² and BLK ¹ terminals momentarily.	Check the door lock actuators: All doors should lock as the battery is connected momentarily.	

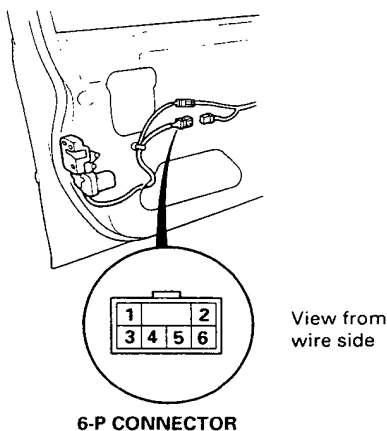
*: Before testing, remove No. 29 (15 A) fuse in the under-hood fuse/relay box and No. 8 (10 A) fuse in the under-dash fuse/relay box.



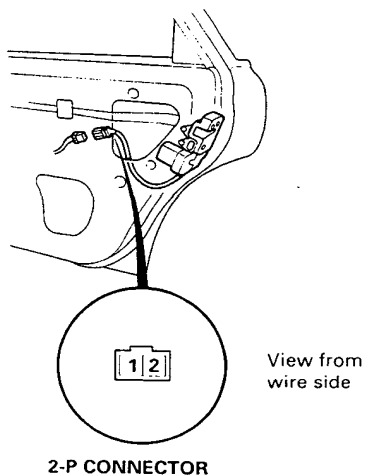
Passenger's Door Lock Actuator Test

1. Remove the passenger's door panel (see section 20).
2. Disconnect the 2-P or 6-P connector from the door lock actuator.

Front Passenger's Door:



Rear Passenger's Door:



3. Test the actuator:

Terminal	3 (1)	4 (2)
Position		
LOCK	⊖	⊕
UNLOCK	⊕	⊖

() : Rear

CAUTION: To prevent damage to the actuator, connect battery power only momentarily.

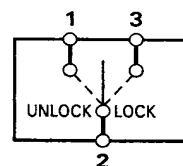
4. If the actuator does not work properly, replace it.

Key Cylinder Switch Test

NOTE: This test applies to the Keyless Entry and Security Alarm System, too.

1. Remove the front door panel.
2. Disconnect the 3-P connector from the key cylinder switch.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal	1	2	3
Position			
LOCK		○	○
UNLOCK	○	○	



3-P CONNECTOR

