ACURA

TL

Service Manual 2004

A Few Words About Safety

Service Information

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the vehicle or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of specially designed tools and dedicated equipment. Any person who intends to use a replacement part, service procedure, or a tool that is not recommended by Honda, must determine the risks to their personal safety and the safe operation of the vehicle.

If you need to replace a part, use Honda parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

FOR YOUR CUSTOMER'S SAFETY

Proper service and maintenance are essential to the customer's safety and the reliability of the vehicle. Any error or oversight while servicing a vehicle can result in faulty operation, damage to the vehicle, or injury to others.

⚠WARNING

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.
Follow the procedures and precautions in this manual and other service materials carefully.

FOR YOUR SAFETY

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g., Hot parts—wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practices, we recommend that you do not attempt to perform the procedures described in this manual.

⚠WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.
Follow the procedures and precautions in this manual carefully.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not to perform a given task.

IMPORTANT SAFETY PRECAUTIONS

- Make sure you have a clear understanding of all basic shop safety practices, and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:
  - Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
  - Protect your eyes by using proper safety glasses, goggles, or face shields anytime you hammer, drill, grind, or work around pressurized air or liquids and springs, or other stored-energy components. If there is any doubt, put on eye protection.
  - Use other protective wear when necessary, for example, gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
  - Protect yourself and others whenever you have the vehicle up in the air. Anytime you lift the vehicle, either with a hoist or a jack, make sure that it is always securely supported. Use jack stands.
  - Protect yourself by wearing an approved welding helmet, gloves, and safety shoes anytime you are welding. You can receive burns from hot parts, allow the parts to cool before working in that area.
  - Protect yourself from paints and harmful chemicals by wearing an approved respirator, eye protection, and gloves whenever you are painting. Spray paint only in an approved paint booth that is well ventilated.

- Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:
  - Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
  - Burns from hot parts or coolant. Let the engine and exhaust system cool before working in those areas.
  - Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers, and clothing are out of the way.

- Gasoline vapors and hydrogen gases from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.
  - Use only a nonflammable solvent, not gasoline to clean parts.
  - Never drain or store gasoline in an open container.
  - Keep all cigarettes, sparks and flames away from the battery and all fuel-related parts.

INTRODUCTION

How to Use This Manual

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.

Safety Messages

Your safety, and the safety of others, is very important. To help you make informed decisions, we have provided safety messages, and other safety information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle. You must use your own good judgment.

You will find important safety information in a variety of forms including:

- **Safety Labels** – on the vehicle.
- **Safety Messages** – preceded by a safety alert symbol ⚠ and one of three signal words, DANGER, WARNING, or CAUTION. These signal words mean:

⚠ DANGER	You WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.
⚠ WARNING	You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.
⚠ CAUTION	You CAN be HURT if you don't follow instructions.

- **Instructions** – how to service this vehicle correctly and safely.

As you read this manual, you will find information that is preceded by a NOTICE symbol. The purpose of this message is to help prevent damage to your vehicle, other property, or the environment.

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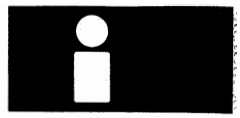
HONDA MOTOR CO.,LTD.
Service Publication Office

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

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The Acura TL SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, side curtain airbags in the sides of the roof, and side airbags in the front seat-backs. 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 requires special precautions and tools, and should be done only by an authorized Acura dealer.

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Acura dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags and/or side airbags.
- Do not bump or impact the SRS unit, front impact sensors, side impact sensors whenever the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF. Otherwise, the system may fail in a collision, or airbags may deploy.
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, in the roof side, and around the floor. Do not use electrical test equipment on these circuits.



General Information

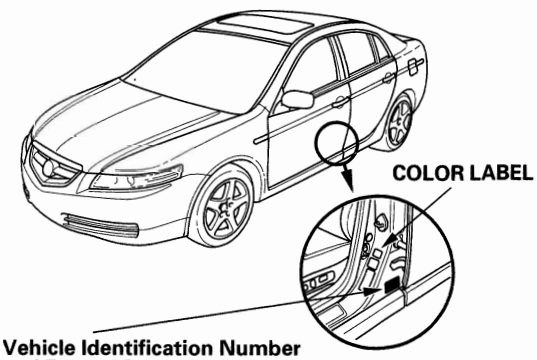
Chassis and Paint Codes

Vehicle Identification Number

19U UA6 5 5 * 4 A 000001

a b c d e f g h

a. Manufacturer, Make and Type of Vehicle
19U: HONDA OF AMERICA MFG., INC. U.S.A.
ACURA passenger vehicle
b. Line, Body and Engine Type
UA6: ACURA TL/J32A3
c. Body Type and Transmission Type
5: 4-door Sedan/6-speed Manual
6: 4-door Sedan/5-speed Automatic
d. Vehicle Grade (Series)
2: TL with 5-speed A/T
5: TL with 6-speed M/T
6: TL with 6-speed M/T and Hi-performance summer tire
e. Check Digit
f. Model Year
4: 2004
g. Factory Code
A:Marysville, Ohio Factory in U.S.A.
h. Serial Number
000001—: U.S. model
800001—: Canada model



Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.

Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.

Engine Number

J32A3 - 1000001

a b

a. Engine Type
J32A3: 3.2-liter SOHC VTEC Sequential Multiport Fuel-injected engine
b. Serial Number

Transmission Number

DEC6 - 1500001

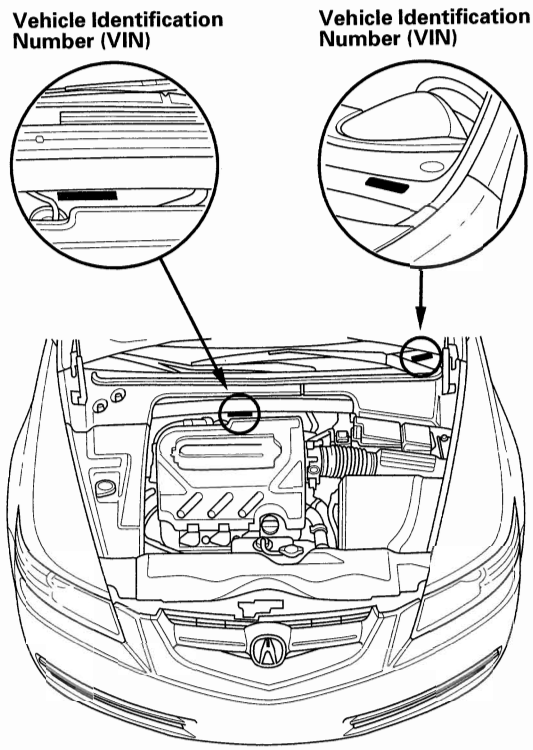
a b

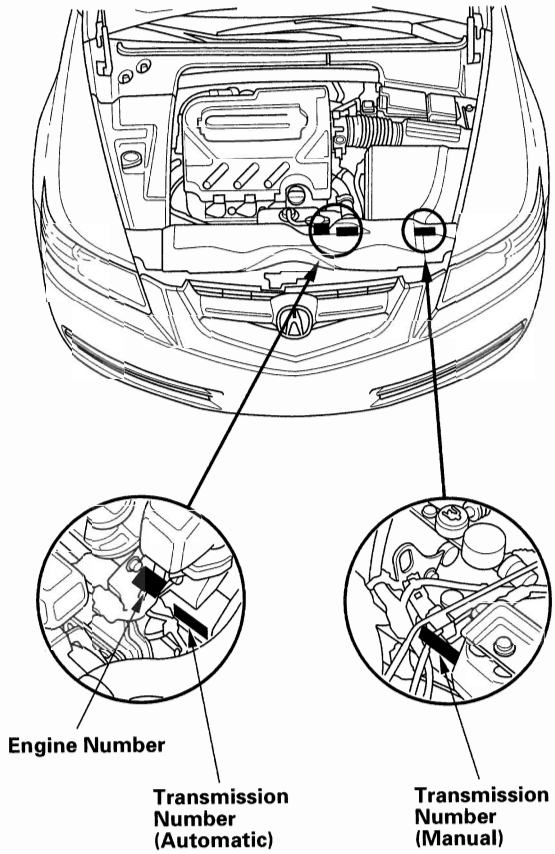
a. Transmission Type
DEC6: 6-speed Manual
BDGA: 5-speed Automatic
b. Serial Number

Paint Code

Code	Color	U.S.	Canada
NH-603P	White Diamond Pearl	○	○
NH-623M	Satin Silver Metallic	○	○
NH-643M	Anthracite Metallic	○	○
B-92PV	Nighthawk Black Pearl	○	○
B-527P	Abyss Blue Pearl	○	○
G-516P	Deep Green Pearl	○	
R-522P	Redondo Red Pearl	○	○
YR-538M	Desert Mist Metallic	○	○

Identification Number Locations

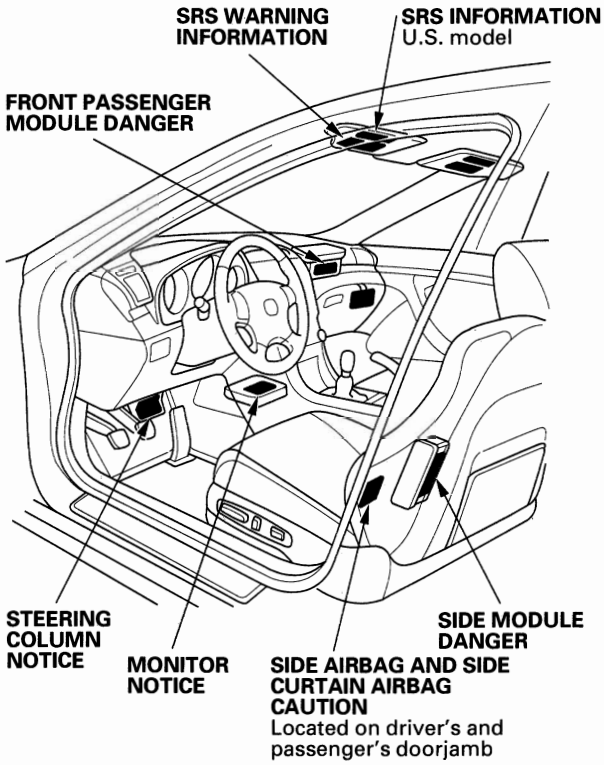




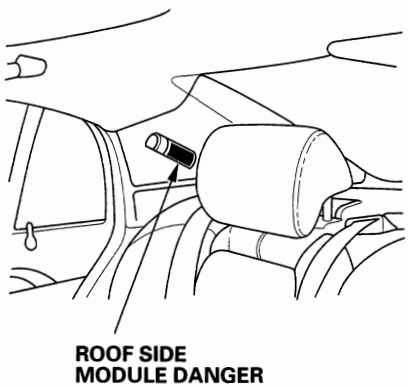
Warning/Caution Label Locations

NOTE: FRONT PASSENGER (CHILD SEAT) AIRBAG WARNING TAG is on the glove box in the U.S. model.

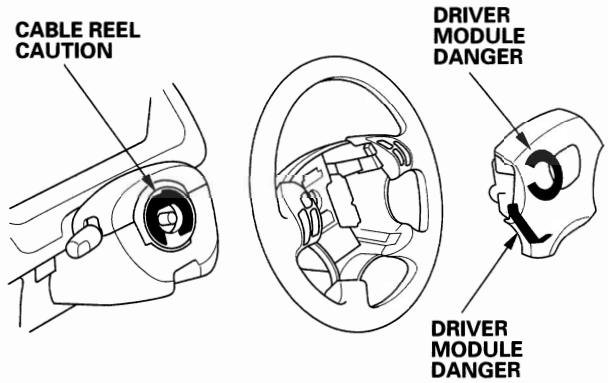
Front Passenger's Compartment:

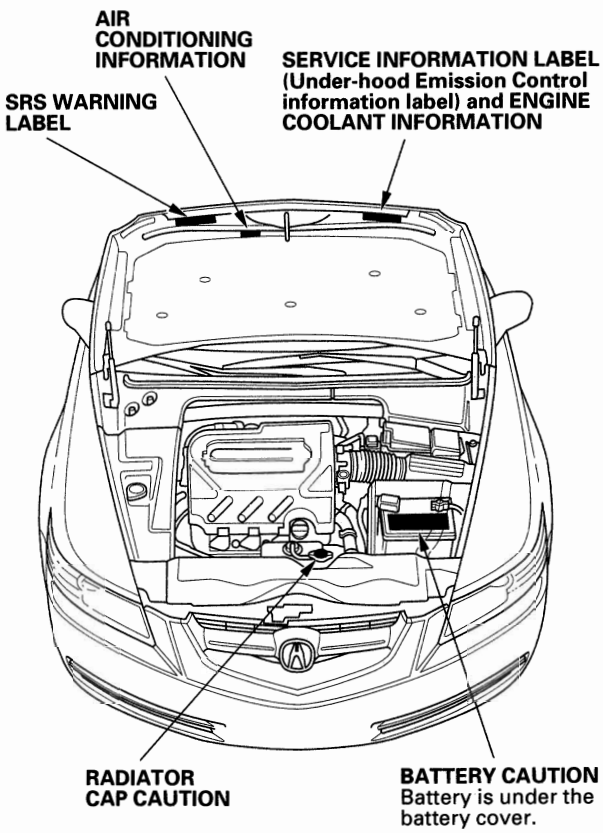


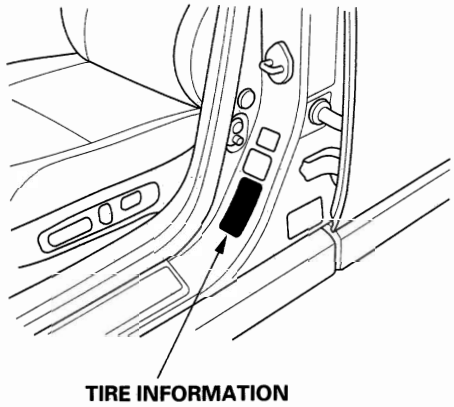
Rear Passenger's Compartment:



Steering Wheel:



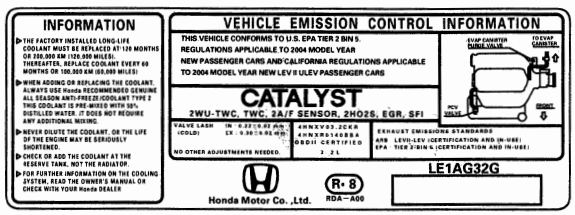

AIR CONDITIONING INFORMATION
SRS WARNING LABEL
SERVICE INFORMATION LABEL (Under-hood Emission Control information label) and ENGINE COOLANT INFORMATION
RADIATOR CAP CAUTION
BATTERY CAUTION
Battery is under the battery cover.


TIRE INFORMATION

Under-hood Emission Control Label

Emission Group Identification

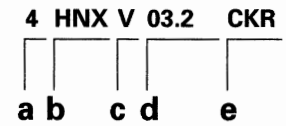
Example:



THIS VEHICLE CONFORMS TO U.S. EPA TIER 2 BIN 5. REGULATIONS APPLICABLE TO 2004 MODEL YEAR NEW PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2004 MODEL YEAR NEW LEV II ULEV PASSENGER CARS.

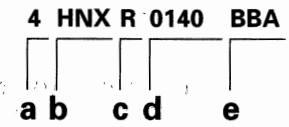
Engine and Evaporative Families:

Engine Family:



- **a. Model Year**
  4: 2004
- **b. Manufacturer Subcode**
  HNX: HONDA
- **c. Family Type**
  V: LDV
- **d. Displacement**
- **e. Sequence Characters**

Evaporative Family:



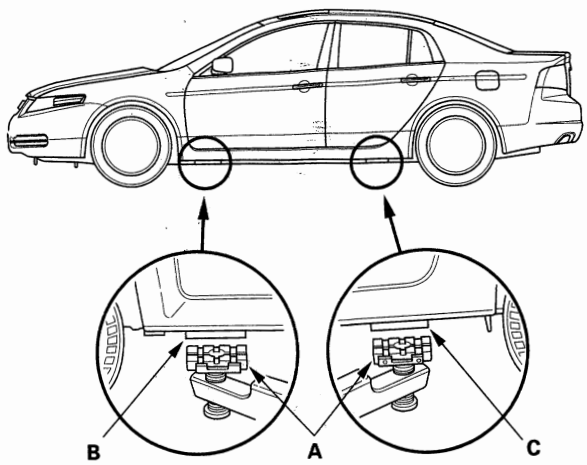
- **a. Model Year**
  4: 2004
- **b. Manufacturer Subcode**
  HNX: HONDA
- **c. Family Type**
  R: EVAP/ORVR
- **d. Canister Work Capacity**
- **e. Sequence Characters**

Lift and Support Points

NOTE: If you are going to remove heavy components such as suspension or the fuel tank from the rear of the vehicle, first support the front of the vehicle with tall safety stands. When substantial weight is removed from the rear of the vehicle, the center of gravity can change and cause the vehicle to tip forward on the hoist.

Frame Hoist

1. Position the hoist lift blocks (A), or safety stands, under the vehicle's front support points (B) and rear support points (C).



2. Raise the hoist a few inches, and rock the vehicle gently to be sure it is firmly supported.

3. Raise the hoist to full height, and inspect the lift points for solid contact with the lift blocks.

Safety Stands

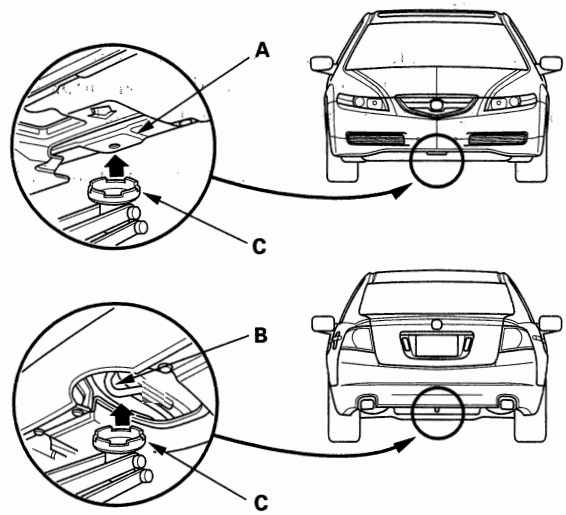
To support the vehicle on safety stands, use the same support points (B and C) as for a frame hoist. Always use safety stands when working on or under any vehicle that is supported only by a jack.

Floor Jack

1. When lifting the front of the vehicle, set the parking brake. When lifting the rear of the vehicle, put the gearshift lever in reverse for manual transmission, or in the P position for automatic transmission.

2. Block the wheels that are not being lifted.

3. Position the floor jack under the front jacking bracket (A) or rear jacking bracket (B). Center the jacking bracket in the jack lift platform (C) and jack up the vehicle high enough to fit the safety stands under it.



4. Position the safety stands under the support points and adjust them so the vehicle is level.

5. Lower the vehicle onto the stands.

Towing

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

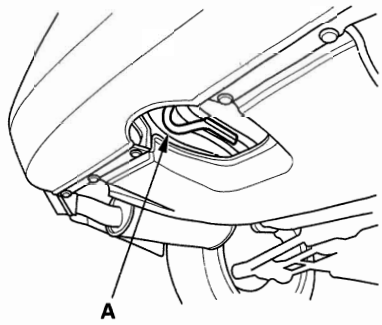
Emergency Towing
There are three popular methods of towing a vehicle, two of which are recommended and one that is not.

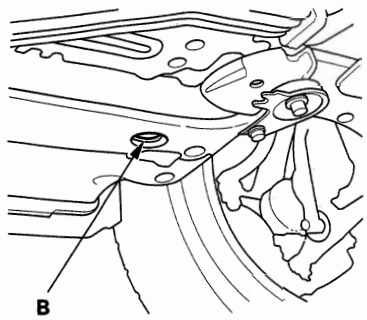
Flat-bed Equipment – The operator loads the vehicle on the back of a truck. This is the best way of transporting the vehicle.

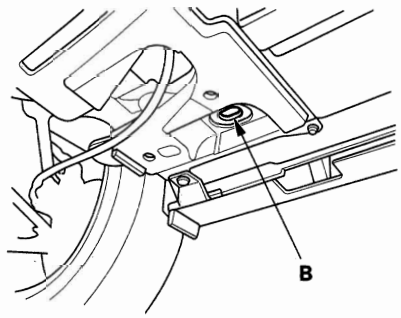
To accommodate flat-bed equipment, the vehicle is equipped with a rear towing hook (A) and rear tie down hook slots (B).

The rear towing hook can be used with a winch to pull the vehicle onto the truck, and the tie down hook slots can be used to secure the vehicle to the truck.

NOTE: The rear tie down hook slots use rubber plugs to cover the openings.







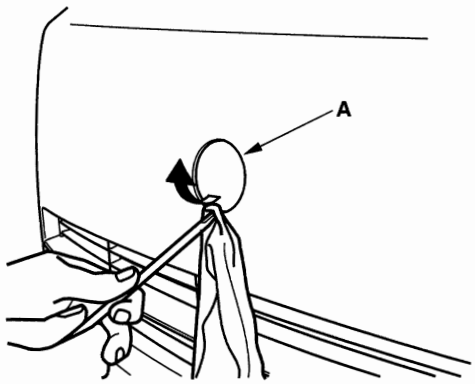
Front Towing Hook Installation

Use the front tow hook for very short distances such as freeing the car, use the detachable towing hook that mounts on the anchor in the front bumper.

NOTICE

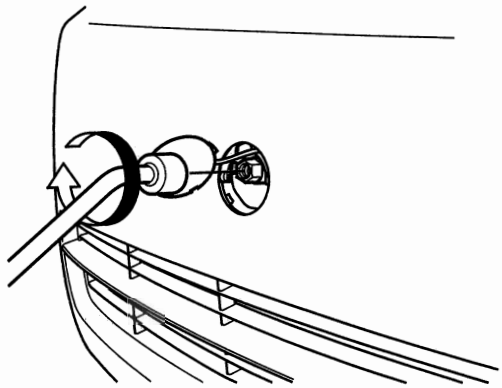
- To avoid damage to the vehicle use the towing hook for straight flat ground towing only. Do not tow as an angle.
- The tow hook should not be used to tow the vehicle onto a flat bed. Do not use it as a tie down.

1. Remove the cover (A) from the front bumper.

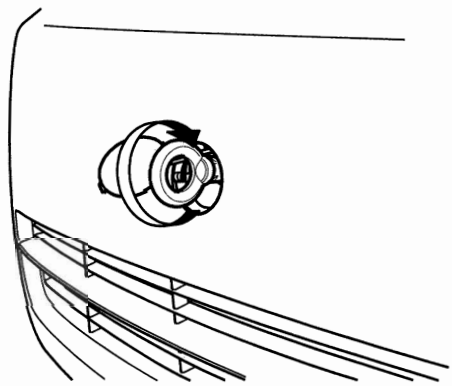


2. Remove the towing hook, hook extension, and wheel wrench from the tool case in the spare tire.

3. Using the wheel wrench, fasten the extension into the bolt hole in the anchor.



4. Screw the towing hook into the extension, and tighten it securely by hand.



(cont'd)

Towing (cont'd)

Wheel Lift Equipment — The tow truck uses two pivoting arms that go under the tires (front or rear) and lifts them off ground. The other two wheels remain on the ground. This is an acceptable way of towing the vehicle.

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 vehicle off the ground. The vehicle's suspension and body can be seriously damaged if this method of towing is attempted.

Do not use this method of towing.

If the vehicle cannot be transported by flat-bed, it should be towed with the front wheels off the ground. If due to damage, the vehicle 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 the D position, then to the N position.
- Turn off the engine.

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

NOTICE
- Improper towing preparations will damage the transmission. Follow the above procedure exactly. If you cannot shift the transmission or start the engine (automatic transmission), the vehicle must be transported on a flat-bed.
- Trying to lift or tow the vehicle by the bumpers will cause serious damage. The bumpers are not designed to support the vehicle's weight.

Parts Marking

To deter vehicle theft, certain major components are marked with the vehicle identification number (VIN). Original parts have self-adhesive labels. Replacement body parts have generic self-adhesive labels. The original engine or transmission VIN plate is transferred to a replacement engine or transmission and attached with break-off bolts.

NOTE: Be careful not to damage the parts marking labels during body repair. Mask the labels before repairing the part.

specs

Specifications

Standards and Service Limits

Design Specifications

Body Specifications

Standards and Service Limits

Engine Electrical

Item	Measurement	Qualification	Standard or New	Service Limit
Ignition coil	Rated voltage		12 V	
	Firing order		1−4−2−5−3−6	
Spark plug	Type		NGK: IZFR6K-11 DENSO: SKJ20DR-M11	
	Gap		1.0−1.1 mm (0.039−0.043 in.)	
Ignition timing		At idle (check the *red* mark)	A/T (in N or P position): 10±2° BTDC M/T (in neutral): 10±2° BTDC	
Alternator-compressor belt	Tension adjustment		Auto tensioner	
Alternator	Output at 13.5 V and normal engine temperature		130A	
	Coil (rotor) resistance	At 68°F (20°C)	2.5 k Ω	
	Slip ring O.D.		14.4 mm (0.57 in.)	14.0 mm (0.55 in.)
	Brush length		10.5 mm (0.41 in.)	1.5 mm (0.06 in.)
	Brush spring tension		3.2 N (0.33 kgf, 0.73 lbf)	
Starter	Output		1.6 kW	
	Commutator mica depth		0.4−0.5 mm (0.016−0.020 in.)	0.15 mm (0.006 in.)
	Commutator runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
	Commutator O.D.		28.0−28.1 mm (1.102−1.106 in.)	27.5 mm (1.083 in.)
	Brush length		15.8−16.2 mm (0.62−0.64 in.)	11.0 mm (0.43 in.)
	Brush spring tension (new)		15.7−17.7 N (1.60−1.80 kgf, 3.53−3.97 lbf)	

Engine Assembly

Item	Measurement	Qualification	Standard or New	Service Limit
Compression	Pressure Check the engine with the starter cranking.	Minimum	930 kPa (9.5 kgf/cm², 135 psi)	———
		Maximum variation	200 kPa (2.0 kgf/cm², 28 psi)	———

Cylinder Head

Item	Measurement	Qualification	Standard or New	Service Limit
Head	Warpage		———	0.05 mm (0.002 in.)
	Height		120.95–121.05 mm (4.762–4.766 in.)	———
Camshaft	End play		0.05–0.20 mm (0.002–0.008 in.)	0.20 mm (0.008 in.)
	Camshaft-to-holder oil clearance		0.050–0.089 mm (0.0020–0.0035 in.)	0.15 mm (0.006 in.)
	Total runout		0.03 mm (0.001 in.) max.	0.04 mm (0.002 in.)
	Cam lobe height	Intake, primary	35.041 mm (1.3796 in.)	———
		Intake, mid	36.445 mm (1.4348 in.)	———
		Intake, secondary	35.284 mm (1.3891 in.)	———
		Exhaust	36.326 mm (1.4302 in.)	———
Valve	Clearance (cold)	Intake	0.20–0.24 mm (0.008–0.009 in.)	———
		Exhaust	0.28–0.32 mm (0.011–0.013 in.)	———
	Stem O.D.	Intake	5.485–5.495 mm (0.2159–0.2163 in.)	5.455 mm (0.2148 in.)
		Exhaust	5.450–5.460 mm (0.2146–0.2150 in.)	5.420 mm (0.2134 in.)
	Stem-to-guide clearance	Intake	0.020–0.045 mm (0.0008–0.0018 in.)	0.08 mm (0.003 in.)
		Exhaust	0.055–0.080 mm (0.0022–0.0031 in.)	0.11 mm (0.004 in.)
Valve seat	Width	Intake	1.25–1.55 mm (0.049–0.061 in.)	2.00 mm (0.079 in.)
		Exhaust	1.25–1.55 mm (0.049–0.061 in.)	2.00 mm (0.079 in.)
	Stem installed height	Intake	46.75–47.55 mm (1.841–1.872 in.)	47.80 mm (1.882 in.)
		Exhaust	46.68–47.48 mm (1.838–1.869 in.)	47.73 mm (1.879 in.)
Valve spring	Free length	Intake	51.54 mm (2.029 in.)	———
		Exhaust	51.06 mm (2.010 in.)	———
Valve guide	I.D.	Intake	5.515–5.530 mm (0.2171–0.2177 in.)	5.55 mm (0.219 in.)
		Exhaust	5.515–5.530 mm (0.2171–0.2177 in.)	5.55 mm (0.219 in.)
	Installed height	Intake	21.20–22.20 mm (0.835–0.874 in.)	———
		Exhaust	20.60–21.60 mm (0.811–0.850 in.)	———
Rocker arm	Arm-to-shaft clearance	Intake	0.026–0.067 mm (0.0010–0.0026 in.)	0.067 mm (0.0026 in.)
		Exhaust	0.026–0.077 mm (0.0010–0.0030 in.)	0.077 mm (0.0030 in.)

Standards and Service Limits

Engine Block

Item	Measurement	Qualification	Standard or New	Service Limit
Block	Warpage of deck		0.07 mm (0.003 in.) max.	0.10 mm (0.004 in.)
	Bore diameter		89.000–89.015 mm (3.5039–3.5045 in.)	89.065 mm (3.5065 in.)
	Bore taper		———	0.05 mm (0.002 in.)
	Reboring limit		———	0.25 mm (0.01 in.)
Piston	Skirt O.D. at 16.0 mm (0.63 in.) from bottom of skirt		88.975–88.985 mm (3.5029–3.5033 in.)	88.965 mm (3.5026 in.)
	Clearance in cylinder		0.015–0.040 mm (0.0006–0.0016 in.)	0.08 mm (0.003 in.)
	Ring groove width	Top	1.240–1.250 mm (0.0488–0.0492 in.)	1.27 mm (0.050 in.)
		Second	1.220–1.230 mm (0.0480–0.0484 in.)	1.25 mm (0.049 in.)
		Oil	2.805–2.825 mm (0.1104–0.1112 in.)	2.85 mm (0.112 in.)
Piston ring	Ring-to-groove clearance	Top	0.055–0.080 mm (0.0022–0.0031 in.)	0.15 mm (0.006 in.)
		Second	0.030–0.055 mm (0.0012–0.0022 in.)	0.13 mm (0.005 in.)
	Ring end gap	Top	0.20–0.35 mm (0.008–0.014 in.)	0.60 mm (0.024 in.)
		Second	0.40–0.55 mm (0.016–0.022 in.)	0.70 mm (0.028 in.)
		Oil	0.20–0.70 mm (0.008–0.028 in.)	0.80 mm (0.031 in.)
Piston pin	O.D.		21.962–21.965 mm (0.8646–0.8648 in.)	21.954 mm (0.8643 in.)
	Pin-to-piston clearance		−0.0050 to +0.0010 mm (−0.00020 to +0.00004 in.)	0.004 mm (0.0002 in.)
Connecting rod	Pin-to-rod clearance		0.005–0.014 mm (0.0002–0.0006 in.)	0.019 mm (0.0007 in.)
	Small-end bore diameter		21.970–21.976 mm (0.8650–0.8652 in.)	———
	Large-end bore diameter	Nominal	58.0 mm (2.28 in.)	———
	End play installed on crankshaft		0.15–0.35 mm (0.006–0.014 in.)	0.45 mm (0.018 in.)
Crankshaft	Main journal diameter		71.976–72.000 mm (2.8337–2.8346 in.)	———
	Rod journal diameter		54.976–55.000 mm (2.1644–2.1654 in.)	———
	Rod/main journal taper		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	Rod/main journal out-of-round		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	End play		0.10–0.35 mm (0.004–0.014 in.)	0.45 mm (0.018 in.)
	Runout		0.025 mm (0.0010 in.) max.	0.03 mm (0.0012 in.)
Crankshaft bearing	Main bearing-to-journal oil clearance		0.020–0.044 mm (0.0008–0.0017 in.)	0.050 mm (0.0020 in.)
	Rod bearing clearance		0.020–0.044 mm (0.0008–0.0017 in.)	0.050 mm (0.002 in.)

Engine Lubrication

Item	Measurement	Qualification	Standard or New	Service Limit
Engine oil	Capacity	Engine overhaul	5.0 ℓ (5.3 US qt)	
		Oil change, including filter	4.3 ℓ (4.5 US qt)	
		Oil change, without filter	4.0 ℓ (4.2 US qt)	
Oil pump	Inner-to-outer rotor clearance		0.04–0.16 mm (0.002–0.006 in.)	0.20 mm (0.008 in.)
	Pump housing-to-outer rotor clearance		0.10–0.19 mm (0.004–0.007 in.)	0.20 mm (0.008 in.)
	Pump housing-to-outer rotor axial clearance		0.02–0.07 mm (0.001–0.003 in.)	0.12 mm (0.005 in.)
	Oil pressure with oil temperature at 176℉ (80℃)	At idle	70 kPa (0.7 kgf/cm², 10 psi)	
		At 3,000 rpm	490 kPa (5.0 kgf/cm², 71 psi)	

Cooling

Item	Measurement	Qualification	Standard or New
Radiator	Coolant capacity (includes engine, heater, hoses, and reservoir)	Engine overhaul	A/T model: 8.1 ℓ (8.6 US qt)
			M/T model: 7.9 ℓ (8.3 US qt)
		Coolant change	A/T model: 6.4 ℓ (6.8 US qt)
			M/T model: 6.3 ℓ (6.7 US qt)
Reservoir	Coolant capacity		0.6 ℓ (0.6 US qt)
Radiator cap	Opening pressure		93–123 kPa (0.95–1.25 kgf/cm², 14–18 psi)
Thermostat	Opening temperature	Begins to open	169–176℉ (76–80℃)
		Fully open	194℉ (90℃)
	Valve lift at fully open		10.0 mm (0.39 in.) min.

Standards and Service Limits

Fuel and Emissions

Item	Measurement	Qualification	Standard or New
Fuel pressure regulator	Pressure		400−450 kPa (4.0−4.5 kg/cm², 56−64 psi)
Fuel tank	Capacity		64.7 ℓ (17.1 US gal)
Engine idle	Idle speed without load	M/T in neutral A/T in N or P position	750±50 rpm
	Idle speed with high electric load (with HVAC on)	M/T in neutral A/T in N or P position	750±50 rpm

Clutch

Item	Measurement	Qualification	Standard or New	Service Limit
Clutch pedal	Height from floor		191 mm (7.52 in.)	———
	Stroke		130−140 mm (5.12−5.51 in.)	———
	Play		10−18 mm (0.39−0.71 in.)	———
	Disengagement height from floor		90.5 mm (3.56 in.) min.	———
Flywheel	Runout on clutch mating surface		0.05 mm (0.002 in.) max.	0.15 mm (0.006 in.)
Clutch disc	Rivet head depth		1.0 mm (0.039 in.)	0.2 mm (0.008 in.)
	Thickness		8.68−9.53 mm (0.342−0.375 in.)	7.2 mm (0.28 in.)
Pressure plate	Warpage		0.03 mm (0.001 in.) max.	0.15 mm (0.006 in.)
	Height of diaphragm spring fingers measured with special tool and feeler gauge		0.6 mm (0.02 in.) max.	0.8 mm (0.03 in.)

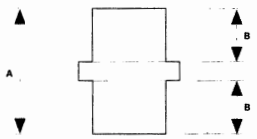
Manual Transmission and M/T Differential

Item	Measurement	Qualification	Standard or New	Service Limit
Transmission fluid	Capacity	Fluid change	2.2 ℓ (2.3 US qt)	
	Use Honda MTF	Overhaul	2.5 ℓ (2.6 US qt)	
Mainshaft	End play		0.14–0.21 mm (0.006–0.008 in.)	Adjust
	Diameter of pilot bearing surface		19.967–19.980 mm (0.7861–0.7866 in.)	19.91 mm (0.784 in.)
	Diameter of 4th and 5th gears distance collar		35.987–36.000 mm (1.4168–1.4173 in.)	35.93 mm (1.415 in.)
	Diameter of ball bearing contact area (clutch housing side)		28.002–28.015 mm (1.1024–1.1030 in.)	27.95 mm (1.100 in.)
	Diameter of needle bearing contact area		41.984–42.000 mm (1.6529–1.6535 in.)	41.93 mm (1.651 in.)
	Diameter of 6th gear distance collar		32.987–33.000 mm (1.2987–1.2992 in.)	32.93 mm (1.296 in.)
	Diameter of ball bearing contact area (transmission housing side)		30.987–31.000 mm (1.2200–1.2205 in.)	30.93 mm (1.218 in.)
	Runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
Mainshaft 3rd gear	I.D.		47.009–47.025 mm (1.8507–1.8514 in.)	47.08 mm (1.854 in.)
	End play		0.06–0.19 mm (0.002–0.007 in.)	0.3 mm (0.01 in.)
	Thickness		23.89–23.97 mm (0.941–0.944 in.)	23.8 mm (0.94 in.)
Mainshaft 4th and 5th gears	I.D.		47.009–47.025 mm (1.8507–1.8514 in.)	47.08 mm (1.854 in.)
	End play		0.06–0.19 mm (0.002–0.007 in.)	0.3 mm (0.01 in.)
	Thickness		22.39–22.47 mm (0.881–0.885 in.)	22.3 mm (0.88 in.)
Mainshaft 6th gear	I.D.		44.009–44.025 mm (1.7326–1.7333 in.)	44.08 mm (1.735 in.)
	End play		0.06–0.19 mm (0.002–0.007 in.)	0.3 mm (0.01 in.)
	Thickness		21.89–21.97 mm (0.862–0.865 in.)	21.8 mm (0.86 in.)
Countershaft	Diameter of needle bearing contact area (clutch housing side)		43.974–43.990 mm (1.7313–1.7319 in.)	43.92 mm (1.729 in.)
	Diameter of distance collar contact area		42.975–42.991 mm (1.6919–1.6926 in.)	42.92 mm (1.690 in.)
	Diameter of ball bearing contact area (transmission housing side)		30.002–30.015 mm (1.1812–1.1817 in.)	29.95 mm (1.179 in.)
	Diameter of countershaft reverse gear		45.934–45.950 mm (1.8084–1.8091 in.)	45.88 mm (1.806 in.)
	Runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
	35 mm shim-to-bearing inner race clearance		0.04–0.10 mm (0.0016–0.0039 in.)	Adjust
Countershaft 1st gear	I.D.		57.010–57.029 mm (2.2445–2.2452 in.)	57.08 mm (2.247 in.)
	End play		0.04–0.17 mm (0.002–0.007 in.)	0.28 mm (0.011 in.)
	Thickness		22.91–22.99 mm (0.902–0.905 in.)	22.86 mm (0.900 in.)
Countershaft 2nd gear	I.D.		57.010–57.029 mm (2.2445–2.2452 in.)	57.08 mm (2.247 in.)
	End play		0.04–0.17 mm (0.002–0.007 in.)	0.28 mm (0.011 in.)
	Thickness		22.91–22.99 mm (0.902–0.905 in.)	22.86 mm (0.900 in.)
Countershaft reverse gear	I.D.		45.970–45.988 mm (1.8098–1.8105 in.)	46.04 mm (1.813 in.)
	O.D.		51.987–52.000 mm (2.0467–2.0472 in.)	51.93 mm (2.044 in.)
	Length		23.03–23.08 mm (0.907–0.909 in.)	———
Countershaft 2nd gear distance collar	I.D.		42.990–43.000 mm (1.6925–1.6929 in.)	43.05 mm (1.695 in.)
	O.D.		51.989–52.000 mm (2.0468–2.0472 in.)	51.94 mm (2.045 in.)
	Length		23.03–23.08 mm (0.907–0.909 in.)	———

(cont'd)

Standards and Service Limits

Manual Transmission and M/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Mainshaft 4th and 5th gears distance collar	I.D.		36.002–36.012 mm (1.4174–1.4178 in.)	36.06 mm (1.420 in.)
	O.D.		41.989–42.000 mm (1.6531–1.6535 in.)	41.94 mm (1.651 in.)
	Length 	A	49.95–50.05 mm (1.967–1.970 in.)	———
		B	22.53–22.58 mm (0.887–0.889 in.)	———
Mainshaft 6th gear distance collar	I.D.		33.002–33.012 mm (1.2993–1.2997 in.)	33.06 mm (1.302 in.)
	O.D.		38.989–39.000 mm (1.5350–1.5354 in.)	38.94 mm (1.533 in.)
	Length		22.03–22.08 mm (0.867–0.869 in.)	———
Reverse gear shaft	O.D.		19.989–20.000 mm (0.7870–0.7874 in.)	19.93 mm (0.785 in.)
Reverse drive/ driven gear	I.D.		25.007–25.020 mm (0.9845–0.9850 in.)	25.07 mm (0.987 in.)
5th synchro ring	Ring-to-gear clearance	Ring pushed against gear	0.70–1.49 mm (0.028–0.059 in.)	0.4 mm (0.016 in.)
6th synchro ring	Ring-to-gear clearance	Ring pushed against gear	0.73–1.44 mm (0.029–0.057 in.)	0.4 mm (0.016 in.)
Double cone synchro	Outer synchro ring-to-synchro cone clearance	Ring pushed against gear	0.70–1.19 mm (0.028–0.047 in.)	0.3 mm (0.012 in.)
	Synchro cone-to-gear clearance	Ring pushed against gear	0.50–1.04 mm (0.020–0.041 in.)	0.3 mm (0.012 in.)
	Outer synchro ring-to-gear cone clearance	Ring pushed against gear	0.95–1.68 mm (0.037–0.066 in.)	0.6 mm (0.024 in.)
1st triple cone synchro	Outer synchro ring-to-synchro cone clearance	Ring pushed against gear	0.70–1.19 mm (0.028–0.047 in.)	0.3 mm (0.012 in.)
	Synchro cone-to-gear clearance	Ring pushed against gear	0.45–1.14 mm (0.018–0.045 in.)	0.3 mm (0.012 in.)
	Outer synchro ring-to-gear cone clearance	Ring pushed against gear	1.12–1.68 mm (0.044–0.066 in.)	0.6 mm (0.024 in.)
2nd triple cone synchro	Outer synchro ring-to-synchro cone clearance	Ring pushed against gear	0.70–1.19 mm (0.028–0.047 in.)	0.3 mm (0.012 in.)
	Synchro cone-to-gear clearance	Ring pushed against gear	0.60–1.88 mm (0.024–0.074 in.)	0.3 mm (0.012 in.)
	Outer synchro ring-to-gear cone clearance	Ring pushed against gear	0.87–1.82 mm (0.034–0.072 in.)	0.6 mm (0.024 in.)
1st/2nd, 3rd/4th, 5th/6th Shift fork	Finger thickness		7.4–7.6 mm (0.29–0.30 in.)	———
	Fork-to-synchro sleeve clearance		0.35–0.65 mm (0.014–0.026 in.)	1.0 mm (0.039 in.)
Reverse shift fork	Finger thickness		6.2–6.4 mm (0.24–0.25 in.)	———
	Fork-to-synchro sleeve clearance		0.35–0.65 mm (0.014–0.026 in.)	1.0 mm (0.039 in.)
Reverse shift lever	Finger thickness		6.400–6.650 mm (0.2520–0.2618 in.)	———
	Shift lever-to-shift fork clearance		0.05–0.50 mm (0.002–0.020 in.)	0.6 mm (0.024 in.)
	Shift lever diameter at contact area		13.0–13.2 mm (0.51–0.52 in.)	———
	Shift lever-to-interlock clearance		0–0.4 mm (0–0.015 in.)	0.5 mm (0.020 in.)
Shift piece	I.D.		14.000–14.068 mm (0.5512–0.5539 in.)	———
	Shift fork diameter at contact area		12.9–13.0 mm (0.50–0.51 in.)	———
	Shift piece-to-shift fork clearance		0.2–0.6 mm (0.008–0.024 in.)	0.7 mm (0.028 in.)

Item	Measurement	Qualification	Standard or New	Service Limit
Shift arm	I.D.		15.973 – 16.005 mm (0.6289 – 0.6301 in.)	———
	Shift piece diameter at contact area		13.9 – 14.0 mm (0.54 – 0.55 in.)	———
	Shift arm-to-shift piece clearance		0.05 – 0.25 mm (0.002 – 0.010 in.)	0.5 mm (0.020 in.)
Select arm	I.D.		11.01 – 11.05 mm (0.433 – 0.435 in.)	———
	Interlock diameter at contact area		12.9 – 13.0 mm (0.50 – 0.51 in.)	———
	Select arm-to-interlock clearance		0.05 – 0.25 mm (0.002 – 0.010 in.)	0.5 mm (0.020 in.)
Oil pump	Oil pump thrust clearance		0.03 – 0.13 mm (0.001 – 0.005 in.)	0.15 mm (0.006 in.)
	Outer rotor-to-body clearance		0.1 – 0.2 mm (0.004 – 0.008 in.)	0.22 mm (0.009 in.)
	Inner rotor-to-outer rotor clearance		0.14 mm (0.006 in.) max.	0.2 mm (0.008 in.)
	Oil pump inner rotor I.D.		17.1 – 17.2 mm (0.067 – 0.68 in.)	———
	Oil pump shaft O.D.		16.8 – 17.0 mm (0.66 – 0.67 in.)	———
M/T differential carrier	Backlash		0.4 – 1.3 mm (0.016 – 0.051 in.)	———
	Driveshaft contact area I.D.		30.025 – 30.045 mm (1.1821 – 1.1829 in.)	———
	Carrier bearing starting torque (preload)		3.43 – 4.51 N·m (35 – 46 kgf·cm, 30 – 40 lbf·in.)	Adjust

Standards and Service Limits

Automatic Transmission and A/T Differential

Item	Measurement	Qualification	Standard or New	Service Limit
ATF (Automatic Transmission Fluid)	Capacity	Fluid change	3.0 ℓ (3.2 US qt)	
	Use Honda ATF-Z1	Overhaul	7.0 ℓ (7.4 US qt)	
ATF pressure	Line pressure	At 2,000 rpm in N or P position	900–960 kPa (9.2–9.8 kgf/cm², 130–140 psi)	850 kPa (8.7 kgf/cm², 120 psi)
	5th clutch pressure	At 2,000 rpm in M position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	4th clutch pressure	At 2,000 rpm in M position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	3rd clutch pressure	At 2,000 rpm in M position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	2nd clutch pressure	At 2,000 rpm in M position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	1st clutch pressure	At 2,000 rpm in M position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	1st-hold clutch pressure	At 2,000 rpm in L position	760–830 kPa (7.7–8.5 kgf/cm², 110–120 psi)	710 kPa (7.2 kgf/cm², 100 psi)
Torque converter	Stall speed Check with vehicle on level ground		2,000 rpm	1,850–2,150 rpm
Clutch	Clutch end-plate-to-top-disc clearance	1st	———	1.1–1.3 mm (0.043–0.051 in.)
		2nd	———	0.85–1.05 mm (0.033–0.041 in.)
		3rd	———	0.7–0.9 mm (0.028–0.035 in.)
		4th, 5th	———	0.55–0.75 mm (0.022–0.030 in.)
		1st-hold	———	0.5–0.9 mm (0.020–0.035 in.)
	Clutch return spring free length	1st	68.3 mm (2.69 in.)	66.3 mm (2.61 in.)
		2nd	53.4 mm (2.10 in.)	51.4 mm (2.02 in.)
		3rd	52.0 mm (2.05 in.)	50.0 mm (1.97 in.)
		4th	33.5 mm (1.32 in.)	31.5 mm (1.24 in.)
		5th	37.4 mm (1.47 in.)	35.4 mm (1.39 in.)
	Clutch disc thickness		1.94 mm (0.076 in.)	———
	Clutch plate thickness	1st, 2nd	1.6 mm (0.063 in.)	When discolored
		3rd, 4th	2.3 mm (0.091 in.)	When discolored
		5th	2.0 mm (0.079 in.)	When discolored
		1st-hold	1.8 mm (0.071 in.)	When discolored
	1st clutch end plate thickness	Mark 1	3.10 mm (0.122 in.)	When discolored
		Mark 2	3.20 mm (0.126 in.)	When discolored
		Mark 3	3.30 mm (0.130 in.)	When discolored
		Mark 4	3.40 mm (0.134 in.)	When discolored
		Mark 5	3.50 mm (0.138 in.)	When discolored
		Mark 6	3.60 mm (0.142 in.)	When discolored
		Mark 7	3.70 mm (0.146 in.)	When discolored
		Mark 8	3.80 mm (0.150 in.)	When discolored
		Mark 9	3.90 mm (0.154 in.)	When discolored
	1st-hold clutch end plate thickness		5.00 mm (0.197 in.)	When discolored

Item	Measurement	Qualification	Standard or New	Service Limit
Clutch	2nd clutch end plate thickness	Mark 1	2.10 mm (0.083 in.)	When discolored
		Mark 2	2.20 mm (0.087 in.)	When discolored
		Mark 3	2.30 mm (0.091 in.)	When discolored
		Mark 4	2.40 mm (0.094 in.)	When discolored
		Mark 5	2.50 mm (0.098 in.)	When discolored
		Mark 6	2.60 mm (0.102 in.)	When discolored
		Mark 7	2.70 mm (0.106 in.)	When discolored
		Mark 8	2.80 mm (0.110 in.)	When discolored
		Mark 9	2.90 mm (0.114 in.)	When discolored
	3rd clutch end plate thickness	Mark 1	2.10 mm (0.083 in.)	When discolored
		Mark 2	2.20 mm (0.087 in.)	When discolored
		Mark 3	2.30 mm (0.091 in.)	When discolored
		Mark 4	2.40 mm (0.094 in.)	When discolored
		Mark 5	2.50 mm (0.098 in.)	When discolored
		Mark 6	2.60 mm (0.102 in.)	When discolored
		Mark 7	2.70 mm (0.106 in.)	When discolored
		Mark 8	2.80 mm (0.110 in.)	When discolored
		Mark 9	2.90 mm (0.114 in.)	When discolored
		Mark 10	3.00 mm (0.118 in.)	When discolored
		Mark 11	3.10 mm (0.122 in.)	When discolored
	4th and 5th clutch end plate thickness	Mark 1	2.10 mm (0.083 in.)	When discolored
		Mark 2	2.20 mm (0.087 in.)	When discolored
		Mark 3	2.30 mm (0.091 in.)	When discolored
		Mark 4	2.40 mm (0.094 in.)	When discolored
		Mark 5	2.50 mm (0.098 in.)	When discolored
		Mark 6	2.60 mm (0.102 in.)	When discolored
		Mark 7	2.70 mm (0.106 in.)	When discolored
		Mark 8	2.80 mm (0.110 in.)	When discolored
		Mark 9	2.90 mm (0.114 in.)	When discolored
ATF pump	Stator shaft needle bearing contact I.D.	Torque converter side	27.000 – 27.021 mm (1.0630 – 1.0638 in.)	When worn or damaged
		ATF pump side	29.000 – 29.021 mm (1.1417 – 1.1426 in.)	When worn or damaged
	ATF pump gear thrust clearance		0.03 – 0.06 mm (0.001 – 0.002 in.)	0.07 mm (0.003 in.)
	ATF pump gear-to-body clearance	Drive gear	0.210 – 0.265 mm (0.0083 – 0.0104 in.)	———
		Driven gear	0.070 – 0.125 mm (0.0028 – 0.0049 in.)	———
	ATF pump driven gear I.D.		14.016 – 14.034 mm (0.5518 – 0.5525 in.)	When worn or damaged
	ATF pump driven gear shaft O.D.		13.980 – 13.990 mm (0.5504 – 0.5508 in.)	When worn or damaged
Reverse shift fork	Fork finger thickness		5.90 – 6.00 mm (0.232 – 0.236 in.)	5.40 mm (0.213 in.)
Park gear and pawl			———	When worn or damaged
Servo body	Shift fork shaft bore I.D.		14.000 – 14.010 mm (0.5512 – 0.5516 in.)	———
	Shift fork shaft valve bore I.D.		37.000 – 37.039 mm (1.4567 – 1.4582 in.)	37.045 mm (1.4585 in.)
Regulator valve body	Sealing ring contact I.D.		32.000 – 32.025 mm (1.2598 – 1.2608 in.)	32.050 mm (1.2618 in.)
Accumulator body	Sealing ring contact I.D.		35.000 – 35.025 mm (1.3780 – 1.3789 in.)	35.05 mm (1.3799 in.)
Stator shaft	Sealing ring contact I.D.		29.000 – 29.021 mm (1.1417 – 1.1426 in.)	29.050 mm (1.1437 in.)

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Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Mainshaft	Diameter of needle bearing contact area	At stator shaft	22.984 – 23.000 mm (0.9049 – 0.9055 in.)	When worn or damaged
		At 4th gear	52.975 – 52.991 mm (2.0856 – 2.0863 in.)	When worn or damaged
		At 5th gear collar	33.975 – 33.991 mm (1.3376 – 1.3382 in.)	When worn or damaged
	I.D. of 4th gear		59.000 – 59.019 mm (2.3228 – 2.3236 in.)	When worn or damaged
	I.D. of 5th gear		40.000 – 40.016 mm (1.5748 – 1.5754 in.)	When worn or damaged
	End play of 4th gear		0.03 – 0.31 mm (0.001 – 0.012 in.)	———
	End play of 5th gear		0.10 – 0.22 mm (0.004 – 0.009 in.)	———
	41 x 73 mm thrust shim thickness	No. 1	7.85 mm (0.309 in.)	When worn or damaged
		No. 2	7.90 mm (0.311 in.)	When worn or damaged
		No. 3	7.95 mm (0.313 in.)	When worn or damaged
		No. 4	8.00 mm (0.315 in.)	When worn or damaged
		No. 5	8.05 mm (0.317 in.)	When worn or damaged
		No. 6	8.10 mm (0.319 in.)	When worn or damaged
	Thrust washer thickness	27 x 47 x 5 mm	5.00 mm (0.197 in.)	When worn or damaged
	Length of 5th gear collar		58.5 – 58.6 mm (2.303 – 2.307 in.)	———
	5th gear collar flange thickness		4.45 – 4.60 mm (0.175 – 0.181 in.)	When worn or damaged
	Sealing ring thickness	32 mm sealing ring	1.87 – 1.97 mm (0.074 – 0.078 in.)	1.800 mm (0.071 in.)
		29 mm sealing ring	1.87 – 1.97 mm (0.074 – 0.078 in.)	1.800 mm (0.071 in.)
	Width of sealing ring groove		2.025 – 2.060 mm (0.080 – 0.081 in.)	2.080 mm (0.082 in.)
	Clutch feed pipe O.D.	4th clutch	5.97 – 5.98 mm (0.2350 – 0.2354 in.)	5.95 mm (0.2343 in.)
		5th clutch	11.47 – 11.48 mm (0.4516 – 0.4520 in.)	11.45 mm (0.4508 in.)
	Clutch feed pipe bushing I.D.	4th clutch	6.018 – 6.030 mm (0.2369 – 0.2374 in.)	6.045 mm (0.2380 in.)
		5th clutch	11.500 – 11.518 mm (0.4528 – 0.4535 in.)	11.530 mm (0.4539 in.)

Item	Measurement	Qualification	Standard or New	Service Limit
Countershaft	Diameter of needle bearing contact area	At 5th gear	34.975–34.991 mm (1.3770–1.3776 in.)	When worn or damaged
		At 2nd gear	39.979–40.000 mm (1.574–1.575 in.)	When worn or damaged
		At park gear	41.964–41.980 mm (1.6521–1.6528 in.)	When worn or damaged
		At right end	38.505–38.515 mm (1.5159–1.5163 in.)	When worn or damaged
	I.D. of 5th gear		41.000–41.016 mm (1.6142–1.6148 in.)	When worn or damaged
	I.D. of 3rd gear		50.000–50.016 mm (1.9685–1.9691 in.)	When worn or damaged
	I.D. of reverse gear		46.000–46.016 mm (1.8110–1.8116 in.)	When worn or damaged
	End play of 1st gear		0.00–0.33 mm (0.000–0.013 in.)	———
	End play of 5th gear		0.04–0.27 mm (0.002–0.011 in.)	———
	End play of 3rd gear		0.015–0.045 mm (0.0006–0.0018 in.)	———
	End play of reverse gear		0.10–0.25 mm (0.004–0.010 in.)	———
	31 x 63.5 x 8.5 mm splined washer difference	A	3.503–3.515 mm (0.1379–0.1384 in.)	When worn or damaged
		B	3.490–3.502 mm (0.1374–0.1379 in.)	When worn or damaged
		C	3.477–3.489 mm (0.1369–0.1374 in.)	When worn or damaged
		D	3.464–3.476 mm (0.1364–0.1369 in.)	When worn or damaged
	Length of distance collar	35 x 47 x 45.6 mm	45.56–45.60 mm (1.794–1.795 in.)	———
		35 x 47 x 7.8 mm	5.92–5.96 mm (0.233–0.235 in.)	———
	Cotter thickness		1.99–2.02 mm (0.078–0.080 in.)	———
	Reverse selector hub O.D.		55.87–55.90 mm (2.1996–2.2008 in.)	When worn or damaged
	Clutch feed pipe O.D.		8.97–8.98 mm (0.353–0.354 in.)	8.95 mm (0.352 in.)
	Clutch feed pipe bushing I.D.		9.000–9.015 mm (0.354–0.355 in.)	9.030 mm (0.356 in.)

(cont'd)

Standards and Service Limits

Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Secondary shaft	Diameter of needle bearing contact area	At 1st gear	37.978 – 37.993 mm (1.4951 – 1.4958 in.)	When worn or damaged
		At 2nd gear	33.986 – 33.999 mm (1.3380 – 1.3385 in.)	When worn or damaged
	I.D. of 1st gear		44.000 – 44.016 mm (1.7323 – 1.7329 in.)	When worn or damaged
	I.D. of 2nd gear		40.000 – 40.016 mm (1.5748 – 1.5754 in.)	When worn or damaged
	End play of 1st gear		0.07 – 0.15 mm (0.003 – 0.006 in.)	———
	End play of 2nd gear		0.04 – 0.12 mm (0.002 – 0.005 in.)	———
	38 x 56.5 mm splined washer thickness	No. 1	6.85 mm (0.270 in.)	When worn or damaged
		No. 2	6.90 mm (0.272 in.)	When worn or damaged
		No. 3	6.95 mm (0.274 in.)	When worn or damaged
		No. 4	7.00 mm (0.276 in.)	When worn or damaged
		No. 5	7.05 mm (0.278 in.)	When worn or damaged
		No. 6	7.10 mm (0.280 in.)	When worn or damaged
	37 x 55 mm thrust shim thickness	No. 1	4.90 mm (0.193 in.)	When worn or damaged
		No. 2	4.95 mm (0.195 in.)	When worn or damaged
		No. 3	5.00 mm (0.197 in.)	When worn or damaged
		No. 4	5.05 mm (0.199 in.)	When worn or damaged
		No. 5	5.10 mm (0.201 in.)	When worn or damaged
		No. 6	5.15 mm (0.203 in.)	When worn or damaged
		No. 7	5.20 mm (0.205 in.)	When worn or damaged
	Cotter thickness		1.99 – 2.02 mm (0.078 – 0.080 in.)	———
	Sealing ring thickness		1.890 – 1.950 mm (0.074 – 0.077 in.)	1.800 mm (0.071 in.)
	Width of sealing ring groove		2.025 – 2.060 mm (0.080 – 0.081 in.)	2.080 mm (0.082 in.)
	Clutch feed pipe O.D.		7.97 – 7.98 mm (0.3138 – 0.3142 in.)	7.95 mm (0.3130 in.)
	Clutch feed pipe bushing I.D.		8.000 – 8.015 mm (0.3150 – 0.3156 in.)	8.030 mm (0.3161 in.)
Reverse idler gear	Diameter of needle bearing contact area	At reverse idler gear shaft	13.990 – 14.000 mm (0.5508 – 0.5512 in.)	When worn or damaged
	End play		0.06 – 0.38 mm (0.002 – 0.015 in.)	———
	I.D.		18.007 – 18.020 mm (0.7089 – 0.7094 in.)	When worn or damaged
	Thrust washer thickness	Transmission housing side	0.96 – 1.04 mm (0.038 – 0.041 in.)	———
		Reverse idler gear shaft holder side	0.97 – 1.05 mm (0.038 – 0.041 in.)	———
	I.D. of reverse idler gear shaft holder		14.006 – 14.024 mm (0.5514 – 0.5521 in.)	When worn or damaged
	I.D. of transmission housing of reverse idler gear shaft contact area		14.006 – 14.024 mm (0.5514 – 0.5521 in.)	———

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coils
Main valve body spring (see page 14-264)	Shift valve D spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	33.7 mm (1.327 in.)	12.6
	Shift valve C spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
	Kick-down valve spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
	Modulator valve spring		1.6 mm (0.063 in.)	10.4 mm (0.409 in.)	33.5 mm (1.319 in.)	9.8
	Relief valve spring		1.2 mm (0.047 in.)	11.1 mm (0.437 in.)	39.0 mm (1.535 in.)	9.9
	Lock-up shift valve spring		0.9 mm (0.035 in.)	7.6 mm (0.299 in.)	63.0 mm (2.480 in.)	22.4
	Cooler check valve spring		0.6 mm (0.024 in.)	5.8 mm (0.228 in.)	14.5 mm (0.571 in.)	6.8
	Torque converter check valve spring		1.2 mm (0.047 in.)	8.6 mm (0.339 in.)	33.4 mm (1.315 in.)	11.7
	Servo control valve spring		0.9 mm (0.035 in.)	6.4 mm (0.252 in.)	32.5 mm (1.280 in.)	17.5
	Reverse CPC valve spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
Regulator valve body spring (see page 14-266)	Stator reaction spring		4.5 mm (0.177 in.)	35.4 mm (1.394 in.)	30.3 mm (1.193 in.)	2.1
	Regulator valve spring A		1.9 mm (0.075 in.)	14.7 mm (0.579 in.)	80.6 mm (3.173 in.)	16.1
	Regulator valve spring B		1.6 mm (0.063 in.)	9.2 mm (0.362 in.)	44.0 mm (1.732 in.)	12.5
	Lock-up control valve spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	42.9 mm (1.689 in.)	15.3
	Lock-up timing valve spring		0.65 mm (0.026 in.)	6.6 mm (0.260 in.)	34.8 mm (1.370 in.)	14.1
Servo body spring (see page 14-267)	CPC valve B spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	CPC valve A spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	Shift valve B spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
	Shift valve A spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
Top accumulator body spring (see page 14-268)	Shift valve E spring		0.8 mm (0.031 in.)	7.1 mm (0.280 in.)	49.0 mm (1.929 in.)	17.2
	CPC valve C spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	5th accumulator spring A		2.2 mm (0.087 in.)	16.4 mm (0.646 in.)	75.7 mm (2.980 in.)	14.2
	5th accumulator spring B		2.0 mm (0.079 in.)	10.0 mm (0.394 in.)	45.5 mm (1.791 in.)	11.6
	4th/1st-hold accumulator spring		3.4 mm (0.134 in.)	19.6 mm (0.772 in.)	57.4 mm (2.260 in.)	8.4

Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coils
Accumulator body spring (see page 14-269)	1st accumulator spring B		2.3 mm (0.091 in.)	12.6 mm (0.496 in.)	42.0 mm (1.654 in.)	9.9
	1st accumulator spring A		2.4 mm (0.094 in.)	19.5 mm (0.768 in.)	67.7 mm (2.665 in.)	10.2
	2nd accumulator spring B		2.6 mm (0.102 in.)	13.0 mm (0.512 in.)	44.0 mm (1.732 in.)	9.0
	2nd accumulator spring A		2.5 mm (0.098 in.)	19.6 mm (0.772 in.)	57.7 mm (2.272 in.)	9.5
3rd accumulator spring (see page 14-270)	3rd accumulator spring		3.1 mm (0.122 in.)	19.6 mm (0.772 in.)	39.4 mm (1.551 in.)	5.5

Item	Measurement	Qualification	Standard or New	Service Limit
A/T differential carrier	Pinion shaft contact area I.D.		18.010 – 18.028 mm (0.7091 – 0.7098 in.)	———
	Carrier-to-pinion shaft clearance		0.023 – 0.057 mm (0.0009 – 0.0022 in.)	0.1 mm (0.004 in.)
	Driveshaft contact area I.D.		28.025 – 30.055 mm (1.103 – 1.104 in.)	———
	Carrier-to-driveshaft clearance		0.045 – 0.096 mm (0.002 – 0.004 in.)	0.12 mm (0.005 in.)
	Carrier-to-intermediate shaft clearance		0.080 – 0.116 mm (0.003 – 0.005 in.)	———
	Tapered roller bearing starting torque (preload)	For new bearing	2.9 – 4.1 N·m (30 – 42 kgf·cm, 26 – 36 lbf·in.)	Adjust
		For used bearing	2.6 – 3.8 N·m (27 – 39 kgf·cm, 23 – 34 lbf·in.)	Adjust
A/T differential pinion gear	Backlash		0.05 – 0.15 mm (0.002 – 0.006 in.)	———
	I.D.		18.042 – 18.066 mm (0.7103 – 0.7113 in.)	———
	Pinion gear-to-pinion shaft clearance		0.055 – 0.095 mm (0.0022 – 0.0037 in.)	0.12 mm (0.005 in.)