1993 VIGOR SERVICE MANUAL
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ACURA

# VIGOR

## Service Manual 1993

This manual is divided into 23 sections. The first page of each section is marked with a black tab that lines up with its corresponding thumb index tab on this page and the back cover. 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.

Each section includes:

1. A table of contents, or an exploded view index showing:
   - Parts disassembly sequence.
   - Bolt torques and thread sizes.
   - Page references to descriptions in text.
2. Disassembly/assembly procedures and tools.
3. Inspection.
4. Testing/troubleshooting.
5. Repair.
6. Adjustments.

## 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 might be done, or of the possible hazardous consequences of every conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.**



First Eidtion 9/92 1364 pages
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**HONDA MOTOR CO., LTD.**
**Service Publication Office**



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

## SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The VIGOR SRS includes a driver's side airbag, located in the steering wheel hub. In addition, the GS model has a front passenger's airbag located in the dashboard above the glove box. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized Acura dealer.

**⚠WARNING**

- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized Acura dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional activation of the airbag (s).**
- **All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, center console, dash, and dashboard lower panel, and in the dashboard above the glove box. Do not use electrical test equipment on these circuits.**

NOTE: The radio may have a coded theft protection circuit. Be sure to get the customer's code number before
— Disconnecting the battery.
— Removing the No. 39 (10 A) fuse in the under-hood fuse/relay box.
— Removing the radio.
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

# General Information

# Chassis and Paint Codes

## U.S. Model

**Vehicle Identification Number**

JH4CC254*PC000001

- **Manufacturer, Make and Type of Vehicle**
  - JH4: HONDA MOTOR CO., LTD. ACURA Passenger car
- **Body Type**
  - CC2: VIGOR 4-Door Hardtop/ G25A1
- **Body and Transmission Type**
  - 5:4-Door Hardtop/5-speed Manual
  - 6:4-Door Hardtop/4-speed Automatic
- **Vehicle Grade**
  - 4: LS, without moonroof
  - 6: GS, with moonroof and passenger airbag
- **Check Digit**
- **Model Year**
  - P: 1993
- **Factory Code**
  - C: Saitama Factory in Japan
- **Serial Number**

**Transmission Number (Manual Transmission)**

L3A3-2000001

- **Transmission Type**
- **Serial Number**

**Transmission Number (Automatic Transmission)**

MPWA-6000001

- **Transmission Type**
- **Serial Number**

**Paint Code**

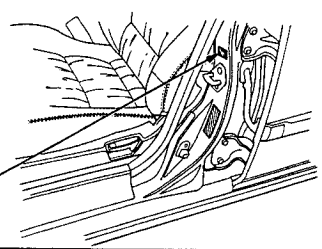
| Paint Code | Color |
|---|---|
| BG-30P | Arcadia Green Pearl |
| NH-503P | Granada Black Pearl |
| NH-536M | Solaris Silver Metallic |
| NH-538 | Frost White |
| R-82P | Cassis Red Pearl |
| RP-18P | Regal Plum Pearl |

**Engine Number**

G25A1-2000001

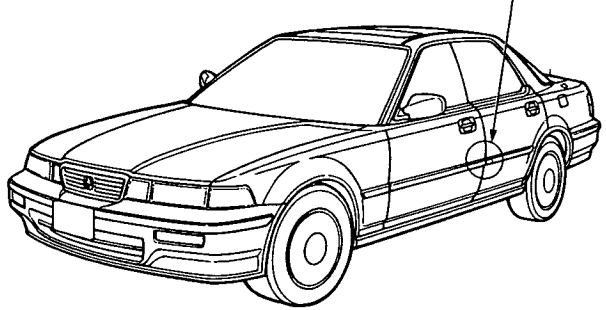
- **Engine Type**
- **Emission Group**
  - 20: California
  - 23: 49ST
- **Serial Number**
  - California: 00001 ~
  - 49ST : 00006 ~

**Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification**



**Paint Code**

**COLOR BG-30P**





## CANADA Model

**Vehicle Identification Number**

JH4CC254*PC800001

- **Manufacturer, Make and Type of Vehicle**
  - JH4: HONDA MOTOR CO., LTD. ACURA Passenger car
- **Body Type**
  - CC2: VIGOR 4-Door Hardtop/ G25A1
- **Body and Transmission Type**
  - 5:4-Door Hardtop/5-speed Manual
  - 6:4-Door Hardtop/4-speed Automatic
- **Vehicle Grade**
  - 4: LS, without moonroof
  - 6: GS, with moonroof and passenger airbag
- **Check Digit**
- **Model Year**
  - P: 1993
- **Factory Code**
  - C: Saitama Factory in Japan
- **Serial Number**

**Transmission Number (Manual Transmission)**

L3A3-2000001

- **Transmission Type**
- **Serial Number**

**Transmission Number (Automatic Transmission)**

MPWA-6000001

- **Transmission Type**
- **Serial Number**

**Paint Code**

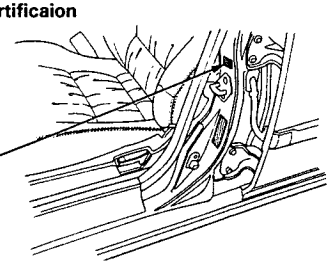
| Paint Code | Color |
|---|---|
| BG-30P | Arcadia Green Pearl |
| NH-503P | Granada Black Pearl |
| NH-536M | Solaris Silver Metallic |
| NH-538 | Frost White |
| RP-18P | Regal Plum Pearl |
| RP-20M | Vineyard Gray Metallic |

**Engine Number**

G25A1-2800001

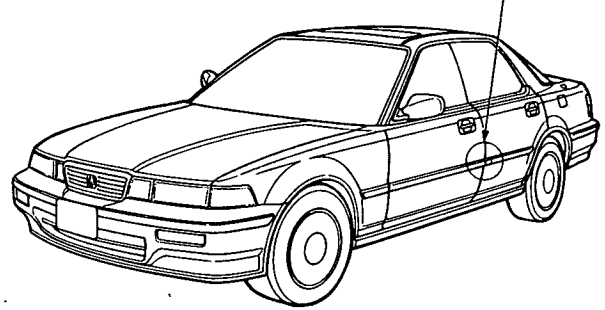
- **Engine Type**
- **Serial Number**

**Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certificaion**

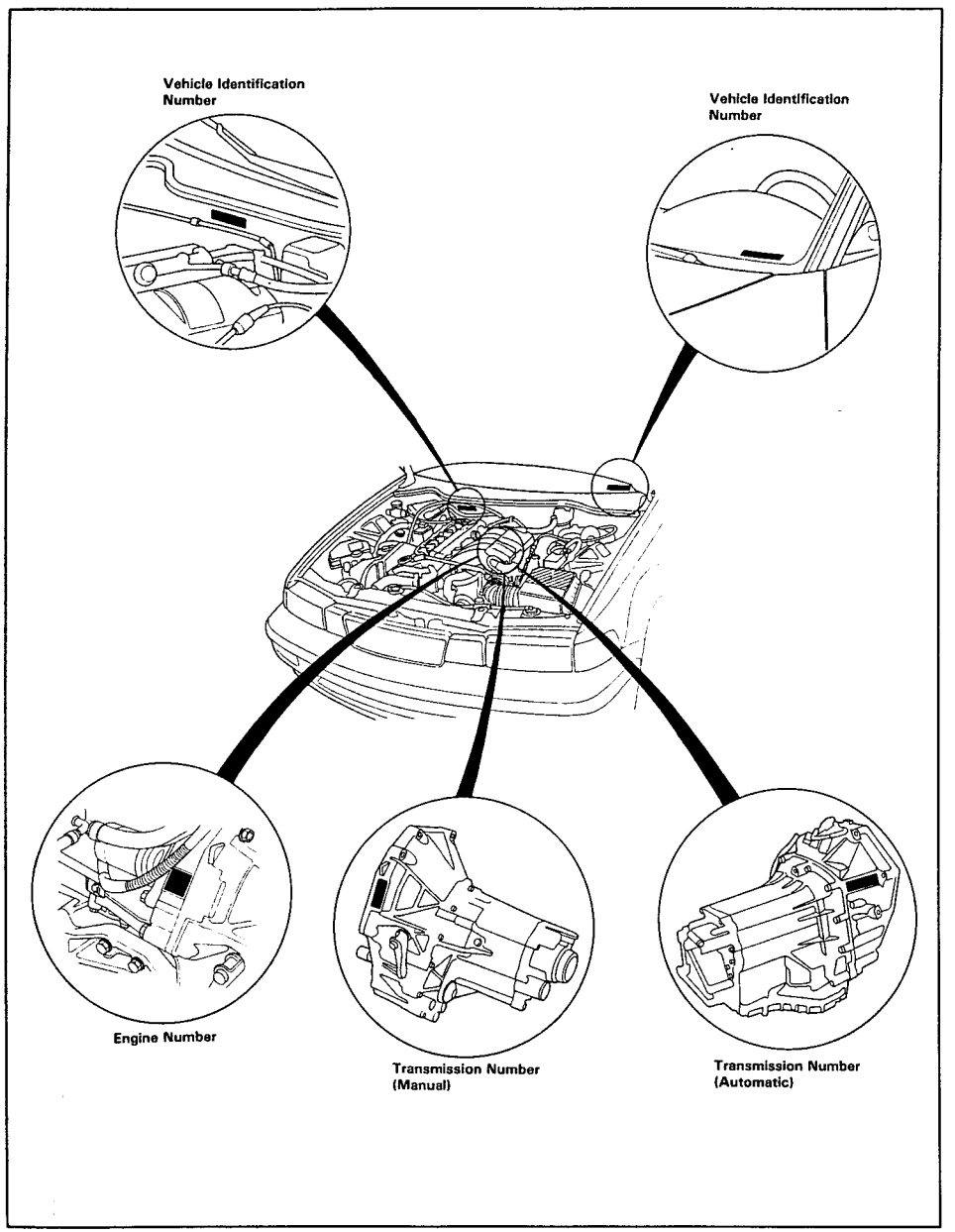


**Paint Code**

**COLOR BG-30P**

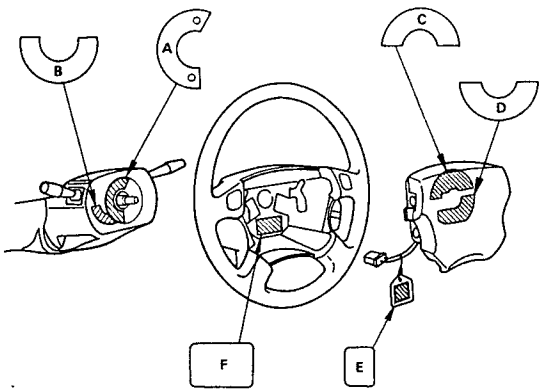


## Identification Number Locations






## Warning/Caution Label Locations




A: CABLE REEL CAUTION A

CAUTION: SRS
BEFORE INSTALLING CABLE REEL:
- CENTER THE FRONT WHEELS.
- ALIGN THE MARKS.
- READ SERVICE MANUAL.

B: CABLE REEL CAUTION B

CAUTION: SRS
NO SERVICEABLE PARTS INSIDE; DO NOT DISASSEMBLE OR TAMPER.

C: DRIVER MODULE DANGER

⚠ DANGER
EXPLOSIVE/FLAMMABLE
CONTACT WITH ACID, WATER OR HEAVY METALS SUCH AS COPPER, LEAD OR MERCURY MAY PRODUCE HARMFUL AND IRRITATING GASES OR EXPLOSIVE COMPOUNDS. STORAGE TEMPERATURES MUST NOT EXCEED 200°F (100°C) FOR PROPER HANDLING, STORAGE AND DISPOSAL PROCEDURES REFER TO SERVICE MANUAL, SRS SUPPLEMENT.
POISON
CONTAINS POISONOUS SODIUM AZIDE AND POTASSIUM NITRATE.
FIRST AID
IF CONTENTS ARE SWALLOWED, INDUCE VOMITING.
FOR EYE CONTACT, FLUSH EYES WITH WATER FOR 15 MINUTES. IF GASES (FROM ACID OR WATER CONTACT) ARE INHALED, SEEK FRESH AIR. IN EVERY CASE, GET PROMPT MEDICAL ATTENTION.
KEEP OUT OF REACH OF CHILDREN.

D: DRIVER MODULE WARNING

⚠ WARNING
THE AIRBAG INFLATOR IS EXPLOSIVE AND, IF ACCIDENTALLY DEPLOYED, CAN SERIOUSLY HURT OR KILL YOU.
- DO NOT USE ELECTRICAL TEST EQUIPMENT OR PROBING DEVICES. THEY CAN CAUSE ACCIDENTAL DEPLOYMENT.
- NO SERVICEABLE PARTS INSIDE. DO NOT DISASSEMBLE.
- PLACE AIRBAG UPRIGHT WHEN REMOVED.
- FOLLOW SERVICE MANUAL INSTRUCTIONS CAREFULLY.

E: INFLATOR WARNING TAG

⚠ WARNING
ACCIDENTAL AIRBAG DEPLOYMENT CAN SERIOUSLY HURT OR KILL YOU. INSTALL THE RED SERVICE CONNECTOR WHEN THE INFLATOR HARNESS IS DISCONNECTED.

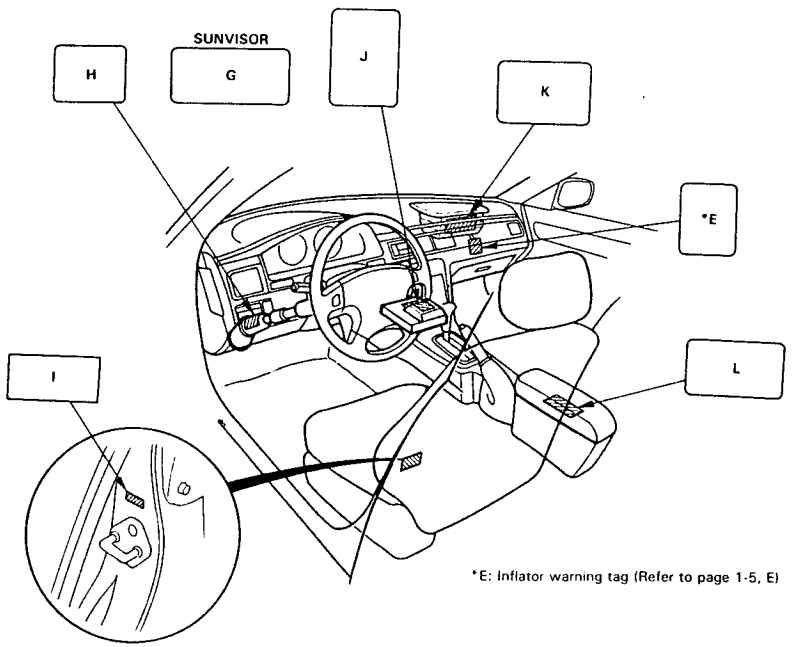
F: STEERING WHEEL NOTICE

NOTICE
IMPROPER STEERING WHEEL REMOVAL OR INSTALLATION CAN DAMAGE SRS COMPONENTS. FOLLOW SERVICE MANUAL INSTRUCTION CAREFULLY.

(cont'd)

## Warning/Caution Label Locations

(cont'd)




*E: Inflator warning tag (Refer to page 1-5, E)

G: DRIVER INFORMATION

SRS ALWAYS WEAR YOUR SEAT BELT
- THIS CAR IS EQUIPPED WITH A DRIVER AIRBAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS).
- IT IS DESIGNED TO SUPPLEMENT THE SEAT BELT.
- BEFORE DRIVING READ LABEL INSIDE THE CONSOLE BOX.

*G: DRIVER INFORMATION

SRS ALWAYS WEAR YOUR SEAT BELT
- THIS CAR IS EQUIPPED WITH A DRIVER AIRBAG AND A FRONT SEAT PASSENGER AIRBAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS).
- IT IS DESIGNED TO SUPPLEMENT THE SEAT BELT.
- BEFORE DRIVING READ LABEL INSIDE THE CONSOLE BOX.

H: STEERING COLUMN NOTICE

NOTICE
TO PREVENT SRS DAMAGE, REMOVE STEERING WHEEL BEFORE REMOVING STEERING SHAFT CONNECTING BOLT

I: LABEL AIRBAG

J: SRS UNIT CAUTION

CAUTION SRS
- NO SERVICEABLE PARTS INSIDE.
- DO NOT DISASSEMBLE OR TAMPER.
- DO NOT DROP.
- STORE IN A CLEAN, DRY AREA.



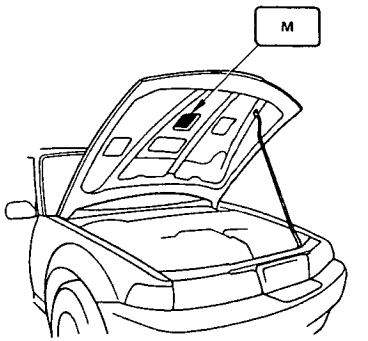
K: FRONT SEAT PASSENGER AIRBAG MODULE DANGER

⚠ DANGER
EXPLOSIVE/FLAMMABLE
CONTACT WITH ACID, WATER OR HEAVY METALS SUCH AS COPPER, LEAD OR MERCURY MAY PRODUCE HARMFUL AND IRRITATING GASES OR EXPLOSIVE COMPOUNDS. STORAGE TEMPERATURES MUST NOT EXCEED 200°F (100°C) FOR PROPER HANDLING, STORAGE AND DISPOSAL PROCEDURES REFER TO SERVICE MANUAL, SRS SUPPLEMENT.
POISON
CONTAINS POISONOUS SODIUM AZIDE AND POTASSIUM NITRATE.
FIRST AID
IF CONTENTS ARE SWALLOWED, INDUCE VOMITING.
FOR EYE CONTACT, FLUSH EYES WITH WATER FOR 15 MINUTES. IF GASES (FROM ACID OR WATER CONTACT) ARE INHALED, SEEK FRESH AIR. IN EVERY CASE, GET PROMPT MEDICAL ATTENTION.
KEEP OUT OF REACH OF CHILDREN.

⚠ WARNING
THE AIRBAG INFLATOR IS EXPLOSIVE AND, IF ACCIDENTALLY DEPLOYED, CAN SERIOUSLY HURT OR KILL YOU.
- DO NOT USE ELECTRICAL TEST EQUIPMENT OR PROBING DEVICES. THEY CAN CAUSE ACCIDENTAL DEPLOYMENT.
- NO SERVICEABLE PARTS INSIDE. DO NOT DISASSEMBLE.
- PLACE AIRBAG UPRIGHT WHEN REMOVED.
- FOLLOW SERVICE MANUAL INSTRUCTIONS CAREFULLY.

L: SRS CONSOLE INFORMATION

AIRBAG INFORMATION
SUPPLEMENTAL RESTRAINT SYSTEM (SRS)
- THE SRS MUST BE INSPECTED TEN YEARS AFTER IT IS INSTALLED. THE DATE OF INSTALLATION IS SHOWN ON THE CERTIFICATION PLATE LOCATED ON THE DRIVER'S DOORJAMB.
- DIAGNOSTIC CHECKS AND REPLACEMENT OF SRS COMPONENTS MUST BE DONE BY AN AUTHORIZED DEALER.
- SEE YOUR OWNER'S MANUAL FOR ADDITIONAL SRS INFORMATION.




M: SRS WARNING (ENGINE HOOD)

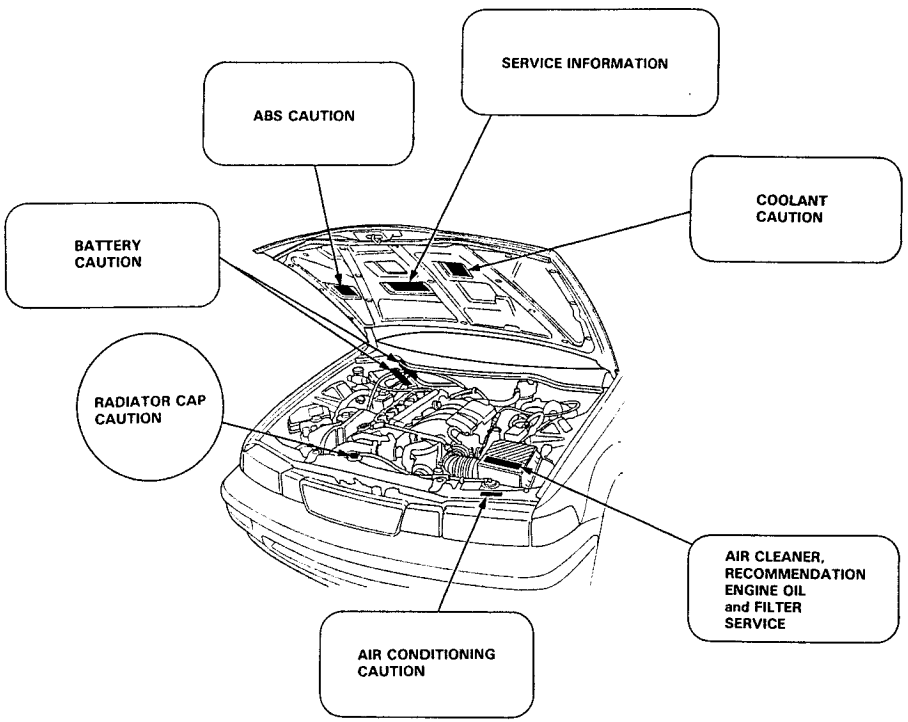
SUPPLEMENTAL RESTRAINT SYSTEM (SRS)
THIS VEHICLE IS EQUIPPED WITH DRIVER AND FRONT SEAT PASSENGER AIRBAGS AND FRONT SEAT BELT TENSIONER SYSTEMS.
ALL SRS ELECTRICAL WIRING AND CONNECTORS ARE COLORED YELLOW.
TAMPERING WITH, DISCONNECTING OR USING ELECTRICAL TEST EQUIPMENT ON THE SRS WIRING CAN MAKE THE SYSTEM INOPERATIVE OR CAUSE ACCIDENTAL FIRING OF THE INFLATOR.

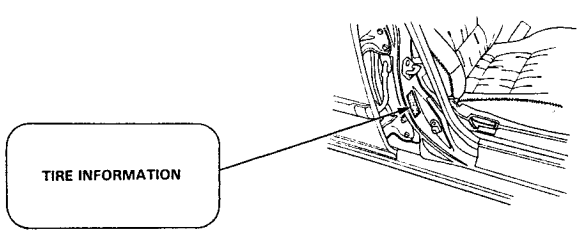
⚠ WARNING
THE AIRBAG INFLATOR IS EXPLOSIVE AND, IF ACCIDENTALLY DEPLOYED, CAN SERIOUSLY HURT YOU.
FOLLOW SERVICE MANUAL INSTRUCTIONS CAREFULLY.

(cont'd)

## Warning/Caution Label Locations

(cont'd)



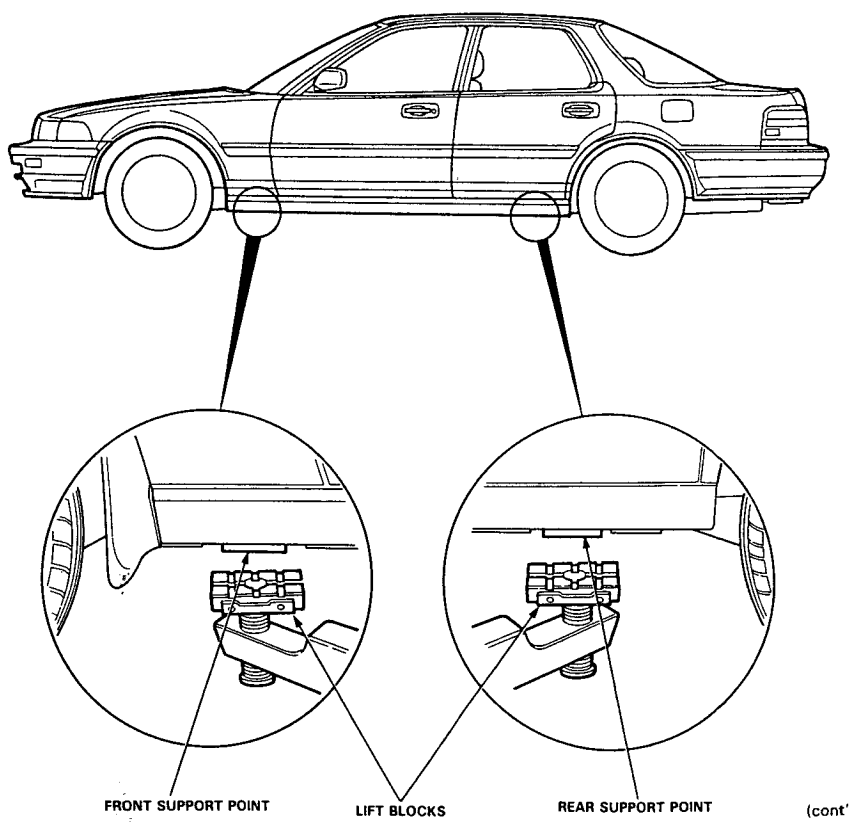






## Lift and Support Points

### Lift

1. Place the lift blocks as shown.
2. Raise the hoist a few inches 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.

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# Lift and Support Points

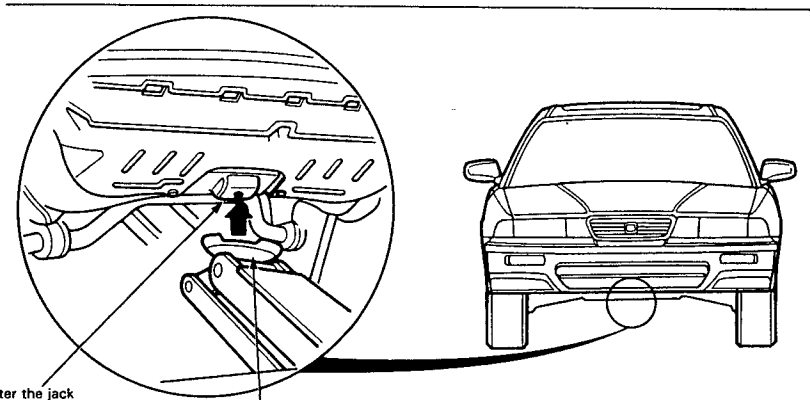
## Floor Jack

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 1-11 so the car will be approximately level, then lower the car onto them.

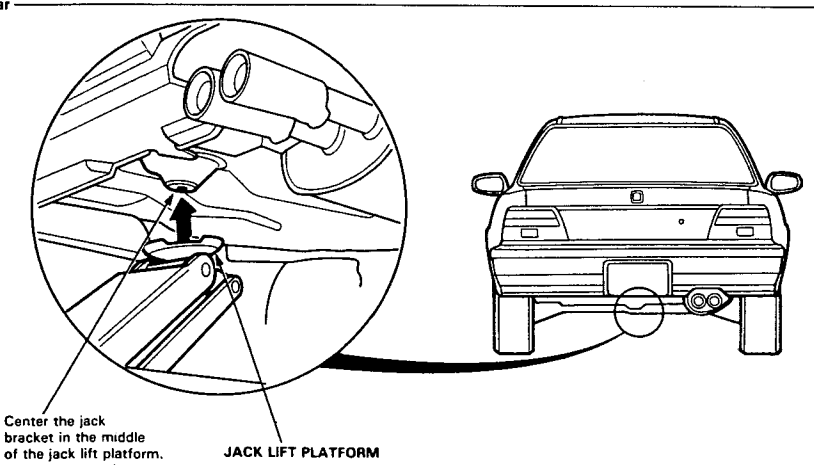
**⚠WARNING**

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

**Front**

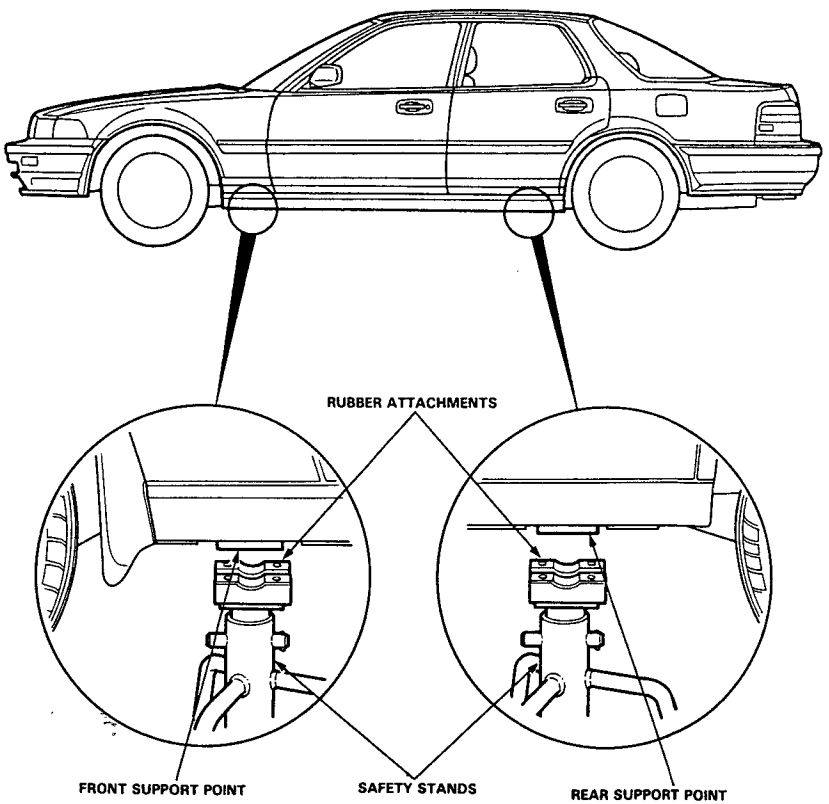



**Rear**






## 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 transporting the car.

**Wheel Lift Equipement** — The tow truck uses two pivoting arms that go under the tires (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:

5-speed Manual Transmission
- Release the parking brake.
- Shift the transmission to neutral.

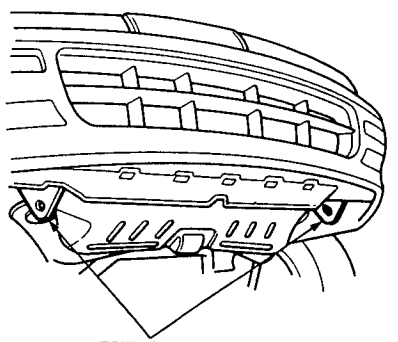
Automatic Transmission
- Release the parking brake.
- Start the engine.
- Shift to D4 position, then to N position.
- Turn off the engine.

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), the 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).

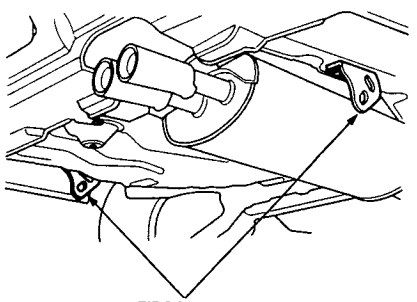
NOTICE: Trying to lift or tow the car by the bumpers will cause serious damage. The bumpers are not designed to support the car's weight.

**Front:**



TOWING HOOKS and TIE DOWN BRACKETS

**Rear:**



TIE DOWN BRACKETS

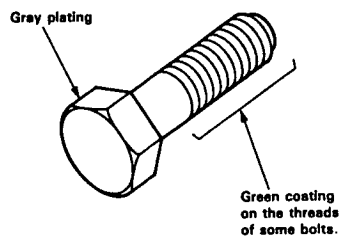


# Service Precautions

## Handling of Special Nuts and Bolts

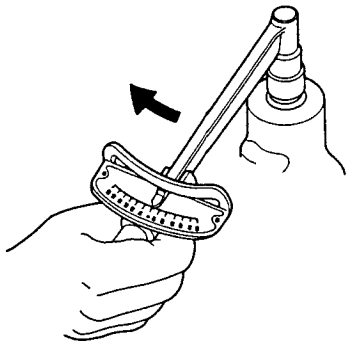
Because the front sub frame sections on this car are constructed with aluminum alloys, use only the special "Dacro" type nuts and bolts recommended by Acura.

NOTE:
- Dacro finish can be identified by gray plating.
- Some Dacro finish bolts have a green coating on the thread section of the bolt for easier application. This type of bolt is called a "Torquer" bolt.
- Use of other types of nuts and bolts may cause electrolysis and corrosion which in turn could cause the bolt to loosen.




Gray plating: "Dacro" type
Gray plating + Green coating on the threads: "Torquer" type

1. When replacing nuts and bolts, use only the same type.
2. Tighten the nuts and bolts with a torque wrench to the specifications provided in this manual.
3. Clean all thread ridges with a non wire type bristle brush. Foreign matter in the threads may cause the bolt to loosen.
4. Sections on this car requiring the use of Dacro nuts and bolts will be indicated by a (☆) in this manual.



# Special Tools

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

specs

# Specifications

# Standards and Service Limits

## Cylinder Head/Valve Train—Section 6

| | MEASUREMENT | | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|---|
| Compression | 250 rpm and wide open throttle kPa (kg/cm², psi) | Nominal | 1,450 (14.5, 206) | |
| | | Minimum | 950 (9.5, 135) | |
| | | Maximum variation | 200 (2.0, 28) | |
| Cylinder head | Warpage | | — | 0.05 (0.002) |
| | Height | | 99.95—100.05 (3.935—3.939) | — |
| Camshaft | End play | | 0.05—0.15 (0.002—0.006) | 0.5 (0.02) |
| | Camshaft-to-holder oil clearance | | 0.050—0.089 (0.002—0.004) | 0.15 (0.006) |
| | Total runout | | 0.03 (0.001) max. | 0.06 (0.002) |
| | Cam lobe height | IN | 39.203 (1.5434) | — |
| | | EX | 38.875 (1.5305) | — |
| Valve | Valve clearance | IN | 0.24—0.28 (0.009—0.011) | — |
| | | EX | 0.28—0.32 (0.011—0.013) | — |
| | Valve stem O.D. | IN | 5.475—5.485 (0.2156—0.2159) | 5.445 (0.2144) |
| | | EX | 5.450—5.460 (0.2146—0.2150) | 5.420 (0.2134) |
| | Stem-to-guide clearance | IN | 0.020—0.045 (0.0008—0.0018) | 0.075 (0.0030) |
| | | EX | 0.05—0.08 (0.002—0.003) | 0.12 (0.005) |
| Valve seat | Width | IN | 1.25—1.55 (0.049—0.061) | 2.0 (0.079) |
| | | EX | 1.25—1.55 (0.049—0.061) | 2.0 (0.079) |
| | Stem installed height | IN | 48.745—49.215 (1.9191—1.9376) | 49.465 (1.9474) |
| | | EX | 51.315—51.785 (2.0203—2.0388) | 52.035 (2.0486) |
| Valve spring | Free length | IN | 52.13 (2.052) *1 | — |
| | | | 52.12 (2.052) *2 | — |
| | | EX | 56.10 (2.209) *1 | — |
| | | | 56.08 (2.208) *2 | — |
| Valve guide | I.D. | IN | 5.505—5.520 (0.2167—0.2173) | 5.52 (0.2173) |
| | | EX | 5.51—5.53 (0.217—0.218) | 5.53 (0.218) |
| | Installed height | IN | 24.75—25.25 (0.974—0.994) | — |
| | | EX | 16.05—16.55 (0.632—0.652) | — |
| Rocker arm | Arm-to-shaft clearance | IN | 0.017—0.050 (0.0007—0.0020) | 0.08 (0.003) |
| | | EX | 0.018—0.054 (0.0007—0.0021) | 0.08 (0.003) |

*1: NIHON HATSUJO manufactured valve spring, *2: CHUO HATSUJO manufactured valve spring.





Unit of length: mm (in)

## Engine Block—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 | 85.010—85.020 (3.3468—3.3472) | 85.070 (3.3492) |
| | | B | 85.000—85.010 (3.3465—3.3468) | 85.070 (3.3492) |
| | Bore taper | | — | 0.05 (0.002) |
| | Reboring limit | | — | 0.5 (0.02) |
| Piston | Skirt O.D. * | No Letter (A) | 84.980—84.990 (3.3457—3.3461) | 84.970 (3.3453) |
| | | B | 84.970—84.980 (3.3453—3.3457) | 84.960 (3.3449) |
| | Clearance in cylinder | | 0.010—0.040 (0.0004—0.0016) | 0.05 (0.002) |
| | Groove width (for ring) | Top | 1.22—1.23 (0.048—0.048) | 1.25 (0.049) |
| | | Second | 1.22—1.23 (0.048—0.048) | 1.25 (0.049) |
| | | Oil | 2.805—2.825 (0.1104—0.1112) | 2.85 (0.112) |
| Piston ring | Ring-to-groove clearance | Top | 0.035—0.060 (0.0014—0.0024) | 0.13 (0.005) |
| | | Second | 0.030—0.055 (0.0012—0.022) | 0.13 (0.005) |
| | Ring end gap | Top | 0.20—0.35 (0.008—0.014) | 0.60 (0.024) |
| | | Second | 0.40—0.55 (0.016—0.022) | 0.70 (0.028) |
| | | Oil | 0.20—0.70 (0.008—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) |
| | Small end bore-to-large end bore parallelism | | 0.12 (0.005)/100 max. | 0.15 (0.006)/100 |
| Crankshaft | Main journal diameter | | 54.976—55.000 (2.1644—2.1654) | — |
| | Rod journal diameter | | 44.976—45.000 (1.7707—1.7717) | — |
| | Taper | | 0.010 (0.0004) max. | 0.01 (0.0004) |
| | Out-of-round | | 0.010 (0.0004) max. | 0.01 (0.0004) |
| | End play | | 0.10—0.35 (0.004—0.014) | 0.45 (0.18) |
| | Total runout | | 0.03 (0.001) max. | 0.06 (0.002) |
| Bearings | Main bearing-to-journal oil clearance | | 0.018—0.048 (0.0007—0.0019) | 0.053 (0.0021) |
| | Rod bearing-to-journal oil clearance | | 0.015—0.043 (0.0006—0.0017) | 0.05 (0.002) |

*: Measured at 21.0 mm (0.83 in) from bottom at skirt

## Engine Lubrication—Section 8

| | MEASUREMENT | | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|---|
| Engine oil | Capacity ℓ (US qt, Imp qt) | | 5.2 (5.5, 4.6) for engine overhaul<br>4.3 (4.5, 3.8) for oil change, including filter | |
| Oil pump | Displacement ℓ (US qt, Imp qt)/min @rpm | | 60.0 (63.4, 52.8) @6,000 | |
| | Inner-to-outer rotor radial clearance | | 0.04—0.16 (0.002—0.006) | 0.20 (0.008) |
| | Housing-to-outer rotor radial clearance | | 0.10—0.18 (0.004—0.007) | 0.20 (0.008) |
| | Housing-to-rotor axial clearance | | 0.02—0.07 (0.001—0.003) | 0.12 (0.005) |
| Relief valve | Pressure setting at oil temperature 176°F (80°C) kPa (kg/cm², psi) | at idle | 70 (0.7, 10) min. | |
| | | at 3,000 rpm | 350 (3.5, 50) min. | |

# Standards and Service Limits

## Cooling—Section 10

| | MEASUREMENT | STANDARD (NEW) |
|---|---|---|
| Radiator | Engine coolant capacity ℓ (US qt, Imp qt) {including engine, heater, cooling line and reservoir} | M/T: 7.6 (8.0, 6.7) for overhaul<br>6.0 (6.3, 5.3) for coolant change<br>A/T: 7.5 (7.9, 6.6) for overhaul<br>5.9 (6.2, 5.2) for coolant change |
| | reservoir capacity: 0.70 ℓ (0.74 US qt, 0.62 Imp qt) | |
| Radiator cap | Opening pressure kPa (kg/cm², psi) | 95—125 (0.95—1.25, 13.5—17.8) |
| Thermostat | Start to open °F (°C) Primary | 176—183 (80—84) |
| | Secondary | 181—189 (83—87) |
| | Fully open °F (°C) | 203 (95) |
| | Valve lift at fully open Primary | 10.0 (0.39) min. |
| | Secondary | 8.5 (0.33) min. |
| Water pump | Displacement ℓ (US qt, Imp qt)/min @rpm | 150.0 (158.5, 132.0) @6,000 |
| Radiator fan | Thermoswitch "ON" temperature °F (°C) | 194—205 (90—96) |
| | Thermoswitch "OFF" temperature °F (°C) | 181—196 (83—91) |

## Fuel and Emission—Section 11

| | MEASUREMENT | STANDARD (NEW) |
|---|---|---|
| Fuel pump | Displacement cc (US oz, Imp oz) in 10 seconds | 230 (7.8, 8.1) min. |
| | Relief valve opening pressure kPa (kg/cm², psi) | 450—600 (4.5—6.0, 64.0—85.3) |
| Pressure | Pressure with regulator vacuum hose disconnected kPa (kg/cm², psi) | 300—350 (3.0—3.5, 43—50) |
| Fuel tank | Capacity ℓ (US gal, Imp gal) | 65 (17.2, 14.3) |
| Engine | Fast idle rpm | 1400 |
| | Idle speed rpm {with headlight and cooling fan off} | M/T 700 (neutral)<br>A/T 700 (P or N position) |
| | Idle CO % | 0.1 max. |

## Clutch—Section 12

| | MEASUREMENT | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|
| Clutch pedal | Clutch pedal height to the floor panel | 207.5 (8.17) | — |
| | Stroke at pedal | 140—150 (5.51—5.91) | — |
| | Total clutch pedal free play (include the pedal play) | 9—15 (0.35—0.59) | — |
| | Pedal play | 1.0—7.0 (0.04—0.28) | — |
| | Clutch pedal disengagement height to the floor panel | 116.4 (4.58) min. | — |
| | to carpet (Reference) | 82.0 (3.23) min. | — |
| Flywheel | Runout | 0.05 (0.002) max. | 0.15 (0.006) |
| Clutch disc | Rivet depth | 1.3 (0.05) min. | 0.2 (0.01) |
| | Surface runout | 0.6 (0.02) max. | 0.8 (0.03) |
| | Thickness | 8.6—9.3 (0.34—0.37) | 6.2 (0.24) |
| Pressure plate | Warpage | 0.03 (0.001) max. | 0.8 (0.03) |





Unit of length: mm (in)

## Manual Transmission—Section 13

| | MEASUREMENT | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|
| Transmission oil | Capacity ℓ (US qt, Imp qt) | 2.0 (2.1, 1.8) for overhaul<br>1.8 (1.9, 1.6) for oil change | |
| Mainshaft | Diameter of needle bearing contact area | | |
| | Clutch housing side | 27.977—27.990 (1.1015—1.1020) | 27.930 (1.0996) |
| | 3rd gear | 35.984—36.000 (1.4167—1.4173) | 35.930 (1.4146) |
| | Diameter of ball bearing contact area | | |
| | Transmission housing side | 28.987—29.000 (1.1412—1.1417) | 28.940 (1.1394) |
| | Runout | 0.02 (0.001) max. | 0.05 (0.002) |
| Mainshaft 3rd gear | I.D. | 41.009—41.025 (1.6145—1.6152) | 41.080 (1.6173) |
| | End play | 0.05—0.20 (0.002—0.008) | 0.3 (0.01) |
| | Thickness | 27.92—27.97 (1.099—1.101) | 27.85 (1.097) |
| Mainshaft 4th gear | I.D. | 41.009—41.025 (1.6145—1.6152) | 41.080 (1.6173) |
| | End play | 0.05—0.17 (0.002—0.007) | 0.3 (0.012) |
| | Thickness | 34.92—34.97 (1.375—1.377) | 34.85 (1.372) |
| Distance collar (Mainshaft 4th gear) | I.D. | 29.002—29.012 (1.1418—1.1422) | 29.060 (1.1441) |
| | O.D. | 35.989—36.000 (1.4169—1.4173) | 35.940 (1.4150) |
| | Length | 27.050—27.070 (1.0650—1.0657) | 27.03 (1.064) |
| Mainshaft 5th gear | I.D. | 41.009—41.025 (1.6145—1.6152) | 41.080 (1.6173) |
| | End play | 0.05—0.17 (0.002—0.007) | 0.3 (0.01) |
| | Thickness | 31.42—31.47 (1.237—1.239) | 31.35 (1.234) |
| Distance collar (Mainshaft 5th gear) | I.D. | 29.002—29.012 (1.1418—1.1422) | 29.060 (1.1441) |
| | O.D. | 35.989—36.000 (1.4169—1.4173) | 35.940 (1.4150) |
| | Length | 27.050—27.070 (1.0650—1.0657) | 27.03 (1.064) |
| Countershaft | Diameter of needle bearing contact area | | |
| | Clutch housing side | 33.000—33.015 (1.2992—1.2998) | 32.950 (1.2972) |
| | 1st gear | 43.984—44.000 (1.7317—1.7323) | 43.930 (1.7295) |
| | Diameter of ball bearing contact area | | |
| | Transmission housing side | 27.977—27.990 (1.1015—1.1020) | 27.930 (1.0996) |
| | Transmission cover side | 24.980—24.993 (0.9835—0.9840) | 24.930 (0.9815) |
| | Runout | 0.02 (0.001) max. | 0.05 (0.002) |
| Countershaft 1st gear | I.D. | 50.009—50.025 (1.9689—1.9695) | 50.080 (1.9716) |
| | End play (when tightened by the specified torque) | 0.05—0.11 (0.002—0.004) | Adjust with a thrust shim |
| | Thickness | 35.95—36.00 (1.415—1.417) | 35.88 (1.413) |
| Countershaft 2nd gear | I.D. | 46.009—46.025 (1.8114—0.8120) | 46.080 (1.8142) |
| | End play (when tightened by the specified torque) | 0.06—0.135 (0.002—0.005) | 0.3 (0.01) |
| | Thickness | 33.92—33.97 (1.335—1.337) | 33.85 (1.333) |
| Distance collar (Countershaft 2nd gear) | I.D. | 34.980—34.990 (1.3772—1.3776) | 35.038 (1.3794) |
| | O.D. | 40.989—41.000 (1.6137—1.6142) | 40.940 (1.6118) |
| | Thickness | 34.085—34.105 (1.3419—1.3427) | — |
| Reverse idler gear | I.D. | 20.054—20.081 (0.7895—0.7906) | 20.109 (0.7917) |
| | Gear-to-shaft clearance | 0.074—0.122 (0.0029—0.0048) | 0.150 (0.0059) |

(cont'd)

# Standards and Service Limits

## Manual Transmission (cont'd) — Section 13

| | MEASUREMENT | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|
| Synchro ring | Ring-to-gear clearance (ring pushed against) | 0.85 – 1.10 (0.034 – 0.043) | 0.4 (0.02) |
| Double cone synchro ring | Clearance (ring pushed against gear) | | |
| | Outer synchro ring-to-gear | 0.95 – 1.68 (0.037 – 0.066) | 0.6 (0.02) |
| | Synchro cone-to-gear | 0.5 – 1.0 (0.02 – 0.04) | 0.3 (0.01) |
| | Outer synchro ring-to-synchro cone | 0.5 – 1.0 (0.02 – 0.04) | 0.3 (0.01) |
| 1st/2nd shift fork | Finger thickness | 7.4 – 7.6 (0.29 – 0.30) | — |
| | Finger-to-synchro sleeve clearance | 0.35 – 0.65 (0.014 – 0.026) | 1.0 (0.04) |
| | Fork-to-shift piece clearance | 0.2 – 0.5 (0.01 – 0.02) | 0.7 (0.03) |
| | Groove width of shift piece contact point | 12.2 – 12.4 (0.48 – 0.49) | — |
| 3rd/4th shift fork | Finger thickness | 7.4 – 7.6 (0.29 – 0.30) | — |
| | Finger-to-synchro sleeve clearance | 0.35 – 0.65 (0.014 – 0.026) | 1.0 (0.04) |
| | Fork-to-shift piece clearance | 0.2 – 0.5 (0.01 – 0.02) | 0.7 (0.03) |
| | Groove width of shift piece contact point | 12.2 – 12.4 (0.48 – 0.49) | — |
| 5th/reverse shift fork | Finger thickness | 7.4 – 7.5 (0.29 – 0.30) | — |
| | Finger-to-synchro sleeve clearance | 0.35 – 0.65 (0.014 – 0.026) | 1.0 (0.04) |
| 5th/reverse shift piece | Width of 5th/reverse shift piece pin | 6.9 – 7.0 (0.27 – 0.28) | — |
| | Groove width of shift piece contact point | 12.2 – 12.4 (0.48 – 0.49) | — |
| Reverse shift holder | Finger groove width | 14.0 – 14.3 (0.55 – 0.56) | — |
| | Groove-to-reverse idler gear clearance | 0.5 – 1.1 (0.02 – 0.04) | 1.7 (0.07) |
| | Groove width A | 7.05 – 7.25 (0.278 – 0.285) | — |
| | B | 7.4 – 7.7 (0.29 – 0.30) | — |
| | Groove-to-5th/reverse shift piece pin clearance A | 0.05 – 0.35 (0.002 – 0.014) | 0.5 (0.02) |
| | B | 0.4 – 0.8 (0.02 – 0.03) | 1.0 (0.04) |
| Shift arm | Diameter of change piece contact point | 12.8 – 13.0 (0.50 – 0.51) | — |
| | Shift arm-to-change piece clearance | 0.10 – 0.40 (0.004 – 0.016) | 0.5 (0.02) |
| | Diameter of shift piece contact point | 12.8 – 13.0 (0.50 – 0.51) | — |
| | Shift arm-to-shift piece clearance | 0.10 – 0.40 (0.004 – 0.016) | 0.6 (0.02) |
| Change piece | Groove width of shift arm contact point | 13.10 – 13.20 (0.516 – 0.520) | — |
| | Groove width of select arm contact point | 12.05 – 12.15 (0.474 – 0.478) | — |
| | Change piece-to-select arm clearance | 0.05 – 0.35 (0.002 – 0.014) | 0.5 (0.02) |
| Shift piece | Groove width of shift arm contact point | 13.10 – 13.20 (0.516 – 0.520) | — |
| | Shift piece to shift fork shafts or 5th/reverse shift piece clearance | 0.2 – 0.5 (0.01 – 0.02) | 0.7 (0.03) |
| | Width of shift fork shafts and 5th/reverse shift piece contact point | 11.9 – 12.0 (0.469 – 0.472) | — |
| Select arm | Diameter of change piece contact point | 11.8 – 12.0 (0.46 – 0.47) | — |
| Secondary gear | Backlash | 0.058 – 0.116 (0.0023 – 0.0046) | 0.176 (0.0069) |
| | Preload N·m (kg-cm, lb-in) | 1.8 – 3.0 (18 – 30, 15.6 – 26.0) | Adjust with a thrust shim |
| | Diameter of bearing contact area Transmission housing side: | 40.002 – 40.018 (1.5749 – 1.5755) | — |
| | Clutch housing side: | 50.002 – 50.018 (1.9685 – 1.9692) | — |
| | Diameter of oil seal contact area | 39.738 – 39.800 (1.5645 – 1.5669) | — |
| Oil pump | Inner rotor-to-outer rotor tip clearance | 0.14 (0.006) max. | 0.20 (0.008) |
| | Clutch housing-to-outer rotor clearance | 0.10 – 0.20 (0.004 – 0.008) | 0.22 (0.009) |
| | Clutch housing-to-rotor axial clearance | 0.03 – 0.15 (0.001 – 0.006) | 0.20 (0.008) |





Unit of length: mm (in)

## Automatic Transmission — Section 14

| | MEASUREMENT | | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|---|
| Transmission fluid | Capacity ℓ (US qt, Imp qt) | | 7.2 (7.6, 6.3) for overhaul<br>2.5 (2.6, 2.2) for fluid change | |
| Hydraulic pressure kPa (kg/cm², psi) | Line pressure at 2,000 rpm [N] or [P] position | | 850 – 900 (8.5 – 9.0, 121 – 128) | 800 (8.0, 114) |
| | 1st clutch pressure at 2,000 rpm [D4] or [1] position | | | |
| | 2nd clutch pressure at 2,000 rpm [D4] position | | 500 (5.0, 71)<br>throttle fully closed<br>\|<br>900 (9.0, 128)<br>throttle more than 1/4 opened | 450 (4.5, 64)<br>throttle fully closed<br>\|<br>800 (8.0, 114)<br>throttle more than 1/4 opened |
| | 3rd clutch pressure at 2,000 rpm [D4] position | | | |
| | 4th clutch pressure at 2,000 rpm [D4] position | | | |
| | 2nd clutch pressure at 2,000 rpm [2] position | | 850 – 900 (8.5 – 9.0, 121 – 128) | 800 (8.0, 114) |
| | 1st and 1st-hold clutch pressure at 2,000 rpm [1] position | | 850 – 900 (8.5 – 9.0, 121 – 128) | 800 (8.0, 114) |
| | Throttle B pressure | Throttle fully closed | 0 (0, 0) | — |
| | | Throttle fully open | 500 – 530 (5.0 – 5.3, 71 – 75) | 470 (4.7, 67) |
| | Modulator pressure | | 460 – 510 (4.6 – 5.1, 65 – 73) | 410 (4.1, 58) |
| Stall speed rpm (check with car on level ground) | | | 2,200 – 2,500 | — |
| Clutch | Clutch initial clearance | 1st-hold | 0.80 – 1.00 (0.031 – 0.039) | — |
| | | 1st | 0.65 – 0.85 (0.026 – 0.033) | — |
| | | 2nd, 3rd, 4th | 0.55 – 0.75 (0.022 – 0.030) | — |
| | Clutch return spring free length | 1st, 3rd | 33.2 (1.31) | 31.2 (1.23) |
| | | 2nd, 4th | 33.9 (1.33) | 31.9 (1.26) |
| | | 1st-hold | 32.0 (1.30) | 30.0 (1.18) |
| | | | 31.0 (1.22) | 29.0 (1.14) |
| | Clutch disc thickness | | 1.88 – 2.00 (0.074 – 0.079) | Until grooves worn out |
| | Clutch plate thickness | 1st, 3rd, 1st-hold | 1.95 – 2.05 (0.077 – 0.081) | Discoloration |
| | | 2nd, 4th | 2.25 – 2.35 (0.089 – 0.093) | Discoloration |
| | Clutch end plate thickness (1st, 1st-hold and 3rd) | Mark 1 | 2.05 – 2.10 (0.081 – 0.083) | Discoloration |
| | | Mark 2 | 2.15 – 2.20 (0.085 – 0.087) | |
| | | Mark 3 | 2.25 – 2.30 (0.089 – 0.091) | |
| | | Mark 4 | 2.35 – 2.40 (0.093 – 0.094) | |
| | | Mark 5 | 2.45 – 2.50 (0.096 – 0.098) | |
| | | Mark 6 | 2.55 – 2.60 (0.100 – 0.102) | |
| | | Mark 7 | 2.65 – 2.70 (0.104 – 0.106) | |
| | | Mark 8 | 2.75 – 2.80 (0.108 – 0.110) | |
| | | Mark 9 | 2.85 – 2.90 (0.112 – 0.114) | |
| | | Mark 10 | 2.95 – 3.00 (0.116 – 0.118) | |
| | | Mark 11* | 3.05 – 3.10 (0.120 – 0.122) | |
| | | Mark 12* | 3.15 – 3.20 (0.124 – 0.126) | |
| | | Mark 13* | 3.25 – 3.30 (0.128 – 0.130) | |
| | *1st and 1st-hold only | Mark 14* | 3.35 – 3.40 (0.132 – 0.134) | Discoloration |
| | Clutch end plate thickness (2nd and 4th) | Mark 1 | 2.05 – 2.10 (0.081 – 0.083) | Discoloration |
| | | Mark 2 | 2.15 – 2.20 (0.085 – 0.087) | |
| | | Mark 3 | 2.25 – 2.30 (0.089 – 0.091) | |
| | | Mark 4 | 2.35 – 2.40 (0.093 – 0.094) | |
| | | Mark 5 | 2.45 – 2.50 (0.096 – 0.098) | |
| | | Mark 6 | 2.55 – 2.60 (0.100 – 0.102) | |
| | | Mark 7 | 2.65 – 2.70 (0.104 – 0.106) | |
| | | Mark 8 | 2.75 – 2.80 (0.108 – 0.110) | |
| | | Mark 9 | 2.85 – 2.90 (0.112 – 0.114) | Discoloration |

(cont'd)

# Standards and Service Limits

## Automatic Transmission (cont'd)—Section 14

| | MEASUREMENT | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|
| Valve body | Stator shaft needle bearing contact I.D. | | |
| | Torque converter side | 27.000–27.021 (1.0630–1.0638) | Wear or damage |
| | Oil pump side | 29.000–29.013 (1.1417–1.1422) | — |
| | Oil pump gear side clearance | 0.03–0.05 (0.001–0.002) | 0.07 (0.003) |
| | Oil pump gear-to-body clearance Drive | 0.210–0.265 (0.0083–0.0104) | — |
| | Driven | 0.070–0.125 (0.0028–0.0049) | — |
| | Oil pump driven gear I.D. | 14.016–14.034 (0.5518–0.5525) | Wear or damage |
| | Oil pump driven gear shaft O.D. | 13.980–13.990 (0.5504–0.5508) | Wear or damage |
| Shifting device and parking brake control | Reverse shift fork finger thickness | 5.90–6.00 (0.232–0.236) | 5.40 (0.213) |
| | Parking brake rachet pawl | — | Wear or other defect |
| | Parking gear | — | |
| Servo body | Shift fork shaft bore I.D. | 14.000–14.010 (0.5512–0.5516) | — |
| | Shift fork shaft valve bore I.D. | 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) | 35.050 (1.3799) |
| Stator shaft | Sealing ring contact I.D. | 29.000–29.013 (1.1417–1.1422) | 29.050 (1.1437) |
| Transmission | Thrust washer thickness | | |
| | Mainshaft ball bearing Fr side | 3.45–3.55 (0.136–0.140) | Wear or damage |
| | Mainshaft 1st gear Fr side | 1.45–1.50 (0.057–0.059) | 1.40 (0.055) |
| | Mainshaft 1st gear Rr side | 2.43–2.50 (0.096–0.098) | Wear or damage |
| | Countershaft 1st gear Rr side | 3.43–3.50 (0.135–0.138) | Wear or damage |
| | Mainshaft 4th gear collar length | 47.50–47.55 (1.870–1.872) | — |
| | Mainshaft 1st gear collar length | 35.50–35.55 (1.398–1.400) | — |
| | Mainshaft 1st gear collar flange thickness | 3.25–3.40 (0.128–0.134) | Wear or damage |
| | Mainshaft 2nd gear thrust washer thickness | 3.97–4.00 (0.156–0.157) | Wear or damage |
| | | 4.02–4.05 (0.158–0.159) | |
| | | 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) | |
| | | 4.47–4.50 (0.176–0.177) | Wear or damage |
| | Mainshaft sealing ring 35 mm thickness | 1.980–1.995 (0.0780–0.0785) | 1.80 (0.071) |
| | Mainshaft sealing ring 29 mm thickness | 1.980–1.995 (0.0780–0.0785) | 1.80 (0.071) |
| | Mainshaft sealing ring groove width | 2.025–2.060 (0.0797–0.0811) | 2.08 (0.082) |
| | Countershaft 3rd gear distance collar length | 24.05–24.10 (0.947–0.949) | — |
| | Countershaft 3rd gear distance collar flange thickness | 4.35–4.50 (0.171–0.177) | Wear or damage |
| | Countershaft reverse gear collar length | 14.00–14.05 (0.551–0.553) | — |
| | Countershaft reverse gear collar flange thickness | 2.45–2.60 (0.096–0.102) | Wear or damage |
| | Countershaft 1st gear collar length | 60.00–60.05 (2.362–2.364) | — |
| | Countershaft distance collar 35 mm length | 65.625–65.675 (2.5837–2.5856) | — |
| | | 65.675–65.725 (2.5856–2.5876) | — |
| | | 65.725–65.775 (2.5876–2.5896) | — |
| | | 65.775–65.825 (2.5896–2.5915) | — |
| | | 65.825–65.875 (2.5915–2.5935) | — |
| | | 65.875–65.925 (2.5935–2.5955) | — |
| | | 65.925–65.975 (2.5955–2.5974) | — |
| | | 65.975–66.025 (2.5974–2.5994) | — |
| | | 66.025–66.075 (2.5994–2.6014) | — |
| | | 66.075–66.125 (2.6014–2.6033) | — |





## Automatic Transmission (cont'd)—Section 14

Unit of length: mm (in)

| | MEASUREMENT | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|
| Transmission (cont'd) | Mainshaft feed pipe O.D. | 11.47–11.48 (0.4516–0.4520) | 11.45 (0.451) |
| | Mainshaft feed pipe O.D. | 5.97–5.98 (0.2350–0.2354) | 5.95 (0.234) |
| | Countershaft feed pipe O.D. | 11.47–11.48 (0.4516–0.4520) | 11.45 (0.451) |
| | Countershaft feed pipe O.D. | 7.97–7.98 (0.3138–0.3142) | 7.95 (0.313) |
| | Mainshaft bushing I.D. | 11.500–11.518 (0.4528–0.4535) | 11.530 (0.4539) |
| | Mainshaft bushing I.D. | 6.018–6.030 (0.2369–0.2374) | 6.045 (0.2380) |
| | Countershaft bushing I.D. | 11.500–11.518 (0.4528–0.4535) | 11.530 (0.4539) |
| | Countershaft bushing I.D. | 8.000–8.015 (0.3150–0.3156) | 8.030 (0.3161) |
| | Diameter of needle bearing contact area | | |
| | On mainshaft and stator shaft | 22.980–22.993 (0.9047–0.9052) | Wear or damage |
| | On mainshaft 1st gear collar | 32.975–32.991 (1.2982–1.2989) | |
| | On mainshaft 4th gear collar | 33.975–33.991 (1.3376–1.3382) | |
| | On mainshaft 2nd collar | 36.975–36.991 (1.4557–1.4563) | |
| | On countershaft (Fr side) | 38.505–38.515 (1.5159–1.5163) | |
| | On countershaft 3rd gear distance collar | 43.975–43.991 (1.7313–1.7319) | |
| | On countershaft 1st gear collar | 33.975–33.991 (1.3376–1.3382) | |
| | On countershaft 4th gear | 31.975–31.991 (1.2589–1.2595) | |
| | On countershaft reverse gear collar | 32.975–32.991 (1.2982–1.2989) | |
| | On reverse idler gear shaft | 13.990–14.000 (0.5508–0.5512) | |
| | Reverse idler gear shaft holder I.D. | 14.416–14.434 (0.5676–0.5683) | |
| | Diameter of one-way clutch contact area | | |
| | Countershaft 1st gear I.D. | 83.339–83.365 (3.2811–3.2821) | |
| | Parking gear O.D. | 66.685–66.696 (2.6254–2.6258) | |
| | Selector hub O.D. | 51.87–51.90 (2.042–2.043) | |
| | Inside diameter | | |
| | Mainshaft 1st gear | 37.000–37.016 (1.4567–1.4573) | |
| | Mainshaft 2nd gear | 43.000–43.016 (1.6929–1.6935) | |
| | Mainshaft 4th gear | 40.000–40.016 (1.5748–1.5754) | |
| | Countershaft 1st gear | 40.000–40.016 (1.5748–1.5754) | |
| | Countershaft 3rd gear | 49.000–49.016 (1.9291–1.9298) | |
| | Countershaft 4th gear | 38.000–38.016 (1.4961–1.4967) | |
| | Countershaft reverse gear | 39.000–39.016 (1.5354–1.5361) | |
| | Reverse idler gear | 18.007–18.020 (0.7089–0.7094) | Wear or damage |
| | End play | | |
| | Mainshaft 1st gear | 0.08–0.24 (0.003–0.009) | — |
| | Mainshaft 2nd gear | 0.07–0.15 (0.003–0.006) | — |
| | Mainshaft 4th gear | 0.10–0.22 (0.004–0.009) | — |
| | Countershaft 1st gear | 0.10–0.41 (0.004–0.016) | — |
| | Countershaft 3rd gear | 0.05–0.17 (0.002–0.007) | — |
| | Countershaft 4th gear | 0.07–0.15 (0.003–0.006) | — |
| | Countershaft reverse gear | 0.10–0.25 (0.004–0.010) | — |
| | Reverse idler gear | 0.05–0.23 (0.002–0.009) | — |
| Secondary gear shaft taper roller bearing starting torque N·m (kg-cm, lb-in) | | 2.3–3.3 (23–33, 20–29) | — |

(cont'd)

# Standards and Service Limits

## Automatic Transmission (cont'd)—Section 14

| | MEASUREMENT | STANDARD (NEW) | | | |
|---|---|---|---|---|---|
| | | Wire Dia. | O.D. | Free Length | No. of Coils |
| Springs | 1st one-way ball spring | 0.29 (0.011) | 4.0 (0.157) | 14.0 (0.551) | 13.0 |
| | Regulator valve spring A | 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) | 7.5 |
| | Stator reaction spring | 6.0 (0.236) | 38.4 (1.512) | 30.3 (1.193) | 2.0 |
| | Torque converter check valve spring | 1.1 (0.043) | 8.4 (0.331) | 41.8 (1.646) | 15.7 |
| | Relief valve spring | 1.1 (0.043) | 8.4 (0.331) | 41.8 (1.646) | 15.7 |
| | Cooler relief valve spring | 1.1 (0.043) | 8.4 (0.331) | 46.8 (1.843) | 17.0 |
| | 3-4 orifice control valve spring | 0.7 (0.028) | 6.6 (0.260) | 34.8 (1.370) | 22.0 |
| | 2-3 orifice control valve spring | 0.7 (0.028) | 6.6 (0.260) | 39.1 (1.539) | 22.0 |
| | Throttle valve spring | 1.0 (0.039) | 7.6 (0.299) | 28.3 (1.114) | 12.1 |
| | 4th exhaust valve spring | 0.6 (0.024) | 5.6 (0.220) | 49.1 (1.933) | 21.0 |
| | 1-2 shift valve spring | 0.9 (0.035) | 8.6 (0.339) | 40.4 (1.591) | 14.5 |
| | 2-3 shift valve spring | 0.9 (0.035) | 9.6 (0.378) | 43.0 (1.693) | 12.1 |
| | 1st accumulator spring A | 2.2 (0.087) | 17.2 (0.677) | 88.6 (3.488) | 15.0 |
| | 1st accumulator spring B | 1.9 (0.075) | 19.8 (0.386) | 51.5 (2.028) | 8.3 |
| | 4th accumulator spring | 3.3 (0.130) | 20.5 (0.807) | 74.1 (2.917) | 11.2 |
| | 2nd accumulator spring | 3.0 (0.118) | 18.7 (0.736) | 88.1 (3.468) | 14.2 |
| | 1st-hold accumulator spring A | 3.5 (0.138) | 21.6 (0.850) | 55.9 (2.201) | 7.7 |
| | 3rd accumulator spring | 3.2 (0.126) | 20.5 (0.807) | 89.0 (3.504) | 12.6 |
| | 1st-hold accumulator spring B | 2.3 (0.091) | 12.8 (0.504) | 53.4 (2.102) | 12.6 |
| | Lock-up shift valve spring | 0.9 (0.035) | 7.6 (0.299) | 73.7 (2.902) | 32.0 |
| | Lock-up timing valve spring | 0.8 (0.031) | 6.6 (0.260) | 59.3 (2.335) | 38.8 |
| | Servo control valve spring | 1.0 (0.039) | 8.1 (0.319) | 52.1 (2.051) | 20.8 |
| | Lock-up control valve spring | 0.7 (0.028) | 6.6 (0.260) | 38.0 (1.496) | 14.1 |
| | Modulator valve spring | 1.4 (0.055) | 9.4 (0.370) | 32.4 (1.276) | 10.5 |
| | CPC valve spring | 1.0 (0.039) | 6.8 (0.268) | 36.1 (1.421) | 17.8 |
| | 4th kick-down spring | 1.0 (0.039) | 7.6 (0.299) | 48.2 (1.898) | 22.2 |
| | 3rd kick-down spring | 1.0 (0.039) | 7.4 (0.291) | 38.6 (1.520) | 16.0 |

## Differential—Section 15

| | MEASUREMENT | | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|---|
| Differential oil | Capacity ℓ (US qt, Imp qt) | | 1.0 (1.11, 0.92) for overhaul<br>0.9 (1.00, 0.84) for oil change | |
| Differential carrier | Pinion shaft contact area I.D. | | 18.000–18.018 (15.8382–15.8540) | —— |
| | Carrier-to-pinion shaft clearance | | 0.013–0.047 (0.0114–0.0019) | 0.10 (0.004) |
| | Driveshaft or intermediate shaft contact area I.D. | | 30.025–30.045 (1.1821–1.1829) | —— |
| | Carrier-to-driveshaft clearance | | 0.045–0.086 (0.0018–0.0034) | 0.12 (0.005) |
| | Carrier-to-intermediate shaft clearance | | 0.080–0.116 (0.0031–0.0046) | 0.15 (0.006) |
| Differential pinion gear | Backlash | | 0.05–0.15 (0.002–0.006) | 0.30 (0.012) |
| | I.D. | | 18.042–18.066 (0.7103–0.7113) | —— |
| | Pinion gear-to-pinion shaft clearance | | 0.055–0.095 (0.0022–0.0037) | 0.15 (0.006) |
| Drive pinion and ring gear | Backlash | at inspection hole | 0.04–0.10 (0.002–0.004) | Adjust with a shim |
| | | at gear circumference | 0.06–0.14 (0.002–0.006) | |
| Drive pinion | Preload N·m (kg-cm, lb-in) | New bearing | 1.30–1.70 (13.0–17.0, 11.3–14.8) | Adjust with a shim |
| | | Reused bearing | 0.65–1.05 (6.5–10.5, 5.6–9.1) | |
| Total bearing preload | Preload N·m (kg-cm, lb-in) | | | |
| | New bearings | | 2.58–3.30 (25.8–33.0, 22.4–28.6) | Adjust with a shim |
| | Reused bearings | | 1.56–2.20 (15.6–22.0, 13.5–19.1) | |
| | Replace only the bearing on the ring gear side | | 1.93–2.65 (19.3–26.5, 16.8–23.0) | |
| | Replace only the bearing on the drive pinion side | | 2.21–2.85 (22.1–28.5, 19.2–24.7) | |





Unit of length: mm (in)

## Steering—Section 17

| | MEASUREMENT | | STANDARD (NEW) |
|---|---|---|---|
| Steering wheel | Play at steering wheel circumference | | 1–10 (0.04–0.4) |
| | Starting load at steering wheel circumference N (kg, lbs) | | |
| | | Engine running | 32 (3.2, 5.1) max. |
| | | When the hydraulic system to the speed sensor is cut off | 50 (5.0, 11.0) min. |
| Gearbox | Angle of rack-guide-screw loosened from locked position | | $20^{+5^\circ}_{0}$ |
| Pump | Pump pressure with valve closed (oil temp./speed: 105°F (40°C) min./idle. Do not run for more than 5 seconds). kPa (kg/cm², psi) | | 8,000–9,000 (80–90, 1,138–1,280) |
| Power steering fluid | Fluid capacity ℓ (US qt, Imp qt) | System | 1.8 (1.9, 1.6) |
| | | Reservoir | 0.5 (0.5, 0.4) |
| Power steering pump belt | Deflection with 100 N (10 kg, 22 lbs) between pulleys | | 6.5–9.0 (0.26–0.35) with used belt<br>4.5–6.5 (0.18–0.26) with new belt |

## Suspension—Section 18

| | MEASUREMENT | | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|---|
| Wheel alignment | Camber | Front | 0° 00′ ± 1° | —— |
| | | Rear | −0° 30′ ± 1° | —— |
| | Caster | Front | 1° 38′ ± 1° | —— |
| | Total toe | Front | 0 ± 2.0 (0 ± 0.08) | —— |
| | | Rear | IN 3.0 ± 2.0 (0.12 ± 0.08) | —— |
| | Front wheel turning angle | Inward wheel | 39° 24′ ±2° | —— |
| | | Outward wheel | 33° 36′ | —— |
| Wheel | 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) |
| | 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) |
| Wheel | 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 at 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) | A/T | 199 (7.8) min. | —— |
| | | M/T | 194 (7.6) min. | —— |
| | Free play | | 1–5 (1/16–13/64) | —— |
| Master cylinder | Piston-to-pushrod clearance | | 0–0.4 (0–0.02) | —— |
| Disc brake | Disc thickness | Front | 23.0 (0.91) | 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 | 11.0 (0.43) | 1.6 (0.06) |
| | | Rear | 9.0 (0.35) | 1.6 (0.06) |

# Standards and Service Limits

## Air Conditioning—Section 22

Unit of length: mm (in)

| | MEASUREMENT | | STANDARD (NEW) |
|---|---|---|---|
| Air conditioning system | Lubricant capacity cc (US oz, Imp oz) | Condenser | 20 (0.68, 0.70) |
| | | Evaporator | 30 (1.01, 1.06) |
| | | Line or hose | 10 (0.34, 0.35) |
| | | Receiver | 10 (0.34, 0.35) |
| Compressor | Lubricant capacity cc (US oz, Imp oz) | | 130–160 (4.40–5.41 4.58–5.63) |
| | Stator coil resistance at 68°F (20°C) Ω | | 3.4–3.8 |
| | Pulley-to-pressure plate clearance | | 0.35–0.65 (0.014–0.026) |
| Compressor belt | Deflection with 100 N (10 kg, 22 lbs) between pulleys | | 6.0–9.0 (0.24–0.35) with used belt<br>3.5–5.5 (0.14–0.22) with new belt |

## Electrical—Section 23

| | MEASUREMENT | STANDARD (NEW) | SERVICE LIMIT |
|---|---|---|---|
| Ignition coil | Rated votage V | 12 | |
| | Primary winding resistance Ω at 77°F (25°C) | 0.3–0.5 | |
| | Secondary winding resistance kΩ at 77°F (25°C) | 10.8–16.2 | |
| Spark plug | Type | See Section 23 | |
| | Gap | 1.1 (0.43) | |
| Ignition timing | At idling °BTDC | 15° ± 2° (Red) | |
| Alternator belt | Deflection with 100 N (10 kg, 22 lbs) between pulleys | 7.5–9.5 (0.30–0.37) with used belt<br>5.0–7.0 (0.20–0.28) with new belt | |
| | **MEASUREMENT** | **STANDARD (NEW)** | **SERVICE LIMIT** |
| Alternator (NIPPON-DENSO) | Output 13.5 V at hot A | 100 | — |
| | Brush length | 10.5 (0.41) | 1.5 (0.06) |
| Starter motor (MITSUBA 1.6 kW) | 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 (0–0.001) | 0.05 (0.002) |
| | Commutator O.D. | 28.0–28.1 (1.102–1.106) | 27.5 (1.083) |
| | Brush length | 15.8–16.2 (0.62–0.64) | 11.0 (0.43) |
| | Brush spring tension (new) N (kg, lbs) | 16.0–18.0 (1.60–1.80, 3.53–3.93) | — |
| Starter motor (MITSUBA 2.0 kW) | Type | Planetary gear reduction, Permanent magnet | |
| | Mica depth | 0.4–0.5 (0.016–0.020) | 0.15 (0.006) |
| | Commutator runout | 0–0.02 (0–0.001) | 0.05 (0.002) |
| | Commutator O.D. | 32.0–32.1 (1.260–1.264) | 31.5 (1.240) |
| | Brush length | 16.8–17.2 (0.66–0.68) | 11.0 (0.43) |
| | Brush spring tension (new) N (kg, lbs) | 17.0–19.0 (1.70–1.90, 3.75–4.19) | — |
| Starter motor (MITSUBISHI 2.0 kW) | Type | Planetary gear reduction, Field coil | |
| | Mica depth | 0.5–0.8 (0.020–0.031) | 0.20 (0.008) |
| | Commutator runout | 0–0.05 (0–0.002) | 0.10 (0.004) |
| | Commutator O.D. | 31.9–32.1 (1.256–1.264) | 31.5 (1.240) |
| | Brush length | 18.0 (0.71) | 11.0 (0.43) |
| | Brush spring tension (new) N (kg, lbs) | 29.7–36.3 (2.97–3.63, 6.55–8.00) | — |



# Design Specifications

specs

| | ITEM | | METRIC | ENGLISH | NOTES |
|---|---|---|---|---|---|
| Dimentions | Overall Length | | 4,835 mm | 190.4 in | |
| | Overall Width | | 1,780 mm | 70.1 in | |
| | Overall Height | | 1,370 mm | 53.9 in | |
| | Wheelbase | | 2,805 mm | 110.4 in | |
| | Track Front/Rear | | 1,520/1,510 mm | 59.8/59.4 in | |
| | Ground Clearance | | 150 mm | 5.9 in | |
| | Seating Capacity | | Five | | |
| Weight (USA) | Gross Vehicle Weight Rating (GVWR) | | 1,925 kg | 4,245 lbs | |
| Weight (CANADA) | Gross Vehicle Weight Rating (GVWR) | | 1,925 kg | 4,245 lbs | |
| ENGINE | Type | | Water-cooled, 4-stroke SOHC gasoline engine | | |
| | Cylinder Arrangement | | Inline 5-cylinder 30° slant mount | | |
| | Bore and Stroke | | 85.0 x 86.4 mm | 3.35 x 3.40 in | |
| | Displacement | | 2,451 cm³ (cc) | 149 cu-in | |
| | Compression Ratio | | 9.0 | | |
| | Valve Train | | Belt driven, SOHC 4 valves per cylinder | | |
| | Lubrication System | | Forced and wet sump, trochoid pump | | |
| | Fuel Required | | Premium UNLEADED grade gasoline with 91 Pump Octane Number or higher | | |
| STARTER | Make/Type | | MITSUBA/Spur gear reduction, permanent magnet 1.6 kW and Planetary gear reduction, permanent magnet 2.0 kW MITSUBISHI/Planetary gear reduction, field coil 2.0 kW | | |
| | Normal Output | | M/T: 1.6 kW A/T: 2.0 kW | | |
| | Nominal Voltage | | 12 V | | |
| | Hour Rating | | 30 seconds | | |
| | Direction of Rotation | | Counterclockwise as viewed from gear end | | |
| | Weight | | Approximate 4.7 kg | 10.4 lbs | |
| CLUTCH | Clutch Type | M/T | Single plate dry, diaphragm spring | | |
| | | A/T | Torque converter | | |
| | Clutch Facing Area | M/T | 239 cm² | 37 sq-in | |
| TRANSMISSION | Transmission | M/T | Synchronized 5-speed forward, 1 reverse | | |
| | | A/T | Electronically controlled 4-speed automatic, 1 reverse | | |
| | Primary Reduction | | Direct 1 : 1 | | |
| | Type | | Manual | Automatic | |
| | Gear Ratio | 1st | 3.071 | 2.647 | |
| | | 2nd | 1.652 | 1.535 | |
| | | 3rd | 1.156 | 0.975 | |
| | | 4th | 0.864 | 0.653 | |
| | | 5th | 0.666 | — | |
| | | Reverse | 3.075 | 1.904 | |
| | Secondary Reduction | Gear type | Single helical gear | | |
| | | Gear ratio | 1.625 | 1.621 | |
| | Final Reduction | Gear type | Hypoid spiral bevel gear | | |
| | | Gear ratio | 2.764 | 2.764 | |

(cont'd)

## Design Specifications

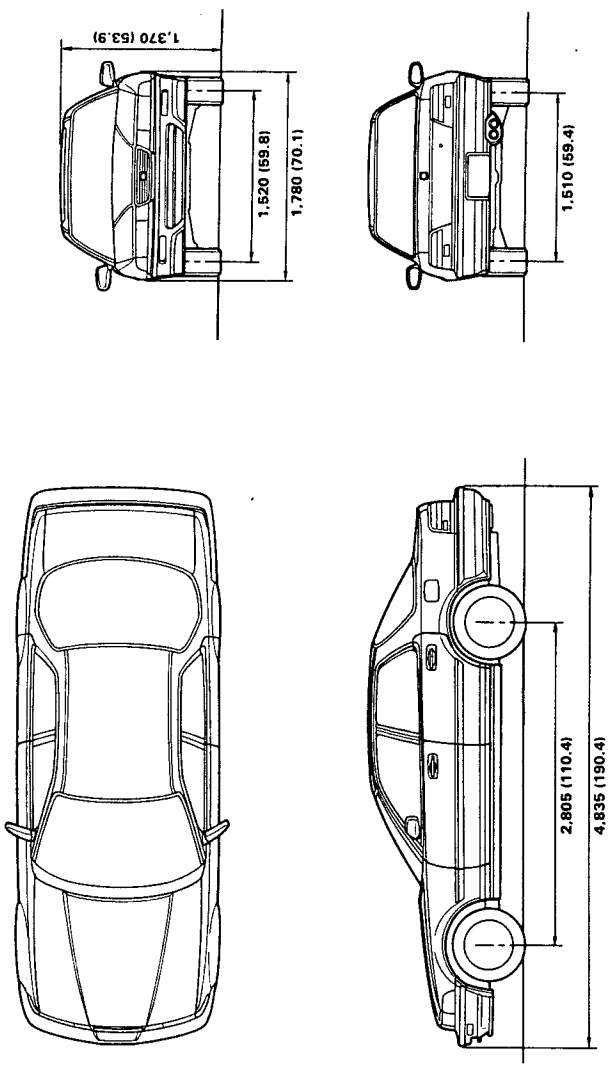
(cont'd)

| | ITEM | | METRIC | ENGLISH | NOTES |
|---|---|---|---|---|---|
| AIR CONDITIONING | Cooling Capacity | | 4.320 Kcal/h | 17,142 BTU/h | |
| | Conditions: | | | | |
| | Engine Speed | | 1,800 rpm | | |
| | Outside Air Temperature | | 27°C | 81°F | |
| | Outside Air Humidity | | 50% | | |
| | Condenser Air Temperature | | 35°C | 95°F | |
| | Condenser Air Velocity | | 4.5 m/sec | 14.8 ft/sec | |
| | Blower Capacity | | 500 m³/h | 17,660 cu ft/h | at 12 V |
| | Compressor | Type/Makes | Swash-plate type/NIPPONDENSO | | |
| | | No. of Cylinder | 10 | | |
| | | Capacity | 177.7 cc/rev | 10.84 cu-in/rev | |
| | | Max. Speed | 8,800 rpm | | |
| | | Lubricant Capacity | 140 cc | 4.73 US oz, 4.93 Imp oz | |
| | Condensor | Type | Corrugated fin type | | |
| | Evaporator | Type | Corrugated fin type | | |
| | Blower | Type | Sirocco fan | | |
| | | Motor Input | 200 W/12 V | | |
| | | Speed Control | Infinately variable | | |
| | | Max. Capacity | 500 m³/h min. | 17,660 cu-ft/h min. | at 12 V |
| | Temp. Control | | Air-mix type | | |
| | Comp. Clutch | Type | Dry, single plate, Poly-V-belt drive | | |
| | | Power Consumption | 40 W max./12 V | | |
| | Refrigerant | Type | R 12 | | |
| | | Quantity | 800 $^{+50}_{0}$ g | 26.5 $^{+1.8}_{0}$ oz | |
| STEERING SYSTEM | Type | | Power assisted, rack and pinon | | |
| | Overall Ratio | | 17.34 | | |
| | Turns, Lock-to-Lock | | 3.52 | | |
| | Steering Wheel Dia. | | 380 mm | 15.0 in | |
| SUSPENSION | Type, Front | | Independent double wishbone, coil spring with stabilizer | | |
| | Type, Rear | | Independent double wishbone, coil spring with stabilizer | | |
| | Shock Absorber, Front and Rear | | Telescopic, hydraulic nitrogen gas-filled | | |

| | ITEM | | METRIC | ENGLISH | NOTES |
|---|---|---|---|---|---|
| WHEEL ALIGNMENT | Camber | Front | 0°00' | | |
| | | Rear | -0°30' | | |
| | Caster | | 1°38' | | |
| | Toe | Front | 0 mm | 0 in | |
| | | Rear | In 3.0 mm | In 0.12 in | |
| BRAKE SYSTEM | Type | Front | Power-assisted self-adjusting ventilated disc | | |
| | | Rear | Power-assisted self-adjusting solid disc | | |
| | Pad Surface Area: | Front | 58.0 cm² x 2 | 8.99 sq-in x 2 | |
| | | Rear | 27.9 cm² x 2 | 4.32 sq-in x 2 | |
| | Parking Brake Kind and Type | | Mechanical actuating, rear two wheel brakes | | |
| TIRE | Size | | 205/60 R 15 91 H<br>T135/80 D 15 (Spare tire) | | |
| ELECTRICAL | Battery | | 12 V–52 AH/5 HR | | |
| | Starter | | M/T: 12 V–1.6 kW, A/T: 12 V–2.0 kW | | |
| | Alternator | | 12 V–100 A | | |
| | Fuses | | | | |
| | In The Under-dash Fuse/Relay Box | | 7.5 A, 10 A, 15 A, 20 A, 30 A | | |
| | In The Under-hood Fuse/Relay Box | | 7.5 A, 10 A, 15 A, 20 A, 30 A, 40 A, 50 A, 120 A | | |
| | Headlights | High | 12 V–65 W | | |
| | | Low | 12 V–55 W | | |
| | Front Turn Signal Lights | | 12 V–45 CP | | |
| | Front Parking Lights | | 12 V–3 CP | | |
| | Rear Turn Signal Lights | | 12 V–45 CP | | |
| | Brake/Taillights | | | | |
| | (and Rear Side Marker Lights) | | 12 V–32/2 CP | | |
| | Front Fog Lights | | 12 V–35 W | | |
| | High Mount Brake Light | | 12 V–45 CP | | |
| | Front Side Marker Lights | | 12 V–5 W | | |
| | Back-up Lights | | 12 V–32 W | | |
| | License Plate Light | | 12 V–8 W | | |
| | Dome Lights | | | | |
| | (front and rear reading lights) | | 12 V–5 W | | |
| | Trunk Light | | 12 V–3.4 W | | |
| | Door Courtesy Lights | | 12 V–3.4 W | | |
| | Vanity mirror light | | 12–2 W | | |
| | Gauge Lights | | 12 V–3.0 W, 1.4 W, 1.7 W | | |
| | Indicator Lights | | 12 V–0.84 W, 1.12 W, 1.4 W, 2.0 W | | |
| | Warning Lights | | 12 V–1.4 W | | |
| | Illumination and Pilot Lights | | 12 V–1.4 W, 1.12 W, 0.84 W<br>12 V–0.91 W, 0.56 W, LED | | |
| | Heater Illumination Lights | | 12 V–1.4 W | | |

## Body Specifications

Unit: mm (in)






## Maintenance

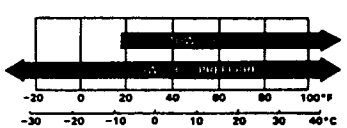
# Maintenance

# Lubrication Points

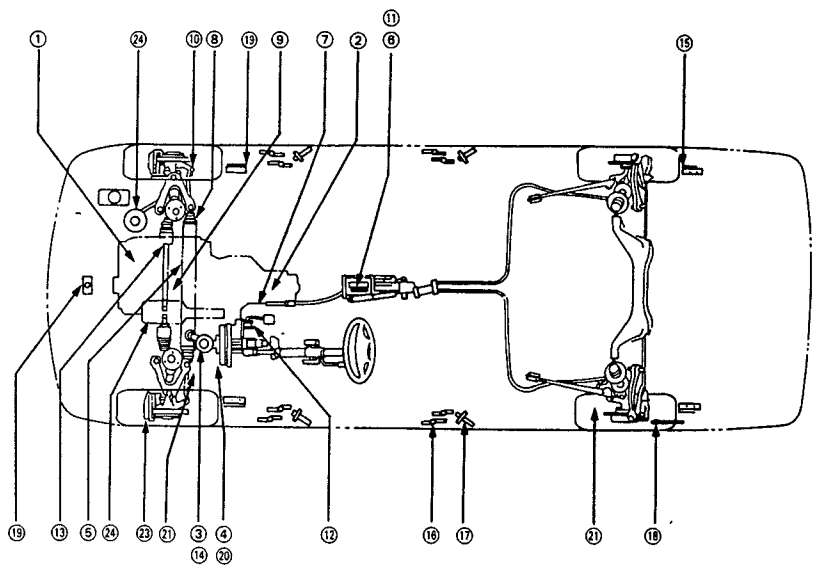
For the details of lubrication points and types of lubricants to be applied, refer to the Illustrated Index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

| No. | LUBRICATION POINTS | LUBRICANT |
|---|---|---|
| 1 | Engine | API Service Grade: Use "Energy Conserving II" SG grade oil 5 W–30 preferred SAE Viscosity: See chart below. |
| 2 | Transmission Manual<br>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 (ATF) |
| 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<br>8<br>9<br>10<br>11<br>12<br>13<br>14<br>15<br>16<br>17<br>18<br>19<br>20 | Release fork (Manual transmission)<br>Steering boots<br>Throttle cable end<br>Steering ball joints<br>Select lever (Automatic transmission)<br>Pedal linkage<br>Intermediate shaft<br>Brake master cylinder pushrod<br>Trunk hinges<br>Door hinges upper and lower<br>Door opening detents<br>Fuel fill lid<br>Engine hood hinges and engine hood latch<br>Clutch master cylinder pushrod | Multi-purpose grease |
| 21 | Brake pipe joint (Front and rear wheel house) | Rust preventives |
| 22 | Caliper Piston seal, Dust seal, Caliper pin, Piston | Silicone grease |
| 23 | Power steering system | Honda power steering fluid-V |
| 24 | Differential | Hypoid gear Oil GL4 or GL5 Viscosity: at above –18°C (0°F): SAE 90 at less than –18°C (0°F): SAE 80 W 90 |

Recommended Engine Oil
API Service Grade: Use "Energy Conserving II"
SG grade oil 5 W–30 preferred




Engine oil viscosity for ambient temperature ranges



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

| Service at the interval listed x 1,000 miles (or km) or after that number of months, whichever comes first. | | | | | | | | | | | | | | | NOTE | SEC and PAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | x 1,000 miles | 7.5 | 15 | 22.5 | 30 | 37.5 | 45 | 52.5 | 60 | 67.5 | 75 | 82.5 | 90 | 97.5 | 105 | | |
| | x 1,000 km | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | | |
| Maintenance item | months | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 | 78 | 84 | | |
| Engine and Transmission | | | | | | | | | | | | | | | | | |
| □ Air cleaner element | | | | | R | | | | R | | | | R✓ | | | | 11-127 |
| Idle speed | | | | | | | | | I*1 | | | | | | | Manual transmission: 700 ± 50 rpm (in neutral)<br>Automatic transmission: 700 ± 50 rpm (in N or P position) | 11-106 |
| Positive crankcase ventilation valve | | | | | | | | | I | | | | | | | If clicking sound is heard as you pinch the hose between the PCV valve and intake manifold, valve is OK. | 11-147 |
| Fuel filter | | | | | | | | | R*1 | | | | ✓ | | | The rubber fuel hoses need periodic replacement since they are subject to cracks and deterioration during a long period of use. | 11-117 |
| Fuel pipes, hoses, and connections | | | | | I*1 | | | | I*1 | | | | I*1 | | | Check fuel lines for loose connections, cracks and deteriorations.<br>Retighten loose connections and replace any damaged parts. | 11-4 |
| Spark plugs | | | | | R | | | | R | | | | R✓ | | | NGK: BKR5E-N11, NIPPONDENSO: K16PR-L11<br>Gap: 1.0—1.1 mm (0.039—0.043 in) | 23-108 |
| Distributor ignition cap and rotor | | | | | | | | | I*1 | | | | | | | | 23-103 |
| Ignition wires | | | | | | | | | I | | | | | | | | 23-106 |
| ■ Engine oil | R | R | R | R | R | R | R | R | R | R | R | R | R✓ | R | R | Capacity for change with filter: 4.3 ℓ (4.5 US qt, 3.8 Imp qt) | 8-4 |
| ■ Engine oil filter | R | R | R | R | R | R | R | R | R | R | R | R | R✓ | R | R | | 8-5 |
| Alternator drive belt | | | | I | | | | | I | | | | I✓ | | | 7.5—9.5 mm (0.30—0.37 in) @ 100 N (10 kg, 22 lbs) tension | 23-121 |
| Cooling system hoses and connections | | | | I*1 | | | | | I*1 | | | | I*1 | | | | 10-2 |
| Valve Clearance | | | I | | I | | I | | I | | I | | I | | I | | 6-33 |

●: Check oil and coolant level at each fuel stop.
□: Under severe driving conditions, service these items more often.
*1: For cars sold in California, this service is recommended only; other areas, it is required.

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

| Service at the interval listed x 1,000 miles (or km) or after that number of months, whichever comes first. | | | | | | | | | | | | | | | NOTE | SEC and PAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | x 1,000 miles | 7.5 | 15 | 22.5 | 30 | 37.5 | 45 | 52.5 | 60 | 67.5 | 75 | 82.5 | 90 | 97.5 | 105 | | |
| | x 1,000 km | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | | |
| Maintenance item | months | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 | 78 | 84 | | |
| Engine and Transmission | | | | | | | | | | | | | | | | | |
| • Engine coolant | | | | | | | R | | | | R | | ✓ | | R*2 | Capacity for change:<br>Manual transmission:<br>6.0 ℓ (6.3 US qt, 5.3 Imp qt)<br>Automatic transmission:<br>5.9 ℓ (6.2 US qt, 5.2 Imp qt)<br>Check specific gravity for freezing point | 10-5 |
| Timing belt | | | | | | | | | | | | | R*3✓ | | | | 6-28, 30 |
| Water pump | | | | | | | | | | | | | I✓ | | | | 10-9 |
| Three way catalytic converter heat shield | | | | | | | | | I | | | | | | | Check condition and tightness | 11-140 |
| Exhaust pipe (before catalytic converter) | | | | | I*1 | | | | I*1 | | | | I*1 | | | Check condition and tightness | 9-4 |
| Exhaust pipe and muffler (after catalytic converter) | | | I | | I | | I | | I | | I | | I | | I | Check condition and tightness | 9-4 |
| □ Manual transmission oil | | | | | R | | | | R | | | | R | | | 1.8 ℓ (1.9 US qt, 1.6 Imp qt) for change | 13-3 |
| □ Automatic transmission fluid | | | | | R | | | | R | | | | R✓ | | | 2.5 ℓ (2.6 US qt, 2.2 Imp qt) for change<br>HONDA Premium Formula ATF or DEXRON® II ATF | 14-91 |
| □ Front differential oil | | | | | R | | | | R | | | | R✓ | | | 0.95 ℓ (1.00 US qt, 0.84 Imp qt) for change<br>Hypoid gear oil classified GL4 or GL5 | 15-4 |
| Brakes | | | | | | | | | | | | | | | | | |
| Front brake pads | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I | Min. thickness: 1.6 mm (0.06 in) | 19-6 |
| □ Front brake discs and calipers | | I | | I | | I | | I | | I | | I | | I | | Min. thickness: 21 mm (0.83 in) | 19-9 |
| □ Rear brake discs, calipers and pads | | I | | I | | I | | I | | I | | I | | I | | Min. thickness: Discs 8.0 mm (0.32 in)<br>: Pads 1.6 mm (0.06 in) | 19-21<br>19-19 |
| Brake hoses and lines (including Anti-lock brake system) | | | I | | I | | I | | I | | I | | I | | I | Check for leaks, damage, interference or twisting. | 19-27 |
| Parking brake | | | I | | I | | | | I | | | | I | | | Fully engaged: 7 to 11 clicks. | 19-4 |
| Brake fluid (including Anti-lock brake system) | | | | | R | | | | R | | | | R✓ | | | Use only DOT3 or DOT4 fluid. Check that brake fluid level is between the upper and lower marks on the reservoir. | 19-10 |

●: Check oil and coolant level at each fuel stop.
□: Under severe driving conditions, service these items more often.
*1: The cars sold in California, this service is recommended only: other areas, it is required.
*2: Thereafter, replace every 2 years or 30,000 miles (48,000 km), whichever comes first.
*3: This service is recommended only.

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

| Service at the interval listed x 1,000 miles (or km) or after that number of months, whichever comes first. | | | | | | | | | | | | | | | NOTE | SEC and PAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | x 1,000 miles | 7.5 | 15 | 22.5 | 30 | 37.5 | 45 | 52.5 | 60 | 67.5 | 75 | 82.5 | 90 | 97.5 | 105 | |
| | x 1,000 km | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | |
| Maintenance item | months | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 | 78 | 84 | |
| Brakes | | | | | | | | | | | | | | | | |
| Anti-lock brake system operation | | | | | I | | | | I | | | | I | | | Function test<br>Wheel sensor signal confirmation Anti-lock brake system indicator light | 19-3 |
| Anti-lock brake system high pressure hose | | | | | | | | | R | | | | | | | Bleed high pressure fluid | 19-71 |
| Steering, Suspension, Miscellaneous | | | | | | | | | | | | | | | | | |
| Front wheel alignment | | | I | | I | | I | | I | | I | | I | | I | | 18-4 |
| Steering operation, tie rod ends, steering gearbox and boots | | | I | | I | | | | I | | | | I | | | Check rack grease and steering linkage.<br>Check the boot for damage or leaking grease. | 17-3 |
| □ Power steering system | | | [I] | | [I] | | [I] | | [I] | | [I] | | [I] | | [I] | | 17-20 |
| Power steering pump belt | | | | | I | | | | I | | | | I | | | 6.5—9.0 mm (0.26—0.35 in) @ 100 N (10 kg, 22 lbs) tension | 17-17 |
| Suspension mounting bolts | | | I | | I | | I | | I | | I | | I | | I | Check tightness of bolts. | 18-8, 22 |
| Supplemental restraint system | | Inspect system 10 years after production | | | | | | | | | | | | | | | – |

□: Under severe driving conditions, service these items more often.

Severe Driving Conditions
Items with an [R] or [I] need service more often if you drive in some severe conditions.

A: Repeated short distance driving
B: Dusty conditions
C: Severe cold weather
D: Areas with road salt or other corrosive materials
E: Rough or muddy roads
F: Towing a trailer

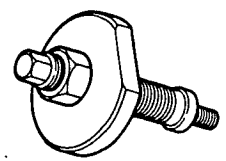
Services for Severe Driving Conditions
— Clean the air cleaner element every 15,000 miles (24,000 km) or 12 months and replace every 30,000 miles (48,000 km) or 24 months under condition B or E.
— Replace engine oil and oil filter every 3,750 miles (6,000 km) or 3 months under condition A, B or F.
— Replace tranmsission oil every 15,000 miles (24,000 km) or 12 months under condition F.
— Replace front differential oil every 15,000 miles (24,000 km) or 12 months under condition F.
— Inspect front brake discs and calipers, and rear brake discs, calipers and pads every 7,500 miles (12,000 km) or 6 months under condition A, B, D, E or F.
— Inspect the power steering system every 7,500 miles (12,000 km) or 6 months under condition B, C or E.

# Engine Removal/Installation

# Engine

## Special Tools

| Ref. No. | Tool Number | Description | Qty | Page Reference |
|---|---|---|---|---|
| ① | 07LAC—PW50101 | Extension Shaft Puller | 1 | 5-7 |



①



## Engine Removal/Installation

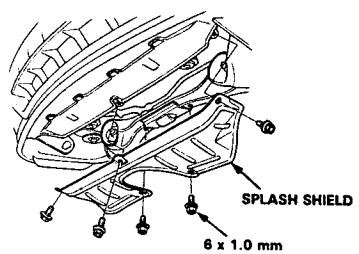
**⚠WARNING**
- **Make sure jacks and safety stands are placed properly and hoist brackets are attached to the correct positions on the engine (see section 1).**
- **Make sure the car will not roll off stands and fall while you are working under it.**

CAUTION:
- **Use fender covers to avoid damaging painted surfaces.**
- **Unspecified items are common.**
- **Unplug the wiring connectors carefully while holding the coupler and the connector portion to avoid damage.**
- **Mark all wiring and hoses to avoid mis-connection. Also, be sure that they do not contact other wiring or hoses or interfere with other parts.**

NOTE: Anti-theft radios have a coded theft protection circuit. Be sure to get the customer's code number before
– Disconnecting the battery.
– Removing the No. 39 (10 A) fuse in the under-hood fuse/relay box.
– Removing the radio.
After service, reconnect power to the radio and turn it on.
When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

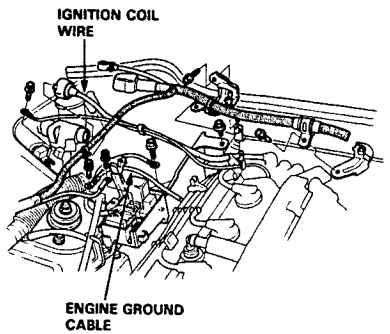
1. Disconnect the battery negative terminal first, then the positive terminal.
2. Remove the radiator cap.

   **⚠WARNING Use care when removing the radiator cap to avoid scalding by hot engine coolant or steam.**
3. Raise the hoist to full height.
4. Remove the engine splash shield.

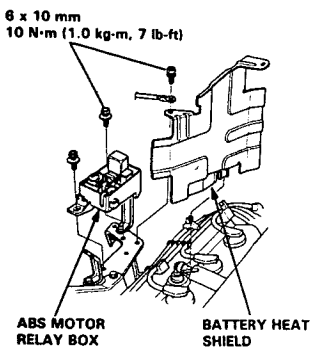



5. Drain the engine coolant (page 10-5).
   • Loosen the drain plug in the radiator.
6. Drain transmission and differential oil/fluid. Reinstall the drain plugs using new washers.
7. Drain the engine oil. Reinstall the drain bolt using a new washer.

   **CAUTION: Do not overtighten the drain bolt.**
8. Lower the hoist.
9. Secure the hood as far open as possible.
10. Remove the ignition coil wire, condenser wire and engine ground cable.




11. Remove the ABS motor relay box and the battery heat shield, then remove the battery.

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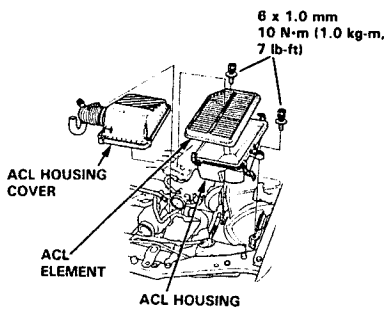
12. Remove the intake air duct and the air cleaner (ACL) housing.

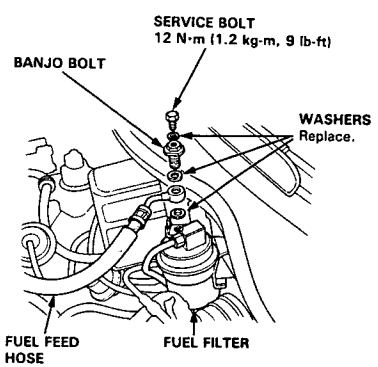



13. Relieve fuel pressure by slowly loosening the service bolt on the fuel filter about one turn (see section 11).

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

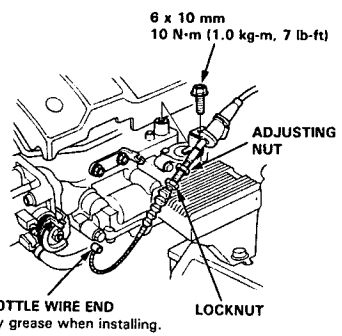
**CAUTION:**
- **Before disconnecting any fuel line, relieve the fuel pressure as described above.**
- **Place a shop towel over the fuel filter to prevent pressurized fuel from spraying over the engine.**

14. Remove the fuel feed hose from the fuel filter and the fuel return hose from the fuel pressure regulator (see section 11).

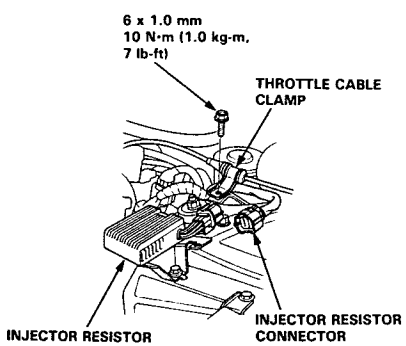



15. Remove the throttle cable by loosening the locknut, then slip the cable end out of the accelerator linkage.

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 (see section 11).

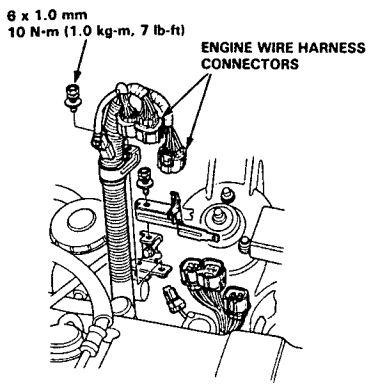



16. Remove the throttle cable clamp and the injector resistor connector.

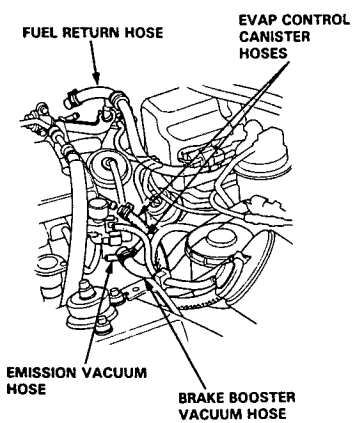




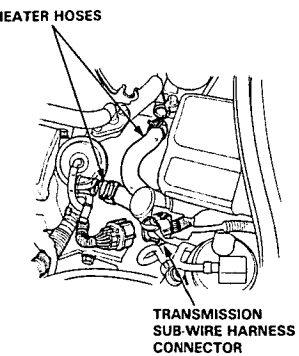

17. Remove the engine wire harness connectors and clamps.




18. Remove the fuel return hose, the evaporative emission (EVAP) control canister hoses, the emission vacuum hose and the brake booster vacuum hose.

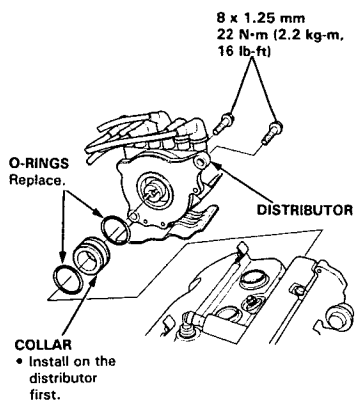



19. Remove the heater hoses and disconnect the transmission sub-wire harness connector (A/T) or back-up light switch connector (M/T).




20. Disconnect the ignition wires, then remove the distributor.

NOTE: When installing the distributor, first install the collar on the distributor.

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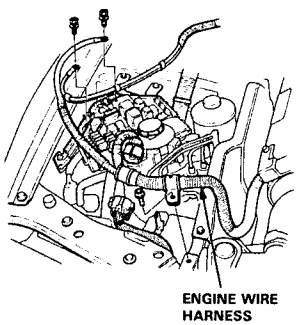
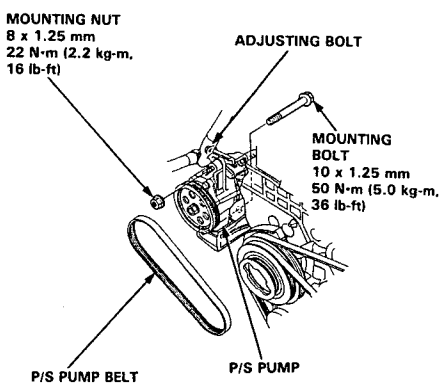
# Engine Removal/Installation

## (cont'd)

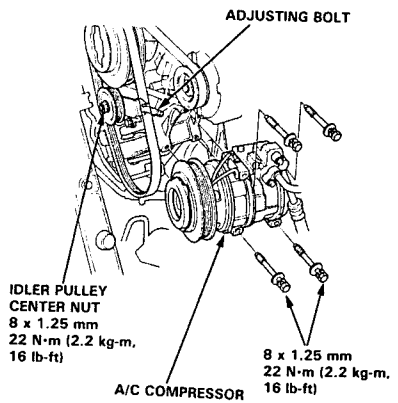
21. Remove the engine wire harness from the underhood fuse/relay box, then remove the transmission ground cable.



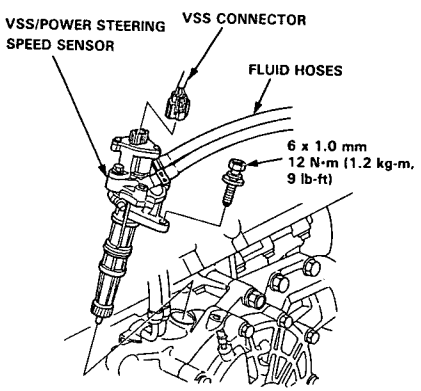

22. Loosen the adjusting bolt, then remove the mounting bolt/nut, the power steering (P/S) pump belt and pump.




23. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt and compressor.
    - Do not disconnect the hoses.
    - Disconnect the connector.

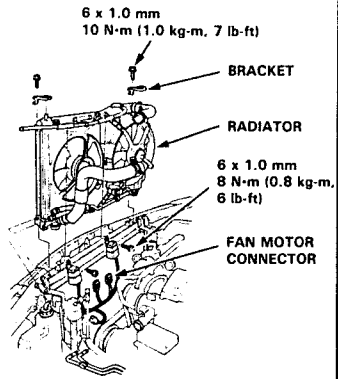



24. Remove the vehicle speed sensor (VSS)/power steering speed sensor.
    - Do not disconnect the fluid hoses.

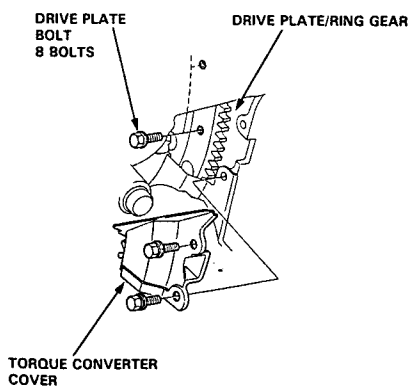





25. Remove the radiator.
    - Disconnect the connectors and automatic transmission fluid (ATF) cooler hoses.

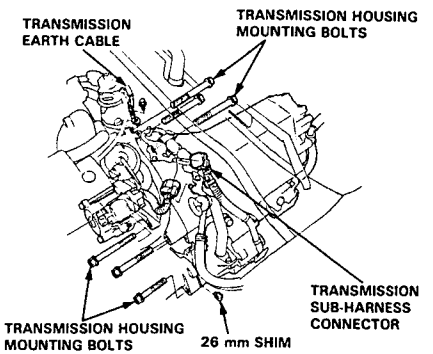



26. Remove the torque converter cover (A/T). Remove the drive plate bolts one at a time while rotating the crankshaft pulley.




27. Remove the transmission housing mounting bolts and the 26 mm shim.

28. Remove the transmission sub-harness connector.

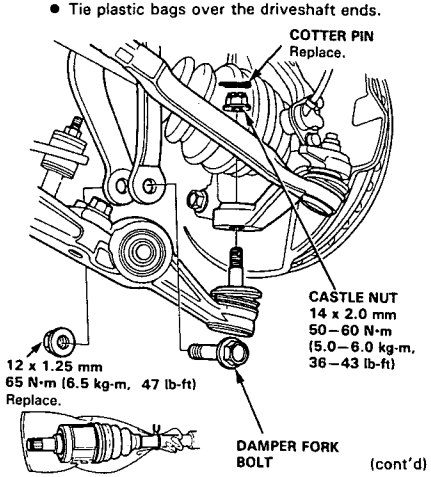



29. Remove the damper forks.

30. Disconnect the suspension lower arm ball joints with the special tool. Refer to section 18 for the proper procedure.

31. Remove the driveshafts.

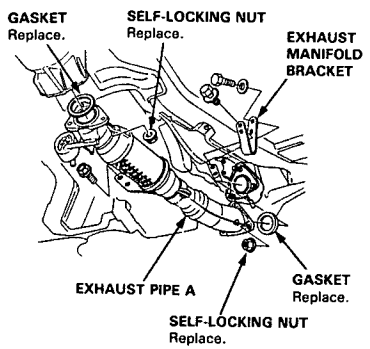
NOTE:
- Coat all precision finished surfaces with clean engine oil or grease.
- Tie plastic bags over the driveshaft ends.



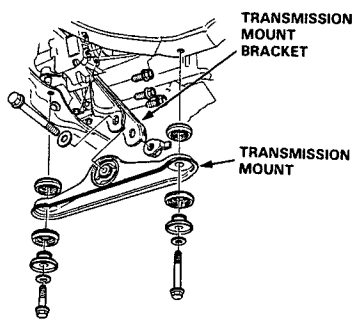

(cont'd)

32. Raise the hoist.

33. Remove the exhaust pipe A.



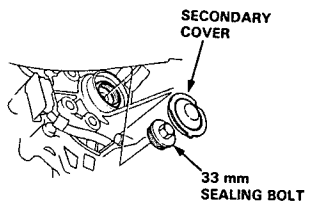

34. Remove the transmission mount and mount bracket.

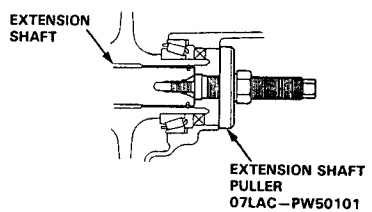



35. Shift the manual transmission to 1st gear or automatic transmission to [P] position.

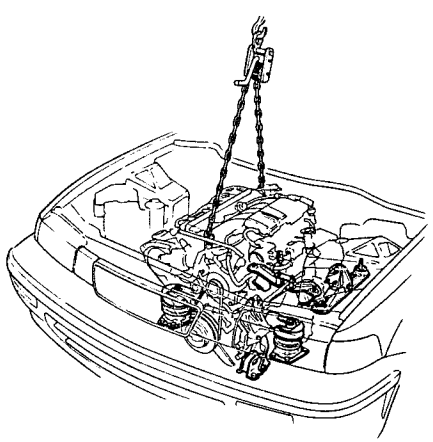
36. Remove the secondary cover and 33 mm sealing bolt.

37. Remove the extension shaft from the differential using the special tool as shown.



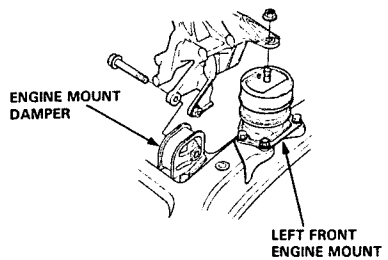

38. Attach a chain hoist to the engine.

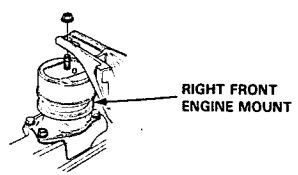




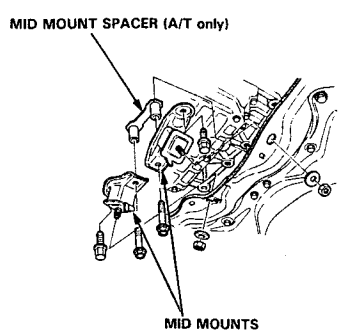
39. Remove the left front engine mount nut and engine mount damper bolt.

40. Remove the right front engine mount nut.

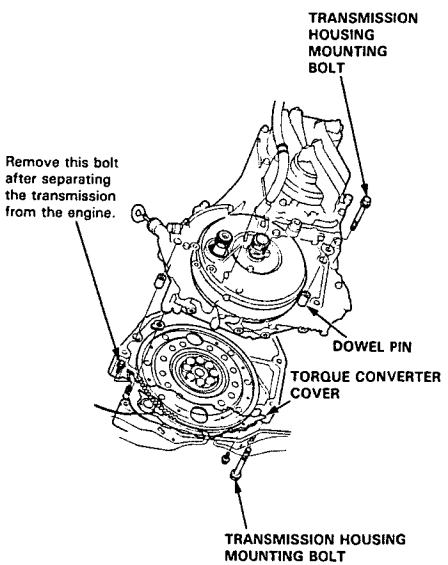



41. Remove the mid mounts.




42. Remove the transmission housing mounting bolts and clutch cover (M/T) or torque converter cover (A/T), then separate the engine and the transmission.
    - Attach the transmission jack with a rubber pad or wooden block.




43. Install the mid mounts to the transmission and retorque the mounting bolts.

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

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

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

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

(cont'd)

# Engine Removal/Installation

(cont'd)

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

NOTE:
- If engine block and/or differential case are replaced, the 26 mm shim thickness must be adjusted (see section 15).
- Fill the opening of the drive pinion and extension shaft with Super High Temp Urea Grease (P/N 08798–9002) and apply the same grease to the splines before installing the transmission (see section 13 (M/T) and 14 (A/T)).
- After service, reconnect power to the radio and turn it on, the word "CODE" will be displayed. Enter the customer's 5-digit code to restore radio operation.

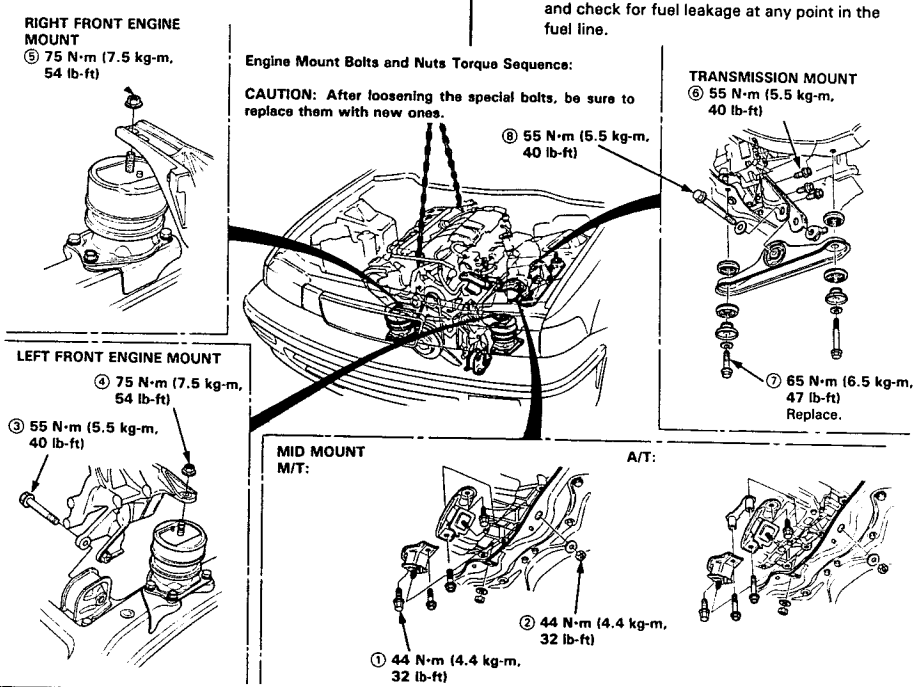
After the engine is in place:
- Torque the engine mount bolts and nuts in sequence shown below.

**CAUTION: Failure to tighten the bolts 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 into place.

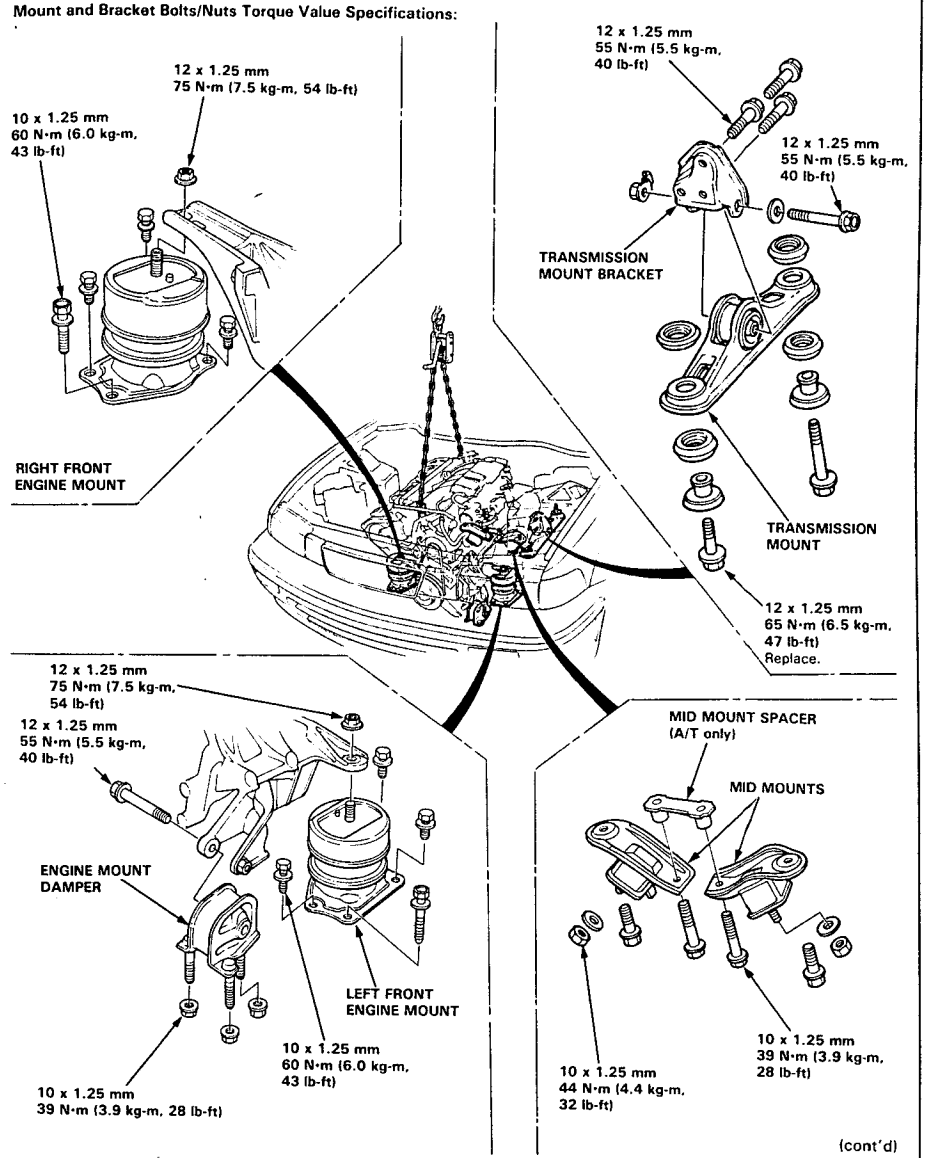
**CAUTION: Use new spring clips.**

- 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.
- Check that the transmission shifts into gear smoothly.
- Adjust the tension of the following drive belts:
  Alternator belt (see section 23).
  Power steering pump belt (see section 17).
  A/C compressor belt (see section 22).
- Clean battery posts and cable terminals with sandpaper, assemble, then apply grease to prevent corrosion.
- Inspect for fuel leakage.
  - After assembling 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 for fuel leakage at any point in the fuel line.






Mount and Bracket Bolts/Nuts Torque Value Specifications:



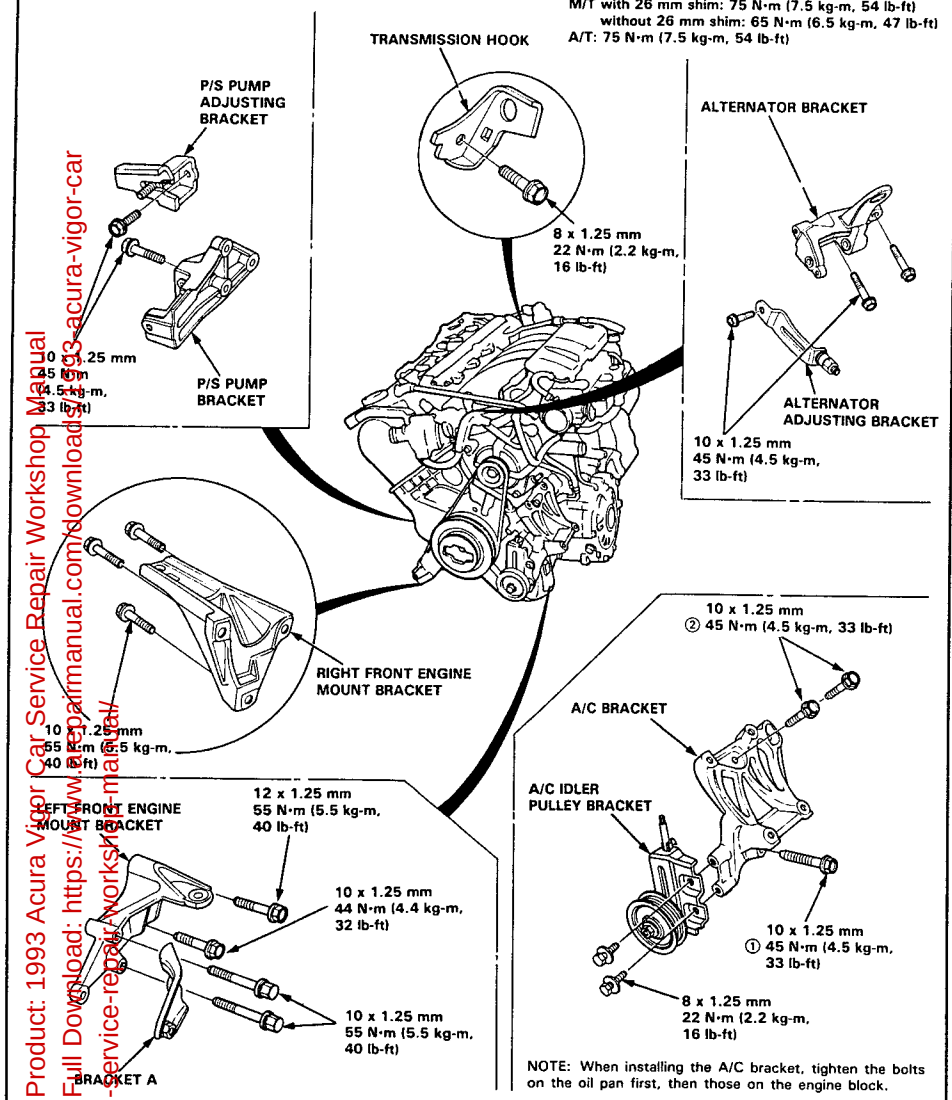

(cont'd)

## Engine Removal/Installation

(cont'd)

Additional Torque Value Specifications:

NOTE: For manifold replacement, refer to section 9.




NOTE: When installing the A/C bracket, tighten the bolts on the oil pan first, then those on the engine block.





## Cylinder Head/Valve Train